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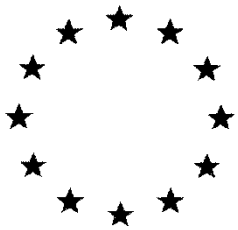

Draft Renewal Assessment Report prepared according to the Commission Regulation (EU) N° 1107/2009

Fenoxaprop-P-ethyl

Volume 3 – B.9 (AS)

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B.9. ECOTOXICOLOGY DATA

INTRODUCTION

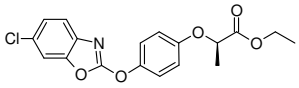
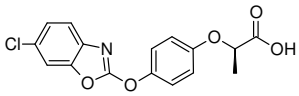
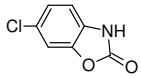
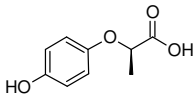
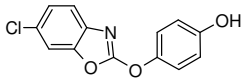
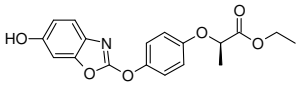
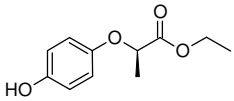
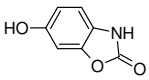
This summary on "Ecotoxicological studies of Fenoxaprop-P-ethyl" has been prepared on behalf of the Regulatory Task Force Fenoxaprop-P-ethyl, existing since 2013 and represented by Cheminova A/S and Bayer CropScience.

Fenoxaprop-p-ethyl is an herbicidal active substance and was included into Annex I of Directive 91/414/EEC in 2008 (Commission Directive 2008/66/EC of 30 June 2008). The approval is now in place under Regulation (EC) 1107/2009 (repealing Commission Directive 91/414/EEC) as specified in Commission Implementing Regulation (EU) No. 540/2011 of 25 May 2011. In the Review Report for the active substance Fenoxaprop-P-ethyl (SANCO/3777/08-rev.1, 14 December 2007) for the first approval, there were no substantial data gaps left open for the section ecotoxicology.

This renewal assessment report (RAR) contains summaries of studies on Fenoxaprop-p-ethyl, which were not available at the time of the Annex I inclusion under Directive 91/414/EEC and were, therefore, not evaluated during the first EU review of this compound. In addition, all studies, which were already submitted for the Annex I inclusion under Directive 91/414/EEC, were re-evaluated according to the current valid test guidelines and were summarised in the RAR.
Studies which were submitted for the first EU peer-review of the active substance Fenoxaprop-p-ethyl but are no longer a data requirement according to the data requirements for active substances (Commission Regulation (EU) 283/2013) and/or plant protection products (Commission Regulation (EU) 284/2013) are briefly summarised (text in italic).

In case where reliable and adequate literature was found during the literature search, summaries are integrated in the respective sections of the RAR.

Table B.9-1: Substances and metabolites (structure, synonyms and codes)

Code number (Synonyms)	Chemical name and molecular formula	Mol weight (g/mol)	Occurrence (% AR)	Structure
Fenoxaprop-P-ethyl[(a)] (AE F046360)	ethyl (2R)-2-{4-[(6-chloro-1,3-benzoxazol-2-yl)oxy] phenoxy}propanoate $C_{18}H_{16}ClNO_5$	361.8	Not applicable	
Fenoxaprop-P-acid[(b)] (AE F088406)	(2R)-2-{4-[(6-chloro-1,3-benzoxazol-2-yl)oxy] phenoxy}propanoic acid $C_{16}H_{12}ClNO_5$	333.7	**Aerobic soil: 85.8 %[(c)]** **Anaerobic soil: 94.8 %[(c)]** Soil photolysis: - Aquatic hydrolysis: 95.6 % (*p*H 9, 25 °C) Aerobic surface water: 101.4 % **Water/sediment: 97.2 %**	
Chlorobenz-oxazolone (AE F054014)	6-chloro-1,3-benzoxazol-2(3H)-one $C_7H_4ClNO_2$	169.6	**Aerobic soil: 19.1 %** **Anaerobic soil: 7.5 %** **Soil photolysis: 6.8 %** Aquatic hydrolysis: 102.4 % (*p*H 4, 25 °C) Aquatic photolysis: 7.1 % Aerobic surface water: 36.8 % **Water/sediment: 8.5 %**	
HOPP-acid[(d)] (AE F096918)	(2R)-2-(4-hydroxyphenoxy) propanoic acid $C_9H_{10}O_4$	182.2	Aerobic soil: - **Anaerobic soil: 74.1 %[(e)]** Soil photolysis: - Aquatic hydrolysis: 14.2 % (*p*H 9, 25 °C) Aquatic photolysis: 2.1 % Aerobic surface water: 21.0 % **Water/sediment: 26.3 %**	
Phenol metabolite (AE F040356)	4-[(6-chloro-1,3-benzoxazol-2-yl) oxy]phenol $C_{13}H_8ClNO_3$	261.7	Aerobic soil: 1.2 % Anaerobic soil: 2.2 % Soil photolysis: - Aquatic hydrolysis: - Aquatic photolysis: 5.9 % Aerobic surface water: - **Water/sediment: 13.1 %**	
Fenoxaprop-P-ethyl-dechloro-hydroxy (Fenoxaprop-dechloro-hydroxy, EHBPP, BCS-CY11271)	ethyl (2R)-2-{4-[(6-hydroxy-1,3-benzoxazol-2-yl)oxy] phenoxy}propanoate $C_{18}H_{17}NO_6$	343.3	Aerobic soil: - Anaerobic soil: - Soil photolysis: - Aquatic hydrolysis: - **Aquatic photolysis: 17.7 %** Aerobic surface water: - Water/sediment: -	
AE F029062	ethyl (2R)-2-(4-hydroxyphenoxy) propanoate $C_{11}H_{14}O_4$	210.2	Aerobic soil: - Anaerobic soil: - Soil photolysis: - Aquatic hydrolysis: 101.2 % (*p*H 4, 25 °C) Aquatic photolysis: 3.3 % Aerobic surface water: - Water/sediment: -	
Hydroxybenz-oxazolone (AE 0316854)	6-hydroxy-1,3-benzoxazol-2(3H)-one $C_7H_5NO_3$	151.1	Aerobic soil: - Anaerobic soil: - Soil photolysis: - Aquatic hydrolysis: - Aquatic photolysis: 5.5 % Aerobic surface water: - Water/sediment: -	

Code number (Synonyms)	Chemical name and molecular formula	Mol weight (g/mol)	Occurrence (% AR)	Structure
AE F031886	ethyl (2R)-2-[4-(1,3-benzoxazol-2-yloxy) phenoxy]propanoate $C_{18}H_{17}NO_5$	327.3	Aerobic soil: - Anaerobic soil: - Soil photolysis: - Aquatic hydrolysis: - Aquatic photolysis: 1.4 % Aerobic surface water: - Water/sediment: -	
AE F064124	6-chloro-5-hydroxy-1,3-benzoxazol-2(3H)-one $C_7H_4ClNO_3$	185.6	Aerobic soil: - Anaerobic soil: - Soil photolysis: - Aquatic hydrolysis: 1.0 % (*p*H 4, 40 °C) Aquatic photolysis: - Aerobic surface water: - Water/sediment: -	
HOPP-acid dimer (AE F096918 dimer)	$C_{18}H_{17}O_8$	361.1	Aerobic soil: - Anaerobic soil: - Soil photolysis: - Aquatic hydrolysis: - Aquatic hydrolysis: 10.6 % (*p*H 9, 40 °C) Aerobic surface water: - Water/sediment: -	

(a) Racemic mixture of R/S (approx. 1/1) is called AE F033171
(b) Racemic mixture of R/S (approx. 1/1) is called AE F053022
(c) Arithmetic mean of ClPh and Ph label applied to the same soil
(d) Racemic mixture of R/S (approx. 1/1) is called AF F020686
(e) Racemic mixture (AE F020686) of HOPP-acid (AE F096918) observed after application of racemic fenoxaprop-ethyl (AE F033171); HOPP acid (AE F096918) max. 49.2 % of AR in study with non-racemic Fenoxaprop-P-ethyl (AE F046360) applied

B.9.1. EFFECTS ON BIRDS AND OTHER TERRESTRIAL VERTEBRATES

B.9.1.1. Effects on birds

No additional studies were submitted for the renewal of the active substance Fenoxaprop-P-ethyl. The studies submitted for the first EU approval of the active substance are summarised below. In addition, the studies were evaluated according to the representative test guidelines.

B.9.1.1.1. Acute oral toxicity to birds

Reference:	**Acute oral toxicity in the male and female Japanese quail (*Coturnix coturnix* japonica) Hoe 046360 active ingredient technical Code: Hoe 046360 0H ZC96 0002**
Author(s), year:	[redacted]; 1987
Report/Doc. number:	Study no. A36978, Reference no. M-118746-01-1
Guideline(s):	US EPA Subdivision E, 71-1 (Avian single-dose oral LD_{50}), October 1982
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Hoe 046360 - active ingredient technical Fenoxaprop-P-ethyl certificate of analysis : 02912, purity : 95.9%
Test species:	Japanese quail (*Coturnix coturnix* japonica)
Number of organisms:	5 males and 5 females per treatment group
Weight, age:	108 – 172 g bodyweight, ca. 6 months
Type of test:	Acute oral toxicity
Applied concentrations:	0 (corn sesame oil vehicle only), 500, 1000 and 2000 mg a.s./kg bw, dosage volume: dosage volume: 10 mL/kg body weight
Type of application:	Administered by means of a rubber catheter into stomach or preventriculus, diluent: sesam oil
Time of exposure:	One single application, monitoring during 14 days
Test conditions:	Test temperature: 20-25 °C, relative humidity: 50-70 %, lightning: 8 h light and 16 h darkness. Feed (quail grower ration prepared by the Baierseich Experimental Farm of Hoechst AG) was provided ad libitum during the study.

Test parameter:

Observations:	After treatment, signs of intoxication, mortality rate and times of death were recorded. The birds were weighed on days 3, 7 and 14 of the 14-day observation period. The total food consumption per group was also recorded for days 0 - 3, 3 -

7 and 7 - 14 after treatment (day 0 = day of treatment). Birds found dead during the study were dissected and examined macroscopically. At the end of the observation period, the surviving birds were killed by carbon dioxide asphyxiation, dissected and also examined for macroscopically visible changes.

Statistics: The LD_{50}, the 95 % confidence range and the mathematical equation of the probit curves could not be calculated by probit analysis on the basis of the mortality rate.

Findings:

Mortalities: One death (cock) occurred at 1000 mg/kg and 4 deaths (2 hens, 2 cocks) at 2000 mg/kg between days 1 and 4 after dosing.

Clinical signs: There were no clinical signs in the 500 mg/kg group. Ruffled feathers and reduced spontaneous activity occurred frequently in the 1000 mg/kg group, and also, together with standing on hocks, in the 2000 mg/kg group. From the 5th day after treatment at latest, all of the birds were free of clinical signs of intoxication.

Body weight, feed consumption: Temporary slight reductions in body weights and food consumption were observed during the first 3 days after treatment, but only among the birds in the highest dose group.

Table B. 9.1.1.1-1: Mortality and growth (bodyweights and food consumption) of Japanese quail following acute oral exposure (gavage)

Test substance [mg a.s./kg]	Cumulative mortality	Sex	Mean bodyweight [%][a]				Food consumption [g/bird/d]		
			0	3	7	14	0-3	3-7	7-14
Control	0	♂	123	132	134	134	36.3	26.3	21.2
	0	♀	131	144	151	143			
1000	1	♂	124	123	132	136	15.2	25	20.5
	0	♀	147	145	152	156			
2000	2	♂	120	109	119	131	11.9	19.7	25.9
	2	♀	143	131	152	155			
Control	0	♂	124	12 6	132	134	15.1	23.6	26.9
	0	♀	137	141	150	148			
500	0	♂	127	125	133	137	12.6	13.9	35.1
	0	♀	145	139	144	142			

[a] The percentage references in each case are to the last weighing

Conclusion: LD_{50} > 2000 mg a.s./kg bw, NOEL = 500 mg a.s./kg bw

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines OCSPP 850.2100 (January, 2012) and OECD 223 (July, 2010)

Check of validity criteria of OCSPP 850.2100:

- Birds were not randomly assigned to treatment and control pens: fulfilled
- More than 10% of the control birds died during the test: fulfilled, actual 0 %

- A minimum of ten birds were not used for each dose level of the test substance and control: fulfilled
- The test substance was not orally administered, via either capsule or gavage: fulfilled
- In the definitive test a minimum of five dose levels of the test substance, plus an appropriate control, were not tested: The test design with three doses actually did not follow one of the recommended designs: 5 dose levels (OCSPP 850.2100) or sequential testing (OECD 223). However, both guidelines also give the possibility of a limit test with 10 individuals at 2000 mg/kg (or higher). It has to be noted that according to the guideline 223 a stage 2 sequential test design would have been necessary if 2-4 birds died (as seen in the 200 mg a.s./kg dose group), nevertheless as 2 controls and 3 concentrations with 10 birds have been tested this deviation is considered acceptable.

Check of validity criteria of OECD 223:
- 10 % mortality in the control: fulfilled, actual 0 %

In addition, the following points deviated from the test guideline or were not reported in detail:
- No detailed information on the breeding conditions was given

Acceptability of the analytical methods used in the test:
The available information is not sufficient to evaluate the acceptability of the analytical methods according to the guidance documents SANCO/3029/99 rev. 4.

Endpoints: The NOEL for lethal effects is proposed to be 500 mg/kg. It is noted that according to OCSPP 850.2100 a definitive test would have to be conducted as "frank" effects (reduction of body weight) were observed. However these effects were only temporary and this test is not considered necessary. According to OECD 223 no further testing is triggered.
LD_{50} > 2000 mg a.s./kg bw
NOEL = 500 mg a.s./kg bw

Conclusion of the RMS:
In conclusion, the discussed deviations add uncertainty as no specific information about the analytic is given. However considering the administration route the RMS is of the opinion that the study is still valid and should be used for the risk assessment.

Reference:	**Hoe 046360 - active ingredient technical (Code: Hoe 046360 OH ZC96 0002) Testing for acute oral toxicity in the male and female Bobwhite quail (*Colinus virginianus*)**
Author(s), year:	[redacted] 1986a
Report/Doc. number:	Study no. A36429, Reference no. M-118215-01-1
Guideline(s):	US EPA Subdivision E, Section 71-1 (Avian single-dose oral LD_{50}), October 1982
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Hoe 046360 - active ingredient technical identification code: Hoe 046360 OH ZC96 0002, purity : 95.6%
Test species:	Bobwhite quail (*Colinus virginianus*)
Number of organisms:	5 males and 5 females per treatment group
Weight, age:	175 - 196 g bodyweight, ca. 6 months
Type of test:	Acute oral toxicity
Applied concentrations:	0 (sesame oil vehicle only), 1000 and 2000 mg a.s./kg bw, dosage volume: dosage volume: 10 mL/kg body weight
Type of application:	Administered by means of a rubber catheter into stomach or preventriculus, diluent: sesam oil
Time of exposure:	One single application, monitoring during 14 days
Test conditions:	Test temperature: 20-25 °C, relative humidity: 50-70 %, lightning: 8 h light and 16 h darkness. Feed (quail grower ration prepared by the Baierseich Experimental Farm of Hoechst AG) was provided ad libitum during the study.

Test parameter:

Observations:	After treatment, signs of intoxication, mortality rate and times of death were recorded. The birds were weighed on days 3, 7 and 14 of the 14-day observation period. The total food consumption per group was also recorded for days 0 - 3, and 7 - 14 after treatment (day 0 = day of treatment). Lethally intoxicated birds were dissected and examined macroscopically. At the end of the observation period, the surviving birds were killed by carbon dioxide asphyxiation, dissected and examined for macroscopically visible changes. The range-finding study followed the same procedure, except that the observation period was only 7 days and no record was kept of food consumption.
Statistics:	The LD_{50}, the 95 % confidence range and the mathematical equation of the probit curves could not be calculated by probit analysis on the basis of the mortality rate.

Findings:

Mortalities:	At 2000 mg/kg one bird died between days 3 and 14 post-treatment.

Clinical signs: The following clinical signs of intoxication were observed in both males and females: In the 2000 mg/kg group, reduced spontaneous activity and, in one case, rapid shallow respiration, were observed from 30 minutes to 4 hours after treatment. 3 - 4 hours after treatment, reduced spontaneous activity and standing on hocks were observed sporadically among the males in this group. From the 5th day after treatment, all of the birds were free of visible clinical signs of intoxication. Food consumption in the 1000 and 2000 mg/kg groups was lower during the first three days of the study. No other substance-related changes were observed.

Body weight, feed consumption: Compared to the control group, there were no treatment-related effects on body weight and feed consumption in the treatment groups.

Table B. 9.1.1.1-2: Mortality and growth (bodyweights and food consumption) of Bobwhite quail following acute oral exposure (gavage)

Test substance [mg a.s./kg]	Cumulative mortality	Sex	Mean bodyweight [g/bird]				Food consumption [g/bird/d]		
			0	3	7	14	0-3	3-7	7-14
Control	0	♂	173	181	184	183	12.2	10.6	11.1
	0	♀	169	180	182	179			
1000	0	♂	181	180	183	184	5.1	8.7	11.4
	0	♀	177	173	176	178			
2000	0	♂	173	166	171	178	6	11.4	11.9
	1	♀	179	177	180	185			

Conclusion: LD_{50} > 2000 mg a.s./kg bw, NOEL = 1000 mg a.s./kg bw

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines OCSPP 850.2100 (January, 2012) and OECD 223 (July, 2010)

Check of validity criteria of OCSPP 850.2100:

- Birds were not randomly assigned to treatment and control pens: fulfilled
- More than 10% of the control birds died during the test: fulfilled, actual 0 %
- A minimum of ten birds were not used for each dose level of the test substance and control: fulfilled
- The test substance was not orally administered, via either capsule or gavage: fulfilled
- In the definitive test a minimum of five dose levels of the test substance, plus an appropriate control, were not tested: The test design with two doses actually did not follow one of the recommended designs: 5 dose levels (OCSPP 850.2100) or sequential testing (OECD 223). However, both guidelines also give the possibility of a limit test with 10 individuals at 2000 mg/kg (or higher).

Check of validity criteria of OECD 223:

	- 10 % mortality in the control: fulfilled, actual 0 % In addition, the following points deviated from the test guideline or were not reported in detail: - No detailed information on the breeding conditions was given **Acceptability of the analytical methods used in the test:** The available information is not sufficient to evaluate the acceptability of the analytical methods according to the guidance documents SANCO/3029/99 rev. 4. **Endpoints:** LD_{50} > 2000 mg/kg NOEL = 1000 mg/kg **Conclusion of the RMS:** The mean body weight gain was lower in the treatment groups than in control (not significant). In conclusion, the discussed deviations add uncertainty as no specific information about the analytic is given. However considering the administration route the RMS is of the opinion that the study is still valid and should be used for the risk assessment.

Reference:	**Hoe 046360 - active ingredient technical (Code: Hoe 046360 OH ZC96 0002)** **Testing for acute oral toxicity in the male and female Mallard duck (*Anas platyrhynchos*)**
Author(s), year:	[redacted] 1986b
Report/Doc. number:	Study no. A36428, Reference no. M-118214-01-1
Guideline(s):	US EPA Subdivision E, Section 71-1 (Avian single-dose oral LD_{50}), October 1982
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Hoe 046360 - active ingredient technical identification code: Hoe 046360 OH ZC96 0002, purity : 95.6 %
Test species:	Mallard duck (*Ana platyrhynchos*)
Number of organisms:	5 males and 5 females per treatment group
Weight, age:	904-1413 g bodyweight, ca. 7 months
Type of test:	Acute oral toxicity

Applied concentrations: 0 (sesame oil vehicle only), 1000 and 2000 mg a.s./kg bw, dosage volume: dosage volume: 10 mL/kg body weight

Type of application: Administered by means of a rubber catheter into stomach or preventriculus, diluent: sesam oil

Time of exposure: One single application, monitoring during 14 days

Test conditions: Test temperature: 20-25 °C, relative humidity: 50-70 %, lighting: 8 h light and 16 h darkness.

Feed: During the study the ducks were given a special diet (mallard grower ration prepared by the Bayerseich Experimental Farm ad libitum during acclimation and during the test.

Test parameter:

Observations: After treatment, signs of intoxication, mortality rate and times of death were recorded. The birds were weighed on days 3, 7 and 14 of the 14-day observation period. The total food consumption per group was also recorded for days 0 - 3, and 7 - 14 after treatment (day 0 = day of treatment). Lethally intoxicated birds were dissected and examined macroscopically. At the end of the observation period, the surviving birds were killed by carbon dioxide asphyxiation, dissected and examined for macroscopically visible changes. The range-finding study followed the same procedure, except that the observation period was only 7 days and no record was kept of food consumption.

Statistics: The LD_{50}, the 95 % confidence range and the mathematical equation of the probit curves could not be calculated by probit analysis on the basis of the mortality rate.

Findings:

Mortalities: No mortalities occurred in the control group and in the 1000 and 2000 mg a.s./kg treatment groups.

Clinical signs: No clinical signs of intoxication occurred in any of the test groups. There was a temporary decrease in food consumption in the 1000 and 2000 mg/kg groups during the first 3 days after treatment. No other substance-related changes were observed.

Body weight, feed consumption: There was a temporary decrease in food consumption in the 1000 and 2000 mg/kg groups during the first 3 days after treatment.

Table B. 9.1.1.1-3: Growth (bodyweights and food consumption) of mallard ducks following acute oral exposure (gavage)

Test substance [mg a.s./kg]	Cumulative mortaliy	Sex	Mean bodyweight [g/bird]				Mean food consumption [g/bird/d]		
			0	3	7	14	0-3	3-7	7-14
Control	0	♂	1208	1274	1264	1233	72.5	65.6	101.3
	0	♀	1062	1060	1036	1037			
1000	0	♂	1155	1192	1166	1173	59.4	61.3	84.8
	0	♀	1065	1061	1020	1015			
2000	0	♂	1158	1180	1191	1195	49.4	63.9	88.1

Test substance [mg a.s./kg]	Cumulative mortaliy	Sex	Mean bodyweight [g/bird]				Mean food consumption [g/bird/d]		
			0	3	7	14	0-3	3-7	7-14
	0	♀	1151	1176	1134	1123			

Conclusion: LD_{50} > 2000 mg a.s./kg bw

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guidelines OCSPP 850.2100 (January, 2012) and OECD 223 (July, 2010)

Check of validity criteria of OCSPP 850.2100:

- Birds were not randomly assigned to treatment and control pens: fulfilled
- More than 10% of the control birds died during the test: fulfilled, actual 0 %
- A minimum of ten birds were not used for each dose level of the test substance and control: fulfilled
- The test substance was not orally administered, via either capsule or gavage: fulfilled
- In the definitive test a minimum of five dose levels of the test substance, plus an appropriate control, were not tested: The test design with two doses actually did not follow one of the recommended designs: 5 dose levels (OCSPP 850.2100) or sequential testing (OECD 223). However, both guidelines also give the possibility of a limit test with 10 individuals at 2000 mg/kg (or higher).

Check of validity criteria of OECD 223:

- 10 % mortality in the control: fulfilled, actual 0 %

In addition, the following points deviated from the test guideline or were not reported in detail:

- No detailed information on the breeding conditions was given

Acceptability of the analytical methods used in the test:

The available information is not sufficient to evaluate the acceptability of the analytical methods according to the guidance documents SANCO/3029/99 rev. 4.

Endpoints:

LD_{50} > 2000 mg/kg

NOEL = 2000 mg/kg

Conclusion of the RMS:

A slight bodyweight reduction has been seen in all groups after 14 days, and a temporary decrease in food consumption in the 1000 and 2000 mg/kg groups during the first 3 days after treatment. However the effects are considered minor

	and to not affect the integrity of the study. In conclusion, the discussed deviations add uncertainty as no specific information about the analytic is given. However considering the administration route the RMS is of the opinion that the study is still valid and should be used for the risk assessment.

Reference:	**Hoe 046360 - active ingredient technical (Code: Hoe 046360 OH ZC96 0002) Testing for acute oral toxicity in the male and female partridge (*Perdix perdix*)**
Author(s), year:	[redacted]; 1986c
Report/Doc. number:	Study no. A36679, Reference no.: M-118455-01-1
Guideline(s):	US EPA Subdivision E, Section 71-1 (Avian single-dose oral LD_{50}), October 1982
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Hoe 046360 - active ingredient technical identification code: Hoe 046360 OH ZC96 0002, purity : 95.6 %
Test species:	Patridge (*perdix perdix*)
Number of organisms:	5 males and 5 females per treatment group
Weight, age:	280-376 g bodyweight
Type of test:	Acute oral toxicity
Applied concentrations:	0 (sesame oil vehicle only), 1000 and 2000 mg a.s./kg bw, dosage volume: dosage volume: 10 mL/kg body weight
Type of application:	Administered by means of a rubber catheter into stomach or preventriculus, diluent: sesam oil
Time of exposure:	One single application, monitoring during 14 days
Test conditions:	Test temperature: 20-25 °C, relative humidity: 50-70 % During the study the birds were given a special diet (grower ration manufactured by Deuka). Food and water were available ad libitum.

Test parameter:

Observations:	After treatment, signs of intoxication, mortality rate and times of death were recorded. The birds were weighed on days 3, 7 and 14 of the 14-day observation period. The total food consumption per group was also recorded for days 0 - 3, 3 - 7 and 7 - 14 after treatment (day 0 = day of treatment). Lethally intoxicated birds were dissected and examined macroscopically. At the end of the observation period, the surviving birds were killed by carbon dioxide asphyxiation, dissected and examined for macroscopically visible changes.

Statistics: The LD_{50}, the 95 % confidence range and the mathematical equation of the probit curves could not be calculated by probit analysis on the basis of the mortality rate.

Findings:

Mortalities: At 2000 mg/kg 5 birds died between days 2 and 10 post-treatment. There was no sex-specific difference in mortality.

Clinical signs: Clinical signs at this dose level included rapid, shallow breathing, occasionally closed eyes and reduced activity. Surviving birds at this dose level were normal by day 10 after dosing. Partridges treated at 1000 mg/kg showed frequently reduced spontaneous activity, ruffled feathers, standing on hocks and diarrhoea, over the first 2 days post dosing but no mortality.

Body weight, feed consumption: Body weights and food consumption were dose dependently reduced during the first week after treatment.

Table B. 9.1.1.1-4: Mortality and growth (bodyweights and food consumption) of padrige following acute oral exposure (gavage)

Test substance [mg a.s./kg]	Cumulative mortality	Mean bodyweight change [g]				Mean food consumption [g/bird/d]		
		0	3	7	14	0-3	3-7	7-14
Control	0	330	355	362	362	31.5	28.6	32.3
1000	0	341	329	329	336	11	21	20.3
2000	5	331	301	310	334	4.6	19.6	21.3

Conclusion: LD_{50} = 2000 mg a.s./kg bw

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines OCSPP 850.2100 (January, 2012) and OECD 223 (July, 2010)

Check of validity criteria of OCSPP 850.2100:

- Birds were not randomly assigned to treatment and control pens: fulfilled
- More than 10% of the control birds died during the test: fulfilled, actual 0 %
- A minimum of ten birds were not used for each dose level of the test substance and control: fulfilled
- The test substance was not orally administered, via either capsule or gavage: fulfilled
- In the definitive test a minimum of five dose levels of the test substance, plus an appropriate control, were not tested: The test design with two doses actually did not follow one of the recommended designs: 5 dose levels (OCSPP 850.2100) or sequential testing (OECD 223). However, both guidelines also give the possibility of a limit test with 10 individuals at 2000 mg/kg (or higher). It has to be noted that according to the guideline 223 a stage 1 sequential test design would have been necessary if 5 birds died (as seen in the 200 mg a.s./kg dose group)

Check of validity criteria of OECD 223:
- 10 % mortality in the control: fulfilled, actual 0 %

In addition, the following points deviated from the test guideline or were not reported in detail:
- No detailed information on the breeding conditions was given

Acceptability of the analytical methods used in the test:
The available information is not sufficient to evaluate the acceptability of the analytical methods according to the guidance documents SANCO/3029/99 rev. 4.

Endpoints:
LD_{50} =2000 mg/kg
NOEL = 1000 mg/kg

Conclusion of the RMS:
In conclusion, the discussed deviations add uncertainty as no specific information about the analytic is given. However considering the administration route the RMS is of the opinion that the study is still valid and should be used for the risk assessment.

B.9.1.1.2. Short-term dietary toxicity to birds

According to the data requirements for active substances (Commission Regulation (EU) 283/2013) and/or plant protection products (Commission Regulation (EU) 284/2013) no short-term dietary toxicity test are required to address the risk to birds. No new short-term dietary toxicity studies were submitted for the re-newal of the active substance Fenoxaprop-P-ethyl. The results of the short-term dietary studies summarised in the DAR (2005) are given below.

Reference: [redacted] ***(1986d): Hoe 046360 - active ingredient technical (Code: Hoe 046360 OH ZC96 000); 8-day dietary LC50 test in the Japanese quail (Coturnix coturnix japonica).***
Document No. A36733
Test guideline: OECD 205 (1984), EPA 71-2 (1982)
GLP: Yes
Material and methods:
Groups of 10 young quails were fed at diet concentrations of 312.5, 625, 1250, 2500 or 5000 ppm technical grade Fenoxaprop-P-ethyl (certificate of analysis no. 02912, purity 95.6 % (w/w)). The test substance was administered over a period of 5 days in the diet. After this period, untreated food was given for a further 3-day period. One similar sized control group was fed untreated diet. During the treatment and observation periods, the signs of intoxication and the mortality rate were recorded at least once daily. Any animals found dead were

immediately dissected and autopsied.

Findings:

Analysis of diets revealed homogeneity and stability for at least 30 days and actual diet concentrations of between 88 and 111 %. No clinical signs were noted after administration of dietary concentrations up to and including 625 ppm. One chick of the 1250 ppm group died on the 2nd day and there were two deaths in the 5000 ppm group (days 5 and 8).

Table B.9.1.1.2-1: Mortality, body weight and food consumption of Japanese quails after 5-day dietary exposure to Fenoxaprop-P-ethyl

dietary level nominal	mortality	group mean body weight data (g)				day 0- 5 food consumption	substance intake
ppm	out of 10	day 0	day 5	gain d1-5	day 8	g/bird/day	mg/kg bw/d
control	0	29.0	47.6	18.6	56.6	10.9	-
312.5	0	28.1	44.6	16.4	55.2	9.7	n.c.
625	0	29.7	45.9	16.2	56.9	9.3	n.c.
1250	1	27.5	34.6	7.1	47.1	8.0	n.c.
2500	0	26.9	31.6	4.7	46.6	4.7	401
5000	2	28.4	23.7	-4.7	34.1	1.9	364

n.c. not calculated

From 1250 ppm onwards, there was a marked dose-related decrease in food consumption accompanied by corresponding reductions in body weight gains during the treatment period; reduced spontaneous activity was also observed in a number of cases. During the 3-day post treatment period body weight gains and food consumption normalised, although the body weights in these groups were still lower at the end of the study. Necropsy revealed no pathomorphological changes.

The dietary LC50 was greater than 5000 ppm. However, due to marked reduction in food consumption, the highest test item intake of 401 mg/kg bw was achieved after exposure to 2500 ppm (see table above, daily dose calculated according to SANCO/4145/2000). The NOEC was considered to be 625 ppm.

Reference: [redacted] ***(1986): The dietary toxicity (LC_{50}) of Hoe 046360 - substance technical (Code: Hoe 046360 OH ZC96 0002) to the Bobwhite quail.***

Document No. A34917

Test guideline: OECD 205 (1984), EPA 71-2 (1982)

GLP: Yes

Material and methods:

Groups of 10 quail chicks were fed at diet concentrations of 156.25, 312.5, 625, 1250, 2500 or 5000 ppm technical grade Fenoxaprop-P-ethyl (certificate of analysis no. 02912, purity 95.6 % (w/w)). The test substance was administered over a period of 5 days in the diet. Three similar sized control groups were fed untreated diet

throughout. Any animals found dead were immediately dissected and autopsied.

Findings:

Analysis of diets revealed actual diet concentrations of between 77 and 91 % (overall mean 85 %). No clinical signs of intoxication attributable to treatment occurred in any dose group. The two mortalities in the 156 and 5000 ppm groups were not considered to be treatment-related. Food consumption and body weight gain were not affected and necropsy revealed no abnormalities in any chicks examined.

Table B. 9.1.1.2-2: Mortality, body weight and food consumption of bobwhite quails after 5-day dietary exposure to Fenoxaprop-P-ethyl

dietary level nominal	mortality	group mean body weight data (g)				day 0- 5 food consumption	substance intake
mg/kg diet	out of 10	day 0	day 5	gain 1-5	day 8	g/bird/day	mg/kg bw/d
control 1	0	18.7	26.0	7.3	32.7	5.4	-
control 2	0	18.9	28.0	9.1	36.9	5.4	-
control 3	0	18.4	28.1	9.7	35.9	6.3	-
156.25	1	17.5	23.7	6.2	29.3	3.5	not calculated
312.5	0	18.5	27.2	8.7	35.2	7.5	
625	0	19.9	29.5	9.6	26.8	6.9	
1250	0	17.5	25.7	8.2	32.4	6.0	
2500	0	17.1	22.0	4.9	28.8	4.2	
5000	1	18.8	25.0	6.2	32.1	5.7	1301

The dietary LC50 was greater than 5000 ppm corresponding to a mean daily test item intake of 1301 mg/kg bw (see table above, daily dose calculated according to SANCO/4145/2000). The NOEC was considered to be 5000 ppm in the absence of any finding attributable to treatment.

Reference: [redacted] ***(1986e): Hoe 046360 - active ingredient technical (Code: Hoe 046360 OH ZC96 0002); 8-day dietary LC50 test in the Mallard duck (Anas plathyrhynchos);.*** *Document No. A36430*

Test guideline: OECD 205 (1984), EPA 71-2 (1982)

GLP: Yes

Material and methods:

Groups of 10 ducklings were fed at diet concentrations of 312.5, 625, 1250, 2500 or 5000 ppm technical grade Fenoxaprop-P-ethyl (certificate of analysis no. 02912, purity 95.6 % (w/w)). The test substance was administered over a period of 5 days in the diet. One similar sized control group was fed untreated diet throughout. Any animals found dead were immediately dissected and autopsied.

Findings:

Analysis of diets revealed homogeneity and actual diet concentrations of between 86 and 107 % (overall mean 98 %). No mortality or clinical signs occurred in any of the groups. From 2500 ppm onwards, there were slight - and in the 5000 ppm group considerable - reductions of food consumption and correspondingly also of body weight gain. During the 3-day post treatment period body weight gains and food consumption normalised,

although the body weight in the top dose group was still lower at the end of the study. Necropsy revealed no pathomorphological changes.

Table B. 9.1.1.2-3: Mortality, body weight and food consumption of Mallard ducks after 5-day dietary exposure to Fenoxaprop-P-ethyl

dietary level nominal	*mortality*	*group mean body weight data (g)*				*day 0- 5 food consumption*	*substance intake*
mg/kg diet	*out of 10*	*day 0*	*day 5*	*gain d1-5*	*day 8*	*g/bird/day*	*mg/kg bw/d*
control	*0*	*85.6*	*158.8*	*73.2*	*199.4*	*38.6*	*-*
312.5	*0*	*103.3*	*169.8*	*65.5*	*226.2*	*38.9*	*not calculated*
625	*0*	*100.5*	*165.3*	*64.8*	*232.9*	*38.9*	
1250	*0*	*101.3*	*154.8*	*53.5*	*219.7*	*37.3*	
2500	*0*	*101.7*	*140.7*	*39.0*	*204.6*	*33.1*	
5000	*0*	*108.0*	*107.2*	*- 0.8*	*156.0*	*18.1*	*841*

The dietary LC_{50} was greater than 5000 ppm corresponding to a mean daily test item intake of 841 mg/kg bw (daily dose calculated according to SANCO/4145/2000). The NOEC was considered to be 1250 ppm due to reduced food consumption and corresponding decreases in body weight gain.

B.9.1.1.3. Sub-chronic toxicity and reproduction to birds

No additional studies were submitted for the renewal of the active substance Fenoxaprop-P-ethyl. The studies submitted for the first EU approval of the active substance are summarised below. In addition, the studies were evaluated according to the representative test guidelines.

Reference:	**Bobwhite quail Dietary reproduction study range finding study Fenoxaprop-P-ethyl, code: AE F046360 00 1D96 0001**
Author(s), year:	[redacted], 2001
Report/Doc. number:	Study no. C017041, Reference no. M-203536-01-1
Guideline(s):	No testing guideline exist for such range finding studies
GLP:	Yes
Deviations:	-
Validity:	Additional information

Material and methods:

Test substance	Fenoxaprop-P-ethyl (AE F046360 00 1D96001), Batch no.: AALC00028, Purity 95.1%
Test species:	Bobwhite quail (*Colinus virginianus*)
Number of organisms:	20 pairs with one male and one female per group

Weight, age:	Mean body weight between 208 g (males) and 218 g (females) at test initiation, 8 months
Type of test:	Reproductive toxicity
Applied concentrations:	Control (untreated diet), 200, 500 and 1000 ppm a.s.
Analytics:	Concentration, homogeneity and stability of the test substance in the diet were sufficiently verified by analytical methods.
Type of application:	Test substance mixed in the diet, administered ad libitum over 7 weeks
Acclimatisation:	All test birds were acclimated to caging and facilities for two weeks prior to the start of acclimatisation period.
Time of exposure:	7 weeks
Test conditions:	
Temperature / relative humidity:	Throughout the test period the mean temperature in the experimental area was approx. 21 - 23 °C and the relative humidity in a range of approx. 40 - 80 %.
Lightning:	From the beginning of the acclimatisation on the birds were housed under a 17 hours light / 7 hours darkness cycle. Illuminance: 50 - 300 lux
Feeding	All adult birds and their offspring were given feed and water ad libitum during study.
Observations/Measurements:	
Behaviour, general health and mortality:	Individually once daily
Food consumption (per replicate):	Weekly from the start of acclimatization
Body weight:	Individually at the beginning of treatment (week 0), in treatment week 2 and at the end of treatment
Necropsy:	At the end of the observation period, the birds were killed by carbon dioxide asphyxiation, dissected and examined both externally and internally (i.e. examination of internal body cavity contents) for macroscopically visible changes.
Reproduction toxicity investigations:	During the 7 week period of substance administration the eggs were collected daily and were recorded weekly per replicate. The number of eggs laid, abnormal, broken or cracked eggs were recorded.
Statistics:	The following parameters were evaluated statistically (Dunnetss´s test) by comparison with the control at the level of significance $p<0.05$: - Bodyweight at each measurement time - Food consumption for each week of treatment
Findings:	
Analytical results:	The stability of the test substance in the diet was found to be at least 35 days. The achieved mean concentrations analysed directly after preparation ranged between 87 and 111 % of the nominal concentrations.
Biological results:	Dietary administration of up to 500 ppm a.s. had no effect on health, body weight

gain, food consumption or egg quality. Necropsy of the animals killed at study end did not show any substance-related changes. In the highest dosing group (1000 ppm), food consumption and body weight gain appeared to be slightly affected. The start of egg production was delayed and remained at a lower level throughout the study. However, the group size might have been too small for meaningful evaluation.

In the 200 ppm group statistically significant reductions in food consumption were detected during weeks 0-2 and 3-5. These findings might be related, at least in part, to one female with decreased activity during recovery from a foot injury. In the absence of comparable effects in the higher dosed groups, this finding was declared to be not attributable to the administration of the test substance.

The relevant data from the study are summarised in the following table:

Table B. 9.1.1.3-1: Mortality, body weight, food consumption and egg production of bobwhite quails after 7-week dietary exposure to Fenoxaprop-P-ethyl

	Nominal diet concentration (ppm)			
Examination	**0**	**200**	**500**	**1000**
Measured concentrations (ppm)	-	198	505	980
No. of replicates at study end	5	4*	5	5
food consumption w 1-7 (g/pen/day)	45.3	35.4	42.1	40.8
body weight (study mean)	211.0	213.0	212.7	203.0
females (g)	225.8	214.6	238.2	227.1
substance intake (mg/kg bw/day)	-	16.6	46.7	94.9
eggs laid mean / female 1 - 7 weeks	30.4	29.8*	34.4	21.0
1 - 3 weeks	7.0	8.0*	9.8	2.8
4 - 7 weeks	23.4	21.8*	24.6	18.2
ratio eggs intact /laid	1.0	0.98	0.99	1.00

*one female producing no eggs was excluded

Conclusion: The NOEC was considered to be 500 ppm, which was equivalent to a mean daily substance intake of 46.7 mg/kg bw.

Comment RMS: **Validity:** A check of the study according to the validity criteria of the currently valid guidlines OCSPP 850.2300 (January, 2012) and OECD 206 (April, 1984) is not considered meaningful, as the study was planned and conducted as a range

	finding study. **Conclusion of the RMS:** In conclusion, the study can only be used as additional information.

Reference:	**Bobwhite quail dietary reproduction study** **Fenoxaprop-P-ethyl, code: AE F046360 00 1D96 0001**
Author(s), year:	[redacted], 2002
Report/Doc. number:	Study no. C027500, Reference no. M-213449-01-1
Guideline(s):	FIFRA Subdivision E, Section 71-4, OECD Guideline 206 (1984)
GLP:	Yes
Deviations:	None relevant
Validity:	Acceptable

Material and methods:

Test substance	Fenoxaprop-P-ethyl (AE F046360 00 1D96001), Batch no.: AALC00028, Purity 95.1%
Test species:	Bobwhite quail (*Colinus virginianus*)
Number of organisms:	64 males / 64 females
Weight, age:	female 207 g (mean), male 208 g (mean) at test initiation, 7 months
Type of test:	Reproductive toxicity
Applied concentrations:	Control (untreated diet), 200, 400 and 800 ppm a.s.
Analytics:	Concentration, homogeneity and stability of the test substance in the diet were sufficiently verified by analytical methods.
Type of application:	Test substance mixed in the diet
Phases of the study:	Acclimation (pre-treatment): 2 weeks; Egg-laying: 10 weeks
Time of exposure:	21 weeks
Test conditions:	
Temperature / relative humidity:	Throughout the test period, the mean temperature in the experimental area was in a range of 20-24°C and the relative humidity 20-70%
Lightning:	Acclimatisation (wk -2 to -1): 8L:16D Pre-egg laying phase (wk 1-7): 8L:16D Induction phase (wk 8-10): 17L:7D Egg laying phase (wk 11-21): 17L:7D Illuminance: 200 - 300 lux
Feeding	All adult birds and their offspring were given feed (special quail grower diet) and water ad libitum during acclimation and testing. The basal diet contained 26% protein and 5% crude fat, and 3.5% crude fibre.

Test parameter:

Observations:	During the study, all adult birds were observed daily for signs of toxicity or abnormal behaviour. Additionally, all offspring were observed daily from hatching until 14 days of age. A record was maintained of all mortalities and clinical observations.
Adult Body weight:	Individually at the start of acclimatisation, the start of treatment, in teratmetn weeks 2, 4, 6, 8 and 21. To avoid any disturbance, the birds were not weighed during the egg laying period (treatment weeks 11-21).
Adult feed consumption:	Feed consumption for each pen was weighted weekly.
Egg parameter:	During the study the eggs were collected daily and individually marked by treatment week and origin with a pen. Eggs showing obvious damage (broken or cracked) or abnormalities (e.g. no shell or yolk, or too small) were recorded and discarded. The number of eggs and the mean egg weight per hen were recorded weekly. One day every two weeks i.e. study weeks 13, 15, 17, 19 and 21, one intact egg per replicate was used for determining shell thickness.
Hatchling parameter:	The numbers and body weight of and 14-day survivors were recorded per female and laying week. In addition, behaviour, severe birth defects and total feed consumption per group during the two weeks post hatching were determined.
Necropsy:	The quails were killed by carbon dioxide asphyxiation, dissected and examined macroscopically for pathological changes. This included examination of the external appearance and an internal macroscopic examination on the thoraco-abdominal organs. The birds found dead during the study were similarly examined.
Statistics:	An explorative analysis was performed to compare a control group with 3 different dose levels of the test compound, Fenoxaprop-P-ethyl (200 ppm, 400 ppm and 800 ppm). The parameters weight gain (changes to preliminary values) and food consumption were analysed. For weight gain one-sided Dunnett tests with a 5% level of significance wre conducted separately for each sex and time point. For food consumption two-sided Dunnett test for every time point were performed. The reproductive parameters were analysed as follows: A monotonic dose-response relationship is assumed to be gereally valid for the reproduction paramerters, i.e. the maximum effect can be observed in the highest dose group. Because of the monotonic assumption the pairwise comparison between control and a dose group were starting out from a comparison of the highest dose group with control. Lowever dosages were only tested ion case all hibher dose groups showed significant test results. The pairwise comparisons between control and treatment groups were conducted by exact one-sided rank sumt tests with a 5% level of significance for each parameter of the three parameter groups to detect an increase (parameters: eggs broken and eggs broken out of number laid), respectively a decrease (all other parameters) compared to control. Suing this closed testing procedure the

significance level was restricted to 5% for every reproduction parameter.

Findings:

Analytical results: The achieved mean dietary concentrations were within the range 95 to 101 % (overall mean 97 %) of the nominal concentrations.

Biological results: Dietary exposure up to and including 400 ppm had no effects on health, body weight gain, food consumption, egg production and quality, fertility, embryonic development, hatching success and chick survival and growth. Necropsy also indicated no substance-related changes, particularly in the reproductive organs. At 800 ppm, there was a slight decrease (~ 10 %) in food consumption and egg production as compared with the control, which attained statistical significance; however, the overall reproductive toxicity endpoint, i.e. number of 14-day old chicks per hen, did not show a statistically significant reduction. All other examinations were not indicative of any substance-related changes.

Table B. 9.1.1.3-2: Mortality, body weight, food consumption and reproduction of Bobwhite quails after 20-week dietary exposure to Fenoxaprop-P-ethyl

	Nominal diet concentration (ppm)			
Parameter	**0**	**200**	**400**	**800**
no. of replicates at study end	16	16	16	16
mean body weight of males w 1	205.4	206.6	207.6	206.5
mean body weight of females w 1	226.8	229.3	228.3	221.0
mean body weight of males w 21	207.9	209.9	206.5	207.4
mean body weight of females w 21	259.6	259.7	259.5	255.1
food consumption w 1 - 21 (g/day)	35.9	35.4	34.6	33.9
food consumption (g/100g bw/day)	8.0	7.8	7.7	7.6
substance intake (mg/kg bw/day)	-	16.0	30.8	60.8
eggs laid per replicate	51.3	51.5	49.1	46.2*
eggs broken / laid (%)	0.23	0.11	0.27	0.76
mean egg shell thickness (mm)	0.211	0.214	0.210	0.211
fertile eggs / eggs set (%)	91.1	95.8	93.1	90.0
live 3-w embryos / eggs fertile (%)	96.7	98.8	98.4	97.0

	Nominal diet concentration (ppm)			
Parameter	**0**	**200**	**400**	**800**
chicks hatched / 3-w embryos (%)	93.6	95.5	95.8	95.5
14-days survivors / hatched (%)	83.7	84.6	82.9	80.2
chick weight day 1 (g)	6.9	7.0	7.0	6.8
chick weight day 14 (g)	24.3	23.2	23.7	24.3
14 d old survivors per hen	32.2	36.0	31.6	27.8

* Statistically significant at $p < 0.05$

Conclusion: Based on the results obtained, the NOEC for systemic and reproductive toxicity was considered to be 400 ppm, equivalent to a mean daily test substance intake of 30.8 mg/kg bw. The dietary concentration of 800 ppm (60.8 mg/kg bw) is regarded as the borderline level for systemic and reproduction toxicity.

Comment RMS: The bird reproduction study was conducted according to the OECD test guideline 206 (1984) which is the currently valid test guideline :

Check of validity criteria of OECD 206:

- Mortality in the controls should not exceed 10 % at the end of the test: fulfilled (0 %).
- Average number of 14-day old survivors per hen in the controls should be at least 12: fulfilled (32.2)
- Average egg shell thickness for the control group should be at least 0.19: fulfilled (0.21).
- There must be evidence that the concentration of the substance being tested has been satisfactorily maintained in the diet (at least 80 % of the nominal concentration) throughout the test: fulfilled, measured concentrations were above 80 % of nominal on several occasions.

Acceptability of the analytical methods used in the test:

The available information is not sufficient to evaluate the acceptability of the analytical methods according to the guidance documents SANCO/3029/99 rev. 4.

It could be demonstrated that concentrations did not fell below 80 % of nominal in the fresh diet confirming that the preparation of the diet was correct or at least worst-case as several samples indicated measured concentrations above the nominal ones.

	Endpoints: The reporting of an EC_x is neither required nor mentioned by guideline OECD 206. EFSA (2013)[1] rates the guideline with 3, which actually means that the NOEL should be maintained as standard endpoint. EC_x- values were therefore not calculated. No assessment of the statistical power was performed by the notifier though the test design is in line with the currently valid guideline (OECD 206). A significant decrease of eggproduction and a slight decrease in food consumption occurred at the highest tested dose of 800 ppm. No futher substance related effects occured. The NOEC of 400 ppm (30.8 mg/kg bw) is agreed by the RMS **Conclusion of the RMS:** In conclusion, validity of the study is considered to be acceptable.

Furthermore studies with the racemic Fenoxparop-ethyl have been available for the first Annex conclusion, the studies are copied form the original DAR (April 2005) as additional information:

Supplementary information – studies with racemic Fenoxaprop-ethyl

Reference: [redacted] (1985): The effects of dietary inclusion of Hoe 33171- active ingredient technical on reproduction in the Bobwhite quail; Code: Hoe 33171 OH ZD96 0001. Document No. A31296

Test guideline: EPA 71-4; OECD 206

GLP: Yes

Material and methods:

Groups of 20 pairs 9 months old bobwhite quails were fed diet containing either 0 (control), 5, 30 or 180 ppm Fenoxaprop-ethyl (purity 95.5 %; certificate of analysis no. 02259). Data on the birds health and reproductive performance were collected according to the above stated guidelines.

Findings:

Achieved mean diet concentrations were within the range of 96 to 101 % (overall mean 97 %) of nominal concentrations. No adverse effects on body weight, food consumption, or general health conditions were observed. Necropsy also indicated no substance-related changes. A number of deaths occurred particularly in the hens of the lowest dosing group during the egg production, but these were not considered to be treatment-related. The reproduction data indicated no reproductive toxicity in any dose group. The behaviour, viability and physical development of the chicks also showed no changes as compared with the control group.

Table B. 9.1.1.3-3: Mortality, body weight, food consumption and reproduction of bobwhite quails after 23-week dietary exposure to Fenoxaprop-ethyl (racemate)

Diet concentration (ppm)	**0**	**5**	**30**	**180**
no. of replicates at study end	20	16	18	20

[1] EFSA (European Food Safety Authority), 2015. Technical report on the outcome of the pesticides peer review meeting on general recurring issues in ecotoxicology. EFSA supporting publication 2015:EN-924. 62 pp.

Diet concentration (ppm)	**0**	**5**	**30**	**180**
food consumption (g/bird/day)	16.4	16.4	16.2	16.9
male body weight - end of study (g)	213	214	206	207
female body weight - end of study (g)	238	236	226	231
eggs/hen	56.2	48.7	46.0	57.6
mean egg weight (g)	10.5	10.5	10.7	10.8
eggs (cracked or broken) / laid (%)	18.0 [a]	17.2 [a]	16.3 [a]	14.6 [a]
mean egg shell thickness (mm)	0.177 [b]	0.176 [b]	0.178 [b]	0.185 [b]
fertile eggs / eggs set (%)	91.6	83.5	97.4	86.3
live 3-wk embryos / eggs fertile (%)	97.0	97.5	97.0	97.2
chicks hatched / 3-w embryos (%)	90.1	87.4	85.5	85.4
14-days survivors / hatched (%)	62.7 [c]	71.1 [c]	67.5 [c]	63.2 [c]
chick weight day 1 (g)	6.8	6.8	7.0	7.0
chick weight day 14 (g)	16.8	17.4	17.0	17.7
chicks / hen	19.4	20.9	20.7	18.1

[a] above the limit of typical control value (2%) of OECD 206; [b] below the limit of validity (0.19 mm) specified in OECD 206; [c] below the limit of typical control value (75 %) of OECD 206

The NOEC for systemic and reproductive toxicity was considered to be 180 ppm, equivalent to a mean daily test substance intake of 16.9 mg/kg bw. The eggshell thickness was below the limit of validity and the very high percentage of cracked eggs was probably the consequence of this. However, the reproductive capacity of the used bird population, particularly of the control pairs, was within the acceptable limits as specified in the relevant testing guidelines.

Comment (RMS): The study is considered as supplementary information only. Study not essential.

Reference: [redacted] (1985): The effects of dietary inclusion of Hoe 33171- active ingredient technical on reproduction in the Mallard duck; Code: Hoe 33171 OH ZD96 0001. Document No. A31342

Test guideline: EPA 71-4; OECD 206

GLP: Yes

Material and methods:

Groups of 6 replicates consisting of 2 males and 5 females each, i.e. 12 males and 30 females at the age of 9 months per dosing group were fed diet containing either 0 (control), 5, 30 or 180 ppm Fenoxaprop-ethyl (purity 95.5 %; certificate of analysis no. 02259). Data on the birds health and reproductive performance were collected according to the above stated guidelines, except the following deviation: The number of replicates per group was 6 instead of 8; however, the size of the individual replicates was about twice as high, i.e. 2 males and 5 females instead of 1 male and 3 females.

Findings:

The mean concentrations of diet samples taken in study weeks 1, 13 and 23 were between 94.6 and 96.6 % (overall mean 95.8 %) of nominal.

No adverse effects on body weight, food consumption or general health conditions were observed. Necropsy also indicated no substance-related changes. A number of deaths occurred exclusively in the males of the control, the low and middle dose group, particularly towards the end of the pre-egg production period, but were not considered to be treatment-related. The reproduction data indicated no reproductive toxicity in any dose group.

The behaviour, viability and development of the chicks also showed no changes as compared with the control group.

Table B. 9.1.1.3-4: Mortality, body weight, food consumption and reproduction of mallard ducks after 23-week dietary exposure to Fenoxaprop-ethyl

diet concentration (ppm)	**0**	**5**	**30**	**180**
no. of replicates at study end	6	6	6	6
no. of males / females at study end	10 / 30	10 / 30	9 / 30	12 / 30
food consumption (g/bird/day)	146	157	148	146
male body weight - end of study (g)	1064	1055	1101	1085
female body weight - end of study (g)	1001	992	1008	996
eggs/hen	31.1	29.6	31.5	30.9
mean egg weight (g)	60.8	59.0	60.5	61.1
eggs cracked or broken / laid (%)	6.2[a]	9.9	10.4	9.1
mean egg shell thickness (mm)	0.316[b]	0.312[b]	0.313[b]	0.309[b]
fertile eggs / eggs set (%)	90.8	93.8	95.0	92.8
live 3-w embryos / eggs fertile (%)	90.8	87.6	85.0	86.0
chicks hatched / 3-w embryos (%)	71.2	80.6	77.1	83.2
14-days survivors / hatched (%)	90.5[c]	86.4	90.6	84.2
chick weight day 1 (g)	37.6	36.0	37.0	38.3
chick weight day 14 (g)	175	165	183	168
chicks / hen	14.4	14.1	14.7	13.9

[a] above the limit of typical control value (6 %) of OECD 206; [b] below the limit of validity (0.34 mm) specified in OECD 206; [c] below the limit of typical control value (94 %) of OECD 206

The NOEC for systemic and reproductive toxicity was considered to be 180 ppm, equivalent to a mean daily test substance intake of 14 mg/kg bw. The reproductive capacity of the used bird population (controls) was low, but still within the acceptable limits. However, the egg shell thickness was below the limit of validity and the very high percentage of broken/cracked eggs was probably a consequence of this.

Comment (RMS): The study is considered as supplementary information only. Study not essential.

Supplementary information – Determination of tissue concentrations

Reference: [redacted] (1985a): Determination of tissue concentrations of Hoe 33171 in the Bobwhite quail after dietary administration. Document No. A32063

Test guideline: not applicable

GLP: Yes

Material and methods:

The report describes the analytical procedures used and the results obtained for the analysis of Fenoxaprop-ethyl in quail tissues derived from study A31296 (see above). After completion of the reproduction study (week 25) pooled samples of fat, liver, kidneys and breast muscle from 3 males and 3 females of each treatment group were taken for analysis of residual concentrations of Fenoxaprop-ethyl.

Findings:

Table B. 9.1.1.3-5: Residues in various tissues of bobwhite quails after 23-week dietary exposure to Fenoxaprop-ethyl

	treatment Fenoxaprop-ethyl (ppm)			
	0	**5**	**30**	**180**
tissue	**residue (ppm)**			
fat	< 0.025	0.15	1.01	5.46
kidney	0.04	0.70	2.04	13.0
liver	< 0.005	0.21	0.74	4.06
muscle	< 0.005	0.02	0.12	0.53
	bioconcentration factor (BCF)			
fat	-	0.03	0.03	0.03
kidney	-	0.14	0.07	0.07
liver	-	0.04	0.02	0.02
muscle	-	0.004	0.004	0.003

BCF = tissue concentration (ppm) / exposure (diet) concentration (ppm)

Kidney samples were found to contain the highest Fenoxaprop-ethyl residues. The test substance did not show a potential for bioaccumulation after 6-month exposure. The concentrations found in the different tissues were low, resulting in BCF values of less than 1.

Comment (RMS): Study considered acceptable. Study not essential.

Reference: [redacted] (1985b): Determination of tissue concentrations of Hoe 33171 in Mallard duck after dietary administration. Document No. A32064.

Test guideline: not applicable

GLP: Yes

Material and methods:

The report describes the analytical procedures used and the results obtained for the analysis of Fenoxaprop-ethyl in duck tissues derived from study A31342 (see above). After completion of the reproduction study (week 22) pooled samples of fat, liver, kidneys and breast muscle from 3 males and 3 females of each treatment group were taken for analysis of residual concentrations of Fenoxaprop-ethyl.

Findings:

Table B. 9.1.1.3-6: Residues in various tissues of mallard ducks after 23-week dietary exposure to Fenoxaprop-ethyl

	treatment Fenoxaprop-ethyl (ppm)			
	0	**5**	**30**	**180**
tissue	**residue (ppm)**			
fat	< 0.025	0.09	0.58	2.86
kidney	< 0.015	0.36	1.99	11.0
liver	< 0.005	0.08	0.58	1.20
muscle	< 0.005	0.01	0.11	0.20
	bioconcentration factor (BCF)			
fat	-	0.02	0.02	0.02
kidney	-	0.07	0.07	0.06
liver	-	0.02	0.02	0.007
muscle	-	0.002	0.004	0.001

BCF = tissue concentration (ppm) / exposure (diet) concentration (ppm)

Kidney samples were found to contain the highest Fenoxaprop-ethyl residues. The test substance did not show any potential for bioaccumulation after 6-month exposure. The concentrations found in the different tissues were low, resulting in BCF values of less than 1.

Comment (RMS): Study considered acceptable. Study not essential.

B.9.1.2. Effects on terrestrial vertebrates other than birds

For detailed information please refer to Vol. 3 (CA) B.6 of this RAR.

B.9.1.2.1. Acute oral toxicity to mammals

No additional studies were submitted for the re-newal of the active substance. A summary of the toxicity of Fenoxaprop-P-ethyl to mammals is given in the following table

Table B. 9.1.2.1-1: Acute toxicity of Fenoxaprop-p-ethyl to mammals

Test species	Test design	Ecotoxicological endpoints	Reference
Rat	Acute, oral	4000 > LD50 > 3150 mg/kg bw	[redacted] 1992
		2000 > LD50 > 300 mg/kg bw	[redacted] 2008
		LD50 = 1098 mg a.s./kg bw	[redacted] 2005
Mouse		LD_{50} > 5000 mg/kg bw	[redacted] 1985a

The lowest endpoint from the acute oral study with rats (Sanders, A., 2005) for the active substance Fenoxaprop-P-ethyl is 1098 mg a.s./kg bw. This endpoint is used for risk assessment.

B.9.1.2.2. Long-term and reproduction toxicity to mammals

A statement is submitted within this Supplemental Dossier for renewal of approval of Fenoxaprop-P-ethyl. A summary of the statement discussing the long-term endpoint for mammals in the risk assessment is given below.

Reference:	**Fenoxaprop-P-ethyl – Toxicity endpoint for the wild mammal reproductive risk assessment**
Author(s), year:	Bomann W., Diesing L.; 2016
Report/Doc. number:	- / M-555984-01-1
Guideline(s):	Not applicable
GLP:	No
Deviations:	-
Validity:	Acceptable

In this summary, relevant studies from the Toxicology section are referenced. For details please refer to MCA Section 5 “Summary of the toxicological and metabolism studies for Fenoxaprop-P-ethyl”.

Objective

In the scope of the last EU review of Fenoxaprop-P-ethyl no definite endpoint has been set that can be used in the reproductive risk assessment for wild mammals. In the EFSA Peer Review Conclusion for this compound (2007) a NOAEL "range" of 9 - 36 mg/kg bw/day is given for the rat reproduction study but in addition a NOAEL of 10 mg/kg bw/day from the rat developmental toxicity study is listed. Since this last review EFSA has published some guidance how to derive reproductive endpoints so that a new evaluation of the Fenoxaprop-P-ethyl data was indicated.

The current position paper analyses the crucial toxicological studies with regard to the relevance of findings for the wild mammal risk assessment. An appropriate NOAEL is proposed that should be used for the wild mammal risk assessment.

Assessment

The main target of Fenoxaprop-P-ethyl after repeated administration of higher doses is the liver with increased liver weights and minimal centrilobular hypertrophy. Kidney weight changes were also noted, but histopathologically no findings were seen. No severe or irreversible damage of organs was evident. Reduced food consumption and lower body weight gains were seen in adult animals and reduced body weights in pups.

An overview of the toxic effects seen in the 90-day feeding, the reproduction and the developmental toxicity studies is provided in the tables below. The outcome of individual studies is summarised in the first table. The second table provides an overview on the dose-effect relationship seen with Fenoxaprop-P-ethyl in these studies by listing treatment related findings in a dose-dependent order.

Table B. 9.1.2.2-1: Summary of subchronic, reproduction and developmental toxicity studies with Fenoxaprop-P-ethyl

Study type **species** **dose levels tested** **ppm / *mg/kg bw/day***	**Overall NOAEL**	**Findings at Lowest Effect Level**	**Ecotox NOAEL**	**Ecotox relevant findings**
90-day feeding Wistar rat 0 – 10 – 80 - 640 ppm ♂: 0 – 0.7 – 5.8 – 49.0 *mg/kg bw* ♀: 0 – 0.8 – 6.3 – 51.8 mg/kg bw	10 ppm	liver and kidney weight ↑ and changes of clin.-chem parameters at 80 ppm	80 ppm	fc, bw ↓ at 640 ppm
2-generation reproduction Wistar rat 0 – 5 – 30 – 180 ppm parents: 0 – 0.6 – 3.6 – 21.6 mg/kg bw pups: 0 – 1 – 6 – 36 mg/kg bw	parental: 30 ppm reprod.: 180 ppm	liver and kidney weight increases at 180 ppm no adverse findings pup weights (↓) at	180 ppm	pups weights (↓) at 180 ppm, however, no negative effects on survival or pups dying until

Study type **species** **dose levels tested** **ppm** / ***mg/kg bw/day***	**Overall NOAEL**	**Findings at Lowest Effect Level**	**Ecotox NOAEL**	**Ecotox relevant findings**
	pups: 30 ppm	180 ppm		day 21
developmental rat Wistar rat 0 – 10 – 32 – 100 mg/kg bw	maternal: 32 mg/kg bw developm.: 32 mg/kg bw	fc, bw ↓ at 100 mg/kg bw skeletal ossification delays at 100 mg/kg bw (not confirmed in another study with same doses)	32 mg/kg bw	skeletal ossification delays at 100 mg/kg bw
developmental rabbit Himalayan rabbit 0 – 10 – 32 – 100 mg/kg bw	maternal: 32 mg/kg bw developm.: 100 mg/kg bw	fc, bw ↓ at 100 mg/kg bw none	32 mg/kg bw	Fc, bw ↓ at 100 mg/kg bw

bw = body weights; fc = feed consumption

In the subchronic toxicity study in rats, body weight gains and food consumption were reduced at the highest dose of 640 ppm which is considered of possible ecotoxicological relevance.

In the rat reproduction study lower pup weights were observed at 180 ppm during the lactation phase. However, no negative effects on survival or on the number of pups dying until day 21 were evident. Therefore, this effect is not considered to be of ecotoxicological population relevance.

In one of the rat developmental toxicity studies, reproductive performance was impaired at the highest test dose (100 mg/kg bw/day) with increased incidences of intra-uterine embryonic deaths, slightly reduced number of live foetuses and skeletal ossification delays. This was however not confirmed in a follow-up study in which the animals delivered by normal birth and reared their offspring for 21 days so that this study is more relevant for ecotoxicology so that the results of the first study are questionable and likely due to variability. Therefore, the follow-up study should be used for ecotoxicological assessment.

Slightly lower body weights of dams were seen in the rabbit developmental toxicity studies at the high dose level of 100 mg/kg bw, but no effects on fetuses at any dose.

Table B. 9.1.2.2-2: Dose-effect relationship in subchronic, reproduction and developmental toxicity studies

Study	ppm	[mg/kg bw/day] ♂ / ♀	Findings

90 day feeding rat	10	0.7 / 0.8	NOEL
reproduction rat - parents	30	3.6	$NOEL_{parents}$
90 day feeding rat	80	5.8 / 6.3	$NOAEL_{ecotox}$ liver weight ↑
development rat		10	$NOAEL_{maternal}$
reproduction rat - parents	180	parental: 21.6	$NOAEL_{reproduction\ \&\ ecotox}$ liver weight ↑, kidney weight ↑
development rat		32	delayed ossification at 100 mg/kg bw (in one of two studies)
development rabbit		32	$NOAEL_{maternal}$
reproduction rat - pups	180	~36	pup weight (↓) (<5%)
90 day feeding rat	640	49.0 / 51.8	fc ↓, bw ↓ (-18% in males), liver weight ↑, kidney weight ↑
development rabbit		100	$NOAEL_{fetal\ \&\ development}$
development rat		100	fc ↓, bw ↓, incidence of intra-uterine deaths ↑, delayed ossification

bw: body weight; fc: feed consumption

Conclusion

With Fenoxaprop-P-ethyl no adverse effects on reproductive performance of rats were evident at doses up to and including 180 ppm. Body weight development of pups was slightly retarded at that dose, however this had no impact on survival of the offspring. Therefore, the dose of 180 ppm in the 2-generation study in rats is regarded as a NOAEL for ecotoxicology (equivalent to a parental NOAEL of 21.6 mg/kg bw and to a pup NOAEL of ~36 mg/kg bw/day). This is supported by the other studies. The subchronic rat study has a NOAEL at 80 ppm (equivalent to 5.8/6.3 mg/kg) and the rat developmental toxicity study at 10 mg/kg bw. A dose of 32 mg/kg bw resulted in delayed ossification, although this could be questioned by the results of a follow-up study. A dose of 640 ppm (equivalent to 21.6 (parental) and ~ 36 (pups) mg/kg bw) appears to be the relevant NOAEL of population relevance for mammalian species in ecotoxicology.

Proposed wild mammal endpoint

$NOAEL_{reproduction}$ rat: 180 ppm, equivalent to 21.6 mg/kg bw/day. This dose level is also protective for pups where body weights were marginally lower at weaning only at ~36 mg/kg bw/day.

Comment RMS:	**Fenoxaprop-P-ethyl: Information from the mammalian toxicology section, relevant to identify the ecotoxicologically relevant reproductive endpoint of mammals**	
	Endpoint	**Studies to check**

	Acute oral LD_{50}	Rat: 300< LD_{50} < 2,150 mg/kg bw (Acute Oral Cat. 4) Mouse: >5,000 mg/kg bw
	Body weight change[1], behavioural effects and systemic toxicity[2]	28-day oral toxicity study: Rat: 2 mg/kg bw/d (↓clinical chemistry findings, ↑kidney weight) Mouse: 1.82 mg/kg bw/d (↑liver weight with histopath and clinical chem. findings) 90-day oral toxicity study Sub-chronic oral toxicity study (OECD 408): Rat: 0.7 mg/kg bw/d (haematological, clinical chemistry and urinalysis findings; ↑ in liver+kidney weights, macroscopically ↑ kidney) Dog (90-d): 15.6 mg/kg bw/d (↓bw gain, clinical chemistry findings aff. liver) Multi-generation study (OECD 416): rat Reproduction NOAEL = 180ppm 8.77-35.98 mg/kg bw/d Parental NOAEL = 30 ppm 1.42-6.06 mg/kg bw/d (changes in liver+kidney weight, and clinical chemistry parameters) Developmental studies (OECD 414): Rat: maternal NOAEL = 32 mg/kg bw/d (↓bw, food consumption, placenta weight, heart weight) Rabbit: maternal NOAEL = 32 mg/kg bw/d (↓food consumption, defecation, ↑ number of resorption sites)
	Indices of gestation, litter size, pup and litter weight[3]	Multi-generation study (OECD 416): rat Pup toxicity NOAEL = 30 ppm 1.42-6.06 mg/kg bw/d (↓ bw gain during lactation, changes in liver+kidney weight, and clinical chem. params) Developmental studies (OECD 414): Rat: developmental NOAEL = 10 mg/kg bw/d

		(ossification effects) Rabbit: developmental NOAEL = 10 mg/kg bw/d (slightly ↓number of live fetuses per dam, diaphragmatic hernia)
	Indices of viability, pre- and post-implantation loss	Multi-generation study (OECD 416) rat Pup survival NOAEL = 30 ppm 1.42-6.06 mg/kg bw/d (intermediate dose) Developmental studies (OECD 414): Rat: NOAEL = 10 mg/kg bw/d (lowest dose), slight ↓number of fetuses Rabbit: NOAEL = 10 mg/kg bw/d (slightly ↓number of live fetuses per dam, diaphragmatic hernia)
	Embryo/foetal toxicity including teratological effects	Multi-generation study (OECD 416): rat: no terato up to highest dose (180 ppm 9.07-35.01 mg/kg/d) Developmental studies (OECD 414): Rat: ↓bw and bw length, skeletal findings (sternebrae misdeveloped, ossification effects) Rabbit: one case of diaphragmatic hernia (low incidence of 2.5%)
	Number aborting and number delivering early	Multi-generation study (OECD 416) Rat: no data given Developmental studies (OECD 414) Rat: none Rabbit: none
	Systemic toxicity and effects on adult body weight	Multi-generation study (OECD 416): rat Parental NOAEL = 30 ppm 1.42-6.06 mg/kg bw/d (↑liver+kidney weight) Developmental studies (OECD 414): Rat: maternal NOAEL = 32 mg/kg bw/d (↓feed consumption and bw gain) Rabbit: no effects
	Indices of post-natal growth[4], indices of lactation and data on physical	Multi-generation study (OECD 416): Pup toxicity NOAEL = 30 ppm 1.42-6.06 mg/kg bw/d (delayed lactation, ↓bw gain during

landmarks	lactation, ↑liver+kidney weight) Developmental studies (OECD 414): Rat: dev. NOAEL 10 mg/kg/d (slightly delayed ossification) Rabbit: no data
Survival and general toxicity up to sexual maturity	Multi-generation study (OECD 416): Rat: data on sexual maturation were not examined Developmental studies (OECD 414): Rat and rabbit study: data on sexual maturation not examined

1 Included as an indicator for parental effects which may disrupt reproduction.

2 Effects derived from absorption of the substance that causes modification of an organ or an apparatus (biochemical, physiological and/or morphological). Examples include behavioural or physiological impairment (e.g. reduced locomotive activity, altered reflexes).

3Any effects in foetal body weight should be evaluated in the context of all pertinent data including other developmental effects as well as maternal toxicity.

4 For example body weight gain, ear and eye opening, tooth eruption, hair growth and effects on sexual maturation such as age and body-weight at vaginal opening or balano-preputial separation.

In the 90-feeding study in rats ([redacted], 1987) at the highest tested dose of 640 ppm the bodyweight was significantly reduced versus controls in males (-18.7 %) and in females (-10.5%). According to PRAS133 parental effects may disrupt reproduction and this effect could determine the choice of the ecotoxicological endpoint. However a maternal effect on bodyweight change has not been seen in the reproduction study in rats ([redacted] 1987) and in developmental toxicity study in rats ([redacted] 1985) up to 32 mg/kg bw.In the reproduction toxicity study ([redacted] 1987) slight reduction in 21 day pub weights (<5%) at the highest tested dose were seen which is not considered as ecotoxicologically relevant. Thus from this study no adverse reproductive effects were seen up to the highest tested dose. In the developmental toxicity study ([redacted] 1986) with rats the NOAEL has been set to 10 mg/kg/bw due to the fetal skeletal ossification findings by the toxicology expert (for further information refer to Volume 3 – B6 Toxicology). This effect is also considered relevant for the ecotox assessment and the endpoint should be set to 10 mg/kg bw/day.

Endpoints: Overall RMS does not agree with applicant that the NOEL should be set to 180ppm equivalent to 21.6 mg/kg bw/day. The former agreed endpoint for AnnexI inclusion of 10 mg/kg bw/day is still considered appropriate based on

	skeletal ossification delays **Conclusion of the RMS:** In conclusion, the ecotoxicological endpoint should be set to 10 mg/kg bw/day and should be used for risk assessment purposes.

B.9.1.3. Active substance bioconcentration in prey of birds and mammals

Substances with a high potential to bioaccumulate in the food chain could bear a risk of secondary poisoning for birds and mammals if feeding contaminated prey like fish or earthworms. For organic chemicals, a log P_{OW} > 3 is used to trigger an evaluation of the potential for bioaccumulation. As the log POW of Fenxoparop-P-ethyl is 4.58 the potential risk for secondary poisoning a risk assessment is conducted (refer to Volume 3 CP PUMA S 69 EW B-9 and Volume 3CP CHA 4960 69 g/L.

B.9.1.4. Other data on effects on terrestrial vertebrate wildlife (birds, mammals, reptiles and amphibians)

Within the conducted literature search no relevant information has been found.

B.9.1.5. Potential for endocrine disruption

Birds

The population relevant effects of Fenoxaprop-P-ethyl on birds were studied in reproductive toxicity studies on bobwhite quail. No statistically significant effects on adult birds, offspring or reproductive parameters were found at 400 mg Fenoxaprop-P-ethyl/kg diet in bobwhite quails. At the highest tested concentration of 800 mg Fenoxaprop-P-ethyl/kg diet tested in Bobwhite quail there was a slight decrease (ca. 10 %) in food consumption and egg production as compared with the control, which attained statistical significance; however, the overall reproductive toxicity endpoint, i.e. the number of 14-day old chicks per hen, did not show a statistically significant reduction.

As there have been established levels at which reproduction was not affected in two avian species (also in study with mallard exposed to the racemic mixture), it is concluded that based on an appropriate risk assessment there are no population relevant adverse effects of Fenoxaprop-P-ethyl. Based on the absence of any indication of relevant effects it can be concluded that Fenoxaprop-P-ethyl is not a (potential) endocrine disrupter in birds.

Amphibians and Reptiles

Currently no test methods are established to assess the population relevant effects of chemicals to amphibians or reptiles. While an amphibian metamorphosis test exists, this test was developed to evaluate potential effects on the thyroid system and not to measure population relevant effects.

Therefore no further studies can be suggested at this time for these groups of organisms.

Wild Mammals

From section toxicology (B.6.): No targeted in vitro or in vivo screening studies to assess the endocrine disrupting potential of Fenoxaprop-P-ethyl (nor fenoxaprop-ethyl) have been submitted. Information from US EPA Endocrine Disruptor Screening Program (EDSP) that involves results from estrogen receptor bioactivity assays has been added.

According to the OECD No. 150 Guidance Document on standardized test guidelines for evaluating chemicals for endocrine disruption (ENV/JM/MONO(2012)22) the following information from in vivo studies indicate possible ED effects:

- Repeated dose 28-day oral toxicity study in rodents (OECD 407):
- 2-generation reproduction toxicity study (OECD 416) incl. 1-generation study (OECD 415)
- Extended 1-generation reproductive study (OECD 443)

A short summary of study results (including those where ED relevant parameters were altered) is given in **Fehler! Verweisquelle konnte nicht gefunden werden.** and **Fehler! Verweisquelle konnte nicht gefunden werden.**.

Organ weights (i.e. testis, adrenals and thyroid) relevant for potential endocrine disruption were not consistently altered by Fenoxaprop-P-ethyl nor by fenoxaprop-ethyl. Therefore they were not considered to be clearly treatment-related. Lipid metabolism was affected by both Fenoxaprop-P-ethyl and fenoxaprop-ethyl, which might be caused by an endocrine mechanism. However, no mechanistic tests for confirmation are available and therefore this assessment cannot be concluded. The conduction of a steroidogenesis assay could provide more insights and is recommended by the RMS.

Table B. 9.1.5-1: Summary of ED relevant results for Fenoxaprop-P-ethyl

Study	Results	Accepted / Deviations
EDSP Estrogen Receptor Bioactivity (US EPA) EPA ACToR Code C71283802	ER Agonist AUC: 0 ER Antagonist AUC: 0.000153 ER Bioactivity: 0.000153	-
Fenoxaprop-P-ethyl: Repeated dose 28-day oral toxicity in rats [redacted] *1987a* See B.6.3.1.1 **OECD 407**	No/not biological relevant effects on adrenals, thyroids and testis. ⇩ bodyweight at high dose ⇩ lipid metabolism (strongly in ♂), ⇧ triglycerides (both sexes) ⇧ liver weight (absolute + relative to bodyweight)	Supplementary. Limited organ weight and histopathology.
Fenoxaprop-P-ethyl: Repeated dose 28-day oral toxicity study in mice [redacted] *1987b* See B.6.3.1.2 **OECD 407**	No/not biological relevant effects on adrenals and thyroids. ⇧ bodyweight gain at h.d. ⇩ lipid metabolism at h.d. (strongly in ♂) ⇩ testis weight at h.d. (absolute + relative) Liver: ⇧ clinical parameters at high dose, ⇧ weight (absolute + relative to bodyweight) and histopathological findings	Supplementary. Limited organ weight and histopathology. No haematology and urinalysis.

Fenoxaprop-P-ethyl: 13-week feeding study in rats [redacted] *1987* See B.6.3.2.1 **OECD 408**	No/not biological relevant effects on ovaries, uterus, thyroids, adrenals and pituitary gland. ⇩ bodyweight gain at h.d. ⇩ lipid metabolism at h.d. (strongly in ♂) ⇧ testis weight (relative) at week 13 at h.d. Liver: ⇧ ALP at high dose, ⇧ weight (absolute + relative) at week 13 at high dose	Yes. Missing BUN measurement. Limited pathology and organ weight analysis.
Fenoxaprop-P-ethyl: 40-days inhalation study in rats (28 appliations) with recovery period [redacted] *1989* See B.6.3.3.1 **OECD 412**	No/not biological relevant effects on ovaries, uterus, epididymides, prostate, seminal vesicles, thyroid, adrenals and pituitary. ⇩ cholesterol (both sexes), ⇧ triglycerides (in ♂) and ⇩ a-2-globulin (in ♂) at high dose ⇩ testis weight (absolute) at 41d at high dose ⇧ liver weight (absolute + relative)	Yes. Animal slightly younger. Limited pathology and organ weight analysis. Dry exposure conditions.

Table B. 9.1.5-2: Summary of ED relevant results for Fenoxaprop-P-ethyl

Study	**Results**	**Accepted / Deviations**
EDSP Estrogen Receptor Bioactivity (US EPA) EPA ACToR Code C66441234	ER Agonist AUC: 0 ER Antagonist AUC: $2.96 \cdot 10^{-7}$ ER Bioactivity: $2.96 \cdot 10^{-7}$	-
Fenoxaprop-ethyl: Range-finding test in a 32-day study in rats [redacted] *1980a* See B.6.3.4.1 **No guideline (study design similar to OECD 407)**	No/not biological relevant effects on ovaries, uterus, prostate, epididymis, seminal vesicles, thyroids and pituitary gland. ⇩ bodyweight gain ⇩ lipid metabolism ⇧ ALP at high dose ⇧ testis weight at h.d. (relative to bodyweight) ⇧ liver weight (relative to bodyweight) ⇩ adrenals weight in ♀ at h.d. (abs.+rel. to bw)	Yes.
Fenoxaprop-ethyl: Repeated 32-day oral administration to mice [redacted] *1980b* See B.6.3.4.2 (1st study) **No guideline (study design similar to OECD 407)**	No/not biological relevant effects on ovaries, uterus, prostate, epididymides, testis, seminal vesicles, thyroids, adrenals and pituitary. ⇩ terminal bodyweight at high dose Liver: ⇧ ALAT and ALP, ⇩ weight in ♂ (abs. + rel.); ⇧ weight in ♀ (absolute + relative to bw); histopathological changes at h.d. (incl. enlargement of liver cells)	Yes.
Fenoxaprop-ethyl: 30-day oral administration study in mice [redacted] *1981* See See B.6.3.4.2 (2nd study) **No guideline (study design similar to OECD 407)**	No/not biological relevant effects on ovaries, uterus, testis, epididymis, prostate, seminal vesicles, thyroid, adrenals, pituitary. Lipid metabolism: ⇧ cholesterol at h.d. in ♀, slightly ⇧ total lipids in ♂ Liver: ⇩weight in ♂ (abs. + rel.); ⇧ weight in	Yes.

	♀ (abs. + rel.); histopathological changes at high doses	
Fenoxaprop-ethyl: Repeated-dose 30-days oral toxicity study in dogs. [redacted] *1980* See B.6.3.4.3 **No guideline**	No/not biological relevant effects on ovaries, uterus, testis, prostate and pituitary gland. Liver: Lobular marking and fatty degeneration Thyroid: hyperplasia of lymph follicles Adrenals: ⇧ weight, haemorrhages of the cortex	Supplementary. Only two animals per dose group. No analysis of t.s. for concentration, stability and homogeneity.
Fenoxaprop-ethyl: 13-week feeding study in rats [redacted] *1981* See B.6.3.5.1 **No guideline (study design similar to OECD 408)**	No/not biological relevant effects on ovaries, uterus and pituitary glands. ⇩ lipid metabolism Liver: ⇧ ALP in ♂, ⇧ weight in ♂ at h.d. (absolute + relative); enlarged liver cells at h.d. (at first sacrif.) ⇧ thyroid weight in ♂ (absolute + relative) ⇧ adrenals weight in ♀ (absolute + relative)	Yes.
Fenoxaprop-ethyl: 13-week dietary study in mice [redacted], *1993a* See B.6.3.5.2 **EPA GD 82-1**	No/not biological relevant effects on ovaries, uterus, vagina, testis, prostate, epididymides, seminal vesicles, thyroid, mammary glands and pituitary glands. ⇧ triglycerides, total protein in ♂ ⇧ adrenals in ♂ (absolute + relative) Liver: ⇧ ALAT, ALP in ♂, ⇧ weight (absolute + relative); histopathological findings (hypertrophy, necrosis, ⇧ mitosis)	Yes. Limited histopathology and organ weight.
Fenoxaprop-ethyl: Multiple generation study in rats [redacted] *1986* See B.6.6.1.2 **EPA GD 83-3**	No changes in vaginal opening. No/not biological relevant effects on uterus, ovaries, testes, prostate and seminal vesicles. ⇧ bodyweight at lactation (F2a: high dose)	Yes. Anogenital distance, oestrus cyclicity and preputial separation not assessed.

B.9.2. EFFECT ON AQUATIC ORGANISMS

In order to complete the aquatic risk assessment and to address the new data requirements for active substance (Regulation 283/2013) and plant protection product (Regulation 284/2013) according to Regulation (EC) no. 1107/2009, additional studies were submitted by the notifiers Bayer CropScience and Cheminova A/S.

B.9.2.1. Acute toxicity to fish

Active substance:

Reference:	**Fenoxaprop-P-ethyl technical 88.1 % w/w Code: AE F046360 00 1C97 0002 The 96 hour acute toxicity to the rainbow trout *Oncorhynchus mykiss*, in a flow through system**
Author(s), year:	[redacted] 1999a
Report/Doc. number:	BM98W520/M-183992-01-1
Guideline(s):	OECD test guideline 203 (1989), US EPA guideline (1982), EU Commission Directive 92/69/EEC, C.1 (1992),
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn., CAS no. : 66441-23-4, 82110-72-3, batch no. : 1+2/86, purity: 95.8% w/w
Test species:	Rainbow trout (*Oncorhynchus mykiss*)
Number of organisms:	20 fish per controls and test concentrations, 2 replicate per treatment
Age, length, weight:	The weight and length of fish were measured at the end of the exposure period. Age: Juvenile Length: 2.5 – 3.7 cm (mean: 3.0 cm) Weight: 0.208 – 0.646 g (mean: 0.343 g)
Loading	0.343 g/L static and 0.043 g/L/day in the test tanks
Type of test:	Flow-through, 96 hours
Applied concentrations:	
Nominal:	0 (control and solvent control), 0.13, 0.22, 0.36, 0.60 and 1.0 mg a.s./L
Solvent:	DMF (0.1 mL/L)
Test conditions:	
Water quality:	Dilution water, hardness: 58 mg /L as $CaCO_3$, alkalinity: 38 mg/L as $CaCO_3$, Conductivity: 150 µmhos/cm, pH: 7.6, dissolved oxygen: 10.1 mg/L, temperature: 19.2 °C
Conductivity:	110 - 120 µmhos/cm

Temperature: 12.6 – 13.2 °C (mean: 12.9 °C)

pH: 7.1 – 7.5

O_2 content: 10.6 – 11.8 mg/L (101 – 114 % air saturation)

Light regime: Light/dark cycle of 16/8, light intensity approximately 115 foot candles

Feeding The fish were not fed during the 96 hours study period.

Methods: Test chambers were 12 L glass tanks containing approximately 10 L of solution. Approximate test chamber dimensions were 24.2 cm long, 25.5 cm high and 19.3 cm wide, with a test solution depth of approximately 21.4 cm. The diluter cycled approximately 3.3 L/hour.

At the initiation of the study ten fish were allocated at random to each test vessel.

Test parameters: All test vessels were monitored for mortality and sub-lethal effects after 3, 6, 24, 48, 72 and 96 hours.

Measurements of temperature, pH, conductivity and dissolved oxygen were made daily.

Analytical measurements: Samples of the test solutions were measured at the start and the end of the test by high performance liquid chromatography.

Statistics: Mortality data was analysed with CT-TOX, a multi-method program that can determine the LC_{50} and 95% confidence interval using non-linear interpolation, Binomial, Moving Average, Probit, and Spearman- Karber methods. The results of the Spearman-Karber method were reported for all time periods. All toxicity values were calculated based on the mean measured concentrations (replicates combined) of active ingredient found in the test solutions.

Findings:

Analytical data: Mean measured concentrations were in the range of 58- 85 % of nominal concentrations. Hence, the results of the study are based on mean measured concentrations.

Table B. 9.2.1-1: Analytical measurements

Nominal concentrations [mg a.s./L]	Measured concentrations [mg/L]			% of nominal concentrations
	0 hours	96 hours	Mean	
Control	< 0.003	< 0.003	< 0.003	-
Solvent control	< 0.003	< 0.003	< 0.003	-
0.13	0.1069	0.0973	0.1021	79
0.22	0.1506	0.1596	0.1551	71
0.36	0.2665	0.3477	0.3071	85
0.60	0.4152	0.6037	0.5095	85
1.0	0.6174	0.5397	0.5786	58

Limit of Quantification (LOQ) = 0.003 mg/L

Biological results: The lowest concentration that resulted in 100% mortality within the period of the test was 0.5786 mg a.s./L.

No mortalities occurred at the two lowest test concentrations (0.1021 and 0.1551

mg a.s./L) over the 96 hour exposure period. In the control and solvent control 0 % mortality occurred.

Table B. 9.2.1-2: Mortality and sub-lethal effects

Test concentration [mg a.s./L]	Mortality [%]						
	0 h	3 h	6 h	24 h	48 h	72 h	96 h
Control	0	0	0	0[b]	0	0	0
Solvent control	0	0	0	0[b]	0	0	0
0.1021	0	0	0	0[b]	0	0	0
0.1551	0	0	0	0[b]	0	0	0
0.3071	0	0	0	0[b]	10	10	10[a,b]
0.5095	0	0	0	0[b]	5[a,b]	60[a,b]	90[a,b]
0.5786	0	0	0	0[a]	100	100	100

[a] Lethargy, [b] On Bottom

Conclusion: Based on these results a LC_{50} of 0.39 mg a.s./L (95%, C.I. = 0.35 to 0.42 mg a.s./L) based on mean measured concentrations was determined. The NOEC of 0.16 mg a.s./L is based on mortality.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guideline OECD 203 (1992, updated 2009).

- The mortality in the controls should not exceed 10% (or 1 fish if less than 10 fish are used) at the end of the test.
- Constant conditions should be maintained throughout the test.
- The dissolved oxygen concentration must have been at least 60% of the air saturation value throughout the test.
- There must be evidence that the concentration of the test substance has been satisfactorily maintained, and preferably, it should be at least 80% of the nominal concertation throughout the test. If the deviation from the nominal concentration is greater than 20%, results should be based on the measured concentrations.

All validity criteria are met.

In addition, the following points deviated from the test guideline or were not reported in detail:

- The measured length of fish is below the recommended 5.0 ± 1.0 cm. The length of fish was measured in the control group at the end of the test. No mortalities were observed during the study. After 24 h all 10 fish sceased swimming, however these behavioural effects where also observed at the other test concentrations. Therefore it can be assumed that the length of fish had no impact on the results of the test.
- The conductivity was higher than the recommended 10 µS/cm.
- The temperature is slightly below the recommended temperature range of 13 – 17

°C.

The deviations to the test guideline are not considered to have an impact on the validity of the test.

Acceptability of the analytical methods used in the test:

Method: HPLC/UV/VIS

Linearity: Calibration is based on single determination at 5 concentrations.

The calibration function was linear within the range from 0.0025 – 0.05 µg/mL (± 20% of nominal concentration) with r^2 = 0.9913.

Accuracy: 2 fortification levels (each 3 measurements): 0.10 and 1.0 mg/L. Mean recoveries for each level: 83 and 106 %

Precision: The relative standard deviation per fortification level: 16.4 and 4.8 %

LOQ: The limit of quantification (LOQ) = 0.003 mg/L.

No information on the limit of detection is given in the study report.

Endpoints:

In the study report the LC_{50} is based on mean measured concentration. The RMS conducted a statistical re-evaluation of the results of the study using the software Tox Rat®. The geometric mean measured concentrations are 0.1020, 0.155, 0.3044, 0.5007 and 0.5772 mg a.s./L. However, this change does not alter the LC_{50} value. Therefore, the RMS agrees on the endpoint given in the study report.

LC_{50} = 0.39 mg a.s./L (95% C.I. = 0.35 – 0.42 mg a.s./L)

NOEC = 0.16 mg a.s./L

The endpoints are based on mean measured concentrations.

Conclusion of the RMS: Based on the evaluation of the study the acute fish toxicity test is considered valid.

Reference: [redacted] (1986c): The Effect of Hoe 046360 - substance, technical Identification code Hoe 046360 OH ZC96 0002 to *Salmo gairdneri* (Rainbow trout) in a dynamic acute toxicity Test (Sg349/b, method OECD). Report No. OEK86/080E

Test guideline: OECD 203

GLP: yes

Test item: Fenoxaprop-P-ethyl, techn.: 95.6 % w/w sum of (D+) and (L-)-enantiomers, batch no.: not stated

Material and methods:

A 96 hours test on the acute toxicity of Fenoxaprop-P-ethyl to rainbow trouts, was performed under flow through conditions at five nominal test concentrations, one control and one solvent control (acetone). The nominal test concentrations were 0.1, 0.18, 0.42, 0.56 and 0.75 mg/L, respectively. The fish were 6.4 cm (mean) in length and had an average weight of 3.4 g. Ten fish were exposed to each test concentration under following test conditions: 16/8-hour light/dark photoperiod, 14.3 – 15.6 °C, pH 7.4 – 7.9, 10.1 – 11.9 mg/L dissolved O_2 and total hardness 315 – 324mg/l $CaCO_3$.

Findings:

Chemical analysis on the test item concentrations was not performed. The 96 hours LC_{50} was estimated to be 0.57 mg/L Fenoxaprop-P-ethyl (95 % CL 0.5 – 0.64 mg/L) based on nominal concentration. Behavioural or sublethal effects like swimming on the surface and slow reaction up to narcosis were observed at test concentrations from 0.42 – 0.75 mg/L, therefore the 96 hours "no effect" concentration (NOEC) was determined to be 0.18 mg/L.

Conclusion: LC_{50} (96 h): 0.57 mg a.s./L and NOEC: 0.18 mg a.s./L based on nominal concentrations

Comment (RMS): The concentrations of test substance in test media were not measured, therefore the study considered not acceptable.

Comment RMS:	This study was considered not acceptable at the first approval of the active substance. The study summary from the DAR is included in the RAR as additional information.

Reference:	**The Effect of Hoe 046360 – substance, technical Identification code: Hoe 046360 OH ZC96 0002 to *Salmo gairdneri* (Rainbow trout) in a Static Acute Toxicity Test**
Author(s), year:	[redacted] 1986b
Report/Doc. number:	OEK86-092E / M-114397-01-1
Guideline(s):	US-EPA (1975)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn. (Hoe 046360), purity: 95.6 % w/w
Test species:	Rainbow trout (*Salmo gairdneri*, known as *Oncorhynchus mykiss*)
Number of organisms:	10 fish per controls and test concentrations, 1 replicate per treatment
Age, length, weight:	Age: 5 months Length: mean: 670 mm Weight: mean: 4.1 g
Loading	0.21 g/L or 0.34 cm/L fish loading per test vessel
Type of test:	Static, 96 hours
Applied concentrations:	
Nominal:	0 (control and solvent control), 0.18, 0.24, 0.32, 0.42, 0.56, 0.75 and 1 mg a.s./L
Solvent:	Acetone (0.5 mL/L)
Test conditions:	
Water quality:	Dilution water, hardness: 45.5 – 49.5 mg /L as $CaCO_3$, alkalinity: 32.4 – 33.9 mg/L as $CaCO_3$
Conductivity:	163 – 192 µmhos/cm
Temperature:	11.6 – 12.7 °C

pH: 7.3 – 8.2

Dissolved oxygen: 9.3 – 12.2 mg/L

Light regime: Light/dark cycle of 16/8, wide spectrum fluorescent lights

Feeding The fish were not fed during the 96 hours study period.

Methods: The test was carried out in 300 L stainless steel tanks containing 200 L test water, with internal dimensions of 800 mm x 640 mm x 670 mm (length x width x height).

At the initiation of the study ten fish were allocated at random to each test vessel.

Test parameters: All test vessels were monitored daily for mortality and sub-lethal effects.

Temperature, dissolved oxygen and pH were measured daily in the 0.18, 0.42 and 1.0 mg a.s./L test concentrations.

Analytical measurements: Samples of the test solutions of the concentrations 0.18, 0.42 and 1.0 mg a.s./L were measured at 24, 48 and 96 hours.

Statistics: The concentrations of test substance lethal to 50 % of the test population (LC_{50}) with the 95 % confidence limits were determined at the 48, 72 and 96 hour exposure period using a computerized calculation program (Stephan et al, EPA, 1978). This program employs the binominal, approximate LC_{50}, moving average and probit method for the calculation.

Findings:

Analytical data: The mean over the 96-hour study period ranged between the 53 and 106 % of the nominal test concentration. The highest concentration of 1.0 was excluded for the LC_{50} calculation. Therefore, the results are based on nominal concentrations.

Table B. 9.2.1-3: Analytical measurements

Nominal concentrations [mg a.s./L]	Measured concentrations [mg/L]				% of nominal concentrations
	0 hours	48 hours	96 hours	Mean	
0.18	0.22	0.18	0.17	0.19	106
0.42	0.39	0.32	0.33	0.35	83
1.0	0.55	0.53	0.52	0.53	53

Biological results: The lowest concentration that resulted in 100% mortality within the period of the test was 0.56 mg a.s./L.

The highest concentration with no mortality was 0.32 mg a.s./L. In the control and solvent control 0 % mortality occurred.

Table B. 9.2.1-4: Mortality and sub-lethal effects

Test concentrations [mg a.s./L]	Mortality [%]			
	24 h	48 h	72 h	96 h
Control	0	0	0	0
Solvent control	0	0	0	0
0.18	0	0	0	0
0.24	0	0	0	0

Test concentrations [mg a.s./L]	Mortality [%]			
	24 h	48 h	72 h	96 h
0.32	0	0	0[c]	0[c]
0.42	0	0[c]	0[a,d]	20[c]
0.56	0[b]	70[c]	90[c]	100
0.75	0[b]	100	100	100
1.0	0[b]	60[a,c]	100	100

[a] Lethargy, [b] Surfacing, [c] Slow Reaction, [d] Loss of equilibrium

Conclusion: Based on these results a LC_{50} of 0.46 mg a.s./L (95%, CL = 0.32 to 0.56 mg a.s./L) based on nominal concentrations was determined.

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guideline OECD 203 (1992, updated 2009).

- The mortality in the controls should not exceed 10% (or 1 fish if less than 10 fish are used) at the end of the test.
- Constant conditions should be maintained throughout the test.
- The dissolved oxygen concentration must have been at least 60% of the air saturation value throughout the test.
- There must be evidence that the concentration of the test substance has been satisfactorily maintained, and preferably, it should be at least 80% of the nominal concertation throughout the test. If the deviation from the nominal concentration is greater than 20%, results should be based on the measured concentrations.

All validity criteria are met. It is noted that only three concentrations out of 7 were analytically verified. In the highest test concentration the mean concentration decreased to 53 % of nominal concentration. However, this concentration was excluded for LC_{50} calculation.

In addition, the following points deviated from the test guideline or were not reported in detail:

- The fish length is above the recommended 5.0 ± 1.0 cm. No mortalities or behaviour effects were observed during the studyTherefore it can be assumed that the length of fish had no impact on the results of the test.
- The conductivity was 163 – 192 µmhos/cm which is higher than the recommended 10 µS/cm.
- The temperature is slightly below the recommended temperature range of 13 – 17 °C.

The deviations to the test guideline are not considered to have an impact on the validity of the test.

Acceptability of the analytical methods used in the test:

No information about the analytical method is given in the study report.

Endpoints:

	The RMS agrees on the endpoints given in the study report. LC_{50} = 0.46 mg a.s./L (95% C.I. = 0.32 – 0.56 mg a.s./L) The endpoints are based on nominal concentrations. NOEC = 0.24 mg a.s./L. **Conclusion of the RMS:** Based on the evaluation of the study the acute fish toxicity test is considered valid.

Reference: [redacted] 1986d): Effect of Hoe 046360 - active ingredient technical (Code: Hoe 046360 OH ZC96 0002) on *Salmo gairdneri* (Rainbow trout) in a static-acute toxicity test (Study No. Sg348/a, BBA/EPA method). Report No. OEK86/073E

Test guideline: BBA, Merkblatt Nr. 33, 1975; US EPA § 72-1

GLP: yes

Test item: Fenoxaprop-P-ethyl, techn.: 95.6 % w/w sum of (D+) and (L-)-enantiomers, batch no.: not stated

Material and methods:

A 96 hours test on the acute toxicity of Fenoxaprop-P-ethyl to rainbow trouts, was performed under static conditions at nine nominal test concentrations, one control and one solvent control (acetone). The nominal test concentrations were 0.1, 0.135, 0.18, 0.24, 0.32, 0.42, 0.56, 0.75 and 1.0 mg/L, respectively. The fish were 5.4 cm (mean) in length and had an average weight of 1.3 g. Ten fish were exposed to each test concentration under following test conditions: 16/8-hour light/dark photoperiod, 15.0 – 16.3 °C, pH 8.0 – 8.2, 8.4 – 10.7 mg/L dissolved O_2 and total hardness 12.5 °dH.

Findings:

Chemical analysis of test concentrations in test vessels was not performed, therefore the assessment is based on nominal concentrations.

The 96 hours LC_{50} was estimated to be 0.61 mg/L Fenoxaprop-P-ethyl (95 % CL 0.42 – 0.75 mg/L). Behavioural or sublethal effects like slower reaction up to narcosis were observed at test concentrations of 0.42 mg/L, therefore the 96 hours "no effect" concentration (NOEC) was determined to be 0.32 mg/L.

Conclusion: LC_{50} (96 h): 0.61 mg a.s./L and NOEC: 0.32 mg a.s./L based on nominal concentrations

Comment (RMS): No measurements of test substance in test media were performed, therefore the study considered not acceptable.

Comment RMS:	This study was considered not acceptable at the first approval of the active substance. The study summary from the DAR is included in the RAR as additional information.

Reference:	**Fenoxaprop-P-ethyl Technical 88.1 % w/w Code: AE F046360 00 1C97 0002 the 96 Hour Acute Toxicity to the Bluegill Sunfish, *Lepomis macrochirus*, in a Flow Through System**
Author(s), year:	[redacted] 1999b

Report/Doc. number:	BM98W521/M-184457-01-1
Guideline(s):	OECD 203 (1989), US EPA (1982), EU Commission Directive 92/69/EEC, C.1 (1992)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn., Batch no. : 1+2/86, purity: 88.1%
Test species:	Bluegill sunfish (*Lepomis macrochirus*)
Number of organisms:	20 fish per controls and test concentrations, 1 replicate per treatment
Age, length, weight:	Age: Juvenile Length: mean: 250 mm Weight: mean: 0.348 g
Loading	0.348 g/L fish loading per test vessel
Type of test:	Flow-through 96 hours
Applied concentrations:	
Nominal:	0 (control), 0 (solvent control), 0.13, 0.22, 0.36, 0.6 and 1 mg a.s./L
Solvent:	DMF (0.1 mL/L)
Test conditions:	
Water quality:	Filtered well water, total hardness: 58 mg/L as $CaCO_3$, Alkalinity: 38 mg/L as $CaCO_3$
Conductivity:	150 – 170 µmhos/cm
Temperature:	21.7 – 22.2 °C
pH:	7.3 – 7.6
O_2 content:	96 – 102 % air saturation
Light regime:	Light/dark cycle of 16/8, artificial daylight approx. 110 foot candles
Feeding	The fish were not fed and test solutions were not aerated during the study.
Methods:	The test chambers had a capacity of 12 L containing 10 L test solution with internal dimensions of 242 mm x 193 mm x 252 mm (length x width x height). The test solutions were renewed at a nominal rate of 3.3 L/hours. At the initiation of the study ten fish were allocated at random to each test vessel.
Test parameters:	All test vessels were monitored for mortality and sub-lethal effects after 3, 6, 24, 48, 72 and 96 hours. Discrete measurements of temperature, dissolved oxygen, pH, and conductivity were obtained at test initiation, at 24, 48, 72 and 96 hours, or within one hour of the designated time.
Analytical measurements:	Samples of the test solutions were measured at start and end of the test by high performance liquid chromatography.
Statistics	Mortality data was analysed with CT-TOX, a multi-method program that can

determine the LC_{50} and 95% confidence interval using non-linear interpolation, Binomial, Moving Average, Probit, and Spearman-Karber methods. The results of the Spearman-Karber method were reported for all time periods.

Findings:

Analytical data: Mean measured concentrations were in the range of 67 to 92 % of nominal concentrations. Hence, the results of the study are based on mean measured concentrations.

Table B. 9.2.1-5: Analytical measurements

Nominal concentrations [mg a.s./L]	Measured concentrations [mg/L]			% of nominal concentrations
	0 hours	96 hours	Mean	
Control	< 0.003	< 0.003	-	-
Solvent control	0.0076	< 0.003	0.003	-
0.13	0.084	0.092	0.088	67
0.22	0.212	0.276	0.192	87
0.36	0.257	0.322	0.290	81
0.60	0.425	0.677	0.551	92
1.0	0.861	0.911	0.886	89

Limit of Quantification (LOQ) = 0.003 mg/L

Biological effects The lowest concentration that resulted in 100% mortality within the period of the test was 0.29 mg a.s./L.

The highest concentration with no mortality was 0.088 mg a.s./L. In the control and solvent control 0 % mortality occurred.

Table B. 9.2.1-6: Mortality and sub-lethal effects

Mean measured concentration [mg a.s./L]	Mortality [%]						
	0 h	3 h	6 h	24 h	48 h	72 h	96 h
Control	0	0	0	0	0	0	0
Solvent control	0	0	0	0	0	0	0
0.088	0	0	0	0	0	0	0
0.192	0	0	0	0	0[c,d]	5[c,d]	40[c,d]
0.290	0	0	0	0	10[c,d]	100	100
0.551	0	0	0	5[a,b,c]	100	100	100
0.886	0	0	0	100	100	100	100

[a] Loss of Equilibrium, [b] Surfacing, [c] On Bottom, [d] Lethargy

Conclusion: Based on these results a LC_{50} of 0.19 mg a.s./L (95%, CL = 0.16 to 0.21 mg a.s./L) based on mean measured concentrations was determined.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guideline OECD 203 (1992, updated 2009). - The mortality in the controls should not exceed 10% (or 1 fish if less than 10 fish

are used) at the end of the test.

- Constant conditions should be maintained throughout the test.
- The dissolved oxygen concentration must have been at least 60% of the air saturation value throughout the test.
- There must be evidence that the concentration of the test substance has been satisfactorily maintained, and preferably, it should be at least 80% of the nominal concertation throughout the test. If the deviation from the nominal concentration is greater than 20%, results should be based on the measured concentrations.

All validity criteria are met.

In addition, the following points deviated from the test guideline or were not reported in detail:

- The conductivity was between 150 and 170 µmhos/cm which is higher than the recommended 10 µS/cm.

The deviation to the test guideline is not considered to have an impact on the validity of the test.

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4.

Method: HPLC/UV/VIS

Linearity: Calibration is based on single determination at 5 concentrations.

The calibration function was linear within the range from 0.0025 – 0.05 µg/mL (± 20% of nominal concentration) with r^2 = 0.9913.

Accuracy: 2 fortifications levels (each 3 measurements): 0.10 and 1.0 mg/L. Mean recoveries for each level: 83 and 106 %

Precision: The relative standard deviation per fortification level: 16.4 and 4.8 %

LOQ: The limit of quantification (LOQ) = 0.003 mg/L.

No information on the limit of detection is given in the study report.

Endpoints:

In the study report the LC_{50} is based on the arithmetic mean measured concentration instead on the geometric mean measured concentrations. The RMS conducted a statistical re-evaluation of the results of the study using the software Tox Rat®. The geometric mean measured concentrations are 0.088, 0.191, 0.288, 0.536 and 0.885 mg a.s./L. However, this change does not alter the LC_{50} value. Therefore, the RMS agrees on the endpoint given in the study report.

LC_{50} = 0.19 mg a.s./L (95% C.I. = 0.16 – 0.21 mg a.s./L)

NOEC = 0.088 mg a.s./L

The endpoint is based on mean measured concentrations.

Conclusion of the RMS: Based on the evaluation of the study the acute fish toxicity test is considered valid.

Reference: [redacted] (1986e): The Effect of Hoe 046360 - substance, technical Identification Code Hoe 046360 OH ZC96 0002 to *Lepomis macrochirus* (Bluegill sunfish) in a static-acute toxicity test (Lm16/a, method EPA). Report No. OEK86/003E

Test guideline: US EPA § 72-1

GLP: yes

Test item: Fenoxaprop-P-ethyl, techn.: 95.6 % w/w sum of (D+) and (L-)-enantiomers, batch no.: not stated

Material and methods:

A 96 hours test on the acute toxicity of Fenoxaprop-P-ethyl to bluegill sunfish, was performed under static conditions at eight nominal test concentrations (in a range from 0.1 – 0.75 mg/L) one control and one solvent control (acetone). The fish were 4.41 cm (mean) in length and had an average weight of 2.12 g. Ten fish were exposed to each test concentration under following test conditions: 16/8-hour light/dark photoperiod, 15.0 – 16.3 °C, pH 7.7 – 8.2, 7.2 – 9.2 mg/L dissolved O_2 and conductivity 175 – 185 µmhos/cm.

Findings:

Chemical analysis of test concentrations in test vessels was not performed, therefore the assessment is based on nominal concentrations.

The 96 hours LC_{50} was estimated to be 0.58 mg/L Fenoxaprop-P-ethyl (95 % CL 0.42 – 0.75mg/L). Behavioural or sublethal effects like slower reaction up to narcosis and irregular swimming were observed at test concentrations of 0.42 mg/L, therefore the 96 hours "no effect" concentration (NOEC) was determined to be 0.32 mg/L.

Conclusion: LC_{50} (96 h): 0.58 mg a.s./L and NOEC: 0.32 mg a.s./L based on nominal concentrations

Comment (RMS): No measurements of test substance in test media were performed, therefore the study considered not acceptable.

Comment RMS:	This study was considered not acceptable at the first approval of the active substance. The study summary from the DAR is included in the RAR as additional information.

Reference:	**Acute toxicity of Fenoxaprop-P-ethyl to fish (*Pimephales promelas*) under flow-through conditions**
Author(s), year:	[redacted] 2011a
Report/Doc. number:	EBFPL012 / M-407842-01-2
Guideline(s):	EPA-FIFRA § 72-1/SEP-EPA-540/9-85-006 (1982/1985), OPPTS 850.1075 (1996), EU Commission Directive 92/69/EEC, C.1 (1992), OECD 203 (1992)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl (techn.), Batch no.: EFLC000572, purity: 97.5%
Test species:	Fathead Minnow (*Pimephales promelas*)

Number of organisms:	10 fish per controls and test concentrations, 1 replicate per treatment
Length, weight:	Length: mean: 380 mm Weight: mean: 0.49 g
Loading	0.123 g/L fish loading per test vessel
Type of test:	Flow-through, 96 hours
Applied concentrations:	
Nominal:	1st Test: 0 (control and solvent control), 0.046, 0.077, 0.129, 0.215, 0.359 and 0.600 mg a.s./L 2nd Test: 0 (control and solvent control), 0.215, 0.359 and 0.600 mg a.s./L
Solvent:	DMF (0.1 mL/L)
Test conditions:	
Water quality:	Reconstituted water, total hardness: 40 - 60 mg/L as $CaCO_3$
Temperature:	24.8 – 25.2 °C
pH:	7.1 – 7.4
O_2 content:	102 – 108 % air saturation
Light regime:	Light/dark cycle of 16/8
Methods:	The test chambers had a capacity of 40 L internal dimensions of 380 mm x 320 mm x 360 mm (height x width x depth). The test solutions were renewed at a nominal rate of 16 L/hours. At the initiation of the study ten fish were allocated at random to each test vessel.
Test parameters:	All test vessels were monitored for mortality and sub-lethal effects after 4 hours and then once daily. Measurements of water temperature, dissolved oxygen, pH, and conductivity were obtained daily, water temperature was additionally measured in the control vessel and recorded hourly with a data logger.
Analytical measurements:	Samples of the test solutions were measured at day -4, -2, 0, 2 and 4 by high performance liquid chromatography.
Statistics	The LC_{50} values and the 95 % confidence intervals were calculated using one of three statistical techniques: moving average, logit analysis or probit analysis.
Findings:	
Analytical data:	Mean measured concentrations were in the range of 114 to 100.5 % of nominal concentrations. Hence, the results of the study are based on nominal concentrations.

Table B. 9.2.1-7: Analytical measurements

Nominal concentrations [mg a.s./L]		Measured concentrations [mg/L]						% of nominal concentrations
		-96 h	-48 h	0 h	48 h	96 h	Mean	
1st Test	Control	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-
	Solvent control	< 0.05	-	< 0.05	< 0.05	< 0.05	-	-
	0.046	0.040	-	0.043	0.040	0.040	0.041	89

Nominal concentrations [mg a.s./L]		Measured concentrations [mg/L]						% of nominal concentrations
		-96 h	-48 h	0 h	48 h	96 h	Mean	
	0.077	0.058	-	0.060	0.058	0.055	0.057	75
	0.129	0.091	-	0.100	0.097	0.096	0.096	74
	0.215	0.165	-	0.184	0.196	0.193	0.185	86
	0.359	0.233	-	0.279	0.293	0.324	0.282	79
	0.600	0.592	-	0.756	0.896	0.871	0.779	130
2nd Test	Control	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
	Solvent control	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
	0.215	0.227	0.217	0.255	0.256	0.274	0.246	114
	0.359	0.359	0.363	0.397	0.398	0.430	0.389	108
	0.600	0.658	0.625	0.596	0.599	0.613	0.618	103

Limit of Quantification (LOQ) = 0.05 µg/L

Biological effects The lowest concentration that resulted in 100% mortality within the period of the test was > 0.600 mg a.s./L.

The highest concentration with no mortality was 0.215 mg a.s./L in both tests. In the control and solvent control 0 % mortality occurred in both tests.

Table B. 9.2.1-8: Mortality and sub-lethal effects

Test concentration [mg a.s./L]		Mortality [%]				
		4 h	24 h	48 h	72 h	96 h
1st Test	Control	0	0	0	0	0
	Solvent control	0	0	0	0	0
	0.046	0	0	0	0	0
	0.077	0	0	0	0	0
	0.129	0	0	0	0	0
	0.215	0	0	0	0	0
	0.359	0	0	0[a,e]	0[a,e]	0[a,e]
	0.600	0	10[a,b,e,f]	80[b,f]	80[a]	90[a]
2nd Test	Control	0	0	0	0	0
	Solvent control	0	0	0	0	0
	0.215	0	0	0	0	0
	0.359	0	10	10[a,d]	10[a,d]	20[a,d]
	0.600	0	10[a,b,c,d]	70[a,b,c,d]	80[a,d]	80[a,b,c,d]

[a] Loss of Equilibrium, [b] Surfacing, [c] On sides or backs, [d] Low activity, [e] Coloration, [f] labored respiration

Conclusion: 1st Test: Based on these results a LC_{50} of 0.471 mg a.s./L (95%, CL = 0.394 to 0.608 mg a.s./L) based on nominal concentrations was determined.

2nd Test: Based on these results a LC_{50} of 0.466 mg a.s./L (95%, CL = 0.375 to 0.601 mg a.s./L) based on nominal concentrations was determined.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guideline OECD 203 (1992, updated 2009). - The mortality in the controls should not exceed 10% (or 1 fish if less than 10 fish are used) at the end of the test. - Constant conditions should be maintained throughout the test. - The dissolved oxygen concentration must have been at least 60% of the air saturation value throughout the test. - There must be evidence that the concentration of the test substance has been satisfactorily maintained, and preferably, it should be at least 80% of the nominal concertation throughout the test. If the deviation from the nominal concentration is greater than 20%, results should be based on the measured concentrations. All validity criteria are met. In addition, the following points deviated from the test guideline or were not reported in detail: - According to the guideline five concentrations should be tested. Two studies were conducted. The first one with five concentrations and the second one with the three highest concentrations of the first study. The second study had to be conducted due to precipitation problems of the active substance. - The temperature is slightly above the recommended temperature range of 21 – 25 °C. - The fish length is slightly above the recommended 2.0 ± 1.0 cm The deviation to the test guideline is not considered to have an impact on the validity of the test. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.05 µg/L) mentioned. **Endpoints:** In the study report mean measured concentrations are calculated from day -4 to day 4 of the study. The RMS calculated the mean measured concentrations from day 0 to day 4. The mean measured concentrations are 0.262, 0.408 and 0.603 mg a.s./L which correspond to 100 to 122 % of nominal concentrations. The RMS agrees on the endpoint given in the study report. LC_{50} = 0.466 mg a.s./L (95% C.I. = 0.375 - 0.601 mg a.s./L) NOEC = 0.215 mg a.s./L **Conclusion of the RMS:** Based on the evaluation of the study the acute fish toxicity test is considered valid.

Metabolites:

Reference:	**Fenoxaprop-P; substance, technical Code: AE F088406 00 1C94 0001 Acute toxicity to rainbow trout (*Oncorhynchus mykiss*)**
Author(s), year:	[redacted] 1996
Report/Doc. number:	CE96/122 / M-141298-01-1
Guideline(s):	OECD 203 (1992), US EPA §72-1, EU Commission Directive 92/69/EEC, C.1 (1992)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P techn. (AE F088406 00 1C94 0001), purity: 95.4 %
Test species:	Rainbow trout (*Oncorhynchus mykiss*)
Number of organisms:	10 fish per control and test concentrations, 1 replicate per treatment
Age, length, weight:	Age: 4 months Length: mean: 460 mm Weight: mean: 1.4 g
Loading	0.28 g/L or 0.92 cm/L
Type of test:	Static, 96 hours
Applied concentrations:	
Nominal:	0 (control), 9.54, 17.17, 30.53, 53.42 and 95.40 mg/L
Test conditions:	
Water quality:	50 % filtered tap water and 50 % deionized water, total hardness: 1.56 – 1.66 mmol/L (Ca^{2+} + Mg^{2+})
Conductivity:	372 – 381 µS/cm
Temperature:	12.9 – 13.9 °C
pH:	7.7 – 8.3
O_2 content:	7.2 – 10.4 mg/L
Light regime:	Light/dark cycle of 16/8
Methods:	The test chambers had a capacity of 50 L with internal dimensions of 630 mm x 500 mm x 200 mm (length x width x height). At the initiation of the study ten fish were allocated at random to each test vessel.
Test parameters:	All test vessels were monitored daily for mortality and sub-lethal effects. The pH, temperature, conductivity and dissolved oxygen concentration were measured at the beginning and at 24 h intervals in all tanks throughout the test. At the termination of the test, the length of all alive fish was recorded.
Analytical measurements:	Samples of the test solutions were measured at start and end of the test by high performance liquid chromatography.

Statistics: Due to the nature of the data, a statistical calculation of the LC_{50} was not possible.

Findings:

Analytical data: Mean measured concentrations were in the range of 72.2 to 144.8 % of nominal concentrations. Hence, the results of the study are based on mean measured concentrations.

Table B. 9.2.1-9: Analytical measurements

Nominal concentrations [mg/L]	Measured concentrations			% of nominal concentrations
	0 hours	96 hours	Mean	
Control	-	-	-	-
9.54	13.49	14.13	13.81	144.8
17.17	15.83	15.34	15.59	90.8
30.53	28.98	28.13	28.56	93.5
53.42	52.86	50.86	51.86	97.1
95.40	70.71	66.98	68.84	72.2

Limit of Quantification (LOQ) = 0.81 mg/L

Biological effects: The lowest concentration that resulted in 100% mortality within the period of the test was > 72.2 mg/L.

The highest concentration with no mortality was 72.2 mg /L. In the control and solvent control 0 % mortality occurred.

Table B. 9.2.1-10: Mortality and sub-lethal effects

Test concentrations [mg/L]	Mortality [%]			
	24 h	48 h	72 h	96 h
Control	0	0	0	0
14.5	0	0	0	0
16.3	0	0	0	0
29.9	0	0	0	0
54.4	0	0	0	0
72.2	0	0	0	0

Conclusion: Based on these results a LC_{50} of > 72.2 mg /L based on mean measured concentrations was determined.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guideline OECD 203 (1992, updated 2009).

- The mortality in the controls should not exceed 10% (or 1 fish if less than 10 fish are used) at the end of the test.
- Constant conditions should be maintained throughout the test.
- The dissolved oxygen concentration must have been at least 60% of the air saturation value throughout the test.
- There must be evidence that the concentration of the test substance has been satisfactorily maintained, and preferably, it should be at least 80% of the nominal

	concertation throughout the test. If the deviation from the nominal concentration is greater than 20%, results should be based on the measured concentrations. All validity criteria are met. In addition, the following points deviated from the test guideline or were not reported in detail: - The conductivity was between 372 and 381 µS/cm which is higher than the recommended 10 µS/cm. - The temperature is slightly below the recommended temperature range of 13 – 17 °C. The deviation to the test guideline is not considered to have an impact on the validity of the test. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Method: HPLC Linearity: Calibration is based on single determination at 5 concentrations. The calibration function was linear within the range from 0.02 – 96.4 mg/mL. Accuracy: Mean recoveries for each level: 103.1 % Precision: The relative standard deviation per fortification level: 0.6 % LOQ: The limit of quantification (LOQ) = 0.81 mg/L. LOD: The limit of detection (LOD) = 0.48 mg/L No information on r^2 and on the fortification levels are given in the study report. **Endpoints:** A LC_{50} of 72.2 mg/L is reported in the study report. This mean value represents the percent of the nominal test concentration. The RMS proposes the geometric mean measured endpoint of LC_{50} > 68.82 mg/L NOEC = 68.82 mg/L **Conclusion of the RMS:** Based on the evaluation of the study the acute fish toxicity test is considered valid.

Reference:	**AE F054014 Technical 99.7% w/w Code: AE F054014 00 1C99 0004 The 96 Hour Acute Toxicity to the Rainbow Trout, *Oncorhynchus mykiss*, in a Static Renewal System**
Author(s), year:	[redacted] 1999c
Report/Doc. number:	BM98W522 / M-184458-01-1
Guideline(s):	OECD 203 (1989), US EPA (1982)
GLP:	Yes
Deviations:	None

Validity:	Acceptable

Material and methods:

Test substance:	Chlorobenzoxazolone (AE F054014), purity: 99.7 %
Test species:	Rainbow trout (*Oncorhynchus mykiss*)
Number of organisms:	30 fish per control and test concentrations, 3 replicate per treatment
Age, length, weight:	Age: Juvenile Length: 350 – 460 mm (mean: 410 mm) Weight: 0.608 – 1.489 g (mean: 1.025 g)
Loading	0.293 g/L
Type of test:	Semi-static, 96 hours

Applied concentrations:

Nominal:	0 (control and solvent control) and 10 mg/L
Solvent	Acetone (0.1 mL/L)

Test conditions:

Water quality:	Dilution water, total hardness: 58 mg/L, alkalinity: 38 mg/L, conductivity: 140 µmhos/cm, pH: 7.1, dissolved oxygen 11.1 mg/L, temperature 17.7 °C
Conductivity:	120 – 130 µS/cm
Temperature:	12.7 – 14.7 °C
pH:	6.8 – 7.5
O_2 content:	8.1 – 11.8 mg/L 80 – 115 % air saturation
Light regime:	Light/dark cycle of 16/8
Methods:	The test chambers had a capacity of 40 L containing 35 L test solution with internal dimensions of 501 mm x 246 mm x 300 mm (length x width x height). Fish were distributed two at a time until each chamber contained 10 organisms.
Test parameters:	All test vessels were monitored for mortality and sub-lethal effects after 3, 6, 24, 48, 72 and 96 hours. The pH, temperature, conductivity and dissolved oxygen concentration were measured daily.
Analytical measurements:	Samples of the test solutions were measured at the start of the test and after 24, 72 and 96 hours by high performance liquid chromatography.
Statistics	Due to the nature of the data, a statistical calculation of the LC_{50} was not possible..

Findings:

Analytical data:	Mean measured concentration was 92 % of nominal concentration. Hence, the results of the study are based on nominal concentrations.

Table B. 9.2.1-11: Analytical measurements

Nominal concentrations [mg/L]	Measured concentrations [mg/L]					% of nominal concentrations
	0 hours	24 hours	72 hours	96 hours	Mean	
Control	< 0.1	< 0.1	< 0.1	< 0.1	-	-

Nominal concentrations [mg/L]	Measured concentrations [mg/L]					% of nominal concentrations
	0 hours	24 hours	72 hours	96 hours	Mean	
Solvent control	< 0.1	< 0.1	< 0.1	< 0.1	-	-
10	8.91	9.16	9.23	9.60	9.224	92

Limit of Quantification (LOQ) = 0.1 mg/L

Biological effects The lowest concentration that resulted in 100% mortality within the period of the test was > 10 mg a.s./L.

The highest concentration with no mortality was 10 mg a.s./L. In the control and solvent control 0 % mortality occurred.

Table B. 9.2.1-12: Mortality and sub-lethal effects

Test concentration [mg a.s./L]	Mortality [%]						
	0 h	3 h	6 h	24 h	48 h	72 h	96 h
Control	0	0	0	0	0	0	0
Solvent control	0	0	0	0	0	0	0
10	0	0[a,b,c]	0[a,b,c]	0[a,b,c,d]	0[a,b,c,d]	0[a,b,c,d]	0[a,b,c,d]

[a] Loss of Equilibrium, [b] Surfacing, [c] On Bottom, [d] Lethargy

Conclusion: Based on these results a LC_{50} of > 10 mg/L based on nominal concentrations was determined.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guideline OECD 203 (1992, updated 2009).

- The mortality in the controls should not exceed 10% (or 1 fish if less than 10 fish are used) at the end of the test.
- Constant conditions should be maintained throughout the test.
- The dissolved oxygen concentration must have been at least 60% of the air saturation value throughout the test.
- There must be evidence that the concentration of the test substance has been satisfactorily maintained, and preferably, it should be at least 80% of the nominal concertation throughout the test. If the deviation from the nominal concentration is greater than 20%, results should be based on the measured concentrations.

All validity criteria are met.

In addition, the following points deviated from the test guideline or were not reported in detail:

- The fish length is slightly below the recommended 5.0 ± 1.0 cm. No mortalities or behaviour effects were observed during the studyTherefore it can be assumed that the length of fish had no impact on the results of the test.
- The conductivity was between 120 and 130 µS/cm which is higher than the recommended 10 µS/cm.
- The temperature is slightly below the recommended temperature range of 13 – 17

	°C. The deviation to the test guideline is not considered to have an impact on the validity of the test. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Method: HPLC/UV Linearity: Calibration is based on single determination at 5 concentrations. The calibration function was linear within the range from 0.01 – 0.2 µg/mL with r^2 = 0.9998. Accuracy: 1 fortification level (4 measurements): 10 mg/L. Mean recovery for each level: 96 % Precision: The relative standard deviation per fortification level: 2.3 % LOQ: The limit of quantification (LOQ) = 0.1 mg/L. LOD: not reported. No information on the limit of detection is given in the study report. **Endpoints:** The RMS agrees on the endpoints given in the study report. LC_{50} > 10 mg /L NOEC = 10 mg/L The endpoints are based in nominal concentrations. **Conclusion of the RMS:** Based on the evaluation of the study the acute fish toxicity test is considered valid.

Reference:	**Rainbow trout (*Oncorhynchus mykiss*), Acute toxicity test (OECD 203), semi-static exposure**
Author(s), year:	[redacted] 2004b
Report/Doc. number:	C043956 / M-235517-01-1
Guideline(s):	OECD 203 (1992)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	HOPP-acid (AE F096918), batch no.: 05022TB, purity: 99.9 %
Test species:	Rainbow trout (*Oncorhynchus mykiss*)
Number of organisms:	10 fish per control and test concentrations, 1 replicate per treatment
Length, weight:	Length: 470 – 590 mm (mean: 528 mm) Weight: 1.01 – 3.76 g (mean: 1.89 g)

Loading	0.75 g/L
Type of test:	Semi-static, 96 hours
Applied concentrations:	
Nominal:	0 (control), 31.25, 62.5, 125, 250 and 500 mg/L
Test conditions:	
Water quality:	Dilution water, total hardness: 0.8 mmol/L, alkalinity: 1.8 – 1.9 mmol/L, conductivity: 214 - 219 µS/cm
Temperature:	14.3 – 15.4 °C
pH:	3.6 – 8.6
O_2 content:	88 – 101 % air saturation
Light regime:	Light/dark cycle of 14/10
Aeration:	Supplement aeration
Methods:	The test chambers had a capacity of approximately 33 L containing 25 L test solution with internal dimensions of 420 mm x 280 mm x 280 mm (length x width x height).
Test parameters:	All test vessels were monitored daily for mortality and sub-lethal effects The pH, temperature and dissolved oxygen concentration were measured daily.
Analytical measurements:	The test solution was renewed after 48 hours by transferring the fish to freshly prepared test chambers. Samples of the test solutions were measured at the start of the test and after 48 hours and the aged solutions at 48 and 96 hours by high performance liquid chromatography.
Statistics	The LC_{50} value was calculated by probit analysis.
Findings:	
Analytical data:	Mean measured concentrations were between 89 - 91 % of nominal concentrations. Hence, the results of the study are based on nominal concentrations.

Table B. 9.2.1-13: Analytical measurements

Nominal concentrations [mg/L]	Measured concentrations [mg/L]					% of nominal concentrations
	0 hours	48 hours (old)	48 hours (new)	96 hours	Mean	
Control	-	0.038	-	-		
31.25	28.76	29.93	29.14	29.63	29.36	94
62.5	56.88	60.12	59.68	58.83	58.88	94
125	114.2	115.0	116.2	115.9	115.33	92
250	228.3	227.8	224.3	225.6	226.5	91
500	430.8	459.3	-	-	445.05	89

Limit of Quantification (LOQ) = 0.014 mg/L

Biological effects	The lowest concentration that resulted in 100% mortality within the period of the test was 500 mg a.s./L. The highest concentration with no mortality was 250 mg/L. In the control and 0 %

mortality occurred. The cumulative mortality of fish during the test period of 96 hours indicates a steep concentration-response relationship, most probably due to the considerable decrease of pH.

Table B. 9.2.1-14: Mortality and sub-lethal effects

Test concentration [mg/L]	Mortality [%]				
	5 h	24 h	48 h	72 h	96 h
Control	0	0	0	0	0
31.25	0	0	0	0	0
62.5	0	0	0	0	0
125	0	0	0	0	0
250	0	0	0	0	0
500	100	100	100	100	100

Conclusion: Based on these results a LC_{50} of 353 mg/L based on nominal concentrations was determined.

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guideline OECD 203 (1992, updated 2009).

- The mortality in the controls should not exceed 10% (or 1 fish if less than 10 fish are used) at the end of the test.
- Constant conditions should be maintained throughout the test.
- The dissolved oxygen concentration must have been at least 60% of the air saturation value throughout the test.
- There must be evidence that the concentration of the test substance has been satisfactorily maintained, and preferably, it should be at least 80% of the nominal concertation throughout the test. If the deviation from the nominal concentration is greater than 20%, results should be based on the measured concentrations.

All validity criteria are met.

In addition, the following points deviated from the test guideline or were not reported in detail:

- In the highest test concentration (500 mg/L) the pH dropped to 3.8. The guideline recommended a pH range of 6 – 8.5.

The deviation to the test guideline is not considered to have an impact on the validity of the test.

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4.

Method: HPLC/UV

Linearity: Calibration is based on single determination at 13 concentrations.

The calibration function was linear within the range from 0.01 – 0.25 mg/L and

	0.25 – 10 mg/L. Accuracy: 1 fortification level (3 measurements): 2.5 mg/L. Mean recovery for each level: 103 % Precision: The relative standard deviation per fortification level: 1.1 %. LOQ: The limit of quantification (LOQ) = 0.014 mg/L. LOD: The limit of detection (LOD) = 0.0038 mg/L No information on r^2 is given in the study report. **Endpoints:** The RMS agrees on the endpoints given in the study report. LC_{50} = 353 mg/L NOEC = 250 mg/L The endpoints are based on nominal concentrations. **Conclusion of the RMS:** Based on the evaluation of the study the acute fish toxicity test is considered valid.

Reference:	**BCS-AB16188: Acute Toxicity to Rainbow Trout (*Oncorhynchus mykiss*) in a 96-hour Semi Static Test**
Author(s), year:	[redacted] 2015a
Report/Doc. number:	EBFPN038 / M-538851-01-1
Guideline(s):	OECD 203 (1992), Commission Regulation (EC) 440/2008, C.1 (2008)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:	
Test substance:	Phenol (BCS-AB16188**,** AE F040356), batch no.: GSE 61869-2-2, purity: 97.0 %
Test species:	Rainbow trout (*Oncorhynchus mykiss*)
Number of organisms:	7 fish per control and test concentrations, 1 replicate per treatment
Length, weight:	Length: mean: 489 mm Weight: mean: 1.10 g
Loading	< 1 g/L fish per test vessel
Type of test:	Semi-static, 96 hours
Applied concentrations:	
Nominal:	Filtrate of 20 mg/L with dilutions of 0 (control), 1:51.5, 1:23.4, 1:10.7, 1:4.84 and 1:2.2
Test conditions:	
Water quality:	Deionised water, total hardness: 250 mg/L as $CaCO_3$, alkalinity: 0.8 mmol/L, pH: 6.5 – 6.6, conductivity: ≤ 10 µS/cm
Temperature:	14 – 16 °C

pH:	6.5 – 6.9
O_2 content:	69 – 98 % air saturation
Light regime:	Light/dark cycle of 16/8
Methods:	The test chambers had a capacity of 12 L containing 9 L test solution. 7 fish were introduced into each aquarium in a random order.
Test parameters:	All test vessels were monitored for mortality and sub-lethal effects after 2, 24, 48, 72 and 96 hours. The pH, temperature and dissolved oxygen concentration were measured daily in the freshly prepared and aged test media of each treatment group.
Analytical measurements:	The test solution was renewed after 24 hours by transferring the fish to freshly prepared test chambers. Samples of the test solutions were measured at the start of the test and after 72 hours and the aged solutions at 48 and 96 hours by high performance liquid chromatography.
Statistics	The LC_{50} value was calculated by probit analysis.

Findings:

Analytical data:	Geometric mean measured concentrations were between 0.030 and 2.49 mg/L. The results of the study are based on geometric mean concentrations.

Table B. 9.2.1-15: Analytical measurements

Nominal concentrations	Measured concentrations [mg/L]				
	0 hours	24 h (old)	72 h (new)	96 h (old)	Geomean
Control	< 0.0001 < 0.0001	< 0.0001 < 0.0001	< 0.0001 < 0.0001	< 0.0001 < 0.0001	-
1:51.5	0.018 0.017	< 0.005* < 0.005*	0.059 0.058	0.026 0.026	0.030
1:23.4	0.036 0.042	0.013 0.013	0.127 0.128	0.074 0.076	0.047
1:10.7	0.081 0.082	0.033 0.033	0.278 0.292	0.173 0.172	0.107
1:4.84	0.167 0.171	0.081 0.082	0.643 0.628	0.436 0.431	0.248
1:2.2	0.373 0.380	0.212 0.217	1.366 1.370	1.220 1.244	0.607
20 mg Filtrate	2.770 2.566	2.343 2.314	2.944 2.935	- -	2.49**

Limit of Quantification (LOQ) = 0.005 mg/L

Limit of Detection (LOD) = 0.0001 mg/L

* LOQ/2 was used to calculate the geometric mean measured concentration

** Only data from test start and 24 hours were used for the calculation because all the fish were dead after 24 hours

Biological effects	The lowest concentration that resulted in 100% mortality within the period of the test was 2.49 mg/L. The highest concentration with no mortality was 0.248 mg/L. In the control 14 %

mortality occurred.

Table B. 9.2.1-16: Mortality and sub-lethal effects

Test concentration [mg/L]	Mortality [%]					
	0 h	**2 h**	**24 h**	**48 h**	**72 h**	**96 h**
Control	0	0	0[c,d]	14[c,d]	14	14
0.030	0	0	0	0	0	0
0.047	0	0	0	0	0	0
0.107	0	0	0	0	0	0
0.248	0	0	0	0	0	0
0.607	0	0	0	0[b,c,e]	0a[b,c,e]	57[b,c,e,f]
2.49	0	0[a,b]	100	100	100	100

[a] On sides or backs, [b] Tumbling, [c] On Bottom, [d] Hyperventilation, [e] Dark colouration, [f] extended gills

Conclusion: Based on these results a LC_{50} of 0.590 mg/L based on geometric mean concentrations was determined.

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guideline OECD 203 (1992, updated 2009).

- The mortality in the controls should not exceed 10% (or 1 fish if less than 10 fish are used) at the end of the test.
- Constant conditions should be maintained throughout the test.
- The dissolved oxygen concentration must have been at least 60% of the air saturation value throughout the test.
- There must be evidence that the concentration of the test substance has been satisfactorily maintained, and preferably, it should be at least 80% of the nominal concertation throughout the test. If the deviation from the nominal concentration is greater than 20%, results should be based on the measured concentrations.

All validity criteria are met.

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.005 mg/L) mentioned.

Endpoints:

The geometric mean measured value of the lowest test concentration was reported as 0.030 mg/L in the study report. The RMS noted that the correct geometric mean measured value is 0.016 mg/L. However, this change does not alter the LC_{50} value. Therefore, the RMS agrees on the endpoint given in the study report.

LC_{50} = 0.590 mg/L

NOEC = 0.248 mg/L

The endpoint is based on geometric mean concentrations.

	Conclusion of the RMS: Based on the evaluation of the study the acute fish toxicity test is considered valid.

Reference:	**BCS-CY11271: Acute Toxicity to Rainbow Trout (Oncorhynchus mykiss) in a 96-hour Semi Static Test**
Author(s), year:	[redacted] 2015a
Report/Doc. number:	EBFPN008 / M-542854-01-1
Guideline(s):	OECD 203 (1992), Commission Regulation (EC) 440/2008, C.1 (2008), US EPA OPPTS 850.1075 (1996)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-deschloro (BCS-CY11271), batch no.: GSE 61479-2-32, purity: 99.2 %
Test species:	Rainbow trout (*Oncorhynchus mykiss*)
Number of organisms:	7 fish per control and test concentrations, 1 replicate per treatment
Length, weight:	Length: mean: 451 mm Weight: mean: 0.84 g
Loading	< 1 g/L fish per test vessel
Type of test:	Semi-static, 96 hours
Applied concentrations:	
Nominal:	0 (control), 0.107, 0.235, 0.517, 1.14 and 2.5 mg/L
Test conditions:	
Water quality:	Deionised water, total hardness: 250 mg/L as $CaCO_3$, alkalinity: 0.8 mmol/L, conductivity: ≤ 10 µS/cm
Temperature:	14 – 15 °C
pH:	6.5 – 7.0
O_2 content:	74 – 101 % air saturation
Light regime:	Light/dark cycle of 16/8
Aeration:	Supplement aeration.
Methods:	The test chambers had a capacity of 12 L containing 10 L test solution. 7 fish were introduced into each aquarium in a random order.
Test parameters:	All test vessels were monitored for mortality and sub-lethal effects after 2, 24, 48, 72 and 96 hours. The pH, temperature and dissolved oxygen concentration were measured daily in the freshly prepared and aged test media of each treatment group.
Analytical measurements:	The test solution was renewed after 24 hours by transferring the fish to freshly

prepared test chambers. Samples of the test solutions were measured at the start of the test and after 72 hours and the aged solutions at 48 and 96 hours using high performance liquid chromatography.

Statistics The LC_{50} value was calculated by probit analysis.

Findings:

Analytical data: Geometric mean measured concentrations were between 51 and 88 % of nominal concentrations. Hence, the results of the study are based on geometric mean concentrations.

Table B. 9.2.1-17: Analytical measurements

Nominal concentrations	Measured concentrations [mg/L]						% of nominal
	0 h	24 h (old)	48 h (old)	72 h (new)	96 h (old)	Geomean	
Control	< 0.0002 < 0.0002	< 0.0002 < 0.0002	- -	< 0.0002 < 0.0002	< 0.0002 < 0.0002	-	
0.107	0.055 0.056	0.039 0.040	- -	0.105 0.106	0.088 0.088	0.067	63
0.235	0.118 0.120	0.090 0.089	- -	0.224 0.224	0.185 0.183	0.145	62
0.517	0.254 0.250	0.198 0.188	- -	0.494 0.491	0.373 0.365	0.307	59
1.14	0.552 0.536	0.424 0.432	- -	1.051 1.085	0.939 0.932	0.695	88
2.5	1.210 1.165	0.920 0.915	1.867 1.857	- -	- -	1.27	51

Limit of Quantification (LOQ) = 0.04 mg/L

Limit of Detection (LOD) = 0.0002 mg/L

Biological effects The lowest concentration that resulted in 100% mortality within the period of the test was 1.27 mg/L.

The highest concentration with no mortality was 0.307 mg/L. In the control 0 % mortality occurred.

Table B. 9.2.1-18: Mortality and sub-lethal effects

Test concentration [mg/L]	Mortality [%]					
	0 h	2 h	24 h	48 h	72 h	96 h
Control	0	0	0	0	0	0
0.067	0	0	0	0	0	0
0.145	0	0	0	0	0	0
0.307	0	0	0	0	0	0
0.695	0	0	0	0[a,c,d]	14[a,c,d]	29[a,c,d]
1.27	0	0	43a[b,c]	100	100	100

[a] On sides or backs, [b] Tumbling, [c] Hyperventilation, [d] Convulsions

Conclusion: Based on these results a LC_{50} of 0.734 mg/L based on geometric mean

concentrations was determined.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guideline OECD 203 (1992, updated 2009). - The mortality in the controls should not exceed 10% (or 1 fish if less than 10 fish are used) at the end of the test. - Constant conditions should be maintained throughout the test. - The dissolved oxygen concentration must have been at least 60% of the air saturation value throughout the test. - There must be evidence that the concentration of the test substance has been satisfactorily maintained, and preferably, it should be at least 80% of the nominal concertation throughout the test. If the deviation from the nominal concentration is greater than 20%, results should be based on the measured concentrations. All validity criteria are met. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.04 mg/L) mentioned. **Endpoints:** The RMS agrees on the endpoints given in the study report. LC_{50} = 0.734 mg/L NOEC = 0.307 mg/L The endpoints are based on mean measured concentrations. **Conclusion of the RMS:** Based on the evaluation of the study the acute fish toxicity test is considered valid.

B.9.2.2. Long-term and chronic toxicity to fish

Two early life stage (ELS) studies with Fenoxaprop-P-ethyl was conducted with *Oncorhynchus mykiss* and *Pimephales promelas* which were not submitted for Annex I inclusion of Fenoxaprop-P-ethyl under Directive 91/414/EEC and are summarised and evaluated below.

In addition to the fish early life stage tests ([redacted] 1999d, [redacted] 2011b) one prolonged toxicity test with the rainbow trout and two juvenile growth tests were submitted. According to the new data requirements prolonged toxicity tests (21 day) and juvenile growth tests are no longer a data requirement. Hence, the studies were not evaluated in detail for the renewal of the EU approval. The study summaries given in the DAR for the first EU approval are given below as additional information (marked in italic).

Reference: [redacted] *(1989ap): The Effect of Fenoxaprop-P-ethyl - substance, technical (Identification code:*

Hoe 046360 OH ZC97 0002) to Salmo gairdneri (Rainbow trout) in a 21-day Prolonged Toxicity Test (method OECD). Report No. CE98/034

Test guideline: OECD 204

GLP: yes

Test item: Fenoxaprop-P-ethyl, techn.: 89.9 % w/w, batch no.: not stated

Material and methods:

The prolonged toxicity of Fenoxaprop-P-ethyl to rainbow trout (Oncorhynchus mykiss formerly Salmo gairdneri) was assessed under flow through conditions over a 21 day exposure period. Five month old fish were exposed to six nominal concentrations: 0.005, 0.01, 0.05, 0.1 and 0.5 mg/L, one dilution water control and one solvent control (acetone). Ten trout per treatment and control were incubated under a 16/8-hour light/dark photoperiod and were fed daily during the study. Environmental test conditions were determined initially and every 24 hours, mean values were 14.1 – 14.7°C, pH 7.8 – 8.0, oxygen 9.5 – 10.2 mg/L, conductivity 659 – 661 µmhos/cm and flow-rate 344 – 360 mL/min.

Daily mortality, behaviour and appearance of fish were checked in each test vessel. The length and weight of alive fish were measured at the start and end of testing.

Chemical analyses of Fenoxaprop-P-ethyl and its metabolite Fenoxaprop-P were conducted at the lowest, middle and highest tested concentration

Findings:

Mean measured concentrations (sum of AE F046360 and AE F053022) were in the range between 82.8 and 105.8 % of nominal concentrations. The quantity of the metabolite Fenoxaprop-P decreased dose-dependently from 26.9 % in the lowest concentration to 5.8 % in the highest concentration. The endpoints are based on nominal concentrations.

After 21 days no mortalities and sublethal effects due to the presence of test substance were observed at concentrations up to 0.1 mg/l, therefore the NOEC was determined to be 0.1 mg/L. At concentration of 0.05 mg/L one fish died due to a fungal infected tail fin, but this was not attributed to test substance. After 21 days at the concentration level of 0.5 mg/L the mortality was 80 % and the following sublethal effects were noted: slow reactions up to narcosis and no uptake of food. Also significant differences in weight and length compared to the control were noted at 0.5 mg/L. The 21 days EC_{50} (mortality) was calculated to be 0.27 mg/L (95% CL 0.16 – 0.62 mg/L).

Conclusion: 21 d EC_{50} (mortality): 0.27 mg/L, 21 d NOEC and LOEC (mortality, weight): 0.1 mg/L and 0.5 mg/L based on nominal concentrations

Reference:	**Fenoxaprop-P-ethyl Technical 88.1% w/w Code: AE F046360 00 1C97 0002 Effects on Early Life Stages of Rainbow Trout, *Oncorhynchus mykiss* (U.S. EPA 72-4)**
Author(s), year:	[redacted] 1999d
Report/Doc. number:	BM98W513 / M-183990-01-1
Guideline(s):	US EPA Guideline 72-4 (1982)
GLP:	Yes

Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn., CAS no.: 66441-23-4, 82110-72-36, batch no.: 1+2/86, purity: 88.1 %
Test species:	Rainbow trout (*Oncorhynchus mykiss*)
Number of organisms:	80 embryos per control and test concentrations, 4 replicate per treatment
Age:	Embryos were 2.5 hours old at test initiation.
Type of test:	Flow-through, 91 days
Applied concentrations:	
Nominal:	0 (control and solvent control), 0.13, 0.22, 0.36, 0.60 and 1.0 mg a.s./L
Solvent:	DMF (0.1 mL/L)
Test conditions:	
Water quality:	Filtered well water, total hardness: 76 – 108 mg/L as $CaCO_3$, alkalinity: 58 – 84 mg/L as $CaCO_3$, conductivity: 160 – 230 µmhos/cm, pH: 6.9 – 7.3, dissolved oxygen: 10.8 – 11.8 mg/L, temperature: 13.0 – 19.9 °C
Conductivity:	140 – 190 µS/cm
Temperature:	8.8 – 11.1 °C
pH:	6.8 – 7.5
O_2 content:	5.8 – 11.5 mg/L 52 – 106 % of air saturation
Light regime:	Larvae: darkness Fry: Light/dark cycle of 16/8
Feeding:	Brine shrimp nauplii, (*Artemia franciscana)* Less than 24 hours old
Methods:	Test chambers were 11.9 L glass aquaria. Embryos were distributed four at a time until each incubation chamber contained 20 embryos. The flow rate of the test solution was approximately 70 mL per minute.
Test parameters:	Embryo incubation chambers were checked daily for dead embryos, number hatched and living and dead larvae until hatch was complete. Observations for death and abnormal appearance of behaviour were performed daily on each replicate chamber until complete swimup. After swimup, observations were performed every Monday, Wednesday and Friday. The length and dry weight were determined at test termination. Dissolved oxygen concentration, pH, temperature, and conductivity were measured twice a week. Additionally, water temperature was monitored continuously in a control test chamber.
Analytical measurements:	The concentration of Fenoxaprop-P-ethyl was analysed in all replicates on day 0, 5, 12, 19, 26, 33, 40, 47, 54, 55, 61, 68, 75, 82 and 91 by high performance liquid

chromatography.

Statistics: Dichtotomous data (survival and hatch) were analysed by 2 x 2 contingency tables and Fisher`s Exact Test. Shapiro-Wilks test and Bartlett`s test were conducted to test for normality and homoscedasticity. Control and solvent control data were pooled since a t-test indicated no significant difference in response. Significant differences were analysed according to a one-war analysis of variance with Dunnett`s, Bonferroni t-test and Williams test.

Findings:

Analytical data: The replicate mean measured concentrations were calculated to be between 61 and 97 % of the nominal values. The overall mean measured concentrations, determined for each test level were between 75 and 85 % of the nominal concentrations. The mean measured concentrations are 0.009708, 0.01716, 0.02832, 0.04853 and 0.08467 mg a.s./L.

The effect values were evaluated based on nominal test item concentrations.

Biological effects: Hatchability of rainbow trout eggs was not significantly affected in any concentration when compared to the pooled controls. Survival of fish was significantly reduced at the nominal concentrations of 0.06 and 0.1 mg/L when compared to the pooled controls. These levels were subsequently omitted from further analysis of growth endpoints. No significant decrease in fry length and dry weight was evident at any nominal concentration when compared to the pooled controls.

Table B. 9.2.2-1: Egg hatchability, mean survival, lengths and dry weight of rainbow trout

Nominal concentrations [mg a.s./L]	Hatchability [%]	Survival at day 91 [%]	Growth parameters at day 91	
			Mean length [mm]	Mean dry weight [g]
Control	95	99	478	0.3855
Solvent control	96	96	500	0.4420
Pooled Control	95.6	97	489	0.4137
0.013	96.2	99	490	0.4084
0.022	95	93	490	0.3944
0.036	98.8	92	470	0.3718
0.06	98.8	91*	450[a]	0.3233[a]
0.10	92.5	58*	390[a]	0.2053 [a]

[a] not included in analysis due to significant effect on survival at these levels

* Statistically significant compared to the pooled control ($p < 0.05$)

Conclusion: Based on the endpoints of length, dry weight and survival the NOEC was determined to be 0.036 mg a.s./L. The LOEC is the nominal concentration of 0.06 mg/L based on mortality.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guideline OECD 210 (2013).

- The dissolved oxygen concentration must be between 60 and 100% of the air saturation value throughout the test.
- The water temperature must not differ by more than ± 1.5°C between test chambers or between successive days at any time during the test, and should be within the temperature ranges specified for the test species (10 ± 1.5 °C).
- The analytical measure of the test concentrations is compulsory.
- Overall survival of fertilised eggs in the controls must be greater than or equal to the given limits (hatching success at least 75% and post hatch success at least 75%).

The dissolved oxygen concentration was not maintained between 60 and 100 % air saturation in the solvent control and test concentration 0.022 mg a.s./L due to faecal matter, microbial growth and the large size of the fish on day 21 and day 22. At day 24 the dissolved oxygen concentration was 100 and 104 % of air saturation. Additionally, the dissolved oxygen was measured in the embryo incubation chambers, which ranged from 86 to 106 % of air saturation. Not all validity criteria are met, however at the NOEC of 0.036 mg a.s./L dissolved oxygen concentration was maintained between 71 and 106 % of air saturation. Thus the test is considered valid.

In addition, the following points deviated from the test guideline or were not reported in detail:

- Test temperature deviated from 10.0 ± 1.0 °C several times during the study. The temperature range was 8.8 – 11.1 °C. It is stated in the study report that these deviations lasted only for 2 hours. Therefore it can be assumed that the temperature deviations had no impact on the results of the test.

The deviation to the test guideline is not considered to have an impact on the validity of the test.

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4.

Method: HPLC/UV

Linearity: Calibration is based on single determination at 5 concentrations.

The calibration function was linear within the range from 0.0025 – 0.05 mg/L (± 20% of nominal concentration) with r^2 = 0.9967.

Accuracy: 2 fortifications levels (each 17 measurements): 0.005 and 0.1 mg/L. Mean recoveries for each level: 103 and 99 %,

Precision: The relative standard deviation per fortification level = 30.5 and 9.7 %

LOQ: The limit of quantification (LOQ) = 0.003 mg/L.

No information on the limit of detection is provided in the study report.

Endpoints:

The RMS agrees on the endpoints given in the study report. However, the test substance was not maintained within ± 20 % of the nominal concentrations. The

	guideline states when the measured concentrations do not remain within 80 – 120 % of the nominal concentration, the effect concentrations should be determined and expressed relative to the arithmetic mean concentration for flow-through tests. At the NOEC of 0.036 mg a.s./L test concentration was 79 % of nominal concentration. Furthermore, the RMS conducted a statistical re-evaluation of the results of the study using the software Tox Rat® to estimate EC_{10} values. The following endpoints (based on mean measured concentrations) were calculated. $EC_{10survival}$ = 0.031 mg a.s./L (95% C.I. = 0.001 – 0.058 mg a.s./L) NW = 1.8 $EC_{10dryweight}$ = 0.030 mg a.s./L (95% C.I. = 0.016 – 0.39 mg a.s./L) NW = 12.5 $EC_{10length}$ = 0.053 mg a.s./L (95% C.I. = 0.032 – 0.064 mg a.s./L) NW = 37.7 The10% effect concentrations were calculated by probit analysis using linear max. likelihood regression. NOEC = 0.02832 mg a.s./L The endpoints are based on mean measured concentrations. **Conclusion of the RMS:** Based on the evaluation of the study the chronic fish toxicity test is considered as valid.

Reference:	**Early-Life Stage Toxicity of Fenoxaprop-P-ethyl (techn.) to Fish (*Pimephales promelas*)**
Author(s), year:	[redacted] 2011b
Report/Doc. number:	EBFPL009 / M-403248-01-3
Guideline(s):	SEP-EPA-560/6-82-002 (1982), OPPTS 850.1400 (1996), OECD 210 (1992)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl (techn.), CAS no.: 71283-80-2, batch no.: EFLC000572, purity: 94.5 %
Test species:	Fathead minnow (*Pimephales promelas*)
Number of organisms:	Hatching phase: 140 eggs per control and test concentrations, 4 replicate per treatment Post-Hatching phase: 60 eggs per control and test concentrations, 4 replicate per treatment
Age:	Eggs were < 24 hours old at test initiation.
Type of test:	Flow-through, 33 days
Applied concentrations:	
Nominal:	0 (control and solvent control), 15.4, 25.8, 43.0 71.9 and 120 µg a.s./L
Solvent:	DMF (0.1 mL/L)

Test conditions:

Water quality:	Reconstituted water, total hardness: 40 – 60 mg/L as $CaCO_3$, pH: 6.0 – 8.0, dissolved oxygen: > 80 % oxygen saturation, temperature: 25 °C ± 2 °C
Total Hardness:	43.8 – 53.2 mg/L as $CaCO_3$
Conductivity:	101 – 142 µS/cm
Temperature:	23.6 – 25.0 °C
pH:	6.9 – 7.2
O_2 content:	95 – 106 % of air saturation
Light regime:	Light/dark cycle of 16/8
Feeding:	Brine shrimp nauplii, (< 48 h old)
Methods:	Test chambers were 4 L glass aquaria. Eggs were distributed five at a time until each incubation cup contained 35 eggs. The flow-rate of the dilution water was 8 L/hour and of the stock solution was 0.8 mL/hour.
Test parameters:	Incubation cups were checked daily for embryo mortality. Hatched larvae were recorded. At the beginning of the post-hatch period the larvae were thinned to 15 individuals in each replicate chamber and all test levels. Larvae and fry were observed daily for mortality and abnormal behaviour and abnormal physical changes were recorded at least on working days. The length, wet weight and dry weight were determined at test termination. Dissolved oxygen concentration, pH, temperature, and total hardness were measured on days 0, 7, 14, 22, 28 and 33. Additionally, water temperature was monitored continuously in two control replicates. Conductivity was measured in the dilution water before splitting and was documented hourly by a data logger.
Analytical measurements:	The concentration of Fenoxaprop-P-ethyl was analysed in alternating replicate test chambers on days -2, 0, 7, 14, 22, 28 and 33 by high performance liquid chromatography.
Statistics:	Student t-test or Mann-Whitney U-test was used to determine if the control and solvent control can be pooled. Shapiro-Wilks test and Levene`s test were conducted to test for normality and homoscedasticity. Control and solvent control data were pooled if the t-test or U-test criteria were met. Data in percent were arcsine transformed before analysis. Significant differences were analysed according to multiple pair-wise comparisons with the Williams test.

Findings:

Analytical data:	The mean measured concentrations of Fenoxaprop-P-ethyl in the test solutions during the test were 13.8, 23.0, 38.1, 61.4 and 100 µg a.s./L. These mean measured values ranged between 83 and 90 percent of nominal during the test period for all test levels. The mean measured concentrations of Fenoxaprop-P (recalculated to Fenoxaprop-P-ethyl) during the test were 2.2, 3.9, 6.0, 9.7 and 11.0 µg/L. These mean measured values ranged between 9 and 15 percent of nominal during the test period for all test levels. The sum of mean measured concentrations of Fenoxaprop-P-ethyl (including the amounts of Fenoxaprop-P)

during the test were 16.0, 26.9, 44.1, 71.0 and 111 µg/L corresponding to recoveries between 93 and 104 percent of nominal during the test period for all test levels. Therefore all reported results refer to the nominal concentrations of Fenoxaprop-P-ethyl.

Biological effects: Egg hatching began on day 4 and was already completed on day 5. The mean hatching success / embryo survival showed no significant difference in any test level. Larval/fry survival showed a significant difference at the concentration of 71.9 and 120 µg a.s./L. Data analysis showed a statistically significant decrease in length and dry weights compared to the pooled control at the highest test concentration of 120 µg a.s./L, but due to the observed high mortality these results were not considered as relevant for this study and were excluded from the NOEC/LOEC determination.

Table B. 9.2.2-2: Egg hatchability, mean survival, lengths and wet weight of fathead minnow

Nominal concentrations [µg a.s./L]	Hatchability [%]	Survival at Day 33 [%]	Growth parameters at day 33	
			Mean length [mm] ± SD	Mean dry weight [g] ± SD
Control	77.9	100	17.1 ± 1.5	16.7 ± 5.4
Solvent control	80.7	98.3	17.5 ± 1.7	17.7 ± 5.9
Pooled Control	79.3	99.2	17.3 ± 1.6	17.2 ± 5.7
15.4	77.1	91.7	17.8 ± 1.7	18.7 ± 6.0
25.8	80.7	98.3	16.8 ± 1.7	15.3 ± 5.5
43.0	71.4	98.3	17.3 ± 2.1	16.7 ± 6.7
71.9	79.3	90*	17.4 ±1.6	17.4 ± 5.5
120	72.9	18.3*	15.1 ±3.1*	11.6 ± 7.0*

* Statistically significant compared to the pooled control ($p < 0.05$)

Conclusion: Based on the endpoints of survival the NOEC was determined to be 43 µg a.s./L. The LOEC is the nominal concentration of 71.9 µg a.s./L based on mortality.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guideline OECD 210 (2013).

- The dissolved oxygen concentration must be between 60 and 100% of the air saturation value throughout the test.
- The water temperature must not differ by more than ± 1.5°C between test chambers or between successive days at any time during the test, and should be within the temperature ranges specified for the test species (25 ± 1.5 °C).
- The analytical measure of the test concentrations is compulsory.
- Overall survival of fertilised eggs in the controls must be greater than or equal to the given limits (hatching success at least 70% and post hatch success at least 75%).

All validity criteria are met.

In addition, the following points deviated from the test guideline or were not

	reported in detail: - At the beginning of the post-hatch period the larvae were thinned to 15 individuals in each replicate (60 individuals per control and test concentration). According to the guideline US EPA OPPTS 850.1400 a sufficient number of fertilized eggs should be used to meet statistical requirements. At least 60 eggs divided between at least two replicate test chambers are recommended. However, according the currently valid test guideline OECD 210 (2013) at least 80 eggs are recommended. The deviation to the test guideline is not considered to have an impact on the validity of the study but on the reliability of the endpoint. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.05 µg/L) mentioned. **Endpoints:** The RMS agrees on the endpoints given in the study report. Furthermore, the RMS conducted a statistical re-evaluation of the results of the study using the software Tox Rat® to estimate the EC_{10} value. The following endpoint (based on mean measured concentrations) was calculated. $EC_{10survival}$ = 0.031 mg a.s./L (95% C.I. = n.d. – n.d.) The 10% effect concentration was calculated by probit analysis using linear max. likelihood regression. NOEC = 0.043 mg a.s./L The endpoints are based on nominal concentrations. **Conclusion of the RMS:** Based on the evaluation of the study the chronic fish toxicity test is considered valid.

Metabolites:

Reference: [redacted] *(2004a): Rainbow trout (Oncorhynchus mykiss), Juvenile growth test (OECD 215), flow-through study conditions, AE F096918; substance pure, code: AE F096918 00 1B99 0001. Report No. C045675*

Test guideline: *OECD 215*

GLP: yes

Test item: *AE F096918, purity: > 99 % (D+)-enantiomer, batch no.: 05022TB*

Material and methods:

The effects of the metabolite HOPP-acid (AE F096918) on survival and growth of juvenile rainbow trout Oncorhynchus mykiss were studied in flow-through exposure system for 28 days. Ten juvenile rainbow trout per treatment group were exposed to nominal concentrations of 0 (control), 0.32, 1.0, 3.2, 10 and 32 mg/L. Mortality

and sublethal effects (intoxication symptoms) were noted daily. Wet weight and length of fish were determined at day 0, day 14 and day 28. The following test conditions were monitored: 15.0 – 15.8 °C, pH 7.2 – 8.1 and 70 – 99 % oxygen saturation.

Chemical analyses of HOPP-acid in test water were performed at the start of the test and at weekly intervals.

Findings:

Mean measured test concentrations were in the range of 92 – 107 % of nominal concentrations, thus endpoints are based on nominal concentrations.

During the study at all treatment levels no mortalities or intoxication symptoms were observed. The increase of length and weight between days 0 and 28 at all treatments was not significantly different compared to control (Williams test). Therefore the NOEC was determined to be 32 mg/L.

Conclusion: 28 d NOEC and LOEC (mortality, growth): ≥ 32 mg/l and > 32 mg/L based on nominal concentrations

Comment (RMS): Study considered acceptable.

Reference: [redacted] [redacted] *(2003): Effects on survival and growth of juvenile rainbow trout (Oncorhynchus mykiss) in a 28 days flow-through study - Fenoxaprop-P, substance, technical (code: AE F088406 00 1C97 0001). Report No. CE02/058*

Test guideline: OECD 215

GLP: yes

Test item: Fenoxaprop-P, techn. 97.4 % w/w, batch no.: not stated

Material and methods:

The effects of the metabolite Fenoxaprop-P on survival and growth of juvenile rainbow trout Oncorhynchus mykiss were studied in a 28 days in flow-through exposure system. 20 fry were exposed to nominal concentrations of 0 (control), 0.32, 0.56, 1.0, 1.8 and 3.2 mg/L. Mortality and sublethal effects (intoxication symptoms) were noted daily. Weight and length of fish were determined at beginning and for surviving fish at termination of testing. Environmental test conditions were monitored: 13.3 ± 0.2 °C, pH 7.3 – 7.9, 7.6 – 10.0 mg/L dissolved oxygen and 262 – 380 µS/cm conductivity.

Chemical analyses of Fenoxaprop-P in test water were performed on day -2, 0, 7, 13, 21 and 28.

Findings:

All mean measured concentrations were above 80 % of nominal, thus the endpoints were based on nominal concentrations. No mortality and sublethal effects were observed at any time and treatment level during the study. The growth based on analysis of weight and length of fish was not affected by Fenoxaprop-P at any treatment level. Therefore the 28 d NOEC and LOEC based on effects on survival and growth was ≥ 3.2 mg/L and > 3.2 mg/L.

Conclusion: 28 d NOEC and LOEC (mortality, growth): ≥ 3.2 mg/l and > 3.2 mg/L based on nominal concentrations

Comment (RMS): Study considered acceptable.

B.9.2.3. Potential for endocrine disruption

Population relevant effects of Fenoxaprop-P-ethyl on fish were studied in early life-stage tests (ELS) in Fathead minnow (*Pimephales promelas*) and in Rainbow trout, (*Oncorhynchus mykiss*). Survival of the fish larvae was the most sensitive endpoint in both species. All other endpoints were affected only at higher concentrations or not at all.

Based on the absence of relevant effects that could hint to an endocrine activity of the compound, it can be concluded that Fenoxaprop-P-ethyl is not a (potential) endocrine disrupter.

No further testing is indicated to evaluate the endocrine disrupter potential of Fenoxaprop-P-ethyl to fish.

B.9.2.4. Bioconcentration in fish

Reference:	**Bioaccumulation and Metabolism of [^{14}C]-Chlorophenyl AE F046360 in Bluegill Sunfish, *Lepomis macrochirus*, in a Flow-Through System**
Author(s), year:	[redacted] 1999
Report/Doc. number:	BM98E517 / M-183971-01-1
Guideline(s):	OECD 305 (1992), US EPA 165 – 4 (1982)
GLP:	Yes
Deviations:	Lighter fish were used than recommended.
Validity:	Acceptable

Materials and Methods

Test substance	Fenoxaprop-P-ethyl, batch no.: 28283-133, purity: 99.5 %, radio-labelled test stubstance: [U-^{14}C-chlorophenyl]-AE F046360, batch no.: Z 28051-0, purity: 97 %
Test species	Bluegill sunfish (*Lepomis macrochirus*)
Number of organisms:	144 per controls and test concentrations, 1 replicate per treatment
Length and weight	Length: mean 4.1 cm (3.9 – 4.6 cm) Weight: mean 1.756 g (2.602 – 1.411 g)
Loading:	0.3512 g/L/day
Source	[redacted]
Diet/Food	Fish were fed three times per day with Rangen Salmon Starter
Acclimatisation period	14 days prior to test initiation
Type of test	Flow-through, Uptake phase: 27 days, Depuration phase: 14 days
Applied concentrations:	
Nominal:	0 (solvent control), 0.01, 0.001 mg a.s./L
Solvent	DMF (0.054 mL/L)
Test conditions:	
Water quality	Well water, Hardness: 76 - 102 mg/L as $CaCO_3$, Alkalinity: 58 - 82 mg/L as $CaCO_3$, pH: 7.0 – 7.4, TOC: < 1 mg/L, Ammonia Nitrogen: < 0.1 mg/L, Total nitrite/nitrate nitrogen: 5.45 mg/L

Temperature	21.1 – 22.7 °C discrete temerpature measurements 21.1 – 23.3 °C continuously monitored
Photoperiod	16 hours light : 8 hours dark
pH	7.4 – 8.1
Dissolved oxygen	7.2 – 8.7 mg/L, 83-100 % air saturation (> 60 % air saturation)
Conductivity	190 - 250 µS/cm
Aeration	Supplementary aeration
Feeding:	Fish were fed twice a day during the uptake phase.
Methods:	The test was conducted in glass aquaria of 110 L capacity with a working volume of 72 L. After 27days of the exposure phase the addition of the test material was terminated. The fish were transferred to identical fresh untreated tanks and exposed to flowing untreated well water for the depuration period. The fish were then exposed to uncontaminated water for 14 days.
Test parameters:	All test aquaria were monitored daily for mortality and sub-lethal effects. Fish were sampled on days 0, 1, 3, 7, 9, 14, 17, 21, 24, 27 of the uptake phase and on day 1, 3, 7, 10, and 14 of the depuration phase. Measurements of temperature, pH, conductivity and dissolved oxygen were undertaken on days 0, 1, 3, 6, 9, 10, 13, 15, 17, 21, 22, 24 and 27of the uptake phase and on days 2, 4, 7, 9 and 11 of the depuration phase.
Analytical measurements:	The concentration of the test medium was determined on days 0, 1, 3, 7, 9, 14, 17, 21, 24, 27 of the uptake phase and on day 1 of the depuration phase.
Statistics:	Statistical analysis was conducted using non-linear regression analysis. The 95 % confidence intervals for the bioconcentration factor were calculated using the delta method for determination of the standard error.

Findings:

Analytical data:	The mean measured concentrations ranged between 112 – 115 % of nominal concentrations in the 27 days of the uptake phase. The average concentration during the uptake was 0.00112 ± 0.00012 mg a.s./L and 0.0115 ± 0.0008 mg a.s./L.

Table B. 9.2.4-1: Measured AE F046360 concentration in the water and the tissue of bluegill

Day	Water concentration [mg/L][a]	High treatment – Nominal concentration = 0.01 mg/L					
		Edible		Whole Fish		Non-Edible	
		[mg/kg]	BCF[b]	[mg/kg]	BCF[b]	[mg/kg]	BCF[b]
Exposure phase							
0	0.0103	n.d.[c]	n.d.	0.00 [d]	n.d.	n.d.	n.d.
1	0.0102	0.342	33	4.103	402	7.863	769
3	0.0114	0.302	26	2.596	228	6.496	570
7	0.0116	0.414	36	2.724	235	6.028	520
9[e]	0.0115	0.552	48	6.947	606	11.108	968
14	0.0115	0.335	29	4.669	404	5.300	459

Day	Water concentration	High treatment – Nominal concentration = 0.01 mg/L					
17	0.0116	0.548	47	3.454	298	11.282	974
21	0.0115	0.462	40	3.180	276	5.230	454
24	0.0115	0.405	35	3.200	278	7.043	611
27	0.015	0.429	37	6.700	582	6.835	593
Mean (excluding Day 9)		0.405	36	3.828	338	7.010	619
Depuration phase (percent depuration)[f]							
1	-	0.111	74	1.247	81	2.735	60
3	-	0.076	82	0.258	96	0.295	96
7	-	0.053	88	0.221	97	0.219	97
10	-	0.049	89	0.131	98	0.185	97
14	-	0.044	90	0.087	99	0.168	98

[a] Running daily mean water concentration

[b] Daily bioconcentration factor was obtained by dividing the tissue concentration by the mean measured water concentration up to and including the respective sampling day.

[c] n.d. = not determined

[d] Samples taken immediately prior to addition of fish to test chambers.

[e] Fish were not feed for 24 hrs. prior to sample

[f] Percent depuration is expressed as a proportion of loss based on total [^{14}C]-AE F046360 tissue residues at Day 27 (end of uptake) of 0.429 mg/kg for edible, 6.700 mg/kg for whole fish, and 6.835 mg/kg for non-edible.

Table B. 9.2.4-2: Measured AE F046360 concentration in the water and the tissue of bluegill

Day	Water concentration [mg/L][a]	Low treatment – Nominal concentration = 0.001 mg/L					
		Edible		Whole Fish		Non-Edible	
		[mg/kg]	BCF[b]	[mg/kg]	BCF[b]	[mg/kg]	BCF[b]
Exposure phase							
0	0.00107	n.d.[c]	n.d.	0.00 [d]	n.d.	n.d.	n.d.
1	0.00102	0.031	31	0.335	330	0.801	789
3	0.00111	0.030	27	0.355	320	0.695	625
7	0.00115	0.036	31	0.334	290	0.528	459
9[e]	0.00114	0.053	46	0.973	856	1.289	1134
14	0.00116	0.037	32	0.374	324	0.681	588
17	0.00114	0.032	28	0.286	251	0.681	599
21	0.00113	0.035	31	0.212	188	0.345	306
24	0.00113	0.038	34	0.313	278	0.606	538
27	0.00112	0.030	27	0.288	257	0.536	478
Mean (excluding Day 9)		0.034	30	0.312	280	0.609	548
Depuration phase (percent depuration)[f]							
1	-	0.011	62	0.145	50	0.237	56
3	-	0.008	72	0.020	93	0.034	94
7	-	0.006	81	0.013	95	0.021	96
10	-	0.005	83	0.012	96	0.021	96
14	-	0.003	89	0.009	97	0.012	98

[a] Running daily mean water concentration

[b] Daily bioconcentration factor was obtained by dividing the tissue concentration by the mean measured water concentration up to and including the respective sampling day.

[c] n.d. = not determined

[d] Samples taken immediately prior to addition of fish to test chambers.

[e] Fish were not feed for 24 hrs. prior to sample

[f] Percent depuration is expressed as a proportion of loss based on total [^{14}C]-AE F046360 tissue residues at Day 27 (end of uptake) of 0.030 mg/kg for edible, 0.288 mg/kg for whole fish, and 0.536 mg/kg for non-edible.

Biological results: During the uptake phase, most of the radioactivity was accumulated in the non-edible tissue. In the high treatment, whole fish tissue residues from the final day of uptake (Day 27) showed an increase, but the three previous time points of the uptake phase (Day 17, 21, and 24) met all of the requirements for steady-state according to OECD.

No mortalities or any noticeable deviations from ordinary fish behaviour, including abnormal behaviour or diseases, were observed in any of the treatments during the course of the study.

Table B. 9.2.4-3: Results based on total radioactivity

Parameter	Description	0.001 mg/L	0.01 mg/L
K_u	Uptake rate [L/kg/day]	461.0 ± 87.6	652.6 ± 201.9
K_d	Depuration rate [/day]	1.61 ±0.31	1.90 ± 0.60
$t_{1/2}$	Depuration Half-Life [day]	0.43	0.36
T_{90}	Time to 90% steady-state [day]	1.4	1.2
$BCF_{kinetic}$	Bioconcentration factor	286 ±9.17	343 ± 15.7
	Correlation coefficient [%]	98.6	98.9

Conclusion: Fenoxaprop-P-ethyl accumulates rapidly in fish tissues, principally in the non-edible portions, regardless of exposure concentration. The steady-state BCFs for the low treatment (0.001 mg/L) were 30, 280, and 548 in edible, whole fish, and non-edible, respectively and for the high treatment (0.01 mg/L) were 36, 338, and 619 in edible, whole fish, and non-edible, respectively. Fenoxaprop-P-ethyl cleared rapidly from fish tissues regardless of exposure concentration. The depuration appeared to be biphasic with the "fast" phase as the major component. Based on a one compartment model with whole fish, the calculated kinetic bioconcentration factors were 286 and 343 for the low and high treatment, respectively. The time to reach 90% of steady-state was about 1 day for both treatments. The depuration half-life was less than 0.5 day for both treatments.

The major residue in all fish tissues was Fenoxaprop acid, AE F053022, which results from hydrolysis of the ester group of the parent. Small amounts of AE F054014 (from cleavage between the two ring-systems) and the parent AE F046360 were also identified. All of these compounds were identified in the water. A trace of

AE F040356 was also found in the fish tissues.

In summary therefore, given the propensity of Fenoxaprop-P-ethyl to degrade by aqueous hydrolysis and microbial breakdown, it is unlikely that significant amounts of parent would be available to bioaccumulate. Any Fenoxaprop ethyl which did accumulate in fish would readily be metabolized to the acid and subsequently undergo rapid depuration.

Comment RMS:	**Validity**: The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 305 (2012). - The water temperature variation is less than ± 2°C, because large deviations can affect biological parameters relevant for uptake and depuration as well as cause stress to animals; - The concentration of dissolved oxygen does not fall below 60% saturation; - The concentration of the test substance in the chambers is maintained within ± 20% of the mean of the measured values during the uptake phase; - The concentration of the test substance is below its limit of solubility in water, taking into account the effect that the test water may have on effective solubility; - The mortality or other adverse effects/disease in both control and treated fish is less than 10% at the end of the test; where the test is extended over several weeks or months, death or other adverse effects in both sets of fish should be less than 5% per month and not exceed 30% in all. Significant differences in average growth between the test and the control groups of sampled fish could be an indication of a toxic effect of the test chemical. The validity criteria according to the OECD test guideline are met; hence, the study is considered valid. In addition, the following points deviated from the test guideline or were not reported in detail: - According to the guideline a dilution water control and a control containing the solvent (i.e. acetone) should be run. In the study no water control group was run, only the solvent control. - According to the guideline if more than one concentration is used, the variation in uptake/depuration constants between the test concentrations should be less than 20 %. The variation between the concentrations for the uptake rate costant is 29 % and for the depuration rate constant is 15 %. - Lighter fish were used than recommended, however the smaller fish had no impact on the loading factor. - The light intensity was 98 foot candles which is outside the recommended range of 150 ± 25 foot candles. - The uptake phase was extended to 27 days due to increased tissue residues on day 9. Day 9 was excluded form further analysis. The above deviations were considered to have no significant effect on the outcome

	of the study. **Acceptability of the analytical methods used in the test:** Method: LSC LOQ: The limit of quantification (LOQ) = 0.33 ng Method: HPLC/TLC LOQ: The limit of quantification (LOQ) = 3.31 ng **Endpoints**: The RMS agrees on the endpoints given in the study report. Based on the results of the study a steady-state $BCF_{whole\ fish}$ of 338 and a kinetic BCF of 343 were determined. **Conclusion of the RMS:** Based on the evaluation of the study the fish bioconcentration test is considered valid.

B.9.2.5. Acute toxicity to aquatic invertebrates

Active substance:

Reference:	**Fenoxaprop-P-ethyl Technical 88.1 % w/w Code: AE F046360 00 1C97 0002** **The 48 Hour Acute Toxicity to *Daphnia magna*, in a Static Renewal System**
Author(s), year:	Stachura, B.J., Ruff D.F., 1998
Report/Doc. number:	BM98W514 / M-147888-01-1
Guideline(s):	OECD 202 (1992), US EPA § 72-2(1982)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:	
Test substance:	Fenoxaprop-P-ethyl (techn.), CAS no.: 66441-23-4. 82110-72-3, batch no.: 1+2/86, purity: 88.1 % w/w
Test species:	Water flea (*Daphnia magna*)
Number of organisms:	20 daphnids per controls and test concentrations, 2 replicate per treatment
Age:	First instar, < 24 hours old
Type of test, duration:	Semi-static test, 48 hours
Applied concentrations:	
Nominal:	0 (control and solvent control), 5.2, 8.6, 14 and 24 mg a.s./L
Solvent:	Acetone (0.1 mL/L)
Test conditions:	
Water quality:	Dilution water, total hardness: 172 mg/L as $CaCO_3$, alkalinity: 114 mg/L as $CaCO_3$, conductivity: 600 µS/cm, pH: 7.6, dissolved oxygen: 8.3 mg/L, temperature: 22 °C

Conductivity:	500 µS/cm
Temperature:	19.7 – 20.1 °C
pH:	7.6 – 7.8
O_2 content:	93 - 97 % of air saturation
Light regime:	Light/dark cycle of 16/8
Feeding:	Daphnids were not fed during the study.
Aeration:	No supplement aeration.
Methods:	The test was conducted in 250 mL glass jars with a working volume of 200 mL. Daphnids were distributed two at a time until each replicate chamber contained 10 organisms.
Test parameters:	Immobility and sub-lethal effects were assessed after 3, 6, 24 and 48 hours. Measurements of pH, temperature and dissolved oxygen concentrations were made at test initiation, 24 hours and at 48 hours. Temperature was also recorded continuously.
Analytical measurements:	The concentration of Fenoxaprop-P-ethyl was analysed at 24 hours and 48 hours by high performance liquid chromatography.
Statistics:	The EC_{50}, and 95 % confidence limits were not calculated. The results of this test showed that Fenoxaprop-P-ethyl is not toxic to *Daphnia magna* at a concentration of up to 1.058 mg/L. This represents the maximum solubility of the test substance under the conditions of this study.

Findings:

Analytical data:	The mean measured concentration of the active substance in the test water was between 24 and 67 % of nominal values. The 2.4 and 4.0 mg a.s./L treatments had visible precipitate during all test organisms observations. The endpoints are based on mean measured concentrations.

Table B. 9.2.5-1: Analytical measurements

Nominal concentrations [mg a.s./L]	Measured concentrations [mg a.s./L]					% of nominal
	0 h (new)	24 h (new)	24 h (old)	48 h (old)	Mean	
Control	< 0.1 NS	NF NS	< 0.1 NF	< 0.1 NS	-	-
Solvent control	< 0.1 NS	NF NS	NF NF	< 0.1 NS	-	-
0.52	0.3779 NS	0.3797 NS	0.3131 0.3262	0.2531 0.2615	0.3186	61
0.86	0.6537 NS	0.7009 NS	0.5743 0.5549	0.4884 0.5003	0.5788	67
1.4	0.8516 NS	1.071 NS	0.7043 0.7428	0.7502 0.7663	0.8144	58
2.4	1.426 NS	1.539 NS	0.8292 0.8096	0.8702 0.8733	1.058	44
4.0	1.023	2.177[a]	0.7813	1.115	0.9687	24

Nominal concentrations [mg a.s./L]	Measured concentrations [mg a.s./L]					% of nominal
	0 h (new)	24 h (new)	24 h (old)	48 h (old)	Mean	
	NS	NS	0.7594	1.165		

[a] Sample not considered accurate due to elevated level. It is thought that undissolved test substance was included in the sample. Therefore, this value will not be included in the mean results calculation.

Limit of Quantification (LOQ) = 0.1 mg/L

New = New samples taken from freshly prepared parent stock solutions prior to distribution to the replicates.

NF = not found

NS = not sampled

Biological Effects: The lowest concentration that resulted in 100% mortality within the period of the test was > 0.9687 mg a.s./L.

The highest concentration with no mortality was 0.9687 mg a.s./L. In the controls 0 % mortality occurred.

Table B. 9.2.5-2: Effects on daphnids (*D. magna*)

Mean measured concentrations [mg a.s./L]	Mean cumulative immobilized organisms [%]			
	3 hours	6 hours	24 hours	48 hours
Control	0	0	0	0
Solvent control	0	0	0	0
0.3186	0	0	0	0
0.5788	0	0	0	0
0.8144	0	0	0	0
1.058	0	0	0[a,b]	0[a,b,c]
0.9687	0	0[a]	0[a,b,c]	0[a,b,c]

[a] Trailing, [b] Lethargy, [c] trapped in precipitate

Conclusion: Based on these results an EC_{50} of > 1.058 mg a.s./L (maximum solubility) based on mean measured concentrations was determined. A definitive EC_{50} could not be determined under the conditions of the study.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 202 (2004).

- In the control, including the control containing the solubilising agent, not more than 10 per cent of the daphnids should have been immobilised;
- The dissolved oxygen concentration at the end of the test should be ≥ 3 mg/l in control and test vessels.

All validity criteria are met; hence, the acute daphnia toxicity test is considered valid.

In addition, the following points deviated from the test guideline or were not reported in detail:

- At least 20 animals, preferably divided into four groups of five each, should be

	used. In the study 20 animals, divided into two groups, were tested. No immobilisation or behaviour effects were observed in the control. Therefore it can be assumed that this deviation had no impact on the results of the test. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Method: HPLC/UV Linearity: Calibration is based on single determination at 5 concentrations. The calibration function was linear within the range from 0.01 – 0.20 µg/mL of with r^2 = 0.9999. Accuracy: 2 fortifications levels (3 measurements): 0.50 and 5.0 mg/L. Mean recoveries for each level: 87 and 97% Precision: The relative standard deviation per fortification level: 1.0 and 5.6 % LOQ: The limit of quantification (LOQ) = 0.1 mg/L. LOD: The limit of detection was not reported. No information on the limit of detection is given in the study report. **Endpoints:** In the study report the EC_{50} is based on the arithmetic mean measured concentration instead on the geometric mean measured concentrations. The geometric mean measured concentrations are 0.3296, 0.5980, 0.8411, 1.1190 and 0.9649 mg a.s./L. The following endpoints were determined: EC_{50} > 0.8411 mg a.s./L NOEC = 0.8411 mg a.s./L The endpoints are based on geometric mean measured concentrations. **Conclusion of the RMS:** Based on the evaluation of the study the acute Daphnia test is considered valid.

Reference: Fischer, R. (1986f): The Effect of Hoe 046360 - substance, technical, Identification Code Hoe 046360 OH ZC96 0002 to *Daphnia magna* (Waterflea) in a Static-Acute Toxicity Test (Dm610/a, method EPA). Report No. OEK86/072E

Test guideline: OECD Guideline 202; EPA-660/3-75-009

GLP: yes

Test item: Fenoxaprop-P-ethyl, techn.: 95.6 % w/w sum of (D+) and (L-)-enantiomers, batch no.: not stated

Material and methods:

The acute toxicity of Fenoxaprop-P-ethyl to *Daphnia magna* (first instar < 24 h old) was studied over a 48 h exposure period under static conditions. The daphnids were exposed to six nominal concentrations 0.56, 1.0, 1.8, 3.2, 5.6, 10.0 mg/L, one dilution control and one solvent control (acetone). As test medium served deionized water with a hardness of 45.9 mg $CaCO_3$. The temperatures in the test solutions ranged from 19.1 – 20.3 °C, the pH was 7.6 – 8.2 and the oxygen content remained above 60 % saturation during the study.

Findings:

Chemical analyses of test solutions of nominal 0.56, 1.8 and 10.0 mg/L were conducted at initiation and termination of the study. Mean measured concentrations were 104, 61 and 77 % of nominal concentrations in fresh and 51, 47 and 59 % of nominal concentrations in old solutions. However, all calculations are based on nominal concentrations.

Immobilisation of daphnids was observed at concentrations ≥ 1.8 mg/L. The concentration with no effects on immobilisation was 1.0 mg/L. The 48 hour EC_{50} was calculated to be 2.7 mg/L (95 % CL: 2.2 – 3.2 mg/L).

Conclusion: EC_{50} (48 h): 2.7 mg/L, NOEC and LOEC: 1.0 and 1.8 mg/L based on nominal concentration

Comment (RMS): All estimated toxicity endpoints are based on nominal concentrations although mean measured concentrations were less than 80 % of nominal concentrations. Thus, study considered not acceptable.

Comment RMS:	This study was considered not acceptable at the first approval of the active substance. The study summary from the DAR is included in the RAR as additional information.

Reference:	**Technical Fenoxaprop-P-ethyl (HOE 046360 00 ZC97 0002): A 96-Hour Flow-through Acute Toxicity Test With The Saltwater Mysid (*Mysidopsis bahia*)**
Author(s), year:	Murphy, D. & Peters, G. T., 1991
Report/Doc. number:	A46598 / M-130627-01-1
Guideline(s):	US EPA FIFRA (1982), Hazard Evaluation Division 540/9-85-010 (1985)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl (HOE 046360), purity: 89.8 %
Test species:	Mysid shrimp *(Mysidopsis bahia)*
Number of organisms:	20 mysids per controls and test concentrations, 2 replicates per treatment
Age:	Juvenile, < 24 hours old
Type of test, duration:	Flow-through, 96 hours
Applied concentrations:	
Nominal:	0 (control and solvent control), 70, 120, 200, 330 and 550 µg a.s./L
Solvent	DMF (0.1 mL/L)
Test conditions:	
Water quality:	Saltwater, salinity: 25 - 29 ‰, pH: 7.8 – 8.1
Temperature:	24.5 – 25.4 °C
pH:	8.0 – 8.2
O_2 content:	6.4 – 7.4 mg/L dissolved oxygen
	88.9 – 103 % of air saturation

Light regime: Light/dark cycle of 16/8

Feeding The organisms were fed daily with brine shrimp (*Artemia* sp.)

Methods: The test was conducted in 500 mL beakers. The diluter was adjusted so that each test chamber received 27.7 volume additions of test water every 24 hours.

Test parameters: Mortality and sub-lethal effects were assessed after 7.5, 24, 48, 72 and 96 hours. Measurements of pH and dissolved oxygen concentrations were made at 24 hours intervals. The water temperature was measured at the beginning and end of the test.

Analytical measurements: Samples of the test solutions were measured at the beginning and end of the test by high performance liquid chromatography.

Statistics: The EC_{50} and the 95 % confidence intervals were calculated using moving average angle analysis, probit analysis and binominal probability. The method was determined by the characteristics of the data base.

Findings:

Analytical data: The mean measured concentration of the active substance in the test water was between 62 and 110 % of nominal values.

Table B. 9.2.5-3: Analytical measurements of Fenoxaprop-P-ethyl

Nominal concentrations [µg a.s./L]	Measured concentrations [µg a.s./L]			% of nominal
	0 h	96 h	Mean	
Control	< 5 < 5	< 5 < 5	< 5	-
Solvent control	< 5 < 5	< 5 < 5	< 5	-
70	76.9 73.3	43.4 45.2	59.7	85.3
120	106 88.1	74.8 74.4	85.8	71.5
200	141 132	165 154	148	74
330	248 260	263 291	266	80.6
550	448 458	477 443	456	83

Limit of Detection (LOD) = 5 µg/L

Biological results: The lowest concentration that resulted in 100% mortality within the period of the test was 266 µg a.s./L. The highest concentration with no mortality was < 59.7 µg a.s./L. In the control 0 % and in the solvent control 5 % mortality occurred.

Table B. 9.2.5-4: Effects on *Mysidopsis bahia*

Mean measured concentrations [µg a.s./L]	Mean cumulative mortality [%]				
	7.5 h	24 h	48 h	72 h	96 h

Mean measured concentrations [µg a.s./L]	Mean cumulative mortality [%]				
	7.5 h	24 h	48 h	72 h	96 h
Control	0	0	0	0	0
Solvent control	0	0	5	5	5
59.7	0	0	0	0	15
85.8	0	10[a]	20	20	30
148	0	5[a,b,c]	50[c]	55	65
266	0	35[c]	85[a]	100	100
456	0	100	100	100	100

[a] Discoloration, [b] Lethargy, [c] Loss of Equilibrium

Conclusion: The 96-hour EC_{50} was calculated as 109 µg a.s./L (95% C.I. = 91.4 – 130 µg a.s./L) based on mean measured concentrations.

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guidelines, the US EPA (OPPTS 850.1035, 1996):

- In the control, including the control containing the solubilising agent, not more than 10 per cent of the organisms should have been immobilised;

All validity criteria are met.

In addition, the following points deviated from the test guideline or were not reported in detail:

- The guideline recommends a light dark period of 14/10 h. In the study 16/8 h was maintained.

- 25 - 29 ‰ salinity was provided in the study. 20 ppt is recommended in the US EPA guideline.

No immobilisation or behaviour effects were observed in the control. Therefore it can be assumed that these deviations had no impact on the results of the test.

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 50 µg/L) mentioned.

Endpoints:

The RMS agrees on the endpoints given in the study report.

96 h-EC_{50} = 109 µg a.s./L (95% C.I. = 91.4 – 130 µg a.s./L)

The endpoints are based on mean measured concentrations.

Conclusion of the RMS: Based on the evaluation of the study the acute test is considered valid.

Metabolites:

Reference:	**Fenoxaprop-P, substance technical (Hoe 088406 00 ZC96 0001) Effect to *Daphnia magna* (Waterflea) in a Static-Acute Toxicity Test (method OECD)**
Author(s), year:	Heusel, R., 1993a
Report/Doc. number:	CE92/002 / M-131419-01-1
Guideline(s):	OECD guideline 202 (1984), US EPA (1975)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-acid, purity: 95.6 %
Test species:	Water flea (*Daphnia magna*)
Number of organisms:	20 daphnids per controls and test concentrations, 2 replicate per treatment
Age:	First instar, < 24 hours old
Type of test, duration:	Static, 48 hours
Applied concentrations:	
Nominal:	Project CE92/002-1: 0 (control and solvent control), 0.1, 0.18, 0.32, 0.56, 1.0, 1.8, 3.2, 5.6 and 10 mg /L Project CE92/002-3: 0 (control and solvent control), 10, 18, 32, 56, 100, 180, 320 and 560 mg /L
Solvent:	Acetone (0.1 mL/L)
Test conditions:	
Water quality:	Artificial test water (Elendt medium, M4), total hardness: 242 mg/L as $CaCO_3$, alkalinity: 47 mg/L as $CaCO_3$
Temperature:	19.7 – 19.9 °C
Conductivity:	655 – 673 µS/cm
pH:	5.8 – 8.0
O_2 content:	9.0 – 9.1 mg/L
Light regime:	Light/dark cycle of 16/8
Feeding:	Daphnids were not fed during the study.
Aeration:	No supplement aeration.
Methods:	The test was conducted in 300 mL glass jars with a working volume of 200 mL.
Test parameters:	Immobility and sub-lethal effects were assessed after 24 and 48 hours. Measurements of pH, temperature and dissolved oxygen concentrations were made at the start and end of the test. Additionally, Temperature was recorded continuously in the untreated control.
Analytical measurements:	The concentration of Fenoxaprop-P was analysed after 0 hours and 48 hours from the lowest (0.1 mg/L), middle (1.0 mg/L) and highest (10 mg /L) test concentration (Project CE92/002-1) by high performance liquid chromatography.
Statistics:	The EC_{50} value and the 95 % confidence intervals were calculated using one of

three statistical techniques: moving average, logit analysis or probit analysis.

Findings:

Analytical measurements: The mean measured concentration of the test medium was between 106 and 125 % of nominal values. The endpoints are based on nominal concentrations.

Table B. 9.2.5-5: Analytical measurements

Nominal concentrations [mg/L]	Measured concentrations [mg/L]			% of nominal concentrations
	0 hours	48 hours	Mean	
Control	0	0	0	-
Solvent control	0	0	0	-
0.098	0.126	0.117	0.122	125
0.975	1.161	1.166	1.164	120
9.750	10.395	10.228	10.312	106

Biological Effects: The lowest concentration that resulted in 100% mortality within the period of the test was 180 mg/L.

The highest concentration with no mortality was 56 mg/L. In the controls 0 % mortality occurred.

Table B. 9.2.5-6: Effects on daphnids (*D. magna*)

Nominal concentrations [mg/L]		Mean cumulative immobilized organisms [%]	
		24 hours	48 hours
Project CE92/002-1	Control	0	0
	Solvent control	0	0
	0.1	0	0
	0.18	0	0
	0.32	0	0
	0.56	0	0
	1.0	0	0
	1.8	0	0
	3.2	0	0
	5.6	0	0
	10	0	0
Project CE92/002-3	Control	0	0
	Solvent control	0	0
	10	0	0
	18	0	0
	32	0	0
	56	0	0
	100	10	10
	180	45	100
	320	100	100
	560	100	100

Conclusion:	Based on these results an EC_{50} of 126 mg/L (95% C.I. 100 – 180 mg a.s./L) based on nominal concentrations was determined.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 202 (2004). - In the control, including the control containing the solubilising agent, not more than 10 per cent of the daphnids should have been immobilised; - The dissolved oxygen concentration at the end of the test should be ≥ 3 mg/l in control and test vessels. All validity criteria are met; hence, the acute daphnia toxicity test is considered valid. In addition, the following points deviated from the test guideline or were not reported in detail: - At least 20 animals, preferably divided into four groups of five each, should be used. In the study 20 animals, divided into two groups, were tested. - The analytical measurements revealed that the test item was not maintained ± 20 % of the nominal test concentration. The mean measured concentration ranged between 106 and 126 % of nominal concentrations. Furthermore, only three concentrations of the Project CE92/002-1 were analytically verified. The deviations to the test guideline are not considered to have an impact on the validity of the test. **Acceptability of the analytical methods used in the test:** Method: HPLC/UV Accuracy: 1 fortifications level. Mean recovery: 101.1 % No information on the linearity, r^2, precision, limit of quantification and limit of detection is given in the study report. **Endpoints:** The RMS agrees on the endpoints given in the study report. 48 h EC_{50} = 126 mg/L NOEC = 56 mg/L based on nominal concentrations **Conclusion of the RMS:** Based on the evaluation of the study the acute Daphnia test is considered valid.

Reference:	**AE F054014 Technical 99.7 % w/w Code: AE F054014 00 1C99 0004 The 48 Hour Acute Toxicity to the Water Flea, *Daphnia magna*, in a Static Renewal System**
Author(s), year:	Young, B.M., Ruff, D.F., 1999a
Report/Doc. number:	BM98W524 / M-184490-01-1

Guideline(s):	OECD 202 (1992)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Chlorobenzoxazolone (AE F054014 techn.), batch no.: YPVII/119, purity: 99.7%
Test species:	Water flea (*Daphnia magna*)
Number of organisms:	20 daphnids per controls and test concentrations, 2 replicate per treatment
Age:	First instar, < 24 hours old
Type of test, duration:	Semi-static, 48 hours

Applied concentrations:

Nominal:	0 (control and solvent control), 0.6,1.3, 2.5, 5.0 and 10 mg/L
Solvent:	Acetone (0.1 mL/L)

Test conditions:

Water quality:	Artificial test water (Marking and Dawson), total hardness: 172 mg/L as $CaCO_3$, alkalinity: 112 mg/L as $CaCO_3$, Conductivity: 600 µS/cm, pH: 7.1, dissolved oxygen: 8.7 mg/L, temperature: 21.5 °C
Temperature:	18.8 – 20.9 °C
Conductivity:	500 µS/cm
pH:	7.4 – 7.9
O_2 content:	97 – 102 % of air saturation
Light regime:	Light/dark cycle of 16/8
Feeding:	Daphnids were not fed during the study.
Aeration:	No supplement aeration.
Methods:	The test was conducted in 250 mL glass jars with a working volume of 200 mL. Daphnids were distributed two at a time until each replicate chamber contained 10 organisms.
Test parameters:	Immobility and sub-lethal effects were assessed after 3, 6, 24 and 48 hours. Measurements of pH, temperature and dissolved oxygen concentrations were made at the start of the test and after 24 and 48 hours. Additionally, Temperature was recorded continuously.
Analytical measurements:	The test solution was renewed after 24 hours by transferring the daphnids to freshly prepared test chambers. Samples of the test solutions were measured at the start of the test and after 24 hours and the aged solutions at 24 and 48 hours by high performance liquid chromatography.
Statistics:	The EC_{50} value and the 95 % confidence intervals were calculated using one of four statistical techniques: moving average, logit analysis, probit analysis or Trimmed Spearman-Karber.

Findings:

Analytical measurements:	The mean measured concentration of the test medium was between 94 and 96 % of

nominal values. Hence, the endpoints are based on nominal concentrations.

Table B. 9.2.5-7: Analytical measurements

Nominal concentrations [mg/L]	Measured concentrations [mg/L]					% of nominal concentrations
	0 h (new)	24 h (new)	24 h (old)	48 h (old)	Mean	
Control	-	-	-	-	-	-
Solvent control	-	-	-	-	-	-
0.6	0.5873	0.5642	0.5707	0.5744	0.5742	96
1.3	1.292	1.204	1.190	1.210	1.224	94
2.5	2.413	2.350	2.426	2.419	2.402	96
5.0	4.734	4.603	4.734	4.680	4.688	94
10	9.620	9.737	9.550	9.654	9.640	96

Biological Effects: The lowest concentration that resulted in 100% mortality within the period of the test was 10 mg/L.

The highest concentration with no mortality was 1.3 mg/L. In the controls 0 % mortality occurred.

Table B. 9.2.5-8: Effects on daphnids (*D. magna*)

Nominal concentrations [mg/L]	Mean cumulative immobilized organisms [%]			
	3 hours	6 hours	24 hours	48 hours
Control	0	0	0	0
Solvent control	0	0	0	0
0.6	0	0	0	0
1.3	0	0	0	0
2.5	0	0	0	10
5.0	0	0	0	0
10	0[a]	0[a]	0[a]	100[a]

[a] Surfacing

Conclusion: Based on these results an EC_{50} of 6.6 mg/L (95% C.I. 6.0 – 7.3 mg/L) based on nominal concentrations was determined.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 202 (2004).

- In the control, including the control containing the solubilising agent, not more than 10 per cent of the daphnids should have been immobilised;
- The dissolved oxygen concentration at the end of the test should be ≥ 3 mg/l in control and test vessels.

All validity criteria are met; hence, the acute daphnia toxicity test is considered valid.

In addition, the following points deviated from the test guideline or were not reported in detail:

	- At least 20 animals, preferably divided into four groups of five each, should be used. In the study 20 animals, divided into two groups, were tested. The deviation to the test guideline is not considered to have an impact on the validity of the test. **Acceptability of the analytical methods used in the test:** Method: HPLC/UV Linearity: Calibration is based on single determination at 5 concentrations. The calibration function was linear within the range from 0.01 – 0.2 µg/mL of (± 20% of nominal concentration) with r^2 = 0.9999. Accuracy: 2 fortifications levels (each 3 measurements): 0.10 and 10.0 mg/L. Mean recoveries for each level: 94.9 and 96.8 % Precision: The relative standard deviation per fortification level 0.67 and 0.07 %. LOQ: The limit of quantification is 0.1 mg/L. No information on the limit of detection is given in the study report. **Endpoints:** The RMS agrees on the endpoint given in the study report. 48 h EC_{50} = 6.6 mg/L NOEC = 1.3 mg/L based on nominal concentrations **Conclusion of the RMS:** Based on the evaluation of the study the acute Daphnia test is considered valid.

Reference:	***Daphnia magna*, Acute immobilization test (OECD 202), AE F096918; substance pure, Code: AE F 096918 00 1B99 0001**
Author(s), year:	Schäfers, C., 2004c
Report/Doc. number:	C043957 / M-235519-01-1
Guideline(s):	OECD 202 (1984)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	HOPP-acid (AE F096918), batch no.: 05022TB, purity: 99.0%
Test species:	Water flea (*Daphnia magna*)
Number of organisms:	20 daphnids per controls and test concentrations, 4 replicates per treatment
Age:	First instar, < 24 hours old
Type of test, duration:	Static, 48 hours
Applied concentrations:	
Nominal:	0 (control), 12.5, 25, 50, 100 and 200 mg/L

Solvent: None

Test conditions:

Water quality: Dilution water,

Temperature: 20.0 – 20.1 °C

pH: 6.5 – 8.4

O_2 content: 95 – 100 % of air saturation

Light regime: Light/dark cycle of 16/8

Feeding: Daphnids were not fed during the study.

Aeration: No supplement aeration.

Methods: The test was conducted in 60 mL glass jars with a working volume of 50 mL.

Test parameters: Immobility and sub-lethal effects were assessed daily.
Measurements of pH, temperature and dissolved oxygen concentrations were made at the start of the test and after 48 hours.

Analytical measurements: Samples of the test solutions were measured at the start and the end of the test by high performance liquid chromatography.

Statistics: Not reported.

Findings:

Analytical measurements: The mean measured concentration of the test medium was between 87 and 98 % of nominal values. Hence, the endpoints are based on nominal concentrations.

Table B. 9.2.5-9: Analytical measurements

Nominal concentrations [mg /L]	Measured concentration			
	0 h		48 h	
	[mg/L]	[%]	[mg/L]	[%]
Control	-	-	-	-
12.5	11.37	91	11.71	94
25	22.48	90	24.16	97
50	44.67	89	47.79	96
100	92.80	93	98.45	98
200	174.9	87	196.3	98

Limit of quantification (LOQ): 0.014 mg/L

Biological Effects: The lowest concentration that resulted in 100% mortality within the period of the test was 10 mg/L.
The highest concentration with no mortality was 1.3 mg/L. In the controls 0 % mortality occurred.

Table B. 9.2.5-10: Effects on daphnids (*D. magna*)

Nominal concentrations [mg/L]	Mean cumulative immobilized organisms [%]	
	24 hours	48 hours
Control	0	0
12.5	0	0
25	0	5

Nominal concentrations [mg/L]	Mean cumulative immobilized organisms [%]	
	24 hours	48 hours
50	0	0
100	0	5
200	0	0

Conclusion: Based on these results an EC_{50} of > 200 mg/L (95% C.I. 6.0 – 7.3 mg/L) based on nominal concentrations was determined.

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 202 (2004).

- In the control, including the control containing the solubilising agent, not more than 10 per cent of the daphnids should have been immobilised;
- The dissolved oxygen concentration at the end of the test should be ≥ 3 mg/l in control and test vessels.

All validity criteria are met; hence, the acute daphnia toxicity test is considered valid.

Acceptability of the analytical methods used in the test:

Method: HPLC/UV

Linearity: Calibration is based on single determination at 13 concentrations.

The calibration function was linear within the range from 0.01 – 0.25 mg/L and 0.25 – 10 mg/L with r^2 = 0.9999.

Accuracy: 1 fortifications level (each 2 measurements): 2.5 mg/L. Mean recovery: 98.5 %

Precision: The relative standard deviation per fortification level 0.71 %.

LOQ: The limit of quantification is 14.4 µg/L.

LOD: The limit of detection is 3.8 µg/L.

Endpoints:

The RMS agrees on the endpoint given in the study report.

48 h EC_{50} > 200 mg/L

based on nominal concentrations

Conclusion of the RMS: Based on the evaluation of the study the acute Daphnia test is considered valid.

Reference:	**Acute Toxicity of (R)-2-(4-Hydroxyphenoxy) propionic acid (HPPA) to *Daphnia magna* in a Static 48-hour Immobilization Test**
Author(s), year:	Pupp, A., Wydra, V., 2008
Report/Doc. number:	235 FPE / M-548131-01-1
Guideline(s):	OECD 202 (2004), Directive 92/69/EEC, C.2 (1992),
GLP:	Yes

Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	(R)-2-(4-Hydroxyphenoxy) propionic acid (HPPA), batch no.: BHBM3MO2, purity: 99.8 %
Test species:	Water flea (*Daphnia magna*)
Number of organisms:	20 daphnids per controls and test concentrations, 4 replicates per treatment
Age:	First instar, < 24 hours old
Type of test, duration:	Static, 48 hours

Applied concentrations:

Nominal:	0 (control), 6.25, 12.5, 25, 50 and 100 mg/L
Solvent:	None

Test conditions:

Water quality:	Dilution water, total hardness: 250 mg/L as $CaCO_3$, alkalinity: 0.8 mmol/L
Temperature:	19 – 20 °C
pH:	6.4 – 7.7
O_2 content:	8.2 – 8.8 mg/L
Light regime:	Light/dark cycle of 16/8
Methods:	The test was conducted in glass jars with a working volume of 80 mL.
Test parameters:	Immobility and sub-lethal effects were assessed after 24 and 48 hours. Measurements of pH, temperature and dissolved oxygen concentrations were made at the start of the test and after 48 hours.
Analytical measurements:	Samples of the test solutions were measured at the start of the test and after 48 hours by high performance liquid chromatography.
Statistics:	The EC_x values and the 95 % confidence intervals were calculated by Probit analysis.

Findings:

Analytical measurements:	The measured concentrations of the test medium were between 96 and 106 % of nominal values. Hence, the endpoints are based on nominal concentrations.

Table B. 9.2.5-11: Analytical measurements

Nominal concentrations [mg/L]	Measured concentrations [mg/L]			% of nominal
	0 h	48 h	Mean	
Control	< 0.9 -	< 0.9 -	-	-
6.25	6.001 6.037	5.991 6.011	6.01	96
12.5	12.472 12.458	12.506 12.498	12.48	100
25	25.138	25.212	25.15	101

Nominal concentrations [mg/L]	Measured concentrations [mg/L]			% of nominal
	0 h	48 h	Mean	
	25.165	25.094		
50	48.986 48.962	48.766 49.005	48.93	98
100	102.927 105.782	103.203 102.306	103.55	104

Limit of Detection (LOD) = 0.9 mg/L

Limit of Quantification (LOQ) = 5.0 mg/L

Biological Effects: The lowest concentration that resulted in 100% mortality within the period of the test was > 100 mg/L.

The highest concentration with no mortality was 25 mg/L. In the control 0 % mortality occurred.

Table B. 9.2.5-12: Effects on daphnids (*D. magna*)

Nominal concentrations [mg/L]	Mean cumulative immobilized organisms [%]	
	24 hours	48 hours
Control	0	0
6.25	0	0
12.5	0	0
25	0	0
50	5	5
100	30	65

Conclusion: Based on these results an EC_{50} of 86.8 mg /L (95% C.I. 69.8 – 108 mg/L) based on nominal concentrations was determined.

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 202 (2004).

- In the control, including the control containing the solubilising agent, not more than 10 per cent of the daphnids should have been immobilised;
- The dissolved oxygen concentration at the end of the test should be ≥ 3 mg/l in control and test vessels.

All validity criteria are met; hence, the acute daphnia toxicity test is considered valid.

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 5.0 mg/L) mentioned.

Endpoints: The RMS agrees on the endpoint given in the study report.

48 h EC_{50} = 86.8 mg/L

	NOEC = 25 mg/L based on nominal concentrations **Conclusion of the RMS:** Based on the evaluation of the study the acute Daphnia test is considered valid.

Reference:	**BCS-AW69425: Acute Toxicity to *Daphnia magna* in a Static 48-hour Immobilisation Test**
Author(s), year:	Hengsberger, A., Härtel, C., 2015a
Report/Doc. number:	EBFPN042 / M-538685-01-1
Guideline(s):	OECD 202 (2004), Directive 92/69/EEC, C.2 (1992),
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	6-hydroxy-1,3-benzoxazol-2(3H)-one (AE 0316854), batch no.: GSE 61724-2-1, purity: 99.4 %
Test species:	Water flea (*Daphnia magna*)
Number of organisms:	20 daphnids per controls and test concentrations, 4 replicates per treatment
Age:	First instar, < 24 hours old
Type of test, duration:	Static, 48 hours
Applied concentrations:	
Nominal:	0 (control), 0.43, 0.94, 2.1, 4.5 and 10 mg/L
Solvent:	None
Test conditions:	
Water quality:	Reconstituted water (Elendt "M4"), total hardness: 250 mg/L as $CaCO_3$, alkalinity: 0.9 mmol/L, MOPS-buffer: 700 mg/L
Temperature:	20 – 22 °C
pH:	6.4 – 6.9
O_2 content:	8.2 – 8.8 mg/L
Light regime:	Light/dark cycle of 16/8
Methods:	The test was conducted in 100 mL glass jars with a working volume of 60 mL.
Test parameters:	Immobility and sub-lethal effects were assessed after 24 and 48 hours. Measurements of pH, temperature and dissolved oxygen concentrations were made at the start of the test and after 48 hours.
Analytical measurements:	Samples of the test solutions were measured at the start of the test and after 48 hours by liquid chromatography.
Statistics:	The EC_x values and the 95 % confidence intervals were calculated by Probit analysis.

Findings:

Analytical measurements: The measured concentrations of the test medium were between 103 and 117 % of nominal values. Hence, the endpoints are based on nominal concentrations.

Table B. 9.2.5-13: Analytical measurements

Nominal concentrations [mg/L]	Measured concentrations [mg/L]			% of nominal
	0 h	48 h	Mean	
Control	< 0.02795 < 0.02795	< 0.02795 < 0.02795	-	-
0.43	0.469 0.491	0.439 0.477	0.47	110
0.94	1.057 1.054	1.010 0.969	1.02	110
2.1	2.270 2.438	2.175 2.343	2.31	111
4.5	4.964 4.701	4.774 4.686	4.78	107
10	11.039 10.512	10.892 10.746	10.80	109

Limit of Detection (LOD) = 0.02795 mg/L

Biological Effects: The lowest concentration that resulted in 100% mortality within the period of the test was 10 mg/L.

The highest concentration with no mortality was 0.94 mg/L. In the control 0 % mortality occurred.

Table B. 9.2.5-14: Effects on daphnids (*D. magna*)

Nominal concentrations [mg/L]	Mean cumulative immobilized organisms [%]	
	24 hours	48 hours
Control	0	0
0.43	0	0
0.94	0	0
2.1	0	5
4.5	15	80
10	65	100

Conclusion: Based on these results an EC_{50} of 3.48 mg/L (95% C.I. 2.90 – 4.12 mg/L) based on nominal concentrations was determined.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 202 (2004).

- In the control, including the control containing the solubilising agent, not more than 10 per cent of the daphnids should have been immobilised;
- The dissolved oxygen concentration at the end of the test should be ≥ 3 mg/l in

	control and test vessels. All validity criteria are met. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 20.0 µg/L) mentioned. **Endpoints:** The RMS agrees on the endpoint given in the study report. 48 h EC_{50} = 3.48 mg/L NOEC = 0.94 mg/L based on nominal concentrations **Conclusion of the RMS:** Based on the evaluation of the study the acute Daphnia test is considered valid.

Reference:	**BCS-AB16188: Acute Toxicity to *Daphnia magna* in a Static 48-hour Immobilisation Test**
Author(s), year:	Börschig, C., Emnet, P., 2015b
Report/Doc. number:	EBFPN039 / M-538878-01-1
Guideline(s):	OECD 202 (2004), Regulation No 440/2008, C.2 (2008)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	AE F040356 (BCS- AB16188) batch no.: GSE 61869-2-2, purity: 97 %
Test species:	Water flea (*Daphnia magna*)
Number of organisms:	20 daphnids per controls and test concentrations, 4 replicates per treatment
Age:	First instar, < 24 hours old
Type of test, duration:	Static, 48 hours
Applied concentrations:	
Nominal:	0 (control), 6.25, 12.5, 25, 50 and 100 mg/L
Solvent:	None
Test conditions:	
Water quality:	Reconstituted water (Elendt “M4”), total hardness: 250 mg/L as $CaCO_3$, alkalinity: 0.9 mmol/L, MOPS-buffer: 700 mg/L
Temperature:	21 – 22 °C
pH:	6.1 – 6.5
O_2 content:	6.3 – 8.8 mg/L
Light regime:	Light/dark cycle of 16/8

Methods: The test was conducted in 100 mL glass jars with a working volume of 60 mL.

Test parameters: Immobility and sub-lethal effects were assessed after 24 and 48 hours.
Measurements of pH, temperature and dissolved oxygen concentrations were made at the start of the test and after 48 hours.

Analytical measurements: Samples of the test solutions were measured at the start of the test and after 48 hours by liquid chromatography.

Statistics: The EC_x values and the 95 % confidence intervals were calculated by Probit analysis.

Findings:

Analytical measurements: The mean measured concentrations of the test medium were between 0.848 and 3.463 mg/L for the three highest test concentrations. The endpoints are based on mean measured concentrations.

Table B. 9.2.5-15: Analytical measurements

Nominal concentrations [mg/L]	Measured concentrations [mg/L]		
	0 h	48 h	Mean
Control	< 0.0002 < 0.0002	< 0.0002 < 0.0002	-
25	0.829 0.867	0.846 0.851	0.848
50	1.840 1.779	1.776 1.717	1.778
100	3.593 3.593	3.353 3.313	3.463

Limit of Detection (LOD) = 0.0002 mg/L

Limit of Quantification (LOQ) = 0.06 mg/L

Biological Effects: The lowest concentration that resulted in 100% mortality within the period of the test was 3.463 mg/L.
The highest concentration with no mortality was 0.848 mg/L. In the control 0 % mortality occurred.

Table B. 9.2.5-16: Effects on daphnids (*D. magna*)

Mean measured concentrations [mg/L]	Mean cumulative immobilized organisms [%]	
	24 hours	48 hours
Control	0	0
0.212	0	0
0.424	0	0
0.848	0	0
1.778	0	55
3.463	25	100

Conclusion: Based on these results an EC_{50} of 1.75 mg/L based on mean measured

concentrations was determined.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 202 (2004). - In the control, including the control containing the solubilising agent, not more than 10 per cent of the daphnids should have been immobilised; - The dissolved oxygen concentration at the end of the test should be ≥ 3 mg/l in control and test vessels. All validity criteria are met; hence, the acute daphnia toxicity test is considered valid. In addition, the following points deviated from the test guideline or were not reported in detail: - Only the three highest test concentrations were analytically verified. The deviation to the test guideline is not considered to have an impact on the validity of the test. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.06 mg/L) mentioned. **Endpoints:** The RMS agrees on the endpoint given in the study report. 48 h EC_{50} = 1.75 mg/L NOEC = 0.848 mg/L based on mean measured concentrations. **Conclusion of the RMS:** Based on the evaluation of the study the acute Daphnia test is considered valid.

Reference:	**BCS-CY11271: Acute Toxicity to *Daphnia magna* in a Static 48-hour Immobilisation Test**
Author(s), year:	Kuhl, R., Emnet, P., 2016
Report/Doc. number:	EBFPN010 / M-547464-01-1
Guideline(s):	OECD 202 (2004), Regulation No 440/2008, C.2 (2008)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Ethyl (R)-2-{4-[(6-hydroxy-1,3-benzoxazol-2-yl)oxy]phenoxy} propanoate (BCS-CY11271) batch no.: GSE 61479-2-3, purity: 99.2%

Test species:	Water flea (*Daphnia magna*)
Number of organisms:	20 daphnids per controls and test concentrations, 4 replicates per treatment
Age:	First instar, < 24 hours old
Type of test, duration:	Static, 48 hours
Applied concentrations:	
Nominal:	0 (control), 4.3, 9.4, 20.7, 45.5 and 100 mg/L
Solvent:	None
Test conditions:	
Water quality:	Reconstituted water (Elendt "M4"), total hardness: 250 mg/L as $CaCO_3$, alkalinity: 0.9 mmol/L, MOPS-buffer: 700 mg/L
Temperature:	20 – 22 °C
pH:	6.4 – 6.6
O_2 content:	6.0 – 9.0 mg/L
Light regime:	Light/dark cycle of 16/8
Methods:	The test was conducted in 100 mL glass jars with a working volume of 60 mL.
Test parameters:	Immobility and sub-lethal effects were assessed after 24 and 48 hours. Measurements of pH, temperature and dissolved oxygen concentrations were made at the start of the test and after 48 hours.
Analytical measurements:	Samples of the test solutions were measured at the start of the test and after 48 hours by liquid chromatography.
Statistics:	The EC_x values and the 95 % confidence intervals were calculated by Probit analysis.
Findings:	
Analytical measurements:	The mean measured concentrations of the test medium were between 0.403 and 9.98 mg/L. The endpoints are based on mean measured concentrations.

Table B. 9.2.5-17: Analytical measurements

Nominal concentrations [mg/L]	Measured concentrations [mg/L]		
	0 h	48 h	Mean
Control	< 0.0009 < 0.0009	< 0.0009 < 0.0009	-
4.3	0.450 0.436	0.373 0.359	0.403
9.4	1.031 0.991	0.816 0.715	0.879
20.7	2.126 2.264	1.627 1.632	1.89
45.5	4.496 4.188	3.870 3.763	4.07
100	9.833 9.355	9.169 11.772	9.98

Limit of Detection (LOD) = 0.0009 mg/L

Limit of Quantification (LOQ) = 0.05 mg/L

Biological Effects: The lowest concentration that resulted in 100% mortality within the period of the test was > 9.98 mg/L.

The highest concentration with no mortality was 4.07 mg/L. In the control 0 % mortality occurred. In the highstest test concentration one test animal was immobilized after 24 h.

Table B. 9.2.5-18: Effects on daphnids (*D. magna*)

Mean measured concentrations [mg/L]	Mean cumulative immobilized organisms [%]	
	24 hours	48 hours
Control	0	0
0.403	0	0
0.879	0	0
1.89	0	0
4.07	0	0
9.98	5	5

Conclusion: Based on these results an EC_{50} of > 9.98 mg/L and a NOEC of 9.98 mg/L based on mean measured concentrations were determined.

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 202 (2004).

- In the control, including the control containing the solubilising agent, not more than 10 per cent of the daphnids should have been immobilised;
- The dissolved oxygen concentration at the end of the test should be ≥ 3 mg/l in control and test vessels.

All validity criteria are met; hence, the acute daphnia toxicity test is considered valid.

In addition, the following points deviated from the test guideline or were not reported in detail:

- The temperature deviated by more than ± 1 °C.

No immobilisation or behaviour effects were observed in the control. Therefore it can be assumed that this deviation had no impact on the results of the test.

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.05 mg/L) mentioned.

Endpoints:

The RMS agrees on the endpoint given in the study report.

48 h EC_{50} > 9.98 mg/L

	NOEC = 9.98 mg/L based on mean measured concentrations. **Conclusion of the RMS:** Based on the evaluation of the study the acute Daphnia test is considered valid.

B.9.2.6. Long-term and chronic toxicity to aquatic invertebrates

Active substance:

Reference:	**The Effect of Fenoxaprop-P-ethyl – substance, technical (Identification code: Hoe 046360 OH ZC97 0002) to *Daphnia magna* (Waterflea) in a 21-day Reproduction Test (method OECD)**
Author(s), year:	Fischer, R., 1989b
Report/Doc. number:	CE89/033 / M-124780-01-1
Guideline(s):	OECD 202 (1984)
GLP:	Yes
Deviations:	None
Validity:	Not acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl (techn.), purity: 89.2 % w/w
Test species:	Water flea (*Daphnia magna*)
Number of organisms:	40 daphnids per controls and test concentrations, 4 replicate per treatment
Age:	First instar, < 24 hours old
Type of test, duration:	Semi-static, 21 days
Applied concentrations:	
Nominal:	0 (control and solvent control), 0.01, 0.032, 0.1, 0.32 and 1.0 mg a.s./L
Solvent:	Acetone (0.1 mL/L)
Test conditions:	
Water quality:	70 % tap water and 30 % deionized water, total hardness: 211 - 231 mg/L as $CaCO_3$, alkalinity: 176 – 189 mg/L as $CaCO_3$
Conductivity:	463 – 496 µmhos/cm
Temperature:	19.0 – 20.0 °C
pH:	7.6 – 7.9
O_2 content:	6.0 – 10.2 mg/L
Light regime:	Light/dark cycle of 16/8
Feeding:	Daphnids were fed three times a week with a mixture of algae and fish food.
Aeration:	No supplement aeration.
Methods:	The test was conducted in glass beakers of 500 mL capacity, containing 400 mL

test water. The test solutions were renewed three times a week.

Test parameters: Immobilisation, mortality, number if dead and alive offspring and development of embryos were assessed three times a week.

Dissolved oxygen, pH and temperature were measured before and after- each test media renewal. Additionally, water temperature of the untreated control was recorded continuously during the whole test period.

Analytical measurements: Chemical analyses of test substance concentrations were conducted from the freshly prepared test solutions on test day 0, 3, 5, 7, 10, 12, 14, 17 and 19 and from the aged test solutions on test day 3, 5, 7, 10, 12, 14, 17, 19 and 21 by high performance liquid chromatography.

Statistics: The NOEC was determined by Analysis of Variance, General Linear Models, Duncan`s Multiple Range Test.

Findings:

Analytical measurements: While at the beginning ≥.80 % of the nominal concentration of Hoe 046360 was recovered, at the time of renewal most of the original test substance had been hydrolysed. Fenoxaprop-P-ethyl hydrolyses rather rapidly. Therefore beside the ester (Hoe 046360) its free acid (Hoe 053022) was also analysed. Therefore the concentrations of Hoe 046360 and Hoe 053022 were added and reported as mean measured concentration (Hoe 046360), as the mean measured sum of both remained below 80% of the nominal concentration at the time of renewal.

The nominal concentration of 0.32 mg a.s./L, which was not analytically verified is given as 0.22 mg a.s./L (70% of the nominal), as the value detected at 0.1 mg a.s./L was 70% of and also the greatest deviation from the nominal. Hence, the results are based on mean measured concentrations.

Reproduction: The mortality of the treated groups was not statistically different from the control, but higher than in the solvent control group. For all evaluation days at least one reproductive parameter significantly impaired by the concentration at 0.75 mg a.s./L. Overall during the 21 d test period at 0.75 mg a.s./L less offsprings were hatched and more were found dead than in any other treatment group.

Table B. 9.2.6-1: Effects on parental survival and reproduction

Nominal concentrations [µg a.s./L]	Parental survival [%]	total dead larvae	Total alive larvae	Mean offspring/female
Control	92.5	0	267.75	28.95
Solvent control	97.5	0	276.75	28.42
0.01	92.5	0	268.75	29.07
0.032	97.5	0	281	28.9
0.1	97.5	0	282.75	29.05
0.32	95.0	0	256.5	27.05
1.0	87.5	29.5*	203*	23.17*

Conclusion: The NOEC for reproduction was determined to be the tested concentration, 0.22

mg a.s./L. The toxicity endpoint is based on mean measured concentrations.

Reference:	**Statement – EC10/EC20 calculation for *Daphnia* reproduction test with Fenoxaprop-P-ethyl (M-124780 – 01-1, R. Fischer, 1989)**
Author(s), year:	Hager, J., 2016a
Report/Doc. number:	M-553480-01-1

Conclusion: EC_{10} = n.d. mg a.s./L (95% C.I.: n.d. – n.d.)
EC_{20} = n.d. mg a.s./L (95% C.I.: n.d. – n.d.)

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 211 (2009): - the mortality of the parent animals (female Daphnia) does not exceed 20% at the end of the test; - the mean number of living offspring produced per parent animal surviving at the end of the test is > 60. Not all validity criteria could be verified, as 10 parent animals per replicate were maintained together in one test vessel, it is not possible to calculate a mean number of living offspring produced per parent animal. Therefore, the study is not considered valid. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Method: HPLC/UV No information is given in the study report on the linearity, accuracy, and precision, the limit of quantification and limit of detection. **Endpoints:** The study is not considered valid; hence no endpoint was determined by the RMS. **Conclusion of the RMS:** Based on the evaluation of the study the chronic reproduction test is not considered valid.

Metabolites:

Reference:	**Fenoxaprop-P *Daphnia magna* chronic toxicity and reproduction test under semi-static conditions**
Author(s), year:	Ebeling, M., Nguyen, D., Gosch, H., 2002
Report/Doc. number:	C02/057 / M-211218-01-1
Guideline(s):	OECD 202 (1984), OECD 211 (1998), US EPA § 72-4, US EPA OPPTS 850.1300 (1996)

GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P (AE F088406), purity: 97.4 % w/w
Test species:	Water flea (*Daphnia magna*)
Number of organisms:	In Groups: 15 daphnids per control and test concentrations, 3 replicates per treatment Individually: 110 daphnids per control and test concentrations, 10 replicates per treatment
Age:	First instar, < 24 hours old
Type of test, duration:	Semi-static, 21 days
Applied concentrations:	
Nominal:	0 (control), 0.032, 0.1, 0.32, 1.0 and 3.2 mg/L
Solvent:	None
Test conditions:	
Water quality:	Dilution water (M4, Elendt 1990), total hardness: 168.2 – 169.9 mg/L as $CaCO_3$
Temperature:	19.0 – 20.2 °C
pH:	7.6 – 8.0
O_2 content:	7.8 – 9.1 mg/L
Light regime:	Light/dark cycle of 16/8
Feeding:	Daphnids were fed five times a week with a suspension of algae.
Aeration:	No supplement aeration.
Methods:	The test was conducted in glass beakers of 500 mL capacity, containing 400 mL test water. The test solutions were renewed three times a week.
Test parameters:	Immobilisation, mortality and number alive offspring were assessed three times a week. The growth was assessed at the end of the test. Dissolved oxygen, pH and temperature were measured from the freshly prepared and ages test solution at each evaluation time. Additionally, water temperature was recorded continuously during the whole test period.
Analytical measurements:	Chemical analyses of test substance concentrations were conducted from the freshly prepared test solutions on test day 0, 2, 5, 12 and 16 and from the aged test solutions on test day 2, 5, 7, 14 and 19 by high performance liquid chromatography.
Statistics:	The NOEC was determined by General Linear Models, Duncan`s Multiple Range Test.
Findings:	
Analytical measurements:	Mean measured concentrations of fresh test solutions were in the range of 106.2 to 113.4 % of nominal concentrations for Fenoxaprop-P. Mean measured

concentrations of Fenoxaprop-P in the old test solutions were in the range of 105.5 to 110.8 %.

Hence, the results are based on nominal concentrations.

Biological results: Daphnids exposed individually: First release of neonate daphnids were observed on day 7 in the controls and test concentrations. The mortality and length of the treated groups was not statistically different from the control. Weight and reproductive performance was significant different compared to the control at the highest test concentration.

Daphnids exposed in groups: Immobilisation of daphnids did not exceed 20 % at any test concentration.

Table B. 9.2.6-2: Effects on parental survival, reproduction and growth

Nominal concentrations [mg/L]	Parental survival [%]	Mean offspring/female at Day 21 [no. ± SD]	Mean Length [mm ± SD]	Mean weight [mg ± SD]
Control	100	76.5 ± 10.6	3.92 ± 0.17	1.26 ± 0.08
0.032	100	76.5 ± 9.5	4.00 ± 0.04	1.26 ± 0.05
0.1	100	76.3 ± 8.7	3.89 ± 0.09	1.20 ± 0.08
0.32	100	69.9 ± 6.0	3.95 ± 0.12	1.25 ± 0.11
1.0	100	69.4 ± 12.3	3.90 ± 0.16	1.19 ± 0.11
3.2	100	62.6 ± 6.6 *	3.85 ± 0.14	1.16 ± 0.09*

Conclusion: The NOEC for reproduction and growth was determined to be the tested concentration 1.0 mg a.s./L. The toxicity endpoint is based on nominal concentrations.

Reference: **Statement – EC_{10}/EC_{20} calculation for Daphnia chronic toxicity test with Fenoxaprop-P (AE F088406) (M-211218-01-1, M. Ebeling, 2002)**

Author(s), year: Hager, J., 2016b

Report/Doc. number: M-553440-01-1

Conclusion: Mean cumulative offspring:

EC_{10} = 0.49 mg/L (95% C.I.: 0.13 – 1.02 mg/L)

EC_{20} = 4.77 mg/L (95% C.I.: 2.09 – 43.29 mg/L)

The toxicity endpoints are based on nominal concentrations.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 211 (2012):

- the mortality of the parent animals (female Daphnia) does not exceed 20% at the end of the test;
- the mean number of living offspring produced per parent animal surviving at the

end of the test is > 60.
All validity criteria were met.

A statement was provided with EC_{10} and EC_{20} calculations for the reproductive performance and daphnids weight. The EC_{10} and EC_{20} for the reproductive performance were considered valid, whereas for the weight no meaningful dose response was found. Therefore, the EC_{10} for weight was not considered valid.

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4.

Method: HPLC/UV

Linearity: The calibration function was linear within the range from 12 – 2500 µg/L.

Accuracy: 5 fortifications levels (3 measurements: fresh water, aged water (daphnids hold individually), aged water (daphnids hold in groups)): 0.03, 0.10, 0.31, 0.97, 3.12 mg/L. Mean recoveries for each level: 102.4, 104.3, 108.3 %

Precision: The relative standard deviation per fortification level : 0.4, 1.1, 0.7 %

LOQ: Limit of quantification = 0.009 mg/L

LOD: Limit of detection = 0.006 mg/L

No information on r^2 is given in the study report.

Endpoints:

The RMS agrees on the endpoint given in the study report. The differences in effect levels after individual and group exposure can be explained by intraspecies interaction. However, the study guideline recommends an individually exposure for semi-static test. Therefore, only the results of the individual exposure will be considered for the risk assessment.

NOEC = 1.0 mg/L (reproduction and weight)

EC_{10} = 0.49 mg/L (95% C.I.: 0.13 – 1.02 mg/L) (reproduction)

EC_{20} = 4.77 mg/L (95% C.I.: 2.09 – 43.29 mg/L) (reproduction)

The endpoints are based on nominal concentrations.

Conclusion of the RMS: Based on the evaluation of the studies the chronic reproduction test is considered valid.

Reference:	***Daphnia magna*, Reproduction test (OECD 211), Semi-static exposure, AE F096918; substance pure, Code: AE F096918 00 1B99 0001**
Author(s), year:	Schäfers, C., 2004d
Report/Doc. number:	C045676 / M-237296-01-1

Guideline(s):	OECD 211 (1998)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	(D+)-2-(4-hydroxyphenoxy)-propionic acid (AE F0962918), batch no.: 05022TB, purity: 99.0 % w/w
Test species:	Water flea (*Daphnia magna*)
Number of organisms:	110 daphnids per control and test concentrations, 10 replicates per treatment
Age:	First instar, < 24 hours old
Type of test, duration:	Semi-static, 21 days

Applied concentrations:

Nominal:	0 (control), 0.32, 1.0, 3.2, 10 and 32 mg/L
Solvent:	None

Test conditions:

Water quality:	Purified drinking water, total hardness: 1.0 mmol/L, conductivity: 216 µS/cm
Temperature:	19.8 – 20.2 °C
pH:	7.5 – 9.0
O_2 content:	90 – 104 % of air saturation
Light regime:	Light/dark cycle of 16/8
Feeding:	Daphnids were fed with a suspension of green algae.
Aeration:	No supplement aeration.
Methods:	The test was conducted in glass beakers of 60 mL capacity, containing 50 mL test water. The test solutions were renewed three times a week.
Test parameters:	Immobilisation, sub-lethal effects and number alive offspring were assessed daily until day 12 and afterwards three times a week. The length of the adults was determined at the end of the test. Dissolved oxygen, pH and temperature were measured from the freshly prepared and ages test solution at day 0, 2, 5, 7, 9, 12, 14, 16, 19 and 21.
Analytical measurements:	Chemical analyses of test substance concentrations were conducted from the freshly prepared test solutions on test day 0, 2, 5, 7, 9, 12, 14, 16 and 19 and from the aged test solutions on test day 2, 5, 7, 9, 12, 14, 16, 19 and 21 by high performance liquid chromatography.
Statistics:	The NOEC was determined by using ANOVA followed by Williams` test. EC_{50} and EC_{10} values were calculated using Probit analysis.

Findings:

Analytical measurements:	Mean measured concentrations of fresh test solutions were in the range of 95 to 101 % of nominal concentrations. Mean measured concentrations in the old test solutions were in the range of 91 to 99 %.

Hence, the results are based on nominal concentrations.

Biological effects: During the study no adult mortality occurred. Adult body length was variable and showed no concentration-response relationship. The mean cumulative number of offspring showed a clear concentration-response relationship with an EC_{10} of 3.0 and an EC_{50} of 18.5 mg/L.

Table B. 9.2.6-3: Effects on parental survival, reproduction and growth

Nominal concentrations [mg/L]	Parental survival [%]	Mean offspring/female at Day 21 [no. ± SD]	Mean Length [mm ± SD]
Control	100	70.9 ± 6.2	4.05 ± 0.47
0.32	100	71.8 ± 7.2	3.65 ± 0.34
1.0	100	70.6 ± 4.7	3.62 ± 0.54
3.2	100	66.2 ± 6.3	3.61 ± 0.38
10	100	43.6 ± 4.5*	3.55 ± 0.37
32	100	26.8 ± 8.8*	3.64 ± 0.48

* Statistically significant compared to the control ($p < 0.05$)

Conclusion: The NOEC for reproduction was determined to be the tested concentration 3.2 mg a.s./L. The EC_{10} was determined at 3.0 mg a.s./L (95% C.I.: 0.8 – 5.2 mg/L). The toxicity endpoints are based on nominal concentrations.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 211 (2012):

- the mortality of the parent animals (female Daphnia) does not exceed 20% at the end of the test;
- the mean number of living offspring produced per parent animal surviving at the end of the test is > 60.

All validity criteria were met; hence, the study is considered valid.

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4.

Method: HPLC/UV

Linearity: Calibration is based on single determination at 6 concentrations for a lower concentration range and 8 concentrations for a higher concentration range. The calibration function was linear within the range from 0.01 – 0.25 mg/L and 0.25 – 10 mg/L.

LOQ: Limit of quantification = 14 µg/L

LOD: Limit of detection = 3.8 µg/L

No information on r^2, the accuracy or precision of the analytical method is given in the study report.

Endpoints:

	The RMS agrees on the endpoint given in the study reports. NOEC = 3.2 mg/L (reproduction) EC_{10} = 3.0 mg/L (95% C.I.: 0.8 – 5.2 mg/L) (reproduction) The endpoints are based on nominal concentrations. **Conclusion of the RMS:** Based on the evaluation of the studies the chronic reproduction test is considered valid.

B.9.2.6.1. Reproductive and development toxicity to an additional aquatic invertebrate species

Reference:	**Fenoxaprop-P-ethyl Technical 88.1 % w/w Code: AE F046360 00 1C97 0002 The 28 Day Chronic Toxicity to the Mysid, *Mysidopsis bahia*, In a Flow through System**
Author(s), year:	Boeri, R. L., Magazu, J. P., Ward, T. J., 1999
Report/Doc. number:	C002140 / M-183980-01-1
Guideline(s):	US EPA (1985), US EPA 72-4 (1988)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl (technical), batch no.: 1+2/86, purity: 88.1 %
Test species:	Mysid shrimp (*Mysidopsis bahia*)
Number of organisms:	60 shrimps per controls and test concentrations, 2 replicates per treatment
Age:	Juvenile, < 24 hours old
Type of test, duration:	Flow-through, 28 days
Applied concentrations:	
Nominal:	0 (control and solvent control), 0.024, 0.052, 0.10, 0.20 and 0.40 mg a.s./L
Solvent	DMF (0.1 mL/L)
Test conditions:	
Water quality:	Natural seawater, pH: 7.8, salinity: 15 ppt
Temperature:	23.4 – 26.7 °C (mean: 24.8 °C)
pH:	7.3 – 8.1
Salinity:	14 – 15 ppt (mean: 15 ppt)
O_2 content:	4.5 – 7.9 mg/L (mean: 7.0 mg/L)
Light regime:	Light/dark cycle of 16/8
Feeding:	Shrimps were fed three times each day with brine shrimp (*Artemia salina*).
Aeration:	No supplement aeration.

Methods: From the test imitation through sexual differentiation, the retention chambers consisted of 10 cm in diameter, 13 cm high glass petri dishes. After sexual maturity was reached, mysids were transferred to ten glass petri dishes (6 cm in diameter and 13 cm high). During the study, the diluter provided the exposure solutions at a rate of 13 volume additions per aquarium per day.

Test parameters: Adult survival and sub-lethal effects were assessed daily. Body weight and total length of the surviving mysids were determined at the end of the test. Offspring were counted and removed every day.

Measurements of temperature, salinity, pH and dissolved oxygen concentrations were made daily. Additionally, water temperature was recorded continuously during the study.

Analytical measurements: The concentrations of the test water were determined on days 0, 7, 11, 20 and 28 using high performance liquid chromatography.

Statistics: Chi-Square Goodness of fit test and Barlett's test were used to test for normality and homogeneity of variance of reproduction data. NOEC was determined by multiple test procedure i.e. ANOVA and Bonferroni`s test, Kruskal and Wallis` test.

Findings:

Analytical data: The mean measured concentrations of the active substance in the test concentrations were between 46 % and 82 % of nominal values. The endpoints are based on mean measured concentrations.

Table B. 9.2.6.1-1: Analytical measurements

Nominal concentrations [mg a.s./L]	Measured concentrations [mg a.s./L]						% of nominal
	Day 0	Day 7	Day 11	Day 20 [a]	Day 28	Mean	
Control	< 0.003 < 0.003	< 0.003 < 0.003	< 0.003 < 0.003	< 0.003 < 0.003	< 0.003 < 0.003	-	-
Solvent Control	< 0.003 < 0.003	< 0.003 < 0.003	< 0.003 < 0.003	< 0.003 < 0.003	< 0.003 < 0.003	-	-
0.024	0.01217 0.01231	0.01332 0.01207	0.01082 0.01316	0.008852 0.01289	0.009180 0.004710	0.01095	46
0.052	0.03086 0.03271	0.03263 0.03446	0.03624 0.03604	0.02713 0.05484	0.01953 0.02210	0.03265	63
0.10	0.07102 0.1170	0.06431 0.07825	0.06454 0.07983	0.1195 0.08995	0.03670 0.04641	0.07675	77
0.20	0.1563 0.1574	0.1320 0.1595	0.1432 0.1557	0.1847 0.1746	0.1359 0.1208	0.1520	76
0.40	0.3296 0.3516	0.3094 0.3229	- -	- -	- -	0.3284	82

Limit of quantification (LOQ) = 0.003 mg/L

[a] The initial sample analyses are not reported due to apparent analytical contamination of the samples. Bach-up samples were analysed and the results reported and used in the calculation of the mean.

Parental survival: In the control and solvent control 10 and 11 % mortality were observed.

Significant differences were observed in the 0.3284 mg a.s./L treatment with 100 % mortality.

Reproduction: The mean number of offspring produced in the control and solvent control were not significantly different. The statistical analysis of all parameters (survival, reproduction, body weight and length) was conducted comparing the treatment data to the pooled control data. The number of offspring per female per day 28 ranged from 0 to 5.8 in the test concentrations.

Table B. 9.2.6.1-2: Effects on parental survival and reproduction

Mean measured concentrations [mg a.s./L]	Parental survival [%]	offspring/female/day 28
Control	90	4.8
Solvent control	89	4.9
0.01095	90	5.8
0.03265	80	3.7
0.07675	87	0*
0.1520	19	0*
0.3284	0*	-

* Statistically significant compared to the pooled control ($p < 0.05$)

Total length and weight: The mean total length of mysids was significantly different compared to the pooled control in the 0.07675 and 0.1520 mg a.s./L treatments. The mean dry weight was statistically significant in the 0.03265, 0.07675 and 0.1520 mg a.s./L treatments.

Table B. 9.2.6.1-3: Effects on total length and weight

Mean measured concentrations [mg a.s./L]	Mean total length [mm]	Mean weights [mg]	
		Wet	Dry
Control	7.2	3.7	0.68
Solvent control	7.3	3.5	0.68
0.01095	7.3	3.2	0.62
0.03265	7.2	3.3	0.61*
0.07675	6.6*	2.5*	0.47*
0.1520	6.1*	2.3*	0.34*
0.3284	-	-	-

* Statistically significant compared to the pooled control ($p < 0.05$)

Conclusion: The NOEC for survival was determined at 0.1520 mg a.s./L, for reproduction, total length and wet weight 0.03265 mg a.s./L and for dry weight 0.01095 mg a.s./L. The toxicity endpoints are based on mean measured concentrations.

Reference: **Re-evaluation of a chronic study performed with the marine invertebrate**

	***Americamysis bahia* and Fenoxaprop-P-ethyl tech. (Boeri, R.L. et al., 1999, M-183980-01-1)**
Author(s), year:	Hager, J., 2018
Report/Doc. number:	M-617174-01-1

Findings: The analysis of data showed that a calculation of EC_{10} / EC_{20} values is possible for the most sensitive measure, i.e. adult dry weight: all linear regression models found a statistically significant dose-response relationship resulting in comparable ECx values. Under the consideration of all goodness of fit parameters and the concentration-effect curves, the Weibull regression fit best the data for the endpoint "parental dry weight". However, all models used failed in calculating 95 %-confidence limits and the reliability criteria for the EC_{10} can therefore not be calculated.

Table B. 9.2.6.1-4: Calculation of effective concentrations (ECx) for the parental dry weight of *Americamysis bahia*

Biological endpoint	Method	ECx [mg a.s./L] (95 % CI)		Godness of fit				
		EC_{10}	EC_{20}	Chi^2	$p(Chi^2)$	r^2	Slope	p (F)
Parental dry weight	Probit	0.026 (n.d.)	0.048 (n.d.)	0.02343	0.988	0.938	1.6164	0.031
	Logit	0.025 (n.d.)	0.049 (n.d.)	0.00267	0.999	0.953	2.7577	0.024
	Weibull	**0.023 (n.d.)**	**0.049 (n.d.)**	**0.00223**	**0.999**	**0.961**	**2.3039**	**0.019**

Bold lines in the table: most appropriate ECx value

Conclusion: EC_{10} = 0.023 mg a.s./L
EC_{20} = 0.049 mg a.s./L

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guideline, the US EPA OPPTS 850.1350 (1996):
- less than 25 % of first generation females in the control groups fail to produce young
- the average number of young produced per female in the controls is more than three per day.

The average numbers of young produced per female in the controls were 4.8 and 4.9 per day and therefore more than three per day.
No information on the produced offspring per female in the controls is given in the study report. Therefore it is not possible to check if more than 25 % of the females failed to produce offspring.
In addition, the following points deviated from the test guideline or were not reported in detail:
- Mysids should be physically separated into replicate groups of no more than eight individuals when most of the mysids reach sexual maturity. According to the

study report up to ten pairs mysids were transferred to individual retention chambers.

- The guideline recommends a light dark period of 14/10 h. In the study 16/8 h was maintained.

- 14 – 15 ppt salinity was provided in the study. 20 ± 3 ppt is recommended in the US EPA guideline.

The deviations to the test guideline are not considered to have an impact on the validity of the test. However, one validity criterium could not be verified.

A re-evaluation was provided with EC_{10} and EC_{20} calculations for the most sensitive parameter parental dry weight. The EC_{10} and EC_{20} for the parental dry weigth were considered valid. However, no confidence intervals could be calculated and the reliability of the ECx values could not be determined.

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.005 mg/L) mentioned.

Endpoints:

The study author proposes a NOECsurvival of 0.152 mg a.s./L. The parental survival was only 19 % at this concentration. The RMS consideres this effect as biologically relevant. Furthermore, EC_{10} and EC_{20} values were provided. The confidence intervals could not be calculated. Therefore the reliability of the EC_{10} and EC_{20} value could not be determined.

$NOEC_{survival}$ = 0.07675 mg a.s./L

$NOEC_{reproduction, length, wet weight}$ = 0.03265 mg a.s./L

$NOEC_{dryweight}$ = 0.011 mg a.s./L.

EC_{10} = 0.023 mg a.s./L

EC_{20} = 0.049 mg a.s./L

The endpoints are based on mean measured concentrations.

The RMS agrees on the endpoint given in the study report.

A NOEC of 0.011 mg a.s./L is considered acceptable.

Conclusion of the RMS: Based on the evaluation of the study the chronic reproduction test is considered valid.

B.9.2.6.2. Development and emergence in *Chironomus* species

Reference:	**Effects of Fenoxaprop-P-ethyl, substance technical; Code: AE F046360 on the development of sediment-dwelling larvae of *Chironomus riparius* in a water-sediment system**
Author(s), year:	Memmert, U., 2000
Report/Doc. number:	C006993 / M-195015-01-1
Guideline(s):	BBA guideline (1995)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	^{14}C-Fenoxaprop-P-ethyl (AE F046360), batch no.: Z 28084-0, purity: 98 %
Test species:	Midge (*Chironomus riparius*)
Number of organisms:	25 larvae per controls and test concentrations, 4 replicates per treatment
Age:	First instar larvae, 2 – 3 days old
Type of test, duration:	Static test, 26 days
Applied concentrations:	
Nominal:	0 (control and solvent control), 25, 50, 100, 200 and 400 µg/L
Solvent:	DMF (95µL/L)
Test substrate:	
Aqueous medium:	Reconstituted test water, conductivity: 150 – 11000 µS/cm, total hardness: 250 mg/L as $CaCO_3$, alkalinity: 0.9 mmol/L
Artificial sediment:	10 % (dry weight) sphagnum peat 20% (dry weight) kaolin clay (kaolinite content ≥ 30%) 70 % (dry weight) sand 0.4 % Calcium carbonate pH: 5.8
Test conditions:	
Temperature:	19 – 20.3 °C
pH:	6.6 – 7.8
O_2 content:	5.0 – 9.0 mg/L
Light regime:	Light/dark cycle of 16/8
Feeding:	Larvae were fed three times per week with fish food.
Aeration:	Supplementary aeration 2-3 cm above the sediment layer.
Methods:	3000 mL glass vessel, filled with a layer wet sediment of 2 cm depth and 200 mL test medium. The ratio of the depth of the sediment layer of the depth of the overlying water was about 1:7.5 (2 cm sediment and 15 cm test medium).
Test parameters:	The number of emerged adults and their sex was recorded daily from Day 10 to Day 26.

The water temperature was measured three times a week. The pH and dissolved oxygen concentrations were measured once a week. Additionally, air temperature was recorded continuously.

Analytical measurements: The radioactivity of the test water, pore water and sediment samples were determined at day 0, 7 and 26 days using liquid scintillation counting. The concentration of the parent molecule and its metabolites were additionally analysed by thin-layer chromatography and high performance liquid chromatography in the water, pore water and sediment samples on Day 7 and 26 from the test concentrations of nominal 100 and 400 µg/L.

Statistics: The NOEC was determined by Williams-test after a one-way analysis of variance.

Findings:

Analytical measurements: Water Phase: The measured test item in the three lowest concentrations corresponded well with the nominal test concentrations. At the two highest test concentrations the measured concentrations were about 164 and 90 % of nominal values. The difference is caused by a non-homogeneous distribution of the test item. After the incubation time the radioactive residue in the water columns had decreased to 20.7 and 40 % of nominal initial values.

Pore water: The amount of radioactivity in the pore water during the incubation did not exceed 1.1 % of the amount applied and remained constant from day 7 to the end of the test. Therefore, the amount of radioactivity in the pore water was independent of the residue in the sediment.

Sediment: The amount of radioactivity in the sediment increased continuously during the incubation from 1.7 and 2.1 % to 39.7 and 46.4 %.

The results are based on nominal initial concentrations.

Table B. 9.2.6.2-1: Analytical measurements

Initial water concentrations [µg/L]	Time [d]	Measured concentrations										
		Water			Pore water			Sediment			Total	
		µg/L	µg	%	µg/L	µg	%	µg/kg	µg	%	µg	%
23.4	0	23.5	45.9	97.9	1.1	0.1	0.2				46	98.1
	7	13.5	25.7	54.8	5.0	0.5	1.1				26.2	55.9
	26	5.1	9.7	20.7	3.0	0.3	0.7				10	21.4
45.8	0	43.8	87.6	95.7							87.6	95.7
	26	10.4	20.8	22.7							20.8	22.7
94.8	0	97.8	190.8	100.6	3.9	0.3	0.2	12.6	3.1	1.7	194.2	102.4
	7	63.8	121.2	63.9	19.5	2.0	1.0	207.5	53.0	27.9	176.1	92.9
	26	23.4	43.9	23.2	11.7	1.3	0.7	295.1	75.4	39.7	120.6	63.6
199.5	0	326.4	652.8	163.6							652.8	163.6
	26	67.7	135.4	33.9							135.4	33.9
401.6	0	373.6	717.4	89.3	11.1	1.0	0.1	68	17.1	2.1	735.4	91.6
	7	305.7	596.2	74.2	102.6	9.2	1.1	799.4	205.3	25.6	810.67	100.9

	26	154.6 167.2	296.9 321.1	37 40	72.1	8.1	1.0	1474	372.9	46.4	677.9 702.1	84.4 87.4

Biological effects: There were no indications on different sensitivities of sexes at all test concentrations, therefore male and female results were pooled for statistical analyses. Effects on the emergence rate and development rate are presented in Table B. 9.2.6.2-2.

Table B. 9.2.6.2-3: Emergence of *Chironomus riparius*

Nominal concentrations [µg/L]	Number of emerged			Emergence [%]	Emergence rate[a]	Development rate ± SD
	Female	Male	Total			
Control	43	50	93	93	0.93	0.070 ± 0.0025
Solvent control	54	41	95	95	0.95	0.070 ±0.0012
25	42	48	90	90	0.9	0.069 ± 0.0008
50	51	44	95	95	0.95	0.069 ± 0.0013
100	51	42	93	93	0.93	0.069 ± 0.0006
200	49	45	94	94	0.94	0.068 ± 0.0022
400	44	38	82	82	0.82	0.066 ± 0.0056*
					NOEC = 200 µg a.s./L	NOEC = 200 µg a.s./L

* Statistically significant compared to the control ($p < 0.05$)

[a] emergence rate was reduced but not statistically significant

Conclusion: The NOEC for emergence was determined at 200 µg a.s./L and for development 200 µg a.s./L. The toxicity endpoints are based on nominal initial concentrations.

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guidelines, the OECD (219, 2004):

- the emergence in the control must be at least 70 % at the end of the test,
- *C. riparius* and *C. yoshimatsui* emergence to adults from control vessels should occur between 12 and 23 days after their insertion into the vessels; for *C. tentans*, a period of 20 to 65 days is necessary,
- at the end of the test, pH and the dissolved oxygen concentration should be measured in each vessel. The oxygen concentration should be at least 60 per cent of the air saturation value at the temperature used, and the pH of overlying water should be in the 6 – 9 range in all test vessels;
- the water temperature should not differ by more than ± 1.0 °C.

All validity criteria were met.

In addition, the following points deviated from the test guideline or were not reported in detail:

- The artificial sediment contained 10 % peat, whereas the guideline recommends 4-5 % peat.

	The deviations to the test guideline are not considered to have an impact on the validity of the test **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Method: LSC LOQ: The limit of quantification (LOQ) = 0.88 µg/L LOD: The limit of detection (LOD) = 0.29 µg/L No information on the linearity, accuracy and precision is given in the study report. Method: HPLC/UV LOQ: The limit of quantification (LOQ) = 0.0003 mg/L (water) The limit of quantification (LOQ) = 0.0007 mg/L (pore water) The limit of quantification (LOQ) = 0.0011 mg/L (sediment) LOD: The limit of detection (LOD) = 100 dpm No information on the linearity, accuracy and precision is given in the study report. **Endpoints:** The RMS agrees on the endpoints given in the study report. NOEC = 200 µg/L (emergence and development) The endpoint is based on nominal concentrations. **Conclusion of the RMS:** Based on the evaluation of the study the chronic reproduction test is considered valid.

B.9.2.7. Effects on algal growth

Active substance:

Reference:	**Effect to *Selenastrum capricornutum* (Green alga) in an Algal Assay Bottle Test (method EPA) Fenoxaprop-P-ethyl: substance, technical (Hoe 046360 00 ZC97 0002).**
Author(s), year:	Heusel, R., 1991a
Report/Doc. number:	CE90/093 / M-129715-03-1
Guideline(s):	OECD 201 (1984), EPA 540/9-86-134 (1986), EPA 600/9-78-018 (1978)
GLP:	Yes
Deviations:	None
Validity:	Not acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl tech., Identification code.: Hoe 046360 00 ZC97 0002, purity: 97.4%
Test species:	Green alga (*Raphidocelis subcapitata*, strain 61.81 SAG, formerly known as *Selenastrum capricornutum* and *Pseudokirchneriella subcapitata)*
Number of organisms:	3000 cells/mL; 6 replicates control and solvent group and 3replicates per treatment
Type of test, duration:	Static test, 120 hours
Applied concentrations:	
Nominal:	0 (control and solvent control), 0.056, 0.10, 0.18, 0.32, 0.56 and 1.0, mg a.s./L (project CE90/093-2) 0 (control and solvent control) 1.8, 3.2 and 5.6 mg a.s./L (project CE90/093-3)
Solvent:	Acetone (0.1 mL/L)
Test conditions:	
Water quality:	Algal nutrient medium (AAP-medium)
Temperature:	project CE90/093-2: 24.5 – 25 °C project CE90/093-3: 24.3 – 25.4 °C
pH:	project CE90/093-2: 7.4 – 8 project CE90/093-3: 7.4 – 8.3
Incubation:	Continuous illumination at ~ 4000 lux
Methods:	The test was conducted in 300 mL Erlenmeyer flasks, which were filled with 100 mL medium and closed with cotton stoppers.
Test parameters:	Samples were taken at test day 1, 2, 3, 4 and 5 to determine the cell densities with counting chambers and a microscope. Measurements of pH and temperature were made in 24 h intervals.
Analytical measurements:	The concentrations of the test substance were determined on days 0, 3 and 5 using high performance liquid chromatography.
Statistics:	The E_bC_{50} value with confidence intervals was calculated using one of three statistical techniques: binominal probability, moving average or probit analysis.
Findings:	
Analytical data:	Mean measured concentrations were in the range of 49 – 78 % of nominal concentrations over the whole test duration. Hence, all nominal values were reduced to 49 %.
Biological effects:	Biomass and growth rates are given in the following tables.

Table B. 9.2.7-1: Effects of technical Fenoxaprop-P-ethyl on the green algae *Selenastrum capricornutum* – project CE90/093-2

Fenoxaprop-P-ethyl [mg/L] (nominal)	Biomass		Growth rate	
	Area under the curve (0 - 120 h)	% inhibition relative to the control	Mean growth rate [h^{-1}] (0-120 h)	% inhibition relative to the control
Control	4744.4	-	0.05	-
Solvent control	4672.4	-	0.05	-
0.056	4766	-2.00	0.05	0.48

Fenoxaprop-P-ethyl [mg/L] (nominal)	Biomass		Growth rate	
	Area under the curve (0 - 120 h)	% inhibition relative to the control	Mean growth rate [h^{-1}] (0-120 h)	% inhibition relative to the control
0.1	4414	5.53	0.05	2.50
0.18	4056.4	13.18	0.05	3.87
0.32	3547.6	24.07	0.05	7.75
0.56	2994.8	35.90	0.05	11.24
1.0	2254	51.76	0.04	14.03

Table B. 9.2.7-2: Effects of technical Fenoxaprop-P-ethyl on the green algae *Selenastrum capricornutum* – project CE90/093-3

Fenoxaprop-P-ethyl [mg/L] (nominal)	Biomass		Growth rate	
	Area under the curve (0 - 120 h)	% inhibition relative to the control	Mean growth rate [h^{-1}] (0-120 h)	% inhibition relative to the control
Control	4902.8	-	0.05	-
Solvent control	4402	-	0.05	-
0.056	1081.2	75.44	0.04	24.96
0.1	426	90.32	0.03	42.43
0.18	142	96.77	0.02	57.22

Conclusion:

72 h E_bC_{50} = 0.54 mg a.s./L (95% C.I.: 0.49 – 0.89 mg a.s./L)
120 h E_bC_{50} = 0.37 mg a.s./L (95% C.I.: 0.37 – 0.38 mg a.s./L)
120 h NOEC = 0.05 mg a.s./L

The toxicity endpoints are based on mean measured concentrations.

Reference:	**Validity check for green algae (*Selenastrum capricornutum*) study with Fenoxaprop-P-ethyl (M-129715-03-1, R. Heusel, 1991)**
Author(s), year:	Hager, J., 2016c
Report/Doc. number:	M-553077-01-1

Validity Check:

CE90/093-2

- In this project part of the study the biomass in the control increased by a factor of 131 over 72 h test period (guideline criteria = 16)
- The mean coefficient of variation for section-by-section specific growth rates in the control cultures must not exceed 35%. For this project part of the study, the observed value is 20.3
- The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7%. For this project part of the study, the observed value is 0.87.

CE90/093-3

- In this project part of the study the biomass in the control increased by a factor of 88 over 72 h test period (guideline criteria = 16)
- The mean coefficient of variation for section-by-section specific growth rates in the control cultures must not exceed 35%. For this project part of the study, the observed value is 82.9
- The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7%. For this project part of the study, the observed value is 1.83.

Conclusion: In the project part CE90/093-2 all current validity criteria are met. However in the project part CE90/093-3, the mean coefficient of variation for section-by-section specific growth rates in the control cultures exceeded the limit of 35%. Thus this study does not meet all three validity criteria according to current OECD TG 201 (adopted March 2006, Annex 5 corrected July 2011).

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011).

- The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day.

- The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%.

- The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*.

One validity criterion was not met in the project CE90/093-3; the coefficient of variation for the section by section specific growth rates in the control and solvent control was 82.9 %.

The other validity criteria are met.

In addition, the following points deviated from the test guideline or were not reported in detail:

- The initial biomass concentration used (3 x 10^3 cells/mL) was lower than recommended according to the OECD test guideline (5 x 10^3 - 10^4 cells/mL).

- No information on morphological changes of the algae is given in the study report.

The deviations to the test guideline are not considered to have an impact on the validity of the test.

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document

	SANCO/3029/99 rev. 4. Method: HPLC/UV No information on the linearity, accuracy, precision, the limit of quantification and detection is given in the study report. **Endpoints:** The study is not considered valid; hence no endpoint was determined by the RMS. **Conclusion of the RMS:** Based on the evaluation the algae test is not considered valid.

Reference: Fischer, R. (1986a): The Effect of Hoe 046360 - substance, technical Identification code Hoe 046360 OH ZC96 0002 to *Scenedesmus subspicatus* CHODAT (Green alga) in a Growth Inhibition Test (5s39/d + 5s39/e, method OECD). Report No. OEK86/043E

Sowig, P. (2002a): Recalculation of biological endpoints from the study Fischer (1986a)

Test guideline: OECD 201

GLP: yes

Test item: Fenoxaprop-P-ethyl, techn.: 95.6 % w/w sum of (D+) and (L-)-enantiomers, batch no.: not stated

Material and methods:

The effects of Fenoxaprop-P-ethyl on the growth of the unicellular green alga *Scenedesmus subspicatus* were assessed in a growth inhibition test. The algal cultures (1 x 10^4 cells/ml) were exposed in two trials to nominal concentrations ranging from 0.0056 to 5.6 mg/L (three replicates per treatment), dilution control and solvent (acetone) control (six replicates each). The test samples were incubated for up to 72 hours under static conditions at temperatures from 25.8 ± 0.18 °C, pH 8.0 ± 0.5 and continuous illumination. Cell densities were determined by cell counts (5 x 1 mm^2 x 0.1 mm in a counting chamber) under microscope. The (re-)calculation of biological endpoints was done using the computer program toxcal.exe for the EC_{50} and SAS for the NOEC (Sowig, 2002a).

Findings:

Chemical analysis of test concentrations was not performed, therefore the calculation of biological endpoints is based on nominal concentrations.

No significant growth inhibition was found in treatments up to 0.32 mg/L. The NOEC was estimated be 0.32 mg/L and the 72 h E_rC_{50} and E_bC_{50} were calculated to be 0.664 mg/L (95% CL 0.56 – 0.32 mg/L) and 0.516 mg/L (95% CL 0.32 – 0.56 mg/L).

Conclusion: 72 hour E_bC_{50}: 0.52 mg/L, E_rC_{50}: 0.66 mg/L, NOEC: 0.32 mg/L based on nominal concentrations

Comment (RMS): The concentration of test substance in test media was not measured , therefore study considered not acceptable.

Comment RMS:	This study was considered not acceptable at the first approval of the active substance. The study summary from the DAR is included in the RAR as additional information.

Reference:	**Toxicity of Fenoxaprop-P-ethyl, technical to *Pseudokirchneriella subcapitata* in an algal Growth Inhibition Test**
Author(s), year:	Meister-Werner, A., Wydra, V., 2009
Report/Doc. number:	272 FPE / M-548267-01-1
Guideline(s):	OECD 201 (2006)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn, CAS no.: 71283-80-2, batch no.: 660-PSH-36, purity: 98.4 %
Test species:	Green alga (*Raphidocelis subcapitata*, strain 61.81 SAG, formerly known as *Selenastrum capricornutum* and *Pseudokirchneriella subcapitata)*
Number of organisms:	5000 cells/mL; 6 replicates per control and 3replicates per treatment
Type of test, duration:	Static, 72 hours
Applied concentrations:	
Nominal:	0 (control and solvent control), 0.06, 0.11, 0.23, 0.45 and 0.9 mg/L
Solvent:	DMF (0.1 mL/L)
Test conditions:	
Water quality:	Algal nutrient medium (OECD-medium)
Temperature:	23 – 24 °C
pH:	8.1 – 10.3
Incubation:	Continuous illumination 5880 to 6440 lux
Methods:	The test was conducted in 50 mL Erlenmeyer flasks, which were filled with 50 mL medium.
Test parameters:	Samples were taken daily to determine the cell densities by spectrophotometric measurement. Measurement of pH was made at test initiation and test termination. Furthermore, water temperature was monitored daily in a surrogate water filled vessel.
Analytical measurements:	The concentrations of Fenoxaprop-P-ethyl and FOP-acid were determined for the control, solvent control, 0.45 mg/L and 0.9 mg/L treatment at test initiation and test termination using high performance liquid chromatography.
Statistics:	The $E_{y/r}C_x$ values with confidence intervals were calculated using probit analysis.
Findings:	
Analytical data:	At the start of the test 62 % of the nominal concentrations of Fenoxaprop-P-ethyl were found (average of the nominal test concentrations of 0.45 and 0.9 mg/L). At the end of the test after 72 hours all values for Fenoxaprop-P-ethyl were below the limit of quantification. These results clearly demonstrate that Fenoxaprop-P-ethyl was not stable under the conditions of the test. The concentration of FOP-acid, the

hydrolysis product of Fenoxaprop-P-ethyl, was below the limit of detection at the start of the test. After 72 hours test duration the measured concentrations of FOP-acid appear to correspond to the nominal exposure concentrations of Fenoxaprop-P-ethyl (95 % of the nominal test concentration of Fenoxaprop-P-ethyl was found as its hydrolysis product FOP-acid). Thus, it can be concluded that the built-up of FOP-acid during the test, was caused by the hydrolysis of Fenoxaprop-P-ethyl. The measurement of Fenoxaprop-P-ethyl and its hydrolysis product clearly indicate correct dosing of the test item at the test start. Thus, all reported results are expressed in terms of the nominal concentrations of the test item.

Table B. 9.2.7-3: Analytical measurements of Fenoxaprop-P-ethyl and FOP-acid

Nominal concentrations [mg/L]	Fenoxaprop-P-ethyl			FOP-acid		
	Measured concentrations [mg/L]		% of nominal concentrations	Measured concentrations [mg/L]		% of nominal concentrations
	0 hours	72 hours		0 hours	72 hours	
Control	< 0.0165	< 0.0165	-	< 0.0165	< 0.0165	-
Solvent control	< 0.0165	< 0.0165	-	< 0.0165	< 0.0165	-
0.45	0.254	< 0.0165	57	< 0.0203	0.438	98
0.9	0.603	< 0.1	67	< 0.0203	0.835	93

Limit of Quantification (LOQ) = 0.1 mg/L

Limit of Determination (LOD) = 0.0165 mg/L (Fenoxaprop-P-ethyl) and 0.0203 mg/L (FOP-acid)

Biological effects: Microscopic observation did not show any difference between the algae that had been growing up to a nominal test concentration of 0.9 mg/L and the algal cells in the control.

Yield and growth rates are given in the following table.

Table B. 9.2.7-4: Effects of Fenoxaprop-P-ethyl on the green algae *Pseudokirchneriella subcapitata*

Nominal concentrations [mg/L]	Yield		Growth rate	
	Yield [10 000 cells/mL]	% inhibition relative to the control	Mean growth rate [d^{-1}]	% inhibition relative to the control
Control	114.717	-	1.813	-
0.06	112.013	2.4	1.805	0.4
0.11	118.321	-3.1	1.823	-0.5
0.23	114.548	0.1	1.813	0.0
0.45	115.255	-0.5	1.815	-0.1
0.9	101.371	11.6*	1.771	2.3*

* Statistical significant different compared to the control

Validity criteria: The cell number in the control cultures increased by a factor of 233 within the test period of 72 h.

The coefficient of variation of the section by section specific growth rates in the control was 26.3 %.

	The coefficient of variation of average specific growth rates during the whole test period in the control was 0.4 %.
Conclusion:	72 h E_yC_{50} > 0.9 mg/L (95% C.I.: n.d. – n.d.) 72 h E_yC_{10} = 0.863 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{50} > 0.9 mg/L (95% C.I.: > 0.9 mg/L) 72 h E_rC_{10} > 0.9 mg/L (95% C.I.: > 0.9 mg/L) 72 h NOEC = 0.45 mg/L (yield and growth rate) The toxicity endpoints are based on nominal concentrations.
Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011). - The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day. - The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%. - The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 201 (2011). In addition, the following points deviated from the test guideline or were not reported in detail: - According to the OECD guideline analysis of all test concentrations at the beginning and at the end of the test is recommended where concentrations are unlikely to remain within 80-120 % of nominal. Fenoxaprop-P-ethyl is hydrolysed rapidly to the metabolite Fenoxaprop-P-acid therefore all test concentrations should have been analysed. In the study the test substance was verified in two test concentrations. The deviation to the test guideline is not considered to have an impact on the validity of the test but on the reliability of the endpoints. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based on the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.05 mg/L) mentioned. **Endpoints:**

	The study author determined the endpoints based on nominal concentrations. The RMS does not agree on this approach as the test concentrations didn´t remain within ± 20 % of the nominal concentrations. The endpoints should have been expressed on mean measured concentrations. The RMS conducted a re-evaluation based on mean measured concentrations of Fenoxaprop-P-ethyl and the metabolite Fenoxaprop-P-acid. The following endpoints (based on mean measured concentrations) were calculated. 72 h E_yC_{50} > 0.71 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{50} > 0.71 mg/L (95% C.I.: n.d. – n.d.) 72 h NOEC = 0.33 mg/L (yield and growth rate) based on mean measured measured concentrations. **Conclusion of the RMS:** Based on the evaluation the algae test is considered valid. However, no reliable endpoint could be determined.

Reference:	**Fenoxaprop-P-ethyl Technical 88.1% w/w Code: AE F046360 00 1C97 0002 Effect to *Anabaena flos-aquae* (Blue-Green Alga) in a Growth Inhibition Test.**
Author(s), year:	Christ, M.T., Ruff, D.F., 1999a
Report/Doc. number:	BM98W518 / M-181468-01-1
Guideline(s):	OECD 201 (1989), EPA 540/9-86-134 (1986),
GLP:	Yes
Deviations:	None
Validity:	Not acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn, CAS no.: 66441-23-4, 82110-72-3, batch no.: 1+2/86, purity: 88.1. % w/w, 95.8 % w/w sum of (D+) and (L-)-enantiomers
Test species:	Blue-green alga (*Anabaena flos-aquae*, strain UTEX#1444)
Number of organisms:	10000 cells/mL; 6 replicates per control and treatment
Type of test, duration:	Static, 96 hours
Applied concentrations:	
Nominal:	0 (control and solvent control) and 10 mg/L
Solvent:	Acetone (0.1 mL/L)
Test conditions:	
Water quality:	Algal nutrient medium (AAP-medium)
Temperature:	23.6 – 26.7 °C
pH:	6.9 – 7.3

Dissolved oxygen: 7.5 – 8.2 mg/L
89 – 98 % saturation

Conductivity: 180 µmhos/cm

Incubation: Continuous illumination 2200 lux

Methods: The test was conducted in 250 mL Erlenmeyer flasks, which were filled with 100 mL medium.

Test parameters: Samples were taken daily to determine the cell densities with a hemacytometer and compound microscope.
Measurement of pH, temperature, dissolved oxygen and conductivity was made at test initiation and test termination. Furthermore, water temperature was monitored hourly in a surrogate water filled vessel.

Analytical measurements: The concentration of the test substance was determined at test initiation and test termination using high performance liquid chromatography.

Statistics: To assess treatment effects for homoscedastic and normally distributed data, a t-test means comparison procedure was used to determine if the exposure concentration exhibited a response significantly different than the pooled control group.

Findings:

Analytical data: All reported results are expressed in terms of the initial measured concentrations of the test item.

Table B. 9.2.7-5: Analytical measurements of Fenoxaprop-P-ethyl and FOP-acid

Nominal concentrations [mg/L]	Fenoxaprop-P-ethyl			FOP-acid		
	Measured concentrations [mg/L]			Measured concentrations [mg/L]		
	0 hours	48 hours	96 hours	0 hours	48 hours	96 hours
Control	NF	NS	NF	NF	NS	NF
Solvent control	NF	NS	< 0.05	NF	NS	NF
10	0.7314	2.087	0.3106	NF	NF	0.5094

Limit of Quantification (LOQ) = 0.05 mg/L

NS = not sampled, NF = not found

Biological effects: Biomass and growth rates are given in the following table.

Table B. 9.2.7-6: Effects of Fenoxaprop-P-ethyl on the blue-green algae *Anabaena flos-aquae*

Initial measured concentrations [mg/L]	Biomass		Growth rate	
	Area under the curve [cells/mL]	% inhibition relative to the control	Mean growth rate [h^{-1}]	% inhibition relative to the control
Control	3850000	-	0.03	-
Solvent control	3910000	-	0.028	-
Pooled control	3880000	-	0.029	-
0.7314	2110000	46*	0.024	17

* Statistical significant different compared to the control

Conclusion:	72 h E_yC_{50} > 0.73 mg/L 72 h E_rC_{50} > 0.73 mg/L The toxicity endpoints are based on initial measured concentrations.
Comment RMS:	**Validity:** The study was conducted according to the OECD test guideline 201 (1989). The RMS conducted a statistical re-evaluation (ToxRat® Professional 3.1.0) of the study to address the validity criteria given in the OECD guideline 201 (2011). The validity criteria according to the OECD guideline 201 are the following: - The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day. - The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%. - The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. For other less frequently tested species, the value should not exceed 10%. In the study the growth rate was 0.701 per day, which corresponds to an increase of biomass by a factor of 6.4. In the study the mean coefficient of variation for section-by-section specific growth rates was 110.9 %. In the study the coefficient of variation of average specific growth rates was 40.6, which is higher than the required 10% for *Anabaena flos-aquae.* No validity criteria were met, hence the study is not considered valid. In addition, the following points deviated from the test guideline or were not reported in detail: - No information on morphological changes of the algae is given in the study report. The deviation to the test guideline is not considered to have an impact on the validity of the test **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Method: HPLC/UV Linearity: Calibration is based on single determination at 5 concentrations. The calibration function was linear within the range from 0.0025 – 0.05 of (± 20% of nominal concentration) with r^2 > 0.9998. Accuracy: 1 fortifications level (2 measurements): 10 mg/L. Mean recovery for

	each level: 101 % Precision: The relative standard deviation per fortification level: 1.9 LOQ: The limit of quantification (LOQ) = 0.05 mg/L. No information on the limit of detection is given in the study report. **Endpoints:** The study is not considered valid; hence, no endpoint was determined by the RMS. **Conclusion of the RMS:** Based on the evaluation the algae test is not considered valid.

Reference:	**Algal growth inhibition - *Navicula pelliculosa* Fenoxaprop-P-ethyl substance, technical**
Author(s), year:	Sowig, P., Weller, O., Gosch, H., 1999
Report/Doc. number:	CE98/107 / M-183542-01-1
Guideline(s):	OECD 201 (1984), EPA 540/9-86-134 (1982), EU directive 92/69/EWG C.3
GLP:	Yes
Deviations:	None
Validity:	Not acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn, purity: 88.1. % w/w, 95.8 % w/w sum of (D+) and (L-)-enantiomers
Test species:	Diatom (*Fistulifera pelliculosa*, strain 1050-3, formerly known as *Navicula pelliculosa*)
Number of organisms:	10000 cells/mL; 6 replicates per control and 3replicates per treatment
Type of test, duration:	Static, 96 hours
Applied concentrations:	
Nominal:	0 (control and solvent control) 1, 1.8, 3.2, 5.6 and 10 mg a.s./L
Solvent:	Acetone (0.1 mL/L)
Test conditions:	
Water quality:	Algal nutrient medium (AAP-medium)
Temperature:	24.1 – 25.1 °C
pH:	7.5 – 8.0
Dissolved oxygen:	7.5 – 8.8 mg/L
Conductivity:	118 µS/cm
Incubation:	Continuous illumination 60.2 – 70.8 $\mu E*m^{-2}*s^{-1}$
Methods:	The test was conducted in 300 mL Erlenmeyer flasks, which were filled with 100 mL medium.
Test parameters:	Samples were taken daily to determine the cell densities with counting chambers and a microscope.

Measurement of pH, temperature and dissolved oxygen was made daily.

Analytical measurements: The concentration of the test substance was determined at test initiation and test termination using high performance liquid chromatography.

Statistics: The $E_{b/r}C_x$ value with confidence intervals was calculated using one of three statistical techniques: binominal probability, moving average or probit analysis.

Findings:

Analytical data: Analysis of the test water resulted in test concentrations ranging from 61.1 – 104.8 %. All reported results are expressed in terms of the mean measured concentrations of the test item. The treatment levels were 0.71, 1.60, 2.70, 5.62 and 9.15 mg a.s./L.

Biological effects: Biomass and growth rates are given in the following tables.

Table B. 9.2.7-7: Effects of Fenoxaprop-P-ethyl on the diatom *Navicula pelliculosa* after 72 hours

Nominal concentrations [mg a.s./L]	Biomass		Growth rate	
	Area under the curve [10^4 cells/mL]	% inhibition relative to the control	Mean growth rate [h^{-1}]	% inhibition relative to the control
Control	196.4	3.35	0.02830	-1.83
Solvent control	203.2	0.00	0.02779	0.00
1	206.4	-1.57	0.03471	-24.89
1.8	178.4	12.20	0.02920	-5.07
3.2	86.4	57.48	0.01953	29.74*
5.6	93.6	53.94	0.02004	27.90*
10	22.4	88.98*	0.00759	72.68*

* Statistical significant different compared to the control

Table B. 9.2.7-8: Effects of Fenoxaprop-P-ethyl on the diatom *Navicula pelliculosa* after 96 hours

Nominal concentrations [mg a.s./L]	Biomass		Growth rate	
	Area under the curve [10^4 cells/mL]	% inhibition relative to the control	Mean growth rate [h^{-1}]	% inhibition relative to the control
Control	563.2	9.74	0.03241	1.75
Solvent control	624.0	0.00	0.03299	0.00
1	758.4	-21.54	0.03820	-15.80
1.8	632.0	-1.28	0.03447	-4.51
3.2	273.6	56.15*	0.02574	21.98*
5.6	247.2	60.38*	0.02388	27.60*
10	123.2	80.26*	0.02001	39.35*

* Statistical significant different compared to the control

Conclusion: 72 h E_bC_{50} = 2.38 mg a.s./L (95% C.I.: 1.70 – 2.53 mg a.s./L)

72 h E_rC_{50} = 4.26 mg a.s./L (95% C.I.: 2.90 – 6.31 mg a.s./L)

96 h E_bC_{50} = 2.46 mg a.s./L (95% C.I.: 1.70 – 2.53 mg a.s./L)

96 h E_rC_{50} > 6.31 mg a.s./L

The toxicity endpoints are based on mean measured concentrations.

Comment RMS:	**Validity:** The study was conducted according to the OECD test guideline 201 (1984). The RMS conducted a statistical re-evaluation (ToxRat® Professional 3.1.0) of the study to address the validity criteria given in the OECD guideline 201 (2011). The validity criteria according to the OECD guideline 201 are the following: - The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day. - The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%. - The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. For other less frequently tested species, the value should not exceed 10%. In the study the growth rate was 0.033 per day, which corresponds to an increase of biomass by a factor of 8. In the study the mean coefficient of variation for section-by-section specific growth rates was 100.7 %. In the study the coefficient of variation of average specific growth rates was 16.9, which is higher than the required 10% for *Navicula pelliculosa.* No validity criteria were met, hence the study is not considered valid. In addition, the following points deviated from the test guideline or were not reported in detail: - No information on morphological changes of the algae is given in the study report. The deviation to the test guideline is not considered to have an impact on the validity of the test **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Method: HPLC/UV Linearity: The calibration function was linear within the range from 0– 860 µg/L Accuracy: Mean recovery for each level: 94.6 % Precision: The relative standard deviation per fortification level: 1.4 %. LOQ: The limit of quantification (LOQ) = 0.13 mg/L. LOD: The limit of detection (LOD) = 0.08 mg/L. No information on the r^2 and the fortification level is given in the study report.

	Furthermore, it is not reported how much concentrations were considered for the calibration. **Endpoints:** The study is not considered valid; hence, no endpoint was determined by the RMS. **Conclusion of the RMS:** Based on the evaluation the algae test is not considered valid.

Reference:	**Fenoxaprop-P-ethyl Technical 88.1% w/w Code: AE F046360 00 1C97 0002 Effect to *Skeletonema costatum* (Marine Diatom) in a Growth Inhibition Test**
Author(s), year:	Young, B.M., Ruff, D.F., 1999b
Report/Doc. number:	BM98W516 / M-181464-01-1
Guideline(s):	OECD 201 (1989), EPA 540/9-86-134 (1986)
GLP:	Yes
Deviations:	None
Validity:	Not acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn, batch no.: 1+2/86, purity: 88.1. % w/w, 95.8 % w/w sum of (D+) and (L-)-enantiomers
Test species:	Diatom (*Skeletonema costatum*, strain CCMP1332)
Number of organisms:	10000 cells/mL; 6 replicates per control and 3replicates per treatment
Type of test, duration:	Static, 96 hours
Applied concentrations:	
Nominal:	0 (control and solvent control) 0.19, 0.38, 0.75, 1.5 and 3.0 mg a.s./L
Solvent:	Acetone (0.1 mL/L)
Test conditions:	
Water quality:	Algal nutrient medium (MAA-medium)
Temperature:	19.9 – 21.8 °C
pH:	7.9 – 9.1
Dissolved oxygen:	6.9 – 9.6 mg/L 94 – 127 % saturation
Salinity:	29 – 30 ‰
Incubation:	14:10 light:dark photoperiod, 4400 lux
Methods:	The test was conducted in 250 mL Erlenmeyer flasks, which were filled with 100 mL medium.
Test parameters:	Samples were taken daily to determine the cell densities with a hemacytometer and compound microscope. Measurements of pH, temperature and dissolved oxygen were made at test initiation and test termination. In addition, the temperature was monitored

continuously in a surrogate vessel.

Analytical measurements: The concentration of the test substance was determined at test initiation and test termination using high performance liquid chromatography.

Statistics: The $E_{b/r}C_x$ value with confidence intervals was calculated using computer methods. Since growth data at 72 and 96 hours had less than 50 % inhibition at all concentrations, EC_{50} values could not be calculated for this study.

Findings:

Analytical data: The mean measured concentrations were in the range of 97 – 107 % of the nominal concentrations. All toxicity values were calculated based on measured concentrations at study initiation.

Table B. 9.2.7-9: Analytical measurements of AE F046360 and AE F088406

Nominal concentrations [mg a.s./L]	Measured concentrations [mg/L]						% of nominal concentrations
	AE F046360		AE F088406		AE F088406 converted to AE F046360	Mean	
	0 h	96 h	0 h	96 h			
Control	NF	NF	NF	NF	-	-	-
Solvent control	NF	NF	NF	NF	-	-	-
0.19	0.2124	NF	NF	0.1701	0.1849	0.1986	105
0.38	0.3804	NF	NF	0.3332	0.3622	0.3713	98
0.75	0.8230	NF	NF	0.6541	0.7110	0.7670	102
1.5	1.843	NF	NF	1.253	1.362	1.6025	107
3.0	3.661	NF	NF	2.013	2.188	2.96245	97

NF = not found

Biological effects: Biomass and growth rates are given in the following table.

Table B. 9.2.7-10: Effects of Fenoxaprop-P-ethyl on the diatom *Skeletonema costatum* after 96 hours

Initial measured concentrations [mg a.s./L]	Biomass		Growth rate	
	Area under the curve [cells/mL]	% inhibition relative to the control	Mean growth rate [h^{-1}]	% inhibition relative to the control
Control	17500000	-	0.041	-
Solvent control	17200000	-	0.041	-
Pooled control	17300000	-	0.041	-
0.21	16700000	4	0.04	2
0.38	16500000	5	0.04	2
0.82	14000000	19*	0.04	4*
1.8	11600000	33*	0.038	7*
3.7	11400000	34*	0.038	7*

* Statistical significant different compared to the control

Conclusion: 72 h E_bC_{50} > 3.7 mg a.s./L

72 h E_rC_{50} > 3.7 mg a.s./L

96 h E_bC_{50} > 3.7 mg a.s./L

96 h E_rC_{50} > 3.7 mg a.s./L

The toxicity endpoints are based on initial measured concentrations.

Reference:	**Validity check for marine diatom (*Skeletonema costatum*) study with Fenoxaprop-P-ethyl (M-181464-01-1, Young& Ruff, 1999)**
Author(s), year:	Hager, J., 2016d
Report/Doc. number:	M-553073-01-1

Validity Check:

- The biomass in the control increased by a factor of 31 over 72 h test period (guideline criteria = 16)
- The mean coefficient of variation for section-by-section specific growth rates in the control cultures must not exceed 35%. For this study, the observed value is 38 %.
- The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 10 %. For this study, the observed value is 2.24 %.

Conclusion: In this study the mean coefficient of variation for section-by-section specific growth rates in the control cultures exceeded the limit of 35%. Thus this study does not meet all three validity criteria according to current OECD TG 201 (adopted March 2006, Annex 5 corrected July 2011).

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011).

- The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day.

- The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%.

- The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. For other less frequently tested species, the value should not exceed 10%.

One validity criteria were not met; the mean coefficient of variation for the section-by-section growth rates was 38 %.

The other validity criteria were met.

In addition, the following points deviated from the test guideline or were not reported in detail:

	- No information on morphological changes of the algae is given in the study report. The deviation to the test guideline is not considered to have an impact on the validity of the test **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Method: HPLC/UV Linearity: Calibration is based on single determination at 5 concentrations. The calibration function was linear within the range from 0.005 – 0.1 µg/mL with r^2 = 1.0. Accuracy: 2 fortifications levels (each 2 measurements): 0.10 and 5.0 mg/L. Mean recoveries for each level: 101.8 and 98.95 % Precision: The relative standard deviation per fortification level: 0.3 and 6.8 % LOQ: The limit of quantification (LOQ) = 0.05 mg/L. No information on the limit of detection is given in the study report. **Endpoints:** The study is not considered valid; hence no endpoint was determined by the RMS. **Conclusion of the RMS:** Based on the evaluation the algae test is not considered valid.

Reference:	**Fenoxaprop-P-ethyl Toxicity to *Skeletonema costatum* (Marine Algae) in a 96-hour algal Growth Inhibition Test**
Author(s), year:	Seyfried, B., 2008
Report/Doc. number:	248FPE / M-548169-01-1
Guideline(s):	OECD 201 (2006), ISO 10253 (1995)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn, batch no.: 660-PSH-36, purity: 98.4. %
Test species:	Diatom (*Skeletonema costatum*)
Number of organisms:	10000 cells/mL; 6 replicates for solvent control and 3replicates per treatment and control
Type of test, duration:	Static, 96 hours
Applied concentrations:	
Nominal:	0 (control and solvent control) 0.042, 0.090, 0.19, 0.42 and 0.90 mg a.s./L
Solvent:	DMF

Test conditions:

Water quality: Algal nutrient medium (F/2-medium)

Temperature: 20 – 21 °C

pH: 8.2 – 9.2

Incubation: Continuous illumination at 6490 – 7020 lux

Methods: The test was conducted in 125 mL Erlenmeyer flasks, which were filled with 50 mL medium.

Test parameters: Samples were taken daily to determine the biomass by fluorescence measurement. The shape and size of the algal cells were examined microscopically in these samples.

Measurement of pH was made at test initiation and test termination. In addition, the temperature was monitored continuously in a surrogate vessel.

Analytical measurements: The concentration of the test substance from the nominal test concentrations of 0.19 to 0.90 mg a.s./L was determined at test initiation and test termination using high performance liquid chromatography.

Statistics: The $E_{b/y/r}C_x$ values with confidence intervals were calculated by probit analysis.

Findings:

Analytical data: The measured concentrations of the test item in the test media of the nominal test concentrations of 0.19, 0.42 and 0.90 mg/L were 78, 81 and 63% of the nominal values at the start of the test. The metabolite FOP-acid was present at 0.19, 0.34 and 0.58 mg/L, corresponding to 110, 87 and 70% of the maximum expected concentrations of FOP-acid. All toxicity values were calculated based on nominal concentrations.

Table B. 9.2.7-11: Analytical measurements of Fenoxaprop-P-ethyl and FOP-acid

Nominal concentrations [mg/L]		Measured concentrations [mg/L]			
		Fenoxaprop-P-ethyl		FOP-acid	
FOP-P-ethyl	FOP-acid	0 h	96 h	0 h	96 h
Control		< 0.005	< 0.005	< 0.05	< 0.05
0.19	0.18	0.149	< 0.005	< 0.05	0.192
0.42	0.39	0.339	< 0.005	< 0.05	0.339
0.90	0.83	0.564	< 0.005	< 0.05	0.584

Limit of Quantification (LOQ) = 0.005 mg Fenoxaprop-P-ethyl/L, 0.05 mg FOP-acid/L

n.a. = not applicable

Biological effects: The microscopic examination of the algal cells at the end of the test showed no difference between the algae growing at the nominal test concentration of 0.90 mg a.s./L and the algal cells in the solvent control. The shape and the size of the algal cells were obviously not affected by the test item up to at least this concentration.

Biomass and growth rates are given in the following table.

Table B. 9.2.7-12: Effects of Fenoxaprop-P-ethyl on the diatom *Skeletonema costatum* after 96 hours

Nominal concentrations [mg/L]	Yield		Growth rate		Biomass	
	Yield [10 000 cells/mL]	% inhibition relative to the control	Mean growth rate [d^{-1}]	% inhibition relative to the control	Area under the curve	% inhibition relative to the control
Solvent control	252.2	0.0	1.43	0.0	261.12	0.0
Control	251.5	0.3	1.43	0.0	255.08	2.3
0.042	255.4	-1.3	1.43	-0.2	255.07	2.3
0.090	251.1	0.4	1.43	0.1	258.20	1.1
0.19	244.9	2.9	1.42	0.5	246.35	5.7
0.42	222.9	11.6*	1.40*	2.1*	218.58*	16.3*
0.90	200.3	20.6*	1.37*	4.0*	186.17*	28.7*

* Statistical significant different compared to the control

Validity: In the solvent control the biomass increased by a factor of 133 over 72 hours.

Conclusion: 72 h E_yC_{50} = 1.5 mg a.s./L (95% C.I.: 1.0 – 3.8 mg a.s./L)

72 h E_yC_{20} = 0.44 mg a.s./L (95% C.I.: 0.28 – 0.58 mg a.s./L)

72 h E_yC_{10} = 0.23 mg a.s./L (95% C.I.: 0.092 – 0.34 mg a.s./L)

72 h E_bC_{50} = 1.6 mg a.s./L (95% C.I.: 1.1 – 4.4 mg a.s./L)

72 h E_bC_{20} = 0.40 mg a.s./L (95% C.I.: 0.25 – 0.54 mg a.s./L)

72 h E_bC_{10} = 0.19 mg a.s./L (95% C.I.: 0.072 – 0.29 mg a.s./L)

72 h E_rC_{50} = 12 mg a.s./L (95% C.I.: 5.2 – 84 mg a.s./L)

72 h E_rC_{20} = 2.3 mg a.s./L (95% C.I.: 1.6 – 5.5 mg a.s./L)

72 h E_rC_{10} = 0.99 mg a.s./L (95% C.I.: 0.81 – 1.4 mg a.s./L)

72 h NOEC = 0.19 mg a.s./L (yield, biomass and growth rate)

96 h E_yC_{50} = 3.3 mg a.s./L (95% C.I.: 2.1 – 8.0 mg a.s./L)

96 h E_yC_{20} = 0.85 mg a.s./L (95% C.I.: 0.71 – 1.1 mg a.s./L)

96 h E_yC_{10} = 0.42 mg a.s./L (95% C.I.: 0.30 – 0.51 mg a.s./L)

96 h E_bC_{50} = 2.2 mg a.s./L (95% C.I.: 1.6 – 3.8 mg a.s./L)

96 h E_bC_{20} = 0.57 mg a.s./L (95% C.I.: 0.47 – 0.67 mg a.s./L)

96 h E_bC_{10} = 0.28 mg a.s./L (95% C.I.: 0.19 – 0.35 mg a.s./L)

96 h E_rC_{50} = 41 mg a.s./L (95% C.I.: 14 – 411 mg a.s./L)

96 h E_rC_{20} = 6.5 mg a.s./L (95% C.I.: 3.6 – 23 mg a.s./L)

96 h E_rC_{10} = 2.5 mg a.s./L (95% C.I.: 1.7 – 5.1 mg a.s./L)

96 h NOEC = 0.19 mg a.s./L (yield, biomass and growth rate)

The toxicity endpoints are based on nominal concentrations.

Reference:	**Validity check for marine diatom (*Skeletonema costatum*) study with Fenoxaprop-P-ethyl (M-548169-01-1, Seyfried, 2008)**
Author(s), year:	Hager, J., 2016e
Report/Doc. number:	M-553070-01-1
Validity:	Acceptable

Validity Check:

- The biomass in the control increased by a factor of 139 over 72 h test period (guideline criteria = 16)
- The mean coefficient of variation for section-by-section specific growth rates in the control cultures must not exceed 35%. For this study, the observed value is 15.3 %.
- The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 10 %. For this study, the observed value is 0.8 %.

Conclusion: The study meets all three validity criteria according to current OECD TG 201 (adopted March 2006, Annex 5 corrected July 2011).

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011).

- The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day.

- The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%.

- The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. For other less frequently tested species, the value should not exceed 10%.

All validity criteria are met, hence the study is considered acceptable.

In addition, the following points deviated from the test guideline or were not reported in detail:

- According to the OECD guideline analysis of all test concentrations at the beginning and at the end of the test is recommended where concentrations are unlikely to remain within 80-120 % of nominal. Fenoxaprop-P-ethyl is hydrolysed rapidly to the metabolite Fenoxaprop-P-acid therefore all test concentrations should have been analysed. In the study the test substance was verified in three test concentrations.The lowest test concentration was below LOQ at the beginning and

	end of the test. The deviation to the test guideline is not considered to have an impact on the validity of the test but on the reliability of the endpoints. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.194 mg/L for Fenoxaprop-P-ethyl and 0.172 mg/L for Fenoxaprop acid) mentioned. **Endpoints:** The study author determined the endpoints based on nominal concentrations. The RMS does not agree on this approach as the test concentrations didn´t remain within ± 20 % of the nominal concentrations. The endpoints should have been expressed on mean measured concentrations. However, only three out of five test concentrations were analytically verified. Taking into account the available information on analytival measurements, no reliable endpoint based on mean measured concentrations could be calculated by the RMS. **Conclusion of the RMS:** Based on the evaluation of the study the algae toxicity test is considered valid. However, no reliable endpoint could be determined.

Reference:	**Toxicity of Fenoxaprop-P-ethyl, technical to *Navicula pelliculosa* in an Algal Growth Inhibition Test**
Author(s), year:	Meister-Werner, A., Wydra, V., 2008
Report/Doc. number:	269FPE / M-548208-01-1
Guideline(s):	OECD 201 (2006)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn, batch no.: 660-PSH-36, purity: 98.4. %
Test species:	Diatom (*Fistulifera pelliculosa*, strain UTEX B 664, formerly known as *Navicula pelliculosa*)
Number of organisms:	10000 cells/mL; 6 replicates per controls and 3 replicates per treatment
Type of test, duration:	Static, 72 hours

Applied concentrations:

Nominal:	0 (control and solvent control) 0.06, 0.11, 0.23, 0.45 and 0.9 mg/L
Solvent:	DMF (0.1 mL/L)

Test conditions:

Water quality: Algal nutrient medium (AAP-medium)

Temperature: 23 °C

pH: 7.5 – 8.8

Incubation: Continuous illumination 7340 – 7720 lux

Methods: The test was conducted in 50 mL Erlenmeyer flasks, which were filled with 50 mL medium.

Test parameters: Samples were taken daily to determine the cell densities by spectrophotometrical measurement. A microscopic examination of the shape of the algal cells after 72 hours was performed for the highest test concentration of 0.9 mg/L.

Measurement of pH was made at test initiation and test termination. In addition, the temperature was monitored continuously in a surrogate vessel.

Analytical measurements: The concentration of the test substance was determined at test initiation and test termination using high performance liquid chromatography.

Statistics: The $E_{y/r}C_x$ value with confidence intervals was calculated by probit analysis.

Findings:

Analytical data: The measured concentrations of Fenoxaprop-P-ethyl in the test media were between 72 – 93 % of the nominal values. The metabolite FOP-acid was present between 72 – 89 % of nominal. All toxicity values were calculated based on initial measured concentrations of Fenoxaprop-P-ethyl which are 0.056, 0.095, 0.18, 0.32, 0.82 mg a.s./L.

Table B. 9.2.7-13: Analytical measurements of Fenoxaprop-P-ethyl and FOP-acid

Nominal concentrations [mg/L]	Fenoxaprop-P-ethyl			FOP-acid		
	Measured concentrations [mg/L]		% of nominal concentrations	Measured concentrations [mg/L]		% of nominal concentrations
	0 hours	72 hours		0 hours	72 hours	
Control	< LOD	< LOD	-	< LOD	< LOD	-
Solvent control	< LOD	< LOD	-	< LOD	< LOD	-
0.06	0.050 0.061	< LOD < LOD	93	< LOD < LOD	0.043 0.044	73
0.11	0.092 0.097	< LOD < LOD	86	< LOD < LOD	0.076 0.083	72
0.23	0.173 0.181	< LOD < LOD	77	< LOD < LOD	0.180 0.180	78
0.45	0.309 0.339	< LOD < LOD	72	< LOD < LOD	0.369 0.369	82
0.9	0.775 0.867		91	< LOD < LOD	0.793 0.810	89

Limit of Detection (LOD) = 0.015 mg/L

Limit of Quantification (LOQ) = 0.03 mg/L

Biological effects: The microscopic examination of the shape of the algal cells after 72 hours showed

no difference between the algae at a nominal test concentration of 0.9 mg/L.
Yield and growth rates are given in the following table.

Table B. 9.2.7-14: Effects of Fenoxaprop-P-ethyl on the diatom *Navicula pelliculosa*

Initial measured concentrations [mg/L]	Yield		Growth rate	
	Yield [10 000 cells/mL]	% inhibition relative to the control	Mean growth rate [d^{-1}]	% inhibition relative to the control
Pooled control	50.633	0.0	1.312	0.0
0.056	48.666	3.9	1.302	0.8
0.095	27.402	45.9*	1.114	15.1*
0.18	27.402	45.9*	1.113	15.2*
0.32	39.659	21.7*	1.233	6.0
0.82	23.839	52.9*	1.045	20.4*

* Statistical significant different compared to the control

Validity criteria: The cell number in the control cultures increased by a factor of 54.3 within the test period of 72 h.
The coefficient of variation of the section by section specific growth rates in the control was 14.4 %.
The coefficient of variation of average specific growth rates during the whole test period in the control was 3.7 %.

Conclusion: 72 h E_yC_{50} = 0.82 mg/L (95% C.I.: n.d. – n.d.)
72 h E_yC_{10} = 0.010 mg/L (95% C.I.: n.d. – n.d.)

72 h E_rC_{50} > 0.82 mg/L (95% C.I.: n.d. – n.d.)
72 h E_rC_{10} = 0.15 mg/L (95% C.I.: n.d. – n.d.)

72 h NOEC = 0.056 mg/L (yield and growth rate)

The toxicity endpoints are based on initial measured concentrations.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011).
- The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day.
- The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%.
- The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. For other less

	frequently tested species, the value should not exceed 10%. All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 201 (2011). **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.03 mg/L) mentioned. **Endpoints:** The study authors determined the endpoints based on initial measured concentrations. The RMS does not agree on this approach as the lowest test concentration was 78.4 % of initial concentration. The endpoints should have been expressed on mean measured concentrations. The RMS conducted a re-evaluation based on mean measured concentrations of Fenoxaprop-P-ethyl and the metabolite Fenoxaprop-P-acid. The following endpoints (based on mean measured concentrations) were calculated. 72 h E_yC_{50} > 0.811 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{50} > 0.811 mg/L (95% C.I.: n.d. – n.d.) 72 h NOEC = 0.049 mg/L (yield and growth rate) based on mean measured measured concentrations. **Conclusion of the RMS:** Based on the evaluation the algae test is considered valid.

Reference:	**Toxicity of Fenoxaprop-P-ethyl, technical to *Anabaena flos-aquae* in an Algal Growth Inhibition Test**
Author(s), year:	Pawlowski, S., Wydra, V., 2005
Report/Doc. number:	130FPE / M-548058-01-1
Guideline(s):	OECD 201 (1984), OECD 201 (2004), Commission Directive 92/69/EEC C.3 (1992)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn, batch no.: 660-PSH-45, purity: 95.6. % w/w
Test species:	Blue-green alga (*Anabaena flos-aquae*, strain UTEX#1444)
Number of organisms:	10000 cells/mL; 6 replicates per control and treatment

Type of test, duration: Static, 72 hours

Applied concentrations:

Nominal: 0 (control and solvent control) and 3.35 mg a.s./L

Solvent: DMF

Test conditions:

Water quality: Algal nutrient medium

Temperature: 23.0 °C

pH: 6.7

Incubation: Continuous illumination 6370 – 6750 lux

Methods: The test was conducted in 50 mL Erlenmeyer flasks, which were filled with 50 mL medium.

Test parameters: Samples were taken daily to determine the cell densities by spectrophotometrical measurement. The shape of the treated algal cells compared to the control was microscopically examined.

Measurement of pH was made at test initiation and test termination. Furthermore, water temperature was monitored daily in a surrogate water filled vessel.

Analytical measurements: The concentration of the test substance was determined at test initiation and test termination using high performance liquid chromatography.

Statistics: The $E_{b/r}C_x$ value with confidence intervals was calculated by probit analysis.

Findings:

Analytical data: At the test start the measured concentration was 1.806 mg/L and declined to a concentration of 0.49 mg/L. Only 50 % of the nominal concentration was found from the test start.

All reported results are expressed in terms of the mean measured concentrations of the test item.

Biological effects: The microscopic examination of the shape of the algal cells after 72 hours showed no difference between the algae at a nominal test concentration of 3.35 mg/L.

Biomass and growth rates are given in the following table.

Table B. 9.2.7-15: Effects of Fenoxaprop-P-ethyl on the blue-green algae *Anabaena flos-aquae,*

Mean measured concentrations [mg/L]	Biomass		Growth rate	
	Area under the curves	% inhibition relative to the control	Mean growth rate [d^{-1}]	% inhibition relative to the control
Control	39.906	0.0	1.253	0.0
Solvent control	38.637	3.2	1.252	0.1
1.15	39.297	1.5	1.238	1.2

* Statistical significant different compared to the control

Validity criteria: The cell number in the control cultures increased by a factor of 42.9 within the test period of 72 h.

The coefficient of variation of the section by section specific growth rates in the control was 28.2 %.

	The coefficient of variation of average specific growth rates during the whole test period in the control was 1.8 %.
Conclusion:	72 h E_bC_{50} > 1.15 mg/L (95% C.I.: n.d. – n.d.) 72 h E_bC_{10} > 1.15 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{50} > 1.15 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{10} >1.15 mg/L (95% C.I.: n.d. – n.d.) 72 h NOEC ≥ 1.15 mg/L (biomass and growth rate) The toxicity endpoints are based on mean measured concentrations.
Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011). - The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day. - The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%. - The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. For other less frequently tested species, the value should not exceed 10%. All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 201 (2011). **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.03 mg/L) mentioned. **Endpoints:** The RMS agrees on the endpoints given in the study report. However, the arithmetic mean was used instead of the geometric mean for the calculation of the mean measured concentration. The RMS conducted a re-calculation of the measured concentration. The following endpoints (based on geometric mean measured concentrations) were calculated. 72 h E_bC_{50} > 0.94 mg/L (95% C.I.: n.d. – n.d.) 72 h E_bC_{10} > 0.94 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{50} > 0.94 mg/L (95% C.I.: n.d. – n.d.)

	72 h E_rC_{10} > 0.94 mg/L (95% C.I.: n.d. – n.d.) The NOE_rC and NOE_yC were determined to be 0.94 mg a.s./L. **Conclusion of the RMS:** Based on the evaluation the algae test is considered valid.

Reference:	**Toxicity of Fenoxaprop-P-ethyl to the Blue Green Algae *Anabaena flos-aquae***
Author(s), year:	Banman, C.S., Howerton, J.H., Lam, C.V., 2011a
Report/Doc. number:	EBFPL010-1 / M-411455-02-1
Guideline(s):	OECD 201 (2006), US EPA OPPTS 850.5400 (1996), EPA 540/9-82-020 (1986)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl, batch no.: EFLC000572, purity: 97.5 % w/w
Test species:	Blue-green alga (*Anabaena flos-aquae*)
Number of organisms:	10000 cells/mL; 3 replicates per controls and treatment
Type of test, duration:	Static, 96 hours
Applied concentrations:	
Nominal:	0 (control and solvent control), 43.8, 87.5, 175, 350 and 700 µg a.s./L
Solvent:	Acetone (0.1 mL/L)
Test conditions:	
Water quality:	Algal nutrient medium (AAP medium)
Temperature:	23.8 – 24.0 °C
pH:	7.4 – 8.9
Conductivity:	93 – 102 µmhos/cm
Incubation:	Continuous illumination 2186 - 2443 lux
Methods:	The test was conducted in 250 mL Erlenmeyer flasks, which were filled with 100 mL medium.
Test parameters:	Samples were taken daily to determine the cell densities via light microscope and Hemacytometer slide. The shape of the treated algal cells compared to the control was microscopically examined. Measurement of pH and conductivity was made at Days 0, 3 and 4. Furthermore, water temperature was monitored hourly in a surrogate water filled vessel.
Analytical measurements:	The concentration of the test substance was determined at test initiation and test termination using high performance liquid chromatography.
Statistics:	The E_rC_{50} value with confidence intervals was calculated by logistic model or Bruce/Versteeg cumulative normal model using nonlinear (weighted) regression

analysis.

Findings:

Analytical data: The measured concentrations of Fenoxaprop-P-ethyl in the test media were between 71 to 92 % of the nominal values. Fenoxaprop-P was present between 47 to 63 % of nominal. All toxicity values were calculated based on geometric mean measured concentrations which are 28.9, 53.5, 116, 221 and 518 µg a.s./L.

Biological effects: No abnormal observation of the cells was noted.

Growth rates are given in the following table.

Table B. 9.2.7-16: Effects of Fenoxaprop-P-ethyl on the blue-green algae *Anabaena flos-aquae*

Mean measured concentrations [µg/L]	Growth rate			
	72 hours		96 hours	
	Mean growth rate [h^{-1}]	% inhibition relative to the control	Mean growth rate [h^{-1}]	% inhibition relative to the control
Control	0.064185	-	0.057396	-
Solvent control	0.062241	-	0.056575	-
Pooled controls	0.063213	-	0.056986	-
28.9	0.063145	0.1	0.058378	-2.4
53.5	0.061018	3.5	0.055874	2.0
116	0.062737	0.8	0.058390	-2.5
221	0.062620	0.9	0.057865	-1.5
518	0.061338	3.0	0.057210	-0.4

* Statistical significant different compared to the control

Validity criteria: The cell number in the control cultures increased by a factor of 96 within the test period of 72 h.

The coefficient of variation of the section by section specific growth rates in the control was 13 %.

The coefficient of variation of average specific growth rates during the whole test period in the control was 3.3 %.

Conclusion: 72 h E_rC_{50} > 518 µg/L (95% C.I.: n.d. – n.d.)

96 h E_rC_{50} > 518 µg/L (95% C.I.: n.d. – n.d.)

72 h NOEC = 518 µg a.s./L (growth rate)

96 h NOEC = 518 µg a.s./L (growth rate)

The toxicity endpoints are based on geometric mean measured concentrations.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011).

- The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific

	growth rate of 0.92/day. - The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%. - The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. For other less frequently tested species, the value should not exceed 10%. All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 201 (2011). In addition, the following points deviated from the test guideline or were not reported in detail: -3 replicates were used for the control and solvent control, whereas the guideline recommends 6 replicates. The deviation to the test guideline is not considered to have an impact on the validity of the test but on the reliability of the endpoint. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.008 mg/L for Fenoxaprop-P-ethyl and 0.00404 mg/L for Fenoxaprop-acid) mentioned. **Endpoints:** The RMS agrees on the endpoints given in the study report. 72 h E_rC_{50} > 518 µg/L (95% C.I.: n.d. – n.d.) 96 h E_rC_{50} > 518 µg/L (95% C.I.: n.d. – n.d.) 72 h NOEC = 518 µg a.s./L (growth rate) 96 h NOEC = 518 µg a.s./L (growth rate) based on geometric mean measured concentrations. **Conclusion of the RMS:** Based on the evaluation the algae test is considered valid.

Reference:	**Toxicity of Fenoxaprop-P-ethyl Technical to the Freshwater Diatom *Navicula pelliculosa***
Author(s), year:	Banman, C.S., Howerton, J.H., Lam, C.V., 2011b
Report/Doc. number:	EBFPL011 / M-411456-01-1
Guideline(s):	OECD 201 (2006), US EPA OPPTS 850.5400 (1996), EPA 540/9-82-020 (1986)
GLP:	Yes
Deviations:	None

Validity:	Not acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl, batch no.: EFLC000572, purity: 97.5 %
Test species:	Diatom (*Fistulifera pelliculosa*, formerly known as *Navicula pelliculosa*)
Number of organisms:	10000 cells/mL; 3 replicates per treatment and control
Type of test, duration:	Static, 96 hours

Applied concentrations:

Nominal:	0 (control and solvent control), 43.8, 87.5, 175, 350 and 700 µg/L
Solvent:	Acetone (0.1 mL/L)

Test conditions:

Water quality:	Algal nutrient medium (AAP-medium)
Temperature:	24.3 – 24.5 °C
pH:	7.4 – 9.5
Conductivity:	144 – 154 µmhos/cm
Incubation:	Continuous illumination 4070 - 4830 lux
Methods:	The test was conducted in 250 mL Erlenmeyer flasks, which were filled with 100 mL medium.
Test parameters:	Samples were taken daily to determine the cell densities via light microscope and Hemacytometer slide. The shape of the treated algal cells compared to the control was microscopically examined. Measurement of pH and conductivity was made at Days 0, 3 and 4. Furthermore, water temperature was monitored hourly in a surrogate water filled vessel
Analytical measurements:	The concentration of the test substance was determined at test initiation and test termination using high performance liquid chromatography.
Statistics:	The E_rC_{50} value with confidence intervals was calculated by logistic model or Bruce/Versteeg cumulative normal model using nonlinear (weighted) regression analysis.

Findings:

Analytical data:	At test initiation the measured concentrations of Fenoxaprop-P-ethyl in the test media were between 59 to 70 % of the nominal values. At the test termination Fenoxaprop-P was present between 23 to 65 % of nominal. All toxicity values were calculated based on geometric mean measured concentrations which are 16.2, 36.7, 92.4, 204 and 466 µg a.s./L.
Biological effects:	No abnormal observation of the cells was noted. Growth rates are given in the following table.

Table B. 9.2.7-17: Effects of Fenoxaprop-P-ethyl on the diatom *Navicula pelliculosa*

Nominal concentrations [µg/L]	Growth rate	
	72 hours	96 hours

	Mean growth rate [h^{-1}]	**% inhibition relative to the control**	**Mean growth rate [h^{-1}]**	**% inhibition relative to the control**
Control	0.050189	-	0.047818	-
Solvent control	0.050049	-	0.047689	-
Pooled controls	0.050119	-	0.047754	-
16.2	0.046496	7.2	0.047155	1.3
36.7	0.049068	2.1	0.048899	-2.4
92.4	0.041937	16.3*	0.046121	3.4
204	0.046619	7.0	0.049035	-2.7
466	0.04612	11.0	0.049945	-4.6

* Statistical significant different compared to the control

Validity criteria: The cell number in the control cultures increased by a factor of 38 within the test period of 72 h.

The coefficient of variation of the section by section specific growth rates in the control was 59 %.

The coefficient of variation of average specific growth rates during the whole test period in the control 5.4 %.

The validity criteria contained in OECD Guideline 201for section-by-section growth rates and average specific growth rates were derived using data from studies done with green algae species such as *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. These criteria can seldom be met with non-green algae and diatom species such as *Anabaena flos-aquae*, *Navicula pelliculosa*, and *Skeletonema costatum*. As such, it is inappropriate to use these criteria in evaluating the regulatory acceptability of studies conducted with non-green species.

Conclusion: 72 h E_rC_{50} > 466 µg/L (95% C.I.: n.d. – n.d.)

96 h E_rC_{50} > 466 µg/L (95% C.I.: n.d. – n.d.)

72 h NOEC = 466 µg a.s./L (growth rate)

96 h NOEC = 466 µg a.s./L (growth rate)

The toxicity endpoints are based on geometric mean measured concentrations

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011).

- The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day.
- The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed

	35%. - The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. For other less frequently tested species, the value should not exceed 10%. One validity criterion was not met; the mean coefficient of variation for the section-by-section growth rates was 59 %. The other validity criteria were met. In addition, the following points deviated from the test guideline or were not reported in detail: -3 replicates were used for the control and solvent control, whereas the guideline recommends 6 replicates. The deviation to the test guideline is not considered to have an impact on the validity of the test but on the reliability of the endpoint. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.008 mg/L for Fenoxaprop-P-ethyl and 0.00404 mg/L for Fenoxaprop-acid) mentioned. **Endpoints:** The study is not considered valid; hence no endpoint was determined by the RMS. In the study report it is stated that the validity criteria are inappropriate for studies conducted with non-green species. However, the RMS does not agree with this statement, as the OECD guideline can be used for freshwater alga and cyanobacteria. **Conclusion of the RMS:** Based on the evaluation the algae test is not considered valid.

Metabolites:

Reference:	**Effect to *Selenastrum capricornutum* (Green alga) in an Algal Assay Bottle Test (method EPA) Fenoxaprop-P, substance technical (Hoe 088406 00 ZC93 0001).**
Author(s), year:	Heusel, R., 1993b
Report/Doc. number:	CE92/003 / M-131203-01-1
Guideline(s):	OECD 201 (1984), EPA 540/9-86-134 (1986), EPA 600/9-78-018 (1978)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance: Fenoxaprop-P tech., Identification code.: Hoe 088406 00 ZC93 0001, purity: 95.6 %

Test species: Green alga (*Raphidocelis subcapitata*, strain 61.81 SAG, formerly known as *Selenastrum capricornutum* and *Pseudokirchneriella subcapitata)*

Number of organisms: 3000 cells/mL; 6 replicates per controls and 3replicates per treatment

Type of test, duration: Static test, 120 hours

Applied concentrations:

Nominal: 0 (control and solvent control), 1.0, 1.8, 3.2, 5.6, 10, 18, 32, 56 and 100, mg/L

Solvent: Acetone (0.1 mL/L)

Test conditions:

Water quality: Algal nutrient medium (AAP-medium)

Temperature: 25.0 – 25.6 °C

pH: 5.4 – 9.5

Incubation: Continuous illumination (180 ± 20 µE m^{-2} s^{-1})

Methods: The test was conducted in 300 mL Erlenmeyer flasks, which were filled with 100 mL medium and closed with cotton stoppers.

Test parameters: Samples were taken at test day 1, 2, 3, 4 and 5 to determine the cell densities with counting chambers and a microscope.
Measurements of pH and temperature were made daily.

Analytical measurements: The concentrations of the test substance from the nominal concentrations of 1.0, 10 and 100 mg/L were determined on days 0, 2 and 5 using high performance liquid chromatography.

Statistics: The E_bC_{50} value with confidence intervals was calculated using one of three statistical techniques: binominal probability, moving average or probit analysis.

Findings:

Analytical data: Mean measured concentrations were in the range of 76.2 – 92.7 % of nominal concentrations over the whole test duration. Hence, all concentrations were corrected by 76.2 % of the nominal value for reporting the summary and the results.

Biological effects: Biomass and growth rates are given in the following table.

Table B. 9.2.7-18: Effects of technical Fenoxaprop-P on the green algae *Selenastrum capricornutum*

Fenoxaprop-P-ethyl [mg/L] (nominal)	Biomass		Growth rate	
	Area under the curve (0 - 72 h)	% inhibition relative to the control	Mean growth rate [h^{-1}] (0-72 h)	% inhibition relative to the control
Control	574.4	-	0.067	-
Solvent control	555.6	3.2	0.067	0.05
1.0	558.0	2.8	0.067	0.05
1.8	553.2	3.7	0.066	0.72
3.2	586.0	-2.0	0.067	0.23

Fenoxaprop-P-ethyl [mg/L] (nominal)	Biomass		Growth rate	
	Area under the curve (0 - 72 h)	% inhibition relative to the control	Mean growth rate [h^{-1}] (0-72 h)	% inhibition relative to the control
5.6	554.8	3.4	0.066	0.87
10	554.0	3.5	0.067	-0.30
18	589.2	-2.6	0.067	-0.36
32	481.2	16.2*	0.064	4.17
56	172.4	69.9*	0.048	28.02
100	59.6	89.6*	0.031	53.43

Conclusion: 72 h E_bC_{50} = 35 mg/L (95% C.I.: 24.4 – 42.7 mg/L)
120 h E_bC_{50} = 34.2 mg/L (95% C.I.: 24.4 – 42.7 mg/L)
120 h NOEC = 13.7 mg/L
The toxicity endpoints are based on mean measured concentrations.

Reference:	**EC_{10}/EC_{20} calculation for algae study (M-131203-01-1, R. Heusel, 1993)**
Author(s), year:	Hager, J., 2016f
Report/Doc. number:	M-553680-01-1
Validity:	Acceptable

Validity Check:
- The biomass in the control increased by a factor of 123 over 72 h test period (guideline criteria = 16)
- The mean coefficient of variation for section-by-section specific growth rates in the control cultures must not exceed 35%. For this study, the observed value is 32.3.
- The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7%. For this study, the observed value is 1.

Conclusion: 72 h E_bC_{10} = 21.379 mg/L (95% C.I.: 19.212 – 23.193 mg/L)
72 h E_bC_{20} = 25.540 mg/L (95% C.I.: 23.594 – 25.806 mg/L)
72 h E_bC_{50} = 35.888 mg/L (95% C.I.: 34.305 – 37.531 mg/L)

72 h E_yC_{10} = 20.932 mg/L (95% C.I.: 19.507 – 22.182 mg/L)
72 h E_yC_{20} = 24.673 mg/L (95% C.I.: 23.396 – 25.806 mg/L)
72 h E_yC_{50} = 33.905 mg/L (95% C.I.: 32.716 – 34.905 mg/L)

72 h E_rC_{10} = 27.508 mg/L (95% C.I.: 25.256 – 29.560 mg/L)
72 h E_rC_{20} = 37.894 mg/L (95% C.I.: 35.807 – 39.803 mg/L)
72 h E_rC_{50} = 69.937 mg/L (95% C.I.: 67.249 – 73.018 mg/L)

72 h NOEC = 13.720 mg/L (yield and biomass)

The toxicity endpoints are based on mean measured concentrations.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011). - The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day. - The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%. - The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 201 (2011). In addition, the following points deviated from the test guideline or were not reported in detail: - The initial biomass concentration used (3 x 10^3 cells/mL) was lower than recommended according to the OECD test guideline (5 x 10^3 - 10^4 cells/mL). - No information on morphological changes of the algae is given in the study report. - The analytical verification of the test substance was only conducted in three test concentrations. The deviations to the test guideline are not considered to have an impact on the validity of the test. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Method: HPLC/UV No information on the linearity, accuracy, precision and the limit of quantification and detection are given in the study report. The information is not sufficient to evaluate the acceptability of the analytical methods according to the guidance documents SANCO/3029/99 rev. 4. **Endpoints:** The RMS agrees on the endpoints given in the study reports and the recalculation of the ECx values. However, it is noted that the arithmetic mean was used instead of the geometric mean for calculation of the mean measured concentrations. A correction of 75.4 % would be necessary instead of 76.2 %. The RMS conducted a re-calculation of the mean measured concentrations which are 0.754, 1.357, 2.413,

	4.222, 7.540, 13.572, 24.128, 42.224 and 75.401 mg/L. The RMS is of the opinion that a statistical re-evaluationn of the endpoints is not considered necessary, as the concentration variation is negligible. 72 h E_bC_{10} = 21.379 mg/L (95% C.I.: 19.212 – 23.193 mg/L) 72 h E_bC_{20} = 25.540 mg/L (95% C.I.: 23.594 – 25.806 mg/L) 72 h E_bC_{50} = 35.888 mg/L (95% C.I.: 34.305 – 37.531 mg/L) 72 h E_yC_{10} = 20.932 mg/L (95% C.I.: 19.507 – 22.182 mg/L) 72 h E_yC_{20} = 24.673 mg/L (95% C.I.: 23.396 – 25.806 mg/L) 72 h E_yC_{50} = 33.905 mg/L (95% C.I.: 32.716 – 34.905 mg/L) 72 h E_rC_{10} = 27.508 mg/L (95% C.I.: 25.256 – 29.560 mg/L) 72 h E_rC_{20} = 37.894 mg/L (95% C.I.: 35.807 – 39.803 mg/L) 72 h E_rC_{50} = 69.937 mg/L (95% C.I.: 67.249 – 73.018 mg/L) 72 h NOEC = 13.720 mg/L (yield and biomass) based on mean measured concentrations. **Conclusion of the RMS:** Based on the evaluation the algae test is considered valid.

Reference:	**Effect on *Pseudokirchneriella subcapitata* (green algae) in a Growth Inhibition Test AE F054014 Technical 99.7% w/w: Code AE F054014 00 1C99 0004**
Author(s), year:	Christ, M.T., Ruff, D.F., 1999b
Report/Doc. number:	BM98W523 / M-184954-01-1
Guideline(s):	OECD 201 (1989), EPA 540/9-86-134 (1986)
GLP:	Yes
Deviations:	None
Validity:	Not acceptable

Material and methods:

Test substance:	Chlorobenzoxazolone (AE F054014, techn.), batch no.: YPVII/119, purity: 99.7 %
Test species:	Green alga (*Raphidocelis subcapitata*, strain #1648, formerly known as *Selenastrum capricornutum* and *Pseudokirchneriella subcapitata)*
Number of organisms:	1.0 x 10^4 cells/mL; 6 replicates per controls and 3replicates per treatment
Type of test, duration:	Static test, 96 hours
Applied concentrations:	
Nominal:	0 (control and solvent control), 3.2, 6.3, 12.5, 25.0 and 50.0 mg/L
Solvent:	Acetone (0.1 mL/L)

Test conditions:

Water quality: Algal nutrient medium (AAP-medium)

Temperature: 23.3 – 25.6 °C

pH: 7.4 – 8.4

Dissolved oxygen: 7.6 – 9.4 mg/L
92 – 111 % air saturation

Conductivity: 170 – 180 µS/cm

Incubation: Continuous illumination ~ 4300 lux

Methods: The test was conducted in 250 mL Erlenmeyer flasks, which were filled with 100 mL medium.

Test parameters: Samples were taken daily to determine the cell densities with a hemacytometer and a microscope.
Measurements of pH, temperature, dissolved oxygen and conductivity were made at test initiation and test termination. Furthermore, water temperature was monitored continuously in a surrogate water filled vessel.

Analytical measurements: The concentrations of the test substance were determined on at test initiation and test termination using high performance liquid chromatography.

Statistics: The $E_{b/r}C_{50}$ values with confidence intervals were calculated using non-linear regression based on Bruce and Versteeg.

Findings:

Analytical data: Mean measured concentrations were in the range of 30 – 76 % of nominal concentrations. Hence, the results are based on mean measured concentrations.

Table B. 9.2.7-19: Analytical measurements of AE F054014

Nominal concentrations [mg/L]	Measured concentrations [mg/L]			% of nominal concentrations
	0 hours	96 hours	Mean	
Control	-	-	-	-
Solvent control	-	-	-	-
3.2	1.575	2.421	1.998	62
6.3	4.754	4.871	4.813	76
12.5	8.940	8.149	8.545	68
25	7.550	14.92	11.24	45
50	10.63	19.83	15.23	30

Biological effects: Biomass and growth rates are given in the following table.

Table B. 9.2.7-20: Effects of AE F054014 on the green algae *Selenastrum capricornutum*

Mean measured concentrations [mg/L]	Biomass		Growth rate	
	Area under the curve (0 - 96 h)	% inhibition relative to the control	Mean growth rate [h^{-1}] (0-96 h)	% inhibition relative to the control
Control	3.33×10^7	-	0.054	-
Solvent control	3.45×10^7	-	0.054	-

Mean measured concentrations [mg/L]	Biomass		Growth rate	
	Area under the curve (0 - 96 h)	% inhibition relative to the control	Mean growth rate [h^{-1}] (0-96 h)	% inhibition relative to the control
1.998	3.06×10^7	10	0.053	1
4.813	3.67×10^7	-8	0.055	-3
8.545	1.11×10^7*	67*	0.042*	22*
11.24	1.31×10^6*	96*	0.011*	80*
15.23	6.62×10^5*	98*	0.010*	81*

Conclusion:

72 h E_bC_{50} = 8.0 mg/L (95% C.I.: 6.6 – 9.6 mg/L)
96h E_bC_{50} = 7.5 mg/L (95% C.I.: 6.3 – 9.0 mg/L)

72 h E_rC_{50} = 9.9 mg/L (95% C.I.: 9.2 – 10.8 mg/L)
96h E_rC_{50} = 9.8 mg/L (95% C.I.: 8.8 – 10.8mg/L)

96 h NOEC = 4.8 mg/L (biomass and growth rate)
The toxicity endpoints are based on mean measured concentrations.

Reference: **EC_{10}/EC_{20} calculation for algae study (M-184954-01-1, Christ & Ruff, 1999b)**
Author(s), year: Hager, J., 2016g
Report/Doc. number: M-553485-01-1

Conclusion:

96 h E_yC_{10} = 6.527 mg/L (95% C.I.: 3.831 – 7.275 mg/L)
96 h E_yC_{20} = 6.972 mg/L (95% C.I.: 4.658 – 7.571 mg/L)

96 h E_rC_{10} = 7.726 mg/L (95% C.I.: 6.413 – 8.419 mg/L)
96 h E_rC_{20} = 8.378 mg/L (95% C.I.: 7.322 – 8.973 mg/L)

The toxicity endpoints are based on mean measured concentrations.

Reference: **Validity check for green algae (*Pseudokirchneriella subcapitata*) study with AE F054014 (M-184954-01-1, Christ & Ruff, 1999)**
Author(s), year: Hager, J., 2016h
Report/Doc. number: M-553072-01-1

Validity Check:

- The biomass in the control increased by a factor of 38 over 72 h test period (guideline criteria = 16)
- The mean coefficient of variation for section-by-section specific growth rates in the control cultures must not exceed 35%. For this study, the observed value is 42.7 %.

– The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7%. For this study, the observed value is 11.7 %.

Conclusion: In this study the mean coefficient of variation for section-by-section specific growth rates in the control cultures exceeded the limit of 35%. Also the coefficient of variation of average specific growth rates during the 72 h test period in replicate control cultures has been greater than 7 %. Thus this study does not meet all three validity criteria according to current OECD TG 201 (adopted March 2006, Annex 5 corrected July 2011).

Comment RMS:

Validity: The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011).

- The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day.
- The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%.
- The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*.

Two validity criteria were not met; the mean coefficient of variation for the section-by-section growth rates was 42.7 % and the coefficient of variation of average specific growth rates was 11.7 %.

The other validity criterion was met.

In addition, the following points deviated from the test guideline or were not reported in detail:

- No information on morphological changes of the algae is given in the study report.

The deviation to the test guideline is not considered to have an impact on the validity of the test

Acceptability of the analytical methods used in the test: Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4.

Method: HPLC/UV

Linearity: Calibration is based on single determination at 5 concentrations.

The calibration function was linear within the range from 0.01 – 0.2 µg/mL of with r^2 = 1.0.

Accuracy: 2 fortifications levels (each 2 measurements): 1.0 and 50 mg/L. Mean recoveries for each level: 96.31 and 97.49 %

Precision: The relative standard deviation per fortification level: 0.16 and 0.42 %

	LOQ: The limit of quantification (LOQ) = 0.1 mg/L No information on the limit of detection is given in the study report. **Endpoints:** The study is not considered valid; hence no endpoint was determined by the RMS. **Conclusion of the RMS:** Based on the evaluation the algae test is not considered valid.

Reference:	**BCS-AC79872: Toxicity to *Pseudokirchneriella subcapitata* in an Algal Growth Inhibition Test**
Author(s), year:	Börschig, C., Emnet, P., 2016
Report/Doc. number:	EBFP0001 / M-560630-01-1
Guideline(s):	OECD 201 (2011), Commission Regulation (EC) 761/2009, C.3 (2009)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:	
Test substance:	Chlorobenzoxazolone (BCS-AC79872, AE F054014, techn.), batch no.: TV2899A, purity: 98.5 %
Test species:	Green alga (*Raphidocelis subcapitata*, strain 61.81 SAG, formerly known as *Selenastrum capricornutum* and *Pseudokirchneriella subcapitata)*
Number of organisms:	5000 cells/mL; 6 replicates per control and 3replicates per treatment
Type of test, duration:	Static test, 72 hours
Applied concentrations:	
Nominal:	0 (control), 0.8, 2.0, 5.1, 12.8 and 32 mg/L
Solvent:	None
Toxic reference:	Potassium dichromate
Test conditions:	
Water quality:	Algal nutrient medium (OECD-medium)
Temperature:	21.8 – 22.7 °C
pH:	7.6 – 9.8
Incubation:	Continuous illumination 5130 to 5680 lux
Methods:	The test was conducted in 50 mL Erlenmeyer flasks, which were filled with 50 mL medium.
Test parameters:	Samples were taken daily to determine the cell densities by spectrophotometric measurement. Measurement of pH was made at test initiation and test termination. Furthermore, water temperature was monitored continuously in a surrogate water filled vessel.
Analytical measurements:	The concentrations of the test substance were determined at test initiation and test

termination using high performance liquid chromatography.

Statistics: The $E_{y/r}C_x$ values with confidence intervals were calculated using Weibull analysis.

Findings:

Analytical data: Mean measured concentrations were in the range of 92 – 101 % of nominal concentrations. Hence, the results are based on nominal concentrations.

Table B. 9.2.7-21: Analytical measurements of AE F054014

Nominal concentrations [mg/L]	Measured concentrations [mg/L]			% of nominal concentrations
	0 hours	72 hours	Mean	
Control	< 0.03	< 0.03	-	-
0.8	0.7665	0.7125	0.7395	92
2	1.9935	1.9225	1.958	98
5.1	5.201	4.9325	5.067	99
12.8	13.208	12.524	12.866	101
32	32.976	31.667	32.322	101

Limit of Detection (LOD) = 0.03 mg/L

Biological effects: The microscopic examination of the shape of the algal cells after 72 hours of test duration did not show any difference between the algae that had been growing up to a nominal test concentration of 32 mg/L and the algal cells in the control.

Yield and growth rates are given in the following table.

Table B. 9.2.7-22: Effects of AE F054014 on the green algae *Pseudokirchneriella subcapitata*

AE F054014 [mg/L] (nominal)	Yield		Growth rate	
	Yield [10 000 cells/mL]	% inhibition relative to the control	Mean growth rate [d^{-1}]	% inhibition relative to the control
Control	129.132	-	1.852	-
0.8	134.125	-3.9	1.865	-0.7
2	138.785	-7.5	1.876	-1.3
5.1	123.890	4.1	1.837	0.8
12.8	0.216	99.8*	0.092	95.0*
32	0.000	100.0*	0.000	100.0*

* Statistical significant different compared to the control

Toxic reference: E_rC_{50} = 1.50 mg/L (95% C.I.: 1.43 – 1.58 mg/L)

E_yC_{50} = 0.721 mg/L (95% C.I.: 0.588 – 0.847 mg/L)

Validity criteria: The mean coefficient of variation for the section by section specific growth rates in the control was 14.5 %.

The coefficient of variation of average specific growth rates during the whole test period in the control was 1.5 %.

The increase of the cell growth in the control and solvent control was 259.3-fold.

Conclusion: 72 h E_yC_{50} = 8.12 mg/L (95% C.I.: 7.64 – 8.60 mg/L)

72 h E_yC_{20} = 5.61 mg/L (95% C.I.: 5.14 – 6.03 mg/L)

72 h E_yC_{10} = 4.39 mg/L (95% C.I.: 3.93– 4.81 mg/L)

72 h E_rC_{50} = 8.78 mg/L (95% C.I.: 8.27 – 9.29 mg/L)
72 h E_rC_{20} = 6.16 mg/L (95% C.I.: 5.65 – 6.62 mg/L)
72 h E_rC_{10} = 4.87 mg/L (95% C.I.: 4.35 – 5.34 mg/L)

72 h NOEC = 5.1 mg/L (yield and growth rate)
The toxicity endpoints are based on nominal concentrations.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011). - The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day. - The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%. - The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 201 (2011). **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.25 mg/L) mentioned. **Endpoints:** The RMS agrees on the endpoints given in the study report. 72 h E_yC_{50} = 8.12 mg/L (95% C.I.: 7.64 – 8.60 mg/L) 72 h E_yC_{20} = 5.61 mg/L (95% C.I.: 5.14 – 6.03 mg/L) 72 h E_yC_{10} = 4.39 mg/L (95% C.I.: 3.93– 4.81 mg/L) 72 h E_rC_{50} = 8.78 mg/L (95% C.I.: 8.27 – 9.29 mg/L) 72 h E_rC_{20} = 6.16 mg/L (95% C.I.: 5.65 – 6.62 mg/L) 72 h E_rC_{10} = 4.87 mg/L (95% C.I.: 4.35 – 5.34 mg/L) 72 h NOEC = 5.1 mg/L (yield and growth rate) based on nominal concentrations. **Conclusion of the RMS:** Based on the evaluation the algae test is considered valid.

Reference:	**Algal, (*Pseudokirchneriella subcapitata)*, Growth inhibition test (OECD 201), static exposure (under consideration of proposal for updating OECD 201 of April 2004), AE F096918 substance pure, Code: AE F096918 00 1B99 0001**
Author(s), year:	Wenzel, A., 2004
Report/Doc. number:	C043958 / M-235521-01-1
Guideline(s):	OECD 201 (2004)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	HOPP-acid (AE F096918), batch no.: 05022TB, purity: > 99.9 %
Test species:	Green alga (*Raphidocelis subcapitata*, formerly known as *Selenastrum capricornutum* and *Pseudokirchneriella subcapitata)*
Number of organisms:	10000 cells/mL; 6 replicates per control and 3replicates per treatment
Type of test, duration:	Static test, 72 hours
Applied concentrations:	
Nominal:	0 (control), 1.0, 3.2, 10.0, 32.0 and 100 mg/L
Solvent:	None
Toxic reference:	Zinc sulphate
Test conditions:	
Water quality:	Algal nutrient medium (OECD-medium)
Temperature:	20.7 – 20.9 °C
pH:	4.45 – 8.57
Incubation:	Continuous illumination 7998 to 8160 lux
Methods:	The test was conducted in 250 mL Erlenmeyer flasks, which were filled with 100 mL medium.
Test parameters:	Samples were taken daily to determine the cell densities using an electronic particle counter. Measurement of pH was made at test initiation and test termination. Furthermore, water temperature was monitored daily in a surrogate water filled vessel.
Analytical measurements:	The concentrations of the test substance were determined at test initiation and test termination using high performance liquid chromatography.
Statistics:	The $E_{y/b/r}C_x$ values with confidence intervals were calculated using Probit analysis.
Findings:	
Analytical data:	Mean measured concentrations were in the range of 85 – 93 % of nominal concentrations. Hence, the results are based on nominal concentrations.

Table B. 9.2.7-23: Analytical measurements of AE F096918

Nominal concentrations [mg/L]	Measured concentrations [mg/L]			% of nominal concentrations
	0 hours	72 hours	Mean	
Control	< 0.014	< 0.014	-	-
1.0	0.90	0.80	0.85	85
3.2	2.86	2.72	2.79	87
10.0	8.93	8.68	8.80	88
32.0	29.95	29.46	29.70	93
100.0	92.74	94.03	93.38	93

Limit of Quantification (LOQ) = 0.014 mg/L

Biological effects: Microscopic observation revealed normal appearances of the algae despite an increase in cell debris in the cultures with increasing growth inhibition.

Yield, biomass and growth rates are given in the following table.

Table B. 9.2.7-24: Effects of AE F096918 on the green algae *Pseudokirchneriella subcapitata*

Nominal concentrations [mg/L]	Yield		Growth rate		Biomass	
	Yield [10 000 cells/mL]	% inhibition relative to the control	Mean growth rate [d^{-1}]	% inhibition relative to the control	Area under the curve	% inhibition relative to the control
Control	164.190	-	1.700	-	2753.120	-
1.0	131.067	20.2	1.620	4.7	2158.160	21.6
3.2	122.900	25.1	1.602	5.8	1887.580	31.4*
10.0	98.663	39.9*	1.508	11.3	1389.110	49.5*
32.0	80.380	51.0*	1.375	19.1*	1148.720	58.3*
100.0	2.131	98.7*	0.245	85.6*	29.724	98.9*

* Statistical significant different compared to the control

Toxic reference: The results are in agreement with published EC_{50}-values regarding biomass increase related to the Zn^{2+}-ion ranging between 45.0 and 65.4 µg/L for biomass.

E_rC_{50} = 68.3 µg/L (95% C.I.: 61.7 – 82.4 µg/L)

E_bC_{50} = 41.2 µg/L (95% C.I.: 37.2 – 45.7 µg/L)

Validity criteria: The cell number in the control cultures increased by a factor of 164 within the test period of 72 h.

The pH of the control cultures did not deviate by more than 0.8 units during the test.

The coefficient of variation of the section by section specific growth rates in the control was 8.7 %.

The coefficient of variation of average specific growth rates during the whole test period in the control was 1.3 %.

Conclusion: 72 h E_yC_{50} = 14.3 mg/L (95% C.I.: n.d. – n.d.)

72 h E_yC_{20} = 2.36 mg/L (95% C.I.: n.d. – n.d.)

72 h E_yC_{10} = 0.92 mg/L (95% C.I.: n.d. – n.d.)

72 h E_bC_{50} = 9.56 mg/L (95% C.I.: 1.18 – 71.7 mg/L)
72 h E_bC_{20} = 1.40 mg/L (95% C.I.: n.d. – 4.92 mg/L)
72 h E_bC_{10} = 0.51 mg/L (95% C.I.: 0.00 – 2.51 mg/L)

72 h E_rC_{50} = 53.4 mg/L (95% C.I.: 31.1 – 101 mg/L)
72 h E_rC_{20} = 32.2 mg/L (95% C.I.: 7.84 – 48.4 mg/L)
72 h E_rC_{10} = 24.7 mg/L (95% C.I.: 3.2 – 38.8 mg/L)

72 h NOEC = 3.2 mg/L (yield)
72 h NOEC = 1.0 mg/L (biomass)
72 h NOEC = 10.0 mg/L (growth rate)

The toxicity endpoints are based on nominal concentrations.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011). - The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day. - The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%. - The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 201 (2011). **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Method: HPLC/UV Linearity: Calibration is based on single determination at 13 concentrations. The calibration function was linear within the range from 0.01 – 0.25 mg/L and 0.25 – 10 mg/L. Accuracy: 1 fortifications level (each 2 measurements): 2.5 mg/L. Mean recovery for each level: 100 % Precision: The relative standard deviation per fortification level: 0 %. LOQ: The limit of quantification (LOQ) = 14.4 µg/L. LOD: The limit of detection (LOD) = 3.8 µg/L No information on the r^2 is given in the study report. **Endpoints:**

	The RMS agrees on the endpoints given in the study report. 72 h E_yC_{50} = 14.3 mg/L (95% C.I.: n.d. – n.d.) 72 h E_yC_{20} = 2.36 mg/L (95% C.I.: n.d. – n.d.) 72 h E_yC_{10} = 0.92 mg/L (95% C.I.: n.d. – n.d.) 72 h E_bC_{50} = 9.56 mg/L (95% C.I.: 1.18 – 71.7 mg/L) 72 h E_bC_{20} = 1.40 mg/L (95% C.I.: n.d. – 4.92 mg/L) 72 h E_bC_{10} = 0.51 mg/L (95% C.I.: 0.00 – 2.51 mg/L) 72 h E_rC_{50} = 53.4 mg/L (95% C.I.: 31.1 – 101 mg/L) 72 h E_rC_{20} = 32.2 mg/L (95% C.I.: 7.84 – 48.4 mg/L) 72 h E_rC_{10} = 24.7 mg/L (95% C.I.: 3.2 – 38.8 mg/L) 72 h NOEC = 3.2 mg/L (yield) 72 h NOEC = 1.0 mg/L (biomass) 72 h NOEC = 10.0 mg/L (growth rate) based on nominal concentrations. **Conclusion of the RMS:** Based on the evaluation the algae test is considered valid.

Reference:	**BCS-AW69425: Toxicity to *Pseudokirchneriella subcapitata* in an Algal Growth Inhibition Test**
Author(s), year:	Hengsberger, A., Haertl, C., 2015b
Report/Doc. number:	EBFPN043 / M-538955-01-1
Guideline(s):	OECD 201 (2011), Commission Regulation (EC) 761/2009, C.3 (2009)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	6-hydroxy-benzoxazolone (AE 0316854), batch no.: GSE 61724-2-1, purity: 99.4 %
Test species:	Green alga (*Raphidocelis subcapitata*, strain 61.81SAG, formerly known as *Selenastrum capricornutum* and *Pseudokirchneriella subcapitata)*
Number of organisms:	5000 cells/mL; 6 replicates per control and 3replicates per treatment
Type of test, duration:	Static, 72 hours
Applied concentrations:	
Nominal:	0 (control), 1.0, 3.2, 10.0, 32.0 and 100 mg/L
Solvent:	None

Toxic reference: Potassium dichromate

Test conditions:

Water quality: Algal nutrient medium (OECD-medium)

Temperature: 23 °C

pH: 6.0 – 6.2

Incubation: Continuous illumination 4575 to 5001 lux

Methods: The test was conducted in 50 mL Erlenmeyer flasks, which were filled with 50 mL medium.

Test parameters: Samples were taken daily to determine the cell densities by spectrophotometric measurement.

Measurement of pH was made at test initiation and test termination. Furthermore, water temperature was monitored daily in a surrogate water filled vessel.

Analytical measurements: The concentrations of the test substance were determined at test initiation and test termination using liquid chromatography.

Statistics: The $E_{y/r}C_x$ values with confidence intervals were calculated using non-linear regression.

Findings:

Analytical data: Mean measured concentrations were in the range of 94 – 103 % of nominal concentrations. Hence, the results are based on nominal concentrations.

Table B. 9.2.7-25: Analytical measurements of AE 0316854

Nominal concentrations [mg/L]	Measured concentrations [mg/L]			% of nominal concentrations
	0 hours	72 hours	Mean	
Control	< 0.00125	< 0.00125	-	-
1.0	1.056	1.002	1.029	103
3.2	3.133	3.099	3.116	97
10.0	10.121	9.044	9.567	96
32.0	29.736	30.392	30.062	94
100.0	103.707	101.768	102.733	103

Limit of Quantification (LOQ) = 0.030 mg/L

Limit of Determination (LOD) = 0.00125 mg/L

Biological effects: Microscopic observation did not show any difference between the algae that had been growing up to a nominal test concentration of 100 mg/L and the algal cells in the control.

Yield and growth rates are given in the following table.

Table B. 9.2.7-26: Effects of AE 0316854on the green algae *Pseudokirchneriella subcapitata*

Nominal concentrations [mg/L]	Yield		Growth rate	
	Yield [10 000 cells/mL]	% inhibition relative to the control	Mean growth rate [d^{-1}]	% inhibition relative to the control
Control	47.753	-	1.521	-
1.0	55.192	-15.6	1.570	-3.2

Nominal concentrations [mg/L]	Yield		Growth rate	
	Yield [10 000 cells/mL]	% inhibition relative to the control	Mean growth rate [d^{-1}]	% inhibition relative to the control
3.2	51.938	-8.8	1.550	-1.9
10.0	80.299	-68.2	1.694	-11.3
32.0	65.305	-36.8	1.626	-6.8
100.0	54.495	-14.1	1.566	-3.0

* Statistical significant different compared to the control

Toxic reference: The results of the toxic reference are:

E_rC_{50} = 0.845mg/L (95% C.I.: 0.807 – 0.885 mg/L)

E_bC_{50} = 0.434 mg/L (95% C.I.: 0.419 – 0.449 mg/L)

Validity criteria: The cell number in the control cultures increased by a factor of 96.5 within the test period of 72 h.

The coefficient of variation of the section by section specific growth rates in the control was 30.9 %.

The coefficient of variation of average specific growth rates during the whole test period in the control was 2.5 %.

Conclusion: 72 h E_yC_{50} > 100 mg/L (95% C.I.: n.d. – n.d.)

72 h E_yC_{20} > 100 mg/L (95% C.I.: n.d. – n.d.)

72 h E_yC_{10} > 100 mg/L (95% C.I.: n.d. – n.d.)

72 h E_rC_{50} > 100 mg/L (95% C.I.: n.d. – n.d.)

72 h E_rC_{20} > 100 mg/L (95% C.I.: n.d. – n.d.)

72 h E_rC_{10} > 100 mg/L (95% C.I.: n.d. – n.d.)

72 h NOEC = 100 mg/L (yield and growth rate)

The toxicity endpoints are based on nominal concentrations.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011).

- The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day.
- The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%.
- The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*.

	All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 201 (2011). **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.030 mg/L) mentioned. **Endpoints:** The RMS agrees on the endpoints given in the study report. 72 h E_yC_{50} > 100 mg/L (95% C.I.: n.d. – n.d.) 72 h E_yC_{20} > 100 mg/L (95% C.I.: n.d. – n.d.) 72 h E_yC_{10} > 100 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{50} > 100 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{20} > 100 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{10} > 100 mg/L (95% C.I.: n.d. – n.d.) 72 h NOEC = 100 mg/L (yield and growth rate) based on nominal concentrations. **Conclusion of the RMS:** Based on the evaluation the algae test is considered valid.

Reference:	**BCS-AB16188: Toxicity to *Pseudokirchneriella subcapitata* in an Algal Growth Inhibition Test**
Author(s), year:	Börschig, C., Emnet, P., 2015c
Report/Doc. number:	EBFPN044 / M-538959-01-1
Guideline(s):	OECD 201 (2011), Commission Regulation (EC) 761/2009, C.3 (2009)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Phenol (AE F040356), batch no.: GSE 61869-2-21, purity: 97.0 %
Test species:	Green alga (*Raphidocelis subcapitata*, strain 61.81 SAG, formerly known as *Selenastrum capricornutum* and *Pseudokirchneriella subcapitata)*
Number of organisms:	5000 cells/mL; 6 replicates per control and 3replicates per treatment
Type of test, duration:	Static, 72 hours
Applied concentrations:	
Nominal:	0 (control), 1:16, 1:8, 1:4, 1:2 and 100 mg/L

Solvent: None

Toxic reference: Potassium dichromate

Test conditions:

Water quality: Algal nutrient medium (OECD-medium)

Temperature: 22 – 24 °C

pH: 6.0 – 6.2

Incubation: Continuous illumination 4630 to 5200 lux

Methods: The test was conducted in 50 mL Erlenmeyer flasks, which were filled with 50 mL medium.

Test parameters: Samples were taken daily to determine the cell densities by spectrophotometric measurement.

Measurement of pH was made at test initiation and test termination. Furthermore, water temperature was monitored daily in a surrogate water filled vessel.

Analytical measurements: The concentrations of the test substance were determined at test initiation and test termination using liquid chromatography.

Statistics: The $E_{y/r}C_x$ values with confidence intervals were calculated using non-linear regression.

Findings:

Analytical data: Mean measured concentrations were in the range of 0.187 – 3.33 mg/L. The results are based on mean measured concentrations.

Table B. 9.2.7-27: Analytical measurements of AE F040356

Nominal concentrations [mg/L]	Measured concentrations [mg/L]		
	0 hours	72 hours	Mean
Control	< 0.002	< 0.002	-
1:16	0.205	0.169	0.187
1:8	0.413	0.374	0.394
1:4	0.847	0.808	0.828
1:2	1.743	1.655	1.7
100.0	3.488	3.181	3.33

Limit of Quantification (LOQ) = 0.050 mg/L

Limit of Determination (LOD) = 0.002 mg/L

Biological effects: Microscopic observation did not show any difference between the algae that had been growing up to a nominal test concentration of 3.33 mg/L and the algal cells in the control.

Yield and growth rates are given in the following table.

Table B. 9.2.7-28: Effects of AE F040356 on the green algae *Pseudokirchneriella subcapitata*

Mean measured concentrations [mg/L]	Yield		Growth rate	
	Yield [10 000 cells/mL]	% inhibition relative to the control	Mean growth rate [d^{-1}]	% inhibition relative to the control

Mean measured concentrations [mg/L]	Yield		Growth rate	
	Yield [10 000 cells/mL]	% inhibition relative to the control	Mean growth rate [d^{-1}]	% inhibition relative to the control
Control	124.501	-	1.836	-
0.187	139.649	-12.2	1.875	-2.2
0.394	121.944	2.1	1.831	0.3
0.828	114.599	8.0	1.808	1.5
1.7	96.239	22.7*	1.752	4.6*
3.33	57.943	53.5*	1.586	13.6*

* Statistical significant different compared to the control

Toxic reference: The results of the toxic reference are:

E_rC_{50} = 0.845mg/L (95% C.I.: 0.807 – 0.885 mg/L)

E_bC_{50} = 0.434 mg/L (95% C.I.: 0.419 – 0.449 mg/L)

Validity criteria: The cell number in the control cultures increased by a factor of 250 within the test period of 72 h.

The coefficient of variation of the section by section specific growth rates in the control was 24.4 %.

The coefficient of variation of average specific growth rates during the whole test period in the control was 3.3 %.

Conclusion: 72 h E_yC_{50} = 3.04 mg/L (95% C.I.: 2.07 – > 3.33 mg/L)

72 h E_yC_{20} = 1.35 mg/L (95% C.I.: 0.663 – 2.75 mg/L)

72 h E_yC_{10} = 0.884 mg/L (95% C.I.: 0.326 – 2.39 mg/L)

72 h E_rC_{50} > 3.33 mg/L (95% C.I.: n.d. – n.d.)

72 h E_rC_{20} > 3.33 mg/L (95% C.I.: n.d. – n.d.)

72 h E_rC_{10} = 2.58 mg/L (95% C.I.: 0.716 – > 3.33 mg/L)

72 h NOEC = 0.828 mg/L (yield and growth rate)

The toxicity endpoints are based on mean measured concentrations.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011).

- The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day.
- The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%.
- The coefficient of variation of average specific growth rates during the whole test

	period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 201 (2011). **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.050 mg/L) mentioned. **Endpoints:** The RMS agrees on the endpoints given in the study report. It is noted that the arithmetic mean was used instead of the geometric mean for calculation of the mean measured concentrations. The RMS conducted a re-calculation of the mean measured concentrations which are 0.187, 0.393, 0.828, 1.699, 3.33 mg/L. The RMS is of the opinion that a statistical re-evaluationn of the endpoints is not considered necessary, as the concentration variation is negligible. 72 h E_yC_{50} = 3.04 mg/L (95% C.I.: 2.07 – > 3.33 mg/L) 72 h E_yC_{20} = 1.35 mg/L (95% C.I.: 0.663 – 2.75 mg/L) 72 h E_yC_{10} = 0.884 mg/L (95% C.I.: 0.326 – 2.39 mg/L) 72 h E_rC_{50} > 3.33 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{20} > 3.33 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{10} = 2.58 mg/L (95% C.I.: 0.716 – > 3.33 mg/L) 72 h NOEC = 0.828 mg/L (yield and growth rate) based on mean measured concentrations. **Conclusion of the RMS:** Based on the evaluation the algae test is considered valid.

Reference:	**BCS-CY11271: Toxicity to *Pseudokirchneriella subcapitata* in an Algal Growth Inhibition Test**
Author(s), year:	Kuhl, R., Emnet, P., 2015b
Report/Doc. number:	EBFPN009 / M-542853-01-1
Guideline(s):	OECD 201 (2011), Commission Regulation (EC) 761/2009, C.3 (2009)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance: Fenoxaprop-deschloro (BCS-CY11271), batch no.: GSE 61479-2-3, purity: 99.2 %

Test species: Green alga (*Raphidocelis subcapitata*, strain 61.81 SAG, formerly known as *Selenastrum capricornutum* and *Pseudokirchneriella subcapitata)*

Number of organisms: 5000 cells/mL; 6 replicates per control and 3replicates per treatment

Type of test, duration: Static, 72 hours

Applied concentrations:

Nominal: 0 (control), 1:81, 1:27, 1:9, 1:3 and 100 mg/L

Solvent: None

Toxic reference: Potassium dichromate

Test conditions:

Water quality: Algal nutrient medium (OECD-medium)

Temperature: 21 – 23 °C

pH: 6.0 – 6.1

Incubation: Continuous illumination 4705 to 5030 lux

Methods: The test was conducted in 50 mL Erlenmeyer flasks, which were filled with 50 mL medium.

Test parameters: Samples were taken daily to determine the cell densities by spectrophotometric measurement.

Measurement of pH was made at test initiation and test termination. Furthermore, water temperature was monitored daily in a surrogate water filled vessel.

Analytical measurements: The concentrations of the test substance were determined at test initiation and test termination using liquid chromatography.

Statistics: The $E_{y/r}C_x$ values with confidence intervals were calculated using non-linear regression.

Findings:

Analytical data: Mean measured concentrations were in the range of 0.100 – 8.73 mg/L. The results are based on mean measured concentrations.

Table B. 9.2.7-29: Analytical measurements of BCS-CY11271

Nominal concentrations [mg/L]	Measured concentrations [mg/L]		
	0 hours	72 hours	Mean
Control	< 0.002	< 0.002	-
1:81	0.1145	0.0865	0.100
1:27	0.6085	0.22	0.275
1:9	0.8655	0.704	0.808
1:3	2.914	2.584	2.74
100	8.818	8.551	8.73

Limit of Quantification (LOQ) = 0.050 mg/L

Limit of Determination (LOD) = 0.002 mg/L

Biological effects: Microscopic observation did not show any difference between the algae that had been growing up to a mean measured concentration of 2.74 mg/L and the algal

cells in the control. In the highest concentration of 8.73 mg/L the cells were deformed compared to the control.

Yield and growth rates are given in the following table.

Table B. 9.2.7-30: Effects of BCS-CY11271 on the green algae *Pseudokirchneriella subcapitata*

Mean measured concentrations [mg/L]	Yield		Growth rate	
	Yield [10 000 cells/mL]	% inhibition relative to the control	Mean growth rate [d^{-1}]	% inhibition relative to the control
Control	110.862	-	1.796	-
0.100	129.026	-16.4	1.850	-3.0
0.275	127.059	-14.6	1.846	-2.8
0.808	113.157	-2.1	1.809	-0.7
2.74	108.435	2.2	1.794	0.1
8.73	70.796	36.1*	1.652	8.0*

* Statistical significant different compared to the control

Toxic reference: The results of the toxic reference are:

E_rC_{50} = 0.845mg/L (95% C.I.: 0.807 – 0.885 mg/L)

E_bC_{50} = 0.434 mg/L (95% C.I.: 0.419 – 0.449 mg/L)

Validity criteria: The cell number in the control cultures increased by a factor of 222.7 within the test period of 72 h.

The coefficient of variation of the section by section specific growth rates in the control was 34.8 %.

The coefficient of variation of average specific growth rates during the whole test period in the control was 4.02 %.

Conclusion: 72 h E_yC_{50} > 8.73 mg/L (95% C.I.: 6.38 – > 8.73 mg/L)

72 h E_yC_{20} = 4.61 mg/L (95% C.I.: 1.58 – > 8.73 mg/L)

72 h E_yC_{10} = 2.86 mg/L (95% C.I.: 0.675 – > 8.73 mg/L)

72 h E_rC_{50} > 8.73 mg/L (95% C.I.: n.d. – n.d.)

72 h E_rC_{20} > 8.73 mg/L (95% C.I.: n.d. – n.d.)

72 h E_rC_{10} > 8.73 mg/L (95% C.I.: n.d. – n.d.)

72 h NOEC = 2.74 mg/L (yield and growth rate)

The toxicity endpoints are based on mean measured concentrations.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 201 (2011).

- The biomass in the control cultures should have increased exponentially by a factor of at least 16 within the 72-hour test period. This corresponds to a specific growth rate of 0.92/day.

	- The mean coefficient of variation for section-by-section specific growth rates (days 0-1, 1-2 and 2-3, for 72-hour tests) in the control cultures must not exceed 35%. - The coefficient of variation of average specific growth rates during the whole test period in replicate control cultures must not exceed 7% in tests with *Pseudokirchneriella subcapitata* and *Desmodesmus subspicatus*. All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 201 (2011). **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.05 mg/L) mentioned. **Endpoints:** The RMS agrees on the endpoints given in the study report. 72 h E_yC_{50} > 8.73 mg/L (95% C.I.: 6.38 – > 8.73 mg/L) 72 h E_yC_{20} = 4.61 mg/L (95% C.I.: 1.58 – > 8.73 mg/L) 72 h E_yC_{10} = 2.86 mg/L (95% C.I.: 0.675 – > 8.73 mg/L) 72 h E_rC_{50} > 8.73 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{20} > 8.73 mg/L (95% C.I.: n.d. – n.d.) 72 h E_rC_{10} > 8.73 mg/L (95% C.I.: n.d. – n.d.) 72 h NOEC = 2.74 mg/L (yield and growth rate) based on mean measured concentrations. **Conclusion of the RMS:** Based on the evaluation the algae test is considered valid.

B.9.2.8. Effects on aquatic macrophytes

Reference:	**Fenoxaprop-P-ethyl Technical 88.1 % w/w Code: AE F046360 00 1C97 0002 Toxicity to duckweed (*Lemna gibba*), in a Static Renewal System**
Author(s), year:	Christ, M.T., Ruff, D.F., 1997
Report/Doc. number:	BM97W502 / M-141562-01-1
Guideline(s):	ASTM guideline E 1415-91 (1997), EPA 540/9-86-134 (1982)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl tech., batch no.: 1+2/86, purity: 88.1 % w/w, sum of (D+) and (L-)-enantiomers: 95.8 % w/w
Test species:	Duckweed *(Lemna gibba* G3)
Number of organisms:	15 plants with 45 fronds per controls and test concentrations, 3 replicates per treatment
Type of test, duration:	Semi-static, 14 days
Applied concentrations:	
Nominal:	0 (control and solvent control), 0.40, 0.66, 1.10, 1.80 and 3.00 mg a.s./L
Solvent:	Acetone (0.1 mL/L)
Test conditions:	
Water quality:	20X-AAP medium, pH 7.5 ± 0.1
Temperature:	22.2 – 25.1 °C
pH:	7.5 – 9.4
O_2 content:	71 – 101 % air saturation
Conductivity:	1500 – 1600 µS/cm
Light regime:	Continuous light, 4000 – 5600 lux
Methods:	The test was conducted in 1200 mL test chambers, which were filled with 800 mL medium. The test chambers were 7.5 cm high with a diameter of 15 cm and a test solution depth of 4.5 cm. Plants were transferred to fresh test solutions on Day 4, 7 and 11.
Test parameters:	Frond counts and abnormal appearance were visual evaluated on Days 2, 4, 7, 9, 11 and 14. Measurements of pH, temperature, dissolved oxygen and conductivity were taken at test initiation, at renewal periods and test termination. Furthermore, water temperature was monitored hourly in a reference vessel.
Analytical measurements:	Sampling and analysis of test concentration were carried out on days 0 and 7 (freshly prepared media) and on days 4, 11 and 14 (old test media) using high performance liquid chromatography.

Statistics: NOEC-values were determined by calculation of statistical analyses significance using one way analysis of variance (ANOVA) with a Dunnett's and Williman's test.

When running a one way analysis of variance a normality test and an equal variance test were done first. The Shapiro-Wilk's-Test was used to test for normally distributed populations and a Bartlett's Test to determine homogeneity of variance.

EC_{50} values could not be derived due to less than 50 % inhibition.

Findings:

Analytical measurements: Mean measured concentrations of fresh test solutions were in the range of 77 – 135 % of nominal concentrations which corresponds to the concentrations of 0.54, 0.51, 1.19, 1.53, 2.76 mg a.s./L. No Fenoxaprop-P-ethyl was found in any old treatment concentration. The results are based on nominal concentrations.

Biological effects: No phytotoxic effects were observed in any treatment concentration. Frond number, biomass and growth rates are given in the following tables.

Table B. 9.2.8-1: Effects of Fenoxaprop-P-ethyl on the duckweed *Lemna gibba* for 7days

Nominal concentrations [mg/L]	Frond number at day 7	Growth rate		Biomass	
		Mean growth rate [d^{-1}]	% inhibition relative to the control	Area under the curve	% inhibition relative to the control
Control	384	0.4778237	-	927	-
Solvent control	447				
0.40	378	0.4659365	2	862	7
0.66	376	0.465525	3	827	11
1.10	335	0.4498715	6	771	17
1.80	365	0.4616109	3	836	10
3.00	360	0.4594546	4	812	12

* Statistically significant difference from control,

Table B. 9.2.8-2: Effects of Fenoxaprop-P-ethyl on the duckweed *Lemna gibba* for 14 days

Nominal concentrations [mg/L]	Frond number at day 14	Growth rate		Biomass	
		Mean growth rate [d^{-1}]	% inhibition relative to the control	Area under the curve	% inhibition relative to the control
Control	4256	0.4057082	-	16193	-
Solvent control	4574				
0.40	4022	0.3999739	1	14988	7
0.66	4898	0.4136186	-2	17123	-6
1.10	4478	0.4072653	0	15472	4
1.80	4749	0.4114666	-1	16528	-2
3.00	4151	0.4016468	1	15688	3

* Statistically significant difference from control,

Conclusion:	14 d E_rC_{50} > 3.00 mg a.s./L 14 d E_bC_{50} > 3.00 mg a.s./L 14 d NOEC ≥ 3.00 mg a.s./L (biomass and growth rate) Based on nominal concentrations
Comment RMS:	The study was evaluated following the recommendations of the currently valid test guideline OECD 221 (2006). The RMS conducted a statistical re-evaluation (ToxRat® Professional 3.1.0) of the study to address the validity criteria given in the OECD guideline 221 (2006). The validity criteria according to the OECD guideline 221 are the following: - The doubling time of frond number in the control must be less than 2.5 days (60h), corresponding to approximately a seven-fold increase in seven days and an average specific growth rate of 0.275 d^{-1}. In the study the doubling time of frond number in the control was 1.5 days, corresponding to a 26.6-fold increase in seven days and an average specific growth rate of 0.478 d^{-1}. All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 221 (2006). In addition, the following points deviated from the test guideline or were not reported in detail: -According to OECD 221 at least one other measurement variable (total frond area, dry weight or fresh weight) should be measured, since some substances may affect other measurement variables much more than frond numbers. In the study only the frond number was assessed. -According to OECD 221 a reference substance should be tested at least twice a year. No information about reference testing is provided in the current study report. -According to OECD 221 each test vessel should contain a total of 9 to 12 fronds at test initiation. In the current test each vessel contained 15 fronds. **Acceptability of the analytical methods used in the test:** Description of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Method: HPLC/UV Linearity: Calibration is based on duplicate determination at five concentrations. The calibration function was linear within the range from 0.01 – 0.2 µg/mL with r^2 = 1.0000. Accuracy: 2 fortifications levels (each 6 measurements): 0.1 and 5.0 mg/L; mean recoveries for each level: 88.5 and 88.6 % Precision: The relative standard deviation per fortification level: 13.5 and 6.1 % LOQ: Limit of quantification (LOQ) = 0.1 mg/L LOD: Limit of detection (LOD) = 0.075 mg/L

	Endpoints: The study author determined the endpoints based on nominal concentrations. The RMS does not agree on this approach as no stable exposure could be shown. In general, the endpoint should have been expressed on mean measured concentrations. Furthermore, it is assumed that the active substance is converted to the metabolite Fenoxaprop-P-acid. No analytical verification of the metabolite was conducted in the study. Taking into account the available information on analytical measurements, no reliable endpoint based on mean measured concentrations could be calucalted by the RMS. **Conclusion of the RMS:** Based on the evaluation of the study the macrophyte toxicity test is considered valid. However, no reliable endpoint could be determined.

Reference:	**Toxicity of Fenoxaprop-P-ethyl Technical to the Aquatic Plant *Lemna gibba* in a Semi Static Growth Inhibition Test**
Author(s), year:	Pawlowski, S., 2005
Report/Doc. number:	134FPE / M-548340-01-1
Guideline(s):	OECD 221 (2004), EPA OPPTS 850.4400 (1996)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:	
Test substance:	Fenoxaprop-P-ethyl tech., batch no.: 660-PSH-45, purity: 95.6 % w/w
Test species:	Duckweed *(Lemna gibba* G3)
Number of organisms:	12 fronds per test vessel, 72 fronds per controls and test concentrations, 6 replicates per treatment
Type of test, duration:	Semi-static, 7 days
Applied concentrations:	
Nominal:	0 (control and solvent control) and 3.00 mg a.s./L
Solvent:	DMF(0.1 mL/L)
Test conditions:	
Water quality:	20X-AAP medium, pH 7.5 ± 0.1
Temperature:	23 – 25 °C
pH:	7.5 – 9.4
Light regime:	Continuous light, 7170 – 7500 lux
Methods:	The test was conducted in 250mL glass flasks, which were filled with 150 mL medium. The test medium was renewed at day 3 and 5.

Test parameters: Frond counts and abnormal appearance were visual evaluated on Days 3, 5 and 7. At test start the dry weight of a sample of fronds identical to that used to inoculate the test vessels was determined. At test end the dry weight of all plants from each vessel was determined.
Measurements of pH were taken at test start and each observation day.
Furthermore, water temperature was monitored daily in a reference vessel.

Analytical measurements: Sampling and analysis of test concentration were carried out on days 0, 3 and 5 of freshly prepared media using high performance liquid chromatography.

Statistics: EC_{50} values and confidence limits were calculated by probit analysis.
NOEC-values were determined by calculation of statistical analyses significance using multiple Dunnett's test, Williman's test and Bonferroni t- test.

Findings:

Analytical measurements: Measured concentrations of fresh test solutions were in the range of 43 to 63 % of nominal concentrations which corresponds to a concentration of 0.80 mg a.s./L. No Fenoxaprop-P-ethyl was found in any old treatment concentration. The results are based on mean measured concentrations.

Biological effects: The shape of fronds and colonies after the test period of 7 days was not different to those in the solvent control, at the nominal test concentrations of 3 mg/L.

Table B. 9.2.8-3: Effects of Fenoxaprop-P-ethyl on the duckweed *Lemna gibba* for 7days

Nominal concentrations [mg/L]	Frond number		Growth rate		Biomass		Dry weight	
	No.	% inhibition	Mean[d^{-1}]	% inhibition	Area under the curve [d^{-1}]	% inhibition	Biomass gain	% inhibition
Control	135	-8.4	0.344	-3.1	305.25	-7.5	26.02	-17.5
Solvent control	124.5	0.0	0.333	0.0	254.08	0.0	22.15	0.0
3.0	120.7	3.1	0.329	1.3	266.92	6.0	24.45	-10.4

* Statistically significant difference from control,

Validity: The doubling time of fronds was 2 and thus less than 2.5 d (60 h), corresponding to an approximately 11-fold increase in 7 days.

Conclusion: 7 d EC_{50} > 0.80 mg a.s./L (growth rate)
7 d EC_{50} > 0.80 mg a.s./L (area under the growth curve)
7 d EC_{50} > 0.80 mg a.s./L (frond number)
7 d EC_{50} > 0.80 mg a.s./L (biomass gain)

7 d NOEC ≥ 0.80 mg a.s./L
based on mean measured concentrations

Comment RMS: The study was evaluated following the recommendations of the currently valid test

	guideline, the OECD test guideline 221 (2006). - The doubling time of frond number in the control must be less than 2.5 days (60h), corresponding to approximately a seven-fold increase in seven days and an average specific growth rate of 0.275 d^{-1}. All validity criteria were met; hence, the study is considered valid according to the OECD test guideline 221 (2006). In addition, the following points deviated from the test guideline or were not reported in detail: -According to OECD 221 a reference substance should be tested at least twice a year. No information about reference testing is provided in the current study report. -No information on the size of the test vessels are given in the study report. The deviation to the test guideline is not considered to have an impact on the validity of the test **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.5 mg/L) mentioned. **Endpoints:** It is assumed that the active substance is converted to the metabolite Fenoxaprop-P-acid. No analytical verification of the metabolite was conducted in the study. Taking into account the available information on analytival measurements, no reliable endpoint based on mean measured concentrations could be calucalted by the RMS. **Conclusion of the RMS:** Based on the evaluation of the study the macrophyte toxicity test is considered valid. However, no reliable endpoint could be determined.

Reference:	**Toxicity of Fenoxaprop-P-ethyl Technical to the Macrophyte, *Myriophyllum spicatum***
Author(s), year:	Banman, C.S., Alexander, T.M., Moore, S., 2013
Report/Doc. number:	EBFPL025 / M-457254-01-1
Guideline(s):	OECD 221 (2006)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl tech., batch no.: EFLC000600, purity: 98.1 % w/w
Test species:	Watermilfoil *(Myriophyllum spicatum)*
Number of organisms:	9 plants per controls and test concentrations, 3 replicates per treatment
Type of test, duration:	Semi-static, 14 days
Applied concentrations:	
Nominal:	0 (control and solvent control) and 100 µg a.s./L
Solvent:	Acetone (0.1 mL/L)
Test conditions:	
Water quality:	20X-AAP medium
Artificial sediment:	5 % (dry weight) sphagnum peat 20% (dry weight) kaolin clay (kaolinite content ≥ 30%) 75 % (dry weight) sand 40 % 20X AAP medium pH: 7.0
Temperature:	19.54 – 21.57 °C
pH:	8.3 – 9.2
Dissolved oxygen	8.4 – 10.2 mg/L
Light regime:	16 h light:8 h dark, 8940 – 10400 lux
Methods:	The test was conducted in 4 L glass beakers, which were filled with 3 L medium. Each plant was planted into a single 125 x 65 mm dish containing 550 grams of artificial sediment. The test medium was renewed on days 3, 5, 7, 10 and 12.
Test parameters:	At test start the wet and dry weight was determined of surrogate shoots. At test end the length of the main shoot and all side shoots and the wet and dry weight of all plants from each vessel were determined. Measurements of pH and dissolved oxygen were taken at test start at day 7 and 14. Furthermore, water temperature was monitored hourly in a reference vessel.
Analytical measurements:	Sampling and analysis of test concentration were carried out on days 0, 3, 10 and 14 of freshly prepared media using high performance liquid chromatography.
Statistics:	NOEC-values were determined by calculation of a two sample t- test.
Findings:	
Analytical measurements:	Measured concentrations of fresh test solutions were in the range of 94 to 68.5 % of nominal concentrations for Fenoxaprop-P-ethyl. No Fenoxaprop-P-ethyl was found in any old treatment concentration. Measured concentrations of Fenoxaprop-p in the old test solutions were in the range of 21.6 to 27.5 %. The combined concentrations of Fenoxaprop-P-ethyl and Fenoxaprop-p were in the range of 0 to 94 %. The results are based on nominal concentrations.

Table B. 9.2.8-4: Analytical measurements

Nominal concentrations [µg a.s./L]	Fenoxaprop-P-ethyl - Measured concentrations [µg a.s./L]					
	0 d (new)	3 d (old)	3 d (new)	10 d (old)	10 d (new)	14 d

Nominal concentrations [µg a.s./L]	Fenoxaprop-P-ethyl - Measured concentrations [µg a.s./L]					
	0 d (new)	**3 d (old)**	**3 d (new)**	**10 d (old)**	**10 d (new)**	**14 d**
Control	< LOQ	< LOQ	< LOQ	< LOQ	< LOQ	< LOQ
Solvent control	< LOQ	< LOQ	< LOQ	< LOQ	< LOQ	< LOQ
100	94.4	< LOQ	75.4	< LOQ	68.5	< LOQ
	Fenoxaprop-P - Measured concentrations [µg/L]					
	0 d (new)	**3 d (old)**	**3 d (new)**	**10 d (old)**	**10 d (new)**	**14 d**
Control	< LOQ	< LOQ	< LOQ	< LOQ	< LOQ	< LOQ
Solvent control	< LOQ	< LOQ	< LOQ	< LOQ	< LOQ	< LOQ
100	< LOQ	21.6	< LOQ	< LOQ	< LOQ	27.5
% nominal combined parent and Fenoxaprop-P	94	22	75	0	69	27

Limit of Quantification (LOQ) = 10 µg/L (Fenoxaprop-P-ethyl and Fenoxaprop-P)

Biological effects: Plants in the control, solvent control and 100 µg/L test vessels appeared normal throughout the study.

Table B. 9.2.8-5: Mean yield for plant shoots, wet and dry weights

Nominal concentrations [µg a.s./L]	Length		Wet weight		Dry weight	
	[cm]	**% inhibition**	**[g]**	**% inhibition**	**[g]**	**% inhibition**
Control	22.3	-	1.4897	-	0.2545	-
Solvent control	18.0	-	1.0779	-	0.2049	-
Pooled controls	20.1	-	-	-	0.2297	-
100	19.1	5.0	1.2556	-16.5	0.2378	-3.5

* Statistically significant difference from control,

Conclusion: 14 d E_yC_{50} > 0.100 mg a.s./L
14 d NOEC ≥ 0.100 mg a.s./L
based on nominal concentrations

Comment RMS: The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 239 (2014).
- The mean shoot length and mean total shoot fresh weight in the control plants at least double during the exposure phase of the test.
- Control plants must not show any visual symptoms of chlorosis and should be visibly free from contamination by other organisms such as algae and/or bacterial films on the plants, at the surface of the sediment and in the test medium.
- The mean coefficient of variation of yield based on measurements of shoot fresh weight (i.e. from test initiation to test termination) in the control cultures does not

	exceed 35 % between replicates. All validity criteria were met. In addition, the following points deviated from the test guideline or were not reported in detail: -According to OECD 239 a reference substance should be tested at least twice a year. No information about reference testing is provided in the current study report. -No analytical measurement of the test substance in the sediment was conducted. - 20X AAP medium was used in the study, whereas the guideline recommends the Smart and Barko medium. - Three replicates per controls and concentration were incorporated, whereas the study recommends six replicates per controls and concentration. - The number of side shoots was not recorded in the study. The deviation to the test guideline is not considered to have an impact on the validity of the test but on the reliability of the endpoint. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.001 mg/L) mentioned. **Endpoints:** The study author determined the endpoints based on nominal concentrations. The RMS does not agree on this approach as no stable exposure could be shown. The endpoints should have been expressed on mean measured concentrations. The RMS conducted a re-evaluation based on mean measured concentrations of Fenoxaprop-P-ethyl and the metabolite Fenoxaprop-P-acid. The following endpoints (based on mean measured concentrations) were calculated. 14 d E_rC_{50} > 0.0336 mg a.s./L 14 d E_yC_{50} > 0.0336 mg a.s./L 14 d NOEC = 0.0336 mg a.s./L **Conclusion of the RMS:** Based on the evaluation of the study the macrophyte toxicity test is considered valid.

Metabolites:

Reference:	**Fenoxaprop-P: Toxicity to the Aquatic Plant *Lemna gibba* in a Static Growth inhibition Test**
Author(s), year:	Hengsberger, A., Emnet, P., 2015
Report/Doc. number:	96921240 / M-548444-01-1

Guideline(s):	OECD 221 (2006), Commission Regulation (EC) 761/2009, C.26 (2009)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-p, batch no.: AE F088406-PU-01, purity: 97.1 % w/w
Test species:	Duckweed *(Lemna gibba* G3)
Number of organisms:	12 fronds per test vessel, 36 fronds per controls and test concentrations, 3 replicates per treatment
Type of test, duration:	Static, 7 days
Applied concentrations:	
Nominal:	0 (control), 1.0, 3.2, 10, 32, 100 mg/L
Solvent:	None
Toxic reference:	3,5 Dichlorophenol
Test conditions:	
Water quality:	20X-AAP medium, pH 7.5 ± 0.1
Temperature:	23 – 24 °C
pH:	7.6 – 9.9
Light regime:	Continuous light, 7520 – 9110 lux
Methods:	The test was conducted in 250mL glass flasks, which were filled with 200 mL medium.
Test parameters:	Frond counts and abnormal appearance were visual evaluated on Days 2, 5 and 7. At test start the dry weight of a sample of fronds identical to that used to inoculate the test vessels was determined. At test end the dry weight of all plants from each vessel was determined. Measurements of pH were taken at test start and test end. Furthermore, water temperature was monitored daily in a reference vessel.
Analytical measurements:	Sampling and analysis of test concentration were carried out on test start and test end using high performance liquid chromatography.
Statistics:	EC_{50} values and confidence limits were calculated by probit analysis. NOEC-values were determined by calculation of statistical significance using William's t-test.

Findings:

Analytical measurements:	Mean measured concentrations of the test solutions were in the range of 86 to 105 % of nominal concentrations. The results are based on nominal concentrations.
Biological effects:	The shape of fronds and colonies after the test period of 7 days was not different to those in the control up to and including the nominal test concentration of 10 mg/L.

Table B. 9.2.8-6: Effects on frond number of Fenoxaprop-p

Nominal concentrations	Yield	Growth rate

[mg/L]	No.	% inhibition	Mean [d^{-1}]	% inhibition
Control	328.0	-	0.477	-
1	333.7	-1.7	0.480	-0.5
3.2	334.0	-1.8	0.480	-0.6
10	277.0	15.5*	0.454	4.9
32	270.3	17.6*	0.451	5.6*
100	95.7	70.8*	0.312	34.6*

* Statistically significant difference from control

Table B. 9.2.8-7: Effects on dry weight of Fenoxaprop-p

Nominal concentrations [mg/L]	Yield		Growth rate	
	[mg]	% inhibition	Mean [d^{-1}]	% inhibition
Control	37.5	-	0.448	-
1	38.8	-3.5	0.453	-1.1
3.2	40.6	-8.2	0.459	-2.4
10	35.0	6.7	0.438	2.2
32	35.8	4.7	0.441	1.6
100	21.1	43.9*	0.370	17.4*

* Statistically significant difference from control,

Toxic reference: The results of the toxic reference are:

$E_rC_{50\ (frond\ number)}$ = 10.0 mg/L (95% C.I.: 7.82 – 12.8 mg/L)

$E_rC_{50\ (dry\ weight)}$ = 9.37 mg/L (95% C.I.: 8.43 – 10.4 mg/L)

$E_yC_{50\ (frond\ number)}$ = 6.24 mg/L (95% C.I.: 4.87 – 7.99 mg/L)

$E_yC_{50\ (dry\ weight)}$ = 6.67 mg/L (95% C.I.: 5.55 – 8.06 mg/L)

Validity: The doubling time of fronds was 1.5 and thus less than 2.5 d (60 h).

Conclusion: $E_rC_{50\ (frond\ number)}$ > 100 mg/L (95% C.I.: n.d. – n.d.)

$E_rC_{50\ (dry\ weight)}$ > 100 mg/L (95% C.I.: n.d. – n.d.)

$E_rC_{20\ (frond\ number)}$ = 63.7 mg/L (95% C.I.: 51.7 – 72.7 mg/L)

$E_rC_{20\ (dry\ weight)}$ > 100 mg/L (95% C.I.: n.d. – n.d.)

$E_rC_{10\ (frond\ number)}$ = 40.8 mg/L (95% C.I.: 27.4 – 50.5 mg/L)

$E_rC_{10\ (dry\ weight)}$ = 66.5 mg/L (95% C.I.: 46.2 – 78.1 mg/L)

$E_yC_{50\ (frond\ number)}$ = 64.1 mg/L (95% C.I.: 51.0 – 81.8 mg/L)

$E_yC_{50\ (dry\ weight)}$ > 100 mg/L (95% C.I.: n.d. – n.d.)

$E_yC_{20\ (frond\ number)}$ = 30.1 mg/L (95% C.I.: 18.2 – 39.5 mg/L)

$E_yC_{20\ (dry\ weight)}$ = 51.6 mg/L (95% C.I.: 31.6 – 64.7 mg/L)

$E_yC_{10\ (frond\ number)}$ = 20.3 mg/L (95% C.I.: 9.95 – 28.9 mg/L)

$E_yC_{10\ (dry\ weight)}$ = 33.6 mg/L (95% C.I.: 14.7 – 46.8 mg/L)

$NOE_rC_{(frond\ number)}$ = 10 mg/L

$NOE_rC_{(dry\ weight)}$ = 32 mg/L

$NOE_yC_{(frond\ number)}$ = 3.2 mg/L

	$NOE_yC_{(dry\ weight)}$ = 32 mg/L based on nominal concentrations
Comment RMS:	The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 221 (2006). - The doubling time of frond number in the control must be less than 2.5 days (60h), corresponding to approximately a seven-fold increase in seven days and an average specific growth rate of 0.275 d^{-1}. All validity criteria were met; hence. In addition, the following points deviated from the test guideline or were not reported in detail: - No statistical analysis is presented in the study report. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.4 mg/L) mentioned. **Endpoints:** The RMS agrees on the EC_{50} values given in the study report. $E_rC_{50\ (frond\ number)}$ > 100 mg/L (95% C.I.: n.d. – n.d.) $E_rC_{50\ (dry\ weight)}$ > 100 mg/L (95% C.I.: n.d. – n.d.) $E_yC_{50\ (frond\ number)}$ = 64.1 mg/L (95% C.I.: 51.0 – 81.8 mg/L) $E_yC_{50\ (dry\ weight)}$ > 100 mg/L (95% C.I.: n.d. – n.d.) based on nominal concentrations. **Conclusion of the RMS:** Based on the evaluation of the study the macrophyte toxicity test is considered valid.

Reference:	**BCS-AB16188: Toxicity to the aquatic Plant *Lemna gibba* in a Semi-Static Growth Inhibition Test**
Author(s), year:	Börschig, C., Emnet, P., 2015d
Report/Doc. number:	EBFPN040 / M-536554-01-1
Guideline(s):	OECD 221 (2006), Commission Regulation (EC) 761/2009, C.26 (2009)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	BCS-AB16188 (AE F040356), batch no.: GSE 61869-2-2, purity: 97 % w/w
Test species:	Duckweed *(Lemna gibba* G3)
Number of organisms:	12 fronds per test vessel, 36 fronds per controls and test concentrations, 3

	replicates per treatment
Type of test, duration:	Semi-static, 7 days
Applied concentrations:	
Nominal:	0 (control), 2.558, 6.41, 16, 40, 100 mg/L
Solvent:	None
Toxic reference:	3,5 Dichlorophenol
Test conditions:	
Water quality:	20X-AAP medium, pH: 6.0
Temperature:	22 – 23 °C
pH:	6.0 – 7.0
Light regime:	Continuous light, 6580 – 7340 lux
Methods:	The test was conducted in 250mL glass flasks, which were filled with 200 mL medium. The test substance was renewed at days 2 and 5.
Test parameters:	Frond counts and abnormal appearance were visual evaluated on Days 2, 5 and 7. At test start the dry weight of a sample of fronds identical to that used to inoculate the test vessels was determined. At test end the dry weight of all plants from each vessel was determined. Measurements of pH were taken at all freshly prepared and aged test media. Furthermore, temperature was monitored daily in a reference vessel.
Analytical measurements:	Sampling and analysis of test concentration were carried out on test start, at every renewal period and test end using high performance liquid chromatography.
Statistics:	EC_{50} values and confidence limits were calculated by probit analysis. NOEC-values were determined by calculation of statistical significance using William's t-test.
Findings:	
Analytical measurements:	Mean measured concentrations of the test solutions were in the range of 2 to 3 % of nominal concentrations. The results are based on mean measured concentrations.
Biological effects:	The shape of fronds and colonies after the test period of 7 days was not different to those in the control up to and including the mean measured test concentration of 1.21 mg/L. At the 7 days observation at the highest test item concentrations of 2.70 mg/L the fronds showed slightly overlapping fronds and a slight chlorosis.

Table B. 9.2.8-8: Effects on frond number of AE F040356

Mean measured concentrations [mg/L]	Yield		Growth rate	
	No.	% inhibition	Mean [d^{-1}]	% inhibition
Control	212.3	-	0.418	-
0.049	185.7	12.6	0.400	4.5
0.137	203.0	4.4	0.412	1.6
0.359	166.3	21.7*	0.385	7.8*
1.21	168.0	20.9*	0.387	7.5*

Mean measured concentrations [mg/L]	Yield		Growth rate	
2.70	142.0	33.1*	0.364	12.9*

* Statistically significant difference from control

Table B. 9.2.8-9: Effects on dry weight of AE F040356

Mean measured concentrations [mg/L]	Yield		Growth rate	
	[mg]	% inhibition	Mean [d^{-1}]	% inhibition
Control	47.2	-	0.407	-
0.049	45.9	2.7	0.403	1.0
0.137	46.8	0.7	0.405	0.4
0.359	42.5	9.9	0.393	3.4
1.21	45.2	4.2	0.401	1.5
2.70	39.4	16.5*	0.383	5.9*

* Statistically significant difference from control,

Toxic reference: The results of the toxic reference are:

$E_rC_{50\ (frond\ number)}$ = 7.68 mg/L (95% C.I.: 7.32 – 8.05 mg/L)

$E_rC_{50\ (dry\ weight)}$ = 7.10 mg/L (95% C.I.: 6.89 – 7.32 mg/L)

$E_yC_{50\ (frond\ number)}$ = 4.98mg/L (95% C.I.: 4.41 – 5.61 mg/L)

$E_yC_{50\ (dry\ weight)}$ = 5.85 mg/L (95% C.I.: 5.55 – 6.41 mg/L)

Validity: The doubling time of fronds was 1.7 and thus less than 2.5 d (60 h).

Conclusion: $E_rC_{50\ (frond\ number)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.)

$E_rC_{50\ (dry\ weight)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.)

$E_rC_{20\ (frond\ number)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.)

$E_rC_{20\ (dry\ weight)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.)

$E_rC_{10\ (frond\ number)}$ = 1.50 mg/L (95% C.I.: 0.938 – > 2.70 mg/L)

$E_rC_{10\ (dry\ weight)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.)

$E_yC_{50\ (frond\ number)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.)

$E_yC_{50\ (dry\ weight)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.)

$E_yC_{20\ (frond\ number)}$ = 0.552 mg/L (95% C.I.: 0.301 – 0.898 mg/L)

$E_yC_{20\ (dry\ weight)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.)

$E_yC_{10\ (frond\ number)}$ = 0.071 mg/L (95% C.I.: < 0.049 – 0.155 mg/L)

$E_yC_{10\ (dry\ weight)}$ = 0.960 mg/L (95% C.I.: n.d. – n.d.)

$NOE_rC_{(frond\ number)}$ = 0.137 mg/L

$NOE_rC_{(dry\ weight)}$ = 1.21 mg/L

$NOE_yC_{(frond\ number)}$ = 0.137 mg/L

$NOE_yC_{(dry\ weight)}$ = 1.21 mg/L

based on mean measured concentrations

Comment RMS:	The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 221 (2006). - The doubling time of frond number in the control must be less than 2.5 days (60h), corresponding to approximately a seven-fold increase in seven days and an average specific growth rate of 0.275 d^{-1}. All validity criteria were met; hence. **Acceptability of the analytical methods used in the test:** Evaluation of the analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.001 mg/L) mentioned. **Endpoints:** The RMS agrees on the EC_{50} values given in the study report. $E_rC_{50\ (frond\ number)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.) $E_rC_{50\ (dry\ weight)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.) $E_yC_{50\ (frond\ number)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.) $E_yC_{50\ (dry\ weight)}$ > 2.70 mg/L (95% C.I.: n.d. – n.d.) based on mean measured concentrations **Conclusion of the RMS:** Based on the evaluation of the study the macrophyte toxicity test is considered valid.

Reference:	**BCS-CY11271: Toxicity to the Aquatic Plant *Lemna gibba* in a Semi-Static Growth Inhibition Test**
Author(s), year:	Kuhl, R., Emnet, P., 2015c
Report/Doc. number:	EBFPN007 / M-553341-01-1
Guideline(s):	OECD 221 (2006), Commission Regulation (EC) 761/2009, C.26 (2009)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	BCS- CY11271, batch no.: GSE 61479-2-3, purity: 99.2 % w/w
Test species:	Duckweed *(Lemna gibba* G3)
Number of organisms:	12 fronds per test vessel, 36 fronds per controls and test concentrations, 3 replicates per treatment
Type of test, duration:	Semi-static, 7 days
Applied concentrations:	
Nominal:	0 (control), 1:81, 1:27, 1:9, 1:3, 100 mg/L
Solvent:	None
Toxic reference:	3,5 Dichlorophenole

Test conditions:

Water quality: 20X-AAP medium, pH: 6.0 – 6.2

Temperature: 22 – 24 °C

pH: 6.2 – 7.2

Light regime: Continuous light, 7350 – 9140 lux

Methods: The test was conducted in 250mL glass flasks, which were filled with 200 mL medium. The test substance was renewed at days 3 and 5.

Test parameters: Frond counts and abnormal appearance were visual evaluated on Days 3, 5 and 7. At test start the dry weight of a sample of fronds identical to that used to inoculate the test vessels was determined. At test end the dry weight of all plants from each vessel was determined.

Measurements of pH were taken at all freshly prepared and aged test media. Furthermore, temperature was monitored daily in a reference vessel.

Analytical measurements: Sampling and analysis of test concentration were carried out on test start, at every renewal period and test end using high performance liquid chromatography.

Statistics: EC_{50} values and confidence limits were calculated by non-linear regression. NOEC-values were determined by calculation of statistical significance using William's t-test.

Findings:

Analytical measurements: The test item did not remain stable in all test concentrations over the course of the test. The results are based on geometric mean measured concentrations.

Biological effects: The shape of fronds and colonies after the test period of 7 days was not different to those in the control up to and including the mean measured test concentration of 0.505 mg/L. At the 7 days observation at the higher test item concentrations the fronds showed gibbous growth, shortened roots, chlorosis and smaller fronds.

Table B. 9.2.8-10: Effects on frond number of BCS- CY11271

Nominal concentrations [mg/L]	Yield		Growth rate	
	No.	% inhibition	Mean [d^{-1}]	% inhibition
Control	247.0	-	0.438	-
0.146	233.7	5.4	0.431	1.6
0.505	260.7	-5.5	0.445	-1.5
2.09	238.3	3.5	0.433	1.1
8.26	167.3	32.3*	0.386	12.0*
29.4	49.0	80.2*	0.232	47.1*

* Statistically significant difference from control

Table B. 9.2.8-11: Effects on dry weight of BCS- CY11271

Nominal concentrations [mg/L]	Yield		Growth rate	
	[mg]	% inhibition	Mean [d^{-1}]	% inhibition
Control	43.0	-	0.484	-
0.146	41.3	4.0	0.479	1.1

Nominal concentrations [mg/L]	Yield		Growth rate	
0.505	46.5	-8.2	0.494	-2.0
2.09	41.3	3.9	0.478	1.1
8.26	31.4	26.8*	0.441	8.9*
29.4	12.9	70.1*	0.322	33.4*

* Statistically significant difference from control,

Toxic reference: The results of the toxic reference are:

$E_rC_{50\ (frond\ number)}$ = 7.68 mg/L (95% C.I.: 7.32 – 8.05 mg/L)

$E_rC_{50\ (dry\ weight)}$ = 7.10 mg/L (95% C.I.: 6.89 – 7.32 mg/L)

$E_yC_{50\ (frond\ number)}$ = 4.98mg/L (95% C.I.: 4.41 – 5.61 mg/L)

$E_yC_{50\ (dry\ weight)}$ = 5.85 mg/L (95% C.I.: 5.55 – 6.41 mg/L)

Validity: The doubling time of fronds was 1.6 and thus less than 2.5 d (60 h).

Conclusion: $E_rC_{50\ (frond\ number)}$ > 29.4 mg/L (95% C.I.: n.d. – n.d.)

$E_rC_{50\ (dry\ weight)}$ > 29.4 mg/L (95% C.I.: n.d. – n.d.)

$E_rC_{20\ (frond\ number)}$ = 12.2 mg/L (95% C.I.: 8.98 – 16.4 mg/L)

$E_rC_{20\ (dry\ weight)}$ = 16.4 mg/L (95% C.I.: 11.9 – 22.9 mg/L)

$E_rC_{10\ (frond\ number)}$ = 7.33 mg/L (95% C.I.: 5.38 – 10.0 mg/L)

$E_rC_{10\ (dry\ weight)}$ = 8.89 mg/L (95% C.I.: 6.49 – 12.2 mg/L)

$E_yC_{50\ (frond\ number)}$ = 12.9 mg/L (95% C.I.: 5.88 – 27.8 mg/L)

$E_yC_{50\ (dry\ weight)}$ = 16.0 mg/L (95% C.I.: 6.80 – > 29.4 mg/L)

$E_yC_{20\ (frond\ number)}$ = 5.69 mg/L (95% C.I.: 3.02 – 10.8 mg/L)

$E_yC_{20\ (dry\ weight)}$ = 6.14 mg/L (95% C.I.: 3.12 – 12.2 mg/L)

$E_yC_{10\ (frond\ number)}$ = 3.71 mg/L (95% C.I.: 1.88 – 7.35 mg/L)

$E_yC_{10\ (dry\ weight)}$ = 3.72 mg/L (95% C.I.: 1.80 – 7.70 mg/L)

$NOE_rC_{(frond\ number)}$ = 2.09 mg/L

$NOE_rC_{(dry\ weight)}$ = 2.09 mg/L

$NOE_yC_{(frond\ number)}$ = 2.09 mg/L

$NOE_yC_{(dry\ weight)}$ = 2.09 mg/L

based on geometric mean measured concentrations.

Comment RMS: The study was evaluated following the recommendations of the currently valid test guideline, the OECD test guideline 221 (2006).

- The doubling time of frond number in the control must be less than 2.5 days (60h), corresponding to approximately a seven-fold increase in seven days and an average specific growth rate of 0.275 d^{-1}.

All validity criteria were met; hence.

Acceptability of the analytical methods used in the test: Evaluation of the

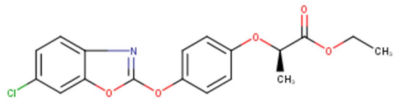
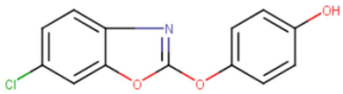
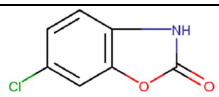
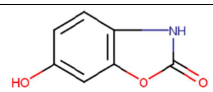
	analytical methods (water/sediment/soil) according to the Guidance Document SANCO/3029/99 rev. 4. Based in the evaluation (see B.5 (AS), B.5.1.2.2) the analytical method is considered acceptable covering the LOQ (= 0.0025 mg/L) mentioned. **Endpoints:** The RMS agrees on the EC_{50} values given in the study report. $E_rC_{50\ (frond\ number)}$ > 29.4 mg/L $E_rC_{50\ (dry\ weight)}$ > 29.4 mg/L $E_yC_{50\ (frond\ number)}$ = 12.9 mg/L $E_yC_{50\ (dry\ weight)}$ = 16.0 mg/L based on geometric mean measured concentrations. **Conclusion of the RMS:** Based on the evaluation of the study the macrophyte toxicity test is considered valid.

B.9.2.9. Further testing on aquatic organisms

Reference:	**Ecotoxicological predictions for Fenoxaprop-P-ethyl and its metabolites M1, M2 and M7 using QSARs**
Author(s), year:	Vrbka, S., Christl, H., 2016
Report/Doc. number:	A15059a / M-553334-01-1

Methods & models:

Table B. 9.2.9-1: Names and structures of the Fenoxaprop-P-ethyl metabolites

Code / Name	IUPAC names/SMILES notation/Molecular Weight/Molecular Formula	Structure
Fenoxaprop-P-ethyl	ethyl (2*R*)-2-{4-[(6-chloro-1,3-benzoxazol-2-yl)oxy]phenoxy}propanoate CCOC(=O)C(C)OC1=CC=C(OC2=NC3=C(O2)C=C(Cl)C=C3)C=C1 361.8 $C_{18}H_{16}ClNO_5$	
M1 / Phenol	4-[(6-chloro-1,3-benzoxazol-2-yl)oxy]phenol OC1=CC=C(OC2=NC3=C(O2)C=C(Cl)C=C3)C=C1 261.7 $C_{13}H_8ClNO_3$	
M2 / Chlorobenzoxazolone	6-chloro-2,3-dihydro-1,3-benzoxazol-2-one ClC1=CC2=C(NC(=O)O2)C=C1 169.6 $C_7H_4ClNO_2$	
M7 / 6-hydroxy-benzoxazolone	6-hydroxy-2,3-dihydro-1,3-benzoxazol-2-one OC1=CC2=C(NC(=O)O2)C=C1 151.1 $C_7H_5NO_3$	

(Q)SAR ECOSAR, VEGA (former DEMETRA), OECD QSAR Toolbox, ChemProp,

approaches/models/methods: expert systems (Escher et al.), a read-across approach and a partial least squares model.

ECOSAR:

Input parameters: Fenoxaprop-P-ethyl:

log K_{ow} = 4.58 (pH 7, experimental value)

water solubility = 0.7 mg/L (20°C, pH 5.8, experimental value)

M1:

log K_{ow} = 3.1 (pH 7, experimental value)

water solubility = 2.0 mg/L (pH 7, experimental value)

M2:

log K_{ow} = 1.5 (pH 7, experimental value)

water solubility = 248 mg/L (pH 7, experimental value)

M7:

log K_{ow} = 1.0 (pH 7, experimental value)

water solubility = 150 mg/L (pH 7, experimental value)

The results are based on SMILES codes of the substances, automated substructure search and experimentally determined log K_{ow} values.

VEGA:

The results are based on 2D structure of the substances, descriptors calculated with the model itself and automated substructure search.

ChemProp:

Input parameters:

Substance	**log Kow (at pH 7)**	**Water solubility * (at pH 7) [g/L]**
Fenoxaprop-P-ethyl	4.58	0.0007
M1	3.1	0.002
M2	1.5	0.248
M7	1.0	0.150

* only used to check whether a calculated toxicity exceeds Sw more than 0.5 logarithmic units

The results are based on 2D structure of the substances, automated substructure search and experimentally determined log K_{ow} values.

Escher approach:

The results are based on baseline toxicity of parent compound and of metabolites, calculated with either ECOSAR or ChemProp, and on an experimental value of parent compound.

Read-across approach within ChemProp model:

Input parameters: The same input parameters as for ChemProp are used.

The results are based in 2D structure of the substances, automated substructure search, and experimentally determined log K_{ow} values.

PLS (partial least squares) model:

The results are based in standard descriptors calculated with Dragon 6 and fingerprint descriptors from UNITY (Certara). The QSAR was built from compounds selected from the PPDB by a similarity search with Tanimoto-similarity > 0.35 to Fenoxaprop-P-ethyl.

OECD QSAR Toolbox:

Profiling: Protein binding by OASIS v.1.3 – mechanistic grouping
Acute aquatic toxicity classification by Verhaar (modified) – grouping by reactivity
Acute aquatic toxicity MOA by OASIS – mechanistic grouping
ECOSAR – for structural grouping
Organic functional groups

Endpoint: Aquatic ECETOC
Aquatic Japan MoE
Aquatic OASIS
ECOTOX

Category definition: Aquatic toxicity classification by ECOSAR

Findings:

Application domain: organic chemicals with average MW < 1000

Table B. 9.2.9-2: Chemical classes suggested with ECOSAR

Substance	Chemical class	Applicable to the substance?	Is the data for the class robust enough?
Fenoxaprop-P-ethyl	Esters	Yes	Yes
M1	Phenol	Yes	Yes
M2	Carbamate Esters, Phenyl	Yes	Yes (algae acute & fish chronic)
M7	Carbamate Esters, Phenyl	Yes	Yes (algae acute & fish chronic)
	Phenol	Yes	Yes

Table B. 9.2.9-3: QSAR predictions for Fenoxaprop-P-ethyl - lowest reliable and regulatory relevant endpoints based on different models, and experimental endpoints

Fenoxaprop-P-ethyl			The lowest predicted endpoint	Experimental values (Sponsor DATA)
			[mg/L]	[mg/L]
Fish, acute	96 h	LC_{50}	0.128	0.19
Daphnid, acute	48 h	EC_{50}	0.037#	1.06
Algae, acute	96 h	EC_{50}	0.672*	0.345 (72h, E_bC_{50})
Fish, chronic	-	chronic	0.066*	0.036

Daphnid, chronic	-	chronic	0.09	0.22

Much lower than the experimental value (> factor 3) hence very conservative QSAR prediction.

* Slightly higher than the experimental value (factor < 2, so still within inter-lab variability[2]).

Table B. 9.2.9-4: QSAR predictions for the metabolite M1 - lowest reliable and regulatory relevant endpoints based on different QSAR models, and experimental endpoints

Metabolite M1			The lowest predicted endpoint	Experimental values (Sponsor DATA)
			[mg/L]	[mg/L]
Fish, acute	96 h	LC_{50}	0.714*	0.59
Daphnid, acute	48 h	EC_{50}	0.762	1.75
Algae, acute	96 h	EC_{50}	2.64	>3.3 (72h, E_rC_{50})
Fish, chronic	-	chronic	0.474	No data
Daphnid, chronic	-	chronic	0.43	No data

* Slightly higher than the experimental value (factor < 2, so still within inter-lab variability[3]).

Table B. 9.2.9-5: QSAR predictions for the metabolite M2 - lowest reliable and regulatory relevant endpoints based on different QSAR models, and experimental endpoints

Metabolite M2			The lowest predicted endpoint	Experimental values (Sponsor DATA)
			[mg/L]	[mg/L]
Fish, acute	96 h	LC_{50}	10.1	> 9.22
Daphnid, acute	48 h	EC_{50}	0.301#	6.6
Algae, acute	96 h	EC_{50}	5.09	>9.9 (72h, E_rC_{50})
Fish, chronic	-	chronic	0.891	No data
Daphnid, chronic	-	chronic	0.16	No data

Much lower than the experimental value (> factor 3) hence very conservative QSAR prediction.

Table B. 9.2.9-6: QSAR predictions for the metabolite M7 - lowest reliable and regulatory relevant endpoints based on different QSAR models, and experimental endpoints

Metabolite M7			The lowest predicted endpoint	Experimental values (Sponsor DATA)
			[mg/L]	[mg/L]
Fish, acute	96 h	LC_{50}	37.6	No data
Daphnid, acute	48 h	EC_{50}	9.48*	3.48
Algae, acute	96 h	EC_{50}	8.16#	>100 (72h, E_rC_{50})
Fish, chronic	-	chronic	1.53	No data
Daphnid, chronic	-	chronic	3.01	No data

* Slightly higher than the experimental value (factor < 2, so still within inter-lab variability[3]).

Much lower than the experimental value (> factor 3) hence very conservative QSAR prediction.

[2] Inter-lab variability varies slightly between different test systems, but is overall considered to be a factor of ca. three. This factor is derived from various ring tests, see e.g. Commission of the European Communities: study D8369, (1979); ISO 6341:1996; OECD (2008); further examples can be found in VanHaecke & Persoone (1981 and 1984); Grothe & Kimerle (1985); Busquet et al. (2014) and OECD (1997).

[3] Inter-lab variability varies slightly between different test systems, but is overall considered to be a factor of ca. three. This factor is derived from various ring tests, see e.g. Commission of the European Communities: study D8369, (1979); ISO 6341:1996; OECD (2008); further examples can be found in VanHaecke & Persoone (1981 and 1984); Grothe & Kimerle (1985); Busquet et al. (2014) and OECD (1997).

Conclusion:	Acute endpoints for fish, Daphnia and algae and chronic endpoints for fish and Daphnia were estimated for the parent molecule and the metabolites M1, M2 and M7 using QSARs. Some QSAR endpoints are not relevant for the risk assessment, as experimental data are available for these. However, comparison of QSAR predicted and measured endpoints indicate that the predicted toxicity was overall similar to experimental data. In cases where it differed by more than a factor of three the predicted toxicity value was always lower than the experimental endpoint, thus more conservative. Hence, the final QSAR estimates (lowest reliable endpoint) are considered to be suitable as basis for an initial conservative estimation of toxicity of the metabolites M1, M2 and M7 to fish, Daphnia and algae.

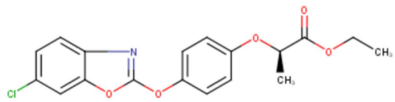
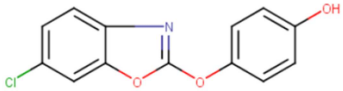
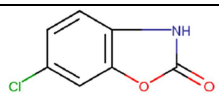
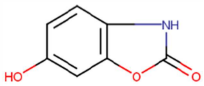
Comment RMS:	Ecotoxicological predictions of Fenoxaprop-P-ethyl and the metabolites Phenol, Chlorobenzoxazolone and 6-hydroxybenzoxazolone were conducted. Different QSAR estimations were provided and the lowest reliable value determined. It is noted that for Fenoxaprop-P-ethyl except for acute fish and daphnids, all predicted endpoints were higher than the values experimentally derived considering that the lowest experimental endpoints have changed during the evaluation of the RMS. The following approach is proposed for derivation of endpoints: For Phenol and Chlorobenzoxazolone the estimated acute values were lower for daphnids and algae and slightly higher for fish compared to the experimentally derived data. No chronic experimental data for the metabolites are available. However, the chronic predicted values were higher compared to the experimental data of Fenoxaprop-P-ethyl. The RMS proposes to use the experimentally derived values of Fenoxaprop-P-ethyl in the risk assessment for Phenol and Chlorobenzoxazolone. The metabolite 6-hydroxybenzoxazolone will not be assessed in the risk assessment however, the same approach as for Phenol and Chlorobenzoxazolone is proposed. The predicted value of algae is lower and for daphnids higher compared to the experimental data of the metabolite. No experimental data are available for acute fish and chronic fish and daphnids. Therefore the RMS proposes that the experimentally derived values for Fenoxaprop-P-ethyl can be used for this compound.

Reference:	**Fenoxaprop-P-ethyl and its metabolites M1, M2 and M7 Prediction of chronic Daphnia endpoints by Quantitative Structure Activity Relations (QSAR)**
Author(s), year:	Schindler, M., 2016
Report/Doc. number:	EnSa-16-0069 / M-553173-01-1

Methods & models:

For the prediction of chronic endpoint values (NOEC) for Daphnia, standard software tools (ECOSAR) are available. However, the predictions are restricted to a few compound classes only, excluding some of the metabolites of Fenoxaprop-P-ethyl. Therefore in-house QSARs were developed as described below. The algorithm chosen for model building is Partial Least Squares (PLS).

Table B. 9.2.9-7: Names and structures of Fenoxaprop-P-ethyl and metabolites

Code / Name	IUPAC names/SMILES notation/Molecular Weight/Molecular Formula	Structure
Fenoxaprop-P-ethyl	ethyl (2*R*)-2-{4-[(6-chloro-1,3-benzoxazol-2-yl)oxy]phenoxy}propanoate CCOC(=O)C(C)OC1=CC=C(OC2=NC3=C(O2)C=C(Cl)C=C3)C=C1 361.8 $C_{18}H_{16}ClNO_5$	
M1 / Phenol	4-[(6-chloro-1,3-benzoxazol-2-yl)oxy]phenol OC1=CC=C(OC2=NC3=C(O2)C=C(Cl)C=C3)C=C1 261.7 $C_{13}H_8ClNO_3$	
M2 / Chlorobenzoxazolone	6-chloro-2,3-dihydro-1,3-benzoxazol-2-one ClC1=CC2=C(NC(=O)O2)C=C1 169.6 $C_7H_4ClNO_2$	
M7 / 6-hydroxy-benzoxazolone	6-hydroxy-2,3-dihydro-1,3-benzoxazol-2-one OC1=CC2=C(NC(=O)O2)C=C1 151.1 $C_7H_5NO_3$	

Two equivalent QSAR PLS models for the prediction of chronic daphnia endpoints have been generated. New QSARs were developed because it turned out that the applicability domain of the QSARs available on the market did not include the whole set of metabolites under investigation.

The new QSARs are based on a set of 95 (89) compounds in total, selected from the PPDB by similarity/diversity considerations. The new QSARs are characterized by their number of latent variables (LV=1), their quality of fit and their quality of prediction.

Suitability and appropriatness: The assessment of suitability and appropriatness of a QSAR for a specific compound is possible by calculating the probability PModX of belonging to the applicability domain of the QSAR.

Results:

Quality of fit: r^2 =0.740 (n = 95)

	r^2=0.830 (n = 89),
Qualtity of prediction:	q^2=0.735 (n = 95)
	q^2 = 0.821 (n = 89)
	For consistency reasons the n = 95 model has to be preferred over the n = 89 QSAR model.
Suitability and appropriatness:	For all metabolites the membership probability exceeds the critical limit of PModX = 0.05.
Conclusion:	The predicted chronic Daphnia endpoints (NOEC values) for the Fenoxaprop-P-ethyl metabolites M1, M2 and M7 are 0.43, 0.16 and 3.01 mg/L, respectively.

Comment RMS:	Predictions on the chronic Daphnia endpoints for Fenoxaprop-P-ethyl and its metabolites were conducted. For the proposal of the RMS, please refer to the commenting box above.

B.9.3. EFFECTS ON ARTHROPODS

B.9.3.1. Effects on bees

B.9.3.1.1. Acute toxicity to adult honeybees

Studies on the acute oral and contact toxicity of the Fenoxaprop-P-ethyl were already submitted for the first EU approval of the active substance. In addition, new acute oral and contact toxicity studies were submitted addressing the acute risk to adult honey-bees which are also evaluated below.

Reference:	**Toxicity to the honeybee *Apis mellifera* L. (laboratory) according to EPPO Guideline No. 170 (1992)**
Author(s), year:	KIeiner, R., 2000
Report/Doc. number:	C006598 / M-194261-01-1
Guideline(s):	EPPO Guideline No. 170 (1992)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and Methods:

Test substance:	Fenoxaprop-P-ethyl tech., Batch no.: AALC00028, Content : 96.2% w/w
Reference:	Dimethoate EC 400, Batch no.: 98-1, Content : 395.7 g/L
Solvent:	Acetone
Test species:	*Apis mellifera* L., adult worker honeybees
Type of test:	Acute oral and contact toxicity test
Number of organisms:	Five replicates with 10 bees for control and the test item treatment groups
Food:	Candy (mixture of sugar and honey -3:1 w/w) and water
Oral toxicity test:	
Applied concentrations:	Control: 50 % (w/w) aqueous sucrose solution with solvent Test item: 100 and 200 µg a.s./bee
Exposure route:	The test item was dissolved in acetone and a 50 % sucrose solution and offered to the bees.
Test conditions:	Temperature: 25 °C ± 2 °C, Relative humidity: 54 - 85 %,
Test parameter:	Mortality counts and checks for behavioural abnormalities were made after exposure for 4, 24, and 48 h.
Contact toxicity test:	
Applied concentrations:	Control: 50 % (w/w) aqueous sucrose solution with solvent Test item: 100 and 200 µg a.s./bee

Test parameter: The test compounds were dissolved in acetone. Bees anaesthetized with CO_2 were treated individually by topical application of the test solution with an Eppendorf Micropipette. 1 µl of the test substance solution or 1 µl of the reference solution were applied to the ventral thorax of each bee. In the control variant 1 µl acetone was applied.

After application, the treated bees were returned to the test cages which were supplied with wate and food tubes (with candy), and transferred to the test room.

Test conditions: Temperature: 25 °C ± 2 °C, Relative humidity: 54 - 85 %

Test parameter: Mortality counts and checks for behavioural abnormalities were made after exposure for 4, 24, and 48 h.

Findings:

Biological results: Oral toxicity test: no test item induced behavioural effects were observed at any time in the contact toxicity test.

Contact toxicity test: No behavioural effects were observed at any time in the contact toxicity test..

Table B. 9.3.1.1-1: Effects of Fenoxaprop-P-ethyl tech. on *Apis mellifera* following 48-h oral exposure in an acute toxicity test

Nominal dose [µg a.s./bee]	Mortality [%] (no. dead bees/no. treated bees)		
	4 h	24 h	48 h
Study 1			
Control (sucrose solution)	0 (0/50)	0 (0/50)	0 (0/50)
Treatment			
100	0 (0/50)	0 (0/50)	0 (0/50)
200	0 (0/50)	0 (0/50)	0 (0/50)
Study 2			
Control (sugar solution + 10% acetone)	0 (0/50)	0 (0/50)	0 (0/50)
Treatment			
100	0 (0/50)	0 (0/50)	0 (0/50)
200	0 (0/50)	0 (0/50)	0 (0/50)
Reference item			
0.001	0 (0/50)	0 (0/50)	6 (3/50)
0.0012	0 (0/50)	10 (5/50)	20 (10/50)
0.0014	0 (0/50)	12 (6/50)	30 (15/50)
0.0016	0 (0/50)	36 (18/50)	48 (24/50)
0.0018	0 (0/50)	60 (30/50)	70 (35/50)
0.002	0 (0/50)	76 (38/50)	88 (44/50)
Test substance: 24h / 48h LD_{50} > 200 µg a.s./bee			

Table B. 9.3.1.1-2: Effects of Fenoxaprop-P-ethyl tech. on *Apis mellifera* following 48-h contact exposure in an acute toxicity test

Nominal dose [µg a.s./bee]	Mortality [%] (no. dead bees/no. treated bees)		
	4 h	24 h	48 h
Study 1			
Control (sugar solution + 10% acetone)	0 (0/50)	0 (0/50)	0 (0/50)
Treatment			
100	0 (0/50)	0 (0/50)	0 (0/50)
200	0 (0/50)	0 (0/50)	0 (0/50)
Study 2			
Treatment			
100	0 (0/50)	0 (0/50)	0 (0/50)
200	0 (0/50)	0 (0/50)	0 (0/50)
Reference item			
0.00313	0 (0/50)	0 (0/50)	0 (0/50)
0.000625	0 (0/50)	2 (1/50)	4 (2/50)
0.0125	0 (0/50)	4 (2/50)	10 (5/50)
0.025	0 (0/50)	36 (18/50)	50 (25/50)
0.05	28 (14/50)	90 (45/50)	90 (45/50)
0.1	98 (49/50)	100 (50/50)	100 (50/50)
Test substance: 24h / 48h LD_{50} > 200 µg a.s./bee			

Conclusions: 48 h LD_{50} > 200 µg a.s./bee (oral toxicity)
48 h LD_{50} > 200 µg a.s./bee (contact toxicity)

Comment RMS: **Validity**: The study was conducted according to the EPPO Guidline No. 170 (1992). According to this guideline the mortality should be ≤ 15%.
The mean mortality of the control in the oral and contact toxicity test was 0 % which is in the line with the recommended maximum mortality of 10 % according to the current OECD guidelines (OECD 213 and 214 (1998)).
The 24 h LD_{50} values of the reference item (dimethoate) in the oral (24 h LD_{50} = 0.34 µg a.s./bee) and contact (24 h LD_{50} = 0.28 µg a.s./bee) toxicity tests were within the recommended range of 0.10 – 0.35 µg a.s./bee (oral) and 0.10 – 0.30 µg a.s./bee (contact), respectively.

All validity criteria according to the OECD test guideline are met taking into account the contact and oral toxicity tests.

Some minor deviations to the OECD guidelines were identified. However, these

	deviations are not considered of relevance for the results of the acute oral and contact toxicity test. The relative humidity in the oral and contact toxicity test is between 54 and 85% which is above the recommendations given in the OECD guidelines (relative humidity between 50 and 70%). Based on the results of the oral and contact toxicity test the deviation of relative humidity is considered to have no impact on the honeybees. Furthermore the bees were starved 1-2 hours bevore the application, according to the guideline at least 2 hours starvation is recommended. **Acceptability of the analytical methods used in the test:** Not required according to the OECD test guideline. **Endpoints:** The RMS agrees on the endpoints given in the study report. 48 h LD_{50} (oral) > 200 µg a.s./bee 48 h LD_{50} (contact) > 200 µg a.s./bee **Conclusion of the RMS:** The study was well conducted and in line with the guidelines. Hence, the RMS is of the opinion, that the study should be used in the risk assessment.

Reference:	**Effects of Fenoxaprop-P-ethyl tech. (acute and oral) on honey bees (Apis mellifera L.) in the laboratory**
Author(s), year:	Sekine, T., 2013
Report/Doc. number:	81631035 / M-470702-01-1
Guideline(s):	OECD 213 and 214 (1998)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and Methods:

Test substance:	Fenoxaprop-P-ethyl tech., Batch no. : BCHR1736-1, Content : 97.3% w/w
Reference:	Perfekthion EC (400 g/L Dimethoate (nom.))
Solvent:	Acetone
Test species:	*Apis mellifera* L., adult worker honeybees
Type of test:	Acute oral and contact limit test
Number of organisms:	Five replicates with 10 bees for the test item treatment and for the control groups
Food:	Commercial ready-to-use sugar syrup (Apiinvert; 30 % sucrose, 31 % glucose, 39 % fructose) *ad libitum*.
Oral toxicity test:	
Applied concentrations:	Control: 20% (w/w) aqueous sucrose solution with solvent and water control

	Test item: 100 µg a.s./bee
Exposure route:	Appropriate amounts of Fenoxaprop-P-ethyl tech. dilutions in acetone were mixed with sugar syrup in order to achieve the required test concentrations in a final dilution of 50 % sugar syrup solution (45 % water, 50 % sugar syrup and 5 % acetone (w/w)). The final concentration of sugar syrup in the aqueous test solutions offered to the bees was 50 % (w/w). For the solvent control, the same proportion of sugar syrup, water and acetone was used; for the water control and reference item tap water and sugar syrup was used at the same ratio 50 % (w/w) tap water, 50 % (w/w) ready-to-use sugar syrup. The treated food was offered in syringes, which were weighed before and after introduction into the cages (duration of uptake was 3 hours 45 minutes for the test item treatments). After a maximum of 3 hours 45 minutes, the uptake was complete and the syringes containing the treated food were removed, weighed and replaced by ones containing fresh, untreated food. The mean target dose levels (e.g. 100 µg a.s./bee nominal) would have been obtained if exactly 20 mg/bee of the treated food were ingested. In practice, uptake of the treated sugar syrup solutions differed slightly from the nominal 20 mg/bee and results are given based on the measured consumption.
Test conditions:	Temperature: 24 °C ± 1°C, Darkness (except during observation)
Test parameter:	Mortality counts and behavioural abnormalities (e.g. vomiting, apathy, intensive cleaning) were made after exposure for 24 and 48 h.
Contact toxicity test:	
Applied concentrations:	Control: 20% (w/w) aqueous sucrose solution with solvent and water control Test item: 100 µg a.s./bee
Exposure route:	Test item was applied as one 5 µL droplet of Fenoxaprop-P-ethyl tech. dissolved in Acetone, placed on the dorsal bee thorax using a Burkard – Applicator. The reference item was applied as one 5 µL droplet of dimethoate dissolved in tap water containing 0.5 % Adhäsit. For the controls, one 5 µL droplet of a) tap water containing 0.5 % Adhäsit and b) pure acetone was used.
Test conditions:	Temperature: 24 °C ± 1°C, Darkness (except during observation)
Test parameter:	Mortality counts and behavioural abnormalities (e.g. vomiting, apathy, intensive cleaning) were made after exposure for 24 and 48 h.
<u>Findings:</u>	
Biological results:	<u>Contact Test:</u> At the end of the contact toxicity test (48 hours after application), there was 4.0 % mortality at 100.0 µg a.s./bee. No mortality occurred in the water control group (water + 0.5 % Adhäsit) and solvent control group (acetone), respectively. Only one single bee in the treatment group was found apathetic during the 24 hours assessment.

Oral Test:

In the oral toxicity test, the maximum nominal test level of Fenoxaprop-P-ethyl tech. (*i.e.* 100 µg a.s./bee) corresponded to an actual intake of 109.5 µg a.s./bee. This dose level led to no mortality after 48 hours. No mortality occurred in the water control group (50 % aqueous sugar syrup solution) and the solvent control group at the end of the oral toxicity test (after 48 hours). No test item induced behavioural effects were observed at any time in the oral toxicity test.

Table B. 9.3.1.1-3: Mortality and behavioural abnormalities of the bees in the contact toxicity test

Dosage [µg a.s./bee]	After 4 hours		After 24 hours		After 48 hours	
	Mortality	Behavioural abnormalities	Mortality	Behavioural abnormalities	Mortality	Behavioural abnormalities
	Mean %	Mean %	Mean %	Mean %	Mean %	Mean %
Test item						
100.0	0.0	0.0	0.0	2.0	4.0	0.0
water	0.0	0.0	0.0	0.0	0.0	0.0
solvent	0.0	0.0	0.0	0.0	0.0	0.0
Reference item						
0.30	6.0	54.0	92.0	6.0	96.0	0.0
0.20	0.0	36.0	78.0	8.0	88.0	6.0
0.15	0.0	14.0	50.0	20.0	68.0	6.0
0.10	0.0	0.0	10.0	0.0	16.0	0.0

results are averages from five replicates (ten bees each) per dosage / control

water = CO_2/water-treated control; solvent = CO_2/solvent control

Table B. 9.3.1.1-4: Mortality and behavioural abnormalities of the bees in the oral toxicity test

Ingested [µg a.s./bee]	After 4 hours		After 24 hours		After 48 hours	
	Mortality	behavioural abnormalities	Mortality	Behavioural abnormalities	Mortality	Behavioural abnormalities
	Mean %	Mean %	Mean %	Mean %	Mean %	Mean %
Test item						
109.5	0.0	0.0	0.0	0.0	0.0	0.0
water	0.0	0.0	0.0	0.0	0.0	0.0
solvent	0.0	0.0	0.0	0.0	0.0	0.0
Reference item						
0.32	14.0	76.0	94.0	2.0	96.0	4.0
0.16	0.0	40.0	52.0	6.0	60.0	0.0
0.08	0.0	14.0	18.0	4.0	24.0	0.0
0.05	0.0	0.0	0.0	0.0	2.0	0.0

results are averages from five replicates (ten bees each) per dosage / control

water = water/sugar treated control; solvent = solvent control

Table B. 9.3.1.1-5: Toxicity to Honey Bees; laboratory tests

Test Item	Fenoxaprop-P-ethyl tech.	
Test Object	*Apis mellifera*	
Exposure	contact (solution in acetone)	oral (sugar syrup/acetone/water solution)
Application rate µg a.s./bee	100.0	109.5
LD_{50} µg a.s./bee	> 100.0	> 109.5
LD_{20} µg a.s./bee	> 100.0	> 109.5
LD_{10} µg a.s./bee	> 100.0	> 109.5
NOED µg a.s./bee*	≥ 100.0	≥ 109.5

* The NOED was estimated using Fisher Exact Test (pairwise comparison, one-sided greater, α = 0.05).

Validity criteria: The contact and oral tests are considered valid as the control mortality in each case was < 10% and the LD_{50} values obtained with the reference item (dimethoate), were within the required ranges.

Validity Criteria	Recommended	Obtained
Control Mortality - Contact Test	≤ 10%	0.0%
Control Mortality - Oral Test	≤ 10%	0.0%
LD_{50} of Reference Item (24 hours) - Contact Test	0.10 – 0.20 µg a.s./bee	0.16 µg a.s./bee
LD_{50} of Reference Item (24 hours) - Oral Test	0.10 – 0.35 µg a.s./bee	0.15 µg a.s./bee

Conclusion: The toxicity of Fenoxaprop-P-ethyl tech. was tested in both, an acute contact and an acute oral toxicity test on honey bees. The contact LD_{50} (48 h) was > 100.0 µg a.s./bee. The oral LD_{50} (48 h) was > 109.5 µg a.s./bee.

Comment RMS: **Validity:** The study was conducted according to the OECD 213 and 214 (1998). The contact and oral tests are considered valid as the control mortality in each case was < 10% and the LD_{50} values obtained with the reference item (dimethoate), were within the required ranges, hence all validity criteria were met.

Some minor deviations to the OECD guidelines were identified. However, these deviations are not considered of relevance for the results of the acute oral and contact toxicity test.

In the contact toxicity test a 5 µL droplet was used in deviation to the OECD guideline recommendation of a 1 µL droplet. This deviation is considered acceptable since a higher volume ensured a more reliable dispersion of the test item.

In the oral toxicity test the bees were starved for 15 minutes only and not for 2 hours as recommended in the OECD guideline. However, this may not have an effect on the results of the study considering the amount of consumed sugar solution.

	Acceptability of the analytical methods used in the test: Not required according to the OECD test guideline. **Endpoints:** The RMS agrees on the endpoints given in the study report. 48 h LD_{50} (oral) > 109.5 µg a.s./bee 48 h LD_{50} (contact) > 100 µg a.s./bee **Conclusion of the RMS:** The study is considered acceptable and the RMS is of the opinion that the results of the study should be used in the risk assessment.

Reference:	**Effects of Fenoxaprop-P-ethyl technical (Acute Contact and Oral) on Honeybees (*Apis mellifera* L.) in the Laboratory**
Author(s), year:	Schmitzer, S., 2007
Report/Doc. number:	IBACON project no.: 37533035, 228 FPE / M-548126-01-1
Guideline(s):	OECD 213 and 214 (1998)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and Methods:

Test substance:	Fenoxaprop-P-ethyl tech., Batch no.: 660-PSH-45, Content: 96.0% w/w (analysed)
Reference:	Perfekthion (BAS 152 11 I), Dimethoate 414.4 g/L (analysed)
Solvent:	Acetone
Test species:	*Apis mellifera* L., adult worker honeybees
Type of test:	Acute oral and contact limit test
Number of organisms:	Five replicates with 10 bees for controls, the reference item treatments and the test item treatment groups
Food:	Ready-to-use syrup (Apiinvert) containing 30% sucrose, 31% glucose and 39% fructose
Oral toxicity test:	
Applied concentrations:	Control: 50% (w/w) aqueous sucrose solution (with tap water) Solvent control: 50% (w/w) sugar solution with solvent (45% tap water, 5% acetone, 50% sugar) Test item: 100 µg a.s./bee (nominal). 108.9 µg a.s./bee (measured) Reference item: 0.05, 0.08, 0.15 and 0.30 µg dimethoate/bee (nominal) 0.05, 0.08, 0.16 and 0.32 µg dimethoate/bee (measured)

Exposure route:	Appropriate amounts of Fenoxaprop-P-ethyl technical or reference item dilutions in acetone were mixed with syrup in order to achieve the required test concentrations in a final dilution of 50 % syrup solution (45 % water, 50 % syrup and 5 % acetone (w/w)). For the controls, the same proportion of syrup, water and acetone was used (solvent control) and similarly, 50 % aqueous syrup solution was used for the negative control. The treated food was offered in syringes, which were weighed before and after introduction into the cages (duration of uptake took 1.5 hours for the test item treatment). After a maximum of 1.5 hours, the syringes containing the treated food were removed, weighed and replaced by ones containing fresh, untreated food. The target dose level (i.e. 100 µg a.s./bee nominal) would have been obtained if 20 mg/bee of the treated food was ingested. In practice, higher (or lower) dose levels were obtained as the bees had a higher or lower uptake of the test solutions than the nominal 20 mg/bee.
Test conditions:	Temperature: 25 °C, Relative humidity: 47 - 74 %, Darkness (except during observation)
Test parameter:	Mortality counts and checks for behavioural abnormalities (e.g. apathy, intensive cleaning, vomiting) were made after exposure for 4, 24 and 48 h.
Contact toxicity test:	
Applied concentrations:	Control: tap water with 0.5% Adhäsit (wetting agent to improve spreading of the test droplet on the water-repellent hairs on the thorax of bees) Solvent control: acetone Test item: 100 µg a.s./bee (limit test) Reference item: 0.10, 0.15, 0.20 and 0.30 µg dimethoate/bee (nominal)
Exposure route:	One single 5 uL droplet of Fenoxaprop-P-ethyl technical in acetone was placed on the dorsal bee thorax using a calibrated Eppendorf Pipette. While filling the pipette the dispersion was agitated continuously. For the controls, one 5 uL droplet of a) tap water containing 0.5 % Adhäsit and b) pure acetone was used. The reference item was also applied in a 5 µL droplet (dimethoate made up in acetone).
Test conditions:	Temperature: 25 °C, Relative humidity: 47 - 74 %, Darkness (except during observation)
Test parameter:	Mortality counts and checks for behavioural abnormalities (e.g. apathy, intensive cleaning, vomiting) were made after exposure for 4, 24 and 48 h.
<u>Findings:</u>	
Biological results:	<u>Oral toxicity test:</u> The actual consumption per bee in the oral test was 108.9 µg a.s./bee of technical Fenoxaprop-P-ethyl. no test item induced behavioural effects were observed at any time in the contact toxicity test. <u>Contact toxicity test</u>: no test item induced behavioural effects were observed at any time in the contact toxicity test.

Table B. 9.3.1.1-6: Effects of Fenoxaprop-P-ethyl tech. on *Apis mellifera* following 48-h oral exposure in an acute toxicity test (averages from 5 replicates per dosage/control)

Nominal dose [µg a.s./bee] (consumed)	Mortality (corrected mortality [a]) [%]		
	4 h	24 h	48 h
Control (sugar solution)	0.0	0.0	0.0
Solvent control (acetone)	0.0	0.0	0.0
Treatment			
100 (108.9)	0.0	0.0	0.0
Reference item			
0.05 (0.05)	2.0	6.0	6.0
0.08 (0.08)	0.0	34.0	42.0
0.15 (0.16)	0.0	96.0	100.0
0.30 (0.32)	50.0	100.0	100.0
Test substance: 24h / 48h LD_{50} > 108.9 µg a.s./bee Reference: 24 h LD_{50} = 0.10 µg dimethoate/bee			

Table B. 9.3.1.1-7: Effects of Fenoxaprop-P-ethyl tech. on *Apis mellifera* following 48-h contact exposure in an acute toxicity test (averages from 5 replicates per dosage/control)

Nominal dose [µg a.s./bee]	Mortality [%]		
	4 h	24 h	48 h
Control (tap water + wetting agent)	0.0	0.0	0.0
Solvent control (acetone)	0.0	0.0	0.0
Treatment			
100	0.0	0.0	2.0
Reference item			
0.10	0.0	6.0	18.0
0.15	0.0	40.0	62.0
0.20	0.0	92.0	98.0
0.30	0.0	82.0	98.0
Test substance: 24 h / 48 h LD_{50} > 100 µg a.s./bee Reference: 48 h LD_{50} = 24 h LD_{50} = 0.16 µg dimethoate/bee			

Validity criteria: The contact and oral tests are considered valid as the control mortality in each case was < 10% and the LD_{50} values obtained with the reference item (dimethoate), were within the required ranges.

Validity Criteria	Recommended	Obtained
Control Mortality - Contact Test	≤ 10%	0.0%
Control Mortality - Oral Test	≤ 10%	0.0%
LD_{50} of Reference Item (24 hours) - Contact Test	0.10 – 0.20 µg a.s./bee	0.16 µg a.s./bee
LD_{50} of Reference Item (24 hours) -	0.10 – 0.35 µg	0.10 µg a.s./bee

Oral Test	a.s./bee	

Conclusions:

48 h LD_{50} > 108.9 µg a.s./bee (oral toxicity)

48 h LD_{50} > 100 µg a.s./bee (contact toxicity)

Comment RMS:

Validity: All validity criteria according to the OECD guidelines 213 and 214 are met.

The mean mortality of the controls (water and solvent) in the oral and contact toxicity test was 0 % which is in the line with the recommended maximum mortality of 10 % according to the OECD guidelines.

The 24 h LD_{50} values of the reference item (dimethoate) in the oral (24 h LD_{50} = 0.10 µg a.s./bee) and contact (24 h LD_{50} = 0.16 µg a.s./bee) toxicity tests were within the recommended range of 0.10 – 0.35 µg a.s./bee (oral) and 0.10 – 0.30 µg a.s./bee (contact), respectively.

Some deviations to the OECD guidelines were identified. However, these deviations are not considered of relevance for the results of the acute oral and contact toxicity test.

The relative humidity in the oral and contact toxicity test is between 47 and 74% which is below the recommendations given in the OECD guidelines (relative humidity between 50 and 70%). Based on the results of the oral and contact toxicity test the deviation of relative humidity is considered to have no impact on the honeybees.

In the oral toxicity test the bees were starved for 20 minutes only and not for 2 hours as recommended in the OECD guideline. However, this may not have an effect on the results of the study considering the amount of consumed sugar solution.

In the contact toxicity test a 5 µL droplet was used in deviation to the OECD guideline recommendation of a 1 µL droplet. This deviation is considered acceptable since a higher volume ensured a more reliable dispersion of the test item.

Acceptability of the analytical methods used in the test: Not required according to the OECD test guideline.

Endpoints: The RMS agrees on the endpoints given in the study report.

48 h LD_{50} (oral) > 108.9 µg a.s./bee

48 h LD_{50} (contact) > 100 µg a.s./bee

Conclusion of the RMS: The study is considered acceptable and the RMS is of the opinion that the results of the study should be used in the risk assessment.

Reference: **Fenoxaprop-P Ethyl: Acute oral toxicity to Bumble Bee *Bombus terrestris* L.**

	under laboratory conditions
Author(s), year:	Schmitt , H., 2015
Report/Doc. number:	S15-00578 / M-548567-01-1
Guideline(s):	No specific guidelines available. OECD Guideline No. 213 (1998), OEPP/EPPO 170 (4) (2010), review article of VAN DER STEEN (2001) and the recent recommendations of the ICPPR bumble bee ring test group (2015)
GLP:	Yes
Deviations:	-
Validity:	Acceptable

Material and Methods:

Test substance:	Fenoxaprop-P-ethyl technical, batch no.: BCHR 1736-1, purity: 97.3 % (analysed)
Reference:	Perfekthion / BAS 152 11 I, batch no.: FRE-000926, purity: 99.5%, content : 400.9 g/L (analysed)
Solvent:	Aceton, A1390 (Tween) CAS : 9005-65-6
Test species:	*Bombus terrestris* L., healthy, adult worker bumble bees
Type of test:	Acute oral test, limit test
Number of organisms:	30 replicates of 1 bee each for control and reference item group and 50 replicates of 1 bee each for the test item treatment group.
Food:	Sucrose solution (50% w/v). Feeding was doe ad libitim during acclimatisation and the test period (except starvation and feeding of application solution(s) in oral toxicity test).
Applied concentrations:	Control: 50 % (w/v) sucrose solution Solvent control: 50 % (w/v) sucrose solution + 5 % acetone + 1 % Tween (80) Test item: 150 µg a.s./bee Reference item: 1.5 µg dimethoate/bee
Exposure route:	Oral toxicity test: Bumble bees were placed in single test units and starved for at least 2 hours. The application volume was 40 µL/replicate (corresponding to 40 µL/bumble bee). The application volume was 40 µL/replicate (corresponding to 40 µL/bumble bee). After treatment, the bumble bees were fed ad libitum with a sucrose solution (50% w/v).
Test conditions:	Temperature: 24.4-25.1 °C, Relative humidity: 56.3-65.8 %, Darkness (except during observation)
Test parameter:	Mortality was recorded 24 hours after application (after start of feeding in the oral toxicity test) and thereafter at 48 hours. Behavioural abnomarlities such as symptoms of poisoning in comparison to the control were recorded at each obseravtion interval.

Findings:

Biological results:	In the control group fed with pure 50 % (w/v) aqueous sucrose solution, no

mortality was observed at the final assessment after 48 hours. In the solvent control group fed with 50 % (w/v) aqueous sucrose solution containing 5 % acetone and 1 % Tween (80), a mortality of 3.3 % was recorded at the end of the testing period. In the reference item group of the oral toxicity test (50 % (w/v) aqueous sucrose solution containing dimethoate), 96.7 % mortality was observed at the end of the 48 hour test period. Consequently the validity criterion were met and the test was deemed valid. In the oral toxicity test, a mortality of 4.0 % (corrected 0.7 %) was observed at the dose of 124.7 µg a.s./bumble bee (based on actual uptake) 48 hours after start of feeding. Two affected bumble bees were recorded at the dose of 124.7 µg a.s./bumble bee (based on actual uptake) bee at the assessment 24 hours after test start.

Table B. 9.3.1.1-8: LD_{50} values in the oral toxicity tests with Fenoxaprop-P-ethyl

Fenoxaprop-P-ethyl	LD_{50}	95% confidence limits
	µg a.s./bumble bee	
	Oral toxicity test	
24 h	> 124.7	n.d.
48 h	> 124.7	n.d.
NOED	≥ 124.7	≥ 124.7

n.d. = not determined

Conclusions: According to the study results, the 48 hour oral LD_{50} (Lethal Dose causing 50% mortality) for Fenoxaprop-P-ethyl is > 124.7 µg a.s./bumble bee and the NOED (No Observed Effect Dose) after 48 hours was determined to be ≥ 124.7 µg a.s./bumble bee.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 247 (October 2017).
- mortality in the water control should be ≤ 10% at the end of the test. If included, also solvent control mortality should be ≤ 10% at the end of the test.
- mortality in the toxic reference substance group should be ≥ 50% at the end of the test.

The validity criteria according to the OECD test guideline are met. The mortality observed in the control and solvent control is ≤ 10%.Furthermore the mortality in the toxic reference group was above 50% (96.7%).

The study is well conducted and reported and well in line with the current OECD guideline 247.

Acceptability of the analytical methods used in the test: No analytics have been

	performed. **Endpoints:** The RMS agrees on the endpoints given in the study report. 96 h LD_{50} > 124.7 µg a.s./bumble bee **Conclusion of the RMS:** Based on the evaluation, the bumble bee acute oral toxicity test is considered valid.

Reference:	**Fenoxaprop-P Ethyl: Acute Contact Toxicity to Bumble Bee *Bombus terrestris* L. under laboratory conditions**
Author(s), year:	Pfeiffer , S., 2015
Report/Doc. number:	S14-00619 / M-526340-01-1
Guideline(s):	no specific guidelines available, based on OEPP/EPPO 170 (4) (2010), OECD Guideline No. 214 (1998) and on the review article of Van der Steen (2001)
GLP:	Yes
Deviations:	-
Validity:	Acceptable

Material and Methods:

Test substance:	Fenoxaprop-P-ethyl technical, batch no.: BCHR 1736-1, purity: 94.3 % (analysed)
Reference:	Perfekthion / BAS 152 11 I, batch no.: FRE-000926, content : 409 g/L (analysed)
Solvent:	Aceton
Test species:	*Bombus terrestris* L., healthy, adult worker bumble bees
Type of test:	Acute contact test, limit test
Number of organisms:	In the control and reference item groups, three replicate groups of 10 bumble bees each were tested. In the test item group, five replicate groups of 10 bumble bees each were tested
Food:	Sucrose solution (50 % w/v). Feeding was done ad libitim during acclimatisation and the test period
Applied concentrations:	Control: The bumble bees of the control groups were treated with acetone (corresponding control group to the test item group) and mineral water (corresponding control group to the reference item group). Test item: The contact toxicity test was carried out as a limit test with one dose of fenoxaprop- P-ethyl: 100 µg Fenoxaprop-P-ethyl /bumble bee. Reference item: As reference item „Perfekthion" (a.s. dimethoate) was used in the contact toxicity test. The tested dose was 12 µg dimethoate a.s./bumble bee. The unit µg a.s./bumble bee refers to the analysed content of the active ingredient dimethoate in the reference item Perfekthion.
Exposure route:	Depending on the treatment group, aliquots of 2 µL of the control, test and reference item solutions were applied dorsally to the thorax of the bumble bees. After the application, the bumble bees were returned to the test cages and fed with

a 50 % aqueous sucrose solution *ad libitum.* In the treatments with mineral water as carrier, i.e. water control and reference item, the outside of the micro applicator needle was cleaned with a mixture of water and a water-wetting agent between each application.

Test conditions: During the experimental phase, the test organisms were kept in constant darkness except during the application and the assessments. The temperature during the test period was between 24.5 and 24.8 °C, the relative humidity was between 59.2 and 61.3 %, recorded with a calibrated data logger.

Test parameter: Mortality was recorded 24 hours after application (after start of feeding in the oral toxicity test) and thereafter at 48 hours. Sub-lethal effects as symptoms of poisoning or any abnormal behaviour in comparison to the control were recorded at each observation interval.

Findings:

Biological results: In the control group, treated with acetone (corresponding to the test item group), no mortality was observed during the 48 h test period. In the control group, treated with mineral water (corresponding to the reference item group), a mortality of 3.33 % was observed at the final assessment after 48 hours.

In the test item treatment group, no mortality was observed at the dose level corresponding to 100 µg Fenoxaprop-P-ethyl/ bumble bee at the final assessment after 48 hours.

In the reference item group, mortality was ≥ 50 % at the end of the test. Thus, the test was considered to be valid.
In the test item treatment group no sub-lethal effects were observed during the entire observation period.

The NOED (No Observed Effect Dose) was determined to be 100 µg fenoxaprop–P-ethyl/bumble bee.

Table B. 9.3.1.1-9: LD_{50} and NOED values in the bumble bee contact toxicity test with Fenoxaprop-P-ethyl

Fenoxaprop-P-ethyl	Contact toxicity test [µg Fenoxaprop-P-ethyl/bumble bee]
LD_{50} (24 h)	> 100
LD_{50} (48 h)	> 100
NOED (48 h)	≥ 100

NOED = No Observed Effect Dose

Conclusions: The 48 hour contact LD_{50} value for Fenoxaprop-P-ethyl was determined to be > 100 µg Fenoxaprop-P-ethyl /bumble bee.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the currently valid test guidelines, the OECD test guideline 246 (October 2017). - mortality in the water control should be ≤ 10% at the end of the test. If included, also solvent control mortality should be ≤ 10% at the end of the test. - mortality in the toxic reference substance group should be ≥ 50% at the end of the test. The validity criteria according to the OECD test guideline are met. The mortality observed in the control and solvent control is ≤ 10%.Furthermore the mortality in the toxic reference group was above 50%. In addition, the following points deviated from the test guideline or were not reported in detail: - According to the OECD test guideline 246 for limit tests, 50 replicates (one bumble bee per replicate) should be used for the controls (negative and solvent) and test item. For the toxic reference, at least 30 replicates should be used. In addition, the bumble bees should be kept individually in cages (prevent hierarchy fights; bumble bees do not share food via trophallaxis). In the study, replicates with each 10 bumble bees per test unit were used for the controls (negative and solvent) and toxic reference. For the test item, 5 replicates with each 10 bumble bees per test unit were usedThe study is not in line considering the housing of bumble bees (single housing) and the number of bumble bees. However taking into account the observed effects (no significant mortalities in the controls and test item) the housing in groups of ten bumble bees might not have had an impact on the results of the study. In addition, taking into account that no final test guideline was available during testing the observed deficiencies should be considered by a weight of evidence. **Acceptability of the analytical methods used in the test:** No analytics have been performed. **Endpoints:** The RMS agrees on the endpoints given in the study report. 48 h LD_{50} > 100 µg a.s./bumble bee **Conclusion of the RMS:** Based on the evaluation, the bumble bee acute oral toxicity test is considered valid.

B.9.3.1.2. Chronic toxicity to adult honeybees

No chronic oral toxicity test with the active substance was submitted. Please refer to the RAR, Volume 3, B.9 (representative formulations).

B.9.3.1.3. Effects on honeybee development and other honeybee life stages

No bee brood feeding test with the active substance was submitted. Please refer to the RAR, Volume 3, B.9 (representative formulations).

B.9.3.1.4. Cage and tunnel tests

No cage and tunnel tests with the active substance were submitted. Please refer to the RAR, Volume 3, B.9 (representative formulations).

B.9.3.1.5. Field tests

Based on the results reported in the available laboratory studies (acute oral and contact toxicity to honey-bees, chronic toxicity to adult honey-bees and effects on larvae of honey-bees), no further studies are required addressing the risk to honey-bees.

B.9.3.1.6. Investigation of special effects

Based on the results on honey-bees (adults and larvae) and non-target arthropods it was demonstrated that the active substance shows no insecticidal activity. Hence, no further data are required.

B.9.3.2. Effects on non-target arthropods other than bees

Please refer to the RAR, Volume 3, B.9 (representative formulations). No studies with the active substance Fenoxaprop-P-ethyl were submitted addressing the risk to non-target arthropods other than bees.

B.9.4. EFFECTS ON NON-TARGET SOIL MESO- AND MACROFAUNA

B.9.4.1. Earthworm – sub-lethal effects

For the renewal of the EU approval of the active substance Fenoxaprop-P-ethyl earthworm reproduction studies conducted with the active substance and the major soil metabolites were submitted. The study summaries are given below.

Active Substance:

Reference:	**Fenoxaprop-P-ethyl a.s.: Sublethal toxicity to the earthworm *Eisenia fetida* in artificial soil**
Author(s), year:	Friedrich, S., 2014
Report/Doc. number:	No. 13 10 48 186 S / M-477100-01-1
Guideline(s):	OECD 222 (2004), ISO 11268-2 (1998)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	AE F046360-01-12 (Fenoxaprop-P-ethyl), Batch no.: BCHR 1736-1, , Purity (analysed): 94.3 % w/w (fenxoaprop-P) 97.3% w/w (sum of D+ and L-enantionmers), CAS no.: 71283-80-2
Test species:	Earthworm *Eisenia fetida* (*Eisenia fetida andrei*, det. Bouché 1972)
Number of organisms:	8 replicates per control group and 4 replicates per treated group, each with 10 individuals.
Weight, age:	Mean: 352 - 547 mg/worm, adults with clitellum, approximately 4 months
Type of test, duration:	Laboratory sub-lethal test, 8 weeks (4 weeks adult mortality, 4 weeks juvenile development)
Applied concentrations:	Nominal: 0 (control, quartz sand), 5.6, 10, 32, and 56 mg test a.s./kg soil dw
Solvent:	None
Toxic standard:	Nutdazim 50 FLOW (Carbendazim, SC 500), tested at concentrations of 5 and 10 mg prod./kg soil dw
Test substrate:	Artificial soil, 10 % sphagnum peat, 20 % kaolin clay, 68.5 % industrial quartz sand, 0.5 % calcium carbonate, 1% horse manure (food), deionised water
Substrate/test vessel:	675 g wet weight corresponding to 500 g dry weight of artificial soil with a water content corresponding to 40-60 % of WHC
Temperature:	18.2 – 21.2 °C
Light regime:	16 hours light (520 lx) / 8 hours dark
Water content:	Test start: 34.9 – 35 % (equivalent to 54.7 – 54.9 % of WHC)

	Test end: 34.5-34.9% (equivalent of 54.1-55.7% of WHC)
pH:	Test start: 6.11 – 6.15
	Test end: 5.79 – 5.86
Feeding:	Air-dried and finely ground horse manure; feeding interval was weekly during the first 4 weeks, weekly amount of manure (5 g) depended on the feeding activity.
Test parameters:	Temperature was recorded continuously during the whole test period. The moisture content and the pH of the artificial soil were determined at the start and the end of the test. At test start: Individual fresh weight (mg/worm), behaviour of earthworms, determination of physico-chemical parameters (water content, pH) of the artificial soil Weekly: observation of behavioural and pathylogical symptoms (including feeding activity) 4 weeks after start of exposure: number of surviving adult earthworms per replicate, observation of behavioural and pathological symptoms (including morphological alterations), fresh weight of survining adult earthworms per replicate 8 weeks after start of exposure: number of juvenils per replicate, observation of behavioural and pathological symptoms (including morphological alterations), determination of physico-chemical parameters (water content, pH) of the artificial soil
Statistics:	The endpoints were mortality, change of biomass (difference in fresh weight of surviving worms between test start and four weeks after treatment) and reproduction (the number of juveniles present). The arithmetic mean and the standard deviation per treatment and per control for each endpoint were calculated. The statistical analysis was performed with the software ToxRat Professional 2.10.06 (RATTE 2010). Shapiro-Wilk´s test and Levene´s test, respectively, were used to test the data for normality and homogeneity of variance. Fisher`s Exact Binomial Test with Bonferroni Correction and the Williams -t-test were used to compare the control with the independent test item groups. For statistical evaluation of the biomass change, the changed mean fresh weight of surviving worms per replicate was used.
<u>Findings:</u>	
Biological results	The mortality of adult worms was 0 to 2.5 % in the treated groups and 0 % in the control group. No statistically significant mortality compared to the control was observed at any test item concentration (Fisher's Exact Binomial Test with Bonferroni Correction, α = 0.05, one-sided greater). No effects on behaviour (including feeding activity) of the worms were observed during the test. The weight change of adult worms ranged between 27.3 and 31.7% in the treated groups and was 30.9% in the control group. The test item caused no statistically significant change in biomass (change in fresh weight after 4 weeks relative to

initial fresh weight) compared to the control group at any concentration tested (Williams- t-test; α = 0.05, one-sided smaller).

No statistically significant effects (Williams-t-test, α = 0.05, one-sided smaller) on number of juveniles compared to the control group were recorded at any concentration tested.

Table B. 9.4.1-1: Observations

	Control	5.6	10	18	32	56
Mortality of adult worms after 4 weeks						
Mortality (%)	0.0	0.0	0.0	2.5	0.0	2.5
Biomass change (change in fresh weight after 4 weeks relative to initial fresh weight)						
Mean (mg)	134.4	137.5	118.6	129.8	121.6	126.1
Mean (%)	30.9	31.7	27.3	29.7	28.1	29.0
Number of juveniles per surviving adult worm after 8 weeks						
Mean	11.0	11.6	11.8	10.7	10.4	10.6
Number of juveniles per replicate after 8 weeks						
Mean	109.5	115.8	118.0	104.8	103.8	104.5
Reproduction compared to control (%)						
% to control	100	105.7	107.8	95.7	94.7	95.4

No statistically significant differences between the control and test item were calculated for biomass and reproduction (Williams- t-test; α = 0.05, one-sided smaller) and mortality (Fisher's Exact Binomial Test with Bonferroni Correction, α = 0.05, one-sided greater)

Table B. 9.4.1-2: Effects on mortality, growth and reproduction of *Eisenia fetida* in a sub-chronic test

Test item **Test object** **Exposure**	**Fenoxaprop-P-ethyl** ***Eisenia fetida*** **Artificial soil**		
	Mortality	**Biomass change**	**Reproduction**
	[mg test item/kg d.w.]		
NOEC LOEC	≥ 56 > 56	≥ 56 > 56	≥ 56 > 56

Validity criteria: All validity criteria for the study were met.

Validity Criteria	**Recommended**	**Obtained**
Adult mortality	≤ 10%	0 % (after 4 weeks)
Number of juveniles per replicate	≥ 30	125, 111, 116, 99, 79, 107, 146 and 93
Coefficient of variation of reproduction	≤ 30%	18.7 %

Reference item: In a separate study, the number of juveniles was reduced by 73 and 99 % by the toxic standard Nutdazim 50 FLOW (Carbendazim, SC 500) in comparison to the control. Therefore, the observed effects assure a high sensitivity of the test system. EC_{10} or EC_{20} could not be calculated since the observed differences between the

control and the treatment groups did not indicate a dose response or were <10%.

Conclusion: Fenoxaprop-P-ethyl a.s. showed no statistically significantly adverse effects on mortality, growth and reproduction of the earthworm Eisenia fetida in artificial soil up to and including 56 mg a.s./kg soil dry weight, i.e. the highest concentration tested.

Based on the statistical evaluation of these results, the overall No-Observed-Effect-Concentration (NOEC) was determined to be ≥ 56 mg a.s./kg soil d.w., and the overall Lowest-Observed-Effect-Concentration (LOEC) was determined to be > 56 mg a.s./kg soil d.w. The EC_{10} and EC_{20} values could not be determined.

Comment RMS:

Validity: The study was evaluated following the recommendations of the test guideline OECD 222 (April, 2004)

Check of validity criteria:

- each replicate (containing 10 adults) to have produced ≥ 30 juveniles by the end of the test: fulfilled, 79 – 146 juveniles per replicate have been produced.
- the coefficient of variation of reproduction to be ≤ 30 %: fulfilled, the coefficient of variation was 18.7 %.
- adult mortality over the initial 4 weeks of the test to be ≤ 10 %: fulfilled: adult mortality was 0.0 %

Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed

Endpoints:

NOEC values for mortality, body weight change and reproduction were determined. An analysis of the statistical power of the test was not performed, but is considered to be acceptable, as the study design followed the recommendations of the cited guideline. It further is noted that the study was not designed to generate EC_x value although the guideline gives some recommendations for this purpose. No EC_X were therefore calculated. However, effects on reproduction were always <10% and no dose-response was observed. The study is therefore considered to be sufficiently reliable for risk assessment purposes.

Effects on body weight change were not significantly different from control (confirmed by RMS, Dunnett-test calculated with ToxRat pro 3.1.0), and below 10 % what could be considered to be of biological relevance.

The RMS agrees on the endpoints given in the study report:

$NOEC_{mortality}$ ≥ 56 mg/kg soil dry weight

$NOEC_{body\ weight\ change}$ ≥ 56 mg/kg soil dry weight

$NOEC_{reproduction}$ ≥ 56 mg/kg soil dry weight

	Conclusion of the RMS: The study is considered to be valid.

Metabolites:

Reference:	**AE F088406: Sublethal toxicity to the earthworm *Eisenia fetida* in artificial**
Author(s), year:	Friedrich, S., 2006
Report/Doc. number:	no. 06 10 48 056 / M-270897-01-2
Guideline(s):	OECD 222 (2004), ISO 11268-2 (1998)
GLP:	Yes
Deviations:	A short term deviation of the temperature in the test room (<7h temperature increased up to 27°C), owing to a technical fault, is not considered to have had any relevant impact on the test results. This judgement is supported by the condition and vitality of the control group.
Validity:	Acceptable

Material and methods:

Test substance:	AE F088406 (Fenoxaprop-acid metabolite of Fenoxaprop-P-ethyl), Batch no.: RSS 1749/LJ.28494, Purity (analysed): 93.8% w/w (fenxoaprop-P) 95.4% w/w (sum of D+ and L- enantionmers), CAS no.: not stated
Test species:	Earthworm *Eisenia fetida* (*Eisenia fetida andrei*, det. Bouché 1972)
Number of organisms:	8 replicates per treatment group and control group, each with 10 individuals.
Weight, age:	421-579 mg/worm, adults with clitellum, approximately 4 months
Type of test, duration:	Laboratory sub-lethal test, 8 weeks (4 weeks adult mortality, 4 weeks juvenile development)
Applied concentrations:	Nominal: 0 (control, quartz sand), 10, 32, 100, 320, 1000 mg/kg soil dw
Solvent:	None
Toxic standard:	Benlate WP (Benomyl 50 %), tested at concentrations of 5 and 10 mg prod./kg soil dw
Test substrate:	Artificial soil, 10 % sphagnum peat, 20 % kaolin clay, 69.9 % industrial quartz sand, 0.4 % calcium carbonate, horse manure (food), deonised water
Substrate/test vessel:	Plastic vessel of Bellaplast (18.3cm x 13.6cm x 6.4cm) with a lid which is pervious to air and light
Temperature:	18.0 – 22.0 °C (a short-term eviation jup to 27 °C is not considered to have had any relevant impact)
Light regime:	16 hours light (600 lx) / 8 hours dark, artificial light
Water content:	Test start: 34.8 – 35.3 % (equivalent to 56.3-57.1 % of WHC) Test end: 35.3-35.9 % (equivalent of 57.1-58.1 % of WHC)
pH:	Test start: 5.5 – 5.6 Test end: 5.6 – 5.7

Feeding: Air-dried and finely ground horse manure; feeding interval was weekly during the first 4 weeks, weekly amount of manure (5 g).

Test parameters: Test start: individual fresh weight (mg/worm), behaviour of earthworms, determination of physico-chemical soil parameters (water content, pH)

Weekly: observation of behavioural and pathological symptoms, feeding activity

4 weeks after application: number of surviving adult earthworms for each test vessel, observation of behavioural and pathological symptoms, fresh weight of surviving adult earthworms per replicate

8 weeks: number of surviving juveniles for each test vessel observation of behavioural and pathological symptoms, morphological alterations, determination of physico-chemical soil parameters (water content, pH)

Statistics: The endpoints were mortality, change of biomass (difference in fresh weight of surviving worms between test start and four weeks after treatment)) and reproduction (the number of juveniles present). The arithmetic mean and the standard deviation per treatment and per control for reproduction and biomass were calculated. The statistical analysis was performed with the software ToxRat Professional 2.09 (RATTE 2005). The determination of the EC50 was calculated by Probit analysis according to the maximum likelihood method (FINNEY 1971). The DUNNETT-test was used to compare the control with the independent test item groups. For statistical evaluation of the biomass change, the changed mean fresh weight of surviving worms per replicate was used.

Findings:

Biological results:

Table B. 9.4.1-3: Observations

AE F088406 [mg/kg d.w.]						
	Control	**10**	**32**	**100**	**320**	**1000**
Mortality of adult worms after 4 weeks						
Mortality (%)	0	0	0	0	0	0
Biomass change (change in fresh weight after 4 weeks relative to initial fresh weight)						
Mean (mg)	224.3	214.4	190.2	209.9	218.5	117.3*
Mean (%)	45.1	42.9	38.1	42.0	43.7	23.5
Number of juveniles per surviving adult worm after 8 weeks						
Mean	12.3	13.1	12.7	12.3	9.8	4.4*
Number of juveniles per replicate after 8 weeks						
Mean	123.3	131.0	126.8	122.8	98.3	43.5*
Reduction of reproduction per treatment (%)						
Mean	0	-6.3	-2.8	0.4	20.3	64.7

* statistically significant (Dunnett-Test, one-sided smaller, $p \leq 0.05$)

Table B. 9.4.1-4: Effects on mortality, growth and reproduction of *Eisenia fetida* in a sub-chronic test

Test item **Test object** **Exposure**	**AE F088406** ***Eisenia fetida*** **Artificial soil**		
	Mortality	**Biomass change**	**Reproduction**
	[mg/kg d.w.]		
LOEC	> 1000	1000	1000
LC_{50}/EC_{50}	> 1000	> 1000	701.9
(95 % confidence limit)	-	-	(665.5 - 741.2)
EC_{20}			322.4
(95 % confidence limit)			(294.3 – 348.8)
EC_{10}			214.2
(95 % confidence limit)			(188.7 – 238.5)
NOEC	≥ 1000	320	320

Validity criteria: All validity criteria for the study were met.

Validity Criteria	**Recommended**	**Obtained**
Adult mortality	≤ 10%	0 % (after 4 weeks)
Number of juveniles per replicate	≥ 30	136, 149, 127, 132, 142, 98, 89 and 113
Coefficient of variation of reproduction	≤ 30%	17.3 %

Reference item: In a reference test, the number of juveniles was reduced by 61% and 100% by the toxic standard in comparison to the control. Therefore, the observed effects of Benlate® (Benomyl, 50%) assure a high sensitivity of the test system.

Conclusion: In an 8-week study on sublethal effects on Eisenia fetida the test item AE F088406 caused a significant reduction in adult biomass gain and number of juveniles at the 1000 mg/kg dry soil. Based on statistical analysis the NOEC for adult toxicity (mortality and biomass) and reproduction (number of juveniles) was 320 mg/kg dry soil.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the test guideline OECD 222 (April, 2004)

Check of validity criteria:

- each replicate (containing 10 adults) to have produced ≥ 30 juveniles by the end of the test: fulfilled, 89 – 149 juveniles per replicate have been produced.
- the coefficient of variation of reproduction to be ≤ 30 %: fulfilled, the coefficient of variation was 17.3 %.
- adult mortality over the initial 4 weeks of the test to be ≤ 10 %: fulfilled: adult mortality was 0.0 %

Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed

Endpoints:
NOEC values for mortality, body weight change and reproduction were determined. An analysis of the statistical power of the test was not performed, but is considered to be acceptable, as the study design followed the recommendations of the cited guideline. It further is noted that the study was not designed to generate EC_x value although the guideline gives some recommendations for this purpose. No EC_X were therefore calculated. Effects on reproduction were significantly different from control at dose levels 1000 and 320 mg/kg soil dry weight (recalcuated by RMS with Williams Multiple Sequential t-test (ToxRat pro 3.1.0)).

The RMS does not agree on the endpoints given in the study report, the NOECreproduction should be set as follows (based on siginificant effects):
$NOEC_{mortality} \geq 1000$ mg/kg soil dry weight
$NOEC_{body\ weight\ change} = 320$ mg/kg soil dry weight
$NOEC_{reproduction}$ =100 mg/kg soil dry weight

Conclusion of the RMS:
The study is considered to be valid.

Reference:	**Fenoxaprop-P-ethyl-Benzoxazolone (BCS-AC79872): Sublethal toxicity to the earthworm *Eisenia fetida* in artificial soil**
Author(s), year:	Friedrich, S., 2016a
Report/Doc. number:	no. 15 10 48 057 S / M-549921-01-1
Guideline(s):	OECD 222 (2004), ISO 11268-2 (1998)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl-Benzoxazolone (BCS-AC79872), Batch no.: TV2899A, Purity: 98.5% (analysed)
Test species:	Earthworm *Eisenia fetida* (Savigny, 1826)
Number of organisms:	4 replicates per treatment group and 8 replicates per control group, each with 10 individuals.
Weight, age:	Mean: 270 – 468 mg/worm, adults with clitellum, approximately 3 months
Type of test, duration:	Laboratory sub-lethal test, 8 weeks (4 weeks adult mortality, 4 weeks reproduction)

Applied concentrations:	Nominal: 0 (control, quartz sand), 50, 89, 158, 281 and 500 mg /kg soil dw
Solvent:	None
Toxic standard:	Nutdazim 50 FLOW (Carbendazim, SC 500), tested at concentrations of 5 and 10 mg prod./kg soil dw
Test substrate:	Artificial soil, 10 % sphagnum peat, 20 % kaolin clay, 69.5 % industrial quartz sand, 0.5 % calcium carbonate 61.5% maximum water holding capacity of artificial soil (dry weight)
Substrate/test vessel:	Plastic vessel of Bellaplast (inside dimensions: about 16.5 cm x 12 cm x 6 cm) with a lid pervious to air and light. 675 g wet weight corresponding to 500 g dray weight of artificial soil with a water content corresponding to 40-60 % of WHC
Temperature:	19.4 – 22.0 °C
Light regime:	16 hours light (570 lux) / 8 hours dark
Water content:	Test start: 35.0 – 35.1 % (equivalent to 56.9 – 57.1 % of WHC) Test end: 34.3 – 34.8 % (equivalent of 55.8 – 56.6 % of WHC)
pH:	Test start: 6.11 – 6.30 Test end: 5.72 – 5.91
Feeding:	Finely ground horse manure, 5 g per replicates was added each week for the first 4 weeks.
Test parameters:	Temperature and air humidity were recorded continuously during the whole test period. At test start: individual fresh weight (mg/worm), behaviour of earthworms, determination of physico-chemical parameters (water content, pH) of the artificial soil Weekly: observation of behavioural and pathological symptoms (including feeding activity) 4 weeks after start of exposure: number of surviving adult earthworms per replicate, observation of behavioural and pathological symptoms (including morphological alterations), fresh weight of survinging adult earthworms per replicate 8 weeks after start of exposure: number of juveniles per replicate, observation of behavioural and pathological symptoms (including morphological alterations), fresh weight of surviving adult earthworms per replicate
Statistics:	The endpoints were mortality, change of biomass (difference in fresh weight of surviving worms between test start and four weeks after treatment) and reproduction (the number of juveniles present). The arithmetic mean and the standard deviation per treatment and per control for reproduction, mortality and biomass were calculated. The statistical analysis was performed with the software ToxRat Professional 3.1.0 (Ratte 2015). The EC_{10} and EC_{20} values (number of juveniles) were estimated by Probit analysis. Confidence limits (95 %) of the ECx values were computed by normal approximation. Multiple Sequentially-rejective Fisher Test After Bonferroni-Holm and the Williams-t-test were used to compare

the control with the independent test item groups. For statistical evaluation of the biomass change, the changed mean fresh weight of surviving worms per replicate was used.

Findings:

Biological results:

Table B. 9.4.1-5: Effects on mortality, growth and reproduction of *Eisenia fetida* in a sub-chronic test

Fenoxaprop-P-ethyl-benzoxazolone (BCS-AC79872) [mg/kg soil d.w.]						
	Control	**50**	**89**	**158**	**281**	**500**
Mortality of adult worms after 4 weeks						
Mortality (%)	1.3	0.0	0.0	2.5	2.5	0.0
Biomass change (change in fresh weight after 4 weeks relative to initial fresh weight)						
Mean (mg)	110.3	112.0	108.9	97.9	66.9*	11.2*
Mean (%)	29.9	30.2	29.6	26.3	18.2	3.1
Number of juveniles per surviving adult worm after 8 weeks						
Mean	14.0	15.7	14.3	8.3	5.0	0.2
Number of juveniles per replicate after 8 weeks						
Mean	137.8	157.0	142.5	81.5*	49.5*	1.5*
Reproduction compared to control (%)						
% to control	100	114.0	103.4	59.2	35.9	1.1

Not statistically significantly different compared to the control for mortality

(Multiple Sequentially-rejective Fisher Test After Bonferroni-Holm, $\alpha = 0.05$, one-sided greater)

* statistically significantly different compared to control for biomass and reproduction (Williams-t-test, $\alpha = 0.05$, one-sided smaller)

Table B. 9.4.1-6: Effects on mortality, growth and reproduction of *Eisenia fetida* in a sub-chronic test

Test item Test object Exposure	**Fenoxaprop-P-ethyl-benzoxazolone (BCS-AC79872)** ***Eisenia fetida*** **Artificial soil**		
	Mortality	Biomass change	Reproduction
	[mg/kg soil d.w.]		
NOEC	≥ 500	158	89
LOEC	> 500	281	158
EC_{10} [1)] (95% confidence limits)	-	-	97 (54 – 173)
EC_{20} [1)] (95% confidence limits)	-	-	125 (81 – 193)

[1)] based on Probit analysis

Validity criteria:

Validity Criteria	Recommended	Obtained
Adult mortality	≤ 10%	1.3 % (after 4 weeks)
Number of juveniles per replicate	≥ 30	130, 115, 102, 163, 159, 128, 134 and 171
Coefficient of variation of reproduction	≤ 30%	17.7 %

Reference item: In a reference test, the number of juveniles was reduced by 46 and 100 % by the toxic standard Nutdazim 50 FLOW (Carbendazim, SC 500) in comparison to the control. Therefore, the observed effects assure a high sensitivity of the test system.

Conclusion: Fenoxaprop-P-ethyl-benzoxazolone (BCS-AC79872) showed no statistically significantly adverse effects on mortality of the earthworm *Eisenia fetida* in artificial soil up to and including 500 mg pure metabolite/kg soil dry weight, i.e. the highest concentration tested. Statistically significant effects on biomass compared to the control group were recorded at concentrations of 281 and 500 mg/kg d.w. The test item showed statistically significantly adverse effects on reproduction at 158, 281 and 500 mg/kg soil d.w. Therefore, the No-Observed-Effect-Concentration (NOEC) for reproduction was determined to be 89 mg/kg soil d.w., and the Lowest-Observed-Effect-Concentration (LOEC) for reproduction was determined to be 158 mg/kg soil d.w.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the test guideline OECD 222 (April, 2004)

Check of validity criteria:

- each replicate (containing 10 adults) to have produced ≥ 30 juveniles by the end of the test: fulfilled, 102 – 171 juveniles per replicate have been produced.
- the coefficient of variation of reproduction to be ≤ 30 %: fulfilled, the coefficient of variation was 17.7 %.
- adult mortality over the initial 4 weeks of the test to be ≤ 10 %: fulfilled: adult mortality was 1.3 %

Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed

Endpoints:

NOEC values for mortality, body weight change and reproduction were determined. An analysis of the statistical power of the test was not performed, but is considered to be acceptable, as the study design followed the recommendations of the cited guideline. It further is noted that the study was not designed to generate EC_x value although the guideline gives some recommendations for this purpose. No EC_X were therefore calculated.

	The RMS does agree on the endpoints given in the study report: $NOEC_{reproduction}$ =89 mg/kg soil dry weight **Conclusion of the RMS:** The study is considered to be valid.

Reference:	**(D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065): Sublethal toxicity to the earthworm *Eisenia fetida* in artificial soil**
Author(s), year:	Friedrich, S., 2016b
Report/Doc. number:	Report no. 15 10 48 058 S, Reference no. M-549919-01-1
Guideline(s):	OECD 222 (2004), ISO 11268-2 (1998)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	(D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065), Batch no.: AE F096918 00 1B98 0001, Purity (analysed): 92.7 % w/w ((D+)-2-(4-hydroxyphenoxy)-propionic acid), 97.9 % w/w (sum of (D+) – and (L-enantiomers))
Test species:	Earthworm *Eisenia fetida* (SYVIGNY, 1826)
Number of organisms:	8 replicates per treatment group and control group, each with 10 individuals.
Weight, age:	Mean: 349 - 548 mg/worm, adults with clitellum, approximately 3 months
Type of test, duration:	Laboratory sub-lethal test, 8 weeks (4 weeks adult mortality, 4 weeks juvenile development)
Applied concentrations:	Nominal: 0 (control, quartz sand), 50, 89, 158, 281 and 500 mg/kg soil dw
Solvent:	None
Toxic standard:	Nutdazim 50 FLOW (Carbendazim, SC 500), tested at concentrations of 5 and 10 mg prod./kg soil dw
Test substrate:	Artificial soil, 10 % sphagnum peat, 20 % kaolin clay, 69.5 % industrial quartz sand, 0.5% calcium carbonate
Substrate/test vessel:	675 g wet weight corresponding to 500 g dry weight of artificial soil with a water content corresponding to 40-60 % of WHC
Temperature:	19.4 – 22.0 °C
Light regime:	16 hours light (580 lx) / 8 hours dark
Water content:	Test start: 34.9 – 35.0 % (equivalent to 56.7 – 56.9 % of WHC) Test end: 34.5-34.9 % (equivalent of 56.1 – 56.7 % of WHC)
pH:	Test start: 6.08 – 6.12

Test end: 5.72 – 5.78

Feeding: Air-dried and finely ground horse manure; feeding interval was weekly during the first 4 weeks, weekly amount of manure (5 g) depended on the feeding activity.

Test parameters: Temperature and air humidity were recorded continuously during the whole test period.

At test start: individual fresh weight (mg/worm), behaviour of earthworms, determination of physico-chemical parameters (water content, pH) of the artificial soil

Weekly: observation of behavioural and pathological symptoms (including feeding activity)

4 weeks after start of exposure: number of survining adult earthworms per replicate, observation of behavioural and pathological symptoms (including morphological alterations), rresh weight of survining adult earthworms per replicate

8 weeks after start of exposure: number of juveniles per replicate, observation of behavioural and pathological symptoms (including morphological alterations), determination of physico-chemical parameters (water content, pH) of the artificial soil

Statistics: The endpoints were mortality, change of biomass (difference in fresh weight of surviving worms between test start and four weeks after treatment) and reproduction (the number of juveniles present). The arithmetic mean and the standard deviation per treatment and per control for reproduction, mortality and biomass were calculated. The statistical analysis was performed with the software ToxRat Professional 3.1.0 (Ratte 2015). The EC_{10} and EC_{20} values (number of juveniles) were estimated by Probit analysis. Confidence limits (95 %) of the ECx values were computed by normal approximation. Multiple Sequentially-rejective Fisher Test After Bonferroni-Holm and the Williams-t-test were used to compare the control with the independent test item groups. For statistical evaluation of the biomass change, the changed mean fresh weight of surviving worms per replicate was used.

Findings:

Biological results:

Table B. 9.4.1-7: Observations

(D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065) [mg/kg soil d.w.]						
	Control	**50**	**89**	**158**	**281**	**500**
Mortality of adult worms after 4 weeks						
Mortality (%)	1.3	2.5	0.0	0.0	2.5	5.0
Biomass change (change in fresh weight after 4 weeks relative to initial fresh weight)						
Mean (mg)	98.3	101.0	89.9	91.7	102.3	95.3

Mean (%)	21.6	22.3	19.8	20.0	22.4	20.9
Number of juveniles per surviving adult worm after 8 weeks						
Mean	11.4	11.8	10.7	11.0	10.1	8.8
Number of juveniles per replicate after 8 weeks						
Mean	112.3	115.3	107.0	110.0	98.5	84.3*
Reproduction compared to control (%)						
% to control	100	102.7	95.3	98.0	87.8	75.1

No statistically significant differences between the control and test item were calculated for mortality (Multiple Sequentially-rejective Fisher Test After Bonferroni-Holm, $\alpha = 0.05$, one-sided greater) and for biomass (Williams-t-test, $\alpha = 0.05$, one-sided smaller)

* statistically significantly different compared to control for reproduction (Williams t-test, $\alpha = 0.05$, one-sided smaller)

Table B. 9.4.1-8: Effects on mortality and reproduction of *Eisenia fetida* in a sub-chronic test

Test item Test object Exposure	**(D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065)** ***Eisenia fetida*** **Artificial soil**		
	Mortality	Biomass change	Reproduction
	[mg pure metabolite/kg soil d.w.]		
NOEC	≥ 500	≥ 500	281
LOEC	> 500	> 500	500
EC_{10} [1)] (95% confidence limits)	-	-	254 (179 – 360)
EC_{20} [1)] (95% confidence limits)	-	-	416 (332 – 520)

[1)] based on Probit analysis

Validity criteria:

Validity Criteria	**Recommended**	**Obtained**
Adult mortality	≤ 10%	1.3 % (after 4 weeks)
Number of juveniles per replicate	≥ 30	123, 96, 109, 148, 91, 110, 89 and 132
Coefficient of variation of reproduction	≤ 30%	18.6 %

Reference item: In a reference test, the number of juveniles was reduced by 46 and 100 % by the toxic standard Nutdazim 50 FLOW (Carbendazim, SC 500) in comparison to the control. Therefore, the observed effects assure a high sensitivity of the test system.

Conclusion: (D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065) showed no statistically significantly adverse effects on mortality and adult biomass change of the earthworm *Eisenia fetida* in artificial soil up to and including 500 mg/kg soil dry weight, i.e. the highest concentration tested. The test item showed statistically significantly adverse effects on reproduction at 500 mg/kg soil d.w. Therefore, the No-Observed-Effect-Concentration (NOEC) for reproduction was determined to be 281 mg/kg soil d.w., and the Lowest-Observed-Effect-Concentration (LOEC)

for reproduction was determined to be 500 mg/kg soil d.w.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the test guideline OECD 222 (April, 2004) Check of validity criteria: - each replicate (containing 10 adults) to have produced ≥ 30 juveniles by the end of the test: fulfilled, 91 – 148 juveniles per replicate have been produced. - the coefficient of variation of reproduction to be ≤ 30 %: fulfilled, the coefficient of variation was 18,6 %. - adult mortality over the initial 4 weeks of the test to be ≤ 10 %: fulfilled: adult mortality was 1.3 % **Acceptability of the analytical methods used in the test:** Not relevant as no analytics were performed **Endpoints:** NOEC values for mortality, body weight change and reproduction were determined. An analysis of the statistical power of the test was not performed, but is considered to be acceptable, as the study design followed the recommendations of the cited guideline. It further is noted that the study was not designed to generate EC_x value although the guideline gives some recommendations for this purpose. No EC_X were therefore calculated. The RMS proposes a lower NOEC due to effects 12 % effect on reproduction. Although this was a non siginificant effect it could be considered biologically relevant: $NOEC_{reproduction}$ = 158 mg/kg soil dry weight **Conclusion of the RMS:** The study is considered to be valid.

B.9.4.1.1. Additional information

For the first EU approval of the active substance Fenoxaprop-P-ethyl acute earthworm studies were submitted addressing the risk to earthworms. According to the current data requirements (Regulation No 283/2013) acute toxicity studies are no longer required. Nevertheless, the study summaries from the DAR are included in the RAR as additional information (marked in italic).

Reference: Fischer, R. (1988): The effect of HOE 046360 – substance, technical (identification code: Hoe 046360 OH ZC97 0001) to Eisenia fetida (earthworm) in a 14 day artificial soil test (method OECD). (Report

OEK89/006E; Document A39888)

Guideline: OECD Guideline 207

GLP: Yes

Material and methods: A 14-days toxicity study on earthworms was carried out with Fenoxaprop-P-ethyl, substance technical (identification code Hoe 046360 OH ZC97 0001; purity 97.2%). The artificial soil was prepared from 10% dried sphagnum peat, 20% kaolin clay, 69.7% industrial quarzsand and $CaCO_3$ to adjust the pH of this medium to 5.7. Air humidity was regulated between 75 and 97% and temperature between 18 and 21° C. The climatic chamber was illuminated constantly. The test substance was mixed into the artificial soil in nominal concentrations of 100, 180, 320, 560 and 1000 mg/kg (dw). For each replicate ten worms were placed on the surface of the test medium. 40 worms were tested for each concentration.

7 and 14 days after starting the test the contents of each test jar were emptied on a steel tray, the mortality was assessed, cocoon production and intoxication symptoms were recorded. After the 7 day assessment live worms and medium were returned into the test jars.

The no observed effect concentration (NOEC) was determined by statistical analysis, employing analysis of variance, general linear models, Duncan's multiple range test and Fisher's least-significant-difference test procedures.

Findings:

The LC_{50} value lay above 1000 mg/kg (dw) after 7 and 14 days test duration. No mortality occurred in any of the control or treatment groups.

At 1000 and 560 mg/kg the worms exhibited cramping. At 1000 mg/kg secretion was observed after mechanic stimulation. No cocoons were seen at concentrations of 560 and 1000 mg/kg. Cocoon production was visibly reduced at 320 mg/kg. The highest concentration tested without mortality and without intoxication symptoms such as higher weight loss than control or reduction in cocoon production was found at 180 mg/kg.

The LC_{50} value for the positive control substance chloracetamid was found after 7 and after 14 days (with 95% confidence limits) at 15.8 (10-18) mg/kg (dw).

Table B. 9.4.1-9: % difference between weight of worms at start and end or testing period

Test concentration (mg/kg)	***Difference (%) range (mean)***
Control	*-3.5 – -11.9 (-7.7)*
100	*-6.2 – -10.8 (-7.7)*
180	*-5.3 – -9.7 (-7.9)*
320	*-2.5 – -11.4 (-8.5)*
560	*-7.6 – -17.9 (-11.0)*
1000	*-10.0 – -20.1 (-15.1)**

**significantly different from control*

Conclusions:

In a 14 days acute toxicity test with earthworms, where Fenoxaprop-P-ethyl (subst. techn.) was applied in 5 concentrations between 100 and 1000 mg/kg (dw) the LC_{50} was determined to be >1000 mg/kg (dw).

Acceptance of the study: Study was accepted by the RMS.

Reference: Sowig, P. (2002b): Acute toxicity to earthworms (Eisenia fetida), Fenoxaprop-P; substance technical, (metabolite of AE F046360). (Report CE02/056; Document C024170)

Guideline: OECD Guideline 207

GLP: Yes

Material and methods

The objective of this study was to determine the effects of Fenoxaprop-P (AE F088406; substance technical, code AE F088406 001C97 0001; purity 97.4% w/w) on earthworms (Eisenia fetida) in an acute toxicity study on artificial soil. The artificial soil was prepared form 10% sphagnum peat, 70% industrial sand and 20% kaolin clay. $CaCO_3$ was added to adjust the pH to about 6. Moisture and temperature (20° C) were maintained during the test. The worms were exposed to five nominal treatment levels, 100, 180, 320, 560 and 1000mg/kg dry soil. Four replicates each of 10 worms were tested for each treatment and the control. Mortality and intoxication symptoms were assessed at day 7 and day 14 after application. Mean individual weight per group at the start of the test and weight difference between start an end of the test were compared by statistical analysis, employing analysis of variance general linear models, Duncan's multiple range test and Dennett's test procedures.

Findings:

No mortality or any adverse effect was observed in any treated group up to and including 560 mg/kg. At 1000 mg/kg one worm was found dead at the 7 day-assessment (e.g. 2.5%) and worms of all replicates exhibited slight convulsive behaviour at the interim and the 14 day-assessment. Only at the highest treatment level the body weight loss of the surviving worms showed a slight, but statistical significant decrease as compared with the untreated control.

Based on mortality and sublethal effects observed at the highest treatment level of 1000 mg/kg the concentration without any observed effects (NOEC) was considered to be 560 mg/kg artificial soil.

Table B. 9.4.1-10: % difference between weight of worms at start and end or testing period

Test concentration (mg/kg)	***Difference (%) range (mean)***
Control	*-4.6*
100	*-4.3*
180	*-4.4*
320	*-3.1*
560	*-7.3*
1000	*-11.7**

**significantly different from control (alpha = 0.05)*

Conclusions:

In a 14 days acute toxicity test with earthworms, where Fenoxaprop-P (subst. techn.) was applied in 5 concentrations between 100 and 1000 mg/kg (dw) the LC_{50} was determined to be >1000 mg/kg (dw).

Acceptance of the study: Study was accepted by the RMS.

Reference: Kunze, C.L. (2002): AE F054014; substance, technical: Acute toxicity to earthworms (Eisenia fetida).

(Report LKC/Rg 407/02; Document C027501)

Guideline: OECD Guideline 207

GLP: Yes

Material and methods:

An acute toxicity study on earthworms with metabolite AE F054014 (chlorobenzoxazolone), substance techn., code AE F054014 001C99 0004, purity 99.7%, batch YP VII/119, was performed on artificial soil. Adult Eisenia fetida (4x10 animals per concentration) were exposed for 14 days to the nominal test concentrations (mixed into soil) of 100, 180, 320, 560 and 1000 mg/kg substrate (dw). The artificial soil consisted of 69% fine quartz sand, 10% sphagnum peat, 20% kaolin and around 1% calcium carbonate to adjust the pH value to about 6. The test conditions were 20±1° C, 70-90% relative humidity and constant light. Seven days after the start of the study the number of surviving worms was determined. After 14 days the weight, abnormal behaviour, observed symptoms as well as the number of surviving earthworms were determined. The weight alterations of the test organisms were statistically evaluated by the U-test of Wilcoxon, Mann &Whitney.

Findings:

For the reference substance chloroacetamide a 14 days LC50 of 21 mg/kg (dw) was determined.

The LC_{50} (14 d) for AE F054014 was found to be >560<1000 mg/kg dry weight substrate. Related to weight alterations, the no-observed-effect-concentration (NOEC) was 320 mg/kg artificial soil, the lowest-observed-effect-concentration (LOEC) was 560 mg/kg soil, the highest non-lethal concentration was 560 mg/kg soil (dw). No symptoms at any treatment levels after 7 and 14 days of exposure were observed. The no adverse observed effect concentration was considered to be 320 mg/kg soil.

Table B. 9.4.1-11: Effects of chlorobenzoxazolone (AE F054014) on Eisenia fetida (mean of four replicates) in an acute toxicity study (14 days)

Test concentration (mg/kg)	***% mortality***	***% weight alterations of survivors***
Control	*3 ± 5*	*+ 4 ± 2*
100	*3 ± 5*	*+ 2 ± 7*
180	*0*	*+ 2 ± 2*
320	*0*	*- 4 ± 3 **
560	*0*	*- 24 ± 2 **
1000	*100*	*-*

** weights of control and the test concentration differ significantly according to the U-test.*

Conclusions:

In a 14 days acute toxicity test with earthworms, where AE F054014 (chlorobenzoxazolone; subst. techn.) was applied in 5 concentrations between 100 and 1000 mg/kg (dw) the LC_{50} was determined to be >560<1000 mg/kg dry weight substrate.

Acceptance of the study: Study was accepted by the RMS.

B.9.4.2. Effects on non-target soil meso- and macrofauna (other than earthworms)

According to the data requirements on active substances (Regulation 283/2013) the risk to soil dwelling organisms has to be addressed (1) if a risk to non-target arthropods was identified or (2) if the product is applied to the bare soil (pre-emergence).

Under consideration of the intended uses on wheat and barley (ground boom sprayer) the risk to soil meso- and macrofauna from exposure to the active substance and its major soil metabolites has to be addressed. Hence, laboratory studies with the soil organisms *Folsomia candida* and *Hypoaspis aculeifer* were submitted.

Active substance:

Reference:	**Fenoxaprop-P-ethyl a.s.: Influence on mortality and reproduction of the soil mite species *Hypoaspis aculeifer* tested in artificial soil**
Author(s), year:	Lopez, M. I. L., 2015
Report/Doc. number:	Report no. E 428 4781-4, Reference no. M-534684-01-1
Guideline(s):	OECD 226 (2008)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Active substance Fenoxaprop-P-ethyl (AE F046360), Batch no. AE F046360-01-12, Purity: 94.3% (analysed)
Test species:	*Hypoaspis aculeifer* (Acari: Laelapidae)
Number of organisms:	8 replicates per control and8 replicates per treatment group, 1 additional replicates per treatment to check the pH and water content of the test substrate at the end of the test not loaded with *Hypoaspis aculeifer*.
Life stage, age:	Mites from a synchronised culture at an age of 28 days after start of egg laying were used in this study
Type of test, duration:	Laboratory sub-lethal test, 14 days
Applied concentrations:	Nominal: 0 (control) and 1000 mg a.s./kg soil dw
Solvent:	None
Toxic standard:	Dimethoate purity: not stated (formulation: Dimethoate EC 400E G), tested at concentrations of 1.0, 1.8, 3.2, 5.6 and 10.0 mg a.s./kg soil dw.
Test substrate:	Artificial soil, 5 % sphagnum peat, 20 % kaolin clay, 75 % fine quartz sand
Substrate/test vessel:	20± 1 g dry weight/test container
Temperature:	20 ± 2 °C
Light regime:	16 hours light (400 - 800 lx) / 8 hours dark
Water content:	Test start: 19.31 – 19.36 % (equivalent to 50.69 – 50.85 % of WHC) Test end: 18.94 – 19.66 % (equivalent of 49.49 – 51.83 % of WHC)
pH:	Test start: 5.35 – 5.52 Test end: 5.17 – 5.35

Feeding: During the test, the Hypoaspis aculeifer were fed with nematodes bred on watered oat flakes.

Test parameters: pH and water content were determined at test start and test end. Water content maintenance was checked weekly after application.

Mortality of adults and number of juvenile Collembola were assessed after 28 days

Statistics: The calculation of mean, SD and % mortality of the control and treatment groups with Excel sheets (Microsoft Excel 2010) is documented in the raw data. The software used to perform the statistical analysis was ToxRat Professional 2.10 released February 20, 2010, (Ratte, 2010).

Findings:

Biological results: Mortality:

In the control group 3.8 % of the adult *Hypoaspis aculeifer* died which is below the allowed maximum of ≤ 20% mortality.

Reproduction:

Concerning the number of juveniles statistical analysis (Student-t test, one-sided smaller, α = 0.05) revealed no significant difference between control and the treatment group.

The $EC_{10, 20}$ -values could not be determined since the study was conducted as limit test and did not indicate adverse effects.

Table B. 9.4.2-1: Observations

Test item	**Fenoxaprop-P-ethyl (BCS-AI29196)**				
Test object	***Hypoaspis aculeifer***				
Exposure	**Artificial soil**				
mg a.s./kg dry weight artificial soil	**Adult mortality (%)**	**Significance (*)**	**Mean number of juveniles per test vessel ± standard dev.**	**Reproduction (% of control)**	**Significance (**)**
Control	3.8	---	194.4 ± 22.7	---	---
1000	1.3	-	216.4 ± 20.7	111.3	-

Calculations were done with un-rounded values.

(*) = Student-t test, one sided smaller; α=0.05; "-": non-significant; "+": significant

Table B. 9.4.2-2: Effects on mortality and reproduction of *Folsomia candida* in a sub-chronic test

Test item	**Fenoxaprop-P-ethyl (BCS-AI29196)**	
Test object	***Hypoaspis aculeifer***	
Exposure	**Artificial soil**	
	Adult mortality	**Reproduction**
	(mg a.s./kg soil d.w.)	

NOEC	≥ 1000	≥ 1000
LOEC	> 1000	> 1000

Validity criteria: All validity criteria for the study were met.

Validity Criteria	Recommended	Obtained
Mean mortality of adult females	≤ 20%	3.8%
Mean number of juveniles per replicate (with 10 mites introduced)	≥ 50	194.4
Coefficient of variation calculated for the number of juveniles per replicate	≤ 30%	11.7%

Reference item: The most recent non-GLP-test (Maria Ivonne Larnaudie Lopez, LAR/HR-O-16/14, January 05, 2015) with the reference item dimethoate was performed at test concentrations 1.0, 1.8, 3.2, 5.6 and 10.0 mg dimethoate/kg dry weight artificial soil.

Dimethoate EC 400E G showed an EC_{50} of 5.47 mg a. s./kg (95% confidence limits from 4.09 mg a.s./kg to 7.30 mg a.s./kg) for reproduction according Probit analysis using maximum likelihood regression.

This is in the recommended range of the guideline, indicating that an EC_{50} based on the number of juveniles of 3.0 to 7.0 mg a.s./kg dry weight artificial soil shows that the test organisms are sufficiently sensitive.

Conclusion: Overall NOEC: ≥1000 mg a.s./kg dry weight artificial soil

Overall LOEC: >1000 mg a.s./kg dry weight artificial soil

Comment RMS: **Validity:** The study was evaluated following the recommendations of the test guideline OECD 226 (July, 2016)

Check of validity criteria:

- Mean adult female mortality should not exceed 20% at the end of the test: fulfilled, actual: 3.8 % for the control
- The mean number of juveniles per replicate (with 10 adult females introduced) should be at least 50 at the end of the test: actual: 194.4 juveniles per replicate for the control
- The coefficient of variation calculated for the number of juvenile mites per replicate should not be higher than 30% at the end of the definitive test: actual: 11.7 % for the water control

Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed

Endpoints:

	An analysis of the statistical power of the test is not considered necessary as the test followed the recommendations of the cited guideline for deriving a NOEC. The study was not designed to derive EC_X values. The endpoints included in the study report could be confirmed. Overall NOEC ≥1000 mg a.s./kg s dw **Conclusion of the RMS:** The study is considered to be valid.

Reference:	**Fenoxaprop-P-ethyl a.s.: Effects on the reproduction of the collembolan *Folsomia candida***
Author(s), year:	Friedrich, S., 2015b
Report/Doc. number:	Report no. 15 10 48 249 S, Reference no. M-538169-01-1
Guideline(s):	OECD 232 (2009), ISO 11267 (1999)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl a.s. (BCS-AI29180), Batch no.: AE F04636-01-12, Purity: sum of R- and S-enantiomers of Fenoxaprop-P-ethyl 97.3% w/w (analysed), Fenoxaprop-P-ethyl 94.3 % w/w (analysed)
Test species:	Collembola *Folsomia candida* (Willem, 1902)
Number of organisms:	8 replicates per control and 4 per treatment group, each with 10 individuals. 2 additional replicates per treatment and control to check the pH and water content of the test substrate after 28 days
Life stage, age:	Juveniles / adults, 9-12 days old
Type of test, duration:	Laboratory sub-lethal limit test, 28 days
Applied concentrations:	Nominal: 0 (control), 18, 32, 56, 100, 178, 316, 562 and 1000 mg a.s./kg soil dw
Solvent:	None
Toxic standard:	Boric acid, Purity: 100 % (analysed), tested at concentrations of 44, 67, 100, 150 and 225 mg/kg soil dw.
Test substrate:	Artificial soil, 5 % sphagnum peat, 20 % kaolin clay, 74.7 % industrial quartz sand, 0.3 % calcium carbonate
Substrate/test vessel:	30 g wet weight/test container
Temperature:	20.3 – 22.0 °C
Light regime:	16 hours light 490 lx) / 8 hours dark

Water content:	Test start: 24.9-25.0 % (equivalent to 59.7 – 60.0 % of WHC) Test end: 24.3-24.8 % (equivalent to 58.3 – 59.5 of WHC)
pH:	Test start: 6.04 – 6.11 Test end: 5.72 – 5.77
Feeding:	Approximately 2 mg of granulated dry yeast at the start of the test and after 14 days
Test parameters:	pH and water content were determined at test start and test end. Mortality of adults, behavioural effects and number of juvenile Collembola were assessed after 28 days
Statistics:	The statistical analysis was performed with the software ToxRat Professional 3.1.0 (RATTE 2015). Multiple Sequentially-rejective Fisher Test After Bonferroni-Holm and Williams-t-test were used to compare the control with the independent test item group.

Findings:

Biological results:

Mortality:

Mortality rate of 0 – 5 % were recorded in the test item treatment group. 3.8 % parental mortality was observed in the control. No statistically significant effect (Multiple sequentially-rejective Fisher Test after Bonferoni Holm for mortality, α = 0.05, one-sided greater) on parental mortality was found for the test item treatment group. No effects on behaviour of the collembolans were observed during the test.

Reproduction:

The mean number of juvenile collembolans counted four weeks after introduction of the parental collembolans into the test vessels was 858 in the control and 843, 861, 873, 868, 833, 843, 889 and 812 at concentrations of 18, 32, 56, 100, 178, 316, 562 and 1000 mg a.s./kg soil d.w., respectively. No statistically significant effects (Williams-t-test, α = 0.05, one-sided smaller) on the number of juveniles was found for any concentration tested.

EC_{10} or EC_{20} could not be calculated since the observed differences between the control and the treatment groups were <10%.

Table B. 9.4.2-3: Effects on mortality and reproduction of *Folsomia candida* in a sub-chronic test

Test item **Test object** **Exposure**	**Fenoxaprop-P-ethyl** ***Folsomia candida*** **Artificial soil**			
mg a.s./kg soil dry weight nominal concentration	**Adult mortality (%)**	**Mean number of juveniles per test vessel ± standard deviation**	**Reproduction (% of control)**	**Significance (*)**
Control	3.8	858 ± 122.6	100	
18	2.5	843 123.2	98	-

32	2.5	861 ± 44.0	100	-
56	2.5	873 202.3	102	-
100	0.0	868 230.9	101	-
178	0.0	833 28.0	97	-
316	2.5	843 52.2	98	-
562	0.0	889 197.7	104	-
1000	5.0	812 73.9	95	-
			Reproduction	
$NOEC_{reproduction}$ (mg a.s./kg soil dry weight) $LOEC_{reproduction}$ (mg a.s./kg soil dry weight)			≥ 1000 > 1000	

The calculations were performed with unrounded values

Percent reproduction: $(R_t / R_c) * 100$ %

R_t = mean number of juveniles observed in the treated groups

R_c = mean number of juveniles observed in the control group

Validity criteria: Validity criteria for the untreated control of the study according to OECD 232 (2009). All validity criteria were met. Therefore this study is valid.

Validity criteria	**Recommended by the guideline**	**Obtained in this study**
Mean adult mortality	≤ 20%	3.8%
Mean number of juveniles per replicate (with 10 collembolans introduced)	≥ 100	Average of 858/vesel
Coefficient of variation calculated for the number of juveniles per replicate	≤ 30%	14.3%

Reference item: In a separate study (BioChem project No. R 15 10 48 003 S, dated August 04, 2015) the EC_{50} (reproduction) of the reference item boric acid was calculated to be 103 mg/kg soil dry weight. The LC_{50} was determined to be 162 mg/kg soil dry weight. The NOEC for mortality and for reproduction was determined to be 67 and 44 mg/kg soil dry weight, respectively.

The EC_{50} value for the reproduction was close to the value of 100 mg/kg soil dry weight as stated in OECD 232 (2009). The EC_{50} therefore showed that the test system was sensitive.

Conclusion: The test item Fenoxaprop-P-ethyl a.s. (BCS-Al29180) showed no statistically significantly adverse effects on adult mortality and reproduction of the predatory mite *Folsomia candida* in artificial soil at concentrations up to and including 1000 mg a.s./kg soil dry weight.

Therefore, the overall No-Observed-Effect-Concentration (NOEC) was determined to be ≥ 1000 mg a.s./kg soil dry weight, and the overall Lowest-Observed-Effect-Concentration (LOEC) was determined to be > 1000 mg a.s./kg

soil dry weight.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the test guideline OECD 232 (July, 2016) Check of validity criteria: - Mean adult mortality should not exceed 20% at the end of the test: fulfilled, actual value in test was 3.8 % - The mean number of juveniles per vessel should be at least 100 at the end of the test: fulfilled, actual value in test was 858 - The coefficient of variation calculated for the number of juveniles should be less than 30% at the end of the definitive test: fulfilled actual value in test = 14.3 % **Acceptability of the analytical methods used in the test:** Not relevant as no analytics were performed **Endpoints:** An analysis of the statistical power of the test is not considered necessary as the test followed the recommendations of the cited guideline for deriving NOEC and EC_x values. Statistics were re-calculated also with ToxRat Professional 3.1.0 resulting in following endpoints: LC_{10} not determined LC_{20} not determined LC_{50} not determined $NOEC_{mortality}$ > 1000 mg a.s./kg soil dw $EC_{10\ reproduction}$ 1024.798 mg a.s./kg soil dw (standarddeviation not determined) $EC_{20\ reproduction}$ = not determined $EC_{50\ reproduction}$ = 1126.909 mg a.s./kg soil dw (standarddeviation not determined) $NOEC_{reproduction}$ > 1000 mg a.s./kg soil dw The RMS therefore agrees on the endpoints given in the study report. NOECmortality ≥ 1000 mg a.s./kg sdw NOECreproduction ≥ 1000 mg a.s./kg sdw **Conclusion of the RMS:** The study is considered to be valid.

Metabolites:

Reference:	**Fenoxaprop-P-acid (BCS-BQ23896): Effects on the reproduction of the collembolans *Folsomia candida***
Author(s), year:	Friedrich, S., 2015a
Report/Doc. number:	Report no. 15 10 48 003 S, Reference no. M-528131-01-1
Guideline(s):	OECD 232 (2009), ISO 11267 (1999)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-acid (BCS-BQ23896), Batch no.: AE F088406-PU-01, CAS no.: 113158-40-0, Purity: 97.1% w/w (analysed)
Test species:	Collembola *Folsomia candida* (Willem, 1902)
Number of organisms:	8 replicates per control and treatment group, each with 10 individuals. 2 additional replicates per treatment and control for measurement purposes
Life stage, age:	Juveniles / adults, 9-12 days old
Type of test, duration:	Laboratory sub-lethal limit test, 28 days
Applied concentrations:	Nominal: 0 (control) and 111.6 mg/kg soil dw
Solvent:	None
Toxic standard:	Boric acid, Purity: 100 % (analysed), tested at concentrations of 44, 67, 100, 150 and 225 mg/kg soil dw.
Test substrate:	Artificial soil, 5 % sphagnum peat, 20 % kaolin clay, 74.7 % industrial quartz sand, 0.3 % calcium carbonate
Substrate/test vessel:	30 g wet weight/test container
Temperature:	18.9 – 21.5 °C
Light regime:	16 hours light (540 lx) / 8 hours dark
Water content:	Test start: 25.0 % (equivalent to 58.5 % of WHC) Test end: 24.5 – 24.6 % (equivalent of 57.4 – 57.6 % of WHC)
pH:	Test start: 6.07 – 6.10 Test end: 5.78 – 5.87
Feeding:	Approximately 2 mg of granulated dry yeast at the start of the test and after 14 days
Test parameters:	pH and water content were determined at test start and test end. Water content maintenance was checked weekly after application. Mortality of adults, behavioural effects and number of juvenile Collembola were assessed after 28 days
Statistics:	The statistical analysis was performed with the software ToRAT Professional 2.10.06 (RATTE 2010). Fisher´s Exact Binominal Test and Student t-test were used to compare the control with the independent test item group

Findings:

Biological effects: No abnormal behaviour was observed with the surviving Collembola.

Table B. 9.4.2-4: Effects on mortality and reproduction of *Folsomia candida* in a sub-chronic test

	Control	**Fenoxaprop-P-acid [mg/kg soil dw]**
Exposure	-	111.6
Mortality of adult Collembola [%] after 28 d	1.3	1.3
Mean number of juveniles per treatment group after 28 d (± SD)	1192 (175)	1053 (132)
Reproduction compared to control [%]	-	99

SD…Standard Deviation

Reference item: In the most recent study the LC_{50} and EC_{50} for the reference item boric acid was determined to be 181 mg test item/kg soil dw and 104 mg test item/kg soil dw, respectively. The NOEC for mortality and for reproduction was determined to be 67 and 44 mg test item/kg soil dw, respectively.

Conclusion: NOEC (mortality, reproduction) ≥ 111.6 mg/kg soil dw

LC_{50} (mortality) > 111.6 mg/kg soil dw

Comment RMS: **Validity:** The study was evaluated following the recommendations of the test guideline OECD 232 (July, 2016)

Check of validity criteria:

- Mean adult mortality should not exceed 20% at the end of the test: fulfilled, actual value in test was 1.3%
- The mean number of juveniles per vessel should be at least 100 at the end of the test: fulfilled, actual value in test was 1191.8
- The coefficient of variation calculated for the number of juveniles should be less than 30% at the end of the definitive test: fulfilled actual value in test = 14.7 %

Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed

Endpoints:

An analysis of the statistical power of the test is not considered necessary as the test followed the recommendations of the cited guideline for deriving NOEC and EC_x values.

No significant adverse effecton adult mortlity and reproduction has been shown, therefore RMS agrees on the endpoints given in the study report.

	$NOEC_{mortality} \geq 111.6$ mg/kg sdw $NOEC_{reproduction} \geq 111.6$ mg/kg sdw **Conclusion of the RMS:** The study is considered to be valid.

Reference:	**Fenoxaprop-P-acid (BCS-BQ23896): Effects on reproduction of the predatory mite *Hypoaspis aculeifer***
Author(s), year:	Schulz, L., 2015
Report/Doc. number:	Report no. 14 10 48 267 S, Reference no. M-533179-01-1
Guideline(s):	OECD 226 (2008)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoaprop-P-acid (BCS-BQ23896), Batch no. KTS10294-1-14, Purity: Fenoxaprop-P 97.1% (analysed), sum of R- and S-isomers 98.3% (analysed), CAS no.: 113158-40-0
Test species:	Predatory mites, *Hypoaspis aculeifer* (Canestrini, 1883)
Number of organisms:	8 replicates per control and 8 replicates per treatment group, 2 additional replicates per treatment and control to check the pH and water content of the test substrate after 14 days, each with 10 individuals.
Life stage:	Adults from a synchronised culture with an age difference of 3 days
Type of test, duration:	Laboratory sub-lethal test, 14 days
Applied concentrations:	Nominal: 0 (control), 111.6 mg/kg soil dw
Solvent:	None
Toxic standard:	Dimethoate (purity (analysed): 99.8 %), 1.0, 1.6, 2.56, 4.1., 6.55 and 10.5 mg/kg soil d.w.
Test substrate:	Artificial soil, 5 % sphagnum peat, 20 % kaolin clay, 74.7 % industrial quartz sand, 0.2 % calcium carbonate
Substrate/test vessel:	20 g dry weight/test container (height of soil approximately 1.6 cm)
Temperature:	19.5 – 21.2 °C
Light regime:	16 hours light (517 lx) / 8 hours dark
Water content:	Test start: 16.48-16.77 % (equivalent to 49.43 – 50.31 % of WHC) Test end: 15.70 – 16.02 % (equivalent of 47.10 – 48.05 % of WHC)
pH:	Test start: 5.8 Test end: 5.7 – 6.0
Feeding:	During the test, the predatory mites were fed ad libitum with *Tyrophagus*

putrescentiae.

Test parameters: pH and water content were determined at test start and test end. Water content maintenance was checked every 2-3 days after application.

Mortality of adults and number of juveniles were assessed after 14 days

Statistics: The statistical analysis was performed with the software ToxRat Professional 2.10.05 (Ratee 2010). Fisher´s Exact Binomial test and the Student-t-test were used to compare the control with the independent test item group.

Findings:

Biological results: Mortality:

In the control group and in the test item group a parental mortality of 5.0 % and 2.5 %, respectively, could be observed at the end of the 14-day exposure period.

Reproduction:

Fourteen days after introduction of the parental mites into the test vessels, the mean number of juveniles was 198.4 in the control and 214.9 in the test item treatment group.

EC_{10} and EC_{20} values could not be determined since the study was conducted as limit test and did not indicate adverse effects.

Table B. 9.4.2-5: Observations

Endpoint	**Control**	**Treatment group (mg/kg soil d.w.) 111.6**
Mortality of soil mites after 14 days (%)	5.0	2.5
Mean number of juveniles after 14 days	198.4	214.9
CV (%)	12.2	16.6
Reproduction (% of control)	**100**	**108**

Not statistically significantly different compared to the control (Fisher´s Exact Binomial Test for mortality, α = 0.05; Student-t-test for reproduction; α = 0.05)

Calculations were done using unrounded values

Percent reproduction: $(R_t / R_c) * 100$ %

R_t = mean number of juvenile mites in the treated group(s)

R_c = mean number of juvenile mites in the control group

CV (%) = Coefficient of variation

Table B. 9.4.2-6: Effects on mortality and reproduction of *Hypoaspis aculeifer* in a sub-chronic test

Test item	**Fenoxaprop-P-acid (BCS-BQ23896)**	
Test object	***Hypoaspis aculeifer***	
Exposure	**Artificial soil**	
	Adult mortality	**Reproduction**

	(mg/kg soil d.w.)	
NOEC	≥ 111.6	≥ 111.6
LOEC	> 111.6	> 111.6

Validity criteria: All validity criteria for the study were met.

Validity Criteria	Recommended	Obtained
Mean mortality of adult females	≤ 20%	5.0%
Mean number of juveniles per replicate	≥ 50	198.4
Coefficient of variation (mean number of juveniles per replicate)	≤ 30%	12.2%

Reference item: In a separate study (BioChem project No. R 14 10 48 001 S, dated June 10, 2014), the EC_{50} (reproduction) of the reference item Dimethoate was calculated to be 6.2 mg/kg soil d.w.

The results of the reference test demonstrate the sensitivity of the test system.

Conclusion: The test item Fenoxaprop-P-acid (BCS-BQ23896) showed no statistically significantly adverse effects on adult mortality and reproduction of the predatory mite *Hypoaspis aculeifer* in artificial soil at 111.6 mg test item/kg soil dry weight.

Therefore, the overall No-Observed-Effect-Concentration (NOEC) was determined to be ≥ 111.6 mg test item/kg soil dry weight, and the overall Lowest-Observed-Effect-Concentration (LOEC) was determined to be > 111.6 mg test item/kg soil dry weight.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the test guideline OECD 226 (July, 2016)

Check of validity criteria:

- Mean adult female mortality should not exceed 20% at the end of the test: fulfilled, actual: 5.0 % for the control
- The mean number of juveniles per replicate (with 10 adult females introduced) should be at least 50 at the end of the test: actual: 198.4 juveniles per replicate for the control
- The coefficient of variation calculated for the number of juvenile mites per replicate should not be higher than 30% at the end of the definitive test: actual: 12.2 % for the water control

Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed

Endpoints:

	An analysis of the statistical power of the test is not considered necessary as the test followed the recommendations of the cited guideline for deriving a NOEC. The endpoints included in the study report could be confirmed. Overall NOEC ≥ 111.6 mg/kg sdw **Conclusion of the RMS:** The study is considered to be valid.

Reference:	**Fenoxaprop-P-ethyl-Benzoxazolone (BCS-AC79872): Effects on the reproduction of the collembolan *Folsomia candida***
Author(s), year:	Friedrich, S., 2016c
Report/Doc. number:	Report no. 15 10 48 108 S, Reference no. M-549923-01-1
Guideline(s):	OECD 232 (2009), ISO 11267 (1999)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl-Benzoxazolone (BCS-AC79872), Batch no.: TV2899A, Purity: 98.5% w/w (analysed)
Test species:	Collembola *Folsomia candida* (Willem, 1902)
Number of organisms:	8 replicates per control and 4 per treatment group, each with 10 individuals. 2 additional replicates per treatment and control to check the pH and water content of the test substrate after 28 days
Life stage, age:	Juveniles / adults, 9-12 days old
Type of test, duration:	Laboratory sub-lethal limit test, 28 days
Applied concentrations:	Nominal: 0 (control), 10, 18, 32, 56 and 100 mg/kg soil dw
Solvent:	None
Toxic standard:	Boric acid, Purity: 100% (analysed), tested at concentrations of 44, 67, 100, 150 and 225 mg/kg soil dw.
Test substrate:	Artificial soil, 5 % sphagnum peat, 20 % kaolin clay, 74.7 % industrial quartz sand, 0.3 % calcium carbonate
Substrate/test vessel:	30 g wet weight/test container
Temperature:	18.9 – 21.9 °C
Light regime:	16 hours light 540 lx) / 8 hours dark
Water content:	Test start: 24.9-25.0 % (equivalent to 59.7 – 60.0 % of WHC) Test end: 24.4-24.9 % (equivalent to 58.5 – 59.7 % of WHC)

pH: Test start: 6.02 – 6.13
Test end: 5.76 – 5.80

Feeding: Approximately 2 mg of granulated dry yeast at the start of the test and after 14 days

Test parameters: pH and water content were determined at test start and test end.
Mortality of adults, behavioural effects and number of juvenile Collembola were assessed after 28 days

Statistics: The statistical analysis was performed with the software ToxRat Professional 3.1.0 (RATTE 2015). Multiple Sequentially-rejective Fisher Test After Bonferroni-Holm and Williams-t-test were used to compare the control with the independent test item group.

Findings:

Biological results: EC_{10} or EC_{20} could not be calculated since the observed differences between the control and the treatment groups were <10%.

Table B. 9.4.2-7: Effects on mortality and reproduction of *Folsomia candida* in a sub-chronic test

Test item Test object Exposure	**Fenoxaprop-P-ethyl-Benzoxazolone (BCS-AC79872)** *Folsomia candida* Artificial soil			
mg/kg soil dry weight nominal concentration	Adult mortality (%)	Mean number of juveniles per test vessel ± standard deviation	Reproduction (% of control)	Significance (*)
Control	2.5	1087 ± 153	-	
10	2.5	1082 ± 100	100	-
18	2.5	1067 ± 146	98	-
32	2.5	1095 ± 108	101	-
56	0.0	1082 ± 73	99	-
100	0.0	1096 ± 110	101	-
			Reproduction	
$NOEC_{reproduction}$ (mg pure metabolite/kg soil dry weight)			≥ 100	
$LOEC_{reproduction}$ (mg pure metabolite/kg soil dry weight)			> 100	

The calculations were performed with unrounded values

(*) = (Williams-t-test one-sided-smaller, $\alpha = 0.05$, + = significant, - = not significant)

Percent reproduction: $(R_t / R_c) * 100$ %

R_t = mean number of juveniles observed in the treated groups

R_c = mean number of juveniles observed in the control group

Validity criteria:

Validity Criteria	**Recommended**	**Obtained**
Mean mortality of adult females	≤ 20 %	2.5 %
Mean number of juveniles per replicate	≥ 100	1087

Coefficient of variation (mean number of juveniles per replicate)	≤ 30 %	14.0 %

Reference item: In a separate study (BioChem project No. R 15 10 48 003 S, dated August 04, 2015), the EC50 (reproduction) of the reference item boric acid was calculated to be 103 mg/kg soil dry weight. The results of the reference test demonstrate the sensitivity of the test system.

Conclusion: The test item Fenoxaprop-P-ethyl-benzoxazolone (BCS-AC79872) showed no statistically significantly adverse effects on adult mortality and reproduction of the collembolan *Folsomia candida* in artificial soil at concentrations up to and including 100 mg/kg d.w. Therefore, the No-Observed-Effect-Concentration (NOEC) for mortality and reproduction was determined to be ≥ 100 mg/kg d.w., and the Lowest-Observed-Effect-Concentration (LOEC) for mortality and reproduction was determined to be > 100 mg /kg d.w.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the test guideline OECD 232 (July, 2016)

Check of validity criteria:

- Mean adult mortality should not exceed 20% at the end of the test: fulfilled, actual value in test was 2.5 %
- The mean number of juveniles per vessel should be at least 100 at the end of the test: fulfilled, actual value in test was 1087.4
- The coefficient of variation calculated for the number of juveniles should be less than 30% at the end of the definitive test: fulfilled actual value in test = 14.0 %

Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed

Endpoints:

An analysis of the statistical power of the test is not considered necessary as the test followed the recommendations of the cited guideline for deriving NOEC and EC_x values. Statistics were re-calculated also with ToxRat Professional 3.1.0 resulting in following endpoints:

LC_{10} not determined

LC_{20} not determined

LC_{50} not determined

$EC_{10\ reproduction}$ not determined

$EC_{20\ reproduction}$ not determined

$EC_{50\ reproduction}$ not determined

$NOEC_{reproduction}$ > 100 mg/kg soil dw

	The RMS therefore agrees on the endpoints given in the study report. NOECmortality ≥ 100 mg/kg sdw NOECreproduction ≥ 100 mg/kg sdw **Conclusion of the RMS:** The study is considered to be valid.

Reference:	**(D+)-2-(4-hydroxyphenoxy)-proprionic acid (BCS-CA37065): Effects on the reproduction of the collembolan *Folsomia candida***
Author(s), year:	Friedrich, S., 2016d
Report/Doc. number:	Report no. 15 10 48 109 S, Reference no. M-549922-01-1
Guideline(s):	OECD 232 (2009), ISO 11267 (1999)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	(D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065), Batch no.: AE F096918 00 1B98 0001 Purity: sum of R- and S-enantiomers of Fenoxaprop-P-ethyl 97.9% w/w (analysed), Fenoxaprop-P-ethyl 92.7 % w/w (analysed)
Test species:	Collembola *Folsomia candida* (Willem, 1902)
Number of organisms:	8 replicates per control and 4 per treatment group, each with 10 individuals. 2 additional replicates per treatment and control to check the pH and water content of the test substrate after 28 days
Life stage, age:	Juveniles / adults, 9-12 days old
Type of test, duration:	Laboratory sub-lethal limit test, 28 days
Applied concentrations:	Nominal: 0 (control), 10, 18, 32, 56, and 100 mg/kg soil dw
Solvent:	None
Toxic standard:	Boric acid, Purity: 100 % (analysed), tested at concentrations of 44, 67, 100, 150 and 225 mg/kg soil dw.
Test substrate:	Artificial soil, 5 % sphagnum peat, 20 % kaolin clay, 74.7 % industrial quartz sand, 0.3 % calcium carbonate
Substrate/test vessel:	30 g wet weight/test container
Temperature:	20.2 – 22.0 °C
Light regime:	16 hours light (510 lx) / 8 hours dark
Water content:	Test start: 24.9-25.0 % (equivalent to 59.7 – 60.0 % of WHC) Test end: 24.2-24.6 % (equivalent to 58.0 – 59.0 % of WHC)
pH:	Test start: 6.02 – 6.07

	Test end: 5.85 – 5.87
Feeding:	Approximately 2 mg of granulated dry yeast at the start of the test and after 14 days
Test parameters:	pH and water content were determined at test start and test end. Mortality of adults, behavioural effects and number of juvenile Collembola were assessed after 28 days
Statistics:	The statistical analysis was performed with the software ToxRat Professional 3.1.0 (RATTE 2015). Multiple Sequentially-rejective Fisher Test After Bonferroni-Holm and Williams-t-test were used to compare the control with the independent test item group.

Findings:

Biological results: EC_{10} or EC_{20} could not be calculated since the observed differences between the control and the treatment groups were <10%.

Table B. 9.4.2-8: Effects on mortality and reproduction of *Folsomia candida* in a sub-chronic test

Test item	**(D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065)**			
Test object	*Folsomia candida*			
Exposure	Artificial soil			
mg pure metabolite/kg soil dry weight nominal concentration	Adult mortality (%)	Mean number of juveniles per test vessel ± standard deviation	Reproduction (% of control)	Significance (*)
Control	2.5	754 ± 95	-	
10	2.5	751 ± 70	100	-
18	0.0	759 ± 59	101	-
32	2.5	752 ± 49	100	-
56	2.5	770 ± 27	102	-
100	0.0	749 ± 107	99	-
			Reproduction	
$NOEC_{reproduction}$ (mg pure metabolite/kg soil dry weight)			≥ 100	
$LOEC_{reproduction}$ (mg pure metabolite/kg soil dry weight)			> 100	

The calculations were performed with unrounded values

(*) = (Williams-t-test one-sided-smaller, $\alpha = 0.05$, + = significant, - = not significant)

Percent reproduction: $(R_t / R_c) * 100$ %

R_t = mean number of juveniles observed in the treated groups

R_c = mean number of juveniles observed in the control group

Validity criteria:

Validity Criteria	**Recommended**	**Obtained**
Mean mortality of adult females	≤ 20 %	2.5 %
Mean number of juveniles per replicate	≥ 100	754
Coefficient of variation (mean	≤ 30 %	12.6 %

number of juveniles per replicate)		

Reference item: In a separate study (BioChem project No. R 15 10 48 003 S, dated August 04, 2015), the EC_{50} (reproduction) of the reference item boric acid was calculated to be 103 mg/kg soil dry weight. The results of the reference test demonstrate the sensitivity of the test system.

Conclusion: The test item (D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065) showed no statistically significantly adverse effects on adult mortality and reproduction of the collembolan *Folsomia candida* in artificial soil at concentrations up to and including 100 mg/kg d.w. Therefore, the No-Observed-Effect-Concentration (NOEC) for mortality and reproduction was determined to be ≥ 100 mg/kg d.w., and the Lowest-Observed-Effect-Concentration (LOEC) for mortality and reproduction was determined to be > 100 mg /kg d.w.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the test guideline OECD 232 (July, 2016)

Check of validity criteria:

- Mean adult mortality should not exceed 20% at the end of the test: fulfilled, actual value in test was 2.5 %
- The mean number of juveniles per vessel should be at least 100 at the end of the test: fulfilled, actual value in test was 750.7
- The coefficient of variation calculated for the number of juveniles should be less than 30% at the end of the definitive test: fulfilled actual value in test = 13.1 %

Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed

Endpoints:

An analysis of the statistical power of the test is not considered necessary as the test followed the recommendations of the cited guideline for deriving NOEC and EC_x values. Statistics were re-calculated also with ToxRat Professional 3.1.0 resulting in following endpoints:

LC_{10} not determined

LC_{20} not determined

LC_{50} not determined

$EC_{10\ reproduction}$ not determined

$EC_{20\ reproduction}$ not determined

$EC_{50\ reproduction}$ not determined

The RMS therefore agrees on the endpoints given in the study report.

NOECoverall ≥ 100 mg/kg sdw

	Conclusion of the RMS: The study is considered to be valid.

Reference:	**Fenoxaprop-P-ethyl-benzoxazonolone (BCS-AC79872): Effects on mortality and reproduction of the predatory mite *Hypoaspis aculeifer***
Author(s), year:	Schulz, L., 2016a
Report/Doc. number:	Report no. 16 10 48 082 S, Reference no. M-553442-01-1
Guideline(s):	OECD 226 (2008)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoaprop-P-ehtyl-benhzoxazolone (BCS-AC79872), Batch no. AE F054014-PU-01, Purity: Fenoxaprop-P 98.5% (analysed) CAS no.: 19932-84-4
Test species:	Predatory mites, *Hypoaspis aculeifer* (Canestrini, 1883) - females
Number of organisms:	8 replicates per control and 4 replicates per treatment group, 2 additional replicates per treatment and control to check the pH and water content of the test substrate after 14 days, each with 10 individuals.
Life stage:	Adults from a synchronised culture with an age difference of 2 days (approx. 32 days from egg laying)
Type of test, duration:	Laboratory sub-lethal test, 14 days
Applied concentrations:	Nominal: 0 (control), 10, 18, 32, 56 and 100 mg /kg soil dw
Solvent:	None
Toxic standard:	Dimethoate (purity (analysed): 99.8 %), 1.0, 1.6, 2.56, 4.1., 6.55 and 10.5 mg/kg soil d.w.
Test substrate:	Artificial soil, 5 % sphagnum peat, 20 % kaolin clay, 74.7 % industrial quartz sand, 0.2 % calcium carbonate
Substrate/test vessel:	20 g dry weight/test container (height of soil approximately 1.6 cm)
Temperature:	19.7 – 21.2 °C
Light regime:	16 hours light (453 lx) / 8 hours dark
Water content:	Test start: 15.55-16.42 % (equivalent to 46.66-49.26 % of WHC) Test end: 15.82-16.25 % (equivalent of 47.46-48.75 % of WHC)
pH:	Test start: 5.7 Test end: 5.2
Feeding:	During the test, the predatory mites were every 2-3 days with *Tyrophagus putrescentiae*.
Test parameters:	pH and water content were determined at test start and test end. Water content

maintenance was checked every 2-3 days after application.

Mortality of adults and number of juveniles were assessed after 14 days

Statistics: The statistical analysis was performed with the software ToxRat Professional 2.10.06 (Ratte 2010). Fisher´s Exact Binomial test with Bonferroni Correction and the Williams-t-test were used to compare the control with the independent test item group.

Findings:

Biological results: EC_{10} could not be calculated since the difference between the treatment groups and the control did not indicate a dose response and did not exceed 10%. Therefore, the EC_{10} was estimated to be > 100 mg/kg soil d.w.

Table B. 9.4.2-9: Observations

Endpoint	Control	10	18	32	56	100
Mortality of soil mites after 14 days (%)	6.3	2.5	5.0	5.0	7.5	2.5
Mean number of juveniles after 14 days	337.0	350.0	336.8	308.0	304.0	322.3
CV (%)	5.8	6.7	7.0	7.3	8.6	8.8
Reproduction (% of control)	100	104	100	91	90	96

Not statistically significantly different compared to the control (Fisher's Exact Binomial with Bonferroni Correction for mortality, α = 0.05, one-sided greater and Williams-t-test for reproduction, α = 0.05, one-sided smaller)

Calculations were done using unrounded values

Percent reproduction: (Rt / Rc) * 100 %

Rt = mean number of juvenile mites in the treated group(s)

Rc = mean number of juvenile mites in the control group

CV (%) = Coefficient of variation

Table B. 9.4.2-10: Effects on mortality and reproduction of *Hypoaspis aculeifer* in a sub-chronic test

Test item	BCS-AC79872	
Test object	*Hypoaspis aculeifer*	
Exposure	Artficial soil	
	Adult mortality	Reproduction
	(mg/kg soil d.w.)	
NOEC	≥ 100	≥ 100
LOEC	> 100	> 100
EC_{10}	> 100	> 100

Validity criteria:

Validity Criteria	Recommended	Obtained
Mean mortality of adult females	≤ 20 %	6.3 %
Mean number of juveniles per replicate	≥ 100	337

Coefficient of variation (mean number of juveniles per replicate)	≤ 30 %	5.8 %

Reference item: In a separate study (BioChem project No. R 15 10 48 001 S, experimental completion date: February 24, 2015), the EC_{50} (reproduction) of the reference item Dimethoate (analysed purity: 99.8 %, tolerance ± 1.0 %) was calculated to be 6.7 mg/kg soil d.w. The results of the reference test demonstrate the sensitivity of the test system.

Conclusion: The test item Fenoxaprop-P-ethyl-benzoxazolone (BCS-AC79872) showed no statistically significantly adverse effects on adult mortality and reproduction of the predatory mite *Hypoaspis aculeifer* in artificial soil at all tested concentrations. Therefore, the No-Observed-Effect-Concentration (NOEC) for mortality and reproduction was determined to be ≥ 100 mg pure metabolite/kg soil d.w. and the Lowest-Observed Effect-Concentration (LOEC) for mortality and reproduction was determined to be > 100 mg pure metabolite/kg soil d.w., respectively.

Comment RMS: **Validity:** The study was evaluated following the recommendations of the test guideline OECD 226 (July, 2016)

Check of validity criteria:

- Mean adult female mortality should not exceed 20% at the end of the test: fulfilled, actual: 6.3 % for the control
- The mean number of juveniles per replicate (with 10 adult females introduced) should be at least 50 at the end of the test: actual: 337 juveniles per replicate for the control
- The coefficient of variation calculated for the number of juvenile mites per replicate should not be higher than 30% at the end of the definitive test: actual: 5.8 % for the water control

Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed

Endpoints:

An analysis of the statistical power of the test is not considered necessary as the test followed the recommendations of the cited guideline for deriving a NOEC. The study was not designed to derive EC_X values though the guideline provides respective recommendations. Statistics were re-calculated with ToxRat Professional 3.1.0 resulting in following endpoints:

LC_{10} not determined

LC_{20} not determined

LC_{50} not determined

$EC_{10\ reproduction}$ not determined

	$EC_{20\ reproduction}$ = not determined $EC_{50\ reproduction}$ = not determined The endpoints included in the study report could be confirmed. Overall NOEC ≥ 100 mg/kg dw **Conclusion of the RMS:** The study is considered to be valid.

B.9.5. EFFECTS ON SOIL NITROGEN TRANSFORMATION

In the first EU peer-review of the active substance Fenoxaprop-P-ethyl nitrogen and carbon mineralisation studies were submitted addressing the risk to soil micro-flora. According to the EU data requirements for active substances (Regulation 283/2013) and plant protection products (Regulation 284/2013) the impact on soil microbial activity should be evaluated, in terms of nitrogen transformation. Hence, the available information on micro-flora respiration (carbon transformation) was not evaluated by the RMS.

Active substance:

Reference:	**Microflora respiration and nitrogen transformation according to OECD guideline number 216 and 217**
Author(s), year:	McMurray A., 2002
Report/Doc. number:	Report no. C020914, Reference no. M-210339-01-1
Guideline(s):	OECD 216 and OECD 217
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl, Purity: 95.1 %
Product code:	AE F046360 00 1D96 0011
Test species:	Soil microflora
Type of test, duration:	Microflora respiration and Nitrogen transformation test, 28/56 days
Applied concentrations:	0 (control), 0.133 and 0. 67 mg a.s./kg soil dw
Solvent/vehicle:	None
Toxic standard:	Dinoseb acetate
Test substrate:	The soil used in the study was obtained from Soil Survey and Land Research Centre. The soil was collected from a grassland site that had not received pesticide

or fertiliser treatment within the previous 12 months.

Soil (BBA classif.)	**% sand**	**% silt**	**% clay**	**% OC**	**pH (water)**	**MWHC (g/100 g)**	**Biomass (g C/100g)**
Medium loamy sand	69.39	19.29	11.32	1.2	5.5	48.4	0.039 (3.25% of OC)

Substrate/test vessel: 50 g soil dw/plastic sample pots

Incubation: 20 ± 2 °C

Water content Test start: 21.78 % w/w (> 45% of WHC)

pH: Soil respiration:

Control: 5.95

Field rate: 5.97

5 times field rate: 5.98

Nitrogen transformation:

Control: 5.96

Field rate: 5.9

5 times field rate: 6.01

Test parameters: Microflora respiration was followed by measuring the CO2 per hour and per kilogram soil. Nitrogen transformation was followed by measuring the amounts of NH^{+}_{4}-N, NO^{-}_{2}-N and NO^{-}_{2}-N in soil.

The nitrogen transformation was determined on day 0 and at intervals of 7, 14, 28, 42 and 56 days after application.

Samples were extracted with 2 M KCl.

Findings:

Biological results: Fenoxaprop-P-ethyl (subst. techn.) did not have any significant effect on microbial carbon turnover when applied at rates equivalent to 100 g a.s./ha and 500 g a.s. /ha on a loamy sand. The maximum percent deviation found during the course of the study was 3.9. There was no observed effect on soil pH at the end of the study. In case of the reference substance dinoseb acetate, applied to a silty sand the variation from control was -31% after 28 days.

Table B. 9.5-1: Effect of Fenoxaprop-P-ethyl techn. subst. on mean (3 repl.) microbial respiration rate in a medium loamy sand soil (ECO050130)

Treatment	mg CO2/h/kg soil (% variation from control)			
	Day 0	Day 7	Day 14	Day 28
Control	18.66	18.49	17.95	16.99
100 g/ha	18.69 (+0.17)	18.74 (+1.33)	17.79 (-0.90)	17.14 (+0.88)
500 g/ha	19.20 (+2.88)	18.00 (-2.68)	17.28 (-3.71)	16.34 (-3.86)

Fenoxaprop-P-ethyl (subst. techn.) did not have any significant effect on microbial carbon turnover when applied at rates equivalent to 100 g a.s./ha. The maximum variation from control was found to be +21% after 42 days (NO_3^-). After 56 days this difference decreased to 0.3%. When Fenoxaprop-P-ethyl was applied at a rate equivalent to 500 g a.s./ha significant effects in excess of 25% were found at days 28 and 42. The study was extended to 56 days at which point effects decreased to 5.4%. The effects observed at days 28 and 56 were therefore considered to be transitory. In case of the reference substance dinoseb acetate, applied to a silty sand the variation from control was -46% after 28 days.

Table B. 9.5-2: Effect of Fenoxaprop-P-ethyl (techn. subst.) on mean (4 repl.) NH4+-N, NO3--N, NO2--N and total mineral nitrogen (N-min) concentrations in a medium loamy sand soil (ECO050130)

Treatm.		mg N/kg soil (% variation from control)					
		Day 0	Day 7	Day 14	Day 28	Day 42	Day 56
Control	NO_2^-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	NO_3^-	12.38	13.83	16.07	24.00	27.54	40.56
	$NH4^+$	6.92	<0.52	<0.52	<0.52	<0.52	<0.52
	N-min	19.30	13.83	16.07	24.00	27.54	40.56
100 g/ha (0.133 mg/kg)	NO_2^-	<0.10 (ND)	<0.10 (ND)	<0.10 (ND)	<0.10 (ND)	<0.10 (ND)	<0.10 (ND)
	NO_3^-	12.23 (-1.2)	13.47 (-2.6)	15.14 (-5.8)	27.73 (+15.5)	33.37 *(+21.2)*	40.67 (+0.27)
	$NH4^+$	7.0 (+1.7)	0.93 (ND)	<0.52 (ND)	<0.52 (ND)	<0.52 (ND)	<0.52 (ND)
	N-min	19.27 (-0.2)	14.4 (+4.1)	15.14 (-5.8)	27.73 (+15.5)	33.37 *(+21.2)*	40.67 (+0.27)
500 g/ha (0.67 mg/kg)	NO_2^-	<0.10 (ND)	<0.1 (ND)	<0.10 (ND)	<0.10 (ND)	<0.10 (ND)	<0.10 (ND)
	NO_3^-	12.1 (-1.9)	14.26 (+3.1)	18.12 (+12.8)	32.36 *(+34.8)*	36.35 *(+32.0)*	42.75 (+5.4)
	$NH4^+$	6.77 (-2.2)	1.02 (ND)	<0.52 (ND)	<0.52 (ND)	<0.52 (ND)	<0.52 (ND)
	N-min	18.91 (-2.0)	15.28 (+10.5)	18.12 (+12.8)	32.36 *(+34.8)*	36.35 *(+32.0)*	42.75 (+5.4)

ND…not determined, *Cursive*… significant (p = 0.05)

Conclusions: It can be concluded from this study that Fenoxaprop-P-ethyl (subst. techn.) does not have an unacceptable effect on soil microbial respiration or nitrogen transformation processes at application rates up to 500 g a.s./ha. The test concentrations in this study were 0.133 mg/kg and 0.67 mg/kg soil.

Comment RMS:	**Validity:**

	The study was evaluated following the recommendations of the test guideline OECD 216 (2000) Check of validity criteria: - The variation between replicate control samples should be less than ± 15%: fulfilled, the coefficient of variation was below 15 % at all sampling dates (7.7%) **Acceptability of the analytical methods used in the test:** Not relevant as no analytics were performed. **Endpoints:** The RMS agrees on the endpoints given in the study report: No long-term effect on nitrogen turnover up to 0.67 mg/kg soil dry weight. **Conclusion of the RMS:** The study is considered to be valid**.**

Reference:	**Effects of Fenoxaprop-P-ethyl Technical on the Activity of the Soil Microflora in the Laboratory**
Author(s), year:	Reis, K.-H.., 2008
Report/Doc. number:	246 FPE / M-548159-01-1
Guideline(s):	OECD 216 and OECD 217
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-p-ethyl, Purity: 98.4 %, Batch No.: 660-PSH-36, CAS No.: 71283-80-2
Test species:	Soil microflora
Type of test, duration:	Microflora respiration and Nitrogen transformation test, 28/42 days
Applied concentrations:	0 (control), 0.11 and 0.55 mg a.s./kg soil dw, 3 replicates per control and treatment group
Solvent/vehicle:	Acetone
Toxic standard:	Sodium chloride at a rate of 16 g/kg dry soil

Test substrate:

Soil (BBA classif.)	**% sand**	**% silt**	**% clay**	**% OC**	**pH**	**WHC (%)**	**Biomass (% of total organic carbon)**
Medium loamy sand	59.3	31.7	9.0	1.1	6.9	51.0	6.0

Substrate/test vessel:	Disposable plastic boxes with 250 – 500 g soil dw (nitrogen test)
Incubation:	20 ± 2°C
Water content	Test start: 50 - 55 % of WHC
pH:	The pH values were checked at each sampling date for one replicate of each treatment group. Over the course of the soil respiration test, the pH values varied from 7.0 to 7.1 and 7.1 to 7.3 for the soil carbon transformation test and soil nitrogen transformation test respectively.
Test parameters:	Microflora respiration was followed by measuring the CO2 per hour and per kilogram soil. Nitrogen transformation was followed by measuring the amounts of NH^+_4-N, NO^-_2-N and NO^-_2-N in soil. The nitrogen transformation was determined on day 0 and at intervals of 7, 14, 28 and 42 after application. Samples were extracted with KCl-solution.

Findings:

Biological results:	During the 42-day test fenoxaprop-P-ethyl techn. had no relevant influence on nitrogen transformation in a loamy sand soil supplemented with Lucerne-grass-green meal. At the end of the experiment (0-42 day interval), differences in the nitrate-N rates between control soil samples and treated soil samples are < 25% and meet the trigger values of above mentioned guideline for a termination of the study. During the 28-day test fenoxaprop-P-ethyl techn., had no influence on carbon transformation after addition of glucose to a loamy sand soil. At the end of the experiment differences in the carbon dioxide rates between control soil samples and treated soil samples are <25% and meet the trigger.

Table B. 9.5-3: Observations

Test item	Fenoxaprop-p-ethyl techn.	
Test object	Soil Microorganisms Nitrogen-Transformation (loamy sand soil)	
Exposure	42 days	
mg test item/kg dry weight soil	0.11	0.55
Final results: Difference in rates of nitrogen formation (%) between control and treatment groups after 42 days	1.6	- 19.0

*) statistically significant difference to the control (student-t-test, two-sided, α= 0.05)

Table B. 9.5-4: Observations

Test item	Fenoxaprop-p-ethyl techn.	
Test object	Soil Microorganisms Carbon-Transformation (loamy sand soil)	
Exposure	28 days	
mg test item/kg dry weight soil	0.11	0.55
Final Result (mg Carbon Dioxide / Hour / kg dry weight Soil) after 28 days	5.43%*) of control	3.42% of control

*) statistically significant difference to the control (student-t-test, two-sided, α= 0.05)

Table B. 9.5-5: Effects of Fenoxaprop-P-ethyl Technical on Soil Respiration and Soil NitrogenTransformation in a Loamy Sand Soil

	Soil Respiration (mg CO_2 / kg soil dry weight / hr) Mean Values					
	Control		**Fenxoaprop-P-ethyl technical**			
			0.11 mg soil dw.		**0.55 mg soil dw.**	
Sampling	**Respiration Rate**	**Replicate Variation[1]**	**Respiration Date**	**Deviation[2]**	**Respiration Rate**	**Deviation[2]**
Day 0	15.381	4.49	17.420*	13.26	17.304*	12.50
Day 7	13.813	0.94	15.559*	12.64	15.390*	11.42
Day 14	14.328	3.27	15.457	7.88	15.362	7.22
Day 28	13.936	3.15	14.693*	5.43	14.412	3.42
	NO_3 – Nitrogen (mg/kg soil dry weight) Mean Values					
	Control		**Fenxoaprop-P-ethyl technical**			
			0.11 mg soil dw.		**0.55 mg soil dw.**	
Sampling	**Nitrate-N content**	**Replicate Variation[1]**	**Nitrate-N content**	**Replicate Variation[2]**	**Nitrate-N content**	**Deviation[2]**
Day 0	13.500	0.93	13.313	-1.39	13.197*	-2.24
Day 7	17.337	2.80	17.662	1.87	13.451	-22.41
Day 14	22.086	0.86	22.844	3.43	18.998*	-13.98
Day 28	28.051	1.47	30.769*	9.69	25.779	-8.10
Day 42	40.068	7.41	40.106	0.09	34.687*	-13.43
	NO_3 - Nitrogen Formation Rate (mg / kg soil dry weight per day)[3]					
	Control		**Fenxoaprop-P-ethyl technical**			
			0.11 mg soil dw.		**0.55 mg soil dw.**	
Interval[3]	**Nitrate-N Formation**		**Nitrate-N Formation**	**Deviation[2]**	**Nitrate-N Formation**	**Deviation[2]**
Day 0-7	0.55		0.62	12.7	0.04	-92.7
Day 0-14	0.62		0.68	9.7	0.42*	-32.3
Day 0-28	0.52		0.62	19.2	0.45	-13.5

Day 0-42	0.63	0.64	1.6	0.51*	-19.0

1 = % variation within control replicates (coefficient of variation, calculated as standard deviation / mean value * 100)

2 = % deviation to control

3 = related to sussessive intervals between samplings

+ = stimulating effect

- = inhibitory effect

dw = dry weight

*Statistically significant different from control (Student-t-test; α = 0.05)

Validity criteria: In this study, the highest coefficient of variation (CV) between nitrate-N concentration and mineral nitrogen content in replicate control samples was 7.41% and 7.33 % (42 days after treatment), respectively, and thus did not exceed the recommended limit < 15%. Highest coefficient of variation (CV) between soil respiration was 3.27% (14 days after treatment) and thus did not exceed the recommended limit < 15%.

Conclusion: Under the conditions of the test, fenoxaprop-P-ethyl techn. had no impact on nitrogen transformation and soil respiration when applied at concentrations up to 0.55mg soil dry weight.

Comment RMS:

Validity:

The study was evaluated following the recommendations of the test guideline OECD 216 (2000)

Check of validity criteria:

- The variation between replicate control samples should be less than ± 15%: fulfilled, the coefficient of variation was below 15 % at all sampling dates (7.4%)

Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed.

Endpoints:

The RMS agrees on the endpoints given in the study report: No long-term adverse effect on nitrogen turnover up to 0.55 mg/kg soil dry weight.

Conclusion of the RMS:

The study is considered to be valid.

Metabolites:

Reference:	**Fenoxaprop-P-acid (BCS-BQ23896): Effects on the activity of soil microflora (Nitrogen transformation test)**
Author(s), year:	Schulz, L., 2016b
Report/Doc. number:	Report no. 14 10 48 087 N, Reference no. M-550893-01-1

Guideline(s):	OECD 216 (2000)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-acid (metabolite of Fenoxaprop-p-ethyl (BCS-BQ23896)), Batch no.: AE F088406-PU-01, Purity (analysed): Fenoxaprop-P 97.1% w/w, sum of R- and S-isomeres 983. % w/w, CAS No.: 113158-40-0
Test species:	Soil microflora
Type of test, duration:	Nitrogen transformation test, 28 days
Applied concentrations:	0 (control), 0.1049 and 0.5244 mg/kg dry soil, 3 replicates per control and treatment group
Solvent/vehicle:	None
Toxic standard:	Dinoterb, tested at concentrations of 16 and 27 mg/kg soil dw, 3 replicates per treatment group
Test substrate:	Agriculturally utilised soil (loamy sand), removed to a depth of 20 cm, from a field located in Canitz, Germany. no application of fertilisers and plant protection products since 2003. C_{ORG} 1.50 %, pH: 6.3, Humus content: 2.58 %, Carbon content of microbial biomass: 35.51 mg C/100 g soil dw (corresponding to 2.37 % of C_{ORG}) Total nitrogen content: 0.17 % Water holding capacity (WHC): 38.42 g/100 g soil dw Texture according to DIN 11277: 9.0 % clay, 37.4 % silt, 53.6 % sand 0.5 % (i.e. 1.0 g/200 g soil dw) lucerne meal
Substrate/test vessel:	200 g soil dw/500 mL glass flasks
Incubation:	19.5 – 21.0 °C, darkness
Water content	Test start: 18.43 – 18.87 g/100 g soil dw (> 45 % of WHC) Test end: 18.12 – 18.51 g/100 g soil dw (> 45 % of WHC)
pH:	Test start: 6.1 Test end: 5.9
Test parameters:	The nitrogen transformation was determined on day 0 (after approximately 3 hours), and at intervals of 7, 14, 21 and 28 days after application. Samples (10 g soil dw) were extracted with 50 mL 1M KCl, mixed on a rotator at 150 rmp for 60 minutes, centrifuged and stored deep-frozen prior to analysis at 20 ± 5 °C. For the quantitative determination of the mineralized part of nitrogen the Autoanalyzer was used.
Statistics:	A statistical evaluation of the test results was performed by means of a 2-sided Student-t-test (for homogeneous variances at 5 % significance level).

Findings:

Biological results: No adverse effects of the test item on nitrogen transformation in soil could be observed at both test concentrations (0.1049 mg/kg dry soil and 0.5244 mg/kg dry soil) 28 days after application. Differences from the control of -3.7 % (test concentration 0.1049 mg/kg dry soil) and +24.8 % (test concentration 0.5244 mg/kg dry soil) were measured at the end of the 28-day incubation period (time interval 14-28).

Table B. 9.5-6: Effects on nitrogen transformation in soil after treatment with the test item

Time Interval	Control			0.1049 mg test item/kg soil dry weight equivalent to 0.0787 kg test item/ha				0.5244 mg test item/kg soil dry weight			
	Nitrate-N[1)]			Nitrate-N[1)]			% difference to control	Nitrate-N[1)]			% difference to control
0-7	4.63	±	0.21	4.65	±	0.06	**+0.4** n.s.	4.84	±	0.19	**+4.5** n.s.
7-14	1.71	±	0.17	1.83	±	0.37	**+7.0** n.s.	1.14	±	0.10	**-33.4** *s
14-28	1.09	±	0.11	1.05	±	0.18	**-3.7** n.s.	1.36	±	0.11	**+24.8** *s

1) Rate: Nitrate-N in mg/kg soil dry weight/time interval/day, mean of 3 replicates and standard deviation

n.s. = No statistically significant difference to the control (Student-t-test for homogeneous variances, 2-sided, $p \leq 0.05$)

*s = statistically significantly different to control (Student-t-test for homogeneous variances, 2-sided, $p \leq 0.05$) The calculations were performed with unrounded values

Validity criteria: The coefficients of variation in the control for NO3-N were maximum 2.4 % and thus fulfilled the demanded range (≤15 %).

Reference item: In the most recent test with the toxic standard (conducted from 08.01.2014 to 05.02.2014), Dinoterb caused an effect of +101.8 % and +172.8 % (required ≥ 25 %) on the nitrogen transformation in a field soil at the tested concentrations of 16.00 mg and 27.00 mg Dinoterb per kg soil dry weight, respectively, 28 days after application (time interval 14-28) and thus demonstrates the sensitivity of the test system.

Conclusion: The test item caused no adverse effects (difference to control < 25 %, OECD 216) on the soil nitrogen transformation (expressed as NO_3-N-production) at the end of the 28-day incubation period. The study was performed in a field soil at concentrations up to 0.5244 mg/kg dry soil, which are equivalent to application rates up to 0.3933 kg/ha.

Comment RMS: **Validity:**

The study was evaluated following the recommendations of the test guideline OECD 216 (2000)

Check of validity criteria:

- The variation between replicate control samples should be less than ± 15%: fulfilled, the coefficient of variation was below 15 % at all sampling dates (10.1%)

	Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed. **Endpoints:** The RMS agrees on the endpoints given in the study report: No long-term adverse effect on nitrogen turnover up to 0.5244 mg/kg soil dry weight is suspected. It has to be noted that the effect is just below the trigger of 25 % (24.8 % effect). **Conclusion of the RMS:** The study is considered to be valid**.**

Reference:	**Fenoxaprop-P-ethyl-Benzoxazolone (BCS-AC79872): Effects on the activity of soil microflora (Nitrogen transformation test)**
Author(s), year:	Schulz, L., 2016c
Report/Doc. number:	Report no.: 15 10 48 021 N, Reference no.: M-550900-01-1
Guideline(s):	OECD 216 (2000)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	BCS-AC79872 (metabolite of Fenoxaprop-p-ethyl), Batch no.: TV2899A, Purity: 98.5% (analysed)
Test species:	Soil microflora
Type of test, duration:	Nitrogen transformation test, 28 days
Applied concentrations:	0 (control, untreated), 0.053 and 0.263 mg pure metabolite/kg soil dw (
Solvent/vehicle:	None
Toxic standard:	Dinoterb

Test conditions:

Test substrate:	Agriculturally utilised soil (loamy sand), removed to a depth of 20 cm, from a field located in Canitz, Germany. no application of fertilisers and plant protection products since 2003. C_{ORG} 1.44 %, pH: 6.4 Humus content: 2.48%, Carbon content of microbial biomass: 49.95 mg C/100 g soil dw (corresponding to 3.47 % of C_{ORG}) Total nitrogen content: 0.15% Water holding capacity (WHC): 35.59 g/100 g soil dw Texture according to DIN 11277: 8.9 % clay, 31.3 % silt, 59.9 % sand 0.5% (i.e. 1.0 g/200 g soil dw) lucerne meal

Substrate/test vessel: 200 g soil dw/500 mL wide mouth glass flasks (treatment and control groups, 3 replicates per treatment)

Incubation: 19.8 – 21.2°C, darkness

Water content Test start: 16.44 – 17.12 g/100 g soil dw (> 45% of WHC)

Test end: 16.15 – 16.76 g/100 g soil dw (> 45% of WHC)

pH: Test start: 5.8 – 5.9

Test end: 5.9 – 6.1

Test parameters: The nitrogen transformation was determined on day 0 (after approximately 3 hours), and at intervals of 7, 14 and 28 days after application.

Samples (10 g soil dw per replicate) were extracted with 50 mL 1M KCl, mixed on a rotator at 150 rmp for 60 minutes, centrifuged and stored deep-frozen prior to analysis at 20 ± 5 °C.

For the quantitative determination of the mineralized part of nitrogen the Autoanalyzer was used.

Statistics: A statistical evaluation of the test results was performed by means of a 2-sided Student-t-test (for homogeneous variances at 5 % significance level).

Findings:

Biological results: No adverse effects of Fenoxaprop-P-ethyl-Benzoxazolone (BCS-AC79872) on nitrogen transformation in soil could be observed at both test concentrations (0.053 mg test item/kg dry soil and 0.263 mg test item/kg dry soil) during the 28-day experiment. Differences from the control of +2.1% (test concentration 0.053 mg test item/kg dry soil) and -12.0% (test concentration 0.263 mg test item/kg dry soil) were measured at the end of the 28-day incubation period (time interval 14-28).

Table B. 9.5-7: Effects on nitrogen transformation in soil after treatment with Fenoxaprop-P-ethyl-benzoxazolone (AE F054014)

Time Interval	Control			0.053 mg test item/kg soil dry weight equivalent to 0.0394 kg test item/ha				0.263 mg test item/kg soil dry weight equivalent to 0.1970 kg test item/ha			
	Nitrate-N[1)]			Nitrate-N[1)]			% difference to control	Nitrate-N[1)]			% difference to control
0-7	5.24	±	0.12	5.19	±	0.26	**-1.1** n.s.	5.33	±	0.18	**+1.6** n.s.
7-14	0.57	±	0.13	0.65	±	0.52	**+14.3** n.s.	0.64	±	0.32	**+13.4** n.s.
14-28	1.51	±	0.15	1.54	±	0.06	**+2.1** n.s.	1.33	±	0.07	**-12.0** n.s.

The calculations were performed with unrounded values

[1)] Rate: Nitrate-N in mg/kg soil dry weight/time interval/day, mean of 3 replicates and standard deviation

n.s. = No statistically significant difference to the control (Student-t-test for homogeneous variances, 2-sided, $p \leq 0.05$)

Validity criteria: The coefficients of variation in the control for NO_3-N were maximum 2.6 % and thus fulfilled the demanded range (≤15 %).

Reference item: In a separate study the reference item Dinoterb caused a stimulation of nitrogen

	transformation of +39.1 %, +62.5 % and +112.0 % at 6.80 mg, 16.00 mg and 27.00 mg Dinoterb per kg soil dry weight, respectively, determined 28 days after application (time interval 14-28).
Conclusion:	Fenoxaprop-P-ethyl-Benzoxazolone (BCS-AC79872) caused no adverse effects (difference to control < 25 %, OECD 216) on the soil nitrogen transformation (expressed as NO_3-N-production) at the end of the 28-day incubation period. The study was performed in a field soil at concentrations up to 0.263 mg /kg dry soil, which are equivalent to application rates up to 0.1970 kg /ha.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the test guideline OECD 216 (2000) Check of validity criteria: - The variation between replicate control samples should be less than ± 15%: fulfilled, the coefficient of variation was below 15 % at all sampling dates **Acceptability of the analytical methods used in the test:** Not relevant as no analytics were performed. **Endpoints:** The RMS agrees on the endpoints given in the study report: No long-term adverse effect on nitrogen turnover up to 0.263 mg/kg soil dry weight. **Conclusion of the RMS:** The study is considered to be valid**.**

Reference:	**(D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065): Effects on the activity of soil microflora (Nitrogen transformation test)**
Author(s), year:	Schulz, L., 2016d
Report/Doc. number:	Report no.: 15 10 48 022 N, Reference no.: M-550904-01-1
Guideline(s):	OECD 216 (2000)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	BCS-CA37065 (D+)-2-(4-hydroxyphenoxy)-propionic acid (metabolite of Fenoxaprop-P-ethyl), Batch no.: RSS 724, Purity: 92.7% (analysed)
Test species:	Soil microflora
Type of test, duration:	Nitrogen transformation test, 28 days
Applied concentrations:	0 (control, untreated), 0.060 and 0.300 mg/kg soil dw

Solvent/vehicle:	None
Toxic standard:	Dinoterb
Test conditions:	
Test substrate:	Agriculturally utilised soil (loamy sand), removed to a depth of 20 cm, from a field located in Canitz, Germany. no application of fertilisers and plant protection products since 2003. C_{ORG} 1.44 %, pH: 6.4 Humus content: 2.48 %, Carbon content of microbial biomass: 52.42 mg C/100 g soil dw (corresponding to 3.64 % of C_{ORG}) Total nitrogen content: 0.15% Water holding capacity (WHC): 35.59 g/100 g soil dw Texture according to DIN 11277: 8.9 % clay, 31.3 % silt, 59.9 % sand 0.5 % (i.e. 1.0 g/200 g soil dw) lucerne meal
Substrate/test vessel:	200 g soil dw/500 mL wide mouth glass flasks (treatment and control groups, 3 replicates per treatment)
Incubation:	19.8 – 21.2 °C, darkness
Water content:	Test start: 16.29 – 17.02 g/100 g soil dw (> 45 % of WHC) Test end: 15.91 – 16.74 g/100 g soil dw (> 45 % of WHC)
pH:	Test start: 5.9 – 6.0 Test end: 5.6
Test parameters:	The nitrogen transformation was determined on day 0 (after approximately 3 hours), and at intervals of 7, 14 and 28 days after application. Samples (10 g soil dw per replicate) were extracted with 50 mL 1M KCl, mixed on a rotator at 150 rmp for 60 minutes, centrifuged and stored deep-frozen prior to analysis at 20 ± 5 °C. For the quantitative determination of the mineralized part of nitrogen the Autoanalyzer was used.
Statistics:	A statistical evaluation of the test results was performed by means of a 2-sided Student-t-test (for homogeneous variances at 5 % significance level).
Findings:	
Biological results:	No adverse effects of (D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065) on nitrogen transformation in soil could be observed at both test concentrations (0.060 mg test item/kg dry soil and 0.300 mg test item/kg dry soil) during the 28-day experiment. Differences from the control of -6.5% (test concentration 0.060 mg test item/kg dry soil) and -5.3% (test concentration 0.300 mg test item/kg dry soil) were measured at the end of the 28-day incubation period (time interval 14-28).

Table B. 9.5-8: Effects on nitrogen transformation in soil after treatment with (D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065)

Time Interval	Control	0.060 mg test item/kg soil dry weight equivalent to 0.0450 kg test item/ha	0.300 mg test item/kg soil dry weight equivalent to 0.2249 kg test item/ha

	Nitrate-N[1)]			Nitrate-N[1)]			% difference to control	Nitrate-N[1)]			% difference to control
0-7	4.61	±	0.38	4.56	±	0.22	**-1.1** n.s.	4.83	±	0.12	**+4.7** n.s.
7-14	2.38	±	0.42	2.14	±	0.43	**-10.0** n.s.	1.98	±	0.22	**-16.8** n.s.
14-28	1.20	±	0.09	1.12	±	0.29	**-6.5** n.s.	1.14	±	0.13	**-5.3** n.s.

The calculations were performed with unrounded values

1) Rate: Nitrate-N in mg/kg soil dry weight/time interval/day, mean of 3 replicates and standard deviation

n.s. = No statistically significant difference to the control (Student-t-test for homogeneous variances, 2-sided, $p \leq 0.05$)

Validity criteria: The coefficients of variation in the control (NO3-N) were maximum 6.1 % and thus fulfilled the demanded range (≤15 %).

Reference item: In a separate study the reference item Dinoterb caused a stimulation of nitrogen transformation of +39.1 %, +62.5 % and +112.0 % at 6.80 mg, 16.00 mg and 27.00 mg Dinoterb per kg soil dry weight, respectively, determined 28 days after application (time interval 14-28).

Conclusion: (D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065) caused no adverse effects (difference to control < 25 %, OECD 216) on the soil nitrogen transformation (expressed as NO_3-N-production) at the end of the 28-day incubation period. The study was performed in a field soil at concentrations up to 0.300 mg test item/kg dry soil, which are equivalent to application rates up to 0.2249 kg test item/ha.

Comment RMS:

Validity:

The study was evaluated following the recommendations of the test guideline OECD 216 (2000)

Check of validity criteria:

- The variation between replicate control samples should be less than ± 15%: fulfilled, the coefficient of variation was below 15 % at all sampling dates

Acceptability of the analytical methods used in the test: Not relevant as no analytics were performed.

Endpoints:

The RMS agrees on the endpoints given in the study report: No long-term adverse effect on nitrogen turnover up to 0.3 mg/kg soil dry weight.

Conclusion of the RMS:

The study is considered to be valid.

B.9.6. EFFECTS ON TERRESTRIAL NON-TARGET HIGHER PLANTS

B.9.6.1. Summary of screening data

Studies on non-target plants (seedling emergence and vegetative vigour) have been conducted with the representative formulation and are presented in the respective Volume 3, B.9 (PPP).

B.9.6.2. Testing on non-target plants

Studies on non-target plants (seedling emergence and vegetative vigour) have been conducted with the representative formulation and are presented in the respective Volume 3, B.9 (PPP).

B.9.7. EFFECTS ON OTHER TERRESTRIAL ORGANISMS (FLORA AND FAUNA)

No studies regarding effects on other terrestrial organisms were submitted for the renewal of the EU approval of the active substance.

Based on the overall risk assessment no further studies on other terrestrial organisms are required.

B.9.8. EFFECTS ON BIOLOGICAL METHODS FOR SEWAGE TREATMENT

For the first EU approval of the active substance Fenoxaprop-P-ethyl a study on effects on biological methods for sewage treatment was submitted. No additional studies were submitted for the renewal of the active substance Fenoxaprop-P-ethyl.

Reference:	**Testing of respiration inhibition to activated sludge of Hoe 046360 00 ZC97 0002**
Author(s), year:	Reinhardt., 1995
Report/Doc. number:	Study no. A55598, Reference no. M-139512-01-1
Guideline(s):	OECD 209 (1984)
GLP:	Yes
Deviations:	None
Validity:	Acceptable

Material and methods:

Test substance:	Fenoxaprop-P-ethyl techn., batch no.: Op 1-2/86, purity: 88.7% w/w
Test species:	Activated sludge (sediment of activated sludge was centrifuged and washed for 3 times) Source: domestic sewage treatment plant (Frankfurt am Main Sindlingen)
Type of test, duration:	Laboratory aerobic activated sludge inhibition test, 3 hours
Applied concentrations:	
Nominal:	1000 mg a.s./L
Toxic reference	3,5-dichlorophenol tested at concentrations of 5, 20 and 30 mg/L, 3 h EC_{50} between 5 mg/L and 30 mg/L.
Substrate/test vessel:	Activated sludge (solid concentration: 4 g/L) and synthetic sewage feed (according OECD guideline) treated with the test item, reference substance and inoculum control

Incubation:	Aerated for 3 hours at 20 ± 2 °C
Test parameters:	Inhibition of respiration rate (rate of oxygen uptake) pH-value, temperature and dissolved oxygen concentration were determined at the start and at the end of the test.
Statistics:	Test item: EC_{50} and NOEC were determined directly from the raw data
Findings:	
Oxygen consumption	No significant effects (< 15 %) on oxygen consumption were observed in the control, and all treatment groups up to a test concentration of 1000 mg a.s./L.

Table B. 9.8-1: Effect of Fenoxaprop-P-ethyl on the respiration rate of activated sludge

Treatment	**Activity mg O2/L*h**	**% Inhibition**	**Mean values**
Control 1	50.4	-	Activity:
2	49.5	-	50.8
3	52.5	-	
1000 mg/l (A)	46.8	7.9	Inhibition:
(B)	54.6	10.2	9.1%
Toxic standard 5 mg/l	34.8	27.3	-
20 mg/l	13.5	73.4	-
30 mg/l	13.5	73.4	-

Conclusions:	EC_{50} > 1000 mg a.s./L based on nominal concentrations.

Comment RMS:	**Validity:** The study was evaluated following the recommendations of the test guideline OECD 209 (2010) Check of validity criteria: - The blank controls (without the test substance or reference substance) oxygen uptake rate should not be less than 20 mg oxygen per one gram of activated sludge (dry weight of suspended solids) in an hour: fulfilled, actual 50,8 mg O_2/g.h (mean). - The coefficient of variation of oxygen uptake rate in control replicates should not be more than 30% at the end of definitive test: fulfilled, actual 3.0 % - The EC_{50} of the reference compound 3,5-Dichlorophenol is in the range of 5 and 40 mg a.s./L. In the test guideline OECD 209 (2010) it is stated : « In order to obtain both a

	NOEC and ECx (e.g. EC50), six control and five treatment concentrations in a geometric series with five replicates are recommended in most cases ». In the present test solely one concentration has been tested (1000 mg/L) furthermore only 3 replicates for the control and 2 replicates for the treatment are available. Additionally the guideline offers the possiblitiy for a range-finding test. This test should be performed using at least three concentrations of the test substance which is also no fullfilled. No information on the analytical method is available in the study report. **Conclusion of the RMS:** The study is not in line with the current testing guideline due to the deviations mentioned above. However a minor inhibition has been seen at a concentration of 1000 mg/L and therefore the study is considered to be acceptable**. Comments from MS and EFSA regarding the validity and useability of this study would be appreaciated by the RMS.**

B.9.9. MONITORING DATA

No monitoring data have been collected by the applicant nor have they been reported in any of the public literature references as evaluated in Document MCA, Section 9. Due to the low to moderate acute and chronic ecotoxicity of Fenoxaprop-P-ethyl as presented in Sections CA 8.1 to CA 8.9, no monitoring of non-target organism is deemed to be necessary.

A literature review was carried out for Fenoxaprop-P-ethyl and the relevant metabolites, relevant impurities and trade names according to the requirements of the Regulation (EU) No 844/2012" (the AIR3 renewal regulation), which itself refers to Article 8(5) of Regulation (EC) No 1107/2009. The review itself is in accordance with the EFSA Guidance document as published in EFSA Journal 2011; 9(2):2092.

Search of the scientific peer reviewed open literature was conducted by both notifiers, covering a period from 2005 to 2016.

Reference:	**Summary of the literature data for Fenoxprop-P-ethyl**
Author(s), year:	Wolf, R., 2016
Report/Doc. number:	M-556789-01-1
Guidelines:	Not applicable
GLP/GEP:	No

LITERATURE DATA

Summary

For Fenoxaprop-P-ethyl and its relevant metabolites, a total of 1250 references were identified and evaluated for potential relevance. Besides references that were clearly out of the scope of the LRR (e.g. publications dealing with chemical synthesis, or efficacy reports), the area of environmental fate and ecotoxicology were most represented in the search results. According to EFSA guidance 1135 publications have been excluded from further consideration after the rapid assessment. For 115 publications full-text documents have been obtained and assessed in detail. Ninety-one publications have been considered irrelevant after detailed assessment. In total 24 publications were evaluated as relevant for detailed assessment and has been classified for relevance according to EFSA guidance.

For Fenoxaprop-P-ethyl the publication by Zhang, Y.; Liu, D.; Diao, J.; He, Z.; Zhou, Z.; Wang, P.; Li, X.; 2010; M-507961-01-1 has been identified as relevant after detailed assessment and classified as case a) according to EFSA Guidance Point 5.4.1. The article assesses the degradation behaviour of the two enantiomers of fenoxaprop-ethyl in aerobic soil. Based on the results, racemic fenoxaprop-ethyl can be degraded in soil by enantioselective hydrolysis while enantiomers of fenoxaprop ethyl esters are configurationally stable. Enantioselective degradation in soil via the R-enantiomer is also observed when the biologically inactive S-form of fenoxaprop acid is applied, while configurational stability is found when fenoxaprop-P-acid is applied to soil. The data support the results of two studies on US soils conducted by the Fenoxaprop Task Force, but also provides further information for refining the risk assessment. Thus a detailed summary is provided under CA 7.1.1.1.

Beside this, 23 other publications have been identified as studies relevant after detailed assessment and classified in accordance with the EFSA Guidance Point 5.4.1. However, none of these studies was considered to have an impact on an EU-agreed endpoint, or would require any adaptation of the risk assessments presented in the Fenoxaprop-P-ethyl supplementary (Annex I Renewal) dossier.

Introduction

A literature review was carried out for Fenoxaprop-P-ethyl and its metabolites according to the requirements of the Regulation (EU) No 844/2012" (the AIR3 renewal regulation), which itself refers to Article 8(5) of Regulation (EC) No 1107/2009. The review itself is in accordance with the EFSA Guidance document as published in EFSA Journal 2011; 9(2):2092.

All steps in the literature review report (LRR) are based on the EFSA Guidance Document mentioned above. The key question is whether any scientific peer-reviewed open literature published within the last ten years before the date of submission of the dossier would be relevant for the risk assessment of Fenoxaprop-P-ethyl and its relevant metabolites in the context of side-effects on health, the environment and non-target species. Wherever such relevance could not be excluded, the scientific findings need to be discussed in detail in the submission for Annex I Renewal and, if necessary, the risk assessments would be updated accordingly.

Search Strategy

It has been the aim of Bayer CropScience to carry out the literature search in a comprehensive and transparent way - to allow the concept to be widely accepted by evaluating Member States and the process to be used in subsequent analyses of other compounds (see Appendix I).

The main parameters that allow the characterization of the literature search are listed below. Abstracts of all references have been downloaded and evaluated. Patents were not considered in the literature search, as they are not covered by the definition "scientific peer-reviewed open literature".

Time window of the literature search

The scientific peer-reviewed open literature published between 2005-01-01 and 2016-01-11 for all compounds.

Databases used in the literature review

Bayer CropScience has used a broad collection of relevant databases for the literature search (Table 8). STN, a scientific information platform hosted by CAS, itself a division of the American Chemical Society, was selected as the preferred provider[4]. It offers a reliable scientific search service that includes all databases considered relevant to cover the requirements established in the AIR3 renewal regulation and the EFSA Guidance document. Moreover, hosted databases have a defined query language for different sources which facilitates duplicate removal. Bayer CropScience routinely works with STN for similar applications.

Table 8: List of data bases for the literature search

Database Name	Date of last Database Update
Agricola	2016-01-05
Biosis	2016-01-06
CABA	2016-01-07
Chemical Abstracts	2016-01-10
Derwent Drug File (DRUGU)	2016-01-08
EMBASE	2016-01-08
Esbiobase	2016-01-07
IPA	2016-01-05
Medline	2016-01-10
Pascal	2014-12-22
PQSciTech	2015-12-22
Registry	2016-01-08
Scisearch	2016-01-04
Toxcenter	2016-01-04

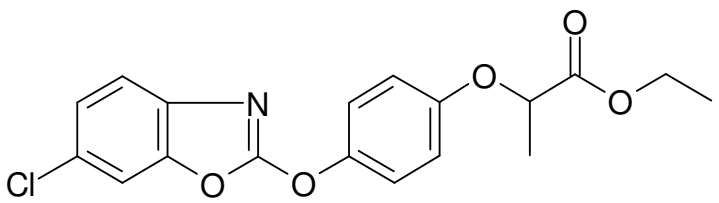
[4] http://www.cas.org/products/ stnfamily/index.html

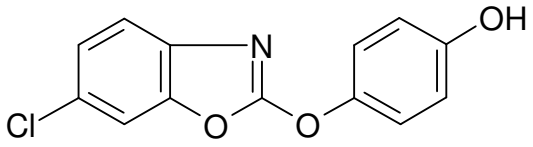
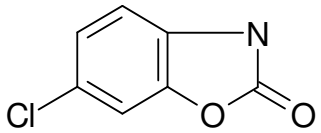
Database Name	Date of last Database Update
FSTA	2015-12-18

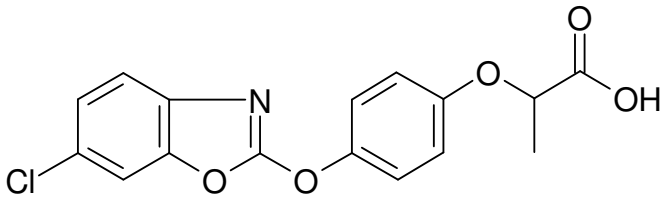
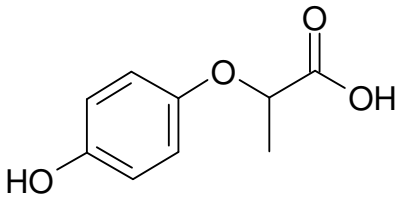
Input parameters for STN literature search

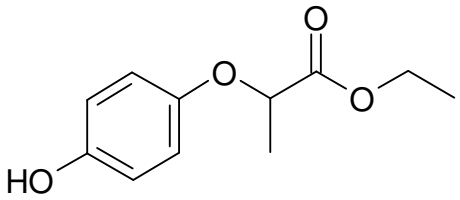
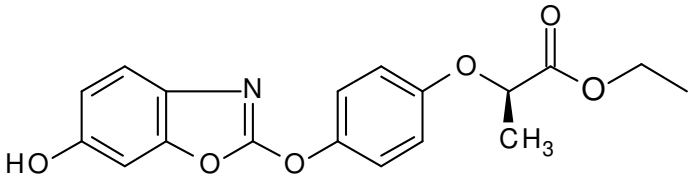
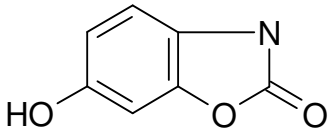
Table 9 presents the input parameters for the database search on Fenoxaprop-P-ethyl and relevant metabolites. The information used for screening the selected databases to identify all relevant publications consists of IUPAC name, CAS name/number, common names, codes and abbreviations, molecular structure, molecular formula, molar mass and other names/codes, as far as available.

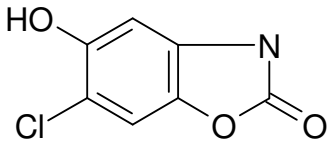
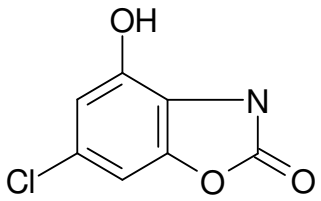
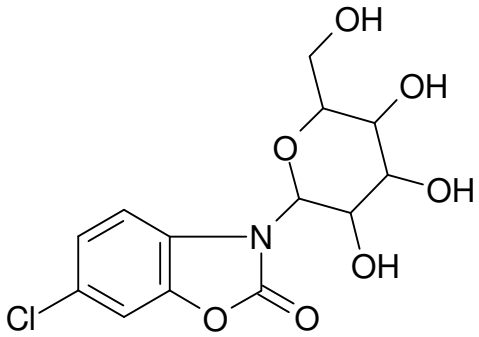
Table 9:List of input parameters for the database search on Fenoxaprop-P-ethyl and relevant metabolites

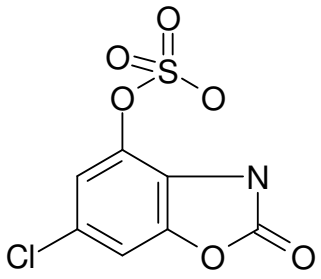
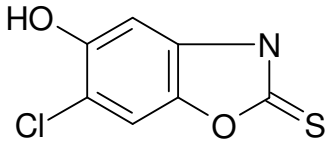
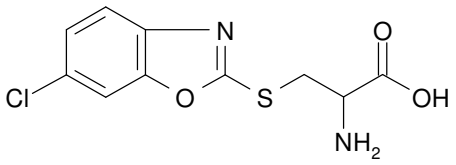
Fenoxaprop-P-ethyl	
IUPAC name:	2-(4-(6-chloro-2-benzoxazolyl)oxy)-phenoxy)propanoic acid ethyl ester
CAS number:	66441-23-4, 71283-80-2, 113776-20-8
STN Query	(66441-23-4 OR 82110-72-3 OR 87714-45-2 OR 116573-18-3 OR 71283-80-2 OR 1223013-63-5 OR 113776-20-8 OR FENOXAPROP-ETHYL OR FENOXAPROP P-ETHYL OR HOE 046360 OR HOE 33171 OR (ACCLAIM OR FURORE OR WHIP OR PUMA OR ISOMERO OR OPTION SUPER OR (RAPSODE OR FENOVA OR FOXTROT OR COUGAR OR STARPROP OR OSKAR OR FOXTAIL OR TETRAMOR OR ARSOL OR RUMBA OR NORTON OR CHEETAH OR DOPLER OR DEPON OR FURORE OR GREENEX OR PUMA OR RALON OR RICESTAR OR WHIP OR TRIUMPH OR GREENEX OR DUKE OR ACCLAIM OR DJINN OR OPTION OR HUSSAR OR GAMO OR PROPER OR LISTEN OR BLEDOR OR RUGIR OR BAGHERA OR PRIMERA OR TIGRESS OR CORNICHE OR ATLAS OR FPE)(W)(R OR TM OR RTM) OR "ETHYL-2-(4-(6-CHLORO-2-BENZOXA 1LYL-OXY)-PHENOXY-PROPANOATE " OR "ETHYL (2R)-2-[4-(6-CHLORO-2-BENZOXAZOLYLOXY)PHENOXY]PROPIONATE" OR "ETHYL 2-[4-(6-CHLOROBENZOXAZOLYL-2-OXY)PHENOXY]PROPIONATE" OR "ETHYL 2-[4-(6-CHLORO-2-BENZOXAZOLYLOXY)PHENOXY]PROPIONATE") AND PY>2004 NOT P/DT
Molecular structure:	
ii) Metabolites (see also Document N – List of metabolites for more details)	

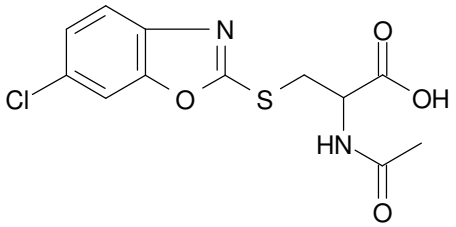
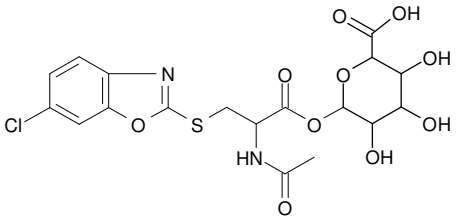
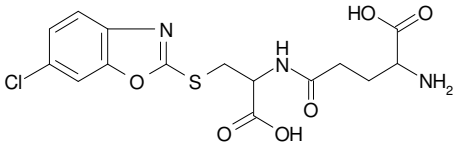
No.:	IUPAC name Structure [CAS number] STN Query
M01	4-((6-chloro-1,3-benzoxazol-2-yl)oxy)phenol  CAS: 70217-01-5 Query: (70217-01-5 OR "4-[(6-CHLORO-2-BENZOXAZOLYL)OXY]PHENOL" OR "6-CHLORO-2-(4-HYDROXYPHENOXY)-BENZOXAZOLE" OR HOE 040356) AND PY>2004 NOT P/DT
M02	6-chloro-1,3-benzoxazol-2(3H)-one  CAS: 19932-84-4 Query: (19932-84-4 OR HOE 054014 OR "6-CHLORO-2(3H)-BENZOXAZOLONE" OR 6-CHLORO-2,3-DIHYDROBENZOXAZOL-2-ONE OR 6-CHLORO-2-BENZOXAZOLINONE OR 6-CHLOROBENZOXAZOLINONE OR 6-CHLORO-2-BENZOXAZOLONE OR 6-CHLOROBENZOXAZOLONE OR NSC 26191 OR NSC 664284) AND PY>2004 NOT P/DT

M03	2-(4-(6-chlorobenzoxazolyl-2-yloxy)phenoxy)propanoic acid  CAS: 113158-40-0, 95617-09-7, 113776-21-9 Query: (113158-40-0 OR 95617-09-7 OR 73519-55-8 OR 108093-88-5 OR 131776-21-9 OR FENOXAPROP ACID OR HOE 53022 OR HOE 088406 OR "2-[4-[(6-CHLORO-2-BENZOXAZOLYL)OXY]PHENOXY]PROPANOIC ACID" OR FENOXAPROP (NOTW)(P OR ETHYL)) AND PY>2004 NOT P/DT
M04	2-(4-hydroxyphenoxy)propanoic acid  CAS: 94050-90-5, 67648-61-7, 105118-15-8 Query: (94050-90-5 OR 67648-61-7 OR 95977-31-4 OR 105118-15-8 OR "2-(4-HYDROXYPHENOXY)PROPANOIC ACID" OR "2-(4-HYDROXYPHENOXY)PROPIONIC ACID" OR "2-(P-HYDROXYPHENOXY)PROPIONIC ACID" OR NSC 522955) AND PY>2004 NOT P/DT

M05	2-(4-hydroxyphenoxy)propanoic acid ethyl ester  CAS: 96478-44-3, 71301-98-9, 65343-67-1 Query: (96478-44-3 OR 71301-98-9 OR 65343-67-1 OR 59012-02-1 OR "2-(4-HYDROXYPHENOXY)PROPIONIC ACID ETHYL ESTER" OR "2-(P-HYDROXYPHENOXY)PROPIONIC ACID ETHYL ESTER" OR "ETHYL 2-(4-HYDROXYPHENOXY)PROPANOATE" OR "ETHYL 2-(4-HYDROXYPHENOXY)PROPIONATE" OR "ETHYL (R)-2-(4-HYDROXYPHENOXY)PROPIONATE") AND PY>2004 NOT P/DT
M06	2-(4-((6-hydroxy-1,3-benzoxazol-2-yl)oxy)phenoxy)propanoic acid  CAS: - Query: ("2-{4-[(6-HYDROXY-1-BENZOXAZOL-2-YL)OXY]PHENOXY}PROPANOIC ACID") AND PY>2004 NOT P/DT
M07	6-hydroxy-1,3-benzoxazol-2(3H)-one  CAS: 78213-03-3 Query: (78213-03-3 OR NSC 603719 OR 6-HYDROXY-2,3-DIHYDROBENZOXAZOL-2-ONE OR "6-HYDROXYBENZOXAZOL-2(3H)-ONE") AND PY>2004 NOT P/DT

M08	6-chloro-5-hydroxy-1,3-benzoxazol-2(3H)-one  CAS: 88412-29-7 Query: (88412-29-7 OR 6-CHLORO-1,3-BENZOXAZOLE-2,5-DIOL OR “6-CHLORO-5-HYDROXY-1,3-BENZOXAZOL-2(3H)-ONE”) AND PY>2004 NOT P/DT
M09	6-chloro-4-hydroxy-1,3-benzoxazol-2(3H)-one  CAS: 88412-28-6 Query: (88412-28-6 OR 6-CHLORO-1,3-BENZOXAZOLE-2,4-DIOL OR "6-CHLORO-4-HYDROXY-1,3-BENZOXAZOL-2(3H)-ONE") AND PY>2004 NOT P/DT
M10	6-chloro-3-hexopyranosyl-1,3-benzoxazol-2(3H)-one  CAS: - Query: ("6-CHLORO-3-HEXOPYRANOSYL-1,3-BENZOXAZOL-2(3H)-ONE") AND PY>2004 NOT P/DT

M11	6-chloro-2-oxo-2,3-dihydro-1,3-benzoxazol-4-yl hydrogen sulfate  CAS: - Query: ("6-CHLORO-2-OXO-2,3-DIHYDRO-1,3-BENZOXAZOL-4-YL HYDROGEN SULFATE" OR "6-CHLORO-2-HYDROXY-1,3-BENZOXAZOL-4-YL HYDROGEN SULFATE") AND PY>2004 NOT P/DT
M12	6-chloro-5-hydroxy-1,3-benzoxazole-2(3H)-thione  CAS: - Query: (6-CHLORO-2-SULFANYL-1,3-BENZOXAZOL-5-OL OR "6-CHLORO-5-HYDROXY-1,3-BENZOXAZOLE-2(3H)-THIONE") AND PY>2004 NOT P/DT
M13	S-(6-chloro-1,3-benzoxazol-2-yl)cysteine  CAS: 150807-93-5 Query: (150807-93-5 OR "S-(6-CHLORO-1,3-BENZOXAZOL-2-YL)CYSTEINE") AND PY>2004 NOT P/DT

M14	N-acetyl-S-(6-chloro-1,3-benzoxazol-2-yl)cysteine  CAS: - Query: ("N-ACETYL-S-(6-CHLORO-1,3-BENZOXAZOL-2-YL)CYSTEINE") AND PY>2004 NOT P/DT
M15	1-O-(N-acetyl-S-(6-chloro-1,3-benzoxazol-2-yl)cysteinyl)hexopyranuronic acid  CAS: - Query: ("1-O-[N-ACETYL-S-(6-CHLORO-1,3-BENZOXAZOL-2-YL)CYSTEINYL]HEXOPYRANURONIC ACID") AND PY>2004 NOT P/DT
M16	gamma-glutamyl-S-(6-chloro-1,3-benzoxazol-2-yl)cysteine  CAS: 1228473-74-2 Query: (1228473-74-2 OR "GAMMA-GLUTAMYL-S-(6-CHLORO-1,3-BENZOXAZOL-2-YL)CYSTEINE") d his

Keyword Filter

No keyword filter was applied.

Search results

A total of 642 publications were found for Fenoxaprop-P-ethyl and 608 for the metabolites.

No.	Name	Number of hits
A.I.*	Fenoxaprop-P-ethyl	642
M01	4-((6-chloro-1,3-benzoxazol-2-yl)oxy)phenol	4
M02	6-chloro-1,3-benzoxazol-2(3H)-one	23
M03	2-(4-(6-chlorobenzoxazolyl-2-yloxy)phenoxy)propanoic acid	485
M04	2-(4-hydroxyphenoxy)propanoic acid	60
M05	2-(4-hydroxyphenoxy)propanoic acid ethyl ester	16
M06	2-(4-((6-hydroxy-1,3-benzoxazol-2-yl)oxy)phenoxy)propanoic acid	0
M07	6-hydroxy-1,3-benzoxazol-2(3H)-one	18
M08	6-chloro-5-hydroxy-1,3-benzoxazol-2(3H)-one	0
M09	6-chloro-4-hydroxy-1,3-benzoxazol-2(3H)-one	0
M10	6-chloro-3-hexopyranosyl-1,3-benzoxazol-2(3H)-one	0
M11	6-chloro-2-oxo-2,3-dihydro-1,3-benzoxazol-4-yl hydrogen sulfate	0
M12	6-chloro-5-hydroxy-1,3-benzoxazole-2(3H)-thione	0
M13	S-(6-chloro-1,3-benzoxazol-2-yl)cysteine	1
M14	N-acetyl-S-(6-chloro-1,3-benzoxazol-2-yl)cysteine	0
M15	1-O-(N-acetyl-S-(6-chloro-1,3-benzoxazol-2-yl)cysteinyl)hexopyranuronic acid	0
M16	gamma-glutamyl-S-(6-chloro-1,3-benzoxazol-2-yl)cysteine	1

*) A.I = active ingredient

Evaluation

The evaluation of the search results was performed according to the EFSA guidance document (for the workflows see Appendix I).

The numbering of the Table 10 to Table 13 corresponds to the numbering system of the EFSA guidance document. The criteria for the assessments are laid down below.

Rapid assessment

Based on the abstracts the following topics were used to classify publications as being obviously irrelevant:

- Efficacy
- Analytical method development
- New ways of synthesis
- Studies on a molecular level, which cannot be related to environmental RA
- Non-EU monitoring studies

- Publications in non-EU language without English abstract
- Abstract refers to a conference contribution and does not contain data, full text not available
- Not relevant due to missing information: Studies with target organisms

The number of obviously irrelevant publications appears in **Table 10**, documenting the study selection process.

Detailed Assessment

Those publications, which have passed the rapid assessment, have been evaluated based on their full text versions. The assessment criteria are shown below:

Not relevant, because

- Target substance not a test item
- Conversion into units useful for RA not possible
- Study design / test system not sufficiently described
- Study design / test system not adequate
- Study design / test system not relevant to EU data requirements
- Test system not relevant to representative uses/GAPs
- Test method does not cover the right targets
- Test material deviates from composition of BCS active ingredient / product
- Findings not related to a certain test system
- no endpoint can be derived
- observations are not attributable (i.e. ecotox) to a specific substance
- effects are caused by a non-relevant route of exposure
- observations cannot be transferred into an endpoint

Table 10 gives a statistical overview of the rapid and detailed assessments.

Table 10: Results of the study selection process, for each data requirement or group of data requirements searched

Data requirement(s) captured in the search (as indicated in Table 9)	A.I.[1)]	M01	M02	M03	M04	M05	M07	M13	M16

Total number of *summary records* retrieved after *all* searches of peer-reviewed literature[2]	642	4	23	485	60	16	18	1	1
Number of *summary records* excluded from the search results after rapid assessment for relevance	565	4	21	454	57	15	17	1	1
Total number of *full-text documents* assessed in detail[2]	77	--	2	31	3	1	1	--	--
Number of *publications* excluded from further consideration after detailed assessment for relevance	57	--	2	27	3	1	1	--	--
Number of *publications* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	20	--	--	4	--	--	--	--	--

[1]) A.I = active ingredient

[2]) both from bibliographic databases and other sources of peer-reviewed literature

The results of the detailed assessment are shown in **Table 98** to **Table 13**.

While **Table 13** contains the publications not meeting the relevance criteria for the detailed assessment, **Table 98** and **Table 99** contain those publications meeting the criteria, respectively ordered by data requirement or author.

Table 98: Report of all relevant studies and studies of unclear relevance after detailed assessment of full-text documents for relevance: ordered by data requirement

KCA- SANCO Data Point	KCP - SANCO Data Point	Author(s)	Year	Title	Source	Classification of study
KCA 5.1. Studies on absorption, distribution, metabolism and excretion in mammals		Zhang, Yanfeng; Li, Xuefeng; Shen, Zhigang; Xu, Xinyuan; Zhang, Ping; Wang, Peng; Zhou, Zhiqiang.	2011	Stereoselective metabolism of fenoxaprop-ethyl and its chiral metabolite fenoxaprop in rabbits.	Chirality, Volume 23, Issue 10, Page 897-903, Publication Year 2011	Case b) The findings of this article do not change existing risk asessments. Majority of aged residues do no longer contain chiral center. Feeding studies are available.
KCA 5.9.2. Data collected on humans		Zawahir, Shukry; Roberts, Darren M.; Palangasinghe, Chathura; Mohamed, Fahim; Eddleston, Michael; Dawson, Andrew H.; Buckley, Nick A.; Ren, Lingling; Medley, Gregory A.; Gawarammana, Indika.	2009	Acute intentional self-poisoning with a herbicide product containing fenoxaprop-P-ethyl, ethoxysulfuron, and isoxadifen ethyl: A prospective observational study.	Clin. Toxicol., Volume 47, Issue 8, Page 792-797, Publication Year 2009	Case b) In this publication poisoning cases discussed in which fenoxaprop-P-ethyl was involved. No mortality and only mild symptoms after poisoning could be observed. This article can be regarded as supplmentary information. A summary is provided under CA 5.9.2/01.

KCA- SANCO Data Point	KCP - SANCO Data Point	Author(s)	Year	Title	Source	Classification of study
KCA 6.5.3. Magnitude of residues in processed commodities		Inoue, Tomonori; Nagatomi, Yasushi; Suga, Keiko; Uyama, Atsuo; Mochizuki, Naoki.	2011	Fate of Pesticides during Beer Brewing.	J. Agric. Food Chem., Volume 59, Issue 8, Page 3857-3868, Publication Year 2011	Case b) Active ingredient artificially spiked to the grain. No active ingredient present in aged residues.The information provided can only be regarded as supportive information.
KCA 7.1.1. Route of degradation in soil		Zhang, Yanfeng; Liu, Donghui; Diao, Jinling; He, Zeying; Zhou, Zhiqiang; Wang, Peng; Li, Xuefeng	2010	Enantioselective Environmental Behavior of the Chiral Herbicide Fenoxaprop - ethyl and Its Chiral Metabolite Fenoxaprop in Soil	Journal of agricultural and food chemistry (2010) , Volume 58, Number 24, p. 12878-12884., Electronic ISSN: 0021-8561 Source Note: 2010 Dec. 22, v. 58, no. 24	Case a) In this publication the degradation behaviour of various forms of the active substance fenoxaprop-ethyl and its metabolite fenoxaprop-acid was investigated in three Chinese soils incubated at 25°C and about 60% of the MWHC in the dark for 25 days in maximum. Enantioselective HPLC analysis (chiral column) was performed following incubation of racemic mixtures as well as the separate enantiomers each of fenoxaprop-ethyl and fenoxaprop-acid. A summary is provided under CA 7.1.1.1./09

KCA- SANCO Data Point	KCP - SANCO Data Point	Author(s)	Year	Title	Source	Classification of study
KCA 7.2.1. Route and rate of degradation in aquatic systems (chemical and photochemical degradation)		Pythoglou, Paschalina; Vryzas, Zisis; Alexoudis, Christos; Senseman, Scott A.; Vassiliou, George.	2012	Influence of biotic and abiotic factors on dissipation of fenoxaprop-P-ethyl in water.	Fresenius Environ. Bull., Volume 21, Issue 10a, Page 3012-3017, Publication Year 2012	Case c) The article contains adequate information about the dissipation, distribution, degradation or metabolism of the substance of concern in air, soil, water or sediment over time. Although the dissipation study followed OECD guidelines the described methodology is out of scope for use in environmental risk assessment.
KCA 7.2.1.1. Hydrolytic degradation		Lin, Jing; Chen, Jingwen; Cai, Xiyun; Wang, Ying.	2009	Influential factors and the degradation pathway in hydrolysis of fenoxaprop-p-ethyl in buffer solutions.	Anquan Yu Huanjing Xuebao, Volume 9, Issue 1, Page 13-16, Publication Year 2009	Case c) The article contains adequate information about the degradation of the substance of concern in water but is out of scope for use in environmental risk assessment.

KCA- SANCO Data Point	KCP - SANCO Data Point	Author(s)	Year	Title	Source	Classification of study
KCA 7.2.1.1. Hydrolytic degradation; KCA 8.2.4.1. Acute toxicity to Daphnia		Lin, Jing; Chen, Jingwen; Cai, Xiyun; Qiao, Xianliang; Huang, Liping; Wang, Degao; Wang, Zhuang.	2007	Evolution of toxicity upon hydrolysis of fenoxaprop-p-ethyl.	J. Agric. Food Chem., Volume 55, Issue 18, Page 7626-7629, Publication Year 2007	Case c) The article contains adequate information about the dissipation of the substance of water over time; EC_{50} values after 48h exposure to *Daphnia magna* are presented. However the publication is out of scope for use in environmental risk assessment.
KCA 7.2.1.2. Direct photochemical degradation; KCA 8.2.4.1. Acute toxicity to Daphnia		Lin, Jing; Chen, Jingwen; Wang, Ying; Cai, Xiyun; Wei, Xiaoxuan; Qiao, Xianliang.	2008	More Toxic and Photoresistant Products from Photodegradation of Fenoxaprop-p-ethyl.	J. Agric. Food Chem., Volume 56, Issue 17, Page 8226-8230, Publication Year 2008	Case c) The article contains adequate information about the dissipation, distribution, degradation or metabolism of the substance of concern in air, soil, water or sediment; 48h EC_{50} values are presented for additional metabolites. Publication is out of scope for use in environmental risk assessment.

KCA- SANCO Data Point	KCP - SANCO Data Point	Author(s)	Year	Title	Source	Classification of study
KCA 7.5. Monitoring data		Barco-Bonilla, Nieves; Romero-Gonzalez, Roberto; Plaza-Bolanos, Patricia; Frenich, Antonia Garrido; Martinez Vidal, Jose L.; Salas, Juan J.; Martin, Isabel.	2013	Study of the distribution of 204 organic contaminants between the aqueous phase and the suspended particulate matter in treated wastewater for proper environmental control.	Desalin. Water Treat., Volume 51, Issue 10-12, Page 2497-2515, Publication Year 2013	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater, soil, surface waters, sediments or air from the European zone. The described method is out of scope for use in environmental risk assessment.
KCA 7.5. Monitoring data		Barco-Bonilla, Nieves; Romero-Gonzalez, Roberto; Plaza-Bolanos, Patricia; Martinez Vidal, Jose L.; Garrido Frenich, Antonia.	2013	Systematic study of the contamination of wastewater treatment plant effluents by organic priority compounds in Almeria province (SE Spain).	Sci. Total Environ., Volume 447, Page 381-389, Publication Year 2013	Case c) This article is out of scope for use in environmental risk assessment in particular representativity of sample collection.

KCA- SANCO Data Point	KCP - SANCO Data Point	Author(s)	Year	Title	Source	Classification of study
KCA 7.5. Monitoring data		Hurtado-Sanchez, M. C.; Romero-Gonzalez, R.; Rodriguez-Caceres, M. I.; Duran-Meras, I.; Frenich, A. Garrido	2013	Rapid and sensitive on-line solid phase extraction-ultra high performance liquid chromatography-electro-spray-tandem mass spectrometry analysis of pesticides in surface waters	Journal of Chromatography A (2013), 1305, 193-202	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater, soil, surface waters, sediments or air from the European zone. The described analytical method is out of scope for use in environmental risk assessment.
KCA 7.5. Monitoring data		Jansson, Christer; Kreuger, Jenny.	2010	Multiresidue analysis of 95 pesticides at low nanogram/liter levels in surface waters using online preconcentration and high performance liquid chromatography/tandem mass spectrometry.	J. AOAC Int., Volume 93, Issue 6, Page 1732-1747, Publication Year 2010	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater, soil, surface waters, sediments or air from the European zone. The descriped method is out of scope for use in environmental risk assessment.

KCA- SANCO Data Point	KCP - SANCO Data Point	Author(s)	Year	Title	Source	Classification of study
KCA 7.5. Monitoring data		Lindqvist, Bengt-Olov; Hansson, Jan-Bertil; Joensson, Christina; Persson, Kenneth M.	2007	Presence of pesticide residues in groundwaters: monitoring in Simrishamn in 2002-2007.	Vatten, Volume 63, Issue 2, Page 159-163, Publication Year 2007	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater, soil, surface waters, sediments or air from the European zone. Out of scope for use in environmental risk assessment..
KCA 7.5. Monitoring data		Montoro, Elena Pastor; Gonzalez, Roberto Romero; Frenich, Antonia Garrido; Torres, M. Elena Hernandez; Vidal, Jose Luis Martinez.	2007	Fast determination of herbicides in waters by ultra-performance liquid chromatography/tandem mass spectrometry.	Rapid Commun. Mass Spectrom., Volume 21, Issue 22, Page 3585-3592, Publication Year 2007	Case c) The article is out of scope for use in environmental risk assessment in particular representativity of sample collection. No endpoint can be derived.

KCA- SANCO Data Point	KCP - SANCO Data Point	Author(s)	Year	Title	Source	Classification of study
KCA 7.5. Monitoring data		Raeppel, Caroline; Fabritius, Marie; Nief, Marie; Appenzeller, Brice M. R.; Millet, Maurice	2014	Coupling ASE, silylation and SPME-GC/MS for the analysis of current-used pesticides in atmosphere	Talanta (2014), 121, 24-29	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater, soil, surface waters, sediments or air from the European zone. The described method is out of scope for use in environmental risk assessment
KCA 7.5. Monitoring data		Reemtsma Thorsten; Alder Lutz; Banasiak Ursula	2013	Emerging pesticide metabolites in groundwater and surface water as determined by the application of a multimethod for 150 pesticide metabolites.	Water research, (2013 Jun 27) . Electronic Publication Date: 27 Jun 2013	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater and surface waters from the European zone. The described method is out of scope for use in environmental risk assessment

KCA- SANCO Data Point	KCP - SANCO Data Point	Author(s)	Year	Title	Source	Classification of study
KCA 7.5. Monitoring data		Sauret, Nathalie; Wortham, Henri; Putaud, Jean-Philippe; Mirabel, Philippe.	2008	Study of the effects of environmental parameters on the gas/particle partitioning of current-use pesticides in urban air.	Atmos. Environ., Volume 42, Issue 3, Page 544-553, Publication Year 2008	Case c) The article reports on the presence of the substance of concern in samples collected from air in urban areas (Strasbourg, France). A new partition equation was defined for the pesticides under study using environmental parameters such as temperature, relative humidity, and organic carbon content of atmospheric aerosols. This assessment is out of scope for use in environmental risk assessment
KCA 7.5. Monitoring data		Sauret-Szczepanski, Nathalie; Mirabel, Philippe; Wortham, Henri.	2005	Development of an SPME-GC-MS/MS method for the determination of pesticides in rainwater: Laboratory and field experiments.	Environ. Pollut. (Amsterdam, Neth.), Volume 139, Issue 1, Page 133-142, Publication Year 2005	Case c) In this article the concentrations of fenoxaprop in rain samples from Strassbourg (France) are presented. However the method is outdated and thus out of scope for use in the environmetal risk assessment

KCA- SANCO Data Point	KCP - SANCO Data Point	Author(s)	Year	Title	Source	Classification of study
KCA 7.5. Monitoring data		Tankiewicz, Maciej; Morrison, Calum; Biziuk, Marek	2013	Multi-residue method for the determination of 16 recently used pesticides from various chemical groups in aqueous samples by using DI-SPME coupled with GC-MS	Talanta (2013), 107, 1-10	Case c) The article reports on an analytical method applied to analytes of natural water samples from river, sea, canal and rain. The method is out of scope for use in environmental risk assessment
KCA 8.2.1. Acute toxicity to fish		Chen, Jiachang; Yang, Lin; Hu, Gengdong; Qu, Jianhong; Wu, Wei; Fan, Limin.	2006	Genetic toxicity of the herbicide puma super to grass carp.	Nongye Huanjing Kexue Xuebao, Volume 25, Issue 2, Page 295-300, Publication Year 2006	Case c) The article contains adequate information about the toxicity of the substance of concern to non-target organisms living in the environment. Injection of grass carps with the substance of concern (Puma super) is out of scope for use in environmental risk assessment.
KCA 8.2.4.1. Acute toxicity to Daphnia		Wang, Ying; Chen, Jing-Wen; Lin, Jing; Cai, Xi-Yun.	2009	Evolutive process and mechanism of photoinduced toxicity of fenoxaprop-p-ethyl and 1-amino-2,4-dibromoanthraquinone.	Huanjing Kexue Yanjiu, Volume 22, Issue 7, Page 843-846, Publication Year 2009	Case c) The article contains adequate information about the toxicity of the substance of concern to non-target organisms living in the environment. It is out of scope for use in environmental risk assessment

KCA- SANCO Data Point	KCP - SANCO Data Point	Author(s)	Year	Title	Source	Classification of study
KCA 8.2.6. Effects on algal growth		Ma, Jianyi; Wang, Shufeng; Wang, Pinwei; Ma, Liangjin; Chen, Xiling; Xu, Ruifu.	2006	Toxicity assessment of 40 herbicides to the green alga Raphidocelis subcapitata.	Ecotoxicol. Environ. Saf., Volume 63, Issue 3, Page 456-462, Publication Year 2006	Case c) The article contains adequate information about the toxicity of the substance of concern to non-target organisms living in the environment. Out of scope for risk assessment
KCA 8.2.8. Further testing on aquatic organisms		Cevik, Fatma; Tutar, Mehmet.	2008	Effect of Fenoxaprop-p-ethyl on Natural Plankton of the Seyhan Dam: A Microcosm Study.	Bull. Environ. Contam. Toxicol., Volume 80, Issue 3, Page 247-250, Publication Year 2008	Case c) The article's relevance for the hazard assessment or risk characterization remained unclear after full-text analysis. It is out of scope for use in environmental risk assessment, not fulfilling AGD requirements.
KCA 8.2.8. Further testing on aquatic organisms		Huang, Fan; Guo, Zhengyuan; Xu, Zhen; Yang, Renbin.	2007	Toxicity of cyhalofop-butyl and fenoxaprop-ethyl to tadpole.	Nongye Huanjing Kexue Xuebao, Volume 26, Issue 3, Page 1063-1066, Publication Year 2007	Case c) The article contains adequate information about the toxicity of the substance of concern to non-target organisms living in the environment. Using Bufo gargarizans tadpoles as target areas is out of scope for use in environmental risk assessment.

Table 99: Report of all relevant studies and studies of unclear relevance after detailed assessment of full-text documents for relevance: ordered by author(s)

Author(s)	KCA- SANCO Data Point	KCP - SANCO Data Point	Year	Title	Source	Classification of study
Barco-Bonilla, Nieves; Romero-Gonzalez, Roberto; Plaza-Bolanos, Patricia; Frenich, Antonia Garrido; Martinez Vidal, Jose L.; Salas, Juan J.; Martin, Isabel.	KCA 7.5. Monitoring data		2013	Study of the distribution of 204 organic contaminants between the aqueous phase and the suspended particulate matter in treated wastewater for proper environmental control.	Desalin. Water Treat., Volume 51, Issue 10-12, Page 2497-2515, Publication Year 2013	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater, soil, surface waters, sediments or air from the European zone. The described method is out of scope for use in environmental risk assessment.
Barco-Bonilla, Nieves; Romero-Gonzalez, Roberto; Plaza-Bolanos, Patricia; Martinez Vidal, Jose L.; Garrido Frenich, Antonia.	KCA 7.5. Monitoring data		2013	Systematic study of the contamination of wastewater treatment plant effluents by organic priority compounds in Almeria province (SE Spain).	Sci. Total Environ., Volume 447, Page 381-389, Publication Year 2013	Case c) This article is out of scope for use in environmental risk assessment in particular representativity of sample collection.

Author(s)	KCA- SANCO Data Point	KCP - SANCO Data Point	Year	Title	Source	Classification of study
Cevik, Fatma; Tutar, Mehmet.	KCA 8.2.8. Further testing on aquatic organisms		2008	Effect of Fenoxaprop-p-ethyl on Natural Plankton of the Seyhan Dam: A Microcosm Study.	Bull. Environ. Contam. Toxicol., Volume 80, Issue 3, Page 247-250, Publication Year 2008	Case c) The article's relevance for the hazard assessment or risk characterization remained unclear after full-text analysis. It is out of scope for use in environmental risk assessment, not fulfilling AGD requirements.
Chen, Jiachang; Yang, Lin; Hu, Gengdong; Qu, Jianhong; Wu, Wei; Fan, Limin.	KCA 8.2.1. Acute toxicity to fish		2006	Genetic toxicity of the herbicide puma super to grass carp.	Nongye Huanjing Kexue Xuebao, Volume 25, Issue 2, Page 295-300, Publication Year 2006	Case c) The article contains adequate information about the toxicity of the substance of concern to non-target organisms living in the environment. Injection of grass carps with the substance of concern (Puma super) is out of scope for use in environmental risk assessment.

Author(s)	KCA- SANCO Data Point	KCP - SANCO Data Point	Year	Title	Source	Classification of study
Huang, Fan; Guo, Zhengyuan; Xu, Zhen; Yang, Renbin.	KCA 8.2.8. Further testing on aquatic organisms		2007	Toxicity of cyhalofop-butyl and fenoxaprop-ethyl to tadpole.	Nongye Huanjing Kexue Xuebao, Volume 26, Issue 3, Page 1063-1066, Publication Year 2007	Case c) The article contains adequate information about the toxicity of the substance of concern to non-target organisms living in the environment. Using Bufo gargarizans tadpoles as target areas is out of scope for use in environmental risk assessment.
Hurtado-Sanchez, M. C.; Romero-Gonzalez, R.; Rodriguez-Caceres, M. I.; Duran-Meras, I.; Frenich, A. Garrido	KCA 7.5. Monitoring data		2013	Rapid and sensitive on-line solid phase extraction-ultra high performance liquid chromatography-electro-spray-tandem mass spectrometry analysis of pesticides in surface waters	Journal of Chromatography A (2013), 1305, 193-202	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater, soil, surface waters, sediments or air from the European zone. The described analytical method is out of scope for use in environmental risk assessment.
Inoue, Tomonori; Nagatomi, Yasushi; Suga, Keiko; Uyama, Atsuo; Mochizuki, Naoki.	KCA 6.5.3. Magnitude of residues in processed commodities		2011	Fate of Pesticides during Beer Brewing.	J. Agric. Food Chem., Volume 59, Issue 8, Page 3857-3868, Publication Year 2011	Case b) Active ingredient artificially spiked to the grain. No active ingredient present in aged residues.The information provided can only be regarded as supportive information.

Author(s)	KCA- SANCO Data Point	KCP - SANCO Data Point	Year	Title	Source	Classification of study
Jansson, Christer; Kreuger, Jenny.	KCA 7.5. Monitoring data		2010	Multiresidue analysis of 95 pesticides at low nanogram/liter levels in surface waters using online preconcentration and high performance liquid chromatography/tandem mass spectrometry.	J. AOAC Int., Volume 93, Issue 6, Page 1732-1747, Publication Year 2010	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater, soil, surface waters, sediments or air from the European zone. The descriped method is out of scope for use in environmental risk assessment.
Lin, Jing; Chen, Jingwen; Cai, Xiyun; Qiao, Xianliang; Huang, Liping; Wang, Degao; Wang, Zhuang.	KCA 7.2.1.1. Hydrolytic degradation; KCA 8.2.4.1. Acute toxicity to Daphnia		2007	Evolution of toxicity upon hydrolysis of fenoxaprop-p-ethyl.	J. Agric. Food Chem., Volume 55, Issue 18, Page 7626-7629, Publication Year 2007	Case c) The article contains adequate information about the dissipation of the substance of water over time; EC_{50} values after 48h exposure to *Daphnia magna* are presented. However the publication is out of scope for use in environmental risk assessment.

Author(s)	KCA- SANCO Data Point	KCP - SANCO Data Point	Year	Title	Source	Classification of study
Lin, Jing; Chen, Jingwen; Cai, Xiyun; Wang, Ying.	KCA 7.2.1.1. Hydrolytic degradation		2009	Influential factors and the degradation pathway in hydrolysis of fenoxaprop-p-ethyl in buffer solutions.	Anquan Yu Huanjing Xuebao, Volume 9, Issue 1, Page 13-16, Publication Year 2009	Case c) The article contains adequate information about the degradation of the substance of concern in water but is out of scope for use in environmental risk assessment.
Lin, Jing; Chen, Jingwen; Wang, Ying; Cai, Xiyun; Wei, Xiaoxuan; Qiao, Xianliang.	KCA 7.2.1.2. Direct photochemical degradation; KCA 8.2.4.1. Acute toxicity to Daphnia		2008	More Toxic and Photoresistant Products from Photodegradation of Fenoxaprop-p-ethyl.	J. Agric. Food Chem., Volume 56, Issue 17, Page 8226-8230, Publication Year 2008	Case c) The article contains adequate information about the dissipation, distribution, degradation or metabolism of the substance of concern in air, soil, water or sediment; 48h EC_{50} values are presented for additional metabolites. Publication is out of scope for use in environmental risk assessment.

Author(s)	KCA- SANCO Data Point	KCP - SANCO Data Point	Year	Title	Source	Classification of study
Lindqvist, Bengt-Olov; Hansson, Jan-Bertil; Joensson, Christina; Persson, Kenneth M.	KCA 7.5. Monitoring data		2007	Presence of pesticide residues in groundwaters: monitoring in Simrishamn in 2002-2007.	Vatten, Volume 63, Issue 2, Page 159-163, Publication Year 2007	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater, soil, surface waters, sediments or air from the European zone. Out of scope for use in environmental risk assessment..
Ma, Jianyi; Wang, Shufeng; Wang, Pinwei; Ma, Liangjin; Chen, Xiling; Xu, Ruifu.	KCA 8.2.6. Effects on algal growth		2006	Toxicity assessment of 40 herbicides to the green alga Raphidocelis subcapitata.	Ecotoxicol. Environ. Saf., Volume 63, Issue 3, Page 456-462, Publication Year 2006	Case c) The article contains adequate information about the toxicity of the substance of concern to non-target organisms living in the environment. Out of scope for risk assessment
Montoro, Elena Pastor; Gonzalez, Roberto Romero; Frenich, Antonia Garrido; Torres, M. Elena Hernandez; Vidal, Jose Luis Martinez.	KCA 7.5. Monitoring data		2007	Fast determination of herbicides in waters by ultra-performance liquid chromatography/tandem mass spectrometry.	Rapid Commun. Mass Spectrom., Volume 21, Issue 22, Page 3585-3592, Publication Year 2007	Case c) The article is out of scope for use in environmental risk assessment in particular representativity of sample collection. No endpoint can be derived.

Author(s)	KCA- SANCO Data Point	KCP - SANCO Data Point	Year	Title	Source	Classification of study
Pythoglou, Paschalina; Vryzas, Zisis; Alexoudis, Christos; Senseman, Scott A.; Vassiliou, George.	KCA 7.2.1. Route and rate of degradation in aquatic systems (chemical and photochemical degradation)		2012	Influence of biotic and abiotic factors on dissipation of fenoxaprop-P-ethyl in water.	Fresenius Environ. Bull., Volume 21, Issue 10a, Page 3012-3017, Publication Year 2012	Case c) The article contains adequate information about the dissipation, distribution, degradation or metabolism of the substance of concern in air, soil, water or sediment over time. Although the dissipation study followed OECD guidelines the described methodology is out of scope for use in environmental risk assessment.
Raeppel, Caroline; Fabritius, Marie; Nief, Marie; Appenzeller, Brice M. R.; Millet, Maurice	KCA 7.5. Monitoring data		2014	Coupling ASE, silylation and SPME-GC/MS for the analysis of current-used pesticides in atmosphere	Talanta (2014), 121, 24-29	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater, soil, surface waters, sediments or air from the European zone. The described method is out of scope for use in environmental risk assessment

Author(s)	KCA- SANCO Data Point	KCP - SANCO Data Point	Year	Title	Source	Classification of study
Reemtsma Thorsten; Alder Lutz; Banasiak Ursula	KCA 7.5. Monitoring data		2013	Emerging pesticide metabolites in groundwater and surface water as determined by the application of a multimethod for 150 pesticide metabolites.	Water research, (2013 Jun 27) . Electronic Publication Date: 27 Jun 2013	Case c) The article reports on the presence of the substance of concern in samples collected from groundwater and surface waters from the European zone. The described method is out of scope for use in environmental risk assessment
Sauret, Nathalie; Wortham, Henri; Putaud, Jean-Philippe; Mirabel, Philippe.	KCA 7.5. Monitoring data		2008	Study of the effects of environmental parameters on the gas/particle partitioning of current-use pesticides in urban air.	Atmos. Environ., Volume 42, Issue 3, Page 544-553, Publication Year 2008	Case c) The article reports on the presence of the substance of concern in samples collected from air in urban areas (Strasbourg, France). A new partition equation was defined for the pesticides under study using environmental parameters such as temperature, relative humidity, and organic carbon content of atmospheric aerosols. This assessment is out of scope for use in environmental risk assessment

Author(s)	KCA- SANCO Data Point	KCP - SANCO Data Point	Year	Title	Source	Classification of study
Sauret-Szczepanski, Nathalie; Mirabel, Philippe; Wortham, Henri.	KCA 7.5. Monitoring data		2005	Development of an SPME-GC-MS/MS method for the determination of pesticides in rainwater: Laboratory and field experiments.	Environ. Pollut. (Amsterdam, Neth.), Volume 139, Issue 1, Page 133-142, Publication Year 2005	Case c) In this article the concentrations of fenoxaprop in rain samples from Strassbourg (France) are presented. However the method is outdated and thus out of scope for use in the environmetal risk assessment
Tankiewicz, Maciej; Morrison, Calum; Biziuk, Marek	KCA 7.5. Monitoring data		2013	Multi-residue method for the determination of 16 recently used pesticides from various chemical groups in aqueous samples by using DI-SPME coupled with GC-MS	Talanta (2013), 107, 1-10	Case c) The article reports on an analytical method applied to analytes of natural water samples from river, sea, canal and rain. The method is out of scope for use in environmental risk assessment
Wang, Ying; Chen, Jing-Wen; Lin, Jing; Cai, Xi-Yun.	KCA 8.2.4.1. Acute toxicity to Daphnia		2009	Evolutive process and mechanism of photoinduced toxicity of fenoxaprop-p-ethyl and 1-amino-2,4-dibromoanthraquinone.	Huanjing Kexue Yanjiu, Volume 22, Issue 7, Page 843-846, Publication Year 2009	Case c) The article contains adequate information about the toxicity of the substance of concern to non-target organisms living in the environment. It is out of scope for use in environmental risk assessment

Author(s)	KCA- SANCO Data Point	KCP - SANCO Data Point	Year	Title	Source	Classification of study
Zawahir, Shukry; Roberts, Darren M.; Palangasinghe, Chathura; Mohamed, Fahim; Eddleston, Michael; Dawson, Andrew H.; Buckley, Nick A.; Ren, Lingling; Medley, Gregory A.; Gawarammana, Indika.	KCA 5.9.2. Data collected on humans		2009	Acute intentional self-poisoning with a herbicide product containing fenoxaprop-P-ethyl, ethoxysulfuron, and isoxadifen ethyl: A prospective observational study.	Clin. Toxicol., Volume 47, Issue 8, Page 792-797, Publication Year 2009	Case b) In this publication poisoning cases discussed in which fenoxaprop-P-ethyl was involved. No mortality and only mild symptoms after poisoning could be observed. This article can be regarded as supplmentary information. A summary is provided under CA 5.9.2/01.
Zhang, Yanfeng; Li, Xuefeng; Shen, Zhigang; Xu, Xinyuan; Zhang, Ping; Wang, Peng; Zhou, Zhiqiang.	KCA 5.1. Studies on absorption, distribution, metabolism and excretion in mammals		2011	Stereoselective metabolism of fenoxaprop-ethyl and its chiral metabolite fenoxaprop in rabbits.	Chirality, Volume 23, Issue 10, Page 897-903, Publication Year 2011	Case b) The findings of this article do not change existing risk asessments. Majority of aged residues do no longer contain chiral center. Feeding studies are available.

Author(s)	KCA- SANCO Data Point	KCP - SANCO Data Point	Year	Title	Source	Classification of study
Zhang, Yanfeng; Liu, Donghui; Diao, Jinling; He, Zeying; Zhou, Zhiqiang; Wang, Peng; Li, Xuefeng	KCA 7.1.1. Route of degradation in soil		2010	Enantioselective Environmental Behavior of the Chiral Herbicide Fenoxaprop - ethyl and Its Chiral Metabolite Fenoxaprop in Soil	Journal of agricultural and food chemistry (2010) , Volume 58, Number 24, p. 12878-12884., Electronic ISSN: 0021-8561 Source Note: 2010 Dec. 22, v. 58, no. 24	Case a) In this publication the degradation behaviour of various forms of the active substance fenoxaprop-ethyl and its metabolite fenoxaprop-acid was investigated in three Chinese soils incubated at 25°C and about 60% of the MWHC in the dark for 25 days in maximum. Enantioselective HPLC analysis (chiral column) was performed following incubation of racemic mixtures as well as the separate enantiomers each of fenoxaprop-ethyl and fenoxaprop-acid. A summary is provided under CA 7.1.1.1./09

Table 13: Report of none-relevant studies excluded after detailed assessment of full-text documents and the removal of duplicate entries (removed due to the separated queries for the compounds, duplicates: 9): ordered by author(s)

Author	Year	Title	Source	Reason for not including in dossier
Afify, Abd El-Moneim M. R.; Attallah, Emad R.; El-Gammal, Hassan A.	2012	A modified multi-residue method for analysis of 150 pesticide residues in green beans using liquid chromatography-tandem mass spectrometry.	AFS, Adv. Food Sci., Volume 34, Issue 1, Page 24-35, Publication Year 2012	Poor data documentation
Akiyama, Yumi; Matsuoka, Tomofumi; Mitsuhashi, Takao.	2009	Multi-residue screening method of acidic pesticides in agricultural products by liquid chromatography/time of flight mass spectrometry.	J. Pestic. Sci. (Tokyo, Jpn.), Volume 34, Issue 4, Page 265-272, Publication Year 2009	Findings cannot be not related to a certain test system
Anil Gupta; Ashok Aggarwal; Chhavi Mangla; Aditya Kumar; Anju Tanwar; Gupta, A.; Aggarwal, A.; Mangla, C.; Kumar, A.; Tanwar, A.	2011	Effect of herbicides fenoxaprop - P - ethyl and 2,4-D ethyl-ester on soil mycoflora including VAM fungi in wheat crop.	Indian Journal of Weed Science (2011) , Volume 43, Number 1/2, pp. 32-40, 23 refs. ISSN: 0253-8040 Published by: Indian Society of Weed Science, Hisar	A detailed analysis indicats that the publication is not reliable. Authors have published for another active substance nearly identical text and results as shown in the complex tables 3 of the publication (see Gupta et al. (2011), EcoScan; 1: 195-199 – not part of this LRR)
Anon.	2009	Study of analytical method for pesticide residues in vegetables and fruits by GC/MS/MS.	Hiroshima-shi Eisei Kenkyusho Nenpo, Volume 28, Page 54-61, Publication Year 2009	No endpoint can be derived

Author	Year	Title	Source	Reason for not including in dossier
Banerjee, Kaushik; Utture, Sagar; Dasgupta, Soma; Kandaswamy, Chandrasekar; Pradhan, Saswati; Kulkarni, Sunil; Adsule, Pandurang	2012	Multiresidue determination of 375 organic contaminants including pesticides, polychlorinated biphenyls and polyaromatic hydrocarbons in fruits and vegetables by gas chromatography-triple quadrupole mass spectrometry with introduction of semi-quantification approach	Journal of Chromatography, A (2012), 1270, 283-295	No endpoint can be derived
Bates, Amber N.; Henry, Gerald M.; Mckenney, Cynthia B.	2013	Tolerance of Hookers evening primrose (Oenothera elata) transplants to postemergence herbicides	Weed Technology (2013), 27(2), 401-404	The data presented in this article is not suitable to allow contribution to risk assessment.
Bozdogan, Ali Musa; Yarpuz-Bozdogan, Nigar; Tobi, Ibrahim; Sayinci, Bahadir	2015	Estimation of occupational risk in herbicide application	Fresenius Environmental Bulletin (2015), 24(7), 2275-2279	Not relevant as the calculations were not performed with the model used currently in EU. There is no indication of the values used for the calculations.
Cai Yue; Zhang Shengli; Li Zengzhi; Cai, Y.; Zhang, S. L.; Li, Z. Z.	2011	Compatibility of Beauveria bassiana to some chemical insecticides and herbicides.	Chinese Journal of Biological Control (2011) , Volume 27, Number 3, pp. 316-323, 18 refs. ISSN: 2095-039X Published by: Chinese Journal of Biological Control, Chinese Academy of Agricultural Sciences, Beijing	The investigation does not report results in values reflecting agreed determinants for the hazard or exposure characterization or risk assessment under Reg. EC No 1107/2009 and information is insufficient to transfer values into such determinants

Author	Year	Title	Source	Reason for not including in dossier
Chen, Jianmei; Shen, Weiming; Gu, Hao	2008	Determination of dissociation constants of R-(+)- 2 -(4 - hydroxyphenoxy) propanoic acid	Nongyao (2008), 47(11), 800-801, 815	The investigation does not report results in values reflecting agreed determinants for the hazard or exposure characterization or risk assessment under Reg. EC No 1107/2009 and information is insufficient to transfer values into such determinants
Chen, Lin-Mei; Sun, Qing; Chen, Ling; Jiang, Jing-Yan	2014	Effects of herbicides on N2O emissions and soil biochemical parameters in winter-wheat field	Nongye Huanjing Kexue Xuebao (2014), 33(7), 1450-1459	The investigation is made in field experiments in China, which cannot be considered as representative for EU.
Creton, Stuart; Weltje, Lennart; Hobson, Hannah; Wheeler, James R.	2013	Reducing the number of fish in bioconcentration studies for plant protection products by reducing the number of test concentrations.	Chemosphere, Volume 90, Issue 3, Page 1300-1304, Publication Year 2013	The publication is a secondary source of information, e.g. review article or study that condenses information of primary nature
Das, A. C.; Das, S. J.; Dey, S.	2012	Effect of herbicides on microbial biomass in relation to availability of plant nutrients in soil.	Journal of Crop and Weed (2012) , Volume 8, Number 1, pp. 129-132, 17 refs. ISSN: 0974-6315 Published by: Crop and Weed Science Society, West Bengal	The publication states that the compound has been mixed into the soil but does not indicate at which rate. The results can therefore not be converted to values suitable for risk assessment.
Das, Amal Chandra; Dey, Sakti	2014	Effect of Combined Application of Systemic Herbicides on Microbial Activities in North Bengal Alluvial Soil	Bulletin of Environmental Contamination and Toxicology (2014), 92(2), 183-189	The observations made relate to a mixture of active substances which is not considered representative for AIR3; results only for fenoxaprop cannot be extracted from available data

Author	Year	Title	Source	Reason for not including in dossier
Das, Amal Chandra; Dey, Sakti	2013	Effect of Systemic Herbicides on Microbial Biomass in Relation to Availability of Some Plant Nutrients in an Alluvial Soil of West Bengal	Bulletin of Environmental Contamination and Toxicology (2013), 90(6), 666-672	The publication states that the compound has been mixed into the soil but does not indicate at which rate. The results can therefore not be converted to values suitable for risk assessment.
Dear, B. S.; Sandral, G. A.; Wilson, B. C. D.	2006	Tolerance of perennial pasture grass seedlings to pre- and post-emergent grass herbicides.	Aust. J. Exp. Agric., Volume 46, Issue 5, Page 637-644, Publication Year 2006	The data presented in this article is not suitable to allow contribution to risk assessment.
Dixit, Anil [Reprint Author]; Sondhia, Shobha; Varshney, Jay G.	2011	Bio-efficacy of pinoxaden in wheat (Triticum aestivum) and its residual effect in succeeding rice (Oryza sativa) crop.	Indian Journal of Agricultural Sciences, (JUL 2011) Vol. 81, No. 7, pp. 659-661.	The article does not contain information related to the substance of concern. Furthermore it is a matter of observations for environmental responses in a region outside Europe
Dong, Weiliang; Hou, Ying; Xi, Xuedong; Wang, Fei; Li, Zhoukun; Ye, Xianfeng; Huang, Yan; Cui, Zhongli	2015	Biodegradation of fenoxaprop - ethyl by an enriched consortium and its proposed metabolic pathway	International Biodeterioration and Biodegradation (2015), 97, 159-167	Duplicate entry, This publication has been found and evaluated for the A.I, M03, M06 and M07. The test soil (chinese soil) and the test design (soil enriched with microbes) cannot be considered to be representative for an EU risk assessment
Fantke, Peter; Gillespie, Brenda W.; Juraske, Ronnie; Jolliet, Olivier.	2014	Estimating Half-Lives for Pesticide Dissipation from Plants.	Environ. Sci. Technol., Volume 48, Issue 15, Page 8588-8602, Publication Year 2014	Study design / test system used in this article is not relevant to EU data requirements

Author	Year	Title	Source	Reason for not including in dossier
Fantke, Peter; Juraske, Ronnie; Anton, Assumpcio; Friedrich, Rainer; Jolliet, Olivier.	2011	Dynamic Multicrop Model to Characterize Impacts of Pesticides in Food.	Environ. Sci. Technol., Volume 45, Issue 20, Page 8842-8849, Publication Year 2011	Study design / test system used in this article is not relevant to EU data requirements
Farhat-Un-Nisa Shehzad; Jasmin Shah; Jan, M. R.	2012	Spectrophotometric method for the determination of fenoxaprop - p - ethyl herbicide in wheat and barley grains using charge transfer complex.	Sarhad Journal of Agriculture (2012) , Volume 28, Number 1, pp. 63-68, 20 refs. ISSN: 1016-4383 Published by: Agricultural University Peshawar, Peshawar URL (Availability): http://www.aup.edu.pk/sj_pdf/SPECTROPHOTOMETRIC percent20ME THOD percent20FOR percent20THE percent20DETERMINATION percent20OF percent20FENOXAPROP-P-ETHYL percent20HERBICIDE percent20IN percent20 percent20-149-2011.pdf	The findings of this article cannot be related to a certain test system
Finizio, A.; Villa, S.; Vighi, M.	2007	Prediction of pesticide mixtures in surface waters emitted from some relevant crops in Italy	Environmental Fate and Ecological Effects of Pesticides, Symposium Pesticide Chemistry, 13th, Piacenza, Italy, Sept. 3-6, 2007 (2007), 526-535. Editor(s): Del Re, Attilio Amerigo Maria. Publisher: Goliardica Pavese s.r.l., Pavia, Italy.	The investigation does not report results in values reflecting agreed determinants for the hazard characterization or risk assessment under Reg. EC No 1107/2009 and information is insufficient to transfer values into such determinants

Author	Year	Title	Source	Reason for not including in dossier
Gomez-Perez, Maria Luz; Plaza-Bolanos, Patricia; Romero-Gonzalez, Roberto; Martinez-Vidal, Jose Luis; Garrido-Frenich, Antonia.	2012	Comprehensive qualitative and quantitative determination of pesticides and veterinary drugs in honey using liquid chromatography-Orbitrap high resolution mass spectrometry.	J. Chromatogr., A, Volume 1248, Page 130-138, Publication Year 2012; J. Chromatogr. A, Volume 1248, Page 130-138, Publication Year 2012	No endpoint can be derived; As sample of honey does not derive from bee hive, the results are not considered to allow contribution for the bee exposure risk assessment.
Greulich, Kerstin; Alder, Lutz.	2008	Fast multiresidue screening of 300 pesticides in water for human consumption by LC-MS/MS.	Anal. Bioanal. Chem., Volume 391, Issue 1, Page 183-197, Publication Year 2008	No endpoint can be derived
Guo, Zheng-Yuan; Huang, Fan; Xu, Zhen.	2008	Residue dynamics of 10 percent fenoxaprop-P-ethyl cyhalofop-butyl EC in rice.	Shengtai Yu Nongcun Huanjing Xuebao, Volume 24, Issue 1, Page 51-54, Publication Year 2008	The article reports on potential hazard observations in the field that cannot be correlated with an agricultural treatment representative for usage of the substance of concern. No essential use.
Henning-De Jong, Irmgard; Van Zelm, Rosalie; Huijbregts, Mark A. J.; De Zwart, Dick; Van Der Linden, Ton M. A.; Wintersen, Arjen; Posthuma, Leo; Van De Meent, Dik.	2008	Ranking of agricultural pesticides in the Rhine-Meuse-Scheldt basin based on toxic pressure in marine ecosystems.	Environ. Toxicol. Chem., Volume 27, Issue 3, Page 737-745, Publication Year 2008	The observations made are based upon an application or exposure that does not allow transferring the results into a value that can be used for the purpose of the hazard assessment or risk characterization

Author	Year	Title	Source	Reason for not including in dossier
Hong, S.-M.; Kwon, H.-Y.; Kim, T.-K.; Kim, D.-H.	2013	Analysis of pesticide residues in brown rice using modified quechers multiresidue method	Organohalogen Compounds (2013), 75, 50-53	Findings not related to a certain test system
Hua R M; Song L Y Hua R M (Reprint); Song L Y	2006	Separation of fenoxaprop - p - ethyl biodegradation products by HPTLC (vol 18, pg 85, 2005)	JPC-JOURNAL OF PLANAR CHROMATOGRAPHY-MODERN TLC, (JAN-FEB 2006) Vol. 19, No. 107, pp. 86-86. ISSN: 0933-4173.	The publication is regarded as an exploratory study as it provides information on effects on cellular or molecular level, investigates on biochemical or clinical responses or reports on metabolism or degradation from isolated micro-organisms.
Huang, Zhiqiang; Zhang, Ying; Wang, Libing; Ding, Li; Wang, Meilin; Yan, Hongfei; Li, Yongjun; Zhu, Shaohua.	2009	Simultaneous determination of 103 pesticide residues in tea samples by LC-MS/MS.	J. Sep. Sci., Volume 32, Issue 9, Page 1294-1301, Publication Year 2009	Findings not related to a certain test system
Inoue, Tomonori; Nagatomi, Yasushi; Kinami, Tomohisa; Uyama, Atsuo; Mochizuki, Naoki.	2010	Fate of pesticides in a distilled spirit of barley shochu during the distillation process.	Biosci., Biotechnol., Biochem., Volume 74, Issue 12, Page 2518-2522, Publication Year 2010	Observations cannot be transferred into an endpoint
Ishibashi, Megumi; Izumi, Yoshihiro; Sakai, Miho; Ando, Takashi; Fukusaki, Eiichiro; Bamba, Takeshi	2014	High-throughput simultaneous analysis of pesticides by supercritical fluid chromatography coupled with high-resolution mass spectrometry	Journal of Agricultural and Food Chemistry (2014) Ahead of Print	No endpoint can be derived

Author	Year	Title	Source	Reason for not including in dossier
Jamin, Emilien L.; Bonvallot, Nathalie; Tremblay-Franco, Marie; Cravedi, Jean-Pierre; Chevrier, Cecile; Cordier, Sylvaine; Debrauwer, Laurent	2013	Untargeted profiling of pesticide metabolites by LC-HRMS: an exposomics tool for human exposure evaluation	Analytical and Bioanalytical Chemistry Ahead of Print	Observations cannot be transferred into an endpoint
Jammer, S.; Voloshenko, A.; Gelman, F.; Lev, O.	2014	Chiral and Isotope Analyses for Assessing the Degradation of Organic Contaminants in the Environment: Rayleigh Dependence	Environmental Science and Technology (2014), 48(6), 3310-3318	Authors calculate the fenoxaprop degradation rate constant based on data from Zhang (2010; evaluated for parent compound, **Table 98**)
Kaiser, Y. I.; Gerhards, R.	2014	Degradation and metabolism of fenoxaprop - P - ethyl in sensitive and resistant populations of Alopecurus myosuroides.	Julius-Kuehn-Archiv (2014) , Number 443, pp. 52-59, 14 refs. ISSN: 1868-9892 Published by: Julius Kuehn Institut, Bundesforschungsinstitut fuer Kulturpflanzen, Quedlinburg Conference: Proceedings 26th German Conference on Weed Biology and Weed Control, Braunschweig, Germany, 11-13 March, 2014. URL (Availability): http://pub.jki.bund.de/index.php/JKA/issue/archive	Study design / test system used in this article is not adequate.

Author	Year	Title	Source	Reason for not including in dossier
Kaiser, Yasmin Isabelle; Gerhards, Roland	2015	Degradation and Metabolism of Fenoxaprop and Mesosulfuron + Iodosulfuron in Multiple Resistant Blackgrass (Alopecurus myosuroides)	Gesunde Pflanzen (2015), 67(3), 109-117	Study design / test system used in this article is not adequate.
Katagi, Toshiyuki [Reprint Author]	2012	Isomerization of chiral pesticides in the environment.	Journal of Pesticide Science, (2012) Vol. 37, No. 1, pp. 1-14. ISSN: 1348-589X. E-ISSN: 1349-0923.; Journal of Pesticide Science, (2012) Vol. 37, No. 1, pp. 1-14. ISSN: 1348-589X. E-ISSN: 1349-0923.	The investigation does not report results in values reflecting agreed determinants for the hazard or exposure characterization or risk assessment under Reg. EC No 1107/2009 and information is insufficient to transfer values into such determinants
Khan, M. I.; Hassan, G.; Khan, I.; Marwat, K. B.; Khan, N. U.; Gul, R.	2011	Tolerance of chickpea (Cicer arietinum L.) cultivars to the major chickpea herbicides.	Pak. J. Bot., Volume 43, Issue 5, Page 2497-2501, Publication Year 2011	The data presented in this article is not suitable to allow contribution to risk assessment.
Kobayashi, Yukari; Yoshizaki, Mayuko; Shimizu, Masanori; Maruyama, Kouichi	2014	Validation study on a multi-residue method for determination of pesticides in agricultural products by LC-MS/MS	Niigata-ken Hoken Kankyo Kagaku Kenkyusho Nenpo (2014), 29, 68-72	No endpoint can be derived
Kudsk, Per; Taberner, Andreu; De Troiani, Rosa M.; Sanchez, Teresa M.; Mathiassen, Solvejg K.	2012	Herbicide tolerance and seed survival of grain amaranth (Amaranthus sp.)	Australian Journal of Crop Science (2012), 6(12), 1674-1680	The presented data is not suitable to allow contribution to risk assessment.

Author	Year	Title	Source	Reason for not including in dossier
Lacina, Ondrej; Zachariasova, Milena; Urbanova, Jana; Vaclavikova, Marta; Cajka, Tomas; Hajslova, Jana.	2012	Critical assessment of extraction methods for the simultaneous determination of pesticide residues and mycotoxins in fruits, cereals, spices and oil seeds employing ultra-high performance liquid chromatography-tandem mass spectrometry.	J. Chromatogr. A, Volume 1262, Page 8-18, Publication Year 2012; J. Chromatogr., A, Volume 1262, Page 8-18, Publication Year 2012	No endpoint can be derived
Lewis, D. F.; Mcelroy, J. S.; Sorochan, J. C.; Mueller, T. C.; Samples, T. J.; Breeden, G. K.	2010	Efficacy and safening of aryloxyphenoxypropionate herbicides when tank-mixed with triclopyr for bermudagrass control in zoysiagrass turf	Weed Technology (2010), 24(4), 489-494	The publication is a matter of observations for environmental responses in a region outside Europe
Loos, Martin; Krauss, Martin; Fenner, Kathrin.	2012	Pesticide Nonextractable Residue Formation in Soil: Insights from Inverse Modeling of Degradation Time Series.	Environ. Sci. Technol., Volume 46, Issue 18, Page 9830-9837, Publication Year 2012	The publication is a secondary source of information, e.g. review article or study that condenses information of primary nature (soil biological activity)
Lucini, Luigi; Molinari, Gian Pietro.	2011	Detection of the herbicide fenoxaprop-P-ethyl, its agronomic safener isoxadifen ethyl and their metabolites residue in rice.	Qual. Assur. Saf. Crops Foods, Volume 3, Issue 2, Page 63-68, Publication Year 2011	No essential use

Author	Year	Title	Source	Reason for not including in dossier
Lucini, Luigi; Molinari, Gian Pietro.	2010	Residues of the herbicide fenoxaprop-P-ethyl, its agronomic safener isoxadifen-ethyl and their metabolites in rice after field application.	Pest Manage. Sci., Volume 66, Issue 6, Page 621-626, Publication Year 2010	Duplicate entry, This publication has been found and evaluated for the A.I, M03 and M02. The article reports on chemical synthesis or development of methods for measurements of the chemical without its application to natural samples. No essential use.
Luks, Ann-Katrin (Reprint); Wijntjes, Christiaan; Schmidt, Burkhard Luks, Ann-Katrin (Reprint) Luks, Ann-Katrin (Reprint); Schmidt, Burkhard	2016	Metabolism of the C-14-labeled herbicide clodinafop-propargyl in plant cell cultures of wheat and tobacco	JOURNAL OF ENVIRONMENTAL SCIENCE AND HEALTH PART B-PESTICIDES FOOD CONTAMINANTS AND AGRICULTURAL WASTES, (1 FEB 2016) Vol. 51, No. 2, pp. 71-80. ISSN: 0360-1234.	Study design / test system used in this article is not adequate.
Matsuoka, Tomofumi; Akiyama, Yumi; Mitsuhashi, Takao.	2009	Screening method of pesticides in meat using cleanup with GPC and mini-column.	Shokuhin Eiseigaku Zasshi, Volume 50, Issue 2, Page 97-107, Publication Year 2009	No endpoint can be derived
Mehta, Ramesh; Yadav, Ashok.	2011	Residual studies of herbicide AEF-046360-8 percent + DIC-1468-14-22 percent EC in soil, wheat straw and grains by HPLC.	Environ. Ecol., Volume 29, Issue 4A, Page 2091-2093, Publication Year 2011	The publication is a matter of observations for environmental responses in a region outside Europe

Author	Year	Title	Source	Reason for not including in dossier
Mezcua, Milagros; Malato, Octavio; Garcia-Reyes, Juan F.; Molina-Diaz, Antonio; Fernandez-Alba, Amadeo R.	2009	Accurate-Mass Databases for Comprehensive Screening of Pesticide Residues in Food by Fast Liquid Chromatography Time-of-Flight Mass Spectrometry.	Anal. Chem. (Washington, DC, U. S.), Volume 81, Issue 3, Page 913-929, Publication Year 2009	Findings not related to a certain test system
Min, Zaw Win; Hong, Su-Myeong; Yang, In-Cheol; Kwon, Hye-Young; Kim, Taek-Kyum; Kim, Doo-Ho	2012	Analysis of pesticide residues in brown rice using modified QuEChERS multiresidue method combined with electrospray ionization-liquid chromatography-tandem mass spectrometric detection	Journal of the Korean Society for Applied Biological Chemistry (2012), 55(6), 769-775	Findings not related to a certain test system
Nakamura, Sadao; Yamagami, Takashi; Ono, Yukiko; Toubou, Kenichi; Daishima, Shigeki	2013	Multi-residue analysis of pesticides in agricultural products by GC/MS using synchronous SIM/scan acquisition	Bunseki Kagaku (2013), 62(3), 229-241	No endpoint can be derived
Namikawa, Mikio; Shibata, Sayo; Shiomi, Tetsuo; Nakagawa, Tomoyuki; Ban, Soichiro; Tomita, Yoko; Semura, Shunsuke; Nakao, Yoshie; Banno, Yukinori; Kawakami, Masahiro.	2014	Simultaneous analysis of residual pesticides in fruit, vegetables, brown rice, and oolong tea by LC-MS/MS.	Shokuhin Eiseigaku Zasshi, Volume 55, Issue 6, Page 279-289, Publication Year 2014	No endpoint can be derived

Author	Year	Title	Source	Reason for not including in dossier
Nimanthika, W. J.; Weerakoon, S. R.	2011	Impact of pre-and post-planting herbicides on growth performance and yield of Oryza genotypes in Sri Lanka.	23rd Asian-Pacific Weed Science Society Conference. Volume 1: weed management in a changing world, Cairns, Queensland, Australia, 26-29 September 2011 (2011) , pp. 405-410, 7 refs. ISBN: 978-0-9871961-0-1 Published by: Asian-Pacific Weed Science Society, Cairns Conference: 23rd Asian-Pacific Weed Science Society Conference. Volume 1: weed management in a changing world, Cairns, Queensland, Australia, 26-29 September 2011.	The article reports exactly on the same results as in Nimanthika and Weerakkoon 2012, Pakistan Journal of Weed Science Research, Volume 18, Number Special Issue, pp. 469-475 – see below
Nimanthika, W. J.; Weerakoon, S. R.	2012	Impact of pre-and post-planting herbicides on growth performance and yield of Oryza genotypes in Sri Lanka. Special issue.	Pakistan Journal of Weed Science Research (2012) , Volume 18, Number Special Issue, pp. 469-475, 7 refs. ISSN: 1815-1094 Published by: Weed Science Society of Pakistan, Department of Weed Science, Peshawar URL (Availability): http://www.wssp.org.pk/si-53-2012,469-475.pdf	The data presented in this article is not suitable to allow contribution to risk assessment.

Author	Year	Title	Source	Reason for not including in dossier
Nougadere, Alexandre; Reninger, Jean-Cedric; Volatier, Jean-Luc; Leblanc, Jean-Charles.	2011	Chronic dietary risk characterization for pesticide residues: A ranking and scoring method integrating agricultural uses and food contamination data.	Food Chem. Toxicol., Volume 49, Issue 7, Page 1484-1510, Publication Year 2011	The dietary risk assessments presented in the publication are not based on the methodology that has to be applied in a regulatory context and/or do not provide relevant information about the risks that result specifically from the representative use(s).; no data reported which might be used for environmental fate or risk assessment; all experimental data derived from other sources
Nowell, Lisa H.; Norman, Julia E.; Moran, Patrick W.; Martin, Jeffrey D.; Stone, Wesley W.	2014	Pesticide Toxicity Index-A tool for assessing potential toxicity of pesticide mixtures to freshwater aquatic organisms	Science of the Total Environment (2014), 476-477, 144-157	No data has been reported which might be used for environmental fate or risk assessment; all experimental data derived from other sources
Omote, M.; Harayama, K.; Sasaki, T.; Mochizuki, N.; Yamashita, H.	2006	Analysis of simultaneous screening for 277 pesticides in malt and beer by liquid chromatography with tandem mass spectrometry.	J. Am. Soc. Brew. Chem., Volume 64, Issue 3, Page 139-150, Publication Year 2006	Findings not related to a certain test system
Padilla, S.; Corum, D.; Padnos, B.; Hunter, D. L.; Beam, A.; Houck, K. A.; Sipes, N.; Kleinstreuer, N.; Knudsen, T.; Dix, D. J.; Reif, D. M.	2012	Zebrafish developmental screening of the ToxCast Phase I chemical library.	Reprod. Toxicol., Volume 33, Issue 2, Page 174-187, Publication Year 2012	The article is on the racemate fenoxaprop-ethyl and NOT on the substance of concern, i.e. fenoxaprop-P-ethyl.

Author	Year	Title	Source	Reason for not including in dossier
Papadakis, Emmanouil-Nikolaos; Tsaboula, Aggeliki; Kotopoulou, Athina; Kintzikoglou, Katerina; Vryzas, Zisis; Papadopoulou-Mourkidou, Euphemia	2015	Pesticides in the surface waters of Lake Vistonis Basin, Greece: Occurrence and environmental risk assessment	Science of the Total Environment (2015), 536, 793-802	The article does not contain information related to the substance of concern
Parul Chaudhary; Rahman, S. M. A.; Chaudhary, P.	2008	Screening of some agrochemicals on feeding preference of Spilarctia obliqua Walker.	Progressive Research (2008) Volume 3, Number 2, pp. 191-193, 7 refs. ISSN: 0973-6417 Published by: Society for Scientific Development in Agriculture and Technology, Jhansi	The article reports on desired effects on organisms considered as such target organisms
Patton, Aaron J.; Weisenberger, Daniel V.; Hardebeck, Glenn A.; Reicher, Zachary J.	2007	Safety of herbicides on Zenith zoysiagrass seedlings.	Weed Technol., Volume 21, Issue 1, Page 145-150, Publication Year 2007	The publication is a matter of observations for environmental responses in a region outside Europe
Petralito, S.; Zanardi, I.; Braconi, D.; Santucci, A.; Memoli, A.; Caccamo, E.; Travagli, V.	2012	Supportive use of cyclodextrins as decontamination agents for herbicides: the case of fenoxaprop-p-ethyl.	Asia-Pac. J. Chem. Eng., Volume 7, Issue S3, Page S342-S347, Publication Year 2012	The study is dealing with the question whether cyclodextrins could be used in formulations as additives to fenoxaprop. This question is not relevant for risk assessment.

Author	Year	Title	Source	Reason for not including in dossier
Plaza-Bolanos, Patricia; Padilla-Sanchez, Juan Antonio; Garrido-Frenich, Antonia; Romero-Gonzalez, Roberto; Martinez-Vidal, Jose Luis.	2012	Evaluation of soil contamination in intensive agricultural areas by pesticides and organic pollutants: south-eastern Spain as a case study.	J. Environ. Monit., Volume 14, Issue 4, Page 1181-1188, Publication Year 2012	The investigation does not report results in values reflecting agreed determinants for the hazard or exposure characterization or risk assessment under Reg. EC No 1107/2009 and information is insufficient to transfer values into such determinants
Polgar, Laszlo; Garcia-Reyes, Juan F.; Fodor, Peter; Gyepes, Attila; Dernovics, Mihaly; Abranko, Laszlo; Gilbert-Lopez, Bienvenida; Molina-Diaz, Antonio.	2012	Retrospective screening of relevant pesticide metabolites in food using liquid chromatography high resolution mass spectrometry and accurate-mass databases of parent molecules and diagnostic fragment ions.	J. Chromatogr. A, Volume 1249, Page 83-91, Publication Year 2012; J. Chromatogr., A, Volume 1249, Page 83-91, Publication Year 2012	Duplicate entry, This publication has been found and evaluated for the A.I and M03. The article reports on chemical synthesis or development of methods for measurements of the chemical without its application to natural samples. No endpoint can be derived.
Raeppel, Caroline; Fabritius, Marie; Nief, Marie; Appenzeller, Brice M. R.; Briand, Olivier; Tuduri, Ludovic; Millet, Maurice	2015	Analysis of airborne pesticides from different chemical classes adsorbed on Radiello Tenax passive tubes by thermal-desorption-GC/MS	Environmental Science and Pollution Research (2015), 22(4), 2726-2734	No endpoint can be derived

Author	Year	Title	Source	Reason for not including in dossier
Reyes, Y.; Infante, D.; Garcia-Borrego, J.; Pozo, E. Del; Cruz, A.; Martinez, B.; Del Pozo, E.	2012	Compatibility of Trichoderma asperellum Samuels with herbicides of more frequent use in rice crop. Compatibilidad de Trichoderma asperellum Samuels con herbicidas de mayor uso en el cultivo del arroz.	Revista de Proteccion Vegetal (2012) , Volume 27, Number 1, pp. 45-53, 22 refs. ISSN: 1010-2752 Published by: Centro Nacional de Sanidad Agropecuaria, La Habana URL (Availability): http://scielo.sld.cu/pdf/rpv/v27n1/rpv08112.pdf	The observation made in this article is based upon a route of exposure that cannot be considered representative for the intended use of the substance of concern
Saito-Shida, Shizuka; Nemoto, Satoru; Matsuda, Rieko	2014	Multiresidue analysis of pesticides in vegetables and fruits by supercritical fluid extraction and liquid chromatography-tandem mass spectrometry	Shokuhin Eiseigaku Zasshi (2014), 55(3), 142-151	Findings not related to a certain test system
Sauret, Nathalie; Wortham, Henri; Strekowski, Rafal; Herckes, Pierre; Nieto, Laura Ines.	2008	Comparison of annual dry and wet deposition fluxes of selected pesticides in Strasbourg, France.	Environ. Pollut. (Oxford, U. K.), Volume 157, Issue 1, Page 303-312, Publication Year 2008	The publication is a secondary source of information, e.g. review article or study that condenses information of primary nature
Shah, Jasmin; Jan, M. Rasul; Muhammad, Mian; Shehzad, Farhat-Un-Nisa.	2010	Flow injection spectrophotometric determination of fenoxaprop-p-ethyl herbicide in different grain samples after derivatization.	J. Braz. Chem. Soc., Volume 21, Issue 10, Page 1923-1928, Publication Year 2010	Findings not related to a certain test system

Author	Year	Title	Source	Reason for not including in dossier
Shah, Jasmin; Jan, Muhammad Rasul; Shehzad, Farhat-Un-Nisa; Muhammad, Mian.	2010	Spectrophotometric method for quantification of fenoxaprop-p-ethyl herbicide in commercial formulations and agricultural samples.	J. Chem. Soc. Pak., Volume 32, Issue 4, Page 537-541, Publication Year 2010	Duplicate entry, This publication has been found and evaluated for the A.I, M02 and M05. Findings not related to a certain test system.
Shehzad, Farhat-Un-Nisa; Shah, Jasmin; Jan, Muhammad Rasul; Muhammad, Mian.	2012	Quantification of fenoxaprop-p-ethyl herbicide in soil and vegetable samples by microwave-assisted solvent extraction and HPLC method.	J. Chem. Soc. Pak., Volume 34, Issue 6, Page 1554-1559, Publication Year 2012	Findings not related to a certain test system.
Shrila Das; Narendra Kumar; Saxena, S. C.; Das, S.; Kumar, N.	2013	In-vitro effect of herbicides on the growth of Bradyrhizobium japonicum and phosphate solubilizing bacteria.	Pantnagar Journal of Research (2013) , Volume 11, Number 1, pp. 87-91, 6 refs. ISSN: 0972-8813 Published by: G.B. Pant University of Agriculture and Technology, Pantnagar	The observation made is based upon a route of exposure that cannot be considered representative for the intended use of the substance of concern
Silva, E. R. L. [Reprint Author]; Alves, L. F. A.; Santos, J.; Potrich, M.; Sene, L.	2008	TECHNIQUES FOR EVALUATION OF THE IN-VITRO EFFECT OF HERBICIDES ON BACILLUS THURINGIENSIS BERLINER VAR. KURSTAKI. Original Title: TECNICAS PARA AVALIACAO IN VITRO DO EFEITO DE HERBICIDAS SOBRE BACILLUS THURINGIENSIS BERLINER VAR. KURSTAKI.	Arqivos do Instituto Biologico Sao Paulo, (JAN-MAR 2008) Vol. 75, No. 1, pp. 59-67.	The publication is dealing with question of compatibility with another plant protection product.

Author	Year	Title	Source	Reason for not including in dossier
Singh, Pratap; Nepalia, V.; Tomar, S. S.	2008	Effect of herbicides and fertilizer levels on soil dehydrogenase and urease activity under soybean (Glycine max) cultivation.	Indian J. Agric. Sci., Volume 78, Issue 7, Page 638-640, Publication Year 2008	The publication is a matter of observations for environmental responses in a region outside Europe.
Singh, Shashi B.; Das, Tapas K.; Kulshrestha, Gita.	2013	Persistence of herbicide fenoxaprop ethyl and its acid metabolite in soil and wheat crop under Indian tropical conditions.	J. Environ. Sci. Health, Part B, Volume 48, Issue 5, Page 324-330, Publication Year 2013	The publication is a matter of observations for environmental responses in a region outside Europe.
Slavov, Svetoslav; Gini, Giuseppina; Benfenati, Emilio.	2008	QSAR trout toxicity models on aromatic pesticides.	J. Environ. Sci. Health, Part B, Volume 43, Issue 8, Page 633-637, Publication Year 2008	The publication is a secondary source of information, e.g. review article or study that condenses information of primary nature.
Steinbach, Philipp; Schwack, Wolfgang.	2013	Experiments for miniaturization and modification of the multi-pesticide residue method EN 12393.	Trends Chromatogr., Volume 8, Page 113-129, Publication Year 2013	No endpoint can be derived.
Takeda, Hironobu; Fujimoto, Toshiko; Taniguchi, Makoto.	2011	Study of simultaneous analysis of pesticide residues in vegetables by LC/MS/MS.	Amagasaki-shiritsu Eisei Kenkyushoho, Volume 36, Page 39-44, Publication Year 2011	No endpoint can be derived.
Wang, Yanhua; Wu, Shenggan; Chen, Liping; Wu, Changxing; Yu, Ruixian; Wang, Qiang; Zhao, Xueping.	2012	Toxicity assessment of 45 pesticides to the epigeic earthworm Eisenia fetida.	Chemosphere, Volume 88, Issue 4, Page 484-491, Publication Year 2012	The study is dealing with a short version of an acute earthworm test (48h). Results are considered not relevant since acute earthworm tests were intentionally withdrawn from the EU data requirements.

Author	Year	Title	Source	Reason for not including in dossier
Wang, Yanhua; Yu, Weihua; Yang, Lizhi; Cang, Tao; Yu, Ruixian; Wang, Qiang; Zhao, Xueping.	2012	Acute toxicity of twenty-two commonly used herbicides to earthworm (Eisenia fetida).	Shengtai Duli Xuebao, Volume 7, Issue 3, Page 317-325, Publication Year 2012	The study is dealing with acute earthworm test. Results are considered not relevant since acute earthworm tests were intentionally withdrawn from the EU data requirements.
Whiteside, Melanie; Mineau, Pierre; Morrison, Clare; Knopper, Loren D.	2008	Comparison of a score-based approach with risk-based ranking of in-use agricultural pesticides in Canada to aquatic receptors.	Integr. Environ. Assess. Manage., Volume 4, Issue 2, Page 215-236, Publication Year 2008	The publication is a secondary source of information, e.g. review article or study that condenses information of primary nature.
Wu, J. X.; Zhang, Y.; Wang, K.; Zhang, H. Y.	2015	Residue analysis and dissipation of fenoxaprop - P - ethyl and its metabolite fenoxaprop-P in rice ecosystem	Journal of Analytical Chemistry (2015), 70(7), 897-902	Duplicate entry, This publication has been found and evaluated for the A.I and M03. Test system not relevant to representative uses/GAPs; The investigation is made in field experiments in China, which cannot be considered as representative for EU, furthermore the use in rice fileds is not foreseen for the AIR of fenoxaprop-p-ethyl.
Yarpuz-Bozdogan, Nigar.	2009	Assessing the environment and human health risk of herbicide application in wheat cultivation.	J. Food, Agric. Environ., Volume 7, Issue 3 and 4, Pt. 2, Page 775-781, Publication Year 2009	The publication is a secondary source of information, e.g. review article or study that condenses information of primary nature.

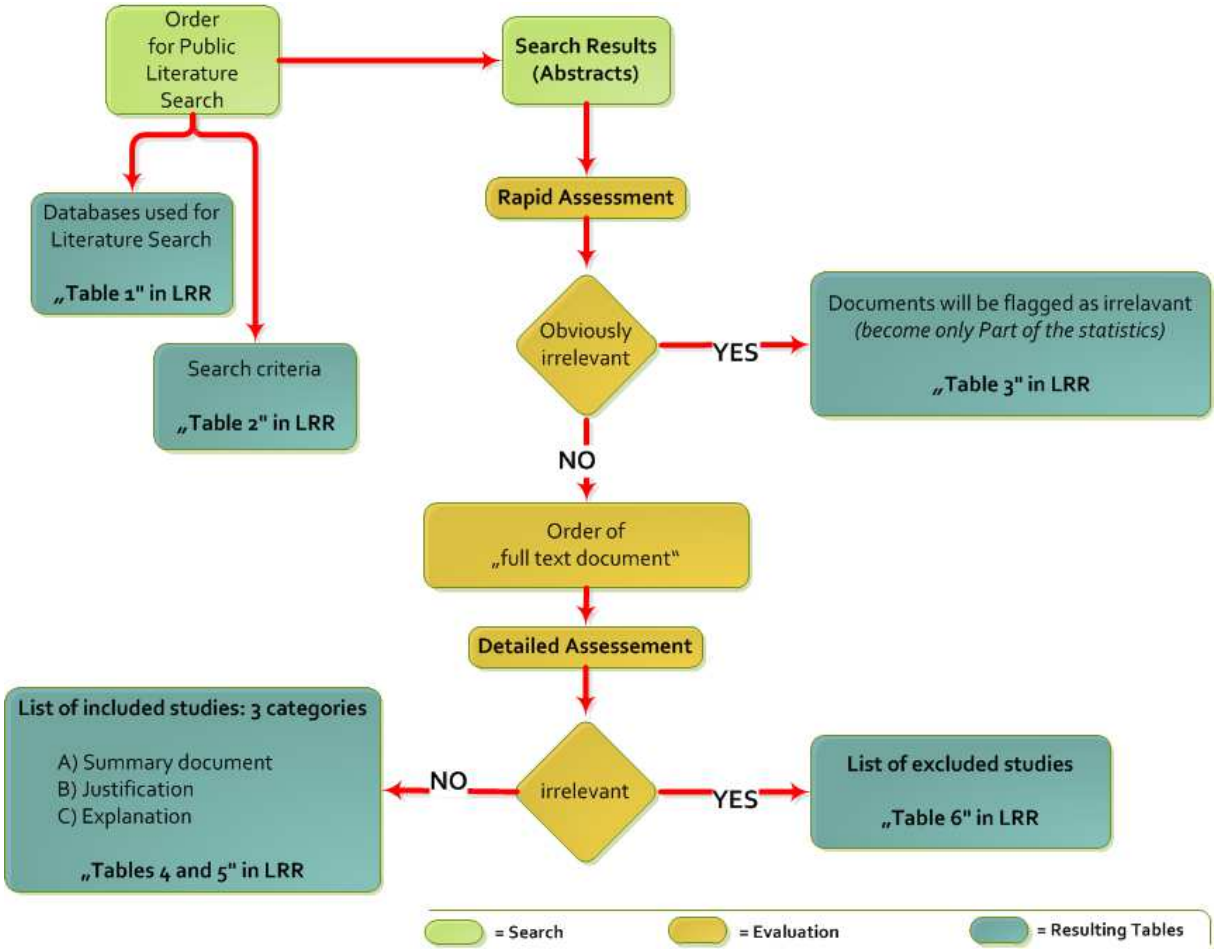
Author	Year	Title	Source	Reason for not including in dossier
Zhang, Anping; Xu, Chao; Liu, Weiping	2008	Influence of toxicity and dissipation of racemic fenoxaprop and its R-enantiomer in Scenedesmus obliquus suspension by cyclodextrins	Journal of Environmental Science and Health, Part B: Pesticides, Food Contaminants, and Agricultural Wastes (2008), 43(3), 231-236	The investigation does not allow attributing the observations made to the substance of concern (e.g.mixture of substances, origin of exposure unclear).

Conclusion

For Fenoxaprop-P-ethyl and its metabolites, a total of 1250 references were identified and evaluated for potential relevance. One publication with relevance after detailed assessment has been classified according to EFSA Guidance 5.4.1 as case a). This publication by Zhang, Y.; Liu, D.; Diao, J.; He, Z.; Zhou, Z.; Wang, P.; Li, X.; 2010; M-507961-01-1 provides further information for refining the risk assessment. No further publication has been identified which would indicate that a side-effect on human health, the environment and non-target species may exist, which would then need to be considered in the risk assessment of the supplementary (renewal) dossier.

Appendices

Appendix I: Search and Evaluation Workflow



Comment RMS:	The literature search was conducted according to EFSA Guidance Document. All

	information like input key words, relevance criteria, eligibility criteria and used databases are given. The RMS is of the opinion that the literature search conducted by the applicant is acceptable. Nevertheless, some points were identified which need further clarification. - The applicant used four different databases, Agricola, Biosis, CABA, Chemical Abstracts, Derwent Drug File (DRUGU), EMBASE, Esbiobase, IPA, Medline, Pascal, PQSciTech, Registry, Scisearch, Toxcenter, FSTA. Not all databases are considered suitable to be used to search for ecotoxicological literature, like e.g. MEDLINE which is a bibliographic database of life sciences and biomedical information. On the other hand, databases like SCOPUS or Web of Sciences were not considered, which are considered potentially more relevant by the RMS for the section ecotoxicology. In general the RMS agrees with the conducted literature search. However more information than presented is considered necessary to comprehend why for example toxicity tests on algae species or *Daphnia magna* (e.g. Ma et. al 2006) were rated as out of scope for the environmental risk assessment. Furthermore Studies on non-standard test species should also be considered at least as additonal information (e.g. toxicity test on tadpole Huang et. al 2007). Overall a study summary should be provided and it has to be explained in more detail why studies could be deemed as not relevant. Based on the available information RMS could not follow the applicant proposal deeming the studies as not relevant.

B.9.10. BIOLOGICAL ACTIVITY OF METABOLITES POTENTIALLY OCCURRING IN GROUNDWATER

There are no concerns for groundwater from the use of fenoxaprop-p in accordance with the use pattern for the current formulation.

PEC_{GW} values were calculated for the active substance and the metabolites considering the representative GAP uses. The PEC_{GW} were calculated using the model FOCUS PEARL and FOCUS PELMO. For details of the calculation please refer to Section B.8 (PPP).

Based on the FOCUS modelling no PEC_{GW} values (for all FOCUS scenarios) greater than 0.1 µg/L were determined for the active substance and its metabolites considering all FOCUS scenarios.

Hence, no assessment of the biological activity of these metabolites is considered necessary.

B.9.11. REFERENCES RELIED ON

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
KCA 8.1.1.1	[redacted]	1987	Acute oral toxicity in the male and female Japanese quail (*Coturnix coturnix* japonica) Hoe 046360 active ingredient technical Code: Hoe 046360 0H ZC96 0002 [redacted] Report No.: A36978 Edition Number: M-118746-01-1 Date: 1986-02-18 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.1.1.1	[redacted]	1986a	Acute oral toxicity in the male and female bobwhite quail (*Colinus virginianus*) Hoe 046360 active ingredient Code: Hoe 046360 0H ZC96 0002 [redacted] Report No.: A36429 Edition Number: M-118215-01-1 Date: 1986-02-10 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.1.1.1	[redacted]	1986b	Acute oral toxicity in the male and female mallard duck (*Anas platyrhynchos*) Hoe 046360 active ingredient Code: Hoe 046360 0H ZC96 0002 [redacted] Report No.: A36428 Edition Number: M-118214-01-1 Date: 1986-02-11 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.1.1.1	[redacted]	1986c	Acute oral toxicity in the male and female partridge (*Perdix perdix*) Hoe 046360 active ingredient technical Code: Hoe 046360 0H ZC96 0002 [redacted] Report No.: A36679 Edition Number: M-118455-01-1 Date: 1986-03-03 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
KCA 8.1.1.2	[redacted]	1986d	8-day dietary LC_{50} test in the Japanese quail (Coturnix coturnix japonica) Hoe 046360 active ingredient technical Code: Hoe 046360 0H ZC96 0002 [redacted] Report No.: A36733 Edition Number: M-118509-01-1 Date: 1986-03-28 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.1.1.2	[redacted]	1986	Dietary toxicity (LC_{50}) to the bobwhite quail of Hoe 046360 substance, technical Code: Hoe 046360 0H ZC96 0002 [redacted] Report No.: A34917 Edition Number: M-115663-01-1 Date: 1986-07-23 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.1.1.2	[redacted]	1986e	8-day dietary LC_{50} test in the mallard duck (Anas platyrhynchos) Hoe 046360 active ingredient technical Code: Hoe 046360 0H ZC96 0002 [redacted] Report No.: A36430 Edition Number: M-118216-01-1 Date: 1986-05-08 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.1.1.3	[redacted]	2001	Bobwhite quail dietary reproduction range finding study Fenoxaprop-P-ethyl Code: AE F046360 00 1D96 0001 [redacted] Report No.: C017041 Edition Number: M-203536-01-1 Date: 2001-09-26 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
KCA 8.1.1.3	[redacted]	2002	Bobwhite quail dietary reproduction study Fenoxaprop-P-ethyl Code: AE F046360 00 1D96 0001 [redacted] Report No.: C027500 Report includes Trial Nos.: PT01-0109 Edition Number: M-213449-01-1 Date: 2002-11-15 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.1.1.3	[redacted]	1985	Effects on reproduction in the bobwhite quail of dietary Inclusion of Hoe 033171 active ingredient technical Code: Hoe 033171 0H ZD96 0001 [redacted] Report No.: A31296 Edition Number: M-108751-01-1 MRID#: 00155304 Date: 1985-06-07 GLP/GEP: Yes, unpublished	Yes	No		Bayer	In DAR (2005)
KCA 8.1.1.3	[redacted]	1985a	Tissue concentrations in bobwhite quail after dietary administration of Code: Hoe 033171 [redacted] Report No.: A32063 Edition Number: M-110525-01-1 Date: 1985-09-25 GLP/GEP: Yes, unpublished	Yes	No		Bayer	In DAR (2005)
KCA 8.1.1.3	[redacted]	1985	Effects on reproduction in the mallard duck of dietary Inclusion of Hoe 033171 active ingredient technical Code: Hoe 033171 0H ZD96 0001 [redacted]	Yes	No		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			Report No.: A31342 Edition Number: M-108817-01-1 MRID#: 00155305 Date: 1985-06-24 GLP/GEP: Yes, unpublished					
KCA 8.1.1.3	[redacted]	1985b	Tissue concentrations in mallard duck after dietary administration of Code: Hoe 033171 [redacted] Report No.: A32064 Edition Number: M-110529-01-1 Date: 1985-09-25 GLP/GEP: Yes, unpublished	Yes	No		Bayer	In DAR (2005)
KCA 8.1.2.2	Bomann, W.; Diesing, L.	2016	Fenoxaprop-P-ethyl - Toxicity endpoint for the wild mammal reproductive risk assessment TF- BCS-CHA Report No.: M-555984-01-1 Date: 2016-05-23 GLP/GEP: n.a., unpublished	N	N		TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.1	[redacted]	1999a	The 96 hour acute toxicity to the rainbow trout, *Oncorhynchus mykiss*, in a flow through system Fenoxaprop-P-ethyl technical 88.1% w/w Code: AE F046360 00 1C97 0002 [redacted] Report No.: C002145 Edition Number: M-183992-01-1 MRID#: 44801504 Date: 1999-03-16 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.2.1	[redacted]	1986c	Effect to *Salmo gairdneri* (rainbow trout) in a dynamic acute toxicity test (Sg349/b, method OECD) Hoe 046360 substance, technical Code: Hoe 046360 0H ZC96 0002 [redacted]	Y	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			Report No.: A33682 Edition Number: M-114394-01-1 Date: 1986-08-01 GLP/GEP: Yes, unpublished					
KCA 8.2.1	[redacted]	1986b	Effect to *Salmo gairdneri* (rainbow trout) in a static acute toxicity test (Sg347/a, method EPA) Hoe 046360 substance, technical Code: Hoe 046360 0H ZC96 0002 [redacted] Report No.: A33683 Edition Number: M-114397-01-1 MRID#: 42009604 Date: 1986-08-18 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.2.1	[redacted]	1986d	Static-acute toxicity test on *Salmo gairdneri* (rainbow trout) (study No. Sg348/a, BBA/EPA method) Hoe 046360 active ingredient Code: Hoe 046360 0H ZC96 0002 [redacted] Report No.: A39607 Edition Number: M-114399-01-2 MRID#: 42009605 Date: 1986-08-11 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.2.1	[redacted].	1999b	The 96 hour acute toxicity to the bluegill sunfish, *Lepomis macrochirus*, in a flow through system Fenoxaprop-P-ethyl technical 88.1% w/w Code: AE F046360 00 1C97 0002 [redacted] Report No.: C002415 Edition Number: M-184457-01-1 MRID#: 44801502 Date: 1999-03-16 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.2.1	[redacted]	1986e	Effect to *Lepomis macrochirus* (bluegill sunfish) in a	Y	N		Bayer	In DAR

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			static-acute toxicity test (Lm16/a, method EPA) Hoe 046360 substance technical Code: Hoe 046360 0H ZC96 0002 [redacted] Report No.: A33183 Edition Number: M-113468-01-1 MRID#: 42009603 Date: 1986-04-25 GLP/GEP: Yes, unpublished					(2005)
KCA 8.2.1	[redacted]	1996	Acute toxicity to rainbow trout (*Oncorhynchus mykiss*) Fenoxaprop-P substance, technical Code: AE F088406 00 1C94 0001 [redacted] Report No.: A57595 Edition Number: M-141298-01-1 Date: 1996-10-21 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.2.1	[redacted].	1999c	The 96 hour acute toxicity to the rainbow trout, *Oncorhynchus mykiss*, in a static renewal system AE F054014 technical 99.7% w/w Code: AE F054014 00 1C99 0004 [redacted] Report No.: C002416 Edition Number: M-184458-01-1 MRID#: 44801503 Date: 1999-03-16 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.2.1	[redacted]	2004b	Rainbow trout (*Oncorhynchus mykiss*), Acute toxicity (OECD 203), semi-static exposure AE F096918; substance pure Code: AE F096918 00 1B99 0001 [redacted]	Y	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			Report No.: C043956 Edition Number: M-235517-01-1 Date: 2004-09-22 GLP/GEP: Yes, unpublished					
KCA 8.2.1	[redacted]	2011a	Acute toxicity of fenoxaprop-P-ethyl to fish (*Pimephales promelas*) under flow-through conditions TF- BCS-CHA Report No.: EBFPL012 Edition Number: M-407842-01-2 Date: 2011-05-18 GLP/GEP: Yes, unpublished	Y	Y	Data requirement according to Regulation (EC) No 1107/2009 and 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.1	[redacted]	2015a	BCS-AB16188: Acute toxicity to rainbow trout (*Oncorhynchus mykiss*) in a 96-hour semi static test [redacted] TF- BCS-CHA Report No.: 102031230 Edition Number: M-538851-01-1 Date: 2015-10-19 GLP/GEP: Yes, unpublished	Y	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.1	[redacted]	2015a	BCS-CY11271: Toxicity to rainbow trout (*Oncorhynchus mykiss*) in a 96-hour semi static test - Revised final report No. 1 - [redacted] TF- BCS-CHA Report No.: 96931230 Edition Number: M-542854-01-1 Date: 2015-11-27 GLP/GEP: Yes, unpublished	Y	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.2.1	[redacted]	1989ap	Effect to Salmo gairdneri (*rainbow trout*) in a 21-day prolonged toxicity test (method OECD) Fenoxaprop-P-ethyl substance, technical Code: Hoe 046360 0H ZC97 0002 [redacted] Report No.: A41460 Edition Number: M-124555-01-1 Date: 1989-08-17	Y	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			GLP/GEP: Yes, unpublished					
KCA 8.2.2.1	[redacted]	1999d	Effects on early life stages of rainbow trout, *Oncorhynchus mykiss* (U.S. EPA 72-4) Fenoxaprop-P-ethyl technical 88.1% w/w Code: AE F046360 00 1C97 0002 [redacted] Report No.: C002144 Edition Number: M-183990-01-1 MRID#: 44786801 Date: 1999-03-10 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.2.2.1	[redacted]	2004a	Rainbow trout (*Oncorhynchus mykiss*), juvenile growth test (OECD 215), flow-through conditions AE F096918; substance pure Code: AE F096918 00 1B99 0001 [redacted] Report No.: C045675 Edition Number: M-237295-01-1 Date: 2004-12-17 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.2.2.1	[redacted]	2003	Effects on juvenile growth of *Oncorhynchus mykiss* (rainbow trout) in a 28 days flow-through study Fenoxaprop-P substance, technical Code: AE F088406 00 1C97 0001 [redacted] Bayer Report No.: C027516 Edition Number: M-213480-01-1 Date: 2003-02-06 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.2.2.1	[redacted]	2011b	Early-life stage toxicity of fenoxaprop-p-ethyl (techn.) to fish (Pimephales promelas) TF- BCS-CHA Report No.: EBFPL009 Edition Number: M-403248-01-3	Y	Y	Data requirement according to Regulation (EC) No	TF- BCS-CHA	Submitted for the purpose of renewal

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			Date: 2011-03-08 GLP/GEP: Yes, unpublished			1107/2009 and 283/2013		
KCA 8.2.2.3	[redacted]	1999	Bioaccumulation and metabolism of (14C)-chlorophenyl AE F046360 in bluegill sunfish, Lepomis macrochirus, in a flow-through system [redacted] Report No.: C002136 Report includes Trial Nos.: A500/CE0026 Edition Number: M-183971-01-1 MRID#: 44778501 Date: 1999-02-19 GLP/GEP: Yes, unpublished	Y	N		Bayer	In DAR (2005)
KCA 8.2.4.1	Stachura, B. J.; Ruff, D. F.	1998	48 hour acute toxicity to *Daphnia magna*, in a static renewal system Fenoxaprop-P-ethyl technical 88.1% w/w Code: AE F046360 00 1C97 0002 AgrEvo USA Company, Pikeville, NC, USA Bayer Report No.: A67511 Edition Number: M-147888-01-1 MRID#: 44664002 Date: 1998-07-20 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.4.1	Fischer, R.	1986f	Effect to *Daphnia magna* (waterflea) in a static-acute toxicity test (Dm610/a, method EPA) Hoe 046360 substance, technical Code: Hoe 046360 0H ZC96 0002 Hoechst AG, Frankfurt am Main, Germany Bayer Report No.: A34147 Edition Number: M-114929-01-1 MRID#: 42009606 Date: 1986-07-14 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.4.1	Heusel, R.	1993a	Effect to *Daphnia magna* (waterflea) in a static-acute toxicity test (method OECD) Fenoxaprop-P substance, technical Code: Hoe 088406 00 ZC93 0001	N	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			Hoechst AG, Frankfurt am Main, Germany Bayer Report No.: A50393 Edition Number: M-131419-01-1 MRID#: 04733415 Date: 1993-04-05 GLP/GEP: Yes, unpublished					
KCA 8.2.4.1	Young, B. M.; Ruff, D. F.	1999a	The 48 hour acute toxicity to the water flea, *Daphnia magna*, in a static renewal system AE F054014 technical 99.7% w/w Code: AE F054014 00 1C99 0004 AgrEvo USA Company, Pikeville, NC, USA Report No.: C002434 Edition Number: M-184490-01-1 MRID#: 44801505 Date: 1999-03-16 GLP/GEP: Yes, unpublished	N	N			In DAR (2005)
KCA 8.2.4.1	Schaefers, C.	2004c	*Daphnia magna*, Acute immobilization test (OECD 202), AE F096918; substance pure Code: AE F096918 00 1B99 0001 Fraunhofer Institut, IME, Schmallenberg, Germany Bayer Report No.: C043957 Edition Number: M-235519-01-1 Date: 2004-09-21 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.4.1	Pupp, A.; Wydra, V.	2008	Acute toxicity of (R)-2-(4-hydroxyphenoxy) propionic acid (HPPA) to *Daphnia magna* in a static 48-hour immobilization test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 234 FPE Edition Number: M-548131-01-1 Date: 2008-02-22 GLP/GEP: Yes, unpublished	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.4.1	Hengsberger, A.; Haertel, C.	2015a	BCS-AW69425: Acute toxicity to *Daphnia magna* in a static 48-hour immobilisation test IBACON GmbH, Rossdorf, Germany	N	Y	Data required for metabolites	TF- BCS-CHA	Submitted for the purpose of

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			TF- BCS-CHA Report No.: 102041220 Edition Number: M-538685-01-1 Date: 2015-10-12 GLP/GEP: Yes, unpublished			following the EFSA AGD		renewal
KCA 8.2.4.1	Boerschig, C.; Emnet, P.	2015b	BCS-AB16188: Acute toxicity to *Daphnia magna* in a static 48-hour immobilisation test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 102031220 Edition Number: M-538878-01-1 Date: 2015-10-09 GLP/GEP: Yes, unpublished	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.4.1	Kuhl, R.; Emnet, P.	2016	BCS-CY11271: Acute toxicity to Daphnia magna in a static 48-hour immobilisation test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: EBFPN010 Edition Number: M-547464-01-1 Date: 2016-01-08 GLP/GEP: Yes, unpublished	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.4.2	Murphy, D.; Peters, G. T.	1991	96-hour flow-through acute toxicity test with the saltwater mysid (*Mysidopsis bahia*) Fenoxaprop-P-ethyl technical Code: Hoe 046360 00 ZC97 0002 Wildlife International, Ltd., Easton, MD, USA TF- BCS-CHA Report No.: A46598 Edition Number: M-130627-01-1 MRID#: 42009607 Date: 1991-06-28 GLP/GEP: Yes, unpublished	N	Y	Study done to cover US data requirement	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.5.1	Fischer, R.	1989b	Effect to *Daphnia magna* (waterflea) in a 21-day reproduction test (method OECD) Fenoxaprop-P-ethyl substance, technical Code: Hoe 046360 0H ZC97 0002 Hoechst AG, Frankfurt am Main, Germany Bayer Report No.: A41697	N	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			Edition Number: M-124780-01-1 Date: 1989-08-30 GLP/GEP: Yes, unpublished					
KCA 8.2.5.1	Ebeling, M.; Nguyen, D.; Gosch, H.	2002	Fenoxaprop-P *Daphnia magna* chronic toxicity and reproduction test under semi-static conditions Code: AE F088406 00 1C97 0001 Bayer CropScience GmbH, Frankfurt am Main, Germany Bayer Report No.: C026337 Edition Number: M-211218-01-1 Date: 2002-12-09 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.5.1	Schaefers, C.	2004d	*Daphnia magna* Reproduction test (OECD 211) Semi-static exposure AE F096918; substance pure Code: AE F096918 00 1B99 0001 Fraunhofer Institut, IME, Schmallenberg, Germany Bayer Report No.: C045676 Edition Number: M-237296-01-1 Date: 2004-12-16 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.5.1	Hager, J.	2016a	Statement - EC_{10}/EC_{20} calculation for Daphnia reproduction test with fenoxaprop-P-ethyl (M-124780-01-1, R. Fischer, 1989) TF- BCS-CHA Report No.: M-553480-01-1 Date: 2016-04-27 GLP/GEP: n.a., unpublished	N	N		TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.5.1	Hager, J.	2016b	Statement - EC_{10}/EC_{20} calculation for Daphnia chronic toxicity test with fenoxaprop-P (AE F088406) (M-211218-01-1, M. Ebeling, 2002) TF- BCS-CHA Report No.: M-553440-01-1 Date: 2016-04-27 GLP/GEP: n.a., unpublished	N	N		TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.5.2	Boeri, R. L.;	1999	The 28 day chronic toxicity to the mysid, *Mysidopsis*	N	Y	Study done to	TF- BCS-	Submitted

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
	Magazu, J. P.; Ward, T. J.		*bahia*, in a flow through system Fenoxaprop-P-ethyl technical 88.1 percent w/w Code: AE F046360 00 1C97 0002 Wilbury Laboratories, Inc., Marblehead, MA, USA TF- BCS-CHA Report No.: C002140 Report includes Trial Nos.: BM98W519 Edition Number: M-183980-01-1 MRID#: 44786802 Date: 1999-03-09 GLP/GEP: Yes, unpublished			cover US data requirement	CHA	for the purpose of renewal
KCA 8.2.5.2	Hager, J.	2018	Re-evaluation of a chronic study performed with the marine invertebrate *Americamysis bahia* and fenoxaprop-P-ethyl tech. (Boeri, R.L. et al., 1999; M-183980-01-1) Bayer AG, Crop Science Division, Monheim, Germany BayerReport No.: M-617174-01-1 Date: 2018-03-12 GLP/GEP: n.a., unpublished	N	N		Bayer	Submitted for the purpose of renewal
KCA 8.2.5.4	Memmert, U.	2000	Effects on the development of sediment - dwelling larvae of *Chironomus riparius* in a water-sediment system Fenoxaprop-P-ethyl substance technical Code: AE F046360 RCC Ltd., Itingen, Switzerland Bayer Report No.: C006993 Edition Number: M-195015-01-1 Date: 2000-01-21 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.6.1	Heusel, R.	1991a	Effect to *Selenastrum capricornutum* (green alga) in an algal assay bottle test (method EPA) Fenoxaprop-P-ethyl substance, technical Code: Hoe 046360 00 ZC97 0002 Hoechst AG, Frankfurt am Main, Germany Bayer Report No.: A45608	N	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			Edition Number: M-129715-03-1 Date: 1991-04-23 **... amended: 1992-04-10** GLP/GEP: Yes, unpublished					
KCA 8.2.6.1	Fischer, R.	1986a	Effect to *Scenedesmus subspicatus* Chodat (green alga) in a growth inhibition test (5s39/d + 5s39/e, method OECD) Hoe 046360 substance, technical Code: Hoe 046360 0H ZC96 0002 Hoechst AG, Frankfurt am Main, Germany Bayer Report No.: A33694 Edition Number: M-114419-01-1 Date: 1986-06-23 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.6.1	Sowig, P.	2002a	Recalculation of biological endpoints from the study: A33694, Fischer, R. (1986): The effect of Hoe 046360 - substance, technical - identification code: Hoe 046360 OH ZC96 0002 to *Scenedesmus subspicatus* CHODAT (green alga) in a growth inhi Bayer CropScience GmbH, Frankfurt am Main, Germany Bayer Report No.: C028687 Edition Number: M-215734-01-1 Date: 2002-12-19 GLP/GEP: n.a., unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.6.1	Heusel, R.	1993b	Effect to *Selenastrum capricornutum* (green alga) in an algal assay bottle test (method EPA) Fenoxaprop-P substance, technical Code: Hoe 088406 00 ZC93 0001 Hoechst AG, Frankfurt am Main, Germany Bayer Report No.: A50170 Edition Number: M-131203-01-1 Date: 1993-04-05 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.6.1	Christ, M. T.; Ruff, D. F.	1999b	Effect to *Pseudokirchneriella subcapitata* (green alga) in a growth inhibition test AE F054014 technical 99.7%	N	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			w/w Code: AE F054014 00 1C99 0004 AgrEvo USA Company, Pikeville, NC, USA Report No.: C002718 Edition Number: M-184954-01-1 MRID#: 44801501 Date: 1999-03-22 GLP/GEP: Yes, unpublished					
KCA 8.2.6.1	Wenzel, A.	2004	Alga, (*Pseudokirchneriella subcapitata*) Growth inhibition test (OECD 201), static exposure AE F096918; substance pure Code: AE F096918 00 1B99 0001 Fraunhofer Institut, IME, Schmallenberg, Germany Bayer Report No.: C043958 Edition Number: M-235521-01-1 Date: 2004-09-24 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.6.1	Meister-Werner, A.; Wydra, V.	2009	Toxicity of Fenoxaprop-P-ethyl, technical to *Pseudokirchneriella subcapitata* in an algal growth inhibition test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 272 FPE Edition Number: M-548267-01-1 Date: 2009-01-06 GLP/GEP: Yes, unpublished	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.1	Hengsberger, A.; Haertel, C.	2015b	BCS-AW69425: Toxicity to *Pseudokirchneriella subcapitata* in an algal growth inhibition test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 102041210 Edition Number: M-538955-01-1 Date: 2015-10-12 GLP/GEP: Yes, unpublished	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.1	Boerschig, C.; Emnet, P.	2015c	BCS-AB16188: Toxicity to *Pseudokirchneriella subcapitata* in an algal growth inhibition test IBACON GmbH, Rossdorf, Germany	N	Y	Data required for metabolites	TF- BCS-CHA	Submitted for the purpose of

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			TF- BCS-CHA Report No.: 102031210 Edition Number: M-538959-01-1 Date: 2015-10-22 GLP/GEP: Yes, unpublished			following the EFSA AGD		renewal
KCA 8.2.6.1	Kuhl, R.; Emnet, P.	2015b	BCS-CY11271: Toxicity to *Pseudokirchneriella subcapitata* in an algal growth inhibition test - Revised final report No. 1 - IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 96931210 Edition Number: M-542853-01-1 Date: 2015-11-27 GLP/GEP: Yes, unpublished	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.1	Hager, J.	2016f	Statement - EC_{10}/EC_{20} calculation for algae study (M-131203-01-1, R. Heusel, 1993) TF- BCS-CHA Report No.: M-553680-01-1 Date: 2016-04-27 GLP/GEP: n.a., unpublished	N	N		TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.1	Hager, J.	2016c	Statement - Validity check for green algae (*Selenastrum capricornut*um) study with fenoxaprop-P-ethyl (M-129715-03-1, R. Heusel, 1991) TF- BCS-CHA Report No.: M-553077-01-1 Date: 2016-03-30 GLP/GEP: n.a., unpublished	N	N		TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.1	Hager, J.	2016h	Statement - Validity check for green algae (*Pseudokirchneriella subcapitata*) study with AE F054014 (M-184954-01-1, Christ & Ruff, 1999) TF- BCS-CHA Report No.: M-553072-01-1 Date: 2016-03-30 GLP/GEP: n.a., unpublished	N	N		TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.1	Hager, J.	2016g	Statement - EC_{10}/EC_{20} calculation for algae study (M-184954-01-1, Christ & Ruff, 1999) TF- BCS-CHA	N	N		TF- BCS-CHA	Submitted for the purpose of

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			Report No.: M-553485-01-1 Date: 2016-04-27 GLP/GEP: n.a., unpublished					renewal
KCA 8.2.6.1	Boerschig, C.; Emnet, P.	2016	BCS-AC79872: Toxicity to *Pseudokirchneriella subcapitata* in an algal growth inhibition test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: EBFP0001 Edition Number: M-560630-01-1 Date: 2016-07-21 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.2	Christ, M. T.; Ruff, D. F.	1999a	Effect to *Anabaena flos-aquae* (blue-green alga) in a growth inhibition test Fenoxaprop-P-ethyl technical 88.1% w/w Code: AE F046360 00 1C97 0002 AgrEvo USA Company, Pikeville, NC, USA Bayer Report No.: C000918 Edition Number: M-181468-01-1 MRID#: 44768103 Date: 1999-01-18 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.6.2	Sowig, P.; Weller, O.; Gosch, H.	1999	Algal growth inhibition - *Navicula pelliculosa* Fenoxaprop-P-ethyl substance, technical Code: AE F046360 00 1C97 0002 Hoechst Schering AgrEvo GmbH, Frankfurt am Main, Germany Bayer Report No.: C001890 Edition Number: M-183542-01-1 MRID#: 44768105 Date: 1999-02-23 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.6.2	Young, B. M.; Ruff, D. F.	1999b	Effect to *Skeletonema costatum* (marine diatom) in a growth inhibition test Fenoxaprop-P-ethyl technical 88.1% w/w Code: AE F046360 00 1C97 0002 AgrEvo USA Company, Pikeville, NC, USA Bayer	N	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			Report No.: C000916 Edition Number: M-181464-01-1 MRID#: 44768104 Date: 1999-01-13 GLP/GEP: Yes, unpublished					
KCA 8.2.6.2	Seyfried, B.	2008	Toxicity to *Skeletonema costatum* (Marine Algae) in a 96-hour algal growth inhibition test RCC Ltd., Itingen, Switzerland TF- BCS-CHA Report No.: 248 FPE Edition Number: M-548169-01-1 Date: 2008-08-13 GLP/GEP: Yes, unpublished	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.2	Meister-Werner, A.; Wydra, V.	2008	Toxicity of Fenoxaprop-P-ethyl, technical to *Navicula pelliculosa* in an algal growth inhibition test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 269 FPE Edition Number: M-548208-01-1 Date: 2008-12-10 GLP/GEP: Yes, unpublished	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.2	Pawlowski, S.; Wydra, V.	2005	Toxicity of fenoxaprop-p-ethyl technical to *Anabaena Flos-aquae* in an algal growth inhibition test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 130 FPE Edition Number: M-548058-01-1 Date: 2005-10-28 GLP/GEP: Yes, unpublished	N	Y	Study performed to address data requirements in the EU	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.2	Banman, C. S.; Howerton, J. H.; Lam, C. V.	2011a	Toxicity of fenoxaprop-P-ethyl to the blue green algae *Anabaena flos-aquae* Bayer CropScience LP, Stilwell, KS, USA TF- BCS-CHA Report No.: EBFPL010-1 Edition Number: M-411455-02-1 Date: 2011-07-27 **... amended: 2011-08-30**	N	Y	Study done to cover US data requirement	TF- BCS-CHA	Submitted for the purpose of renewal

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			GLP/GEP: Yes, unpublished					
KCA 8.2.6.2	Banman, C. S.; Howerton, J. H.; Lam, C. V.	2011b	Toxicity of fenoxaprop-P-ethyl technical to the freshwater diatom *Navicula pelliculosa* Bayer CropScience LP, Stilwell, KS, USA TF- BCS-CHA Report No.: EBFPL011 Edition Number: M-411456-01-1 MRID#: 48566201 Date: 2011-07-27 GLP/GEP: Yes, unpublished	N	Y	Study done to cover US data requirement	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.2	Hager, J.	2016e	Statement - Validity check for marine diatom (*Skeletonema costatum*) study with fenoxaprop-P-ethyl (M-548169-01-1, Seyfried, 2008) TF- BCS-CHA Report No.: M-553070-01-1 Date: 2016-04-22 GLP/GEP: n.a., unpublished	N	N		TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.6.2	Hager, J.	2016d	Statement - Validity check for marine diatom (*Skeletonema costatum*) study with fenoxaprop-P-ethyl (M-181464-01-1, Young & Ruff, 1999) TF- BCS-CHA Report No.: M-553073-01-1 Date: 2016-03-30 GLP/GEP: n.a., unpublished	N	N		TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.7	Christ, M. T.; Ruff, D. F.	1997	Toxicity to duckweed (*Lemna gibba*), in a static renewal system fenoxaprop-P-ethyl technical 88.1 percent w/w Code: AE F046360 00 1C97 0002 AgrEvo USA Company, Pikeville, NC, USA Bayer Report No.: A57845 Edition Number: M-141562-01-1 MRID#: 44664003 Date: 1997-11-25 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.2.7	Banman, C.S.; Alexander, T. M.; Moore, S.	2013	Toxicity of Fenoxaprop-P-ethyl technical to the aquatic macrophyte, *Myriophyllum spicatum* SynTech Research Laboratory Services, LLC, Stilwell,	N	Y	Data requirement according to	TF- BCS-CHA	Submitted for the purpose of

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			KS, USA TF- BCS-CHA Report No.: EBFPL025 Edition Number: M-457254-01-1 Date: 2013-05-08 GLP/GEP: Yes, unpublished			Regulation (EC) No 1107/2009 or 283/2013		renewal
KCA 8.2.7	Hengsberger, A.; Emnet, P.	2015	Fenoxaprop-P: Toxicity to the aquatic plant *Lemna gibba* in a static growth inhibition test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 96921240 Edition Number: M-548444-01-1 Date: 2015-07-29 GLP/GEP: Yes, unpublished	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.7	Boerschig, C.; Emnet, P.	2015d	BCS-AB16188: Toxicity to the aquatic plant *Lemna gibba* in a semi-static growth inhibition test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 102031240 Edition Number: M-536554-01-1 Date: 2015-10-19 GLP/GEP: Yes, unpublished	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.7	Kuhl, R.; Emnet, P.	2015c	BCS-CY11271: Toxicity to the aquatic plant *Lemna gibba* in a static growth inhibition test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: EBFPN007 Edition Number: M-553341-01-1 Date: 2015-12-15 GLP/GEP: Yes, unpublished	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.7	Pawlowski, S.	2005	Toxicity of fenoxaprop-p-ethyl technical to the aquatic plant *Lemna gibb*a in a semi static growth inhibition test IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 134 FPE Edition Number: M-548340-01-1 Date: 2005-11-18	N	Y	Data required for metabolites following the EFSA AGD	TF- BCS-CHA	Submitted for the purpose of renewal

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			GLP/GEP: Yes, unpublished					
KCA 8.2.8	Vrbka, S.; Christl, H.	2016	Ecotoxicological predictions for fenoxaprop-P-ethyl and its metabolites M1, M2 and M7 using QSARs tier3 solutions GmbH, Leverkusen, Germany TF- BCS-CHA Report No.: A15059a Edition Number: M-553334-01-1 Date: 2016-04-26 GLP/GEP: No, unpublished	N	N		TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.2.8	Schindler, M.	2016	Fenoxaprop-P-ethyl and its metabolites M1, M2 and M7 - Prediction of chronic Daphnia endpoints by quantitative structure activity relations (QSAR) TF- BCS-CHA Report No.: EnSa-16-0069 Edition Number: M-553173-01-1 Date: 2016-04-20 GLP/GEP: No, unpublished	N	N		TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.3.1.1.1, KCA 8.3.1.1.2	Kleiner, R.	2000	Toxicity to the honeybee *Apis mellifera* L. (laboratory) according to EPPO Guideline No. 170 (1992) Code: AE F046360 00 1D96 0001 BioChem agrar GmbH, Cunnersdorf, Germany Bayer Report No.: C006598 Edition Number: M-194261-01-1 Date: 2000-01-10 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.3.1.1.1	Sekine, T.	2013	Effects of fenoxaprop-P-ethyl tech. (acute contact and oral) on honey bees (*Apis mellifera* L.) in the laboratory IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 81631035 Edition Number: M-470702-01-1 Date: 2013-11-20 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.3.1.1.1	Schmitzer, S.	2007	Effects of fenoxaprop-p-ethyl technical - (Acute contact and oral) on honey bees (*Apis mellifera* L.) in the laboratory	N	Y	Data requirement according to	TF- BCS-CHA	Submitted for the purpose of

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 228 FPE Edition Number: M-548126-01-1 Date: 2007-11-29 GLP/GEP: Yes, unpublished			Regulation (EC) No 1107/2009 or 283/2013		renewal
KCA 8.3.1.1.1	Schmitt, H.	2015	Fenoxaprop-P-ethyl: Acute oral toxicity to the bumble bee, *Bombus terrestris* L. under laboratory conditions Eurofins Agroscience Services EcoChem GmbH, Niefern-Oeschelbronn, Germany TF- BCS-CHA Report No.: S15-00578 Edition Number: M-548567-01-1 Date: 2015-12-15 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.3.1.1.2	Pfeiffer, S.	2015	Fenoxaprop-P-ethyl: Acute contact toxicity to the bumble bee, *Bombus terrestris* L. under laboratory conditions Eurofins Agroscience Services EcoChem GmbH, Niefern-Oeschelbronn, Germany TF- BCS-CHA Report No.: S14-00619 Edition Number: M-526340-01-1 Date: 2015-03-27 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.4.1	Fischer, R.; Schulze, E. F.	1989	Effect to *Eisenia fetida* (earthworm) in a 14 day artificial soil test (method OECD) Hoe 046360 substance, technical Code: Hoe 046360 0H ZC96 0002 Hoechst AG, Frankfurt am Main, Germany Bayer Report No.: A39888 Edition Number: M-121462-01-1 Date: 1989-01-12 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)
KCA 8.4.1	Sowig, P.	2002b	Acute toxicity to earthworms (*Eisenia fetida*) Fenoxaprop-P substance, technical Code: AE F088406 00 1C97 0001	N	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			Bayer CropScience GmbH, Frankfurt am Main, Germany Bayer Report No.: C024170 Edition Number: M-216406-01-1 Date: 2002-12-09 GLP/GEP: Yes, unpublished					
KCA 8.4.1	Lechelt-Kunze, C.	2002	AE F054014; substance technical: Acute toxicity to earthworms (*Eisenia fetida*) Code: AE F054014 00 1C99 0004 Report No.: C027501 Report includes Trial Nos.: E3102326-7 Edition Number: M-213451-01-1 Date: 2002-11-05 GLP/GEP: Yes, unpublished	N	N			In DAR (2005)
KCA 8.4.1	Friedrich, S.	2014	Fenoxaprop-P-ethyl a.s.: Sublethal toxicity to the earthworm *Eisenia fetida* in artificial soil BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: 13 10 48 186 S Edition Number: M-477100-01-1 Date: 2014-01-23 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.4.1	Friedrich, S.	2006	AE F088406: Sublethal toxicity to the earthworm E*isenia fetida* in artificial soil BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: M-270897-01-2 Date: 2006-05-15 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.4.1	Friedrich, S.	2016a	Fenoxaprop-P-ethyl-Benzoxazolone (BCS-AC79872): Sublethal toxicity to the earthworm *Eisenia fetida* in artificial soil BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: 15 10 48 057 S	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or	TF- BCS-CHA	Submitted for the purpose of renewal

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			Edition Number: M-549921-01-1 Date: 2016-03-02 GLP/GEP: Yes, unpublished			283/2013		
KCA 8.4.1	Friedrich, S.	2016b	(D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065): Sublethal toxicity to the earthworm *Eisenia fetida* in artificial soil BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: 15 10 48 058 S Edition Number: M-549919-01-1 Date: 2016-03-02 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.4.2	Friedrich, S.	2015a	Fenoxaprop-P-acid (BCS-BQ23896): Effects on the reproduction of the collembolan *Folsomia candida* BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: 15 10 48 003 S Edition Number: M-528131-01-1 Date: 2015-05-22 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.4.2	Larnaudie Lopez, M. I.	2015	Fenoxaprop-p-ethyl a.s.: Influence on mortality and reproduction of the soil mite species *Hypoaspis aculeifer* tested in artificial soil TF- BCS-CHA Report No.: E 428 4781-4 Edition Number: M-534684-01-1 Date: 2015-09-08 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.4.2	Schulz, L.	2015	Fenoxaprop-P-acid (BCS-BQ23896): Effects on the reproduction of the predatory mite *Hypoaspis aculeifer* BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: 14 10 48 267 S Edition Number: M-533179-01-1 Date: 2015-07-23 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.4.2	Friedrich, S.	2015b	Fenoxaprop-P-ethyl a.s.: Effects on the reproduction of	N	Y	Data	TF- BCS-	Submitted

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			the collembolan *Folsomia candida* BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: 15 10 48 249 S Edition Number: M-538169-01-1 Date: 2015-09-30 GLP/GEP: Yes, unpublished			requirement according to Regulation (EC) No 1107/2009 or 283/2013	CHA	for the purpose of renewal
KCA 8.4.2	Friedrich, S.	2016c	Fenoxaprop-P-ethyl-Benzoxazolone (BCS-AC79872): Effects on the reproduction of the collembolan *Folsomia candida* BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: 15 10 48 108 S Edition Number: M-549923-01-1 Date: 2016-03-03 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.4.2	Friedrich, S.	2016d	(D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065): Effects on the reproduction of the collembolan Folsomia candida BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: 15 10 48 109 S Edition Number: M-549922-01-1 Date: 2016-03-03 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.4.2	Schulz, L.	2016a	Fenoxaprop-P-ethyl-benzoxazolone (BCS-AC79872): Effects on mortality and reproduction of the predatory mite *Hypoaspis aculeifer* tested in artificial soil BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: 16 10 48 082 S Edition Number: M-553442-01-1 Date: 2016-04-25 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.5	McMurray, A.	2002	Microflora respiration and nitrogen transformation according to OECD guideline numbers 216 and 217 Fenoxaprop-P-ethyl technical substance Code: AE	N	N		Bayer	In DAR (2005)

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			F046360 00 1D96 0001 Chemex Environmental International Ltd., Cambridge, United Kingdom Bayer Report No.: C020914 Edition Number: M-210339-01-1 Date: 2002-03-07 GLP/GEP: Yes, unpublished					
KCA 8.5	Reis, K. H.	2008	Effects of fenoxaprop-p-ethyl technical on the activity of the soil microflora in the laboratory IBACON GmbH, Rossdorf, Germany TF- BCS-CHA Report No.: 246 FPE Edition Number: M-548159-01-1 Date: 2008-08-05 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.5	Schulz, L.	2016b	Fenoxaprop-P-acid (BCS-BQ23896): Effects on the activity of soil microflora (Nitrogen transformation test) BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: 14 10 48 087 N Edition Number: M-550893-01-1 Date: 2016-02-23 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.5	Schulz, L.	2016c	Fenoxaprop-p-ethyl-benzoxazolone (BCS-AC79872): Effects on the activity of soil microflora (Nitrogen transformation test) BioChem agrar GmbH, Gerichshain, Germany TF- BCS-CHA Report No.: 15 10 48 021 N Edition Number: M-550900-01-1 Date: 2016-02-23 GLP/GEP: Yes, unpublished	N	Y	Data requirement according to Regulation (EC) No 1107/2009 or 283/2013	TF- BCS-CHA	Submitted for the purpose of renewal
KCA 8.5	Schulz, L.	2016d	(D+)-2-(4-hydroxyphenoxy)-propionic acid (BCS-CA37065): Effects on the activity of soil microflora (Nitrogen transformation test) BioChem agrar GmbH, Gerichshain, Germany	N	Y	Data requirement according to Regulation	TF- BCS-CHA	Submitted for the purpose of renewal

Data Point	Author(s)	Year	Title Compagny Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Data protection claimed Y/N	Justification if data protection is claimed	Owner	Previous evaluation
			TF- BCS-CHA Report No.: 15 10 48 022 N Edition Number: M-550904-01-1 Date: 2016-02-23 GLP/GEP: Yes, unpublished			(EC) No 1107/2009 or 283/2013		
KCA 8.8	Reinhardt, J.	1995	Respiration inhibition to activated sludge of Code: Hoe 046360 00 ZC97 0002 Hoechst AG, Frankfurt am Main, Germany Bayer Report No.: A55598 Edition Number: M-139512-01-1 Date: 1995-11-07 GLP/GEP: Yes, unpublished	N	N		Bayer	In DAR (2005)