European Commission

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

FENOXAPROP-P-ETHYL

Volume 3 – B.3 (PPP) – PUMA S69 EW

Rapporter Member State: Austria
Co-Rapporter Member State: Finland

Version History

When	What
2005/April	Initial DAR of the active substance.
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B.3. DATA ON APPLICATION AND EFFICACY

For efficacy related elements, it is envisaged that only limited information will be provided to address the requirements of Article 4(3) of Regulation (EC) No 1107/2009. Detailed consideration of efficacy will occur in the subsequent product authorisation process when a full biological assessment dossier will be required. Therefore only limited efficacy information is required under the appropriate headings in line with the relevant guidance for renewals - Guidance Document on the renewal of approval of active substances to be assessed in compliance with Regulation (EU) No 844/2012 Appendix II (SANCO/2012/11251). Please refer to the Appendix I beginning on page 6 of this document.

B.3.1. FIELD OF USE ENVISAGED

Fenoxaprop-P-ethyl + Mefenpyr-diethyl EW 144 (69+75 g/L) is used as grass herbicide in cereal crops.

B.3.2. EFFECTS ON HARMFUL ORGANISMS

Fenoxaprop-P-ethyl is applied for the control of: *Avena spp*., *Apera spica venti*, *Alopecurus myosuroides*, *Echinochloa crus galli* and other annual grass weeds in wheat soft and durum, barley, triticale, spelt and rye.

Fenoxaprop-P-ethyl is especially effective against annual grass weeds from the two-leaf stage up to full tillering, which makes, it very flexible to use.

B.3.3. DETAILS OF INTENDED USE

Crop and/or situation (a)	Zone	Product code	F G or I (b)	Pests or Group of pests controlled (c)	Formulation		Application				Application rate per treatment			PHI (days) (l)	Remarks: (m)
					Type (d-f)	Conc. of as (i)	Method kind (f-h)	Growth stage & season (j)	Number min max (k)	Interval between applica-tions (min)	kg as/hL min max	water L/ha min max	kg as/ha min max		
wheat (s+w) durum wheat rye, w.-rye triticale	Europe	PUMA S69 EW	F	grass weed species	EW	(1) 69 (2) 75	Groundboom sprayer	BBCH 11-39 (autumn or spring)	1	-	(1) 0.007 - 0.083 (2) 0.0075 - 0.090	100 -400	(1) 0.028 0.083 (2) 0.030. 0.090	F*	Dose rate: max. **1.2 1 L product/ha** F*: PHI is covered by the normal vegetation period between last application and harvest
barley (s+w)	Europe	PUMA S69 EW	F	grass weed species	EW	(1) 69 (2) 75	Groundboom sprayer	BBCH 12-32 (autumn or spring)	1	-	(1) 0.007 - 0.083 (2) 0.0075 - 0.090	100 - 400	(1) 0.028 0.083 (2) 0.030. 0.090	F*	Dose rate: max. **1.2 L product/ha** F*: PHI is covered by the normal vegetation period between last application and harvest

Remarks:

(a) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure)
(b) Outdoor or field use (F), glasshouse application (G) or indoor application (I)
(c) e.g. biting and suckling insects, soil born insects, foliar fungi, weeds
(d) e.g. wettable powder (WP), emulsifiable concentrate (EC), granule (GR)
(e) GCPF Codes - GIFAP Technical Monograph No 2, 1989
(f) All abbreviations used must be explained
(g) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
(h) Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated
(i) g/kg or g/l
(j) Growth stage at last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application
(k) The minimum and maximum number of application possible under practical conditions of use must be provided
(l) PHI - minimum pre-harvest interval
(m) Remarks may include: Extent of use/economic importance/restrictions

B.3.4. APPLICATION RATE AND CONCENTRATION OF THE ACTIVE SUBSTANCE

Fenoxaprop-P-ethyl + Mefenpyr-diethyl EW 144 (69+75 g/L) is applied once per season at water volume of 100 to 400 L/ha. The maximum recommended application rate of 83 g as/ha corresponds to 1.2 L/ha of the formulated product.

B.3.5. METHOD OF APPLICATION

Fenoxaprop-P-ethyl is, like most herbicides, applied in the field as water-based spray solution. Spray equipment is usually a ground boom sprayer achieving 18 to 24 m width and equipped with flat-fan nozzles spaced about every 50 cm. A standard water volume can be in the range of 100 to 400 L/ha.

B.3.6. NUMBER AND TIMING OF APPLICATIONS AND DURATION OF PROTECTION

In general one application from BBCH 11 to 32 (max. to BBCH 39) is sufficient.

B.3.7. NECESSARY WAITING PERIODS OR OTHER PRECAUTIONS TO AVOID PHYTOTOXIC EFFECTS ON SUCCEEDING CROPS

The necessary waiting period is determined by the interval between latest application at BBCH 39 and harvest. Fenoxaprop-P-ethyl has no soil activity, thus no restrictions for plant back intervals and succeeding crops are needed.

B.3.8. PROPOSED INSTRUCTIONS FOR USE

For details please refer to document C.

B.3.9. EFFECTIVENESS

Fenoxaprop-P-ethyl, once in the plant, is quickly converted into the free D+ acid fenoxaprop-P, which inhibits the biosynthesis of fatty acids. The further formation of cell membranes in the growing points of the weed plants is inhibited eventually causing the plant death. In addition this inhibition of fatty acid biosynthesis causes further changes within the weed plant, such as an increase in soluble sugars and free amino acids in the stem tissues of the grass weed plants and also a reduction in the chlorophyll content as a consequence of the reduction of thylakoid membranes

The optimum time of application is between the 2 leaves and early tillering stage of weeds. Some grass weeds can be well controlled up to the end of tillering (in some cases with higher doses). In general, early treatment is recommended to benefit from the maximum yield potential of the treated crop due to reduced weed competition.

WEED SPECTRUM

Good to very good control (> 85%)

Alopecurus myosuroides
Apera spica-venti
Avena fatua
Digitaria spp.
Echinochloa crus galli
Panicum dichotomiflorum
Panicum miliaceum
Phalaris spp.
Poa trivialis
Setaria italica
Setaria viridis

Sorghum halepense

A summary table of achieved control (efficacy % against targets representative of proposed uses at the proposed dose), as required according to SANCO/10054/2013-rev.3, 11 July 2013 (Appendix I) is not available.

B.3.10. INFORMATION ON THE DEVELOPMENT OF RESISTANCE

In the action mechanism classification of the HRAC, "Fenoxaprop-P-ethyl + Mefenpyr-diethyl EW 144 (69+75 G/L)" is listed in group A - Inhibition of acetyl CoA carboxylase (ACCase). As some naturally occurring weed biotypes resistant to ACCase herbicides may exist through normal genetic variability in any weed population the resistant individuals will not be controlled and can eventually dominate the weed population if these herbicides are used repeatedly, the following use patterns is recommended to avoid and/or delay the development of resistance in the field:

- No use of Fenoxaprop-P-ethyl + Mefenpyr-diethyl EW 144 (69+75 G/L) on locations where resistance of monocotyledonous weeds to compounds of the HRAC group A are suspected.
- Fenoxaprop-P-ethyl + Mefenpyr-diethyl EW 144 (69+75 G/L) should be used alternately with other compounds (compound change) from different HRAC-groups in cereals as well as within the whole crop rotation.
- The recommended dose rate should not be reduced, in order to obtain an efficacy level as high as possible. Increase of the seed bank of the local weed population should be absolutely avoided.
- A wide and diverse crop rotation (including cereal/dicot crops, winter and spring crops) should be favored. All additional agronomic measures should be implemented i.e. ploughing cultivation, stale seedbed etc.

Summary information on the active substance fenoxaprop-P-ethyl

IUPAC name:	(D+)-ethyl-2-(4-(6-chloro-2-benzoxazolyl-oxy)-phenoxy-propanoate
Chemical group:	Aryloxyphenoxy-propionate ("fop")
Mode of action:	Inhibition of the acetyl CoA carboxylase (ACCase) HRAC group A
Plant translocation:	Systemic apo- and symplastic
Biological action: Harmful organism, plant growth regulator, etc.	Foliar systemic Inhibition of fatty acid biosynthesis
Root-uptake, foliar-uptake, systemic etc.	Foliar uptake, Systemic with translocation in roots and leaves

Inherent risk-related to the active substance

In Europe, 34 resistance cases are reported to be resistant against Fenoxaprop-P-ethyl. These weed species are listed in the following table below (www.weedscience.com, 03-04-2017). The inherent risk related to the active substance Fenoxaprop-p-ethyl is considered high.

1	2009	*Avena sterilis*	Greece	ACCase inhibitors (A/1)	clodinafop-propargyl, diclofop-methyl, fenoxaprop-P-ethyl, pinoxaden, tralkoxydim
2	2009	*Avena fatua*	Germany	ACCase inhibitors (A/1), ALS inhibitors (B/2)	cycloxydim, fenoxaprop-P-ethyl, flupyrsulfuron-methyl-sodium, mesosulfuron-methyl, pinoxaden
3	2011	*Avena fatua*	Poland	ACCase inhibitors (A/1), ALS inhibitors (B/2)	fenoxaprop-P-ethyl, iodosulfuron-methyl-sodium, metsulfuron-methyl, pinoxaden, propoxycarbazone-sodium, sulfometuron-methyl
4	1994	*Avena fatua*	United Kingdom	ACCase inhibitors (A/1), ALS inhibitors (B/2), Antimicrotubule mitotic disrupter (Z/25)	fenoxaprop-P-ethyl, flamprop-M-isopropyl, fluazifop-P-butyl, imazamethabenz-methyl, mesosulfuron-methyl, pinoxaden, pyroxsulam, tralkoxydim
5	1999	*Alopecurus myosuroides*	Netherlands	ACCase inhibitors (A/1), ALS inhibitors (B/2)	clodinafop-propargyl, cycloxydim, fenoxaprop-P-ethyl, penoxsulam
6	1983	*Alopecurus myosuroides*	Germany	ACCase inhibitors (A/1), PSII inhibitor (Ureas and amides) (C2/7)	chlorotoluron, fenoxaprop-P-ethyl, isoproturon
7	1996	*Alopecurus myosuroides*	Belgium	ACCase inhibitors (A/1)	clodinafop-propargyl, fenoxaprop-P-ethyl
8	1993	*Alopecurus myosuroides*	France	ACCase inhibitors (A/1)	clodinafop-propargyl, cycloxydim, diclofop-methyl, fenoxaprop-P-ethyl, haloxyfop-P-methyl, sethoxydim
9	1996	*Avena sterilis ssp. ludoviciana*	France	ACCase inhibitors (A/1)	fenoxaprop-P-ethyl
10	1996	*Avena fatua*	France	ACCase inhibitors (A/1)	fenoxaprop-P-ethyl
11	1996	*Avena fatua*	Belgium	ACCase inhibitors (A/1)	clodinafop-propargyl, fenoxaprop-P-ethyl
12	1996	*Alopecurus myosuroides*	Belgium	ACCase inhibitors (A/1), ALS inhibitors (B/2), Microtubule inhibitors (K1/3), Photosystem II inhibitors (C1/5), PSII inhibitor (Ureas and amides) (C2/7)	atrazine, chlorotoluron, clodinafop-propargyl, fenoxaprop-P-ethyl, flupyrsulfuron-methyl-sodium, pendimethalin, propaquizafop
13	1996	*Alopecurus*	Netherlands	ACCase inhibitors (A/1), PSII	chlorotoluron, clodinafop-

		myosuroides		inhibitor (Ureas and amides) (C2/7)	propargyl, fenoxaprop-P-ethyl, isoproturon
14	1997	*Avena sterilis*	Turkey	ACCase inhibitors (A/1)	clodinafop-propargyl, diclofop-methyl, fenoxaprop-P-ethyl, tralkoxydim
15	2003	*Alopecurus myosuroides*	Germany	ACCase inhibitors (A/1)	clethodim, cycloxydim, fenoxaprop-P-ethyl, fluazifop-P-butyl
16	2011	*Alopecurus myosuroides*	Sweden	ACCase inhibitors (A/1)	clodinafop-propargyl, cycloxydim, fenoxaprop-P-ethyl
17	2007	*Alopecurus myosuroides*	Germany	ACCase inhibitors (A/1), ALS inhibitors (B/2), Long chain fatty acid inhibitors (K3/15), PSII inhibitor (Ureas and amides) (C2/7)	chlorotoluron, fenoxaprop-P-ethyl, flufenacet, isoproturon, mesosulfuron-methyl, pinoxaden
18	2010	*Apera spica-venti*	Poland	ACCase inhibitors (A/1)	fenoxaprop-P-ethyl, pinoxaden
19	2009	*Apera spica-venti*	Germany	ACCase inhibitors (A/1), ALS inhibitors (B/2), PSII inhibitor (Ureas and amides) (C2/7)	fenoxaprop-P-ethyl, iodosulfuron-methyl-sodium, isoproturon, mesosulfuron-methyl, pinoxaden, pyroxsulam, sulfosulfuron
20	2009	*Alopecurus myosuroides*	Germany	ACCase inhibitors (A/1), ALS inhibitors (B/2)	cycloxydim, fenoxaprop-P-ethyl, flupyrsulfuron-methyl-sodium, mesosulfuron-methyl, pinoxaden
21	2011	*Avena fatua*	Turkey	ACCase inhibitors (A/1)	diclofop-methyl, fenoxaprop-P-ethyl, tralkoxydim
22	2012	*Avena fatua*	Germany	ACCase inhibitors (A/1)	clodinafop-propargyl, fenoxaprop-P-ethyl, pinoxaden
23	2001	*Alopecurus myosuroides*	Denmark	ACCase inhibitors (A/1), ALS inhibitors (B/2)	clodinafop-propargyl, fenoxaprop-P-ethyl, flupyrsulfuron-methyl-sodium
24	2009	*Alopecurus myosuroides*	Italy	ACCase inhibitors (A/1)	clodinafop-propargyl, fenoxaprop-P-ethyl, pinoxaden
25	1982	*Alopecurus myosuroides*	United Kingdom	ACCase inhibitors (A/1)	clethodim, clodinafop-propargyl, cycloxydim, diclofop-methyl, fenoxaprop-P-ethyl, fluazifop-P-butyl, pinoxaden, quizalofop-P-ethyl, sethoxydim
					clodinafop-propargyl, fenoxaprop-P-ethyl
26	2014	*Alopecurus myosuroides*	Sweden	ACCase inhibitors (A/1), ALS inhibitors (B/2)	cycloxydim, fenoxaprop-P-ethyl, flupyrsulfuron-methyl-sodium, iodosulfuron-methyl-sodium, mesosulfuron-methyl, pyroxsulam
27	2011	*Alopecurus myosuroides*	Sweden	ACCase inhibitors (A/1), ALS inhibitors (B/2), Lipid Inhibitors (N/8)	fenoxaprop-P-ethyl, flupyrsulfuron-methyl-sodium, prosulfocarb, pyroxsulam
28	2011	*Alopecurus myosuroides*	Poland	ACCase inhibitors (A/1)	fenoxaprop-P-ethyl, pinoxaden

29	1993	*Avena sterilis*	United Kingdom	ACCase inhibitors (A/1), ALS inhibitors (B/2), Antimicrotubule mitotic disrupter (Z/25)	fenoxaprop-P-ethyl, flamprop-methyl, fluazifop-P-butyl, imazamethabenz-methyl, iodosulfuron-methyl-sodium, mesosulfuron-methyl, tralkoxydim
30	2001	*Alopecurus myosuroides*	Denmark	ACCase inhibitors (A/1)	fenoxaprop-P-ethyl
31	2004	*Phalaris minor*	Iran	ACCase inhibitors (A/1)	clodinafop-propargyl, diclofop-methyl, fenoxaprop-P-ethyl, pinoxaden, tralkoxydim
32	2011	*Avena fatua*	Poland	ACCase inhibitors (A/1)	fenoxaprop-P-ethyl, pinoxaden
33	2011	*Apera spica-venti*	Poland	ACCase inhibitors (A/1), ALS inhibitors (B/2)	chlorsulfuron, fenoxaprop-P-ethyl, pinoxaden, sulfometuron-methyl, sulfosulfuron
34	2012	*Alopecurus myosuroides*	Poland	ACCase inhibitors (A/1), ALS inhibitors (B/2)	fenoxaprop-P-ethyl, iodosulfuron-methyl-sodium, mesosulfuron-methyl, pinoxaden, sulfometuron-methyl

Table was provided by the RMS Austria.

Inherent risk of target weeds to develop resistance to herbicides

Major target weeds of winter and spring cereals are *Apera spica venti*, *Alopecurus myosuroides*, *Poa annua*, *Bromus* species for winter cereals and especially *Avena fatua* in spring cereals. Following confirmed resistance cases (resistance to Fenoxaprop-p-ethyl) were observed in Europe: *Apera spica venti* (3 cases), *Alopecurus myosuroides* (18 cases), *Poa annua* and *Bromus specis* (0 cases), *Avena fatua* (8 cases).
The inherent risk related to target weeds is considered high.

B.3.11. ADVERSE EFFECTS ON TREATED CROPS

CROP TOLERANCE

"Fenoxaprop-P-ethyl + Mefenpyr-diethyl EW 144 (69+75 G/L)" contains the safener mefenpyr-diethyl. Mefenpyr-diethyl is absorbed by the foliage of grass species and subsequently translocated within the plants together with the herbicide fenoxaprop-P-ethyl. In cereal crops, mefenpyr-diethyl enhances the rate of fenoxaprop-P-ethyl metabolism into water-soluble non-phytotoxic products, without changing the metabolic pathway. This phenomenon is not observed in grass weed species. This specific safener effect in cereals increases the crop tolerance of "Fenoxaprop-P-ethyl + Mefenpyr-diethyl EW 144 (69+75 G/L)" while maintaining the high level of grass weed control.

"Fenoxaprop-P-ethyl + Mefenpyr-diethyl EW 144 (69+75 G/L)" is generally selective in broad-leaved crops and some species of turf (within specified growth stage limits).

No residues have been detected in the grains harvested from a crop treated with Fenoxaprop-P-ethyl + Mefenpyr-diethyl EW 144 (69+75 G/L) (69+75). In addition, the yields are normal and the grains quality is not altered by the product application. These facts explain the absence of impact of the product on the germination power of the grain.

However, a summary of crop safety (x specific crop safety trials with N doses and 2N doses, maximum % phytotoxicity), as required according to SANCO/10054/2013-rev.3, 11 July 2013 (Appendix I) is not available.

B.3.12. OBSERVATIONS ON OTHER UNDESIRABLE OR UNINTENDED SIDE-EFFECTS

ROTATIONAL CROPS- DEGRADATION IN SOIL

"Fenoxaprop-P-ethyl + Mefenpyr-diethyl EW 144 (69+75 G/L)" degrades quickly in the soil and poses no threat to following crops grown in the normal rotation. In crop failure situations, in some cases it may be necessary to observe a short waiting period before planting a susceptible crop. Reference should be made to local recommendations.

According to SANCO/10054/2013-rev.3, 11 July 2013 (Appendix I), a brief summary of any testing on impacts on succeeding or adjacent crops should be available for Fenoxaprop-P-ethyl.

Comment RMS:	Data provided in chapter B.3.1.-B.3.8. are considered acceptable. In chapter B.3.10., an overview table of current resistance cases of Fenoxaprop-p-ethyl was added by the RMS. It can be concluded that the overall risk of resistance development (Fenoxaprop-p-ethyl) is high. According to the guidance document SANCO/10054/2013-rev.3, 11 July 2013 (Appendix I), chapter B.3.9., B.3.11. and B.3.12. should also be addressed in Volume 3-B.3 (PPP). Currently, no data are available. (The RMS is aware of the fact that SANCO/10054/2013-rev.3, 11 July 2013 (Appendix I) only refers to the approval of new active substances. For renewals (that is the case of Fenoxaprop-p-ethyl), SANCO/2012/11251-rev.4, December 2014, is the currently valid document. In this version, Appendix II was deleted, obviously by accident, because the older version, SANCO/2012/11251-rev.1.2 of July 2012, has had Appendix II. Appendix II refers to efficacy requirements. Therefore, the RMS recommended using SANCO/10054/2013-rev.3, 11 July 2013 (Appendix I), even though it was originally intended for new active substance.)

B.3.13. 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