REGISTRATION REPORT

Part B

Section 9

Ecotoxicology

Detailed summary of the risk assessment

Product code: GLOB2111F

Product name(s): Starinta

Chemical active substance(s):

Bixafen, 125 g/L

Central Zone

Zonal Rapporteur Member State: Poland

CORE ASSESSMENT

(authorization)

Applicant: Globachem nv

Submission date: December 2023

zRMS Assessment : 09/08/2024

Version after commenting : 15/11/2024

Version history

When	What
August 2024	zRMS assesment
November 2024	Version after commenting

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9 Ecotoxicology (KCP 10)

9.1 Critical GAP and overall conclusions

Table 9.1-1: Table of critical GAPs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Use-No. *	Member state(s)	Crop and/or situation (crop destination / purpose of crop)	F, Fn, Fpn G, Gn, Gpn or I **	Pests or Group of pests controlled (additionally: develop-mental stages of the pest or pest group)	**Application**				**Application rate**			PHI (days)	Remarks: e.g. g safener/ synergist per ha	**Conclusion**						
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between applications (days)	kg or L product/ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max			Birds	Mammals	Aquatic organisms	Bees	Non-target arthro-	Soil organisms	Non-target plants
Zonal uses (field or outdoor uses, certain types of protected crops)																				
1-10, 21-30, 41, 42	PL, CZ, HU, RO	winter cereals (wheat, barley, rye, triticale, oats, spelt)	F	*Puccinia recondite, Puccinia striiformis, Pyrenophora teres, Pyrenophora tritici-repentis, Rhynchosporium secalis, Zymoseptoria tritici, Puccinia triticina, Puccinia recondita , Fusarium sp.*	Normal downward spraying	BBCH 30 – 69	a) 1 b) 1	/	a) 1 L/ha b) 1 L/ha	a) ~~100~~ 125 b) ~~100~~ 125	100 - 300	/	/							
11-20, 31-40	PL, CZ, HU, RO	Spring cereals (wheat, barley, rye, triticale, oats, spelt)	F	*Puccinia recondite, Puccinia striiformis, Pyrenophora teres, Pyrenophora tritici-repentis, Rhynchosporium secalis, Zymoseptoria tritici, Puccinia triticina, Puccinia recondita , Fusarium sp.*	Normal downward spraying	BBCH 30 – 69	a) 1 b) 1	/	a) 1 L/ha b) 1 L/ha	a) ~~100~~ 125 b) ~~100~~ 125	100 - 300	/	/							

* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1

** F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

Explanation for column 15 – 21 "Conclusion"

A	Acceptable, Safe use
R	Further refinement and/or risk mitigation measures required
C	To be confirmed by cMS
N	No safe use

Remarks table:

(1) Numeration necessary to allow references
(2) Use official codes/nomenclatures of EU
(3) 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)
(4) F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application
(5) Scientific names and EPPO-Codes of target pests/diseases/ weeds or when relevant the common names of the pest groups (e.g. biting and sucking insects, soil born insects, foliar fungi, weeds) and the developmental stages of the pests and pest groups at the moment of application must be named
(6) Method, e.g. high volume spraying, low volume spraying, spreading, dusting, drench
Kind, e.g. overall, broadcast, aerial spraying, row, individual plant, between the plants - type of equipment used must be indicated
(7) Growth stage at first and 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
(8) The maximum number of application possible under practical conditions of use must be provided
(9) Minimum interval (in days) between applications of the same product.
(10) For specific uses other specifications might be possible, e.g.: g/m³ in case of fumigation of empty rooms. See also EPPO-Guideline PP 1/239 Dose expression for plant protection products
(11) The dimension (g, kg) must be clearly specified. (Maximum) dose of a.s. per treatment (usually g, kg or L product / ha).
(12) If water volume range depends on application equipments (e.g. ULVA or LVA) it should be mentioned under "application: method/kind".
(13) PHI - minimum pre-harvest interval
(14) Remarks may include: Extent of use/economic importance/restrictions

9.1.1 Overall conclusions

9.1.1.1 Effects on birds (KCP 10.1.1), Effects on terrestrial vertebrates other than birds (KCP 10.1.2), Effects on other terrestrial vertebrate wildlife (reptiles and amphibians) (KCP 10.1.3)

The TER_a value is greater than the Annex VI trigger of 10, indicating low acute risk to mammals from bixafen following application of GLOB2111F at the intended GAP. The TER_{lt} value for bixafen is greater than the Annex VI trigger of 5, indicating that GLOB2111F presents no unacceptable long-term risk to mammals when applied according to the proposed GAP.

The risk assessment for secondary poisoning, required for bixafen, showed that the risk for earthworm-eating and fish-eating mammals is acceptable following use of GLOB2111F according to the proposed use pattern. Furthermore, the risk assessment for exposure *via* drinking water also showed an acceptable risk.

9.1.1.2 Effects on aquatic organisms (KCP 10.2)

The calculated FOCUS Steps 1 to 4 PEC/RAC ratios for GLOB2111F and the active substance bixafen are all above the Annex VI trigger values, indicating that GLOB2111F poses low acute and chronic risk to aquatic organisms when the following risk mitigation measures are respected:

5 meters no-spray buffer zone or the use of 50% or 75% drift-reduction nozzle depending on the relevant FOCUS Step 3 scenarios.
The calculated FOCUS Steps 1 to 4 PEC/RAC ratios for GLOB2111F and the active substance bixafen are all above the Annex VI trigger values, indicating that GLOB2111F poses low acute and chronic risk to aquatic organisms when the following risk mitigation measures are respected:

5 meters no-spray buffer zone or the use of 50% (scenarios D3, D4, D6, R1 and R4) or 75% (scenarios D1, D2, D5 and R3) drift-reduction nozzle, depending on the relevant scenarios.

9.1.1.3 Effects on bees (KCP 10.3.1)

Risk assessment based on SANCO/10329/2002 rev. 2 (final): HQ values for oral and dermal exposure are below the relevant trigger. Therefore, it can be assumed that the intended uses of GLOB2111F represent low risk exposure to honey bees and bumble bees.

~~Risk assessment based on EPPO (2010): The chronic TERs for honey bee adults and larvae are higher than the trigger of 1, indicating that the proposed uses according to the intended GAP of GLOB2111F poses an acceptable chronic risk to honey bee larvae and adults.~~

Risk assessment based on EFSA bee GD (EFSA Journal 2013;11(7):3295): Acceptable chronic risk was demonstrated for adult honey bees, and larvae for all intended uses.

9.1.1.4 Risk assessment based on SANCO/10329/2002 rev. 2 (final): HQ values for oral and dermal exposure are below the relevant trigger. Therefore, it can be assumed that the intended uses of GLOB2111F represent low risk exposure to honey bees and bumble bees.

Risk assessment based on EPPO (2010): The chronic TERs for honey bee adults and larvae are higher than the trigger of 1, indicating that the proposed uses according to the intended GAP of GLOB2111F poses an acceptable chronic risk to honey bee larvae and adults.

Risk assessment based on EFSA bee GD (EFSA Journal 2013;11(7):3295): Acceptable chronic risk was demonstrated for adult honey bees, and larvae for all intended uses.

9.1.1.5 Effects on arthropods other than bees (KCP 10.3.2)

The PER values all fall below the relevant trigger value indicating an acceptable risk for non-target arthropods for the intended use of GLOB2111F.

9.1.1.6 Effects on non-target soil meso- and macrofauna (KCP 10.4), The TER values together with the higher tier field study indicate an acceptable risk for earthworms and other non-target soil organisms for the intended use of GLOB2111F.

9.1.1.7 Effects on soil microbial activity (KCP 10.5)

The TER values together with the higher tier field study indicate an acceptable risk for earthworms and other non-target soil organisms for the intended use of GLOB2111F.

As the $PEC_{soil,\ accumulation}$ of bixafen and the formulation are all lower than the concentration at which no significant effects are detected, it can be concluded that the risk of GLOB2111F to soil micro-organisms is acceptable in accordance with the intended use.

9.1.1.8 As both the PECsoil, accumulation of bixafen and the formulation are lower than the concentration at which no significant effects are detected, it can be concluded that the risk of GLOB2111F to soil micro-organisms is acceptable in accordance with the intended use.

9.1.1.9 Effects on non-target terrestrial plants (KCP 10.6)

First tier risk assessment indicates that there is no unacceptable risk from GLOB2111F for non-target plants when applied according to the proposed use rates.

9.1.1.10 Effects on other terrestrial organisms (flora and fauna) (KCP 10.7)

Tests on other non-target species are not required.

9.1.2 Grouping of intended uses for risk assessment

The following table documents the grouping of the intended uses to support application of the risk envelope approach (according to SANCO/11244/2011).

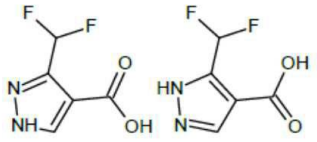
Table 9.1-2: Critical use pattern of GLOB2111F grouped according to crop

Grouping according to criterion			
Group	**Intended uses**	**relevant use parameters for grouping**	**relevant parameter or value for sorting**
1	Winter cereals	Growth stage: BBCH 30-69 Application rate: 1 x 1 L/ha	-
2	Spring cereals	Growth stage: BBCH 30-69 Application rate: 1 x 1 L/ha	-

9.1.3 Consideration of metabolites

A list of metabolites found in environmental compartments is provided below. The need for conducting a metabolite-specific risk assessment in the context of the evaluation of GLOB2111F is indicated in the table.

Table 9.1-3 Metabolites of Bixafen

Metabolite	Chemical structure	Molar mass	Maximum occurrence in compartments	Risk assessment required?
M44		162.1 g/mol	Soil Max. 2.9 % at the end of study	Not relevant (EU assessment)

9.2 Effects on birds (KCP 10.1.1)

9.2.1 Toxicity data

Avian toxicity studies have been carried out with bixafen and its relevant metabolites. Full details of these studies are provided in the respective EU DAR and related documents.

Effects on birds of GLOB2111F were not evaluated as part of the EU assessment of bixafen. However, the provision of further data on the GLOB2111F is not considered essential, because birds are typically exposed to dry residues on their food items following the dilution and spraying of the formulated product. During these processes, much of the formulation constituents are likely to be lost by volatilisation. Since oral exposure is the main route of exposure, toxicity data for the active substances are therefore used in preference to data from tests with the formulated material. On this basis, the risk to birds from the proposed uses of GLOB2111F will be assessed using data on bixafen.

For bixafen, there are no metabolites in soil or plants that need to be considered.

The selection of studies and endpoints for the risk assessment is in line with the results of the EU review process.

Table 9.2-1: Endpoints and effect values relevant for the risk assessment for birds

Species	Substance	Exposure System	Results	Reference
Colinus virginianus	Bixafen	Acute toxicity	LD_{50} > 2000 mg/kg bw	[redacted], 2005 EFSA Journal 2012;10(11):2917
Colinus virginianus	Bixafen	Reproductive toxicity[2]	NOEC = 24.5 mg/kg bw/d	[redacted], 2007 EFSA Journal 2012;10(11):2917
Colinus virginianus	Bixafen	Reproductive toxicity[1]	NOEC = 30.0 mg/kg bw/d	[redacted], 2009 EFSA Journal 2012;10(11):2917

1 Endpoint used in risk assessment;
2 Endpoint considered less reliable due to high bird aggression & injury in EFSA Journal 2012;10(11):2917.

9.2.1.1 Justification for new endpoints

No new endpoints were used.

9.2.2 Risk assessment for spray applications

The risk assessment is based on the methods presented in the Guidance Document on Risk Assessment for Birds and Mammals on request from EFSA (EFSA Journal 2009; 7(12): 1438; hereafter referred to as EFSA/2009/1438).

To achieve a concise risk assessment, the risk envelope approach is applied. Here, the assessment for the use group 1 also covers the risk for birds from all other intended uses (see 9.1.2).

9.2.2.1 First-tier assessment (screening/generic focal species)

The results of the acute and reproductive screening and first-tier risk assessments are summarised in the following tables.

Table 9.2-2: First-tier assessment of the acute and long-term/reproductive risk for birds due to the use of GLOB2111F in winter and spring cereals (use group 1 and 2)

Intended use	Cereals				
Active substance/product	Bixafen				
Application rate (g/ha)	1 × 125				
Acute toxicity (mg/kg bw)	2000				
TER criterion	10				
Crop scenario Growth stage	**Indicator/generic focal species**	**SV_{90}**	**MAF_{90}**	**DDD_{90} (mg/kg bw/d)**	**TER_a**
Screening step	Small omnivorous bird	158.8	1.0	19.85	100.8
Reprod. toxicity (mg/kg bw/d)	30				
TER criterion	5				

Crop scenario Growth stage	Indicator/generic focal species	SV_m	MAF_m × TWA	DDD_m (mg/kg bw/d)	TER_{lt}
Screening step	Small omnivorous bird	64.8	0.53	4.29	~~5.7~~ 7.0

SV: shortcut value; MAF: multiple application factor; TWA: time-weighted average factor; DDD: daily dietary dose; TER: toxicity to exposure ratio. TER values shown in bold fall below the relevant trigger.

9.2.2.2 Higher-tier risk assessment

No refinement needed, since the risk was found to be acceptable at a lower tier.

9.2.2.3 Drinking water exposure

When necessary, the assessment of the risk for birds due to uptake of contaminated drinking water is conducted for a small granivorous bird with a body weight of 15.3 g (*Carduelis cannabina*) and a drinking water uptake rate of 0.46 L/kg bw/d (*cf.* Appendix K of EFSA/2009/1438).

Leaf scenario

Since GLOB2111F is not a product for spray applications / not intended to be applied on leafy vegetables forming heads or crop plants with comparable water collecting structures at principal growth stage 4 or later, the leaf scenario does not have to be considered.

Puddle scenario

Due to the characteristics of the exposure scenario in connection with the standard assumptions for water uptake by animals, no specific calculations of exposure and TER are necessary when the ratio of effective application rate (in g/ha) to relevant endpoint (in mg/kg bw/d) does not exceed 50 in the case of less sorptive substances (Koc < 500 L/kg) or 3000 in the case of more sorptive substances (Koc ≥ 500 L/kg).

With a K(f)oc of 3869~~3827~~ L/kg, bixafen belongs to the group of more sorptive substances. To achieve a concise risk assessment, the risk envelope approach is applied. Here, the assessment for the use group 1 also covers the risk for birds from all other intended uses in groups (see 9.1.2).

Effective application rate (g/ha)	=	125		
Acute toxicity (mg/kg bw)	=	>2000	quotient =	0.063
Reprod. toxicity (mg/kg bw/d)	=	30.0	quotient =	4.17

9.2.2.4 Effects of secondary poisoning

The log P_{ow} of bixafen amounts to 3.3 and thus exceeds the trigger value of 3. A risk assessment for effects due to secondary poisoning is required.

Risk assessment for earthworm-eating birds via secondary poisoning

According to EFSA/2009/1438, the risk for vermivorous birds is assessed for a bird of 100 g body weight with a daily food consumption of 104.6 g. Bioaccumulation in earthworms is estimated based on measured/predicted concentrations in soil/porewater / is based on experimental data.
To achieve a concise risk assessment, the risk envelope approach is applied. Here, the assessment for the use group 1 also covers the risk for birds from all other intended uses in groups (see 9.1.2).

Table 9.2-6: Assessment of the risk for earthworm-eating birds due to exposure to bixafen via bioaccumulation in earthworms (secondary poisoning) for the intended use in winter and spring cereals (use group 1 and 2)

Parameter	Bixafen	comments
$PEC_{accumulation}$ (mg/kg soil)	0.0462	1 application of 125 g a.i./ha
log P_{ow} / P_{ow}	1995	Log P_{OW} = 3.3
Koc	3869	Mean (n = 5)
foc	0.02	Default
BCF_{worm}	0.32	$BCF_{worm/soil}$ = ($PEC_{worm,ww}$/$PEC_{soil,dw}$) = (0.84 + 0.012 × P_{ow}) / foc × Koc
PEC_{worm}	0.0148	PEC_{worm} = PEC_{soil} × $BCF_{worm/soil}$
Daily dietary dose (mg/kg bw/d)	0.0155	DDD = PEC_{worm} × 1.05
NOEL (mg/kg bw/d)	30	Relevant reproductive endpoint
TER_{lt}	1931.2	

TER values shown in bold fall below the relevant trigger.

Risk assessment for fish-eating birds via secondary poisoning

According to EFSA/2009/1438, the risk for piscivorous birds is assessed for a bird of 1000 g body weight with a daily food consumption of 159 g. Bioaccumulation in fish is estimated based on predicted concentrations in surface water.

Table 9.2-7: Assessment of the risk for fish-eating birds due to exposure to bixafen via bioaccumulation in fish (secondary poisoning) for the intended use in winter and spring cereals (use group 1 and 2)

Parameter	Bixafen	comments
PEC_{sw} (twa = 21 d) (mg/L)	0.0069881	Worst-case FOCUS Step 1 21-d twa
BCF_{fish}	523	UK, 2011
BMF	/	biomagnification factor (relevant for BCF ≥ 2000)
PEC_{fish}	3.6548	PEC_{fish} = PEC_{water} × BCF_{fish}
Daily dietary dose (mg/kg bw/d)	0.5811	DDD = PEC_{fish} × 0.159
NOEL (mg/kg bw/d)	30	Relevant reproductive endpoint
TER_{lt}	51.63	

TER values shown in bold fall below the relevant trigger.

9.2.2.5 Biomagnification in terrestrial food chains

Not relevant.

9.2.3 Risk assessment for baits, pellets, granules, prills or treated seed

Not relevant.

9.2.4 Overall conclusions

The TER_a value is greater than the Annex VI trigger of 10, indicating low acute risk to birds from bixafen following application of GLOB2111F at the intended GAP. The TER_{lt} value for bixafen is greater than the Annex VI trigger of 5, indicating that GLOB2111F presents no unacceptable long-term risk to birds when applied according to the proposed GAP.

The risk assessment for secondary poisoning, required for bixafen, showed that the risk for earthworm-eating and fish-eating birds is acceptable following use of GLOB2111F according to the proposed use pattern. Furthermore, the risk assessment for exposure *via* drinking water also showed an acceptable risk.

zRMS comments:

The risk assessment to birds was performed in accordance with the recommendation of Guidance Document on Risk Assessment for Birds & Mammals on request from EFSA (EFSA Journal 2009; 7(12):1438).

The results of the 'screening phase' acute and long-term dietary risk assessment - Toxicity Exposure Ratios (TER_A and TER_{LT}) were calculated taking into account the EU agreed and accepted in core assessment endpoints for most sensitive species for the active substance and using the EFSA Bird and Mammal risk assessment calculator for the higher predicted application rate than it is foreseen in GAP exceeding the trigger set by Commission regulation (EU) 546/2011 for acceptability of effects. Revealed that there is no potential of risk for birds resulting from acute and long-term exposure to active substance following use of Starinta 100 SC in compliance with proposed GAP.

A quantitative drinking water risk assessment is not triggered for the proposed use pattern of Starinta 100 SC according to EFSA/2009/1438 criteria and therefore the risk to birds via drinking water is acceptable.

No unacceptable effects to fish-eating and earthworm-eating birds are expected following application of Starinta 100 SC according to the proposed use pattern..

No risk mitigation measures are required.

Conclusion:
According to the performed risk assessment there is no potential of risk to birds resulting from exposure to active substance following use of Starinta 100 SC (GLOB2111F) in compliance with proposed GAP.

9.3 Effects on terrestrial vertebrates other than birds (KCP 10.1.2)

9.3.1 Toxicity data

Mammalian toxicity studies have been carried out with bixafen. Full details of these studies are provided in the respective EU DAR and related documents.

Effects on mammals of GLOB2111F were not evaluated as part of the EU assessment of bixafen. However, the provision of further data on the formulation GLOB2111F is not considered essential, because the risk for mammals from GLOB2111F can be adequately assessed from the risk assessment for the active

substance.

The selection of studies and endpoints for the risk assessment is in line with the results of the EU review process.

Table 9.3-1: Endpoints and effect values relevant for the risk assessment for mammals

Species	Substance	Exposure System	Results	Reference
Rat	Bixafen	Oral Acute	$LD_{50} \geq 5000$ mg/kg bw	[redacted], 2005 EFSA Journal 2012;10(11):2917
Rat	Bixafen	Long-term repro NOEL (2-generation study)	NOAEL = 33.3 mg/kg bw/day (400 mg/kg food)	[redacted], 2007 EFSA Journal 2012;10(11):2917

9.3.1.1 Justification for new endpoints

No new endpoints were used.

9.3.2 Risk assessment for spray applications

The risk assessment is based on the methods presented in the Guidance Document on Risk Assessment for Mammals and Mammals on request from EFSA (EFSA Journal 2009; 7(12): 1438; hereafter referred to as EFSA/2009/1438).
To achieve a concise risk assessment, the risk envelope approach is applied. Here, the assessment for the use group 1 also covers the risk for mammals from all other intended uses in groups (see 9.1.2).

9.3.2.1 First-tier assessment (screening/generic focal species)

The results of the acute and reproductive first-tier risk assessments are summarised in the following tables.

Table 9.3-2: First-tier assessment of the acute and long-term/reproductive risk for mammals due to the use of GLOB2111F in winter and spring cereals (use group 1 and 2)

Intended use	Cereals				
Active substance/product	Bixafen				
Application rate (g/ha)	1 × 125				
Acute toxicity (mg/kg bw)	5000				
TER criterion	10				
Crop scenario Growth stage	**Indicator/generic focal species**	**SV_{90}**	**MAF_{90}**	**DDD_{90} (mg/kg bw/d)**	**TER_a**
Screening step	Small herbivorous mammal	118.4	1.0	14.8	337.8
Reprod. toxicity (mg/kg bw/d)	33.3				
TER criterion	5				
Crop scenario	**Indicator/generic focal species**	**SV_m**	**MAF_m ×**	**DDD_m (mg/kg bw/d)**	**TER_{lt}**

Growth stage			**TWA**		
Screening step	Small herbivorous mammal	48.3	0.53	3.2	~~10.41~~ ~~10.31~~ 10.41

SV: shortcut value; MAF: multiple application factor; TWA: time-weighted average factor; DDD: daily dietary dose; TER: toxicity to exposure ratio. TER values shown in bold fall below the relevant trigger.

9.3.2.2 Higher-tier risk assessment

No refinement needed, since the risk was found to be acceptable at a lower tier.

9.3.2.3 Drinking water exposure

When necessary, the assessment of the risk for mammals due to uptake of contaminated drinking water is conducted for a small omnivorous mammal with a body weight of 21.7 g (*Apodemus sylvaticus*) and a drinking water uptake rate of 0.24 L/kg bw/d (*cf.* Appendix K of EFSA/2009/1438).

Puddle scenario

Due to the characteristics of the exposure scenario in connection with the standard assumptions for water uptake by animals, no specific calculations of exposure and TER are necessary when the ratio of effective application rate (in g/ha) to relevant endpoint (in mg/kg bw/d) does not exceed 50 in the case of less sorptive substances (Koc < 500 L/kg) or 3000 in the case of more sorptive substances (Koc ≥ 500 L/kg).

With a K(f)oc of 3827 L/kg, bixafen belongs to the group of more sorptive substances. To achieve a concise risk assessment, the risk envelope approach is applied. Here, the assessment for the use group 1 also covers the risk for mammals from all other intended uses in groups (see 9.1.2).

Effective application rate (g/ha)	=	125		
Acute toxicity (mg/kg bw)	=	5000	quotient =	0.025
Reprod. toxicity (mg/kg bw/d)	=	33.3	quotient =	3.75

9.3.2.4 Effects of secondary poisoning

The log P_{ow} of bixafen amounts to 3.3 and thus exceeds the trigger value of 3. A risk assessment for effects due to secondary poisoning is required.

Risk assessment for earthworm-eating mammals via secondary poisoning

According to EFSA/2009/1438, the risk for vermivorous mammals is assessed for a small mammal of 10 g body weight with a daily food consumption of 12.8 g. Bioaccumulation in earthworms is estimated based on measured/predicted concentrations in soil/porewater / is based on experimental data.
To achieve a concise risk assessment, the risk envelope approach is applied. Here, the assessment for the use group 1 also covers the risk for mammals from all other intended uses in groups (see 9.1.2).

Table 9.3-5: Assessment of the risk for earthworm-eating mammals due to exposure to bixafen via bioaccumulation in earthworms (secondary poisoning) for the intended use in winter and spring cereals (use groups 1 and 2)

Parameter	Bixafen	comments
$PEC_{accumulation}$ (mg/kg soil)	0.0462	1 application of 125 g a.i./ha
log P_{ow} / P_{ow}	1995	Log P_{OW} = 3.3

Parameter	Bixafen	comments
Koc	3869	Mean (n = 5)
foc	0.02	Default
BCF_{worm}	0.32	$BCF_{worm/soil} = (PEC_{worm,ww}/PEC_{soil,dw})$ $= (0.84 + 0.012 \times P_{ow}) / foc \times Koc$
PEC_{worm}	0.0148	$PEC_{worm} = PEC_{soil} \times BCF_{worm/soil}$
Daily dietary dose (mg/kg bw/d)	0.0189	$DDD = PEC_{worm} \times 1.28$
NOEL (mg/kg bw/d)	33.3	Relevant reproductive endpoint
TER_{lt}	1758.4	

TER values shown in bold fall below the relevant trigger.

Risk assessment for fish-eating mammals via secondary poisoning

According to EFSA/2009/1438, the risk for piscivorous mammals is assessed for a mammal of 3000 g body weight with a daily food consumption of 425 g. Bioaccumulation in fish is estimated based on predicted concentrations in surface water / is based on the regulatory acceptable concentration for aquatic organisms as a limit value for admissible concentrations of bixafen in water.

Table 9.3-6: Assessment of the risk for fish-eating mammals due to exposure to bixafen via bioaccumulation in fish (secondary poisoning) for the intended use in winter and spring cereals (use group 1 and 2)

Parameter	Bixafen	comments
PEC_{sw} (twa = 21 d) (mg/L)	0.0069881	Worst-case FOCUS Step 1 21-d twa
BCF_{fish}	523	UK, 2011
BMF	/	biomagnification factor (relevant for BCF ≥ 2000)
PEC_{fish}	3.6548	$PEC_{fish} = PEC_{water} \times BCF_{fish}$
Daily dietary dose (mg/kg bw/d)	0.5190	$DDD = PEC_{fish} \times 0.142$
NOEL (mg/kg bw/d)	33.3	Relevant reproductive endpoint
TER_{lt}	64.16	

TER values shown in bold fall below the relevant trigger.

9.3.2.5 Biomagnification in terrestrial food chains

Not relevant.

9.3.3 Risk assessment for baits, pellets, granules, prills or treated seed

Not relevant.

9.3.4 Overall conclusions

The TER_a value is greater than the Annex VI trigger of 10, indicating low acute risk to mammals from bixafen following application of GLOB2111F at the intended GAP. The TER_{lt} value for bixafen is greater than the Annex VI trigger of 5, indicating that GLOB2111F presents no unacceptable long-term risk to mammals when applied according to the proposed GAP.

The risk assessment for secondary poisoning, required for bixafen, showed that the risk for earthworm-eating and fish-eating mammals is acceptable following use of GLOB2111F according to the proposed use pattern. Furthermore, the risk assessment for exposure *via* drinking water also showed an acceptable risk.

zRMS comments:

The risk assessment to wild mammals was performed in accordance with the recommendation of Guidance Document on Risk Assessment for Birds & Mammals on request from EFSA (EFSA Journal 2009; 7(12):1438).

The results of the 'screening phase' acute and long-term dietary risk assessment - Toxicity Exposure Ratios (TER_A and TER_{LT}) were calculated taking into account the EU agreed and accepted in core assessment endpoints for most sensitive species for the active substance and using the EFSA Bird and Mammal risk assessment calculator for the higher predicted application rate than it is foreseen in GAP exceeding the trigger set by Commission regulation (EU) 546/2011 for acceptability of effects. Revealed that there is no potential of risk for mammals resulting from acute and long-term exposure to active substance following use of Starinta 100 SC (GLOB2111F) in compliance with proposed GAP.

No unacceptable effects to mammals through drinking water are expected following application of Starinta 100 SC according to the proposed use pattern.

No unacceptable effects to fish-eating and earthworm-eating birds are expected following application of Starinta 100 SC according to the proposed use pattern.

No risk mitigation measures are required.

Conclusion:
According to the performed risk assessment there is no potential of risk to mammals resulting from exposure to active substance following use of Starinta 100 SC (GLOB2111F) in compliance with proposed GAP.

9.4 Effects on other terrestrial vertebrate wildlife (reptiles and amphibians) (KCP 10.1.3)

Not relevant.

9.5 Effects on aquatic organisms (KCP 10.2)

9.5.1 Toxicity data

Studies on the toxicity to aquatic organisms have been carried out with bixafen. Full details of these studies are provided in the respective EU DAR and related documents.

Effects on aquatic organisms of GLOB2111F were not evaluated as part of the EU assessment of bixafen. New data submitted with this application are listed in Appendix 1 and summarised in Appendix 2.

The selection of studies and endpoints for the risk assessment is in line with the results of the EU review

process. Justifications are provided below.

Table 9.5-1: Endpoints and effect values relevant for the risk assessment for aquatic organisms – Bixafen

Species	Substance	Exposure System	Results	Reference
Oncorhynchus mykiss	Bixafen	4 d, s	LC_{50} = 0.095 mg a.s./L $_{nom}$	[redacted] 2006 EFSA Journal 2012;10(11):2917
Pimephales promelas	Bixafen	33 d, f	NOEC = 0.0046 mg a.s./L $_{mm}$	[redacted], 2006b EFSA Journal 2012;10(11):2917
Daphnia magna	Bixafen	2 d, s	EC_{50} = 1.2 mg a.s./L $_{nom}$	Bruns, 2006 EFSA Journal 2012;10(11):2917
Daphnia magna	Bixafen	21 d, s	NOEC = 0.05 mg a.s./L $_{nom}$	Bruns, 2007 EFSA Journal 2012;10(11):2917
Chironomus riparius	Bixafen	28 d, s, spiked water	NOEC = 0.0156 mg a.s./L $_{nom}$	Dorgerloh, 2007 EFSA Journal 2012;10(11):2917
Chironomus riparius	Bixafen	28 d, s, spiked sediment	NOEC = 20 mg/kg dry sediment $_{nom}$	Bruns, 2009 DAR, UK 2011
Pseudokirchneriella subcapitata	Bixafen	3 d, s	E_rC_{50} = 0.0965 mg a.s./L $_{nom}$	Dorgerloh, 2006a EFSA Journal 2012;10(11):2917

s: static; ss: semi-static; f: flow-through; nom: based on nominal concentrations; mm: based on mean measured concentrations; im: based on initial measured concentrations

Table 9.5-2: Endpoints and effect values relevant for the risk assessment for aquatic organisms – GLOB2111F

Species	Substance	Exposure System	Results	Reference
Oncorhynchus mykiss	GLOB2111F	96 h, s	LC_{50} = 0.632 mg/L (worst case, expresed as mg sum componets/L)	Applicant calculation*
Daphnia Magna	GLOB2111F	48 h, s	EC_{50} > 5.00 mg/L $_{nom}$	Zaworska, 2023 0064/0025/E
Raphidocelis subcapitata	GLOB2111F	72 h, s	E_rC_{50} > 1.00 mg/L $_{nom}$ E_yC_{50} = 0.860 mg/L $_{nom}$	Domagała, 2023 0064/0024/E

s: static; ss: semi-static; f: flow-through; nom: based on nominal concentrations; mm: based on mean measured concentrations
* Endpoint calculated based on the CA model.

9.5.1.1 Justification for new endpoints

No formulation study has been carried out on fish the in order to avoid conducting studies on vertebrates. Based on the active substance data, acute toxicity of bixafen to algae and fish has been found similar. Therefore, a formulation endpoint for algae is considered to be protective enough for both groups of aquatic organisms.

However, to reduce uncertainty around the use of the formulation endpoint for algae to predict toxicity of the product to fish, a formulation endpoint for fish has been calculated based on the available data from all individual components of the formulation by means of the concentration addition model (CA model). For this calculation reference is made to the Part C. Additionally, the suitability of the CA mode to predict the toxicity of the formulation has also been considered.

9.5.2 Risk assessment

The evaluation of the risk for aquatic and sediment-dwelling organisms was performed in accordance with the recommendations of the "Guidance document on tiered risk assessment for plant protection products for aquatic organisms in edge-of-field surface waters in the context of Regulation (EC) No 1107/2009", as provided by the Commission Services (SANTE-2015-00080, 15 January 2015).

In the following tables, the ratios between predicted environmental concentrations in surface water bodies (PEC_{SW}, PEC_{SED}) and regulatory acceptable concentrations (RAC) for aquatic organisms are given per intended use for each FOCUS scenario and each organism group.

Table 9.5-3: Aquatic organisms: acceptability of risk (PEC/RAC < 1) for bixafen for each organism group based on FOCUS Steps 1, 2 and 3 calculations for the use of GLOB2111F in winter cereals (use group 1)

Group		**Fish acute**	**Fish prolonged**	**Inverteb. acute**	**Inverteb. prolonged**	**Algae**	**Sed. dwell. prolonged**		**Sed. dwell. prolonged**
Test species		***Oncorhynchus mykiss***	***Pimephales promelas***	***Daphnia magna***	***Daphnia magna***	***Pseudokirchn. subcapitata***	***Chironomus riparius***		***Chironomus riparius***
Endpoint		LC_{50}	NOEC	EC_{50}	NOEC	E_rC_{50}/E_yC_{50}	NOEC		NOEC
(µg/L)		95	4.6	1200	50	96.5	15.6		20000
AF		100	10	100	10	10	10		10
RAC (µg/L)		0.95	0.46	12	5	9.65	1.56		2000
FOCUS Scenario	**PEC $_{gl\text{-}max}$ (µg/L)**							**PEC $_{gl\text{-}max}$ (µg/kg)**	
Step 1									
	7.977	**8.397**	**17.341**	0.665	**1.595**	0.827	**5.113**	1200.35	0.6
Step 2									
N-Europe	1.343	**1.414**	**2.920**	0.112	0.269	0.139	0.861	216.47	0.108
S-Europe	2.421	**2.548**	**5.263**	0.202	0.484	0.251	**1.552**	400.8	0.2
Step 3									
D1/ditch	0.7892	0.831	**1.716**	0.066	0.158	0.082	0.506	43.453	0.022
D1/stream	0.6136	0.646	**1.334**	0.051	0.123	0.064	0.393	4.979	0.002
D2/ditch	0.8	0.842	**1.739**	0.067	0.160	0.083	0.513	45.115	0.023
D2/stream	0.6753	0.711	**1.468**	0.056	0.135	0.070	0.433	34.9	0.017
D3/ditch	0.7864	0.828	**1.710**	0.066	0.157	0.081	0.504	6.525	0.003
D4/pond	0.02703	0.028	0.059	0.002	0.005	0.003	0.017	3.658	0.002
D4/stream	0.5811	0.612	**1.263**	0.048	0.116	0.060	0.373	1.541	0.001
D5/pond	0.02724	0.029	0.059	0.002	0.005	0.003	0.017	2.869	0.001

Group		Fish acute	Fish prolonged	Inverteb. acute	Inverteb. prolonged	Algae	Sed. dwell. prolonged		Sed. dwell. prolonged
D5/stream	0.6276	0.661	**1.364**	0.052	0.126	0.065	0.402	1.681	0.001
D6/ditch	0.7774	0.818	**1.690**	0.065	0.155	0.081	0.498	6.778	0.003
R1/pond	0.03769	0.040	0.082	0.003	0.008	0.004	0.024	9.702	0.005
R1/stream	0.5179	0.545	**1.126**	0.043	0.104	0.054	0.332	35.696	0.018
R3/stream	0.7277	0.766	**1.582**	0.061	0.146	0.075	0.466	16.783	0.008
R4/stream	0.5202	0.548	**1.131**	0.043	0.104	0.054	0.333	32.196	0.016

AF: Assessment factor; PEC: Predicted environmental concentration; RAC: Regulatory acceptable concentration; PEC/RAC ratios above the relevant trigger of 1 are shown in bold

Table 9.5-4: Aquatic organisms: acceptability of risk (PEC/RAC < 1) for bixafen for each organism group based on FOCUS Steps 1, 2 and 3 calculations for the use of GLOB2111F in spring cereals (use group 2)

Group		Fish acute	Fish prolonged	Inverteb. acute	Inverteb. prolonged	Algae	Sed. dwell. prolonged		Sed. dwell. prolonged
Test species		***Oncorhynchus mykiss***	***Pimephales promelas***	***Daphnia magna***	***Daphnia magna***	***Pseudokirchn. subcapitata***	***Chironomus riparius***		***Chironomus riparius***
Endpoint		LC_{50}	NOEC	EC_{50}	NOEC	E_rC_{50}/E_yC_{50}	NOEC		NOEC
(µg/L)		95	4.6	1200	50	96.5	15.6		20000
AF		100	10	100	10	10	10		10
RAC (µg/L)		0.95	0.46	12	5	9.65	1.56		2000
FOCUS Scenario	**PEC $_{gl\text{-}max}$ (µg/L)**							**PEC $_{gl\text{-}max}$ (µg/kg)**	
Step 1									
	7.977	**8.397**	**17.342**	0.665	**1.595**	0.827	**5.114**	1200.350	0.600
Step 2									
N-Europe	1.343	**1.414**	**2.920**	0.112	0.269	0.139	0.861	216.470	0.108
S-Europe	2.421	**2.548**	**5.262**	0.202	0.484	0.251	**1.552**	400.800	0.200

Group		Fish acute	Fish prolonged	Inverteb. acute	Inverteb. prolonged	Algae	Sed. dwell. prolonged		Sed. dwell. prolonged
Step 3									
D1/ditch	0.7961	0.838	**1.731**	0.066	0.159	0.082	0.510	43.5099	0.022
D1/stream	0.6961	0.733	**1.513**	0.058	0.139	0.072	0.446	5.0136	0.003
D3/ditch	0.7872	0.829	**1.711**	0.066	0.157	0.082	0.505	5.7821	0.003
D4/pond	0.02705	0.028	0.059	0.002	0.005	0.003	0.017	3.8962	0.002
D4/stream	0.6434	0.677	**1.399**	0.054	0.129	0.067	0.412	1.4047	0.001
D5/pond	0.02724	0.029	0.059	0.002	0.005	0.003	0.017	2.8386	0.001
D5/stream	0.6608	0.696	**1.437**	0.055	0.132	0.068	0.424	0.3604	<0.001
R4/stream	0.5202	0.548	**1.131**	0.043	0.104	0.054	0.333	40.1399	0.020

AF: Assessment factor; PEC: Predicted environmental concentration; RAC: Regulatory acceptable concentration; PEC/RAC ratios above the relevant trigger of 1 are shown in bold

For the intended uses in winter and spring cereals, calculated PEC/RAC ratios did not indicate an acceptable risk for the most sensitive group of aquatic organisms (long term risk for fish as characterised by a NOEC for *Pimephales promelas* of 4.6 µg/L in connection with an assessment factor of 10) in all FOCUS Steps 1-3 scenarios. Therefore, further PEC/RAC ratios were calculated based on FOCUS Step 4 PEC_{SW} considering reduced exposure of surface water bodies.

Table 9.5-5: Aquatic organisms: PEC calculation and acceptability of risk (PEC/RAC < 1) for bixafen based on FOCUS Step 4 calculations and toxicity data for fish prolonged with mitigation of spray drift and run-off for the use of GLOB2111F in winter cereals (use group 1)

PEC_{sw} (µg/L)	**Scenario**	**STEP 4 bixafen**	
Nozzle reduction	Vegetative strip (m)	None	None
	No spray buffer (m)	1/3	5
None	D1 ditch	0.7892	0.2137
50 %		0.3945	-
75 %		0.1971	-
90 %		-	-
None	D1 stream	0.6136	0.224
50 %		0.4135	-
75 %		0.2065	-
90 %		-	-
None	D2 ditch	0.8	0.3551
50 %		0.4029	-
75 %		0.3551	-
90 %		-	-
None	D2/stream	0.6753	0.2471
50 %		0.4554	-
75 %		0.228	-
90 %		-	-
None	D3/ditch	0.7864	0.2129
50 %		0.3931	-
75 %		0.1964	-
90 %		-	-
None	D4/stream	0.5811	0.2121
50 %		0.3916	-
75 %		0.1956	-
90 %		-	-
None	D5/stream	0.6276	0.2291
50 %		0.4229	-
75 %		0.2113	-
90 %		-	-
None	D6/ditch	0.7774	0.2105
50 %		0.3886	-
75 %		0.1941	-
90 %		-	-
None	R1/stream	0.5179	0.189
50 %		0.349	-

PEC_{sw} (µg/L)	**Scenario**	**STEP 4 bixafen**	
Nozzle reduction	Vegetative strip (m)	None	None
	No spray buffer (m)	1/3	5
75 %		0.1864	-
90 %		-	-
None	R3/stream	0.7277	0.2656
50 %		0.4904	-
75 %		0.245	-
90 %		-	-
None	R4/stream	0.5202	0.3145
50 %		0.3506	-
75 %		0.3145	-
90 %		-	-
RAC (µg/L) 0.46		PEC/RAC ratio	
None	D1 ditch	**1.716**	0.465
50 %		0.858	-
75 %		0.428	-
90 %		-	-
None	D1 stream	**1.334**	0.487
50 %		0.899	-
75 %		0.449	-
90 %		-	-
None	D2 ditch	**1.739**	0.772
50 %		0.876	-
75 %		0.772	-
90 %		-	-
None	D2/stream	**1.468**	0.537
50 %		0.990	-
75 %		0.496	-
90 %		-	-
None	D3/ditch	**1.710**	0.463
50 %		0.855	-
75 %		0.427	-
90 %		-	-
None	D4/stream	**1.263**	0.461
50 %		0.851	-
75 %		0.425	-
90 %		-	-
None	D5/stream	**1.364**	0.498
50 %		0.919	-
75 %		0.459	-
90 %		-	-
None	D6/ditch	**1.690**	0.458
50 %		0.845	-
75 %		0.422	-

PECsw (µg/L)	Scenario	STEP 4 bixafen	
Nozzle reduction	Vegetative strip (m)	None	None
	No spray buffer (m)	1/3	5
90 %		-	-
None	R1/stream	**1.126**	0.411
50 %		0.759	-
75 %		0.405	-
90 %		-	-
None	R3/stream	**1.582**	0.577
50 %		**1.066**	-
75 %		0.533	-
90 %		-	-
None	R4/stream	**1.131**	0.684
50 %		0.762	-
75 %		0.684	-
90 %		-	-

PEC: Predicted environmental concentration; RAC: Regulatory acceptable concentration; PEC/RAC ratios above the relevant trigger of 1 are shown in bold

Table 9.5-6: Aquatic organisms: PEC calculation and acceptability of risk (PEC/RAC < 1) for bixafen based on FOCUS Step 4 calculations and toxicity data for fish prolonged with mitigation of spray drift and run-off for the use of GLOB2111F in spring cereals (use group 2)

PECsw (µg/L)	Scenario	STEP 4 bixafen	
Nozzle reduction	Vegetative strip (m)	None	None
	No spray buffer (m)	1/3	5
None	D1 ditch	0.7961	0.2156
50 %		0.398	-
75 %		0.1988	-
90 %		-	-
None	D1 stream	0.6961	0.2541
50 %		0.4691	-
75 %		0.2343	-
90 %		-	-
None	D3/ditch	0.7872	0.2131
50 %		0.3935	-
75 %		0.1966	-
90 %		-	-
None	D4/stream	0.6434	0.2348
50 %		0.4335	-
75 %		0.2166	-
90 %		-	-
None	D5/stream	0.6608	0.2412
50 %		0.4453	-

PEC_{sw} (µg/L)	**Scenario**	**STEP 4 bixafen**	
Nozzle reduction	Vegetative strip (m)	None	None
	No spray buffer (m)	1/3	5
75 %		0.2224	-
90 %		-	-
None	R4/stream	0.5202	0.2957
50 %		0.3505	-
75 %		0.2957	-
90 %		-	-
RAC (µg/L) 0.46		PEC/RAC ratio	
None	D1 ditch	**1.731**	0.469
50 %		0.865	-
75 %		0.432	-
90 %		-	-
None	D1 stream	**1.513**	0.552
50 %		**1.020**	-
75 %		0.509	-
90 %		-	-
None	D3/ditch	**1.711**	0.463
50 %		0.855	-
75 %		0.427	-
90 %		-	-
None	D4/stream	**1.399**	0.510
50 %		0.942	-
75 %		0.471	-
90 %		-	-
None	D5/stream	**1.437**	0.524
50 %		0.968	-
75 %		0.483	-
90 %		-	-
None	R4/stream	**1.131**	0.643
50 %		0.762	-
75 %		0.643	-
90 %		-	-

PEC: Predicted environmental concentration; RAC: Regulatory acceptable concentration; PEC/RAC ratios above the relevant trigger of 1 are shown in bold

For the intended uses on winter and spring cereals, calculated PEC/RAC ratios indicate an acceptable risk for the most sensitive group of aquatic organisms (long term risk for fish as characterised by a NOEC for *Pimephales promelas* of 4.6 µg/L in connection with an assessment factor of 10) when the following mitigation measures are considered:

- 5 meters no-spray buffer zone or the use of 50% or 75% drift-reduction nozzle depending on the relevant FOCUS Step 3 scenarios.

Table 9.5-7: Aquatic organisms: acceptability of risk (PEC/RAC < 1) for GLOB2111F for each organism group based on FOCUS Steps 1, 2 calculations for the use in winter cereals (use group 1)

Group		**Fish acute**	**Inverteb. acute**	**Algae**
Test species		*Oncorhynchus mykiss*	*Daphnia magna*	*Raphidocelis subcapitata*
Endpoint (µg/L)		LC_{50} 632	E_rC_{50} 5000	E_rC_{50} 1000
AF		100	100	10
RAC (µg product /L)		6.32	50	10
FOCUS Scenario	**PEC sw-max (µg/L)**			
Drift Swash Calculator				
1 m	6.4889	**1.02**	0.130	0.649
50% Drt	3.2445	0.51	-	-
5 m	~~0.524~~ 1.7589*	0.08 0.28	-	-

*corrected according to Part B8

For the intended use in cereals, calculated PEC/RAC ratios for the formulation GLOB2111F indicate an acceptable risk at the edge of the field with the use of a 5 meters no-spray buffer zone or 50% drift reduction nozzle.

9.5.3 Overall conclusions

The calculated FOCUS Steps 1 to 4 PEC/RAC ratios for GLOB2111F and the active substance bixafen are all above the Annex VI trigger values, indicating that GLOB2111F poses low acute and chronic risk to aquatic organisms when the following risk mitigation measures are respected:

5 meters no-spray buffer zone or the use of 50% (scenarios D3, D4, D6, R1 and R4) or 75% (scenarios D1, D2, D5 and R3) drift-reduction nozzle, depending on the relevant scenarios.

zRMS comments:
Bixafen
The risk assessment was performed based on the EU agreed endpoints, in accordance with the EFSA Journal 2012;10(11):2917, and FOCUS Step 1 to 4 PECsw values accepted in Section B8.

For winter cereals all PEC/RAC ratios are below trigger value of 1 with 5 m buffer zone or 50% drift reduction nozzle except R3 stream scenario.
For R3 stream scenario 5 m buffer zone or 75% drift reduction nozzle is required.

For spring cereals all PEC/RAC ratios are below trigger value of 1 with 5 m buffer zone or 50% drift reduction nozzle except D1 stream scenario.
For D1 stream scenario 5 m buffer zone or 75% drift reduction nozzle is required.

GLOB2111F/Starinta
For GLOB2111F tests on invertebrates and algae were provided by Applicant but no test with fish was

reported.
According to the Commission Regulation (EU) No 546/2011, point 10.2.1 Acute toxicity:
" Test shall be carried out on one species from each of the three/four groups of aquatic organisms, that is to say fish, aquatic invertebrates, algae…"
and
"Testing shall be performed where:
(a) the acute toxicity of the plant protection product cannot be predicted on the basis of the data for the active substance;.."

Given that:
- the formulation contains only one active substance and
- based on the aquatic acute data for active substance, the toxicity of bixafen to fish and algae is in the same range of magnitude,
- results of studies performed with the formulation on daphnia and algae did not show higher or unexpected toxicity than predicted based on the results of the active substance,
- formulation endpoint for fish was calculated based on the available data from all individual components of the formulation by means of the concentration addition model (CA model)

it can be assumed that acute toxicity to fish for formulation can be predicted on the basis of the data for the active substance and the risk assessment for fish for active substance is applicable to the assessment of the formulated product. Additionally, taking into consideration Article 62 of Regulation 1107/2009 and because of animal welfare regarding to studies on vertebrates, no acute fish study with the formulation is considered necessary.

The PEC/RAC ratios are below trigger value of 1 with 5 m buffer zone or 50% drift reduction nozzle.

Conclusion:
According to the performed risk assessment there is no potential of risk for aquatic organisms resulting from acute and long-term exposure to active substance following use of GLOB2111F in compliance with proposed GAP when risk mitigation measures were applied.

The appropriate risk mitigation measures should be considered at national level. If it is necessary Member states will need to further consider the risk to aquatic organisms based on national requirements.

9.6 Effects on bees (KCP 10.3.1)

9.6.1 Toxicity data

Studies on the toxicity to bees have been carried out with bixafen. Full details of these studies are provided in the respective EU DAR and related documents.

Effects on bees of GLOB2111F were not evaluated as part of the EU assessment of bixafen. New data submitted with this application are listed in Appendix 1 and summarised in Appendix 2.

The selection of studies and endpoints for the risk assessment deviates from the results of the EU review process. Justifications are provided below.

Table 9.6-1: Endpoints and effect values relevant for the risk assessment for bees

Species	Substance	Exposure System	Results	Reference
Apis mellifera	Bixafen	Acute, oral	LD_{50} > 121.4 µg a.s./bee	Schmitzer, 2005 EFSA Journal 2012; 10(11):2917
Apis mellifera	Bixafen	Acute, contact	LD_{50} > 100 µg a.s./bee	
Apis mellifera	GLOB2111F	Acute, oral	LD_{50} = 100 µg product/bee $_{nom}$ LD_{50} = 64 µg product/bee $_{mm}$	Orosz, 2023 22/139-116MT
Apis mellifera	GLOB2111F	Acute, contact	LD_{50} > 100 µg product/bee	
Bombus terrestris	GLOB2111F	Acute, oral	LD_{50} > 100 µg product/bee	Orosz, 2023 22/139-116MTB
Bombus terrestris	GLOB2111F	Acute, contact	LD_{50} > 100 µg product/bee	
Apis mellifera	GLOB2111F	Adult oral, 10 d	LD_{50} > 1000 mg product/kg (eq. to > 124 mg a.s./kg) LDD_{50} = 109 µg product/bee/day (eq. to 13.5 µg a.s./bee/day) NOEC = 313 mg product/kg (eq. to 38.8 mg a.s./kg) NOEDD = 28.9 µg product/bee/day (eq. to 3.6 µg a.s./bee/day)	Orosz, 2023 22/139-134MT
Apis mellifera	GLOB2111F	Larval oral, 22 d	LC_{50} > 650 mg product/kg food (eq. to > 80.60 mg a.s./kg food) LD_{50} > 100 µg product/bee (eq. to 12.40 µg a.s./bee) NOEC > 650 mg product/kg food (eq. to > 80.60 mg a.s./kg food) NOED > 100 µg product/bee (eq. to > 12.40 µg a.s./bee) LC_{10} = 40.983 mg product/kg food (eq. to 5.08 mg a.s./kg food) LD_{10} = 6.3 µg product/bee (eq. to 0.78 µg a.s./bee)	Wozniak, 2023 0064/0026/E

9.6.1.1 Justification for new endpoints

GLOB2111F was not the representative formulation during the Annex 1 inclusion of the active substance bixafen. Therefore, toxicity to honeybees from the formulation was tested and used in the risk assessment.

9.6.2 Risk assessment

The evaluation of the risk for bees was performed in accordance with the recommendations of the "Guidance Document on Terrestrial Ecotoxicology", as provided by the Commission Services (SANCO/10329/2002 rev.2 (final), October 17, 2002).

To achieve a concise risk assessment, the risk envelope approach is applied. Here, the assessment for the use group 1 also covers the risk from all other intended uses in groups (see 9.1.2).

9.6.2.1 Hazard quotients for bees

The acute risk to honey bees from use of GLOB2111F was assessed using the maximum single application rate and the LD_{50} values to calculate hazard quotients *(EPPO 2010)* as follows:

$$Hazard\ Quotient = \frac{Maximum\ application\ rate\ (g\ formulation/ha)}{Acute\ LD_{50}\ (\mu g\ formulation/bee)}$$

Hazard quotients were calculated for oral exposure (Q_{HO}) and contact exposure (Q_{HC}) to GLOB2111F. A hazard quotient of less than 50 indicates a low risk to bees in the field.

Table 9.6-2: First-tier assessment of the risk for bees due to the use of GLOB2111F in winter cereals (use group 1)

Intended use	Cereals		
Active substance	Bixafen		
Application rate (g/ha)	1 × 125		
Test design	**LD_{50} (lab.) (µg/bee)**	**Single application rate (g/ha)**	**Q_{HO}, Q_{HC} criterion: $Q_H \leq 50$**
Oral toxicity	> 121.4	125	1.03
Contact toxicity	> 100		1.25
Product	GLOB2111F		
Application rate (g/ha)	1 × 1006 g a.s./ha*		
Test design	**LD_{50} (lab.) (µg/bee)**	**Single application rate (g/ha)**	**Q_{HO}, Q_{HC} criterion: $Q_H \leq 50$**
Oral toxicity	64	1006	15.72
Contact toxicity	> 100		10.06

Q_{HO}, Q_{HC}: Hazard quotients for oral and contact exposure. Q_H values shown in bold breach the relevant trigger.
*Based on a product density = 1.006 g/mL.

All the hazard quotients are considerably less than 50, indicating that GLOB2111F poses a low acute risk to honey bees. Therefore, a low acute risk to bees is expected from the application of GLOB2111F.

9.6.3 Chronic risk assessment (KCP 10.3.1.2)

The chronic risk assessments were only performed using the endpoints of the studies with the formulated product, since these are worst case compared to the endpoints of the studies with the active substances.

9.6.3.1 Larval chronic risk assessment

A chronic larval study is available and the potential acceptable risk can be further demonstrated by carrying out a worst-case risk assessment through the calculation of a TER value as set out in the modified EPPO 2010 approach according to the ECPA proposal of 9 June 2017 (POS/17/LO/28028).

A worst-case of potential exposure via residues in pollen and nectar can be estimated based on the default worst-case residue of 1 mg a.s./kg proposed in the EPPO 2010 scheme, based on a database of measured values from aerial plant parts, as a surrogate for nectar and pollen.

The default residues can then be combined with a measure of consumption in order to estimate the exposure. Worst case data from *Rortais et al., 2005*[1], as proposed in the EPPO scheme, have been used to estimate the consumption by bee larvae:

Worker larvae consuming 59.4 mg sugar in 5 days Assuming 30% sugar content of nectar the worst-case consumption with worker larvae is:

59.4/0.30 = 198 mg nectar in 5 days.

In addition worker larvae are considered to consume 2 mg pollen during their development phase (EFSA 2013).

Thus considering the mean RUD values for nectar and pollen in EFSA 2013 exposure can be estimated for the whole development period.

Nectar dose: 0.125 x 2.9 x 198/1000 = 0.0718 µg/larva
Pollen dose: 0.125 x 6.1 x 2/1000 = 0.00153 µg/larva

Total exposure ETE = 0.073 µg/larvae (as a default worst-case residue at 0.1 kg a.s./ha)

This can be compared to the larval NOED of 0.78 µg a.s./larva.

TER = NOEDD (µg/larva)/ ETE (µg/larva) = 0.78/0.073= 10.64

The EPPO 2010 scheme proposes a trigger of 1 for assessment of the chronic risk to honey bees. It is clear that with a TER value of 10.64, the proposed use of GLOB2111F poses an acceptable risk to bee larval development.

~~The risk assessment was also conducted according to the "EFSA Guidance Document on the risk assessment of plant protection products on bees (*Apis mellifera*, *Bombus* spp. and solitary bees)" (EFSA Journal 2013;11(7):3295).~~

~~*Chronic oral exposure larvae (liquid formulations):*~~

~~Screening step assessment for spray applications:~~

~~ETR = AR x SV / NOEL = 1.01 x 4.4 / 6.3 = 0.71~~

~~The protection goal is met as the calculated value is below the trigger value of 0.2. Therefore, a refined risk assessment is needed.~~

~~Treated crop:~~
~~$ETR_{chronic\ larva}$ = AR x Ef x SV x TWA / NOEL = 1.01 x 1 x 0.15 x 0.85 / 6.3 = 0.02~~

~~Adjacent crop:~~
~~$ETR_{chronic\ larva}$ = AR x Ef x SV x TWA / NOEL = 1.01 x 0.0033 x 4.4 x 0.85 / 6.3 = 0.002~~

~~Weeds in the treated field:~~
~~$ETR_{chronic\ larva}$ = AR x Ef x SV x TWA / NOEL = 1.01 x 0.5 x 2.2 x 0.85 / 6.3 = 0.15~~

[1] Agnès RORTAIS, Gérard ARNOLD, Marie-Pierre HALM, Frédérique TOUFFET-BRIENS (2005). Modes of honeybees exposure to systemic insecticides: estimated amounts of contaminated pollen and nectar consumed by different categories of bees. Apidologie 36 (2005) 71–83

~~Plants in the field margin:~~
~~$ETR_{chronic\ larva}$ = AR x Ef x SV x TWA / NOEL = 1.01 x 0.0092 x 2.2 x 0.85 / 6.3 = 0.003~~

~~Succeeding crops:~~
~~$ETR_{chronic\ larva}$ = AR x Ef x SV x TWA / NOEL = 1.01 x 1 x 0.4 x 0.85 / 6.3 = 0.05~~

~~The protection goal is met for all scenarios as the calculated value is below the trigger value of 0.2.~~

9.6.3.2 Adult chronic risk assessment

The adult chronic risk assessment is performed using the modified EPPO 2010 approach according to the ECPA proposal of 9 June 2017 (POS/17/LO/28028).

This is based upon the method of EPPO 2010 risk assessment for systemic substances which is cited in the regulation as a current risk assessment scheme. It uses NOEDD values for the endpoint so avoids the issues associated with the generation of LDD_{50} values for substances of low toxicity, and calculates exposure in a similar way to EFSA 2013. The approach is also in line with other chronic risk assessments (e.g. birds and mammals). EPPO 2010 recommended the calculation of a TER using the following equation:

TER = NOEDD/daily dose

Where daily dose (DD) is based on the worst case a sugar need of 128 mg/bee/day (Rortais et al 2005) of a bee feeding exclusively from nectar containing 30% sugar using the following equation:

Daily dose (µg a.i./bee) = A.R. x [128 mg/(1000 x0.3)] x RUD = 0.125 x [128/(1000x0.3)] x 2.9 = 0.1547 µg/bee

A.R. = application rate in kg a.i./ha
RUD = residue per unit dose from the EFSA bee guidance. Mean RUD_{nectar} = 2.9 mg a.i./kg (foliar sprays).

TER = NOEDD/daily dose = 13.52/0.1547 = 87.41

The EPPO 2010 scheme proposes a trigger of 1 for assessment of the chronic risk to honey bees. It is clear that with a TER value of 87.41, the proposed use of GLOB117H pose an acceptable chronic risk to adult bees.

~~The risk assessment was also conducted according to the "EFSA Guidance Document on the risk assessment of plant protection products on bees (*Apis mellifera*, *Bombus* spp. and solitary bees)" (EFSA Journal 2013;11(7):3295).~~

~~*Chronic oral exposure adult bees (liquid formulations):*~~

~~Screening step assessment for spray applications:~~

~~ETR = AR x SV / 10d LDD_{50} = 1.10 x 7.6 / 109 = 0.070~~

~~The protection goal is not met as the calculated value is greater than the trigger value of 0.03. Therefore, a refined risk assessment is needed.~~

~~Treated crop:~~
~~$ETR_{chronic\ adult\ oral}$ = AR x Ef x SV x TWA / LD_{50oral} = 1.01 x 1 x 0.92 x 0.72 / 109 = 0.006~~

~~Adjacent crop:~~

~~$ETR_{chronic\ adult\ oral}$ = AR x Ef x SV x TWA / LD_{50oral} = 1.01 x 0.0033 x 5.8 x 0.72 / 109 = <0.001~~

~~Weeds in the treated field:~~
~~$ETR_{chronic\ adult\ oral}$ = AR x Ef x SV x TWA / LD_{50oral} = 1.01 x 0.5 x 2.9 x 0.72 / 109 = 0.010~~

~~Plants in the field margin:~~
~~$ETR_{chronic\ adult\ oral}$ = AR x Ef x SV x TWA / LD_{50oral} = 1.01 x 0.0092 x 2.9 x 0.72 / 109 = <0.001~~

~~Succeeding crops:~~
~~$ETR_{chronic\ adult\ oral}$ = AR x Ef x SV x TWA / LD_{50oral} = 1.01 x 1 x 0.54 x 0.72 / 109 = 0.004~~

~~The protection goal is met for adjacent crops, on succeeding crops and plants in the field margin as the calculated value is below the trigger value of 0.03.~~

Screening level assessment and chronic first-tier risk assessment for bees according to EFSA's Bee Guidance Document (2013):

A screening assessment for acute toxicity to honey- and bumble bees as well as chronic toxicity to adult bees and bee larvae followed by a first tier assessment for chronic toxicity to adult bees has been conducted and is presented in the Tables below:

Table 9.6-21: Screening assessment of the risk for bees due to the use of GLOB2111F according to the proposed use pattern

Type of assessment	Species	Endpoint	SV*	HQ/ETR	Trigger
Screening level assessment: Field crops – application rate of 1 × 1006 g product/ha					
Acute contact	*Apis mellifera*	100 µg product/bee	n.a.	10.1	HQ >42
Acute oral		60 µg product/bee	7.6	0.12	ETR >0.2
Acute contact	*Bombus terrestris*	100 µg product/bee	n.a.	**10.1**	HQ >7
Acute oral		100 µg product/bee	11.2	**0.11**	ETR >0.036
Chronic adult, oral	*Apis mellifera*	109 µg product/bee/day	7.6	**0.070**	ETR >0.03
Chronic larvae, oral	*Apis mellifera*	100 µg product/bee	4.4	0.04	ETR >0.2

HQ/ETR values shown in bold breach the relevant trigger.
* SV: Shortcut value for down-ward application
n.a. Not applicable

In the screening assessment an acceptable risk for honey bees was demonstrated for all scenarios except for the chronic adult bees and for bumble bees acute oral and acute contact, therefore a first-tier assessment has been conducted (Table 9.6-22 and 9.6-23).

Table 9.6-22: First tier assessment of the chronic risk for adult honey bees due to the use of bixafen as contained in GLOB2111F according to the proposed use pattern

Scenario	Species	Endpoint	Ef	SV	TWA	ETR	Trigger
Tier 1 assessment – Field crops BBCH 30-39, application rate of 1 × 1.006 kg a.s./ha							
Treated crop	*Apis mellifera*	LDD_{50} = 109 µg product/bee/day	1	0.92	0.72	0.006	ETR > 0.03
Weeds [a]			0.5	2.9		0.010	
Field margin			0.0092	2.9		0.000	
Adjacent crop			0.0033	5.8		0.000	
Succeeding crop			1	0.54		0.004	
Tier 1 assessment – Field crops BBCH 40-69, application rate of 1 × 1.006 kg a.s./ha							
Treated crop	*Apis mellifera*	LDD_{50} = 109 µg product/bee/day	1	0.92	0.72	0.006	ETR > 0.03
Weeds [a]			0.3	2.9		0.006	
Field margin			0.0092	2.9		0.000	
Adjacent crop			0.0033	5.8		0.000	
Succeeding crop			1	0.54		0.004	

Ef: Exposure factor
SV: Shortcut value for down-ward application
TWA: Time weighted average factor based on a default DT_{50} of 10 days and a 10-day time window
[a] Weeds after emergence assessed as a worst-case scenario

The first-tier risk assessment indicates an acceptable chronic risk to honeybees from the use of bixafen as contained in GLOB2111F on field crops for all scenarios.

Table 9.6-23: First tier assessment of the acute oral risk for *Bombus terrestris* due to the use of GLOB2111F according to the proposed use pattern

Scenario	Species	Endpoint	Ef	SV	TWA	ETR	Trigger
Tier 1 assessment – Field crops BBCH 30-39, application rate of 1 × 1.006 kg a.s./ha							
Treated crop	*Bombus terrestris*	LD_{50} > 100 µg product/bee	1	2.3	1	0.0231	ETR > 0.36
Weeds [a]			0.5	6.5		0.0327	
Field margin			0.0092	6.5		0.0006	
Adjacent crop			0.0033	11.2		0.0004	
next crop			1	0.9		0.0091	
Tier 1 assessment – Field crops BBCH 40-69, application rate of 1 × 1.006 kg a.s./ha							

Treated crop	*Bombus terrestris*	LD_{50} > 100 µg product/bee	1	2.3	1	0.0231	ETR > 0.36
Weeds [a]			0.3	6.5		0.0196	
Field margin			0.0092	6.5		0.0006	
Adjacent crop			0.0033	11.2		0.0004	
next crop			1	0.9		0.0091	

Ef: Exposure factor
SV: Shortcut value for down-ward application
TWA: Time weighted average factor based on a default DT_{50} of 10 days and a 10-day time window
[a] Weeds after emergence assessed as a worst-case scenario

Table 9.6-23: First tier assessment of the acute contact risk for *Bombus terrestris* due to the use of GLOB2111F according to the proposed use pattern

Scenario	Species	Endpoint	Ef	HQ	Trigger
Tier 1 assessment – Field crops BBCH 30-39, application rate of 1 × 1.006 kg a.s./ha					
Treated crop	*Bombus terrestris*	LD_{50} > 100 µg product/bee	0	**10.1**	ETR > 7
Weeds [a]			0.5	5.0	
Field margin			0.028	0.3	
Tier 1 assessment – Field crops BBCH >40, application rate of 1 × 1.006 kg a.s./ha					
Treated crop	*Bombus terrestris*	LD_{50} > 100 µg product/bee	0	**10.1**	ETR > 7
Weeds [a]			0.3	3.0	
Field margin			0.028	0.3	

Ef: Exposure factor
SV: Shortcut value for down-ward application
TWA: Time weighted average factor based on a default DT_{50} of 10 days and a 10-day time window
[a] Weeds after emergence assessed as a worst-case scenario

The first-tier risk assessment indicates an acceptable acute risk to bumble bees from the use of bixafen as contained in GLOB2111F on field crops for all scenarios except acute contact in treated crops. Nevertheless, the acute contact toxicity value is higher than 100 µg product/bee and no mortality or other adverse effects were observed during the study at the highest tested dose, so it can be assumed with a high degree of probability that the risk to bumble bees in treated crops is acceptable.

9.6.3.3 Higher-tier risk assessment for bees (tunnel test, field studies)

Not relevant.

9.6.4 Effects on bumble bees

The acute risk to bumble bees from use of GLOB2111F was assessed using the maximum single application rate and the LD_{50} values to calculate hazard quotients ***(EPPO 2010)*** as follows:

$$Hazard\ Quotient = \frac{Maximum\ application\ rate\ (g\ formulation/ha)}{Acute\ LD_{50}\ (\mu g\ formulation/bee)}$$

Hazard quotients were calculated for oral exposure (Q_{HO}) and contact exposure (Q_{HC}) to GLOB2111F. A hazard quotient of less than 50 indicates a low risk to bees in the field.

Table 9.6-2: First-tier assessment of the risk for bees due to the use of GLOB2111F in winter cereals (use group 1)

Intended use	Cereals		
Product	GLOB2111F		
Application rate (g/ha)	1 × 1006 g a.s./ha*		
Test design	**LD_{50} (lab.) (µg/bee)**	**Single application rate (g/ha)**	**Q_{HO}, Q_{HC} criterion: $Q_H \leq 50$**
Oral toxicity	> 100	1006	10.06
Contact toxicity	> 100		10.06

Q_{HO}, Q_{HC}: Hazard quotients for oral and contact exposure. Q_H values shown in bold breach the relevant trigger.
*Based on a product density = 1.006 g/mL.

All the hazard quotients are considerably less than 50, indicating that GLOB2111F poses a low acute risk to bumble bees. Therefore, a low acute risk to bees is expected from the application of GLOB2111F.

9.6.5 Effects on solitary bees

Not required.

9.6.6 Overall conclusions

Risk assessment based on SANCO/10329/2002 rev. 2 (final): HQ values for oral and dermal exposure are below the relevant trigger. Therefore, it can be assumed that the intended uses of GLOB2111F represent low risk exposure to honey bees and bumble bees.

Risk assessment based on EPPO (2010): The chronic TERs for honey bee adults and larvae are higher than the trigger of 1, indicating that the proposed uses according to the intended GAP of GLOB2111F poses an acceptable chronic risk to honey bee larvae and adults.

Risk assessment based on EFSA bee GD (EFSA Journal 2013;11(7):3295): Acceptable chronic risk was demonstrated for adult honey bees, and larvae for all intended uses.

zRMS Comments:

The submitted risk assessment is based on the recommendations of the Guidance Document on Terrestrial Ecotoxicology (SANCO/10329/2002 rev 2) and new EU guidance (2013).

The Applicant submitted studies on chronic toxicity of formulation Starinta (GLOB2111F) to adult bees and larvae. New studies were accepted. Therefore, the requirements set out in Regulation 284/2013 are considered fulfilled.

The acute risk assessment performed in accordance with the SANCO guidance presented by the Applicant was accepted.

There is currently no EU agreed chronic risk assessment scheme for bees. However, as agreed in the Central Zone a risk assessment based on the EFSA bee GD is presented below for illustrative purposes.

Effects on bumble bees
The Applicant submitted studies on acute toxicity of formulation Starinta (GLOB2111F) to bumble bees. New studies were accepted

Effects on solitary bees
No data with the active substances or the formulated product is available.

An acceptable risk to bees of the formulation Starinta (GLOB2111F) can be concluded, based on the risk assessment scheme of the Guidance Document on Terrestrial Eco-toxicology (SANCO/10329/2002 rev 2).

Conclusion:

An acceptable risk to bees of the formulation Starinta (GLOB2111F) can be concluded, based on the EFSA bee GD (EFSA Journal 2013;11(7):3295). The risk assessment performed in accordance with EFSA guidance (2013) will be considered at the Member State level according to national requirements.

9.7 Effects on arthropods other than bees (KCP 10.3.2)

9.7.1 Toxicity data

Studies on the toxicity to non-target arthropods have been carried out with bixafen. Full details of these studies are provided in the respective EU DAR and related documents.

Effects on non-target arthropods of GLOB2111F were not evaluated as part of the EU assessment of bixafen. New data submitted with this application are listed in Appendix 1 and summarised in Appendix 2.

Table 9.7-1: Endpoints and effect values relevant for the risk assessment for non-target arthropods

Species	Substance	Exposure System	Results	Reference
Typhlodromus pyri (protonymphs)	GLOB2111F	Extended laboratory test bean leaves (2D)	LR_{50} > 2 L/ha ER_{50} > 2 L/ha	Kulec-Płoszczyca, 2023 ETOX-2023-30
Aphidius rhopalosiphi (adults)	GLOB2111F	Extended laboratory test barley plants (3D)	LR_{50} > 2 L/ha ER_{50} > 2 L/ha	Orovecz, 2023 22/139-351FD
Chrysoperla carnea	GLOB2111F	Extended laboratory test	LR_{50} > 2 L/ha ER_{50} > 2 L/ha	Kubisiak, 2023 0064/0028/E

Species	Substance	Exposure System	Results	Reference
		bean leaves (2D)		
Coccinella septempuntata	GLOB2111F	Extended laboratory test bean leaves (2D)	LR_{50} > 2 L/ha ER_{50} > 2 L/ha	Domagała, 2023 0064/0027/E

9.7.1.1 Justification for new endpoints

GLOB2111F was not the representative formulation during the Annex 1 inclusion of the active substance bixafen. Therefore, toxicity to non-target arthropods from the formulation was tested and used in the risk assessment.

9.7.2 Risk assessment

The evaluation of the risk for non-target arthropods was performed in accordance with the recommendations of the "Guidance Document on Terrestrial Ecotoxicology", as provided by the Commission Services (SANCO/10329/2002 rev.2 (final), October 17, 2002), and in consideration of the recommendations of the guidance document ESCORT 2.

To achieve a concise risk assessment, the risk envelope approach is applied. Here, the assessment for the use group 1 also covers the risk for non-target arthropods from all other intended uses in groups (see 9.1.2).

9.7.2.1 Risk assessment for in-field exposure

Non-target arthropods living in the crop can be exposed to residues from GLOB2111F by direct contact either as a result of overspray or through contact with residues on plants and soil or in food items. GLOB2111F is applied at a maximum rate of 1 x 1 L formulation/ha in cereals. The in-field exposure (predicted environmental residue, PER) is calculated according to ESCORT 2 using the following equation:

$$PER_{in-field} = Application\ \text{rate (L fp/ha)} \times \text{MAF}$$

The MAF is a generic multiple application factor, which is used to take into account the potential build-up of applied substances between applications based on the application interval, DT_{50} value and number of applications. As GLOB 2111F is applied only once a season, a MAF of one is used for the risk assessment.

The potential risk of GLOB2111F to in-field non-target arthropods was assessed by calculation of the hazard quotient (HQ = exposure/toxicity) with the predicted environmental rate (PER) and the lowest lethal rate (LR_{50}) values according to the following formula:

$$\text{In field HQ} = \frac{\text{In-field PER}}{LR_{50}}$$

The HQ trigger for Tier II extended laboratory studies 1. The resulting $HQ_{in\text{-}field}$ values are presented in Table 9.7-2.

Table 9.7-2: First- and higher-tier assessment of the in-field risk for non-target arthropods due to the use of GLOB2111F in winter cereals (use group 1)

Intended use	Cereals
Active substance/product	GLOB2111F
Application rate (g/ha)	1 × 1 L/ha
MAF	1.0

Test species Higher-tier	**Rate with ≤ 50 % effect* (mL/ha)**	**$PER_{in\text{-}field}$ (mL/ha)**	**$PER_{in\text{-}field}$ below rate with ≤ 50 % effect?**
Typhlodromus pyri	> 2000	1000	yes
Aphidius rhopalosiphi	> 2000	1000	yes
Chrysoperla carnea	> 2000	1000	yes
Coccinella septempuntata	> 2000	1000	yes

MAF: Multiple application factor; PER: Predicted environmental rate; HQ: Hazard quotient; DALT: Days after last treatment.
Criteria values shown in bold breach the relevant trigger.

* If an LR_{50} or ER_{50} from a relevant extended laboratory test is available, it should be considered in place of the rate with ≤ 50 % effect.

The in-field HQ values for exposure to maximum residues for the representative species *Aphidius rhopalosiphi, Typhlodromus pyri, Chrysoperla carnea and Coccinella septempuntata* are less than the ESCORT 2 trigger value of 1 for the Tier II studies.

9.7.2.2 Risk assessment for off-field exposure

Risk assessment of areas immediately surrounding the crop is considered important since these areas represent a natural reservoir for immigration, emigration and reproduction of arthropod populations and provide increased species diversity. Exposure of non-target arthropods living in off-field areas to GLOB2111F will mainly be due to spray drift from field applications. Off-field areas are assumed to be densely vegetated and thus spray drift is unlikely to reach bare ground. Therefore, evaluation of exposure *via* soil residues in off-field areas was not considered. Off-field foliar PER values were calculated from in-field foliar PERs in conjunction with drift values published by the *BBA (2000)*[2] as shown in the following equation:

$$\text{Off- field foliar PER} = \frac{\text{Maximum in-field foliar PER x (\% drift/100)}}{\text{vegetation distribution factor}}$$

Vegetation distribution factor: The model used to estimate spray drift was developed for drift onto a two-dimensional water surface and, as such, does not account for interception and dilution by three-dimensional vegetation in off-crop areas. Therefore, a vegetation distribution or dilution factor is incorporated into the equation when calculating PERs to be used in conjunction with toxicity endpoints derived from two-dimensional (glass plate or leaf disc) studies.

[2] BBA (2000): Bundesanzeiger Jg. 52 (Official Gazette), Nr 100, S. 9879-9880 (25.05.2000) Bekanntmachung über die Abtrifteckwerte, die bei der Prüfung und Zulassung von Pflanzenschutzmitteln herangezogen werden

The drift value at 1 m distance is 2.77 % of the application rate (90th percentile drift). The drift factor (% drift/100) is therefore 2.77 / 100 = 0.0277.

In order to assess the potential risk of GLOB2111F to off-field non-target arthropods, the predicted environmental rate is compared with the toxicity endpoints according to the following formula:

$$\text{Off-field HQ} = \frac{PER_{off-field}\ (\text{g/ha})}{LR_{50}\ (\text{g/ha})} \times Correction\ \text{factor}$$

The HQ trigger for Tier II extended laboratory studies is 1.

Correction factor: ESCORT 2 recommends that a correction factor of 5 be used when assessing Tier II data, or 10 for Tier I data, to account for extrapolation from testing just 2 representative species, to the species diversity expected in off-crop areas.

Table 9.7-3: First- and higher-tier assessment of the off-field risk for non-target arthropods due to the use of GLOB2111F in winter cereals (use group 1)

Intended use	Winter cereals
Active substance/product	GLOB2111F
Application rate (mLha)	1 × 1000 mL/ha
MAF	1
vdf	10 (Tier II)

Test species Tier II	**LR_{50} (lab.) (mLha)**	**Drift rate**	**$PER_{off-field}$ (mL/ha)**	**CF**	**$HQ_{off-field}$ criterion: HQ ≤ 2**
Typhlodromus pyri	> 2000	0.0277	2.77	5	0.007
Aphidius rhopalosiphi	> 2000				0.007
Chrysoperla carnea	> 2000				0.007
Coccinella septempuntata	> 2000				0.007

MAF: Multiple application factor; vdf: Vegetation distribution factor; (corr.) PER: (corrected) Predicted environmental rate; CF: Correction factor; HQ: Hazard quotient. Criteria values shown in bold breach the relevant trigger.

* If an LR_{50} or ER_{50} from a relevant extended laboratory test is available, it should be considered in place of the rate with ≤ 50 % effect.

9.7.2.3 Additional higher-tier risk assessment

Not relevant.

9.7.2.4 Risk mitigation measures

No risk mitigation needed.

9.7.3 Overall conclusions

The PER values all fall below the relevant trigger value indicating an acceptable risk for non-target arthropods for the intended use of GLOB2111F.

zRMS Comments:
The submitted risk assessment based on the "Guidance Document on Terrestrial Ecotoxicology" (2002) was accepted.

Acceptable risk may be concluded for in-field and off-field populations of non-target arthropods from the intended uses of Starinta (GLOB2111F).

Conclusion:
The risk to arthropods other than bees is acceptable if the Starinta (GLOB2111F) is applied in accordance with proposed use pattern.

9.8 Effects on non-target soil meso- and macrofauna (KCP 10.4)

9.8.1 Toxicity data

Studies on the toxicity to earthworms and other non-target soil organisms (meso- and macrofauna) have been carried out with bixafen. Full details of these studies are provided in the respective EU DAR and related documents.

Effects on earthworms and other non-target soil organisms (meso- and macrofauna) of GLOB2111F were not evaluated as part of the EU assessment of bixafen. New data submitted with this application are listed in Appendix 1 and summarised in Appendix 2.

Table 9.8-1: Endpoints and effect values relevant for the risk assessment for earthworms and other non-target soil organisms (meso- and macrofauna)

Species	Substance	Exposure System	Results	Reference
Eisenia fetida	Bixafen	Acute 14d, 5% peat	$LC_{50.corr}$ > 500 mg/kg dw*	Lührs, 2006a EFSA Journal 2012; 10(11):2917
Eisenia fetida	Bixafen	Chronic 56d, 5% peat	$NOEC_{corr}$ = 50 mg/kg dw*	Lührs, 2006b EFSA Journal 2012; 10(11):2917
Folsomia candida	Bixafen (formulated as Bixafen EC125)	Chronic 28d	$NOEC_{corr}$ = 3.87 mg/kg dw dw*	Lührs, 2007 EFSA Journal 2012; 10(11):2917
Hypoaspis aculeifer	Bixafen (formulated as Bixafen EC125)	Chronic 14d	$NOEC_{corr}$ = 3.08 mg/kg*	Kratz, 2007 EFSA Journal 2012; 10(11):2917
Eisenia fetida	GLOB2111F	Mixed into substrate 56 d, chronic 10 % peat content	$NOEC_{corr}$ > 500 mg/kg dw*	Orosz, 2023a 22/139-211G
Folsomia candida	GLOB2111F	Mixed into substrate / Overspray 21 d, chronic 5 % peat content	$NOEC_{corr}$ = 8.55 mg/kg dw*	Orosz, 2023b 22/139-130CO
Hypoaspis aculeifer	GLOB2111F	Mixed into substrate 14 d, chronic	NOEC > 500 mg/kg dw*	Orosz, 2023c 22/139-389TLA

Species	Substance	Exposure System	Results	Reference
		5 % peat content		

* Corrected value derived by dividing the endpoint by a factor of 2 in accordance with the EPPO earthworm scheme 2002.

9.8.1.1 Justification for new endpoints

EU agreed endpoints were used in the risk assessment. No deviations were made.

9.8.2 Risk assessment

The evaluation of the risk for earthworms and other non-target soil organisms (meso- and macrofauna) was performed in accordance with the recommendations of the "Guidance Document on Terrestrial Ecotoxicology", as provided by the Commission Services (SANCO/10329/2002 rev 2 (final), October 17, 2002).

9.8.2.1 First-tier risk assessment

The relevant PEC_{soil} for risk assessments covering the proposed use pattern are taken from Section 8 (Environmental Fate), Chapter 8.7.2, Table 8.7-3. According to the assessment of environmental-fate data, multi-annual accumulation in soil is considered for bixafen.

To achieve a concise risk assessment, the risk envelope approach is applied. Here, the assessment for the use group 1 also covers the risk for earthworms and other non-target soil organisms (meso- and macrofauna) from all other intended uses in groups (see 0).

Table 9.8-2: First-tier assessment of the acute and chronic risk for earthworms and other non-target soil organisms (meso- and macrofauna) due to the use of GLOB2111F in winter cereals (use group 1)

Intended use	Winter cereals		
Acute effects on earthworms			
Product/active substance	**LC_{50} (mg/kg dw)**	**PEC_{soil} (mg/kg dw)**	**TER_a (criterion TER ≥ 10)**
Bixafen	> 500	0.0462	10822.5
Chronic effects on earthworms			
Product/active substance	**NOEC (mg/kg dw)**	**PEC_{soil} (mg/kg dw)**	**TER_{lt} (criterion TER ≥ 5)**
Bixafen	50	0.0462	1082.3
GLOB2111F	> 500	0.268	1865.7
Chronic effects on collembolan			
Product/active substance	**NOEC (mg/kg dw)**	**PEC_{soil} (mg/kg dw)**	**TER_{lt} (criterion TER ≥ 5)**
Bixafen	3.87	0.0462	83.8
GLOB2111F	8.55	0.268	31.9
Chronic effects on *Hypoaspis aculeifer*			

Product/active substance	**NOEC (mg/kg dw)**	**PEC_{soil} (mg/kg dw)**	**TER_{lt} (criterion TER ≥ 5)**
Bixafen	3.08	0.0462	66.7
GLOB2111F	> 500	0.268	1865.7

TER values shown in bold fall below the relevant trigger.

9.8.2.2 Higher-tier risk assessment

Not relevant.

9.8.3 Overall conclusions

The TER values ~~together with the higher tier field study~~ indicate an acceptable risk for earthworms and other non-target soil organisms for the intended use of GLOB2111F.

zRMS comments:

Acute risk assessment for earthworms is no longer required.

For the risk assessment the EU agreed endpoints for bixafen, formulation toxicity data and the PECsoil values, accepted in Part B8, were used.

All TER values are above the trigger value of 5.

Conclusion
According to the performed risk assessment there is low chronic risk to earthworms and other non-target organisms resulting from long-term exposure to active substance following use of GLOB2111F in compliance with proposed GAP.

9.9 Effects on soil microbial activity (KCP 10.5)

9.9.1 Toxicity data

Studies on effects soil microorganisms have been carried out with bixafen. Full details of these studies are provided in the respective EU DAR and related documents.

Effects on soil microorganisms of GLOB2111F were not evaluated as part of the EU assessment of bixafen. New data submitted with this application are listed in Appendix 1 and summarised in Appendix 2.

Table 9.9-1: Endpoints and effect values relevant for the risk assessment for soil microorganisms

Endpoint	**Substance**	**Exposure System**	**Results**	**Reference**
N-mineralisation	Bixafen	28 d, aerobic soil type	≤ 25% inhibition at 1.67mg a.s./kg dw soil	Lechelt-Kunze, 2005 EFSA Journal 2012; 10(11):2917

Endpoint	Substance	Exposure System	Results	Reference
N-mineralisation	GLOB2111F	28 d, aerobic soil type	≤ 25% inhibition at 13.6 mg/kg dw soil	Adamcsik, 2023 22/139-055AN

9.9.1.1 Justification for new endpoints

EU agreed endpoints were used in the risk assessment. No deviations were made.

9.9.2 Risk assessment

The evaluation of the risk for soil microorganisms was performed in accordance with the recommendations of the "Guidance Document on Terrestrial Ecotoxicology", as provided by the Commission Services (SANCO/10329/2002 rev 2 (final), October 17, 2002).
The relevant PEC_{soil} for risk assessments covering the proposed use pattern are taken from Section 8 (Environmental Fate), Chapter 8.7.2, Table 8.7-3 and were already used in the risk assessment for earthworms and other non-target soil organisms (meso- and macrofauna) (see 9.8).

To achieve a concise risk assessment, the risk envelope approach is applied. Here, the assessment for the use group 1 also covers the risk for the soil microorganisms from all other intended uses in groups (see 0).

Table 9.9-2: Assessment of the risk for effects on soil micro-organisms due to the use of GLOB2111F in winter cereals (use group 1)

Intended use	Winter cereals		
N-mineralisation			
Product/active substance	**Max. conc. with effects ≤ 25 % (mg/kg dw)**	**PEC_{soil} (mg/kg dw)**	**Risk acceptable?**
Bixafen	1.67 (at 28 d)	0.0462	yes
GLOB2111F	13.6 (at 28 d)	0.268	yes

9.9.3 Overall conclusions

As both the $PEC_{soil,\ accumulation}$ of bixafen and the formulation are lower than the concentration at which no significant effects are detected, it can be concluded that the risk of GLOB2111F to soil micro-organisms is acceptable in accordance with the intended use.

zRMS comments:

For the assessment of risk to micro-organisms for formulation the endpoint from study presented in Appendix 2 was used. For active substances the EU agreed endpoint was used.

The predicted environmental concentrations in soil (PECsoil) of the active substance and formulation, accepted in Part B8, were taken into account.

Conclusion:
Since no effects (> 25%) were seen at application rates far higher than the values of PECsoil for active substances and formulation it can be concluded that application of GLOB2111F, according to the GAP, will not cause any detrimental effect to soil micro-organisms.

9.10 Effects on non-target terrestrial plants (KCP 10.6)

9.10.1 Toxicity data

Studies on the toxicity to non-target terrestrial plants have been carried out with bixafen. Full details of these studies are provided in the respective EU DAR and related documents.

Effects on non-target terrestrial plants of GLOB2111F were not evaluated as part of the EU assessment of bixafen. New data submitted with this application are listed in Appendix 1 summarised in Appendix 2.

Table 9.10-1: Endpoints and effect values relevant for the risk assessment for non-target terrestrial plants

Species	Substance	Exposure System	Results	Reference
Avena sativa$_m$ *Zea mays*$_m$ *Brassica napus*$_d$ *Glycine max*$_d$ *Solanum lycopersicum*$_d$ *Fagopyrum acutatum*$_d$	GLOB2111F	Vegetative vigour	ER_{50} > 1000 mL/ha	Woźniak, 2023 0064/0044/E
Avena sativa$_m$ *Zea mays*$_m$ *Brassica napus*$_d$ *Glycine max*$_d$ *Solanum lycopersicum*$_d$ *Fagopyrum acutatum*$_d$	GLOB2111F	Seedling emergence	ER_{50} = 649.90 mL/ha *(Zea mays)*	Woźniak, 2023 0064/0043/E

m: monocotyledonous; d: dicotyledonous

9.10.1.1 Justification for new endpoints

GLOB2111F was not the representative formulation during the Annex 1 inclusion of the active substance bixafen. Therefore, toxicity to non-target plants from the formulation was tested and used in the risk assessment.

9.10.2 Risk assessment

9.10.2.1 Tier-1 risk assessment (based screening data)

Not relevant.

9.10.2.2 Tier-2 risk assessment (based on dose-response data)

The risk assessment is based on the “Guidance Document on Terrestrial Ecotoxicology”, (SANCO/10329/2002 rev.2 final, 2002). It is restricted to off-field situations, as non-target plants are non-crop plants located outside the treated area.

To achieve a concise risk assessment, the risk envelope approach is applied. Here, the assessment for the use group 1 also covers the risk for non-target terrestrial plants from all other intended uses in groups (see 0).

Effects on non-target plants are of concern in the off-field environment, where they may be exposed to spray drift. The amount of spray drift reaching off-crop habitats is derived by the *BBA (2000)*[3] from the spray-drift predictions of *Ganzelmeier & Rautmann (2000)*[4] as recommended by the "Guidance Document on Terrestrial Ecotoxicology under Council Directive 91/414/EEC, SANCO/10329/2002.

Consequently, the initial exposure assessment was based on air deposition following the application of GLOB2111F to areas adjacent to the field without and (if appropriate) with consideration of drift mitigation measures. Predicted exposure rates were calculated with the following formula:

$$PER_{off\text{-}field} = (Appl.\ rate \times Spray\ drift)$$

where PER = Predicted Environmental Rate (kg/ha or L/ha)
Appl. rate = rate of a single application expressed in the same units as the PER
Spray drift = % of the applied rate deposited to the off-field area by spray drift

Table 9.10-2: Assessment of the risk for non-target plants due to the use of GLOB2111F in winter cereals (use group 1)

Intended use	Winer cereals			
Active substance/product	GLOB2111F			
Application rate (mL/ha)	1 x 1000 mL/ha			
MAF	1			
Test species	**ER_{50} (g/ha)**	**Drift rate**	**$PER_{off\text{-}field}$ (g/ha)**	**TER criterion: TER ≥ 5**
Zea mays	649.90	0.0277	27.7	23.46

MAF: Multiple application factor; PER: Predicted environmental rate; TER: toxicity to exposure ratio. TER values shown in bold fall below the relevant trigger.

9.10.2.3 Higher-tier risk assessment

Not relevant.

9.10.2.4 Risk mitigation measures

No risk mitigation needed.

9.10.3 Overall conclusions

First tier risk assessment indicates that there is no unacceptable risk from GLOB2111F to non-target plants when applied according to the proposed use rates.

[3] BBA (2000) Bundesanzeiger Jg. 52 (Official Gazette), Nr 100, S. 9879-9880 (25.05.2000) Bekanntmachung über die Abtrifteckwerte, die bei der Prüfung und Zulassung von Pflanzenschutzmitteln herangezogen werden. Public domain.
[4] Ganzelmeier H., Rautmann D. (2000) Drift, drift-reducing sprayers and sprayer testing. Aspects of Applied Biology 57, 2000, Pesticide Application. Public domain.

zRMS comments

The risk assessment was based on the results of formulation studies presented in Appendix 2 (vegetative vigour and on seedling emergence). *Zea mays* was the most sensitive species.

The TER value is above the trigger value of 5.

Conclusion
No unacceptable risk to non-target terrestrial plants is expected following the application of GLOB2111F according to the proposed use pattern.

9.11 Effects on other terrestrial organisms (flora and fauna) (KCP 10.7)

Tests on other non-target species are not required.

9.12 Monitoring data (KCP 10.8)

Not relevant.

9.13 Classification and Labelling

Based on the available aquatic acute toxicity studies with *Daphnia magna* and *Pseudokirchneriella subcapitata*, GLOB2111F must not be classified for acute aquatic toxicity (EC_{50} > 1 mg/L).

zRMS comment

Based on the summation method in accordance with CLP Regulation the following classification for formulation is proposed:
Aquatic acute toxicity Category 1, H 400 Very toxic to aquatic life.
For details see Part C point 9.5.1

The classification of the formulation for aquatic chronic toxicity is determined by calculation in accordance with EU Regulation 1272/2008 (CLP labelling), and is chronic category 1 (H410).

Hazard class(es), categories	Aquatic Acute 1, Aquatic chronic 1
Hazard pictograms or Code(s) for hazard pictogram(s)	
Signal word	Warning
Hazard statement(s)	H400, H410
Precautionary statement(s)	P273, P391, P501
Additional labelling phrases	To avoid risks to man and the environment, comply with the instructions for use. [EUH401]

Appendix 1 Lists of data considered in support of the evaluation

Tables considered not relevant can be deleted as appropriate.

MS to blacken authors of vertebrate studies in the version made available to third parties/public.

List of data submitted by the applicant and relied on

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 10.2.1	Zaworska, K.	2023	*Daphnia magna* acute immobilization test of the test item GLOB2111F according to OECD guideline 202. 0064/0025/E SORBOLAB Research Laboratory LLC GLP Unpublished	N	Globachem NV
KCP 10.2.1	Domagała, J.	2023	Freshwater algae (*Raphidocelis subcapitata*) growth inhibition test of the test item GLOB2111F according to OECD 201 guideline. 0064/0024/E SORBOLAB Research Laboratory LLC GLP Unpublished	N	Globachem NV
KCP 10.3.1.1	Orosz, I.	2023	A GLP acute contact and oral toxicity study with GLOB2111F on honey bees (*Apis mellifera*). 22/139-116MT Charles River Laboratories Hungary Kft. GLP Unpublished	N	Globachem NV
KCP 10.3.1.1	Orosz, I.	2024	A GLP acute contact and oral toxicity study with GLOB2111F on bumblebees (*Bombus terrestris*). 22/139-116MTB. Charles River Laboratories Hungary Kft.	N	Globachem NV

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
			GLP Unpublished		
KCP 10.3.1.2	Orosz, I.	2024	A GLP 10-day chronic oral toxicity study with GLOB2111F on honey bees (*Apis mellifera*). 22/139-134MT Charles River Laboratories Hungary Kft. GLP Unpublished	N	Globachem NV
KCP 10.3.1.2	Woźniak, A	2023	Honey bee larval toxicity test following repeated exposure of the test item GLOB2111F according to OECD GD 239 ENV/JM/MONO(2016)34. 0064/0026/E SORBOLAB Research Laboratory LLC GLP Unpublished	N	Globachem NV
KCP 10.3.2	Kulec-Płoszczyca, E.	2024	Extended laboratory residual contact test with the predatory mite *Typhlodromus pyri* for regulatory testing of GLOB2111F. ETOX-2023-30 EcoTox Alliance Sp. z o. o. GLP Unpublished	N	Globachem NV
KCP 10.3.2	Balász, O	2023	Effect of GLOB2111F on the parasitic wasp (*Aphidius rhopalosiphi*) in an extended laboratory trial. 22/139-351FD Charles River Laboratories Hungary Kft. GLP Unpublished	N	Globachem NV
KCP 10.3.2	Kubisiak, K.	2023	Extended laboratory test to determine the effects of the test item GLOB2111F on the green lacewing (*Chrysoperla carnea*). 0064/0028/E SORBOLAB Research Laboratory LLC. GLP Unpublished	N	Globachem NV

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 10.3.2	Domagała, J.	2023	Extended laboratory test to determine the effects of the test item GLOB2111F on the ladybird beetle (*Coccinella septempunctata*). 0064/0027/E SORBOLAB Research Laboratory LLC. GLP Unpublished	N	Globachem NV
KCP 10.4.1.1	Orosz, I.	2023	A GLP reproduction study of GLOB2111F on earthworms (*Eisenia fetida*). 22/139-211G Charles River Laboratories Hungary Kft. GLP Unpublished	N	Globachem NV
KCP 10.4.2	Orosz, I.	2023	A GLP Reproduction Test of GLOB2111F in Soil with Collembolan (*Folsomia candida*). 22/139-130CO Charles River Laboratories Hungary Kft. GLP Unpublished	N	Globachem NV
KCP 10.4.2	Orosz, I.	2024	A GLP Reproduction Test of GLOB2111F in Soil with Predatory mite (*Hypoaspis (Geolaelaps) aculeifer*). 22/139-389TLA Charles River Laboratories Hungary Kft. GLP Unpublished	N	Globachem NV
KCP 10.5	Adamcsik, B.	2024	A GLP Soil Microorganisms Nitrogen Transformation Study of GLOB2111F. 22/139-055AN Charles River Laboratories Hungary Kft. GLP Unpublished	N	Globachem NV
KCP 10.6.2	Woźniak, A.	2024	Terrestrial plant test: vegetative vigour test of the test item GLOB2111F according to OECD 227 guideline. 0064/0044/E	N	Globachem NV

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
			SORBOLAB Research Laboratory LLC. GLP Unpublished		
KCP 10.6.2	Woźniak, A.	2024	Terrestial plant test: seedling emergence and seedling growth test of the test item GLOB2111F according to OECD 208 Guideline. 0064/0043/E SORBOLAB Research Laboratory LLC. GLP Unpublished	N	Globachem NV

List of data submitted or referred to by the applicant and relied on, but already evaluated at EU peer review

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 10.1.1	[redacted]	2005	Acute oral toxicity for bobwhite quail (*Colinus virginianus*) with BYF 00587 techn. a.s.. [redacted] GLP Unpublished	Y	BCS
KCP 10.1.1	[redacted]	2007	BYF 00587: Effects of a subchronical dietary exposure to northern bobwhite quails including effects on reproduction and behaviour. [redacted] GLP Unpublished	Y	BCS

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 10.1.1	[redacted]	2009	Toxicity of Bixafen (BYF 00587) Technical on the 6-Week Reproduction to the Bobwhite Quail (*Colinus virginianus*). [redacted] GLP Unpublished	Y	BCS
KCP 10.1.2	[redacted]	2005	BYF 00587 - Acute toxicity in the rat after oral administration. [redacted] GLP Unpublished	Y	BCS
KCP 10.1.2	[redacted]	2007	Technical grade BYF 00587: A two generation reproductive toxicity study in the Wistar rat. [redacted] GLP Unpublished	Y	BCS
KCP 10.2.1	[redacted]	2006	Acute toxicity of BYF 00587 (tech.) to fish (*Oncorhynchus mykiss*) under static conditions. [redacted] GLP Unpublished	Y	BCS
KCP 10.2.1	Bruns, E.	2006	Acute toxicity of BYF 00587 tech. to the waterflea *Daphnia magna* in a static laboratory test system Report No.: EBDRP004 Bayer CropScience AG GLP Unpublished	N	BCS
KCP 10.2.1	Dorgerloh, M.	2006a	*Pseudokirchneriella subcapitata* growth inhibition test with BYF 00587 AG. Report No.: EBDRP005 Bayer CropScience GLP Unpublished	N	BCS

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP 10.2.2	[redacted]	2006b	Early-life Stage toxicity of BYF 00587 tech. to fish (*Pimephales promelas*) [redacted] GLP Unpublished	Y	BCS
KCP 10.2.2	Bruns, E.	2007	Influence of BYF00587 (tech.) on development and reproductive output of the waterflea *Daphnia magna* in a static renewal laboratory test system. Report No.: EBDRP064 Bayer CropScience AG GLP Unpublished	N	BCS
KCP 10.2.2	Dorgerloh, M.	2007	*Chironomus riparius* 28-day chronic toxicity test with bixafen (tech.) in a watersediment system using spiked water. Report No.: EBDRP088 Bayer CropScience AG GLP Unpublished	N	BCS
KCP 10.2.2	Bruns, E.	2009	*Chironomus riparius* 28-day chronic toxicity test with bixafen (tech.) in a watersediment system using spiked sediment. Report No.: EBDRP155 Bayer CropScience AG GLP Unpublished	N	BCS
KCP 10.3.1.1	Schmitzer, S.	2005	Effects of BYF 00587 (acute contact and oral) on honey bees (*Apis mellifera* L.) in the laboratory Report No.: 24481035 IBACON GmbH GLP Unpublished	N	BCS
KCP 10.4.1	Luehrs, U.	2006a	BYF 00587: Acute toxicity (14 days) to the earthworm *Eisenia fetida* in artificial soil with 5% peat Report No.: 29612021	N	BCS

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
			IBACON GmbH GLP Unpublished		
KCP 10.4.1.1	Luehrs, U.	2006b	BYF 00587: Effects on reproduction and growth of earthworms *Eisenia fetida* in artificial soil with 5% pea Report No.: 29611022 IBACON GmbH GLP Unpublished	N	BCS
KCP 10.4.2	Luehrs, U.	2007	BYF 00587 EC 125: effects on reproduction of the collembola *Folsomia candida* in artificial soil with 5% peat Report No.: 36952016 IBACON GmbH GLP Unpublished	N	BCS
KCP 10.4.2	Kratz, M. A.	2007	Bixafen EC 125: Influence on mortality and reproduction on the soil mite species Hypoaspis aculeifer tested in artificial soil with 5 % peat Bayer CropScience AG Report No.: KRA-HR-4/07 GLP Unpublished	N	BCS
KCP 10.5	Leicher, T.;	2007	Determination of effects on nitrogen transformation in soil. Report No.: LRT-N-79/07 Bayer CropScience AG GLP Unpublished	N	BCS

The following tables are to be completed by MS

List of data submitted by the applicant and not relied on

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP XX	Author	YYYY	Title Company Report N Source GLP/non GLP/GEP/non GEP Published/Unpublished	Y/N	Owner

List of data relied on not submitted by the applicant but necessary for evaluation

Data point	Author(s)	Year	Title Company Report No. Source (where different from company) GLP or GEP status Published or not	Vertebrate study Y/N	Owner
KCP XX	Author	YYYY	Title Company Report N Source GLP/non GLP/GEP/non GEP Published/Unpublished	Y/N	Owner

Appendix 2 Detailed evaluation of the new studies

A 2.1 KCP 10.1 Effects on birds and other terrestrial vertebrates

A 2.1.1 KCP 10.1.1 Effects on birds

A 2.1.1.1 KCP 10.1.1.1 Acute oral toxicity

A 2.1.1.2 KCP 10.1.1.2 Higher tier data on birds

A 2.1.2 KCP 10.1.2 Effects on terrestrial vertebrates other than birds

A 2.1.2.1 KCP 10.1.2.1 Acute oral toxicity to mammals

A 2.1.2.2 KCP 10.1.2.2 Higher tier data on mammals

A 2.1.3 KCP 10.1.3 Effects on other terrestrial vertebrate wildlife (reptiles and amphibians)

A 2.2 KCP 10.2 Effects on aquatic organisms

A 2.2.1 KCP 10.2.1 Acute toxicity to fish, aquatic invertebrates, or effects on aquatic algae and macrophytes

Comments of zRMS:	The study was performed according to OECD TG 202 and principles of GLP. The validity criteria are met. The study is considered acceptable and suitable for the risk assessment. 48 h EC_{50} = 5.00 mg/L nom

Reference:	KCP 10.2.1
Report	*Daphnia magna* acute immobilization test of the test item GLOB2111F according to OECD guideline 202, Zaworska K., 2023, 0064/0025/E.
Guideline(s):	Yes (OCD 202)
Deviations:	No
GLP:	Yes
Acceptability:	Yes/No/Supplementary

The aim of the study was to assess the effect of the test item GLOB2111F on the immobilization of *Daphnia magna*. The study was conducted in accordance with OECD guideline 202. The impact of the test item was compared to the control group. Based on the results obtained, EC_{10}, EC_{20}, EC_{50}, EC_{95} NOEC and LOEC values were estimated.

Materials and methods

Test design:	tested concentrations and control in four repetitions – 5 daphnids in one replicate
Type of exposure:	static test
Test vessels:	glass beakers of 100 mL volume; volume of solution 80 mL
Medium:	M7
Time of exposure:	48 h
Tested concentrations:	– control (0 mg of the test item/L of medium) – 0.21 mg of the test item/L of medium – 0.47 mg of the test item/L of medium – 1.03 mg of the test item/L of medium – 2.27 mg of the test item/L of medium – 5.00 mg of the test item/L of medium
Test conditions:	average temperature of medium: 19.8°C (min. 19.6°C, max. 20.0°C) photoperiod 16 h day/8 h night with an average light intensity of 1227 lux

Results and discussions

Determination of active substance (bixafen) in the test item solution in M7 medium was performed by high performance liquid chromatography with PDA detection according to experimental procedure SPB-FA/367. Determination was performed using a calibration curve. The method was validated in Study code 0064/0035/FA based on experimental procedure SPB-FA/11 and SANTE/2020/12830, rev.1 guideline which is in line with current rev. 2 of the guideline. The stability of the test item was confirmed on the basis of the results of chemical analysis of the solutions at the beginning of the experiment and after 24 and 48 hours for all tested concentrations and control. Toxic endpoints are related to test item nominal concentrations.

All validity criteria were met:

- in the control, the number of immobilized daphnia at the end of the test was 0% (required: not exceed 10%),
- the control daphnids showed no immobilization or other signs of disease or stress, for example, discoloration or unusual behavior such as trapping at surface water, (required: not more than 10 %)
- the lowest dissolved oxygen concentration at the end of the test was 9.89 mg/L, (required ≥3 mg/L) in control and test concentrations.

In the course of the test, it was shown that the test item had statistically significant effect on immobilization of daphnia in the range of concentrations 1.030 mg of test item/L of medium – 5.000 mg of the test item/L of medium. Based on the obtained results values NOEC was determined to be 0.470 mg of the test item/L of medium and LOEC to be 1.030 mg of the test item/L of medium (after 48 h of exposure). The results presented in the table below.

Table A1: Immobilization of daphnia after 48 h – definitive test

Concentration (mg/mL)	Time after application	
	24 h	48 h
	Inmobilised daphnia (%)	
Control	0	0
0.21	0	0
0.47	0	5.0
1.03	0	15.0 +
2.27	0	20.0 +
5.00	5.0	40.0 +

+ significantly different to control by ToxRat Professional using step-down Cochran-Armitrage test at the significance level p> 0.05

Table A2: Final results of the study

Parameter (mg of the test item/L)	Exposure time	
	24 h	**48 h**
EC_{10}	> 5.00	0.940 (0.285-1.607)*
EC_{20}	> 5.00	1.916 (1.016-3.666)*
EC_{50}	> 5.00	> 5.00
EC_{95}	> 5.00	> 5.00
LOEC	> 5.00	1.03
NOEC	≥ 5.00	0.47

*the lower and upper 95% confidence limits are given in brackets

Conclusion

In the course of the test, it was shown that the test item had statistically significant effect on immobilization of daphnia in the range of concentrations 1.03 mg of test item/L of medium – 5.00 mg of the test item/L of medium. Based on the obtained results values NOEC was determined to be 0.47 mg of the test item/L of medium and LOEC to be 1.03 mg of the test item/L of medium (after 48 h of exposure). Effect concentration of EC_{50} > 5 mg/L test item nominal was determined.

Comments of zRMS:	The study was performed according to OECD TG 201 and principles of GLP. The validity criteria are met. The study is considered acceptable and suitable for the risk assessment. 72 h E_rC_{50} > 1.00 mg/L nom 72 h E_yC_{50} = 0.860 mg/L nom

Reference:	KCP 10.2.1
Report	Freshwater algae (*Raphidocelis subcapitata*) growth inhibition test of the test item GLOB2111F according to OECD 201 guideline, Domagała J., 2023, 0064/0024/E.
Guideline(s):	Yes (OCD 201)
Deviations:	No

GLP: Yes

Acceptability: Yes/No/Supplementary

The aim of the study was to assess the effect of the test item GLOB2111F on the algae *Raphidocelis subcapitata* expressed as yield, average specific growth rate and sectional growth rate according to OECD Guideline 201. The endpoints of the test were the EC_{10}, EC_{20} and EC_{50} values for the parameters listed above, determined on the basis of algal cell count measurements. NOEC and LOEC values were also statistically determined after 72 hours.

Materials and methods

Test design:	tested concentration in 3 replicates and control in 6 replicates
Type of exposure:	static test
Test vessels:	250 mL conical glass flasks, volume solution 100 mL
Medium:	AAP
Time of exposure:	72 h
Shaking	continuous on orbital shakers with a frequency of 90 rpm
Tested concentrations:	– control (0 mg of the test item/L of medium) – 0.482 mg of the test item/L of medium – 0.578 mg of the test item/L of medium – 0.694 mg of the test item/L of medium – 0.833 mg of the test item/L of medium – 1.00 mg of the test item/L of medium
Test conditions:	average temperature 22.9°C (min 22.0°C, max 23.9°C) continuous fluorescent lightening: 6820-7310 lux

Results and discussions

Determination of active substance (bixafen) in the test item solution in AAP medium was performed by high performance liquid chromatography with PDA detection according to experimental procedure SPB-FA/367. Determination was performed using a calibration curve. The method was validated in Study code 0064/0035/FA based on experimental procedure SPB-FA/11 and SANTE/2020/12830, rev.1 guideline which is in line with current rev. 2 of the guideline. The stability of the test item was confirmed on the basis of the results of chemical analysis of the solutions at the beginning of the experiment and after 24, 48 and 72 hours for all tested concentrations and control. Toxic endpoints are related to test item nominal concentrations.

All validity criteria were met:

- yield in control during 72 hours of test increased exponentially 203.8 times (requirements according to OECD 201: ≥16)
- the coefficient of variance for the average specific growth rate for all repetitions of the control culture over the entire time of the test was 1.61% (requirements according to OECD 201: <7%)
- the average coefficient of variance for a sectional growth rate day after day (0-24 h, 24-48 h, 48-72 h) for the control culture was 33.37% (requirements according to OECD 201: <35%).

In course of the experiment, the test item GLOB2111F showed effect on the freshwater algae *Raphidocelis subcapitata* in yield in the concentrations range from 0.482 mg/L to 1.000 mg/L and average specific growth rate in the concentration range from 0.694 mg/L to 1.000 mg/L after 72 h of exposure. The test item statistically significantly affected sectional growth rate in concentration 1.000 mg/L after 72 h of exposure. The results presented in the table below.

Table A3: Observations 72 hours after exposure start

Concentration (mg/mL)	Inhibition (%)		
	Yield	Average specific growth rate	Sectional growth rate
Control	-	-	-
0.482	8.36 +	1.58	1.44
0.578	8.67 +	1.64	-2.08
0.694	24.97 +	5.47 +	-6.96
0.833	39.06 +	9.21 +	-2.44
1.00	76.86 +	27.30 +	26.28 +

+ significantly different to control by y ToxRat Professional using t-test after Williams at the significance level of $\alpha \geq 0.05$

Table A4: Final results of the study

Parameter (mg of the test item/L)	Yield	Average specific growth rate	Sectional growth rate
EC_{10} - 72 h [mg/L]	0.614 (0.541 – 0.697)*	0.835 (0.801 – 0.870)*	0.985 (n.d. – n.d.)*
EC_{20} - 72 h [mg/L]	0.690 (0.612 – 0.779)*	0.944 (0.903 – 0.989)*	0.995 (n.d. – n.d.)*
EC_{50}- 72 h [mg/L]	0.860 (0.740 – 0.998)*	>1.000	>1.000
LOEC - 72 h [mg/L]	≤0.482	0.694	1.000
NOEC - 72 h [mg/L]	≤0.482	0.578	0.833

*the lower and upper 95% confidence limits are given in brackets

Conclusion

In course of the experiment, the test item GLOB2111F showed effect on the freshwater algae *Raphidocelis subcapitata* in yield in the concentrations range from 0.482 mg/L to 1.000 mg/L and average specific growth rate in the concentration range from 0.694 mg/L to 1.000 mg/L after 72 h of exposure. The test item statistically significantly affected sectional growth rate in concentration 1.000 mg/L after 72 h of exposure.

A 2.2.2 KCP 10.2.2 Additional long-term and chronic toxicity studies on fish, aquatic invertebrates and sediment dwelling organisms

A 2.2.3 KCP 10.2.3 Further testing on aquatic organisms

A 2.3 KCP 10.3 Effects on arthropods

A 2.3.1 KCP 10.3.1 Effects on bees

A 2.3.1.1 KCP 10.3.1.1 Acute toxicity to bees

A 2.3.1.1.1 KCP 10.3.1.1.1 Acute oral toxicity to bees

Comments of zRMS:	The study was conducted to OECD guidance's 213 and 214 and according to the principles of GLP. All validity criteria were met. No deviations to the study plan were recorded. The study is considered to be reliable and suitable for the risk assessment.

Reference:	KCP 10.3.1.1
Report	A GLP acute contact and oral toxicity study with GLOB2111F on honey bees (*Apis mellifera*), Orosz I., 2023, 22/139-116MT.
Guideline(s):	Yes (OCD 213 and 214)
Deviations:	No
GLP:	Yes
Acceptability:	Yes/No/Supplementary

The objective of the study was to determine the acute oral and contact LD_{50} of the test item in the honey bee. The test item was administered to the bees by feeding (oral test) and by topical application (contact test).

Materials and methods

Test item:
GLOB2111F; Batch No.: KS160222-02

Reference item:
Dimethoate Pestanal (99.4%)

Test species:
Honey bee (*Apis mellifera*), Race: Carniolan bee. Adult worker honey bees (*Apis mellifera*) were used in the study. Bees were obtained from a healthy colony in a multiple-storey type hive. The colony was healthy, disease-free, and queenright with a one-year-old queen and had 12 inhabited combs. The date of the last medical treatment of bees: 15 September 2022. The bees were anaesthetized with CO_2 then allocated to the cages, ten bees per each cage. Several reserve groups were also maintained.

Test design:
The bees were starved for up to approximately 2 hours before dosing. In case of the oral experiment the test item was dispersed in 50 % w/v sucrose solution at the appropriate concentrations and was administered as a single dose of 0.2 mL in the feeders. When the bees had consumed the test solution (usually within 3-4 hours or a maximum of 6 hours exposure), the feeders were replaced with others containing sucrose solution alone ad libitum. The amount of consumed treated diet was assessed.

In case of the contact experiment bees were lightly anaesthetized with carbon dioxide then 1 µl/bee volume of a test solutions at the appropriate concentrations / 1 µL concentration was applied to the thorax of each bee. After application, the bees were allocated to test cages and supplied with sucrose solution.

Because no significant toxic response was observed during the preliminary range-finding test, a limit test was performed in case of the oral and contact experiments using only one test group at 100 µg test

item/bee dose in the definitive test in order to demonstrate that the LD50 is greater than this value. A limit test for oral and contact was made, but due to non-treatment related mortality levels of >10% these tests were excluded (data is archived but not reported). To be sure of identifying and possible test item effects, the oral and contact studies were performed as definitive tests with five dose levels in a geometric series (factor 2.0) and appropriate controls and reference material. In the definitive oral test, the test item dose levels were 6.25; 12.5; 25, 50 and 100 µg test item/bee. One untreated control (sucrose only) was used. For all doses and controls, four replicates each containing 10 bees were used. Reference substance groups were used. In the definitive contact test, the test item dose levels were 6.25; 12.5; 25, 50 and 100 µg test item/bee. Two sets of control groups were run with deionised water and acetone, and one control group with distilled water (in the first run, the deionised water was found to be contaminated, hence was re-run). For all doses and controls, four replicates each containing 10 bees were used. Reference substance groups were used.

Results and discussions

All validity criteria were met. There was 10% mortality in the control group in the oral definitive test, and 5% mortality in the solvent control group in case of the contact experiment. In the contact definitive test, the first deionised water control was found to be contaminated; a replacement deionised control, a distilled water control and two acetone control groups all had <10% mortality.

The LD_{50} value of the reference item was 0.228 µg/bee in the oral experiment and the LD_{50} value was 0.187 µg/bee in the contact experiment. For the valid runs, all control mortalities were ≤10% and the toxic standard meets the specified range, therefore, the validity criteria were met and therefore the reported studies are considered as valid.

In the definitive oral test, dose concentrations in 50% sucrose were designed to give dose levels of 6.25; 12.5; 25, 50 and 100 µg test item/bee in a volume of 20 µL/bee. There were no treatment related mortalities or behavioural disorders. The control group (sucrose alone) had no more than 10% mortality.

At the nominal dose levels of 25, 50 and 100 µg test item/bee in 50% sucrose, a concentration related reduction in food intake indicating a repellency effect was observed, the calculated actual test item intakes are tabulated below.

Table A5: Calculated actual test item intakes

Nominal dose [µg test item/bee]	Control	6.25	12.5	25	50	100
Food consumption (% of given food)	99.6	99.7	93.0	81.3*	79.6*	64.1*
Calculated dose [µg/bee]	0.0	6.2	12	20	40	64

*: statistically significant compared to the control

In the definitive contact test, dose concentrations in acetone were administered with dose levels of 6.25; 12.5; 25, 50 and 100 µg test item/bee, as 1 µL/bee. There were no treatment related mortalities or behavioural disorders. The two control groups with the vehicle (acetone) had no more than 5% mortality. Deionised water and distilled water controls were also run.

Conclusion

The acute oral and acute contact toxicity of the test item was tested on honey bees (Apis mellifera) under laboratory conditions according to OECD 213 and 214. Based on the results obtained, the LD_{50} (48 h) in the oral toxicity test was determined to be >100 µg formulated product/bee (nominal). No adverse effects were noticed on behaviour. However, a repellent effect was observed between the concentration levels of 25 and 100 µg/bee.

In the contact toxicity test, the LD_{50} (48 h) was determined to be >100 µg formulated product/bee (nominal). No adverse effects were noticed on behaviour.

Oral 48 h LD_{50}: >100 µg test item/bee (nominal) / 64 µg test item/bee (calculated)
NOED: ≥100 µg test item/bee (nominal) / 64 µg test item/bee (calculated)
LOED: >100 µg test item/bee (nominal) / 64 µg test item/bee (calculated)

Based on the repellent effect:
NOED: 12.5 µg test item/bee (nominal) / 12 µg test item/bee (calculated)
LOED: 25 µg test item/bee (nominal) / 20 µg test item/bee (calculated)

Contact 48 h LD_{50}: >100 µg formulated product/bee (nominal)
NOED: ≥100 µg test item/bee (nominal)
LOED: >100 µg test item/bee (nominal)

Comments of zRMS:	The study was conducted to OECD guidance's 246 and 247 and according to the principles of GLP. All validity criteria were met. Only small deviations in relative humidity values recorded. The study is considered to be reliable and suitable for the risk assessment.

Reference:	KCP 10.3.1.1
Report	A GLP acute contact and oral toxicity study with GLOB2111F on bumblebees (*Bombus terrestris*) Orosz I., 2024, 22/139-116MTB.
Guideline(s):	Yes (OCD 246 and 247)
Deviations:	No
GLP:	Yes
Acceptability:	Yes/No/Supplementary

The objective of the study was to determine the acute oral and contact LD_{50} of the test item in the honey bee. The test item was administered to the bees by feeding (oral test) and by topical application (contact test).

Materials and methods

The objective of the study was to determine the acute oral and acute contact toxicity of the test item in the bumblebee according to the OECD Guideline for Testing of Chemicals No. 246 and 247.

Based on the Sponsor's request five test concentrations in a geometric series (using a factor not exceeding 2.0) was used in the definitive test. The following test concentration levels were used: 6.25, 12.5, 25, 50, 100 µg test item/bumblebee.

In the oral experiment the test item was diluted in a 50 % w/v sucrose vehicle solution and was offered to the bumblebees in a volume of 40 µL/bumblebee.

In the contact experiment two control groups, deionised water and acetone, were allocated in the experiment. The test item was diluted in acetone and a volume of 2 µL/bumblebee was dropped onto the dorsal side of each bumblebee.

Thirty bumblebees were used in all control and treated groups in the contact and oral experiments, other than the highest oral group (100 µg test item/bumblebee) where 35 bumblebees were used due to "non-feeders" in the preliminary experiment. The duration of the experiments was 48 hours.

Results and discussions

The mortality in the control group was ≤ 10% (0 % in the oral and 0% and 3% in the contact experiment) during the study.

The mortality in the reference control group was ≥ 50% (100% in the oral and 97% in the contact experiment) during the study.

All validity criteria were within the acceptable range; therefore, the study was considered as valid.

Samples taken from the test formulation were analyzed. During the formulation analysis in the oral experiment the content of bixafen and difenoconazole was determined between 90.0 and 95.8% relative to the nominal dose of bixafen, and between 90.7 and 96.0% relative to the nominal dose of difenoconazole, indicating fully adequate preparation of the feeding solutions.

During the formulation analysis in the contact experiment the content of bixafen and difenoconazole was determined between 99.3 and 113.9% relative to the nominal dose of bixafen, and between 100.6 and 114.8% relative to the nominal dose of difenoconazole, indicating fully adequate preparation of the formulation using acetone.

Based on these results, effect parameters were expressed as analytically confirmed nominal doses.

There was no mortality in the control group or in the test item treated groups during the oral experiment.

Table A6: Mortality at the end of the oral definitive test

Nominal dose (µg/bumblebee)	Control (sucrose solution)	6.25	12.5	25	50	100	Reference control (4 µg a.i./bumblebee)
Cumulative mortality	0/30	0/30	0/30	0/30	0/30	0/35	30/30
Percentage mortality (%)	0	0	0	0	0	0	100

There were no test item related clinical symptoms in the test item treated groups in either experiment.

The amount of consumed test item in the tested doses was considered as 6.2, 12.3, 24.1, 48.5 µg/bumblebee. At the highest dose level the amount of consumed test item was considered as 40.4 µg/bumblebee (97.1 µg/bumblebee, if the "non-feeders" are excluded from calculation, hence the approximation to 100 µg/bumblebee is considered to be valid).

Table A7: Diet consumption in the test item treated groups

Target dose [µg/bumblebee]	Control	6.25	12.5	25	50	100
Average food consumption (mg/bumblebee)	50.6	49.3 n.s.	46.8 n.s.	45.9 n.s.	34.8*	19.2*
Calculated dose [µg/bumblebee]	0.0	6.2	12.3	24.1	48.5	40.4#

n.s.: statistically not significantly different compared to the control (Dunnett's Multiple t-test, α=0.05)
*: statistically significant compared to the control.
#: Calculated with all bumblebees. The calculated dose is 97.1 µg/bumblebee when the "non-feeders" are excluded.

In the definitive contact test, dose concentrations in acetone were administered with dose levels of 6.25; 12.5; 25, 50 and 100 µg test item/bee, as 1 µL/bee. There were no treatment related mortalities or behavioural disorders. The control groups generally showed a mortality of no more than 10%. Deionised water and distilled water controls were also run.

Table A8: Mortality at the end of the contact definitive test

Nominal dose (µg/bumblebee)	Control (deionised water)	Control (acetone)	6.25	12.5	25	50	100	Reference control (10 µg a.i./bumblebee)
Cumulative mortality	0/30	1/30	0/30	0/30	0/30	0/30	0/30	29/30
Percentage mortality (%)	0	3	0	0	0	0	0	97

Conclusion

In the acute oral and acute contact toxicity studies the test item was tested on bumblebees (*Bombus terrestris*) under laboratory conditions according to OECD 246 and 247. Based on the results obtained, the LD_{50} (48 h) in the oral toxicity test was determined to above the highest tested concentration (target of 100 µg test item/bumblebee) for oral and contact exposure. No adverse effects were noticed on behaviour.

However, a repellent effect was observed at the oral target dose levels of 50 and 100 µg test item/bumblebee, resulting in a test item intake below the target values. The repellency did not affect all bees, in the highest dose group, after excluding the "non-feeders" the mean intake was close to 100 µg test item/bumblebee.

In the contact toxicity test, the LD_{50} (48 h) was determined to be higher than 100 µg test item/bumblebee (nominal). No adverse effects were noticed on behaviour.

Oral 48 h LD_{50}: >100 µg test item/bumblebee (target)
NOED: ≥100 µg test item/bumblebee (target)
LOED: >100 µg test item/bumblebee (target)

Based on the repellent effect:
NOED: 25 µg test item/bumblebee (target)
LOED: 50 µg test item/bumblebee (target)

Contact 48 h LD_{50}: >100 µg test item/bumblebee
NOED: ≥100 µg test item/bumblebee
LOED: >100 µg test item/bumblebee

A 2.3.1.1.2 KCP 10.3.1.1.2 Acute contact toxicity to bees

Please see A2.3.1.1.1 above.

A 2.3.1.2 KCP 10.3.1.2. Chronic toxicity to bees

Comments of zRMS:	The experiment was performed before the OECD guideline 245. The validity criteria of the OECD guideline are met: - The average mortality across replicates for the untreated control and solvent control groups is ≤ 15 % at the end of the test (10 days following start of exposure) (observed: 15% in the untreated control) - The average mortality in the reference substance treated group is ≥ 50 % at the end of the test (10 days following start of exposure) (observed: 93%). Some deviation was noted according to Study Director to have no impact on the study:

	- due to technical reasons, temperature values (minimum of 29.2°C) outside the expected range of 31-35°C and relative humidity values (minimum of 39% and maximum of 99%) outside the expected range of 50-70% were recorded occasionally during the study, - due to technical reasons randomization was performed on the same day when the experiment has been started (Day 0) instead of Day -1. Consequently, this study is considered acceptable for use in the risk assessment.

Reference:	KCP 10.3.1.2
Report	A GLP 10-day chronic oral toxicity study with GLOB2111F on honey bees (*Apis mellifera*), Orosz I., 2024, 22/139-134MT.
Guideline(s):	Yes (OCD 245)
Deviations:	No
GLP:	Yes
Acceptability:	Yes/No/Supplementary

The objective of the study was to determine the chronic oral toxicity of the test item in honey bees (max. 2 days old) according to the OECD Guideline for Testing of Chemicals No. 245. Groups of bees were given test item in sucrose solution and observed for mortality and adverse clinical signs for 10 days.

Materials and methods

Test item:
GLOB2111F; Batch No.: KS160222-02

Reference item:
Dimethoate Pestanal (99.4%)

Test species:
Newly emerged worker honey bees (*Apis mellifera*) were used in the study, this was to ensure that the age of the test bees was homogeneous and they were young enough to be likely to survive the 10 day study period. Bees are obtained from a single colony in order to provide a similar status regarding origin and health. The colony had no symptoms of diseases and had a known maintenance and physiological status history. No chemical substances (such as antibiotics, anti-varroa treatments, etc.) had been used in the hive for at least one month prior to the test.

Two days before the start of the test, three brood combs with sealed brood (containing pollen) were taken from the hive. Combs were brought directly to an incubator in the laboratory, in which the bees hatched. During the following days, freshly emerged bees were taken out and used for the test.
The bees were lightly anaesthetized with CO_2 then allocated to the cages, ten bees per each cage. Several reserve groups were also maintained. No starvation period was made before the test started.

Test design:
The concentrations in the definitive test were selected based on the results of the preliminary range-finding test.

As it was not certain that no toxic response was observed during the preliminary range-finding test, five dose levels in a geometric series (factor 3.2*) and two untreated control groups were used in the main test. The following dose levels were used: 1, 3.1, 9.8, 31.3 and 100 µg test item/bee.
*Note: According to the OECD no. 245 in specific cases with e.g. a flat dose-response relationship a larger spacing factor may be applicable.
For all doses, for the control and for the reference substance group, three replicates, each containing 10 bees were used.

Results and discussions

All validity criteria were within acceptable limits and therefore the study can be considered as valid.

The test concentrations were analytically determined at the start of the experiment, and compared with QC samples. During the formulation analysis the content of bixafen was determined. The analyzed concentrations were at 101.6 and 105.5 relative to the nominal dose in case of bixafen, indicating a fully adequate preparation of the feeding solutions.

There was 15% mortality in the control group and statistically significant mortality (33%) was detected in the highest concentration level.

Table A6: Mortality at the end of the definitive test

Nominal dose [µg/bee]	Control (sucrose solution)	1	3.1	9.8	31.3	100
Cumulative mortality	9/60	7/30	4/30	7/30	5/30	10/30
Percentage mortality (%)	15	23 n.s	13 n.s	23 n.s	17 n.s	33*

n.s.: statistically not significant compared to the control.
*: Statistical significance compared to control ($p < 0.05$); Statistical method: Pearson

The average mortality in the reference substance treated group was 93% at the end of the test.

At 100 µg test item/bee the incidence of behavioural observations was relatively low but appeared to be slightly higher than the concurrent control (or controls in other studies of this type); these findings were considered to be potentially related with treatment but not to indicate a clear adverse effect of the test item.

The overall mean group food consumption was 98 mg/bee/day. There were no trends or differences between treated groups and the negative control group.

Based on the measured food consumption per group the mean calculated doses per group were: 1.0, 3.0, 9.3, 28.9 and 109.1 µg/bee/day.

Conclusion

The chronic oral toxicity of the test item was tested on honey bees (*Apis mellifera*) under laboratory conditions. The test was performed at different concentrations, the highest concentration was 100 µg test item / 100 mg feeding solution (the expected intake per bee per day). No test item related mortality occurred and no adverse effects were noticed on behaviour.

LD_{50}:	> 1000 mg/kg feeding solution (nominal)
LOEC:	1000 mg/kg feeding solution (nominal)
NOEC:	313 mg/kg feeding solution (nominal)
LDD_{50}:	> 100 µg test item/100 mg feeding solution / 109 µg test item/bee/day
LOEDD:	100 µg test item/100 mg feeding solution / 109 µg test item/bee/day
NOEDD:	31.3 µg test item/100 mg feeding solution / 28.9 µg test item/bee/day

A 2.3.1.3 KCP 10.3.1.3 Effects on honey bee development and other honey bee life stages

Comments of zRMS:	The study was conducted to OECD guidance TG 239 and according to the principles of GLP. The validity criteria of the OECD guideline are met: - in control cumulative larval mortality from day 3 to day 8 was 11.11% (required: ≤15%), - in control the adults emergence rate on day 22 was 72.22% (required: ≥70%), - reference item mortality should be ≥ 50% for larvae across all reference replicates at day 8 (actual value 100%) During the range-finding, definitive and reference test changes in temperature and humidity took place. The above deviations did not affect the test result The study is considered to be reliable.

Reference:	KCP 10.3.1.2
Report	Honey bee larval toxicity test following repeated exposure of the test item GLOB2111F according to OECD GD 239 ENV/JM/MONO(2016)34, Woźniak A., 2023, 0064/0026/E.
Guideline(s):	Yes (OCD GD 239)
Deviations:	Minor
GLP:	Yes
Acceptability:	Yes/No/Supplementary

The assessment test of the test item GLOB2111F toxicity on honey bee larvae (*Apis mellifera* L.) was conducted in accordance with the OECD GD 239 ENV/JM/MONO(2016)34 Guideline. During the test, the impact on the successive stages of development of the honey bee, resulting from the repeated exposure of the larval stage to the test item, were determined. The aim of the study was to determine the concentration of the test item causing the mortality of 50% of the population in the test (LC_{50} value) and the dose of the test item causing the mortality of 50% of the population after 22 days (LD_{50} value). The values of NOEC and NOED, LC_{10}/LD_{10} and LC_{20}/LD_{20} were determined for emerged adults (survival) on the 22nd day of the study.

Materials and methods

Test design	<u>stability test:</u> tested concentrations and control in one replicate <u>range-finding, definitive test, reference test:</u> tested concentrations and control in one replicate; 36 larvae per replicate, 12 larvae from 3 different breeding
Test cages	<u>stability test:</u> volumetric flask of 100 mL volume <u>range-finding, definitive, reference test:</u> 48-well breeding plates with queen-cell cups placed in the dissector and placed in incubator; from day 15 of the test – transparent plastic boxes placed in test room

Exposition time	4 days (from day 3 to day 6)
Duration of the test	stability test: 72 hours range-finding, definitive, reference test: 22 days
Tested concentrations (doses)	stability test: control (0 g of test item/L of deionized water) 0.05 g of test item/L of deionized water, corresponding to 0.65 mg of test item/kg of diet with deionized water 50 g of test item/L of deionized water, corresponding to 650 mg of test item/kg of diet with deionized water. range-finding test: control (0 mg of test item/kg of diet with deionized water), corresponding to 0 µg of test item/larva (0 g of test item/L of deionized water) 0.65 mg of test item/kg of diet with deionized water, corresponding to 0.1 µg of test item/larva (0.05 g of test item/L of deionized water) 6.5 mg of test item/kg of diet with deionized water, corresponding to 1 µg of test item /larva (0.50 g of test item/L of deionized water) 65 mg of test item/kg of diet with deionized water, corresponding to 10 µg of test item /larva (5.0 g of test item/L of deionized water) 650 mg of test item/kg of diet with deionized water, corresponding to 100 µg of test item /larva (50.0 g of test item/L of deionized water) definitive test: control (0 mg of test item/kg of diet with deionized water)), corresponding to 0 µg of test item/larva (0 g of test item/L of deionized water) 8.02 mg of test item/kg of diet with deionized water, corresponding to 1.23 µg of test item/larva (0.62 g of test item/L of deionized water) 24.07 mg of test item/kg of diet with deionized water, corresponding to 3.70 µg of test item/larva (1.85 g of test item/L of deionized water) 72.22 mg of test item/kg of diet with deionized water, corresponding to 11.11 µg of test item/larva (5.56 g of test item/L of deionized water) 216.67 mg of test item/kg of diet with deionized water, corresponding to 33.33 µg of test item/larva (16.67 g of test item/L of deionized water) 650.00 mg of test item/kg of diet with deionized water, corresponding to 100.00 µg of test item/larva (50.0 g of test item/L of deionized water) reference test: dimethoate: 48 mg of reference item/kg of diet with deionized water i.e. 0.053 µg of reference item/µL, corresponding to 7.39 µg of reference item/larva (0.528 g of reference item/L of deionized water)
Test conditions	stability test: average temperature 6.5°C (min 4.4°C, max 8.0°C); darkness* range-finding test*: – for larval stage (day 1-8): average temperature 34.3°C (min. 33.9°C, max. 34.9°C); average relative humidity 92% (min. 89%, max. 96%), darkness** – for pre-pupal stage (day 8-15): average temperature 34.3°C (min. 33.0°C, max. 34.8°C); average relative humidity 82% (min. 74%; max. 95%), darkness**

– for pupal/imago stage (day 15-22): average temperature 34.4°C (min. 34.0°C; max. 34.8°C); average relative humidity 73% (min. 60%; max. 85%), darkness

definitive test and reference test*:
– for larval stage (day 1-8): average temperature 34.4°C (min. 33.8°C, max. 35.0°C); average relative humidity 93% (min. 89%, max. 99%), darkness**
– for pre-pupal stage (day 8-15): average temperature 34.4°C (min. 32.0°C, max. 34.9°C); average relative humidity 82% (min. 73%; max. 96%), darkness**
– for pupal/imago stage (day 15-22): average temperature 34.6°C (min. 34.0°C; max. 34.9°C); average relative humidity 73% (min. 60%; max. 85%), darkness

* Deviations from the Study plan was found concerning way of temperature measurements during stability test and temperature and humidity measurements during range-finding and definitive and reference test. The above deviations did not affect the test result. The study met the validity criteria. Deviations from the Study plan are described in details in point 6.
** Deviations from the Study plan were found concerning changes in temperature and humidity during larval, pre-pupal during the range-finding and definitive and reference test and temperature during pupal/imago stage of definitive and reference test . The above deviations did not affect the test result. The study met the validity criteria. Deviations from the Study plan are described in details in point 6.

Results and discussions

In course of the experiment, the test item has shown apitoxic effect in mortality of following developmental stages of bees after 22 days of the test. At the end of the study, the concentration and the dose causing 10%, 20% and 50% mortality of the population in the test (LC_{10}, LC_{20}, LC_{50} and LD_{10}, LD_{20}, LD_{50} values) were determined, as well as NOEC and NOED values were determined at 22nd day. The final results of the experiment are presented in the table below.

Table A7: Final results of the experiment

Parameter	Concentration [mg of test item/kg of food]	Parameter	Dose [µg of test item/larva]
LC_{10}	40.983 (n.d. – 144.343)*	LD_{10}	6.300 (n.d. – 22.197)*
LC_{20}	424.064 (119.183 – n.d.)*	LD_{20}	65.236 (18.326 – n.d.)*
LC_{50}	>650.00	LD_{50}	>100.00
NOEC	≥650.00	NOED	≥100.00
LOEC	>650.00	LOED	>100.00

* upper and lower confidence limits (95%) given in the brackets

Conclusion

The test item in the course of this test show no statistically significant apitoxic effect on larval mortality at the concentration 0.65 mg of test item/kg of food - 650 mg of test item/kg of food. The test item did not show an apitoxic effect on pupae mortality at a concentration range of 0.65 mg of test item/kg of food - 650 mg/kg of food. The test item did not show a statistically significant apitoxic effect on adult emergence at a concentration of 0.65 mg of test item/kg of food - 650 mg/kg of food.

A 2.3.1.4 KCP 10.3.1.4 Sub-lethal effects

A 2.3.1.5 KCP 10.3.1.5 Cage and tunnel tests

A 2.3.1.6 KCP 10.3.1.6 Field tests with honeybees

A 2.3.2 KCP 10.3.2 Effects on arthropods other than bees

Comments of zRMS:	The study follows the guideline specified by Blümel et al. (2000) and according to the principles of GLP. Validity criteria were met: - mortality of the control group was 8.33% on day 7 of exposure (criterion: a maximum of 20%), - mortality of the mites exposed to the reference item at the rate of 4.0 g/ha, was 94.55% on day 7 of exposure (criterion: from 50 to 100%), - the cumulative mean number of eggs per female in the control group was 4.6 (required: ≥ 4 eggs per female). One temperature deviation occurred and deviation concerning the study completion date, above deviations did not affect the study results, since validity criteria were met. The study is considered to be valid and suitable for the risk assessment. Agreed endpoint: LR50 > 0.5 L prod./ha ER50 > 0.5 L prod./ha

Reference:	KCP 10.3.2.
Report	Extended laboratory residual contact test with the predatory mite *Typhlodromus pyri* for regulatory testing of GLOB2111F, Kulec-Płoszczyca E., 2024, ETOX-2023-30.
Guideline(s):	Yes (IOBC - Blümel, 2000)
Deviations:	No
GLP:	Yes
Acceptability:	Yes/No/Supplementary

The aim of the extended laboratory test was to assess the effects of the test item, GLOB2111F on mortality and reproduction of the predatory mite, *T. pyri*.

On the basis of the preliminary test results, it was decided to use four rates of the test item in the main test. These were 0.128, 0.32, 0.8 and 2.0 L/ha.

The mites, *T. pyri* at the protonymphal stage (24 hours old) were exposed to the test item applied to leaf discs. The mites were fed with pine pollen (*Pinus* sp.). Mortality observations were made after 7 days of

the treatment. Observations of reproduction of the control group and groups treated with the test item at all the rates, i.e. 0.128, 0.32, 0.8 and 2.0 L/ha, were made after 9, 11, and 14 days of the treatment.

Mortality of *T. pyri* after 7 days of the treatment, the mean reproduction rate (Rr) after 14 days of the treatment and the reproduction reduction (Pr) after 14 days of the treatment were test endpoints.

To verify the sensitivity of the mites and the precision of the test procedure, an insecticide, dimethoate was used as a reference item. The rate of the reference item was 4.0 g/ha.

The control group was treated with distilled water.

Results and discussions

In the main test, mortality of the control group after 7 days of exposure was 8.33%. After 7 days of exposure to GLOB2111F at rates of 0.128, 0.32, 0.8 and 2.0 L/ha, the percentages of mortality corrected according to the Abbott's formula, were 10.91, 14.55, 36.36 and 45.45%, respectively.

There were no statistically significant difference in mortality the group treated with the test item at the rate of 0.128 L/ha in comparison to the control group (Step-down Cochran-Armitage test procedure, p(trend) > alpha 0.05). There were statistically significant difference in mortality between groups treated with the test item at the rates of 0.32, 0.8 and 2.0 L/ha in comparison to the control group (Step-down Cochran-Armitage test procedure, p(trend) < alpha 0.05).

The LR_{50} value is higher than the maximum tested rate, i.e. > 2.0 L/ha, i.e. > 252.4 g bixafen/ha.
$NOER_{mortality}$ is equal to 0.128 L/ha, i.e. 16.15 g bixafen/ha.

After 7 days of exposure to dimethoate at the rate of 4.0 g/ha, the percentage of Abbott's corrected mortality was 94.55%. Therefore, the validity criterion specified in the method description was met. The results obtained in the reference item group showed that the test organisms were sensitive to dimethoate.

Reproduction of the surviving mites from the control group and all the groups treated with test item, i.e. at the rates of 0.128, 0.32, 0.8 and 2.0 L/ha was assessed, since mortality of these groups was < 50.0%.

The mean reproduction rate (Rr), i.e. cumulative number of offspring per female in the control group was 4.6 offspring/female.

The mean reproduction rates (Rr) afte14 days of exposure to test item at the rates of 0.128, 0.32, 0.8 and 2.0 L/ha were 4.5, 4.1, 2.9 and 2.7 offspring/female, respectively.

The percentages of reproduction reduction (Pr) caused by test item at the rates of 0.128, 0.32, 0.8 and 2.0 L/ha were 2.2, 11.3, 35.9 and 40.1%, respectively.

There were no statistically significant difference in reproduction between the group treated with the test item at the rates of 0.128, 0.32 and 0.8 L/ha and the control group (Williams Multiple Sequential t-test Procedure, $|t|<|t^*|$).

There were statistically significant differences in reproduction between the group treated with the test item at the rate of 2.0 L/ha and the control group (Williams Multiple Sequential t-test Procedure, $|t|>|t^*|$).

The calculated ER_{50} value is higher than the maximum tested rate, i.e. > 2.0 L/ha, i.e. > 252.4 g bixafen/ha.

$NOER_{reproduction}$ is equal to 0.32 L/ha, i.e. 40.38 g bixafen/ha.

Conclusion

The effects of test item on mortality and reproduction of *Typhlodromus pyri* in the main test are summarized in the table below.

Table A11: Effects of test item on mortality and reproduction of *Typhlodromus pyri* in the main test

Test item rate [L/ha]	Mortality (dead + escaped mites)		Test item rate [L/ha]	Reproduction	
	Total [%]	Corrected[a] [%]		Mean reproduction rate (Rr) [no.]	Reproduction reduction (Pr) [%]
control	8.33	–	control	4.6	–
0.128	18.33	10.91	0.128	4.5	2.2
0.32+	21.67	14.55	0.32	4.1	11.3
0.8+	41.67	36.36	0.8	2.9	35.9
2.0+	50.00	45.45	2.0+	2.7	40.1
LR_{50}	> 2.0 [L/ha]		**ER_{50}**	> 2.0 [L/ha]	
	> 252.4 [g bixafen/ ha]			> 252.4 [g bixafen/ ha]	
$NOER_{mortality}$	0.128 [L/ha]		**$NOER_{reproduction}$**	0.32 [L/ha]	
	16.15 [g bixafen/ ha]			40.38 [g bixafen/ ha]	
Reference item: dimethoate					
Rate [g/ha]	**Total [%]**	Corrected[a] [%]	**Reproduction**		
4.0	95.0	94.55	not assessed		

[a]: mortality corrected according to the Abbott formula
+: statistically significant differences between control and groups exposed to test item
*: The LR_{50} /ER_{50} value with (95%-confidence limits)

Comments of zRMS:	The study follows the guideline specified by Mead Briggs et al. and according to the principles of GLP. The adult mortality in the control group was ≤ 10 % (0%) during the experiment. The adult mortality in the toxic reference item group after 48 hours was >50% (70.0%). Adult wasps in the control treatment produced a minimum mean value of 5.0 mummies (10.7) per female and no more than two of the surviving wasps produced zero values. The study is acceptable and suitable for the use in the risk assessment. Agreed endpoint: LR50 > 0.5 L prod./ha ER50 > 0.5 L prod./ha

Reference:	KCP 10.3.2.
Report	Effect of GLOB2111F on the parasitic wasp (*Aphidius rhopalosiphi*) in an extended laboratory trial, Balász O., 2023, 22/139-351FD
Guideline(s):	Yes (CANDOLFI *et al* (2001))
Deviations:	No
GLP:	Yes

Acceptability: Yes/No/Supplementary

In an extended laboratory study, adults of *Aphidius rhopalosiphi* (Hymenoptera, Braconidae) were exposed to dried residues of GLOB2111F on barley plants.

Materials and methods

A cohort of adult wasps was obtained from the breeder. To minimize levels of natural mortality, the animals were less than 48 h after emergence when introduced into the treated test arenas.

For the subsequent fecundity assessments, a series of pots of aphid-infested barley was prepared. Each pot contained 20-40 seedlings (approximately 7-10 days old) and each pot was infested with >100 nymphal aphids (*Rhopalosiphum padi*).

The test duration was 14 days; 48 hours in the exposure units, a day with aphids, then 11 days for development of the eggs. Following treatment of test plants, the units were assembled and connected to the ventilating air supply. Five female wasps from the culture were transferred into each exposure arena using an aspirator.

After 48 hours, surviving female wasps were removed from the units using an aspirator. At least 15 female wasps each, from control and the three test item treatment rates as corrected mortality was < 50% were placed individually into the fecundity arenas and confined with host aphids for further 24 hours before being removed. The parasitized aphids within the fecundity arenas were left to develop in situ and the number of aphid mummies that developed was recorded 11 days later.

The effects on mortality and reproduction were determined. As no mortalities or toxic effects were observed throughout the preliminary range-finding test, three application rates at 0.2 L/ha, 1.0 L/ha and 2.0 L/ha (Maximum Use Rate), were tested in the main experiments. Based on the result of the preliminary range-finding test, a limit test could have been performed, but at the request of the Sponsor two additional concentrations were used in the main test.

Three experiments were performed in this study. In the first and second experiment were stopped because due to technical errors the mummies number of parasitic wasp was below the threshold of 5.0 mummies per female in the control group. Therefore, these experiments were invalid. Results of the invalid experiments were not reported; however, all data will be kept and archived in the raw data binder.

Results and discussions

The results of the control group met validity criteria.

Mortality in the reference item treatment was 70.0 % after 48 hours and also met the validity criterion (> 50 %). The cumulative mean number of mummies in the control group was 10.7, so the validity criterion (> 5.00 mummies/female) was met.

Mortality and reproduction of the wasps in the control treatment as well as susceptibility to the reference item proved the study to be valid.

After 48 hours, no mortality was noted in the test item treated or control groups. The LR_{50} was determined to be higher than the highest tested rate of 2.0 L/ha GLOB2111F in 400 L water/ha.

Reproduction was assessed in the control and test item treatments. The mean number of mummies per female was 10.7 in the control, while it was 11.1, 11.7 and 10.4 in the test item rates of 0.2 L/ha, 1.0 L/ha and 2.0 L/ha. No significant of reproduction was observed at the all-test item treatment rate when compared to the control.

A toxic reference item (Dimethoate Pestanal at 3.4 g/ha) was included in the test to indicate the relative susceptibility of the test organism and the sensitivity of the test system. The results of toxic reference item were 70.0% (> 50%) mortality at 48 h. No reproduction assessment was performed with the reference item treatment.

Results are summarised in the tables below.

Table A9: Effects of GLOB2111F on mortality of the parasitoid *Aphidius rhopalosiphi* in an extended laboratory trial

Mortality (%)		Control	0.2 L/ha	1.0 L/ha	2.0 L/ha	Reference item
hour 2	**%**	0.00	0.00	0.00	0.00	0.00
hour 24	**%**	0.00	0.00 n.s.	0.00 n.s.	0.00 n.s.	13.3 n.s.
hour 48	**%**	0.00	0.00 n.s.	0.00 n.s.	0.00 n.s.	70.00*
Corrected mortality (%)[1]		-	**0.00**	**0.00**	**0.00**	**70.00***

[1] Corrected mortality according to Abbott (1925) at 48 hours
Statistical method of analysis: no statistical test was necessary in case of test item treated groups and Fisher`s Exact Binomial Test in case of reference group.
n.s.: Statistically not significant compared to the control.
*: Significantly different compared to the control (p<0.01).

Table A10: Effects of GLOB2111F on reproduction of the parasitoid *Aphidius rhopalosiphi* in an extended laboratory trial

Application rate (L/ha)	Number of replicates (females)	Mean reproduction [1]	SD	Effect on Reproduction [2] (%)
Control	15	10.7	6.58	-
0.2	15	11.1 n.s	4.98	-3.1
1.0	15	11.7 n.s	5.11	-8.7
2.0	15	10.4 n.s	3.27	3.1

[1]mean number of mummies produced per surviving wasp
[2]compared to control, a positive value indicates a decrease
Statistical method of analysis: Dunnett`s Multiple t-test
n.s.: Statistically not significant compared to the control.

Conclusion

Under the conditions of the test, the test item had no effect on the adult mortality or repellency or on reproduction of wasps at 2.0 L GLOB2111F/ha in 400 L water/ha.

Adult mortality and repellency
LR_{50}: >2.0 L GLOB2111F /ha in 400 L water/ha
NOER: 2.0 L GLOB2111F /ha in 400 L water/ha
LOER: >2.0 L GLOB2111F /ha in 400 L water/ha
Reproduction
ER_{50}: >2.0 L GLOB2111F /ha in 400 L water/ha
NOER: 2.0 L GLOB2111F /ha in 400 L water/ha
LOER: >2.0 L GLOB2111F /ha in 400 L water/ha

Comments of zRMS:	The study was carried out according to current guidelines. The study is considered acceptable, validity criteria were met. • mortality of larvae exposed to the reference item: 73.33% (72.41% after correction by Abbott's formula) (requirements: ≥ 50%) • control cumulative mortality — dead larvae and pupae and adults died

	during emergence or not successfully moulted: 3.33% (requirements <20%) • number of eggs laid by a female per day: 17.82 for control (requirements ≥15 eggs/day), • hatching rate: 87.47% for control (requirements ≥70%). In the experimental part of the study a deviation from the guidelines developed by the IOBC, BART and EPPO Joint initiative (Vogt H. et al., 2000) occurred. These were short-term changes in humidity and temperature which did not affect the condition of the test system. These deviations did not affect the results of the study. Agreed endpoint: LR50 > 0.5 L prod./ha ER50 > 0.5 L prod./ha

Reference:	KCP 10.3.2.
Report	Extended laboratory test to determine the effects of the test item GLOB2111F on the green lacewing (*Chrysoperla carnea*), Kubisiak K., 2023, 0064/0028/E.
Guideline(s):	Yes (IOBC - Vogt, 2000)
Deviations:	Minor
GLP:	Yes
Acceptability:	Yes/No/Supplementary

An extended laboratory study of the effect of the test item GLOB2111F on mortality of larvae and pupae and sublethal effect on reproductive performance of the green lacewing (*Chrysoperla carnea*) was carried out in accordance with IOBC, BART, EPPO Joint Initiative and Vogt et al., 2000 and ESCORT 2. Candolfi et al. 2001. The endpoints of the experiment are LR_{10}, LR_{20} and LR_{50} values for larval and pupal mortality and quantitative judgement on the reproductive performance − number of eggs laid per female (fecundity) and hatching ability (fertility). The NOER and LOER values were also statistically determined. Reference item treatment was conducted.

Materials and methods

Test design	<u>range-finding test:</u> – tested doses and control in 15 replicates (1 larva per replicate) <u>definitive test:</u> – tested doses and control in 30 replicates (1 larva per replicate)
Experimental area	bean leaf with designated experimental area
Duration	<u>range-finding test:</u> – 0-23 day after treatment (mortality assessment) reference item treatment: – 0-29 day after treatment (mortality assessment) definitive test: – 0-27 day after treatment (mortality assessment) – 40-50 day after treatment (reproduction performance)[1]
Test item doses	<u>range-finding test:</u> – control (0 mL of the test item/200 L of water/ha) – 20 mL of the test item/200 L of water /ha

– 200 mL of the test item/200 L of water/ha
– 2000 mL of the test item/200 L of water/ha
definitive test:
– control (0 mL of the test item/200 L of water/ha)
– 125 mL of the test item/200 L of water /ha
– 250 mL of the test item/200 L of water/ha
– 500 mL of the test item/200 L of water/ha
– 1000 mL of the test item/200 L of water/ha
– 2000 mL of the test item/200 L of water/ha
reference item treatment:
– 15 g of dimethoate/200 L of water/ha.

Test conditions
range-finding test:
– average temperature 25.6°C (min 20.6°C, max 27.9°C)[2]
– average relative humidity 62.3% (min 48.4%, max 78.9%)[2]
– photoperiod 16 h day/8 h night with a light intensity 1144-1259 lux
definitive test:
– average temperature 23.3°C (min 19.9°C, max 27.9°C)[3]
– average relative humidity 67.0% (min 49.9%, max 81.2%)[3]
– photoperiod 16 h day/8 h night with a light intensity 1127-1264 lux
reference item treatment:
– average temperature 23.5°C (min 19.9°C, max 27.9°C)[4]
– average relative humidity 62.6% (min 49.9%, max 68.8%)[4]
– photoperiod 16 h day/8 h night with a light intensity 1129-1257 lux

Deviation from the Study plan was found concerning: [1] duration of oviposition stabilizing time and duration of reproductive performance during definitive test. Deviations from the Study plan and IOBC, BART, EPPO Joint Initiative, Vogt et al., 2000 and ESCORT 2, Candolfi et al. 2001 guideline were found, concerning: [2] temperature and humidity during range-finding test. [3] temperature and humidity during definitive test. [4] temperature and humidity during reference item treatment. Above deviations had no effect on the course of the study and obtained results.

Results and discussions

The test item in the conditions of an extended laboratory test showed a statistically significant effect on the survival of the larvae, pupae and adults during emergence of the green lacewing in doses of 500 mL of the test item/200 L of water/ha, 1000 mL of the test item/200 L of water/ha and 2000 mL of the test item/200 L of water/ha.

The test item did not affect the reproductive performance of the green lacewing. Average number of laid eggs/female/day (fecundity) for control and all tested doses is ≥15 and mean hatching rate (fertility) is ≥70%, which, in accordance with the adopted method of assessment, means no effect of the test item on reproductive ability. Individuals from the all tested doses were assessed for reproduction. This was due to a mortality of ≤50% of the introduced organisms.

Final results of the test are presented in the table below.

Table A11: Final results of the extended laboratory test with the green lacewing (*Chrysoperla carnea*)

Dose [mL of the test item/200 L of water/ha]	Mortality						
	Mortality [%]	Abbott corected mortality [%]	LR_{10}	LR_{20}	LR_{50}	NOER	LOER
Control	3.33	0.00	[mL of the test item/200 L of water/ha]				
125	0.00	0.00	436.311	898.509	>2000.000	250.000	500.000
250	6.67	3.45	[g of active substance/200 L of water/ha]				
500	20.00	17.24					
1000	30.00	27.59	Bixafen 55.281	Bixafen 113.841	Bixafen >253.400	Bixafen 31.675	Bixafen 63.350
2000	36.67	34.48					
Reference item [15 g of dimethoate/ 200 L of water/ha]	73.33	72.41					

Dose [mL of the test item/ 200 L of water/ha]	Reproduction		
	Average number of eggs per female per day [psc.]	Hatching rate [%]	Significance*
Control	17.82	87.47	not applicable
125	17.79	85.34	-
250	16.50	86.62	-
500	16.58	83.42	-
1000	16.64	86.75	-
2000	16.39	83.96	-

LR_{10} dose of the test item resulting in a reduction of 10%
LR_{20} dose of the test item resulting in a reduction of 20%
LR_{50} dose of the test item resulting in a reduction of 50%
NOER the highest dose of the test item did not cause statistically significant differences compared to the control
LOER the lowest dose of the test item causing statistically significant differences compared to the control
* the average number of eggs/female /day is ≥15 and hatching rate is ≥70%, which means that the test item has no effect on reproductive ability
\- insignificant

Conclusion

The test item in the conditions of an extended laboratory test showed a statistically significant effect on the survival of the larvae, pupae and emerging adults of the green lacewing in doses of 500 mL of the test item/200 L of water/ha, 1000 mL of the test item/200 L of water/ha and 2000 mL of the test item/200 L of water/ha.

The test item did not affect the reproductive performance of the green lacewing. Average number of laid eggs/female/day (fecundity) for control and for all tested doses) is ≥15 and mean hatching rate (fertility) is ≥70%, which, in accordance with the adopted method of assessment, means no effect of the test item on reproductive performance. Individuals from the all tested doses were assessed for reproductive performance. This was due to a mortality of ≤50% of the introduced organisms.

Reference item − dimethoate at a dose of 15 g dimethoate/200 L of water/ha shows a statistically significant effect on the mortality of green lacewing and caused 73.33% mortality of the introduced organisms (72.41% after Abbott's correction).

The obtained result complies with the adopted validity criterion (larval mortality ≥50%). The response of the test organisms to the reference item was correct.

Comments of zRMS:	The study was conducted according to the method Schmuck et al., 2000 Validity criteria were met: • control larvae mortality: 10.0% (requirements: <30%) • mortality of larvae exposed to the reference item at a dose of 3.2 g dimethoate/200 L of water/ha: 100% (requirements: >40%) • number of eggs laid by a female per day (fecundity): 6.1 for control (requirements: >2 eggs/day). These were short-term changes in humidity and temperature which did not affect the condition of the test system. These deviations did not affect the results of the study. The study is acceptable and suitable for the use in the risk assessment. Agreed endpoint: LR50 > 0.5 L prod./ha ER50 > 0.5 L prod./ha

Reference:	KCP 10.3.2.
Report	Extended laboratory test to determine the effects of the test item GLOB2111F on the ladybird beetle (*Coccinella septempunctata*), Domagała J., 2023, 0064/0027/E.
Guideline(s):	Yes (Schumck et al. 2000)
Deviations:	Minor
GLP:	Yes
Acceptability:	Yes/No/Supplementary

An extended laboratory study of the effect of the test item GLOB2111F on larval and pupae mortality and sublethal effect on reproductive performance of the ladybird beetle (*Coccinella septempunctata*) was carried out in accordance with IOBC, BART, EPPO Joint Initiative, Schumck et al. 2000 guideline.

The endpoints of the experiment are LR_{10}, LR_{20}, LR_{50} values for larval and pupal mortality and quantitative judgement on the reproductive performance − number of eggs laid per female (fecundity) and hatching ability (fertility). The NOER and LOER values were also statistically determined.

Materials and methods

Test design	range-finding test: – tested doses and control in 15 replicates (1 larva per replicate) reference item treatment: – tested dose and control in 30 replicates (1 larva per replicate) definitive test – tested doses and control in 30 replicates (1 larva per replicate)
Experimental area	bean leaf with designated test area
Time of exposure	range-finding test: – 19 days (larvae, pupae and adults during emergence mortality phase) reference item treatment: – 5 days (mortality phase)

	definitive test: – 20 days (assessment of larvae and pupae mortality: approx. 10-15 days, assessment of adults mortality: from the moment of pupation) – 14 days (reproduction assessment phase)
Doses	range-finding test: – control (0 mL of the test item/200 L water/ha) – 20 mL of the test item/200 L of water /ha – 200 mL of the test item/200 L of water/ha – 2000 mL of the test item/200 L of water/ha definitive test: – control (0 mL of the test item/200 L water/ha) – 125 mL of the test item/200 L of water /ha – 250 mL of the test item/200 L of water/ha – 500 mL of the test item/200 L of water/ha – 1000 mL of the test item/200 L of water /ha – 2000 mL of the test item/200 L of water/ha reference item treatment: – 3.2 g of dimethoate/200 L of water/ha.
Test conditions	range-finding test: – average temperature 23.7°C (min 20.9°C, max 25.8°C)* – average relative humidity 74.0% (min 64.9%, max 82.8%) – photoperiod 16 h day/8 h night with a light intensity 1120-1270 lux definitive test: – average temperature 24.8°C (min 20.6°C, max 27.9°C)* – average relative humidity 62.8% (min 48.4 %, max 79.2%)** – photoperiod 16 h day/8 h night with a light intensity 1100-1270 lux reference item treatment: – average temperature 25.0°C (min 20.9°C, max 27.0°C)* – average relative humidity 67.8% (min 58.5 %, max 78.9%)** – photoperiod 16 h day/8 h night with a light intensity 1150-1200 lux

Deviations from the Study plan and IOBC, BART, EPPO Joint Initiative, Schumck et al. 2000 guideline were found, concerning: * temperature during range-finding test, definitive test and refrence item treatment. ** humidity during definitive test and refrence item treatment. Above deviations had no effect on the course of the study and obtained results.

Results and discussions

The test item in the conditions of the extended laboratory test did not show a statistically significant effect on the survival of ladybug (*Coccinella septempunctata*) larvae and pupae in all tested doses.

The test item did not affect the reproductive of the ladybird beetle (*Coccinella septempunctata*) in doses of 125 mL of the test item/200 L of water/ha, 250 mL of the test item/200 L of water/ha, 500 mL of the test item/200 L of water/ha, 1000 mL of the test item/200 L of water/ha and 2000 mL of the test item/200 L of water/ha. Average number of laid eggs/female/day for test dose 125 mL of the test item/200 L of water/ha, 250 mL of the test item/200 L of water/ha, 500 mL of the test item/200 L of water/ha, 1000 mL of the test item/200 L of water/ha and 2000 mL of the test item/200 L of water/ha was >2.0, which, in accordance with the adopted method of assessment (based on historical data), means no effect of the test

item on reproductive ability.

The final results of the study are presented in the table below.

Table A12: Final results of the test of the extended laboratory test with the ladybird beetle (*Coccinella septempunctata*)

Dose [mL of the test item /200 L water/ha]	Mortality						
	Mortality [%]	Abbott corected mortality [%]	LR_{10}	LR_{20}	LR_{50}	NOER	LOER
			[mL of the test item/200 L water/ha]				
Control	10.0	n.a.	397.231	n.d.	n.d.	≥2000.000	>2000.000
125	13.3	3.7	[g of active substance/200 L water/ha]				
250	16.7	7.4	Bixafen 49.654	Bixafen n.d.	Bixafen n.d.	Bixafen ≥250.000	Bixafen >250.000
500	26.7	18.6					
1000	23.3	14.8					
2000	20.0	11.1					

Reference item	Mortality [%]	Abbott corected mortality [%]
Control	0.0	n.a.
3.2 g of dimethoate/ 200 L water/ha	100.00	100.00

Dose [mL of the test item/ 200 L water/ha]	Impact of the test item on reproductive performance			
	Average numer of eggs/ female/day [pcs.]	Average hatching [%]	Average number of fertile eggs/surviving female/day [pcs.]	Significance*)
Control	7.9	76.6	6.1	n.a.
125	7.7	75.2	5.8	-
250	7.5	73.3	5.5	-
500	7.4	71.9	5.3	-
1000	7.2	68.5	5.0	-
2000	7.3	69.6	5.1	-

LR_{10} dose of the test item resulting in a reduction of 10%
LR_{20} dose of the test item resulting in a reduction of 20%
LR_{50} dose of the test item resulting in a reduction of 50%
NOER the highest dose of the test item did not cause statistically significant differences compared to the control
LOER the lowest dose of the test item causing statistically significant differences compared to the control
*) the average number of fertile egg / surviving female / day is > 2.0 for control, which means that the test item has no effect on reproductive ability
n.a. not applicable
n.d. not determined due to mathematical reasons or value is beyond the tested rate
- insignificant

Conclusion

The test item in the conditions of the extended laboratory test did not show a statistically significant effect on the survival of ladybug (*Coccinella septempunctata*) larvae and pupae in all tested doses.

The test item did not affect the reproductive abilities of the ladybird beetle (*Coccinella septempunctata*) in doses of 125 mL of the test item/200 L of water/ha, 250 mL of the test item/200 L of water/ha, 500 mL of the test item/200 L of water/ha, 1000 mL of the test item/200 L of water/ha and 2000 mL of the test item/200 L of water/ha. Average number of laid eggs/female/day for test dose 125 mL of the test item/200 L of water/ha, 250 mL of the test item/200 L of water/ha, 500 mL of the test item/ 200 L of water/ha, 1000 mL of the test item/200 L of water/ha and 2000 mL of the test item/200 L of water/ha was >2.0, which, in accordance with the adopted method of assessment (based on historical data), means no effect of the test item on reproductive ability.

Reference item - dimethoate at a dose of 3.2 g dimethoate/200 L of water/ha shows a statistically significant effect on the mortality of ladybird beetle larvae and causes 100% mortality of the larvae. The obtained result complies with the adopted validity criterion (larval mortality >40%). The response of the test organisms to the reference item was correct.

A 2.4 KCP 10.4 Effects on non-target soil meso- and macrofauna

A 2.4.1 KCP 10.4.1 Earthworms

A 2.4.1.1 KCP 10.4.1.1 Earthworms - sub-lethal effects

Comments of zRMS:	The study was performed according to OECD TG 222 and principles of GLP. The validity criteria are met. The study is considered acceptable and suitable for the risk assessment. NOEC: 1000 mg/kg soil dry weight

Reference:	KCP 10.4.1.1
Report	A GLP reproduction study of GLOB2111F on earthworms (*Eisenia fetida*), Orosz I., 2023, 22/139-211G.
Guideline(s):	Yes (OCD 222)
Deviations:	No
GLP:	Yes
Acceptability:	Yes/No/Supplementary

The objective of the study was to determine the effects of test item on reproduction of earthworms (*Eisenia fetida*).

Materials and methods

This test involved keeping adult earthworms in precisely defined test item treated artificial soil. Mortality and growth effects on the adult worms were determined after four weeks exposure. The adults were then removed from the soil and effects on reproduction were assessed after a further four weeks by counting the number of offspring present in the soil.

Different concentrations of the test item were mixed homogeneously into the soil and filled into plastic containers before the earthworms were introduced on top of the soil. Five concentrations (4 replicates each) and an untreated control (8 replicates) were prepared. Each replicate contained 10 worms at the start of the test. The test was performed according to guidelines OECD 222 (2016). The test concentrations selected for definitive test based on the results of the range finding test were: 16.3, 29.4, 52.9, 95.3, 171, 309, 556 and 1000 mg /kg soil dry weight.

Results and discussions

As the results of the control group show validity criteria were met in the study. One out of eighty animal died in the control and 1/40 animal died at the concentration level of 52.9 mg/kg soil dry weight and 2/40 animals died at the concentration level of 171 mg/kg soil dry weight during the experiment. These were considered to natural causes rather than a toxic effect as the mortality was 1.3, 2.5 or 5.0 % in these test groups (within the historical control range and no dose response).

No behavioural effects were observed during the experiment.

No test item related effects were detected in changes in biomass or on food consumption during the study in the treated groups when compared to the controls.

In the control, the average number of offspring was 168.9 juveniles per replicate. There was no statistically significantly reduced number of juveniles at any test item treated groups compared to the control

Conclusion

The validity criteria of the study were met.

Under the conditions of the test, the test item had no effect on the mortality, clinical signs or weight gain or reproduction of earthworms (*Eisenia fetida*).

Adult mortality
LC_{50} (28 day): >1000 mg/kg soil dry weight
NOEC: 1000 mg/kg soil dry weight
LOEC: >1000 mg/kg soil dry weight

Reproduction
EC_{50} (28 day): >1000 mg/kg soil dry weight
NOEC: 1000 mg/kg soil dry weight
LOEC: >1000 mg/kg soil dry weight

A 2.4.1.2 KCP 10.4.1.2 Earthworms - field studies

A 2.4.2 KCP 10.4.2 Effects on non-target soil meso- and macrofauna (other than earthworms)

Comments of zRMS:	The study was performed according to OECD TG 232 and principles of GLP. The validity criteria were met. The study is considered acceptable and suitable for the risk assessment. $NOEC_{mortality}$ = 17.1 mg/kg soil dry weight

Reference:	KCP 10.4.2
Report	A GLP Reproduction Test of GLOB2111F in Soil with Collembolan (*Folsomia candida*), Orosz I., 2023, 22/139-130CO.
Guideline(s):	Yes (OCD 232)
Deviations:	No
GLP:	Yes
Acceptability:	Yes/No/Supplementary

A Collembola (*Folsomia candida*) reproduction study was performed to determine the effect of the test item. The toxic effects of the test item were evaluated according to the OECD No. 232 guideline (2016).

Materials and methods

The effects of different concentrations of test item were determined on the reproduction of 9-day old springtails (*Folsomia candida*) in defined artificial soil substrate, as recommended in OECD 232. Four replicates were used per concentration; eight replicates were used for the control each containing 10 springtails. The springtails were incubated in glass containers for 28 days (until offspring (F1) emerge from eggs laid by mature adults). The number of offspring and the mortality of adults were determined at the end of the test.

The examined concentrations were 1.6, 2.9, 5.3, 9.5, 17.1, 30.9, 55.6, 100 mg/kg artificial soil dry weight. At the start of the test and after a period of 14 days the adult springtails were fed with about 2 mg of granulated dry yeast per container. The test containers were tightly closed during the test and open briefly twice a week to allow aeration. The test containers were held in a climate chamber under controlled light-dark cycles and the temperature was checked continuously

Results and discussions

The adult mortality in the control group was ≤ 20 % (16.3%) during the experiment, the mean reproduction in control was 403.3 juveniles per control vessel. The coefficient of variance of reproduction in control was: 19.7 %.

All validity criteria were within acceptable; therefore, the study was considered as valid.

After 28 days of exposure there was 16.3% mortality in the control group. No statistically significantly different mortality was observed in the treated group between the concentration levels of 1.6 to 17.1 mg/kg soil dry weight. The adult mortality was statistically significant at the concentration levels of 30.9, 55.6 and 100 mg/kg soil dry weight concentration compared to the control.

The mortality data are shown in the table below.

Table A13: Mortality of adult Collembola after 28 days

Concentration mg/kg soil dry weight	Number of surviving adults per replicate								Sum	Mean number of surviving animals	Total number of dead animals	Mean mortality	Standard Deviation	Significance
	1	2	3	4	5	6	7	8				(%)	(%)	
Control	8	9	9	9	9	8	9	6	67	8	13	16.3	12.7	-
1.6	10	10	9	9					38	10	2	5.0	6.1	NS
2.9	10	7	9	5					31	8	9	22.5	28.6	NS
5.3	6	8	10	9					33	8	7	17.5	20.7	NS
9.5	8	9	10	9					36	9	4	10.0	9.1	NS
17.1	10	8	8	9					35	9	5	12.5	10.9	NS
30.9	2	5	8	3					18	5	22	55.0	58.8	*
55.6	0	0	0	0					0	0	40	100.0	NA	*
100	0	0	0	0					0	0	40	100.0	NA	*

Statistical method: Step-down Cochran-Armitage Test (trend analysis); α=0.05.
NA: not applicable
NS: Statistically not significant compared to the control.
*: Significantly different compared to the control (p<0.01)

The number of juveniles was statistically not significant in the treated groups at the concentration range of 1.6 to 30.9 mg/kg soil dry weight. The number of juveniles was statistically significantly lower at the concentration levels of 55.6 and 100 mg/kg soil dry weight concentration.

The reproduction data are shown in the table below.

Table A14: Number of juveniles per container

Concentration mg/kg soil dry weight	Number of juveniles per replicate								Mean	standard deviation (%)	% of control	Reduction of reproduction (%)	Significance
	1	2	3	4	5	6	7	8					
Control	460	453	367	414	441	313	505	273	403	19.7	-	0.0	-
1.6	549	492	326	420					447	21.5	110.8	-10.8	NS
2.9	476	303	586	313					420	32.5	104.0	-4.0	NS
5.3	189	507	553	719					492	45.0	122.0	-22.0	NS
9.5	486	414	472	481					463	7.2	114.9	-14.9	NS
17.1	533	509	284	410					434	26.1	107.6	-7.6	NS
30.9	225	383	406	120					284	47.8	70.3	29.7	NS
55.6	3	7	10	1					5	76.8	1.3	98.7	*
100	0	0	0	0					0	NA	0.0	100.0	*

Statistical method: Multiple Sequentially-rejective Welsh-t-test After Bonferroni-Holm; α=0.05.
NA: not applicable
NS: Statistically not significant compared to the control.
*: Significantly different compared to the control (p<0.01)

Conclusion

The test item has adverse effect on the mortality of adults and on reproduction of springtails (*Folsomia candida*).

Adult mortality

LC_{10} (28 days):	3.96 mg/kg soil dry weight (95 % conf. limits: 0.05 – 9.82 mg/kg soil dry weight)
LC_{50} (28 days):	19.45 mg/kg soil dry weight (95 % conf. limits: 6.76 – 80.05 mg/kg soil dry weight)
NOEC for mortality:	17.1 mg/kg soil dry weight
LOEC for mortality:	30.9 mg/kg soil dry weight

Reproduction

EC_{10} (28 days):	25.22 mg/kg soil dry weight (95 % conf. limits: 13.85 – 45.93 mg/kg soil dry weight)
EC_{50} (28 days):	33.66 mg/kg soil dry weight (95 % conf. limits: 12.72 – 84.39 mg/kg soil dry weight)
NOEC for reproduction:	30.9 mg/kg soil dry weight
LOEC for reproduction:	55.6 mg/kg soil dry weight

Comments of zRMS:	The study was performed according to OECD TG 226 and principles of GLP. The validity criteria were met. The study is considered acceptable and suitable for the risk assessment. NOEC > 1000 mg/kg soil dry weight

Reference:	KCP 10.4.2.
Report	A GLP Reproduction Test of GLOB2111F in Soil with Predatory mite (*Hypoaspis (Geolaelaps) aculeifer*) , Orosz I., 2024, 22/139-389TLA.
Guideline(s):	Yes (OCD 226)
Deviations:	No
GLP:	Yes

Acceptability: Yes/No/Supplementary

A predatory mite (*Hypoaspis (Geolaelaps) aculeifer*) reproduction study was performed to determine the effect of the test item on the mortality and reproduction of mites by cutaneous and alimentary uptake in a defined artificial soil substrate. The toxic effects of the test item were evaluated according to the OECD No. 226 guideline (2016).

Materials and methods

The effects of different concentrations of test item were determined on the reproduction of 28-30 days old mites in defined artificial soil substrate, as recommended in OECD 226. Four replicates were used per concentration; eight replicates were used for the control and for the reference control each containing 10 mites. The mites were incubated in the substrate in glass containers for 14 days. The surviving mites were extracted from the soil via heat/light extraction (25°C for 12 h, 35°C for 12 h, 45°C for 24 hours (in total 48 hours)). On Day 16 of the experiment, the number of surviving adults and juveniles were determined.

As a probably significant toxic response was observed during the Range-finding test, eight test concentrations in a geometric series (using a factor not exceeding 1.8) with four replicates and eight control samples were used in the definitive test. The following test concentration levels were used: 16.3, 29.4, 52.9, 95.3, 171, 309, 556, 1000 mg/kg soil dry weight.

Predatory mites were fed with cheese mites (*Tyrophagus putrescentiae*) *ad libitum*. The test containers were tightly closed during the test and open briefly twice a week to allow aeration. The test containers were held in a climate chamber under controlled light-dark cycles and the temperature was checked continuously.

Results and discussions

reproduction in control was 196 juveniles per control vessel. The coefficient of variance of reproduction in control was: 23.1 %.

The observed toxicity in the reference control group demonstrated that the laboratory test conditions were adequate during the study.

All validity criteria were within acceptable; therefore, the study was considered as valid.

After 14 days of exposure there was 1.3% mortality in the control group. Statistically not significantly different mortality was observed in the test item treated group compared to the control. The mortality was between 0.0 and 10.0% at the tested concentrations.

The mortality was 100% in the reference control group.

The mortality data are shown in the table below.

Table A15: Mortality of adult mites after 14 days

Concentration (mg/kg soil dry weight)	Number of surviving adults per replicate								Total number of surviving animals	Total number of dead animals	Mean mortality (%)	Significance
	1	2	3	4	5	6	7	8				
Control	9	10	10	10	10	10	10	10	79	1	1.3	-
16.3	10	8	9	10					37	3	7.5	NS
29.4	9	8	9	10					36	4	10.0	NS
52.9	7#	10	10	8					28	2	6.7	NS
95.3	8	10	10	9					37	3	7.5	NS
171	12$	10	10	8					40	0	0.0	NS
309	10	10	10	10					40	0	0.0	NS
556	12$	10	9	9					40	0	0.0	NS

1000	9	9	10	10					38	2	5.0	NS
Reference control	0	0	0	0	0	0	0	0	0	80	100.0	*

NS: Statistically not significant compared to the control. (Statistical method: Chi^2 2x2 Table Test with Bonferroni Correction; α=0.05.)
*: Statistically significant compared to the control. (Statistical method: Fisher's Exact Binomial test; α=0.05.)
#: The replicate was classified as outlier, therefore, it was excluded from the statistical evaluation.
$Note: Due to technical error, probably more than 10 mites were placed on the soil surface at the start of the experiment.

The mean number of juveniles was 196 in the control group. The numbers of juveniles were statistically not significant at the tested concentrations, reduction of reproduction was between 9.6 and 26.1%.

Statistically significantly reduce reproduction (99%) was observed in the reference control group.

The reproduction data are shown in the table below.

Table A16: Number of juveniles per container

Concentration (mg/kg soil dry weight)	Number of juveniles per replicate								Mean	CV (%)	Reduction of reproduction (%)	Signifi-cance
	1	2	3	4	5	6	7	8				
Control	239	234	236	146	236	135	182	159	196	23.1	-	-
16.3	146	163	155	243					177	25.3	9.8	NS
29.4	168	148	136	136					147	10.3	25.0	NS
52.9	53#	81#	157	74#					157	-	19.8	NS
95.3	145	153	138	95#					145	5.2	25.8	NS
171	242	170	119	151					171	30.6	13.0	NS
309	152	165	145	98#					154	6.6	21.4	NS
556	116	153	89#	165					145	17.7	26.1	NS
1000	134	209	172	193					177	18.3	9.6	NS
Reference control	2	0	1	1	0	4	1	0	1	120.6	99.4	*

NS: Statistically not significant compared to the control (Statistical method: Dunnett's Multiple t-test; α=0.05.).
*: Significantly different compared to the control (p<0.05) (Statistical method: Student-t test; α=0.05.).
CV: coefficient of variation
#: The replicate was classified as outlier and no dose-response was observed, therefore, it was excluded from the statistical evaluation.

Conclusion

The test item had no adverse effect on the mortality of adults or on reproduction of predatory mites (*Hypoaspis (Geolaelaps) aculeifer*).

Adult mortality
LC_{50} (28 days): >1000 mg/kg soil dry weight
NOEC for mortality: ≥1000 mg/kg soil dry weight
LOEC for mortality: >1000 mg/kg soil dry weight

Reproduction
EC_{50} (28 days): >1000 mg/kg soil dry weight
NOEC for reproduction: ≥1000 mg/kg soil dry weight
LOEC for reproduction: >1000 mg/kg soil dry weight

A 2.4.2.1 KCP 10.4.2.1 Species level testing

A 2.4.2.2 KCP 10.4.2.2 Higher tier testing

A 2.5 KCP 10.5 Effects on soil nitrogen transformation

Comments of zRMS:	The study was conducted to OECD guideline 216 and according to the principles of GLP. All the validity criterion were met. The study is considered to be reliable and suitable for the risk assessment.

Reference:	KCP 10.5
Report	A GLP Soil Microorganisms Nitrogen Transformation Study of GLOB2111F, Adamcsik B., 2024, 22/139-055AN.
Guideline(s):	Yes (OCD 216)
Deviations:	No
GLP:	Yes
Acceptability:	Yes/No/Supplementary

Materials and methods

The purpose of this study was to assess the potential long-term adverse effects of the test item, GLOB2111F, on the nitrogen transformation activity of soil microorganisms after a single exposure, under aerobic conditions.

The samples of standard sandy loam soil were treated at two concentration levels selected by the Sponsor (1.36 and 13.6 mg test item / kg soil dry weight). The treated soil samples were incubated parallel with the untreated (control) samples for 28 days. The nitrate content of the soil samples was monitored at Day 0 (start), Day 7, Day 14 and Day 28. After 28 days, the formed nitrate was calculated in treated and control soil samples

Results and discussions

The validity criterion for control samples was that the relative standard deviation (RSD) of the nitrate content of the three replicate control samples should be less than ± 15%. The determined RSD of the three replicate control samples were 2.19%, 0.94%, 1.82% and 2.92% on Day 0, Day 7, Day 14 and Day 28, respectively.

The inhibition of soil respiration and nitrogen transformation was determined in a separate reference Study (Test Facility Study Code: 21/012-055AN). According to the results, the inhibiting effect of the selected reference item was confirmed. Compared to the control sample, the difference was more than 25%. The relative standard deviation (RSD) of the nitrate content of the three replicate samples at each concentration level was less than ± 15%.

All the determined parameters met the criteria; therefore, the study was considered to be valid.

The mean nitrate concentration and the nitrate formation rate in all treatment group at the end of the 28-day testing period was similar to the control results. Based on the calculations, statistically significant difference between the control and any treatment group was not observed. No inhibition effect of the test item was determined; therefore, the test item is considered to have no long-term influence on the nitrogen transformation in soil.

Table A17: Nitrate formation rate (Day 0 – 28)

Treatment [mg test item / kg soil dry weight]	Concentration [mg NO_3-N / kg soil dw] DAY 0	Concentration [mg NO_3-N / kg soil dw] DAY 28	Nitrate formation rate [mg NO_3-N / kg soil dw per day]	Mean [mg NO_3-N / kg soil dw per day]	Std. Dev.	RSD %	Statistical evaluation#
days 0 - 28							
Control	44.989	100.261	1.974	1.825	0.13	7.2	N/A
	46.974	95.423	1.730				
	45.726	95.292	1.770				
1.36	45.110	95.608	1.803	1.810	0.03	1.6	-
	44.955	94.943	1.785				
	44.791	96.347	1.841				
13.6	46.345	101.328	1.964	2.032	0.07	3.2	-
	46.124	103.210	2.039				
	47.564	106.172	2.093				
#Performed by ToxRatPro version 3.3.0 - : not significant; + : significant							

Conclusion

In conclusion, under the conditions of this study, the test item is considered to have no long-term adverse effect on the nitrogen transformation activity of soil microorganisms.

The relative standard deviation (RSD) of the nitrate content of the control samples on each sampling occasion was less than ± 15%, therefore, the results are met the validity criterion.

A 2.6 KCP 10.6 Effects on terrestrial non-target higher plants

A 2.6.1 KCP 10.6.1 Summary of screening data

A 2.6.2 KCP 10.6.2 Testing on non-target plants

Comments of zRMS:	The study was conducted to OECD guideline 227 and according to the prin-ciples of GLP. All the validity criterion are met. The study is considered to be reliable and suitable for the risk assessment. ER_{50} > 1000 mL/ha

Reference:	KCP 10.6.2
Report	Terrestrial plant test: vegetative vigour test of the test item GLOB2111F according to OECD 227 guideline, Woźniak A. Woźniak, 2024, 0064/0044/E.
Guideline(s):	Yes (OCD 227)
Deviations:	Minor
GLP:	Yes
Acceptability:	Yes/No/Supplementary

A study of the test item effect on GLOB2111F on the plant vigor, in particular plant survival, fresh and dry weight, shoot length and phytotoxicity according to OECD 227 guideline. The study was performed in order to compare the test item effect on the above parameters in relation to control and determination of ER_{10}, ER_{25}, ER_{50} and, where possible, statistical values of NOER and LOER..

Materials and methods

Study design: oat (control in 4 replicates, tested doses in 4 replicates, 5 seeds for each replicate)
oilseed rape (control in 7 replicates, tested doses in 7 replicates, 3 seeds for each replicate)
corn, tomato, soybean, buckwheat (control in 10 replicates, tested doses in 10 replicates, 2 seeds for each replicate)

Test vessels: plastic pots with a diameter 15 cm and area 176.63 cm2 , with stands

Observation time: 21 days after germination of 50% of the seeds in control

Rates:
– 0.00 mL of the test item/200 L of water/ha – control
– 25.60 mL of the test item/200 L of water/ha corresponding to 129.15 mg of the test item/L of water
– 64.00 mL of the test item/200 L of water/ha corresponding to 322.88 mg of the test item/L of water
– 160.00 mL of the test item/200 L of water/ha corresponding to 807.20 mg of the test item/L of water
– 400.00 mL of the test item/200 L of water/ha corresponding to 2018.00 mg of the test item/L of water
– 1000.00 of the test item/200 L of water/ha corresponding to 5045.00 mg of the test item/L of water

Study conditions:

Description	**Temperature[1] [°C]**	**Humidity[1] [%RH]**	**Light intensity daily light cycle: 16h day/8h night [µEm^{-2}S^{-1}]**	**CO_2[2]**
Average	26.4	54.5	354.4	821
Minimum	19.7	34.9	337.5	785
Maximum	34.2	87.7	372.7	855

[1, 2] Deviation from the Study plan and OECD 227 Guideline was found. These deviations did not affect the study results. The study met the validity criteria.

Results and discussions

The test met the validity criteria of the study according to OECD guideline 227:

– emergence in control: for all tested plants 100%; requirements: at least 70%.
– no visible signs of intoxication in control in all tested species of plants (e.g. chlorosis, necrosis, wilting, deformation of leaves and / or stems).
– average plant survival in the control: 100% for all tested species of plants; requirements: at least 90%.
– the environmental conditions and artificial soil were the same for all plant species used in the study.

Determination of active substance concentrations in deionized water solution of the test item was performed by high performance liquid chromatography with PDA detection according to experimental procedure SPB-FA/320. Determination was performed using a calibration curve. The method was validated in Study code 0064/0023/FA based on experimental procedure SPB-FA/11 and SANTE/2020/12830, rev.1 guideline which is in line with current rev. 2 of the guideline.

Table A18: Final results of the vegetative vigour test with GLOB2111F

Parameter**		Survival	Shoot length	Fresh weight	Dry weight	Phytotoxicity
Monocotyledonae						
Oat *Avena sativa*						
ER_{10} / LR_{10}	mL of test item/ha	750.98	>1000.00*	663.56	779.83	653.41
ER_{25} / LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
ER_{50} / LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
LOER	mL of test item/ha	>1000.00	>1000.00	>1000.00	1000.00	
NOER	mL of test item/ha	≥1000.00	≥1000.00	≥1000.00	400.00	
Corn *Zea mays*						
ER_{10}/ LR_{10}	mL of test item/ha	923.95	>1000.00*	>1000.00*	>1000.00*	>1000.00*
ER_{25}/ LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
ER_{50}/ LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
LOER	mL of test item/ha	>1000.00	>1000.00	>1000.00	>1000.00	
NOER	mL of test item/ha	≥1000.00	≥1000.00	≥1000.00	≥1000.00	
Dicotyledonae						
Oilseed rape *Brassiaca napus*						
ER_{10} / LR_{10}	mL of test item/ha	>1000.00*	780.09	>1000.00*	100.91	>1000.00*
ER_{25} / LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
ER_{50} / LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
LOER	mL of test item/ha	>1000.00	>1000.00	>1000.00	64.00	
NOER	mL of test item/ha	≥1000.00	≥1000.00	≥1000.00	25.60	
Soybean *Glycine max*						
ER_{10} / LR_{10}	mL of test item/ha	923.95	986.34	>1000.00*	>1000.00*	636.14
ER_{25} / LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	998.06
ER_{50} / LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
LOER	mL of test item/ha	>1000.00	>1000.00	>1000.00	>1000.00	
NOER	mL of test item/ha	≥1000.00	≥1000.00	≥1000.00	≥1000.00	
Tomato *Solanum lycopersicon*						
ER_{10} / LR_{10}	mL of test item/ha	923.95	>1000.00*	>1000.00*	106.75	630.01
ER_{25} / LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	813.95	981.48
ER_{50} / LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
LOER	mL of test item/ha	>1000.00	>1000.00	>1000.00	>1000.00	
NOER	mL of test item/ha	≥1000.00	≥1000.00	≥1000.00	≥1000.00	
Buckwheat *Fagopyrum acutatum*						
ER_{10} / LR_{10}	mL of test item/ha	923.95	>1000.00*	77.89	229.05	976.30
ER_{25} / LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	811.42	657.86	>1000.00*
ER_{50} / LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
LOER	mL of test item/ha	>1000.00	>1000.00	>1000.00	>1000.00	
NOER	mL of test item/ha	≥1000.00	≥1000.00	≥1000.00	≥1000.00	

ER_{10}/LR_{10} rate that cause 10% of impact
ER_{25}/LR_{25} rate that cause 25% of impact
ER_{50}/LR_{50} rate that cause 50% of impact
NOER the highest non-observe effective concentration causing no statistically significant differences in comparison to the control
LOER the lowest observe effective concentration causing statistically significant differences in comparison to the control
* based on the data analysis
** rate for 200 L of water

Conclusion

The application of GLOB2111F at rates of 25.60, 64.0, 160, 400, 1.000 mL test item/ha in 200 L water/ha at BBCH stage 12-14 caused no adverse effects on plant survival, phytotoxicity and biomass (measured as shoot length, fresh and dry weight) of plants of oat (*Avena sativa*), corn (*Zea mays*), tomato (*Solanum lycopersicum*), oilseed rape (*Brassica napus*), soybean (*Glycine max*) and buckwheat (*Fagopyrum acutatum*).

Comments of zRMS:	The study was conducted to OECD guideline 208 and according to the principles of GLP. All the validity criterion are met. The study is considered to be reliable and suitable for the risk assessment. $ER_{50\ \text{Dry weight}}$ = 649.90 mL/ha (*Zea mays*)

Reference:	KCP 10.6.2
Report	Terrestial plant test: seedling emergence and seedling growth test of the test item GLOB2111F according to OECD 208 Guideline, Woźniak A. Woźniak, 2024, 0064/0043/E.
Guideline(s):	Yes (OCD 208)
Deviations:	No
GLP:	Yes
Acceptability:	Yes/No/Supplementary

A study of the test item GLOB2111F effect on seedling emergence and early growth of higher plants, in particular plant survival, fresh and dry weight, shoot length and phytotoxicity according to OECD 208 Guideline. The study was performed in order to compare the test item effect on the above parameters in relation to control and determination of ER_{10}, ER_{25}, ER_{50} and, where possible, statistical values of NOER and LOER.

Materials and methods

Study design: oat (control in 4 replicates, tested doses in 4 replicates, 5 seeds for each replicate)
oilseed rape (control in 7 replicates, tested doses in 7 replicates, 3 seeds for each replicate)
corn, tomato, soybean, buckwheat (control in 10 replicates, tested doses in 10 replicates, 2 seeds for each replicate)

Test vessels: plastic pots with a diameter 15 cm and area 176.63 cm^2 , with stands

Observation time: 21 days after germination of 50% of the seeds in control

Rates:
– 0.00 mL of the test item/200 L of water/ha – control
– 25.60 mL of the test item/200 L of water/ha corresponding to 129.15 mg of the test item/L of water
– 64.00 mL of the test item/200 L of water/ha corresponding to 322.88 mg of the test item/L of water
– 160.00 mL of the test item/200 L of water/ha corresponding to 807.20 mg of the test item/L of water
– 400.00 mL of the test item/200 L of water/ha corresponding to 2018.00 mg of the test item/L of water
– 1000.00 of the test item/200 L of water/ha corresponding to 5045.00 mg of the test item/L of water

Study conditions:

Description	Temperature[1] [°C]	Humidity[1] [%RH]	Light intensity daily light cycle: 16h day/8h night [$\mu Em^{-2}S^{-1}$]	CO_2[2]
Average	27.4	53.1	355.0	816
Minimum	19.7	31.2	331.8	778
Maximum	37.2	85.9	372.0	855

[1, 2] Deviation from the Study plan and OECD 227 Guideline was found. These deviations did not affect the study results. The study met the validity criteria.

Results and discussions

The test met the validity criteria of the study according to OECD guideline 208:

– germination process efficiency in control: 100% for all tested species of plants; requirements: at least 70%.
– no visible signs of intoxication in control in all tested species of plants: e.g. chlorosis, necrosis, wilting, deformation of leaves and / or stems.
– average plant survival in the control: 100% for all tested species of plants; requirements: at least 90%.
– the environmental conditions and artificial soil were the same for all plant species used in the study.

Determination of active substance concentration in aqueous solution of the test item was performed by high performance liquid chromatography with PDA detection according to experimental procedure SPB-FA/316. Determination was performed using a calibration curves. The method was validated in Study code 0064/0017/FA based on experimental procedure SPB-FA/11 and SANTE/2020/12830, rev.1 guideline which is in line with current rev. 2 of the guideline. The dose of the test item was confirmed on the basis of the results of chemical analysis of the solutions.

Table 19: Final results of seedling emergence and seedling growth test with GLOB2111F

Parameter**		Emergence	Survival	Shoot length	Fresh weight	Dry weight	Phytotoxicity
Monocotyledonae							
Oat *Avena sativa*							
ER_{10} / LR_{10}	mL of test item/ha	>1000.00*	>1000.00*	982.97	686.69	947.92	36.69
ER_{25} / LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
ER_{50} / LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
LOER	mL of test item/ha	>1000.00*	>1000.00*	1000.00	>1000.00	1000.00	
NOER	mL of test item/ha	>1000.00*	>1000.00*	400.00	≥1000.00	400.00	
Corn *Zea mays*							
ER_{10} / LR_{10}	mL of test item/ha	664.17	>1000.00*	30.26	9.48	8.88	33.73
ER_{25} / LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	287.12	78.77	67.85	>1000.00*
ER_{50} / LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	654.50	649.90	>1000.00*
LOER	mL of test item/ha	>1000.00	>1000.00*	160.00	64.00	160.00	
NOER	mL of test item/ha	≥1000.00	>1000.00*	64.00	25.60	64.00	
Monocotyledonae							
Tomato *Solanum lycopersicon*							
ER_{10} / LR_{10}	mL of test item/ha	>1000.00*	>1000.00*	165.48	>1000.00*	551.95	46.98
ER_{25} / LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
ER_{50} / LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
LOER	mL of test item/ha	>1000.00	>1000.00*	400.00	>1000.00	>1000.00	
NOER	mL of test item/ha	≥1000.00	>1000.00*	160.00	≥1000.00	≥1000.00	
Oilseed rape *Brassica napus*							
ER_{10} / LR_{10}	mL of test item/ha	>1000.00*	>1000.00*	506.29	589.90	83.49	51.23
ER_{25} / LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
ER_{50} / LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
LOER	mL of test item/ha	>1000.00*	>1000.00*	>1000.00	>1000.00	>1000.00	
NOER	mL of test item/ha	>1000.00*	>1000.00*	≥1000.00	≥1000.00	≥1000.00	
Soybean *Glycine max*							
ER_{10} / LR_{10}	mL of test item/ha	>1000.00*	>1000.00*	983.25	>1000.00*	524.60	46.98
ER_{25} / LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
ER_{50} / LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
LOER	mL of test item/ha	>1000.00	>1000.00*	64.00	>1000.00	>1000.00	
NOER	mL of test item/ha	≥1000.00	>1000.00*	25.60	≥1000.00	≥1000.00	
Buckwheat *Fagopyrum acutatum*							
ER_{10} / LR_{10}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	961.86	322.45
ER_{25} / LR_{25}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
ER_{50} / LR_{50}	mL of test item/ha	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*	>1000.00*
LOER	mL of test item/ha	>1000.00	>1000.00*	1000.00	>1000.00	>1000.00	
NOER	mL of test item/ha	≥1000.00	>1000.00*	400.00	≥1000.00	>1000.00	

ER_{10}/LR_{10} rate that cause 10% of impact
ER_{25}/LR_{25} rate that cause 25% of impact
ER_{50}/LR_{50} rate that cause 50% of impact
NOER the highest non-observe effective concentration causing no statistically significant differences in comparison to the control
LOER the lowest observe effective concentration causing statistically significant differences in comparison to the control
* based on the data analysis
** rate for 200 L of water

Conclusion

The pre-emergence application of GLOB20111F at rates of 25.60, 64.0, 160, 400, 1.000 mL test item/ha in 200 L water/ha caused no adverse effects on seedling emergence, survival of emerged plants, phytotoxicity and biomass and biomass (measured as shoot length, fresh and dry weight) of oat (*Avena sativa*), corn (*Zea mays*), tomato (*Solanum lycopersicum*), oilseed rape (*Brassica napus*), soybean (*Glycine max*) and buckwheat (*Fagopyrum acutatum*).

A 2.6.3 KCP 10.6.3 Extended laboratory studies on non-target plants

A 2.7 KCP 10.7 Effects on other terrestrial organisms (flora and fauna)

A 2.8 KCP 10.8 Monitoring data