

European Commission



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XDE-729 Methyl (Halauxifen-methyl) Volume 3 – B.3

**Rapporteur Member State: United Kingdom
Co-Rapporteur Member State: France**

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B.3 Data on application and further information**B 3.1 Data on application relevant to active substance (IIA 3.1 to 3.6)****B 3.1.1 Function (IIA 3.1)**

Herbicide

B.3.1.2 Effects on harmful organisms (IIA 3.2)

XDE-729 methyl acts as a post-emergence systemic herbicide for the control of a range of broad leaved weeds. It is proposed to be used from early autumn through late spring in winter cereals.

B.3.1.3 Field of use (IIA 3.3)

Agriculture

B.3.1.4 Harmful organisms controlled (IIA 3.3)

a) Details of existing and intended uses (crops, groups of crops, plants or plant products treated or protected)

The applicant has stated the following:

Numerous field trials set up from 2008 to 2011 in the European Union (Northern, Central and Southern zones) have demonstrated that XDE-729 methyl containing products that also include cloquintocet-mexyl (applied at the currently developed autumn and spring rates) are safe to winter and spring cereals (except winter and spring oats) without any varietal restriction according to our current knowledge.

The crop list includes:

- Winter cereals: soft wheat, durum wheat, barley, rye, spelt, triticale.
- Spring cereals: soft wheat, durum wheat, barley, rye.

Proposed application timings where crop safety has been observed were at growth stages from BBCH 10 (emergence: coleoptile penetrates soil surface =cracking stage) to BBCH 45 (late boot stage: flag leaf sheath swollen), even under dry or humid conditions, cold or warm conditions.

Development of further extensions of use in additional crops (Oil seed rape, pastures, olive trees) is possible.

b) Details of harmful organisms against which protection is afforded

The applicant has stated the following:

Numerous field trials were set up from 2008 to 2011 in the European Union (Northern, Central and Southern zones) to determine the efficacy profile of XDE-729 methyl in both winter and spring cereals. Detailed summaries of these trials will be presented

and discussed in the zonal Biology Assessment Dossiers. [RMS comment: See Volume, Appendix1 for details]/

XDE-729 methyl has a wide spectrum of activity on broadleaf weeds species, with some activity on certain perennial weed species. Control can be influenced by weed size with smaller stages more easily controlled. However, the activity of XDE-729 methyl on target weeds is not significantly influenced by environmental conditions and is active under cold (inactive periods of growth) and warm conditions with active growth. Hence it can be used in both the autumn and spring with late spring applications (up to crop growth stage BBCH 39-45) to control certain species such as *Galium aparine*.

Primary target weeds in Europe are as follows (in alphabetic order)

- **Autumn applications of XDE-729 methyl in winter cereals:**

Highly susceptible species to XDE-729 methyl (95-100%)

- *Centaurea cyanus* (CENCY)
- *Fumaria officinalis* (FUMOF)
- *Geranium dissectum* (GERDI)
- *Geranium pusillum* (GERPU)
- *Lamium amplexicaule* (LAMAM)
- *Lamium purpureum* (LAMPU)
- *Papaver rhoeas* (PAPRH)
- *Stellaria media* (STEME)

Susceptible species to XDE-729 methyl (85-94.9%)

- *Galium aparine* (GALAP)
- *Veronica hederifolia* (VERHE)
- *Veronica persica* (VERPE)

- **Spring applications of XDE-729 methyl to either winter or spring cereals:**

Highly susceptible species to XDE-729 methyl (95-100%)

- *Chenopodium album* (CHEAL)
- *Galium aparine* (GALAP)
- *Geranium dissectum* (GERDI)
- *Geranium pusillum* (GERPU)
- *Lamium amplexicaule* (LAMAM)
- *Lamium purpureum* (LAMPU)
- *Papaver rhoeas* (PAPRH) (northern EU)

Susceptible species to XDE-729 methyl (85-94.9%)

- *Papaver rhoeas* (PAPRH) (southern EU)
- *Fumaria officinalis* (FUMOF)

The above species are susceptible to XDE-729 methyl at dose rates ranging between 4.5 to 7.5 g ae /ha, depending on the species and growth stage at application.

B 3.1.5 Mode of action (IIA 3.5)

XDE-729 methyl is a member of the pyridine-carboxylic family of herbicidal auxins (group O) and results in typical auxinic symptoms of herbicide damage. As a member of the group O herbicides it has been shown to control ALS (group B) resistant *Papaver rhoeas*.

XDE-729 methyl is a product, that when applied to sensitive species, will present auxin-like properties. Natural auxins are used by the plant to regulate minute amount of hormones which bind to specific receptor proteins turning on and off vital plant processes. XDE-729 methyl moves systemically throughout the target weed binding to receptor sites normally used by these plant hormones. This causes a disruption of normal plant growth processes via the binding of XDE-729 to the receptors. This binding results in the deregulation of plant growth metabolic pathways and thus causes uneven cell division and growth, culminating in plant death.

Symptoms of XDE-729 methyl herbicide damage to sensitive species normally occur within a couple of hours. Symptoms of herbicide damage include: cessation of growth, epinasty, leaf cupping, chlorosis, swelling/thickening of stems, callus tissue and distortion of the meristems and eventually plant death.

Details of the biochemical mechanisms are given below.

Reference report: Walsh, T.A., et al. *Mutations in an auxin receptor homolog AFB5 and in SGT1b confer resistance to picolinate auxins but not to 2,4-D or IAA in Arabidopsis*. Dow AgroSciences, unpublished report # DAI 0656. 14 Sept 2005. Ref. Bio-6

In 2006, Walsh et al isolated two lines of Arabidopsis with reduced sensitivity to the experimental 6-arypicolinate herbicide DAS534, which through screening were used to indentify Aradidopsis with the AFB5 and SGT1b genes. These artificial mutations were used to determine the binding sites in sensitive plants.

A major component of the herbicidal activity of XDE-729 methyl is mediated via interactions with a SCF AFB5 ubiquitin ligase which is involved with auxin signaling and other pathways. This molecular target for XDE-729 AFB5 was found to be in the same family of genes as transport inhibitor response 1 (TIR1), the molecular target for indole acetic acid (IAA) and the herbicide 2,4-D (Dharmasiri et al., 2005; Kepinski et al., 2005). Research with TIR1 indicates that natural auxins as well as 2,4-D allow TIR1 to bind the transcription repressor Aux/IAA. This binding allows the F-box protein to ubiquitinate the Aux/IAA. The ubiquitined Aux/IAA is then degraded by the proteasome. Degradation of the Aux/IAA repressor allows for unregulated transcription of the genes that would usually be repressed by Aux/IAA (Badescu et al., 2006).

The homolog of AFB5 to TIR1 suggests that XDE-729 methyl allows for Aux/IAA to bind to AFB5 much like 2,4-D allows Aux/IAA to bind to TIR1, allowing for the unregulated transcriptions of genes which would normally be suppressed by Aux IAA. A line of Arabidopsis was mutaganized to be resistant to XDE-729 (afb5). The lack of resistance of afb5 Arabidopsis to 2,4-D indicates that the molecular recognition site

of the oxyacetate auxin herbicide 2,4-D is different from that of the picolinate auxin herbicides (XDE-729).

B 3.1.6 Information on the occurrence or possible occurrence of the development of resistance and appropriate management strategies (IIA 3.6)

The applicant has provided the following information:

- Satchivi, N, et al. Response of herbicide resistant corn poppy (*Papaver rhoeas*) to application of XDE-729 methyl ester. Unpublished Dow AgroSciences report number DAI 1072, 1 Nov 2011. Ref. Bio-12
- Riches, C. XDE-729 *Papaver Rhoeas* baseline monitoring –Europe 2010. Dow AgroSciences study Id EA10D2C071. AgHerba Consultants UK, July 2011. Ref. Bio-13

A total of 14 auxinic herbicides are currently registered in the European Union for the control weeds species in a range of crops including cereals and grasslands. Many of these herbicides have been on the market for decades. Despite the length of time these herbicides have been on the EU market, resistance to this class of herbicide is still relatively low. Especially when compared to high risk groups such as the ALS herbicides.

In Europe, two annual broad leaf weed species have developed significant resistance to auxinic herbicides: *Stellaria media* to mecoprop in the UK and *Papaver rhoeas* to 2,4-D (and MCPA) in Spain and Italy.

Considering the length of time these auxinic herbicides have been on the market, their wide geographic spread of use and a relatively low number of confirmed cases of resistance, this chemistry can be considered to be a low risk in terms of resistance developing.

Two glasshouse studies were conducted to provide data on the resistance profile of XDE-729 methyl and to generate baseline data. The test species used in these studies was *Papaver rhoeas* because it is susceptible to XDE-729 methyl and there are many EU biotypes which are resistant to either sulfonylureas, or to 2,4-D or to both sulfonylureas and 2,4-D. A summary of these studies is given below.

A more detailed summary, including data on *Stellaria media* and *Galium aparine*, plus field data will be presented in the zonal biology dossiers, document M3, chapter IIIA.6 (“Efficacy data and information”).

In the first of these studies conducted by Satchivi et al, seven *P. rhoeas* biotypes from locations in Northern Spain, with reported poor efficacy to either 2, 4-D or tribenuron-methyl (sulfonylurea, ALS mode of action) were tested with XDE-729 methyl formulated as GF-2353 (XDE-729 methyl, 95.94 g a.e/L SC). Other treatments in the this study included 2,4-D amine, mecoprop-P amine, MCPA amine, florasulam, thifensulfuron-

methyl and tribenuron-methyl. Data presented in this report demonstrated resistance to 2,4-D applied at 1600 g ae /ha in four Spanish biotypes.

XDE-729 methyl applied at the purposed maximum registered rate of 7.5 g a.e/ha to the same populations achieved between 82 and 90 % control. The absence of cross resistance between 2,4-D and XDE-729 methyl can be explained by the difference of the perception of both types of auxinic herbicides at the molecular level. In the study previously discussed by Walsh et al (description of biochemical and biological mode of action) it was indicated that 2,4-D and the picolinic herbicide DAS534 do not bind to the same receptors. Thus differential binding between XDE-729 methyl and 2,4-D could explain why 2,4-D resistant biotypes of *Papaver rhoeas* were susceptible to applications of XDE-729 methyl.

In the second study conducted by Riches C. of Agherba, twenty one biotypes of *P. rhoeas* collected from sites throughout Europe (Belgium, France, Germany, Greece, Hungary, Italy, Spain and the UK) were used to establish the baseline sensitivity of XDE-729 methyl to *P. rhoeas*. The study also evaluated potential cross resistance between 2-4-D and ALS resistant biotypes.

Data from this study demonstrated consistent control of all 21 biotypes by XDE-729 methyl, with a maximum of a 3 X variation for both the ER₅₀ and ER₈₀ values based on percent visual control. The study also demonstrated no cross resistance between XDE-729 methyl and the ALS herbicide tribenuron-methyl and auxinic herbicide 2,4-D, with good control (> 78 %) of all 2,4-D and ALS resistant biotypes by XDE-729 methyl applied at 6 g a.e/ha, 28 days after application

B 3.2 Data on application relevant to the plant protection product - 'GF-2573' (IIIA 3.1 to 3.9)**B.3.2.1 Field of Use (IIIA 3.1)**

Agriculture

B.3.2.2 Effects on harmful organisms (IIIA 3.2)

XDE-729 methyl acts as a post-emergence systemic herbicide for the control of a range of broad leaved weeds frequently damaging cereal crops in the European Union. It has the flexibility to be used from early autumn through late spring in winter cereals.

B.3.2.3 Details of intended uses (IIIA 3.3)

See table B.3.1 below:

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Summary of EU intended uses

Crop and/or situation (a)	Member State or Country	Product Name	F or G (b)	Pests or Group of pests controlled (c)	Formulation		Application			Application rate per treatment			PHI days (k)	Remarks (l)
					Type (d-f)	Conc. of a.s. (i) g/L	Method Kind (f-h)	Growth stage (j)	Number min max	kg as/hl min max	Water (l/ha) min max	kg as./ha min max		
Winter cereals (soft wheat, durum wheat, barley, spelt, rye, triticale)	EU	GF-2573	F	Broadleaf weeds	EC	XDE-729 methyl 7.817	Overall, Broadcast foliar spray	BBCH 10 - 29 and BBCH 13 - 45	1-2	0.00196-0.00782 followed by 0.00156 – 0.00625	100-400	0.00782 followed by 0.00625		The applications are made in autumn only (7.82 g/ha), or in spring only (6.25 g/ha) or in both autumn and spring (7.82 + 6.25 g/ha). Autumn applications are from BBCH 10 to 29. Spring applications are from BBCH 13 to 45.
Spring cereals (wheat, barley, durum wheat, rye)	EU	GF-2573	F	Broadleaf weeds	EC	XDE-729 methyl 7.817	Overall, Broadcast foliar spray	BBCH 13 to 45	1	0.00156 – 0.00625	100-400	0.00625		The application is made in spring only, from BBCH 13 to 45.

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Summary of intended uses on Zonal Basis

Crop and/or situation (a)	Member State or Country	Product Name	F or G (b)	Pests or Group of pests controlled (c)	Formulation		Application			Application rate per treatment			PHI days (k)	Remarks (l)
					Type (d-f)	Conc. of a.s. (i) g/L	Method Kind (f-h)	Growth stage (j)	Number min max	kg as/hl min max	Water (l/ha) min max	kg as./ha min max		

Northern Zone

Winter cereals (soft wheat, barley, rye, triticale)	Northern Zone	GF-2573	F	Broadleaf weeds	EC	XDE-729 methyl 7.817	Overall, Broadcast foliar spray	BBCH 10 to 29 (Sep 1st-Dec 31st) and BBCH 13 to 45 (March 1 st -Jun 20th)	1-2	0.00196-0.00782 followed by 0.00156 – 0.00625	100-400	0.00782 followed by 0.00625		The applications are made in autumn only (7.82 g/ha), or in spring only (6.25 g/ha) or in both autumn and spring (7.82 + 6.25 g/ha). Autumn applications are from BBCH 10 to 29, from Sept 1st to Dec 31st. Spring applications are from BBCH 13 to 45, from March 1st to June 20th.
Spring cereals (wheat, barley)	Northern Zone	GF-2573	F	Broadleaf weeds	EC	XDE-729 methyl 7.817	Overall, Broadcast foliar spray	BBCH 13 to 45 (March 1 st – Jun 20th)	1	0.00156 – 0.00625	100-400	0.00625		The application is made in spring only, from BBCH 13 to 45, from March 1st to June 20th

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Crop and/or situation (a)	Member State or Country	Product Name	F or G (b)	Pests or Group of pests controlled (c)	Formulation		Application			Application rate per treatment			PHI days (k)	Remarks (l)
					Type (d-f)	Conc. of a.s. (i) g/L	Method Kind (f-h)	Growth stage (j)	Number min max	kg as/hl min max	Water (l/ha) min max	kg as./ha min max		

Central Zone

Winter cereals (soft wheat, durum wheat, barley, spelt, rye, triticale)	Central Zone	GF-2573	F	Broadleaf weeds	EC	XDE-729 methyl 7.817	Overall, Broadcast foliar spray	BBCH 10 to 29 (Sep 1st-Dec 31st) and BBCH 13 to 45 (Jan 1st - Jun 30th)	1-2	0.00196-0.00782 followed by 0.00156 – 0.00625	100-400	0.00782 followed by 0.00625		The applications are made in autumn only (7.82 g/ha), or in spring only (6.25 g/ha) or in both autumn and spring (7.82+6.25 g/ha). Autumn applications are from BBCH 10 to 29, from Sept 1st to Dec 31st. Spring applications are from BBCH 13 to 45, from January 1st to June 30th
Spring cereals (wheat, barley, durum wheat, rye)	Central Zone	GF-2573	F	Broadleaf weeds	EC	XDE-729 methyl 7.817	Overall, Broadcast foliar spray	BBCH 13 to 45 (Feb 1st-Jun 30th)		0.00156 – 0.00625	100-400	0.00625		The application is made in spring only, from BBCH 13 to 45, from February 1st to June 30th

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Crop and/or situation (a)	Member State or Country	Product Name	F or G (b)	Pests or Group of pests controlled (c)	Formulation		Application			Application rate per treatment			PHI days (k)	Remarks (l)
					Type (d-f)	Conc. of a.s. (i) g/L	Method Kind (f-h)	Growth stage (j)	Number min max	kg as/hl min max	Water (l/ha) min max	kg as./ha min max		

Southern Zone

Winter cereals (soft wheat, durum wheat, barley, spelt, rye, triticale)	Southern Zone	GF-2573	F	Broadleaf weeds	EC	XDE-729 methyl 7.817	Overall, Broadcast foliar spray	BBCH 10 to 29 (Sep 1st-Dec 31st) and BBCH 13 to 45 (Jan 1st - May 31 st)	1-2	0.00196-0.00782 followed by 0.00156 – 0.00625	100-400	0.00782 followed by 0.00625		The applications are made in autumn only (7.82 g/ha), or in spring only (6.25 g/ha) or in both autumn and spring (7.82+6.25 g/ha). Autumn applications are from BBCH 10 to 29, from Sept 1st to Dec 31st. Spring applications are from BBCH 13 to 45, from January 1st to May 31 st
Spring cereals (wheat, barley, durum wheat, rye)	Southern Zone	GF-2573	F	Broadleaf weeds	EC	XDE-729 methyl 7.817	Overall, Broadcast foliar spray	BBCH 13 to 45 (Feb 1st-May 31 st)	1	0.00156 – 0.00625	100-400	0.00625		The application is made in spring only, from BBCH 13 to 45, from February 1st to May 31 st

- (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 plant - 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) Indicate the minimum and maximum number of application possible under practical conditions of use
- (l) PHI - minimum pre-harvest interval
- (m) Remarks may include: Extent of use/economic importance/restrictions

B.3.2.4 Application rate (IIIA 3.4)

The applications are made in autumn only (7.82 g/ha), or in spring only (6.25 g/ha) or in both autumn and spring (7.82+6.25 g/ha).

B.3.2.5 Concentration of active substance in material used (IIIA 3.5)

All recommended applications involve dilution in water as the carrier or dilutant. The recommended application volume is 100 to 400 L water/ha (i.e. maximum concentration = 0.00782 and minimum = 0.00196 kg as/hl).

See table B.3.1 above for further details.

B.3.2.6 Method of application (IIIA 3.6)

GF-2573 can be applied through all conventional sprayers including tractor mounted or self propelled hydraulic sprayers.

B.3.2.7 Number and timing of applications and duration of protection (IIIA 3.7)

The applications are made in autumn only (7.82 g/ha), or in spring only (6.25 g/ha) or in both autumn and spring (7.82+6.25 g/ha). Autumn applications are from BBCH 10 to 29. Spring applications are from BBCH 13 to 45.

See Summary of intended uses (table B.3.1) for more details.

The applicant has stated:

XDE-729 methyl will provide season long control of sensitive weed species present at the time of application. It will not control sensitive weed species which emerge post application because XDE-729 methyl does not provide residual control.

B 3.2.8 Necessary waiting period or other precautions to avoid phytotoxic effects on succeeding crops (IIIA 3.8)**1) Minimum waiting periods or other precautions between last application and sowing or planting succeeding crops**

The applicant has stated:

Autumn applications of XDE-729 methyl :

In most of the cases, XDE-729 methyl was applied in November and succeeding crops were sown in March-April after plough (4-5 months after treatment).

XDE-729 methyl was perfectly safe to all tested crops, whatever the local conditions.

Thus, after an autumn application of XDE-729 methyl, all tested crops (spring barley, spring wheat, spring oil seed rape, maize, sunflower, ryegrass, field beans or peas) can be safely sown after ploughing in spring.

Spring applications of XDE-729 methyl :

XDE-729 methyl was applied either in March or in April. Succeeding crops were sown 1 or 2 months later. Two soil cultivation practices were tested: either plough or minimum tillage before sowing the succeeding crops.

Results which have been achieved specify that after a spring application of XDE-729 methyl, it is possible to sow :

- 1 month after application (whatever the soil cultivation practice):
 - Spring wheat
 - Spring barley
 - Maize
 - Faba beans
 - Spring oil seed rape
- 2 months after application (whatever the soil cultivation practice) :
 - Sunflower

Conclusion: In case of unexpected crop failure XDE-729 persistence in soil is short enough to allow farmers sowing a wide range of frequent crops, after either autumn or spring applications, whatever the soil cultivation practices (plough or minimum tillage).

2) Limitations on choice of succeeding crops

The applicant has indicated that following an autumn application there will be no restrictions in the choice of succeeding crops. However, following a spring application the following restrictions will apply

- 1 month after application (whatever the soil cultivation practice):
 - Spring wheat
 - Spring barley
 - Maize
 - Faba beans
 - Spring oil seed rape
- 2 months after application (whatever the soil cultivation practice) :
 - Sunflower

3) Description of damage to rotational crops

The applicant has indicated that symptoms of herbicide damage include: cessation of growth, epinasty, leaf cupping, chlorosis, swelling/thickening of stems and distortion of the meristems and in very severe cases plant death.

B.3.3 Summary of data on application

XDE-729 methyl is a new active substance belonging to a new family of 6-arylpicolinate herbicides. XDE-729 methyl is a member of the pyridine-carboxylic family of herbicidal auxins (HRAC Group O).

XDE-729 methyl is intended for the control of a range of broad-leaved weed species post-emergence at a maximum dose of 7.5 g a.s./ha. It is proposed for use in winter and spring cereals, from early autumn through late spring. It provides a phenotypic response similar to the natural auxins and synthetic auxin herbicides.

The information supplied on both the active and product adequately addresses data on application.

B.3.4 Further information on the active substance (IIA 3.7 to 3.9)

B.3.4.1 Recommended methods and precautions concerning handling, storage, transport and fire (IIA 3.7)

The applicant has provided a material safety data sheet (see Volume 3, Appendix 1) providing the information regarding methods and precautions concerning handling, storage, transport and fire.

B.3.4.2 Procedures for destruction or decontamination (IIA 3.8.1, IIA 3.8.2)

- 1) Pyrolytic behaviour of the active substance under controlled conditions at 800 °C and the content of polyhalogenated dibenzo-p-dioxins in the products of pyrolysis (EC: IIA 3.8.1)

As the halogen content of XDE-729 methyl is less than 60%, there is no need for a pyrolysis study.

- 2) Detailed instructions for safe disposal

The applicant has indicated that if destruction is necessary then incineration via a licensed incinerator is recommended. XDE-729 methyl decomposes at approximately 221.06°C.

- 3) Methods other than controlled incineration for the disposal of the active substance, contaminated packaging and contaminated materials

The applicant has indicated that other than incineration, no further disposable methods are recommended. Contact with the supplier should be made to evaluate the return of excess material before destruction is undertaken.

B.3.4.3 Emergency measures in case of an accident (IIA 3.8.2, IIA 3.9)

The applicant has stated that contaminated water should be contained and decontaminated in a suitable sewage plant or by incineration.

B.3.5 Further information on the plant protection product (IIIA 4)**B.3.5.1 Packaging (type, materials, size etc.), compatibility of the preparation with the proposed packaging materials (IIIA 4.1)**

Description and specification of the packaging and materials used in packaging, size, capacity, size of openings, types of closure and seals

Specific Requirement:	
Material:	1. PET bottle 2. F-HDPE bottle
Capacity:	1. PET Bottles 0.25 litre, 0.5 litre, 1 litre, 2 litre, 3 litre, 5 litre, 10 litre, 20 litre. 0.25 litre bottles may or may not be, packed 12 x 0.25 litre or 24 x 0.25 litre to an outer corrugated fibreboard case. 0.5 litre bottles, may or may not be, packed 10 x 0.5 litre to an outer corrugated fibreboard case. 1 litre bottles, may or may not be, packed 10 x 1 litre to an outer corrugated fibreboard case. 2 litre bottles, may or may not be, packed 8 x 2 litre to an outer corrugated fibreboard case. 3 litre bottles, may or may not be, packed 6 x 3 litre to an outer corrugated fibreboard case. 5 litre bottles, may or may not be, packed 2 x 5 litre, 3 x 5 litre or 4 x 5 litre to an outer corrugated fibreboard case 10 litre bottles may or may not be, packed 2 x 10 litre to an outer corrugated fibreboard case. 2. F-HDPE bottle, 0.25 litre, 0.5 litre, 1 litre, 2 litre, 3 litre, 5 litre, 10 litre, 20 litre. 0.25 litre bottles may or may not be, packed 12 x 0.25 litre or 24 x 0.25 litre to an outer corrugated fibreboard case. 0.5 litre bottles, may or may not be, packed 10 x 0.5 litre to an outer corrugated fibreboard case. 1 litre bottles, may or may not be, packed 10 x 1 litre to an outer corrugated fibreboard case. 2 litre bottles, may or may not be, packed 8 x 2 litre to an outer corrugated fibreboard case. 3 litre bottles, may or may not be, packed 6 x 3 litre to an outer corrugated fibreboard case. 5 litre bottles, may or may not be, packed 2 x 5 litre, 3 x 5 litre or 4 x 5 litre to an outer corrugated fibreboard case 10 litre bottles may or may not be, packed 2 x 10 litre to an outer corrugated fibreboard case.

Suitability of the packaging and closures

The applicant have stated:

The packaging complies with ADR regulations having been tested using the ADR test methods appropriate to the pack type and material and classification of the contents and an appropriate UN certificate issued.

Resistance of the packaging material to its contents

A packaging storage stability study has been carried out on GF-2573, an Emulsion concentrate (EC), for 2 weeks at 54°C in glass and 8 weeks at 40°C in PET and F-HDPE. This forms part of a study to determine the 2-year packaging stability.

F-HDPE bottles and PET bottles are proposed primary sales packages for GF-2573 and are reported in this document.

Method DAS-AM-G-10-34 has been used to determine formulation stability in the container. Visual observations were used to study the effect of the formulation on the container and closure material and container pour out.

The XDE-729 methyl and cloquintocet-methyl active concentrations after both 2 weeks at 54°C and 8 weeks at 40°C in F-HDPE and PET bottles were greater than 95% of the initial value and met the Food and Agriculture Organisation (FAO) and World Health Organization (WHO) Specifications for stability of pesticides at elevated temperature.

Both bottle types remained in good condition throughout the entire study and showed no evidence of corrosion or other effects that would interfere with the safe handling of the product.

Each filled test container was weighed and observed to determine if the package condition changed from the time of study initiation. Results of the weighing showed no significant weight change from the initial weights for both bottle types. Both bottle types remained in good condition throughout the entire study and showed no evidence of corrosion or other effects that would interfere with the safe handling of the product.

F-HDPE bottles and PET bottles are expected to be compatible with GF-2573 after two years storage at ambient on the basis of the accelerated storage data presented in this report.

B.3.5.2 Procedures for cleaning application equipment (IIIA 4.2)

Two studies were submitted to address effectiveness of tank cleaning procedures as part of the submission. These studies have not been evaluated as part of the consideration for authorisation of XDE-729 methyl, they are for consideration by efficacy experts during evaluation of the product at member state level. It is noted however, that the notifier concludes that there is potential for low levels of crop injury to subsequent crops, and therefore as a precautionary approach, the following label text has been suggested for GF-2573 by the notifier:

TANK CLEANING

XDE-729 methyl (GF-2573) is active to a range of broad-leaved crop species. To avoid subsequent injury to crops other than cereals (wheat, durum wheat, spelt, barley, rye, triticale), all spraying equipment must be thoroughly cleaned both inside and out.

The use of a proprietary cleaner such All Clear Extra at 0.5 % v/v or bleach containing 5 % hypochlorite is advised where sensitive crops are likely to be sprayed following use of XDE-729 methyl containing products.

B.3.5.3 Re-entry periods, necessary waiting periods or other precautions to protect man, livestock and the environment (IIIA 4.3)Re-entry period (in days) for livestock, to areas to be grazed

The applicant has stated that a re-entry period for grazing is not needed since cereals are not normally used for this purpose.

Re-entry period (in hours or days) for man to crops, buildings or spaces treated

The applicant has stated that under practical conditions of use, there is no reason for workers to enter the crop shortly after treatment. The general approach of avoiding re-entry until the spray solution has dried is recommended.

Withholding period (in days) for animal feeding-stuffs

The applicant has stated that cereal grain and straw would be used as feedstuffs only at crop maturity / normal commercial harvest, which is the timing when crop residue samples were collected for residue analysis. No withholding period is required.

Waiting period (in days) between application and handling treated products

The applicant has stated that good agricultural practice dictates to avoid handling until the spray solution has dried.

Waiting period (in days) between last application and sowing or planting succeeding crops

The applicant has highlighted that based upon the confined rotational crop study (See B.7.1.3 for further details), no waiting period is required since there were non-detectable residues (<0.003 mg/kg) in succeeding crops starting at a 14-day plant-back interval. Residues will not increase with longer waiting periods.

B.3.5.4 Recommended methods and precautions concerning handling, storage, transport or fire (IIIA 4.4)**a) Warehouse storage**

The applicant has indicated:

Product should be stored in compliance with local regulations. Store in a cool, dry, well-ventilated place in the original container. Protect from excessive heat and cold. Do not store near food, drink, animal feeding stuffs, pharmaceuticals, cosmetics or fertilisers. Keep out of reach of children.

b) **Transport**

The applicant has stated:

ROAD & RAIL

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: Substituted Aryl Pyridine Carboxylate Ester and Cloquintocet-mexyl

Hazard Class: 9 ID Number: UN3082 **Packing Group:** PG III

Classification: M6

Hazard identification No: 90

Environmental Hazard: Yes

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: Substituted Aryl Pyridine Carboxylate Ester and Cloquintocet-mexyl

Hazard Class: 9 ID Number: UN3082 **Packing Group:** PG III

EMS Number: F-A,S-F

Marine pollutant.: Yes

AIR

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: Substituted Aryl Pyridine Carboxylate Ester and Cloquintocet-mexyl

Hazard Class: 9 ID Number: UN3082 **Packing Group:** PG III

Cargo Packing Instruction: 964

Passenger Packing Instruction: 964

Environmental Hazard: Yes

INLAND WATERWAYS

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: Substituted Aryl Pyridine Carboxylate Ester and Cloquintocet-mexyl

Hazard Class: 9 ID Number: UN3082 **Packing Group:** PG III

Classification: M6

Hazard identification No: 90

Environmental Hazard: Yes

c) **Fire**

The applicant has provided the following:

Extinguishing Media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function. Water fog, applied gently may be used as a blanket for fire extinguishment.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Do not use direct water stream. May spread fire. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

d) **Nature of protective clothing and equipment proposed for use in storage, transport or in the event of fire**

The applicant has provided the following:

Eye/Face Protection: Use safety glasses (with side shields). Safety glasses (with side shields) should be consistent with EN 166 or equivalent.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Hand protection: Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator. Use the following CE approved air-purifying respirator: Organic vapor cartridge with a particulate pre-filter, type AP2.

Ingestion: Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

B.3.5.5 Emergency measures in case of an accident (IIIA 4.5)

a) Containment of spillages

The applicant has stated:

Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See also Volume 3, Appendix 1 for MSDS, Disposal Considerations, for additional information.

b) Decontamination of areas, vehicles and buildings

The applicant has cross-referenced the MSDS. Therefore please see MSDS at Volume 3, Appendix 1.

c) Disposal of damaged packaging, adsorbents and other materials

The applicant has stated:

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

d) Protection of emergency workers and bystanders

The applicant has cross-referenced the MSDS (Volume 3, Appendix 1) and provided the following statement

Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment.

e) **First aid measures**

The applicant has provided the following:

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: No emergency medical treatment necessary.

Skin Contact: Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly. Suitable emergency safety shower facility should be available in work area.

Eye Contact: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice. Suitable emergency eye wash facility should be available in work area.

Ingestion: No emergency medical treatment necessary.

Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

B.3.5.6 Procedures for destruction or decontamination of the plant protection product and its packaging (IIIA 4.6)

a) **Details of proposed procedures**

The applicant has stated that GF-2573 does not require specific neutralisation. Any spilled material should be contained and swept up into labelled containers for disposal. No neutralization procedures are proposed for small or large quantities. In addition, as the halogen content of XDE-729 methyl is less than 60%, there is no need for a pyrolysis study.

b) **Detailed instructions for safe disposal of the plant protection product and its packaging**

The applicant states:

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to

determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

No additional disposal methods are recommended.

B 3.6 Summary of further information on the active substance and plant protection product

Information supplied adequately addresses methods for handling the active substance and plant protection products.

B.3.7 Efficacy

a) Summary of effectiveness and crop safety data supporting efficacy

Active substance	XDE-729 methyl
Chemical name (IUPAC)	Methyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl) pyridine-2-carboxylate)
Chemical structure	
Chemical family	6-arylpicolinate herbicide
Mode of action	XDE-729 methyl is a member of the pyridine-carboxylic family of herbicidal auxins (group O) and results in typical auxinic symptoms of herbicide damage. As a member of the group O herbicides it has been shown to control ALS (group B) resistant <i>Papaver rhoeas</i> .
Absorption and translocation	Following post-emergence application XDE-729 methyl will undergo de-esterification to release the activity moiety (XDE-729 acid form). The acid can then be translocated throughout the plant via the phloem. Evidence has also been provided to demonstrate that XDE-729 can also be taken into the plant via the root system.
Crop tolerance	Winter and spring cereals (wheat, durum wheat, spelt, barley, rye, triticale – except oats) show excellent tolerance to XDE-729 methyl applied from BBCH 09 to BBCH 45 at projected label rates (7.5 g a.e/ha in autumn, 6 g a.e/ha in spring), when a safener (cloquintocet-mexyl) is used in the formulated product.
Weed control	When autumn applied in winter cereals XDE-729 methyl controls a range of annual broad leaved weed species: - <i>Centaurea cyanus</i> - <i>Galium aparine</i>

	- <i>Geranium spp</i> - <i>Lamium spp</i> - <i>Papaver Rhoeas</i> - <i>Stellaria media</i> - <i>Veronica spp</i> When spring applied in winter cereals XDE-729 methyl controls a range of annual broad leaved weed species: - <i>Chenopodium album</i> - <i>Fumaria officinalis</i> - <i>Galium aparine</i> - <i>Geranium spp</i> - <i>Lamium spp</i> - <i>Papaver Rhoeas</i>
Minimum Effective Dose	Autumn uses: the 7.5 g a.e./ha rate of XDE-729 methyl provides acceptable levels of control of <i>Stellaria media</i> and <i>Veronica spp</i> Spring uses: the 6 g a.e./ha rate of XDE-729 methyl provides acceptable levels of control of <i>Papaver Rhoeas</i>
Neighboring crops	Volatility: XDE-729 methyl does not present a risk to susceptible adjacent crops. Spray drift: depending on crops a safe buffer zone of 1 to 5 m is recommended to avoid injuries to susceptible adjacent crops.
Crop rotation	XDE-729 methyl rapidly degrades and residues in the soil generally do not persist long enough to injure crops the following season. It requires adequate moisture and temperature for breakdown to occur.

b) RMS assessment of effectiveness and crop safety data supporting efficacy

Regulation (EC) No 1107/2009 is divided into Chapter II on the approval of active substances and Chapter III on the authorisation of plant protection products containing approved active substances.

Regulation (EC) No 1107/2009 states in Chapter II, Article 4(3), that 'a plant protection product, consequent on application consistent with good plant protection practice and having regard to realistic conditions of use, shall meet the following requirements: a) it shall be sufficiently effective and c) it shall not have any unacceptable effects on plants or plant products. The Regulation also states in article 8 that a summary dossier shall include information with respect to one or more representative uses on a widely grown crop in each zone of at least one plant protection product containing the active substance, demonstrating that the approval criteria provided for in Article 4 are met i.e. Sufficiently effective and with no unacceptable effects on plants or plant products.

XDE-729 methyl is a new active substance belonging to a new family of 6-arylpicolinate herbicides. XDE-729 methyl is a member of the pyridine-carboxylic family of herbicidal auxins (HRAC Group O).

XDE-729 methyl, as GF-2573, is intended for use in winter and spring cereals (wheat, durum wheat, spelt, barley, rye triticale – except oats) for the post-emergence control of a range of broad-leaved weeds. The intended use is post-emergence of the crop from BBCH 10 to BBCH 45. The proposed dose is 7.5 g a.e/ha in autumn and/or 6 g a.e/ha in spring and use is intended in all three EU regulatory zones. This EC formulation contains also 7.5 g ai/L of cloquintocet-mexyl and 750 g/L of methylated seed oil.

The applicant provided the results the preliminary testing to demonstrate the absence of insecticidal or fungicidal effects. In addition, the results of preliminary tests were summarised to indicate that XDE-729 methyl requires the use of a safener. Field trials set up in the European Union in 2008-2010 to wheat, durum wheat, spelt, barley, rye and triticale have demonstrated that cloquintocet-mexyl is an effective safener when used at a 1:1 herbicide-to-safener ratio. The cloquintocet-mexyl safener does not prevent crop symptoms in oats, at the currently developed rates of XDE-729 methyl.

The applicant indicated that an adjuvant may be recommended for use with XDE-729 methyl to optimize effectiveness. As a consequence, several XDE-729 methyl containing products developed in Europe will include adjuvants (methylated seed oil or non ionic surfactant). Alternatively, when such an adjuvant cannot be incorporated into the formulation, tank mixing an adjuvant with XDE-729 methyl containing products may be recommended to users. Detailed data are not available to evaluate the claim that effectiveness is increased with the use of an adjuvant and this will need to be considered at the product stage for specific claims.

Data from preliminary screening demonstrated that *Galium aparine*, *Lamium purpureum*, *Papaver rhoeas* and *Stellaria media* are susceptible to post-emergence applications of XDE-729 methyl. Of these species *G. aparine* and *L. purpureum* are the most sensitive to XDE-729 methyl, with *Matricaria chamomilla*, *Veronica persica* and *Viola tricolor* being the most tolerant to post emergence applications of XDE-729 methyl.

The applicant summarised the results of field trials conducted over 2 years in **winter cereals** using an autumn application of GF-2573 applied at 3 to 9 g a.e/ha. The applicant considered the control of *Stellaria media* and *Veronica hederifolia*. Both of these weed species are common targets in cereals in the Northern, Central and Southern EC regulation 1107/2009 work sharing zones.

Results demonstrated an acceptable level of control of both species at the proposed dose of 7.5 a.e/ha. In the control of *Stellaria media* there was some evidence from the 14 trials of a dose response between the proposed dose and lower doses of 4.5 and 6 g a.e/ha. Data were also presented for *Veronica hederifolia* from 19 trials across all zones. GF-2573 at 7.5 g a.e/ha also gave acceptable control of this species although when trials from the Southern zone were considered separately (n=6) there was less evidence of a dose response compared to taking data from across all zones.

The applicant also summarised the results of 7 trials conducted over 2 years in **winter cereals** where GF-2573 was applied in the spring at 3 to 6 g a.e/ha. The applicant considered the effectiveness against *Papaver rhoeas*. This is a major target in the Northern, Central and Southern EC regulation 1107/2009 work sharing zones. Results

demonstrated an acceptable level of control of *Papaver rhoeas* at the proposed dose of 6.0 a.e/ha, with some evidence of lower levels of control at 3 and 4.5 g a.e/ha.

Field trials set up in the European Union in 2008-2010 to wheat, durum wheat, spelt, barley, rye and triticale have demonstrated that cloquintocet-mexyl is an effective safener when used at a 1:1 herbicide-to-safener ratio. All laboratory and field studies which were completed have shown that XDE-729 methyl does not present any unacceptable effects on grain quantity and quality (1000 grain weight, protein content etc....). The preliminary processing studies specify that XDE-729 methyl is safe in both bread making and malting / brewery studies.

The applicant also considered other potential unacceptable effects in terms of the risk to adjacent and succeeding crops.

From the information provided by the applicant it appears unlikely that XDE-729 methyl poses a significant risk to adjacent crops due to volatility. In terms of spray drift various post-emergence field replicated trials were set up in France, Germany and the UK in 2010 and 2011 (French CEB method n° 212) to evaluate the safe distance (buffer zone) to be advised on labels to avoid damaging adjacent susceptible crops. XDE-729 methyl was used as GF-2573 (7.5 g a.e/L). These field results show that safe distances from 1 to 5 m (depending on crops) will be recommended to avoid spray drift damages to adjacent susceptible crops.

In terms of the risk of damage to succeeding crops several field trials have been set up in 2010 and 2011 to evaluate which crops a farmer can sow after a XDE-729 methyl application. These studies were set up across various EU geographies (France, Germany, UK, Hungary and Denmark), mixing soil types and weather conditions. XDE-729 methyl was tested at 1X and 2X rates (7.5 and 15 g a.e/ha for autumn applications; 6 and 12 g a.e/ha for spring applications). These trials include a range of crops commonly grown in arable rotations across the EU and indicate that any risks to succeeding crops can be satisfactorily managed using cultivations and appropriate planting intervals.

When applied to soil and plants, XDE-729 methyl is metabolized to XDE-729 (acid form) first and then to M-757. Two studies were established to determine the biological activity of the M-757 metabolite to that of XDE-729 methyl, formulated as GF-2573 (XDE-729 methyl at 7.5 g a.e/L, EC) to consider the biological relevance of M-757. The M-757 metabolite is not considered to be biologically relevant from the results of the preliminary tests submitted.

For approval of an active substance 'a plant protection product, consequent on application consistent with good plant protection practice and having regard to realistic conditions of use, shall meet the following requirements: a) it shall be sufficiently effective and c) it shall not have any unacceptable effects on plants or plant products'. The applicant has addressed this requirement.

B.3.8 References relied on

Annex Point/ Reference Number	Author(s)	Year	Title Source (where different from the Company), Company, Report Number, GLP or GEP status (where relevant), Published or not	Data Protection claimed (Y/N)	Owner
KIIA 3.1/01	Satchivi, N., Schmitzer, P.	2010	Efficacy and selectivity of XDE-729 applied to cereal crops Dow AgroSciences DAS Report No.: DAI 0978 (Accession Number) 2007951 GLP/GEP (Y/N): N Published (Y/N): N	Y	DAS
KIIA 3.1/02	Satchivi, N., Toft, A., Bangel, B.	2010	Safener effects on the phytotoxicity of XDE-729 to Wheat and Barley Dow AgroSciences DAS Report No.: DAI 0979 (Accession Number) 2008041 GLP/GEP (Y/N): N Published (Y/N): N	Y	DAS
KIIA 3.2.2/01	DeBoer, G.J, et al.	2011	Understanding metabolism, uptake and translocation of XDE-729 and its methyl ester (XDE-729 ME) in wheat, L. Purpureum and V. persica and the effect of safener on wheat selectivity Dow AgroSciences DAS Report No.: DAI 1026 (Accession Number) 2009024 GLP/GEP (Y/N): N Published (Y/N): N	Y	DAS
KIIA 3.2.2/02	Brockmann, A, et al.	2011	Standardized bioassay for the determination of ED 10 (NOEL) and ED 50 values for GF-2573 (XDE-729, 7.5 g ae/L, EC) and selected following crop species Agro-check DAS Report No.: EA10D2C069 (Accession Number) 2014411 GLP/GEP (Y/N): Y Published (Y/N): N	Y	DAS

Annex Point/ Reference Number	Author(s)	Year	Title Source (where different from the Company), Company, Report Number, GLP or GEP status (where relevant), Published or not	Data Protection claimed (Y/N)	Owner
KIIA 3.2.2/03	Davis, J.	2011	Determination of the foliar No Observable Effect Level (NOEL) of XDE-729 (GF-2573 7.5 g ae/l) to a range of crop species Stockbridge Technology Centre Ltd DAS Report No.: EA11D2C077 (Accession Number) 2014412 GLP/GEP (Y/N): N Published (Y/N): N	Y	DAS
KIIA 3.5/01	Walsh, T.A., et al	2005	Mutations in an auxin receptor homolog AFB5 and in SGT1b confer resistance to picolinate auxins but not to 2,4-D or IAA in Arabidopsis Dow AgroSciences DAS Report No.: DAI 0656 (Accession Number) 220827 GLP/GEP (Y/N): N Published (Y/N): N	Y	DAS
KIIA 3.5.2/01	Davies, J.	2012	Determination of the Soil No Observable Effect Level (NOEL), EC10 and EC50 of XDE-729 and its M-757 metabolite to a range of rotational crop species Stockbridge Technology Centre. DAS Report No.: EA10D2C067, STC/10/E583 (Accession Number) 2007832 GLP/GEP (Y/N): N Published (Y/N): N	Y	DAS
KIIA 3.5.2/02	Brougham, K, et al	2012	Determination of the foliar No Observable Effect Level (NOEL) ED 10 and ED 50 values of XDE-729 methyl metabolite M-757 to a range of crop species Dow AgroSciences DAS Report No.: EA11D2C079 (Accession Number) 2012815 GLP/GEP (Y/N): N Published (Y/N): N	Y	DAS

Annex Point/ Reference Number	Author(s)	Year	Title Source (where different from the Company), Company, Report Number, GLP or GEP status (where relevant), Published or not	Data Protection claimed (Y/N)	Owner
KIIA 3.6/01	Satchivi, N, et al.	2011	Response of herbicide resistant corn poppy (Papaver rhoeas) to application of XDE-729 methyl ester Dow AgroSciences DAS Report No.: DAI 1072 (Accession Number) 2011607 GLP/GEP (Y/N): Y Published (Y/N): N	Y	DAS
KIIA 3.6/02	Riches, C.	2011	XDE-729 Papaver Rhoeas baseline monitoring –Europe 2010 AgHerba Consultants DAS Report No.: EA10D2C071 (Accession Number) 2009925 GLP/GEP (Y/N): Y Published (Y/N): N	Y	DAS

Plant Protection Product ‘GF-2573’-By Annex Point

Annex Point/ Reference Number	Author(s)	Year	Title Source (where different from the Company), Company, Report Number, GLP or GEP status (where relevant), Published or not	Data Protection claimed (Y/N)	Owner
KIIIA 4.2.1/01	Harris, D.	2012	Evaluation of the Tank Cleaning Regime for Florasulam (GF-1352), XDE-729 methyl (GF-2573) and XDE-729 Methyl + Florasulam (GF-2644). UK 2011 Dow AgroSciences Ltd DAS Report No.: GHE-P-12773, EA11D5A042 (Accession Number) 2012644 GLP/GEP (Y/N): Y Published (Y/N): N	Y	DAS

Annex Point/ Reference Number	Author(s)	Year	Title Source (where different from the Company), Company, Report Number, GLP or GEP status (where relevant), Published or not	Data Protection claimed (Y/N)	Owner
KIIIA 4.2.2/01	Ouse,D,G, Gifford,, J.M. and Bingham-Burr, D.	2012	Lab scale testing of spray tank clean out procedures for XDE-729 (GF-2573) and XDE-729 pre-mixed with florasulam (GF-2644) or fluroxypyr-meptyl (GF-2819), proposed formulations for use in Europe. Dow AgroSciences Ltd DAS Report No.: 2013717, DGO12027, DGO12040 (Accession Number) 2014023 GLP/GEP (Y/N): Y Published (Y/N): N	Y	DAS