FINAL REGISTRATION REPORT

Part B

Section 3

Efficacy Data and Information

Concise summary

Product code: GLOB289H

Product Name: Zeppos

Chemical active substance:

6 g/kg Iodosulfuron-methyl-sodium

30 g/kg Mesosulfuron-methyl

90 g/kg Mefenpyr-diethyl (Safener)

Central Zone

Zonal Rapporteur Member State: Poland

CORE ASSESSMENT

Applicant: Globachem N.V.

Submission date: December 2019

MS Finalisation date: 22/01/2021 ; 01/2022 ; 02/2023

Version history

When	What
December 2019	dRR submitted by Applicant
January 2021	ZRMs evaluated version of dRR submitted by Applicant.
January 2022	ZRMs corrected dRR according to commenting period.
February 2023	ZRMs corrected dRR according to commenting period from DE.

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3 Efficacy Data and Information (including Value Data) on the Plant Protection Product (KCP 6)

Transformation of the dRR (applicant version) into the RR (zRMS version)

The process chosen by the zRMS to transform the dRR into a RR should be explained. Options are to rewrite the document (with track change or not) or to use commenting boxes such as the following:

Comments of zRMS:	Comments of zRMS are presented in commenting boxes at the end of each chapter. The text of dRR was generally not changed or rewritten (small changes in the document are marked by grey colour). Changes according to commenting period were marked by yellow and for comments from DE (laterd) by violet.

3.1 Summary and conclusions of zRMS on Section 3: Efficacy (KCP 6)

Abstract

Comments of zRMS: Overall summaries are not necessary here. It was provided at the end of each chapter of the dRR.

Table 3.1-1: Acceptability of intended uses (and respective fall-back GAPs, if applicable)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Use-No. *	**Member state(s)**	**Crop and/ or situation** (crop destination / purpose of crop)	**F, Fn, Fnp G, Gn, Gnp or I ****	**Pests or Group of pests controlled** (additionally: devel-opmental stages of the pest or pest group)	**Application**				**Application rate**			**PHI** (days)	**Remarks:** e.g. g safener/ synergist per ha, other dose rate expression, dose range (min-max)	**zRMS Conclusion (efficacy)**
					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 prod-uct / 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			
Zonal uses (field or outdoor uses, certain types of protected crops)														
~~1~~	~~PL~~	~~Cereals (winter/spring soft wheat, winter/spring durum wheat, triticale, spelt and winter rye)~~	~~F~~	~~Annual grassy weeds and Annual dicotyle-donous weeds: CAPBP~~	~~Downwards spraying~~	~~BBCH 21-32~~	~~a) 1 b) 1~~	~~NA~~	~~a) 0.1 b) 0.1~~	~~a) 0.6 + 3 b) 0.6 + 3~~	~~100-400~~	~~NA~~	~~Applied with 0.2 L/ha oil/wetting agent~~	Not accepted
2	PL	Cereals (winter/~~spring~~ soft wheat, winter/~~spring durum wheat~~, triticale, ~~spelt~~ and winter rye)	F	Annual grassy weeds and Annual dicotyle-donous weeds: VERPE, APESV, POAAN, STEME, PAPRH, MATIN, ALOMY, CAPBP, VIOAR, GALAP ~~MATCH~~	Downwards spraying	BBCH 21-32	a) 1 b) 1	NA	a) 0.2 b) 0.2	a) 1.2 + 6 b) 1.2 + 6	100-400	NA	Applied with 0.4 L/ha oil/wetting agent	Acceptable with further restriction
3	PL	Cereals (winter/~~spring~~ soft wheat, winter/~~spring durum wheat~~, triticale, ~~spelt~~ and winter rye)	F	Annual grassy weeds and Annual dicotyle-donous weeds: APESV GALAP MATIN STEME, VERPE CABP, ALOMY POAAN, PAPRH VIOAR	Downwards spraying	BBCH 21-32	a) 1 b) 1	NA	a) 0.3 b) 0.3	a) 1.8 + 9 b) 1.8 + 9	100-400	NA	Applied with 0.6 L/ha oil/wetting agent	Acceptable with further restriction

4	PL	Cereals (winter/~~spring~~ soft wheat, winter/~~spring~~ ~~durum~~ ~~wheat~~, triticale, ~~spelt~~ and winter rye)	F	Annual grassy weeds and Annual dicotyledonous weeds: ALOMY, POAAN ~~AVEFA~~ STEME ~~CHEAL~~ MATIN PAPRH, CAPBP VIOAR, GALAP VERPE, VIOAR	Downwards spraying	BBCH 21-32	a) 1 b) 1	NA	a) 0.4 b) 0.4	a) 2.4 + 12 b) 2.4 + 12	100-400	NA	Applied with 0.8 L/ha oil/wetting agent	Acceptable with further restriction
5	BE, NL, DE, UK, CZ	Cereals (winter/spring soft-wheat, winter/spring durum wheat, triticale, spelt and winter rye)	F	Annual grassy weeds and Annual dicotyledonous weeds: VERPE CHEAL PAPRH	Downwards spraying	BBCH 21-32	a) 1 b) 1	NA	a) 0.3 b) 0.3	a) 1.8 + 9 b) 1.8 + 9	100-400	NA	Optionally with 0.6 L/ha oil/wetting agent	To be confirmed by cMS
6	BE, NL, DE, UK, CZ	Cereals (winter soft wheat, winter durum wheat, triticale, spelt and winter rye)	F	Annual grassy weeds and Annual dicotyledonous weeds: MATCH MATIN STEME	Downwards spraying	BBCH 21-32	a) 1 b) 1	NA	a) 0.4 b) 0.4	a) 2.4 + 12 b) 2.4 + 12	100-400	NA	Applied with 0.8 L/ha oil/wetting agent	To be confirmed by cMS
7	BE, NL, DE, UK, CZ	Cereals (winter soft wheat, winter durum wheat, triticale, spelt and winter rye)	F	Annual grassy weeds and Annual dicotyledonous weeds: ALOMY STEME MATIN GALAP VIOAR	Downwards spraying	BBCH 21-32	a) 1 b) 1	NA	a) 0.5 b) 0.5	a) 3 + 15 b) 3 + 15	100-400	NA	Applied with 1 L/ha oil/wetting agent	To be confirmed by cMS

* 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

Column 15: zRMS conclusion.

A	Acceptable
R	Acceptable with further restriction
C	To be confirmed by cMS
N	Not acceptable / evaluation not possible
n.r.	Not relevant for section 3

3.2 Efficacy data (KCP 6)

Introduction

This core assessment dossier summarises the information related to the efficacy of the plant protection product GLOB289H, a water dispersible granulate formulation (WDG) containing the active ingredients iodosulfuron-methyl sodium (6 g/kg) and mesosulfuron-methyl (30 g/kg) for post-emergence weed control in cereals, in combination with the safener Mefenpyr-diethyl (90 g/kg). Poland is considered to be the zRMS of this dossier and belongs to the Central EU zone according to the Regulation No 1107/2009. At the time of submission, the cMS countries are Belgium, the Netherlands, the United Kingdom, Germany and the Czech Republic. According to the EPPO standard PP1/241 (zones of comparable climate in the EPPO region) all cMS countries belong to the Maritime EPPO Zone. The zRMS, Poland, is part of the North-East EPPO Zone. In this dossier, trials are performed in both the Maritime and the North-East EPPO zones.

These active ingredients were included into Annex I of Directive 91/414 (2003/84/EC for iodosulfuron-methyl sodium and 2003/119/EC for mesosulfuron-methyl). The decision to approve both actives in accordance with Regulation (EC) n° 1107/2009 was taken in Commission Implementing Regulation (EU) n° 844/2012 for iodosulfuron-methyl sodium and nº 844/2012 for mesosulfuron-methyl. The SANTE documents for iodosulfuron-methyl sodium (SANTE/2016/11167 Rev 3 - 7/12/2016) and for mesosulfuron-methyl (SANTE/11827/2016 Rev 2 - 23 March 2017) are considered to provide the relevant review information or a reference to where such information can be found.

The Annex I Inclusion Directive for the active substances provides specific provisions under Part B which need to be considered by the applicant in the preparation of their submission and by the MS prior to granting an authorisation.

For the implementation of the uniform principles of Annex VI, the conclusions of the review report on the active substances, and in particular Appendices I and II thereof, as finalised in the corresponding Standing Committee on Plants, Animals, Food and Feed shall be taken into account.

In this overall assessment there are however no efficacy related concerns.

Appendix 1 of this document contains the list of references included in this document for support of the evaluation.

Description of active substances

The active substances iodosulfuron-methyl sodium and mesosulfuron-methyl are old active substances registered in many EU countries and used for the weed control in cereals. Iodosulfuron-methyl sodium and mesosulfuron-methyl were originally approved by Bayer Cropscience (AgrEvo GmbH & Aventis Cropscience) either alone, or in mixture with other herbicides. In most EU countries (BE, NL, UK, DE, …), the mixture containing iodosulfuron-methyl sodium (6 g/kg) and mesosulfuron-methyl (30 g/kg) already exists as Atlantis WG and is already on the market for more than 10 years. Therefore, taking in consideration both the expired data protection period and the equivalence between Atlantis WG and GLOB289H formulations, it is considered that data used to demonstrate the efficacy and selectivity of Atlantis WG can be used to support GLOB289H, with the exemption of supplying any study on efficacy/selectivity. However, as Article 34 of the REGULATION (EC) No 1107/2009 also states that "applicants… shall provide the following information: (c) on the request of the concerned Member State, the data needed to demonstrate that the plant protection product has comparable effects to the plant protection product.", several efficacy and selectivity trials have been conducted to demonstrate the equivalent behaviour of GLOB289H and Atlantis WG.

Mode of action

The product GLOB289H contains iodosulfuron-methyl sodium (6 g/kg) and mesosulfuron-methyl (30 g/kg). The other ingredients are the safener Mefenpyr-diethyl (90 g/kg) and co-formulants.

Both iodosulfuron-methyl-sodium and mesosulfuron-methyl are inhibitors of the branched chain amino acid synthesis (ALS/AHAS). They act by inhibiting the biosynthesis of the essential amino acids valine and isoleucine, hence stopping cel division and plant growth. The selectivity to cereals is due to differential degradation, compared with that in grass weeds, which is enhanced by the addition of the safener mefenpyr-diethyl.

GLOB289H is used for post-emergence control of grass and broadleaved weeds in cereals.

Table 3.2-2: Details of the active substance in GLOB289H

Active substance	Iodosulfuron-methyl-sodium	Mesosulfuron-methyl
Concentration (Unit: g/kg or g/L...)	6 g/kg	30 g/kg
Chemical group	Sulfonylurea	Sulfonylurea
Mode of action	ALS/AHAS inhibitor	ALS/AHAS inhibitor
Biological action	Post-emergence control of grasses and broadleaved weeds	Post-emergence control of grasses and broadleaved weeds

Description of the plant protection product

Information on the detailed composition can be found in the confidential dossier of this submission (Registration Report - Part C).

The appearance of the product is that of a water dispersible granulate (WDG). It is not explosive, has no oxidising properties. It does not self-ignite. The stability data indicate a shelf life of at least 2 years at ambient temperature.

Its technical characteristics are acceptable for a WDG formulation and such that no particular problems are to be expected when GLOB289H is used as recommended.

The classification proposal GLOB289H according to Regulation (EC) 1272/2008 (CLP Regulation) can be found in Part A of this submission.

Table 3.2-3: Simplified table of currently registered uses and requested uses for GLOB289H

Uses		Member State	Requested rate(s)	Comments / Other relevant details on GAPs
Crop(s)	**Target(s)**			
Cereals (winter/spring° soft wheat, winter/spring° durum wheat, triticale, spelt and winter rye)	grasses and dicotyledonous weeds	PL	~~0.1~~ 0.2– 0.4* kg/ha	1 application POST-EMERGENCE **REQUESTED** *appliaction always with oil
Cereals (winter/spring° soft wheat, winter/spring° durum wheat, triticale, spelt and winter rye)	grasses and dicotyledonous weeds	BE, NL, DE, UK, CZ	0.3* – 0.5** kg/ha	1 application POST-EMERGENCE **REQUESTED** *0.3 kg/ ha with or without oil **0.4 and 0.5 kg/ha always with oil

°Note: Maximum dose rate in spring cereals: 0.3 kg/ha

Further details are in the table “All intended uses” in Part B - Section 0.

Description of the target pests

Table 3.2-4: Glossary of pests mentioned in the dossier

EPPO code	Scientific name
ALOMY	*Alopecurus myosuroides (MAJOR)*
APESV	*Apera spica-venti*
AVEFA	*Avena fatua (MAJOR)*
CAPBP	*Capsella bursa-pastoris*
GALAP	*Galium aparine (MAJOR)*
CHEAL	*Chenopodium album*
LAMPU	*Lamium purpureum*
MATCH	*Matricaria chamomilla*
MATIN	*Tripleurospermum inodorum*
PAPRH	*Papaver rhoeas*
POAAN	*Poa annua (MAJOR)*
POLAV	*Polygonum aviculare*
STEME	*Stellaria media*
VERPE	*Veronica persica*
VIOAR	*Viola arvensis*

Note: Major weeds are indicated in the table

The weed susceptibility scale used in this dossier is shown in the table below.

Table 3.2-5: Susceptibility scale

Weed species susceptibility	Level of control
Highly Susceptible (HS)	95 - 100 %
Susceptible (S)	85 - 94.9 %
Moderately Susceptible (MS)	70 - 84.9 %
Moderately Tolerant (MT)	50 - 69.9 %
Tolerant (T)	0 - 49.9 %

Table 3.2-6: Major / minor status of intended uses (for all cMS and zRMS).

Crop and/or situation	Crop status		Pests or group of pests controlled	Pest status	
	Major	minor		Major	minor
Winter wheat (soft) (TRZAW)	PL, BE, NL, DE, UK, CZ	-	Annual grassy weeds and Annual dicotyledonous weeds (major weeds indicated in table 3.2.3)	PL, BE, NL, DE, UK, CZ	-
Winter durum wheat (TRZDW)	-	PL, BE, NL, DE, UK, CZ		PL, BE, NL, DE, UK, CZ	-
Spring wheat (soft) (TRZAS)	PL, BE, NL, DE, UK, CZ	-		PL, BE, NL, DE, UK, CZ	-
Spring durum wheat (TRZDS)	DE	PL, BE, NL, ~~DE~~, UK, CZ		PL, BE, NL, DE, UK, CZ	-
Spelt (TRZSP)	PL, DE, BE	NL, UK, CZ		PL, BE, NL, DE, UK, CZ	-
Winter rye (SECCW)	PL, BE, DE, UK, CZ	NL		PL, BE, NL, DE, UK, CZ	-
Triticale (TTLSS)	PL, BE, DE, UK, CZ	NL		PL, BE, NL, DE, UK, CZ	-

Compliance with the Uniform Principles

All data submitted in this dossier are in compliance with the Uniform Principles.

Information on trials submitted (3.2 Efficacy data)

In this dossier, the list of individual trials is presented under 3.2.3 Efficacy tests.

Table 3.2-7: Presentation of trials (efficacy trials, preliminary trials...)

Crop(s)*	Target(s)*	Country	Years	Type of trial**	Number of trials (number of valid trials)		GEP, non-GEP, official***	Comments (any other relevant information)
					Maritime zone	NE Zone		
Winter wheat	Annual dicotyledonous weeds Annual grassy weeds	France	2017	MED + E	3	-	GEP	
		Germany	2017	MED + E	2	-	GEP	
			2018	MED + E	3	-	GEP	
			2019	E	2	-	GEP	
		Belgium	2017	MED + E	2	-	GEP	
			2019	E	1	-	GEP	
		United Kingdom	2017	MED + E	1	-	GEP	
			2018	MED + E	3	-	GEP	
		Czech Republic	2017	MED + E	1	-	GEP	
			2018	MED + E	2	-	GEP	
			2019	E	2	-	GEP	
		The Netherlands	2017	MED + E	1	-	GEP	
		Poland	2017	MED + E	-	2	GEP	
			2018	MED + E	-	4	GEP	
Winter triticale		Germany	2018	MED + E	1	-	GEP	
		Poland	2017	MED + E	-	3	GEP	
			2018	MED + E	-	1	GEP	
Winter barley		Germany	2018	MED + E	1	-	GEP	
TOTAL		7	-	-	25	10	GEP	Total: 35

* According to the GAP table. Timing of the application(s) can be added if relevant (e.g. Pre-mergence vs post-emergence, spring vs autumn).

** P = preliminary trial, MED = minimum effective dose, E = efficacy trial.

*** GEP: Good Experimental Practices. Official: carried out by a national official organisation.

The trials were performed in 7 different countries of which 6 well-spread in the Maritime EPPO zone and 1 in the North-East EPPO zone (Poland) in order to obtain data from a large area.

Table 3.2-8: Presentation of reference standards used in trials

Crop(s)	Reference standard	Country(ies) where the product is registered (1)	Authorization number	Active sub-stance(s)	Formulation		Registered application rate(3)	Application rate in trials (per treatment)	Remark(4)
					Type(2)	Concentra-tion of a.s.			
Cereals	Atlantis WG	UK	12478	Iodosulfuron Mesosulfuron	WG	6 g/kg 30 g/kg	0.4 kg/ha	0.4 kg/ha	Winter wheat only
		NL	/	Iodosulfuron Mesosulfuron	WG	6 g/kg 30 g/kg	0.5 kg/ha	0.5 kg/ha	No longer authorized
		FR	/	Iodosulfuron Mesosulfuron	WG	6 g/kg 30 g/kg	0.5 kg/ha	0.5 kg/ha	No longer authorized
		BE	9372P/B	Iodosulfuron Mesosulfuron	WG	6 g/kg 30 g/kg	0.3-0.5 kg/ha	0.3-0.5 kg/ha	/
		DE	025094-00	Iodosulfuron Mesosulfuron	WG	6 g/kg 30 g/kg	0.15-0.5 kg/ha	0.15-0.5 kg/ha	/
		CZ	/	Iodosulfuron Mesosulfuron	WG	6 g/kg 30 g/kg	0.5 kg/ha	0.5 kg/ha	No longer authorized
	Atlantis OD	CZ	4686-0	Iodosulfuron Mesosulfuron	OD	2 g/L 10 g/L	0.6-1.2 L/ha	0.6-1.2 L/ha	/
		PL	R-98/2009	Iodosulfuron Mesosulfuron	OD	2 g/L 10 g/L	0.45-1.2 L/ha	0.45-1.2 L/ha	/

(1) only on use(s) applied for (with the test product).
(2) e.g. WP (wettable powder), EC (emulsifiable concentrate), etc.
(3) dose(s) / dose range authorized on that use in the country.
(4) Other relevant information (e.g. uses, number of applications, spray volume, method of application, etc.).

Comments of zRMS:	This document summarizes the information related to the efficacy of the plant protection product – ZEPPOS (product code: GLOB289H). GLOB289H is a water dispersible granules (WG) formulation containing iodosulfuron-methyl-sodium (6 g/kg) and mesosulfuron-methyl (30 g/kg), and as a safener – mefenpyr-diethyl (90 g/kg). For now, this mentioned active substances are on the list of approved active substances. Both, iodosulfuron-methyl-sodium and mesosulfuron-methyl are inhibitors of the branched chain amino acid synthesis (ALS/AHAS). They act by inhibiting the biosynthesis of the essential amino acids valine and isoleucine, hence stopping cel division and plant growth. The selectivity to cereals is due to differential degradation, compared with that in grass weeds, which is enhanced by the addition of the safener mefenpyr-diethyl. GLOB289H is used for post-emergence control of grass and broadleaved weeds in cereals. All necessary information's about tested plant protection products, active compund, studied weeds, reference products, etc. are correctly presented in this drr by Applicant. In Poland 5 plant protection products containing mesosulfuron-methyl as active compound and 20 with iodosulfuron-methyl-sodium are already registered. In 2 registered herbicides, those 2 active compunds are contained together. In Poland formulation WG is not registred for iodosulfuron-methyl-sodium and mesosul-furon-methyl yet. Whilst, in cMS this formulation in registred and commonly used plant protection products is already existing.

	The product – ZEPPOS (product code: GLOB289H) containing iodosulfuron-methyl-sodium (6 g/kg) and mesosulfuron-methyl (30 g/kg), and as a safener – mefenpyr-diethyl (90 g/kg) by Globachem N.V. has not been previously evaluated in any country according to Uniform Principles. Poland is a ZRMs. BE, NL, DE, UK, CZ is a cMS.

3.2.1 Preliminary tests (KCP 6.1)

GLOB289H is equivalent to different Iodosulfuron + Mesosulfuron formulations authorised long ago in Europe. As stated in the introduction, the data protection period on these old formulations based on Iodosulfuron + Mesosulfuron is already expired. Therefore, no data to justify the mixture is considered to be necessary. However, in order to demonstrate the benefit on the association of both actives, some trials (Reference is made to KCP 6.2) included a comparison of GLOB289H with each active ingredient at the equivalent rate of the mixture. A clear benefit of the mixture of Iodosulfuron + Mesosulfuron on several target weed species is observed, expanding the weed spectrum as well as increasing the efficacy compared to the solo active ingredients. Some examples for major weeds justifying this combination are shown in the table below.

Table 3.2-9: Justification to combine both active ingredients in GLOB289H

Weed	Timing (DA-A)	Number of trials	# weeds/m² untreated control	% control with GLOB289H							
				0.3 kg/ha GLOB289H + oil		0.5 kg/ha GLOB289H + oil		0.5 L/ha Meso 30 OD		0.03 L/ha Iodo 100 OD	
			Mean	Mean	Min & Max	Mean	Min & Max	Mean	Min & Max	Mean	Min & Max
ALOMY	46-66	6	29	66	24 & 100	79	49 & 100	77	35 & 100	36	26 & 43
GALAP	29-65	4	24	53	30 & 65	72	50 & 81	17	0 & 48	68	25 & 93

Comments of zRMS:	Preliminary range-finding tests were not submitted by the Applicant. The active substances of ZEPPOS (product code: GLOB289H) – iodosulfuron-methyl-sodium and mesosulfuron-methyl, are registered and have been commonly used in agricultural practice for many years. So, many efficacy trials are available to evaluate the effectiveness of products containing those active compounds. Preliminary tests were not necessary in this case in the opinion of Evaluator. Applicant submitted justification to combine both active ingrendients in GLOB289H. So, a clear benefit of the mixture of Iodosulfuron + Mesosulfuron on several target weed species is observed, expanding the weed spectrum as well as increasing the efficacy compared to the solo active ingredients.

3.2.2 Minimum effective dose tests (KCP 6.2)

Reference is made to the efficacy trials submitted under section KCP 6.2. In many trials the efficacy of a lower dose rate of GLOB289H was tested and compared to the advised dose rate range. It can be observed that highest dose rates generally generate a better efficacy compared to the lower rates. However, for some weeds a lower dose rate is sufficient, depening on the weed species. A summary of these dose response results is provided in the following tables.

Maritime EPPO Zone

Several field trials were established in the Maritime EPPO Zone (25) in order to determine the minimum effective dose of GLOB289H in cereals. GLOB289H was tested at 0.3-0.5 kg/ha for the control of weeds in cereals (applied with oil). This rate reflects the proposed label rate. For the minimum effective dose, 40% (0.12 kg/ha) and 60% (0.19 kg/ha) of the lowest rate (0.3 kg/ha) of GLOB289H were tested. This is in accordance with the EPPO standard PP 1/225 'Minimum effective dose'. Some examples of the dose response results are provided in **~~Błąd! Nie można odnaleźć źródła odwołania.~~** Table 3.2-10a.

Table 3.2-10a: Minimum effective dose. Efficacy of GLOB289H at proposed label rates, at 40 and 60% of the lowest proposed dose rate

Weed	Timing (DA-A)	Number of trials	# weeds/m² untreated control	% control with GLOB289H									
				40% of Rate 1 +oil (0.12 kg/ha)		60% of Rate 1 + oil (0.19 kg/ha)		Rate 1 + oil (0.3 kg/ha)		Rate 2 + oil (0.4 kg/ha)		Rate 3 + oil (0.5 kg/ha)	
			Mean	Mean	Min & Max	Mean	Min & Max	Mean	Min & Max	Mean	Min & Max	Mean	Min & Max
Maritime EPPO zone													
ALOMY	33-69	5	30	-	-	56	3 & 99	72	43 & 99	77	58 & 99	87	68 & 100
APESV	14-55	3	14	77	60 & 94	84	63 & 99	89	70 & 99	93	80 & 99	-	-
CHEAL	14-53	2	10	50	33 & 68	57	40 & 74	70	55 & 84	82	65 & 99	-	-
MATIN	14-64	5	12	-	-	81	51 & 100	89	73 & 100	94	80 & 100	-	-
POAAN	14 & 57	5	33	69	28 & 88	79	58 & 96	88	73 & 97	92	78 & 99	-	-
STEME	14 & 64	4	7	-	-	76	50 & 99	82	60 & 99	91	76 & 99	-	-

It can be observed that for different timings, an increase in dose rate most of the time provides an increase in control. However, in some cases the lower dose rate: 0.3 kg/ha of GLOB289H already provide the good control, while for other cases the 0.4 or 0.5 kg/ha is necessary (for more results reference is made to the efficacy section KCP 6.2). Nevertheless, it can be seen that the 40% and 60% dose rate of 0.12 and 0.19 kg/ha most of the time seems to be insufficient to provide a good control against different weed species. For the full details, reference is made to the efficacy section.

North-East EPPO Zone

Several field trials were established in the North-East EPPO Zone (10) in order to determine the minimum effective dose of GLOB289H in cereals. GLOB289H was tested at 0.1-0.4 kg/ha for the control of weeds in cereals. These rates reflect the proposed label rates. For the minimum effective dose, 40% (0.12 kg/ha) and 60% (0.19 kg/ha) of the lowest rate (0.3 kg/ha) of GLOB289H were tested. This is in accordance with the EPPO standard PP 1/225 'Minimum effective dose'. However, these results show that the lowest dose rate of 0.12 kg/ha is in a few cases even sufficient to control some weed species. Examples of the dose response results are provided in ~~**Błąd! Nie można odnaleźć źródła odwołania.b**~~ Table 3.2-11.

Table 3.2-11: Minimum effective dose. Efficacy of GLOB289H at proposed label rates, at 40 and 60% of the lowest proposed dose rate

Weed	Timing (DA-A)	Number of trials	# weeds/m² untreated control	% control with GLOB289H							
				40% of Rate 1 +oil (0.12 kg/ha)		60% of Rate 1 + oil (0.19 kg/ha)		Rate 1 + oil (0.3 kg/ha)		Rate 2 + oil (0.4 kg/ha)	
			Mean	Mean	Min & Max	Mean	Min & Max	Mean	Min & Max	Mean	Min & Max
North-East EPPO zone											
ALOMY	49-56	3	37	-	-	72	64 & 80	83	75 & 90	87	78 & 97
APESV	48-58	4	31	75	36 & 99	80	40 & 99	87	54 & 99	88	51 & 100
AVEFA	35-56	3	42	-	-	44	30 & 63	73	65 & 83	88	78 & 96
CAPBP	56	2	6	87	83 & 92	90	89 & 92	97	95 & 100	98	96 & 100
MATIN	49-56	4	15	-	-	76	64 & 92	86	78 & 93	95	88 & 99
PAPRH	49-56	3	18	-	-	68	63 & 76	82	81 & 83	94	88 & 100

It can be observed that for different timings, an increase in dose rate most of the time provides an increase in control. However, in some cases the lower dose rates: 0.12 or 0.19 kg/ha of GLOB289H already provide the good control (CAPBP & APESV respectively), while for other cases 0.3-0.4 kg/ha is necessary (for more results reference is made to the efficacy section KCP 6.2). Nevertheless, it can be seen that the 40% and 60% dose rate of 0.12 and 0.19 kg/ha most of the time seems to be insufficient to provide a good control against different weed species. For the full details, reference is made to the efficacy section.

Comments of zRMS:	The applicant has proposed doses of ZEPPOS (product code: GLOB289H) that reflect those of currently-authorised sulcitrione products across the EU. In order to provide information to establish the minimum effective dose, some of the trials conducted to demonstrate efficacy should include at least two lower dose(s) than recommended dose. In the appropriate researches of efficacy were tested differ doses and to register was chosen the lowest effective, which is in accordance to EPPO 1/225 (2). During field tests Applicant used different doses of herbicide ZEPPOS (product code: GLOB289H) containing iodosulfuron-methyl-sodium and mesosulfuron-methyl. So, in the appropriate researches of efficacy were tested differ doses and to register was chosen the lowest effective, which is in accordance to EPPO 1/225 (2). ZEPPOS (GLOB289H) was tested at a range of dose rates, but to demonstrate minimum effective dose rate, the control obtained with ZEPPOS applied at winter cereals during 35 trials (in total): 25 trials carried out in the Maritime EPPO zone and 10 trials in North-East EPPO zone. • Maritime – five different doses were studied: 0,12 kg.ha (0,4 N), 0,19 kg/ha (0,6 N) and three N doses: 0,3 kg/ha; 0,4 kg/ha and 0,5 kg/ha. • MED – lack of trials • N-E – four different doses were studied: 0,12 kg/ha (0,4 N), 0,19 kg/ha (0,6N) and N doses: 0,3 kg/ha and 0,4 kg/ha.. • S-E – lack of trials. It can be seen that the 40% and 60% dose rate of 0.12 kg/ha and 0.19 kg/ha most of the time seems to be insufficient to provide a good control against different weed species. In the Maritime EPPO zone – in some cases 0.3 kg/ha of GLOB289H already provide the good control, while for other cases the 0.4 kg/ha or 0.5 kg/ha is necessary. In the North-east EPPO zone – in some cases the lower dose rates: 0.12 or 0.19 kg/ha of GLOB289H already provide the good control (CAPBP & APESV respectively), however the 0,3 and 0,4 kg.ha provide the best control of weeds in studied cereals.

3.2.3 Efficacy tests (KCP 6.2)

GLOB289H is used as a post-emergence herbicide in cereals to control weeds (post-emergence of crop and weed). As mentioned, the active substances iodosulfuron-methyl sodium and mesosulfuron-methyl are old active substances, which are already being used for a long time (in the same concentration as GLOB289H) for weed control in cereals in many EU countries.

GLOB289H can be used in combination with an oil (estherified rapseseed oil) to ensure the optimal uptake of the active ingredients by the weeds. For the lower dose of 0.3 kg/ha, the addition of oil is optional. For the higher dose is it obligatory since dose is expacially used against difficult weeds that are also capable of developing resistance. Therefore the trials are also performed like this with different estherified rapeseed oils tested. Furthermore, the reference product Atlantis WG is also sprayed in combination with this oil.

Table 3.2-12: Details on trial methodology

Guidelines	General guidelines	EPPO PP 1/152 (4), 1/135 (4), 1/181 (4)
	Specific guidelines	EPPO PP 1/93 (3)
Experimental	Plot design	RCBD

design	Plot size	12 - 21 m²
	Number of replications	4
Crop	Trials per crop	Cereals (35 trials) Winter wheat: 29 Winter barley: 1 Winter triticale: 5
	Varieties per crop	30 varieties Winter wheat: Claire, Benchmark, Rubisko, Istabracq, Anapolis, Altigo, Reform, Discus, Arkadia, Muszelka, Avatar, Faustus, Skyfall, Avenue, Tobak, Akteur, Siskin, Evolution, Bohemia, Ozon, Preludio, Astoria, Tonacja, KWS Talent, LG Imposanto Winter barley: LG Veronika Winter triticale: Torino, Borwo, Twingo, Talendo
Application	Crop stage (BBCH) at application	Post-emergence (weed and crop)
	Number of applications Intervals	1
	Spray volumes	200-300 L/ha
Assessment	Assessment types	Efficacy against weeds
	Assessment dates	Shortly before harvest (last measurement)
	Field / Greenhouse...	Field trials
	GEP	All trials were performed according to GEP

A total of 35 trials were carried out to evaluate the efficacy of GLOB289H for the control of dicotyledonous and grass weeds in cereals. 25 trials were performed in the Maritime EPPO Zone while 10 other trials were performed in the North-East EPPO Zone (Poland).

Trials were conducted on winter wheat, barley and triticale in 2017, 2018 and 2019 in Germany, France, Belgium, the Netherlands, the United Kingdom, the Czech Republic and Poland. The trials are conducted by officially recognized company in the respective countries to carry out field efficacy testing in accordance with European Commission Directive 93/71/EEC.

In Table 3.2-11 detailed information is given about the different trials. The trials were conducted in different regions, representative for commercial growing of cereals.

Trials were set up to compare the efficacy of GLOB289H to the already approved product based on the same active ingredients Atlantis WG (Table 3.2-12a).
Table 3.2-12b shows the different doses that were tested on the different sites: in general, the supported doses were applied as well as a lower dose rate in order to check the minimum effective dose.

Trial plots areas were between 12 and 21 m^2. Plots were replicated 4 times and were arranged in randomized block design within each trial.

Trials have been conducted according to the relevant guidelines and more specifically:
EPPO PP 1/135 (4) Phytotoxicity assessment
EPPO PP 1/181 (4) Conduct and reporting of efficacy trials including GLP
EPPO PP 1/152 (4) Design and analysis of efficacy evaluation trials
EPPO PP 1/93 (3) Weeds in cereals

Treatments were applied to all trials using a boom sprayer, calibrated to apply a spray volume of 200 – 300 L/ha. Further details of the method of application used in individual trials can be found in the individual trial reports.

Table 3.2-13: Summary form of information concerning trial sites and application details

Reference is made to the Biological Assessment Dossier.

Details of the formulations tested are provided in the table 3.2-12a while details of application rates and timings are provided in table 3.2-12.

Table 3.2-14a: Formulations included in efficacy trials

Product	Active substance	Active sub-stance content	Formulation type
Atlantis (36) WG	Mesosulfuron-methyl Iodosulfuron-methyl-sodium	30 g/kg 6 g/kg	WG
Atlantis (12) OD	Mesosulfuron-methyl Iodosulfuron-methyl-sodium	10 g/L 2 g/L	OD
GLOB289H	Mesosulfuron-methyl Iodosulfuron-methyl-sodium	30 g/kg 6 g/kg	WG
Mesosulfuron 30 OD	Mesosulfuron-methyl	30 g/L	OD
Iodosulfuron 100 OD	Iodosulfuron-methyl-sodium	100 g/L	OD
Actirob B/Actirob 842 EC	Esterified Rapeseed Oil	812/842 g/L	EC
Mero	Esterified Rapeseed Oil	81.4 %	EC
Biopower	Sodium Laureth sulfate	27 %	SC
Vexzone	Anionic & non-ionic surfactant	65 %	/

Note: Only the products used in this dossier are shown in this table and the tables below.

Table 3.2-12b: Rates of application

Trial reference number	Product	Application rate		
		g as/ha	Product/ha	Timing
KCP 6.2-1	Untreated Atlantis WG + Actirob B GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H Mesosulfuron 30 OD + Actirob B Iodosulfuron 100 OD + Actirob B Iodo OD + Meso OD + Actirob B	- 14.4 + 650 18 + 812 14.4 + 650 10.8 + 487 10.8 15 + 812 1.8 + 406 1.8 + 15 + 812	- 0.4 kg + 0.8 L 0.5 kg + 1 L 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.3 kg 0.5 L + 1 L 0.018 L + 0.5 L 0.018 L + 0.5 L + 1 L	Post-em
KCP 6.2-3 – 7, KCP 6.2-11 – 12 KCP 6.2-17	Untreated Atlantis WG + Actirob B GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H Mesosulfuron 30 OD + Actirob B Iodosulfuron 100 OD + Actirob B Iodo OD + Meso OD + Actirob B	- 18 + 812 18 + 812 14.4 + 650 10.8 + 487 10.8 15 + 812 3 + 812 1.8 + 15 + 812	- 0.5 kg + 1 L 0.5 kg + 1 L 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.3 kg 0.5 L + 1 L 0.03 L + 1 L 0.018 L + 0.5 L + 1 L	Post-em
KCP 6.2-8	Untreated Atlantis 12 OD + Mero Atlantis WG + Mero GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H Mesosulfuron 30 OD + Actirob B Iodosulfuron 100 OD + Actirob B Iodo OD + Meso OD + Actirob B	- 14.4 + 814 18 + 814 18 + 812 10.8 + 487 10.8 15 + 812 3 + 812 1.8 + 15 + 812	- 1.2 L + 1 L 0.5 kg + 1 L 0.5 kg + 1 L 0.3 kg + 0.6 L 0.3 kg 0.5 L + 1 L 0.03 L + 1 L 0.018 L + 0.5 L + 1 L	Post-em

KCP 6.2-9 KCP 6.2-13	Untreated Atlantis 12 OD + Actirob 842 EC Atlatis 12 OD Atlantis 12 OD + Actirob 842 EC Atlatis 12 OD GLOB289H + Actirob 842 EC GLOB289H GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC	- 14.4 + 505 14.4 7.2 + 505 7.2 18 + 842 14.4 14.4 + 674 10.8 + 505 7.2 + 337 3.6 + 168	- 1.2 L + 0.6 L 1.2 L 0.6 L + 0.6 L 0.6 L 0.5 kg + 1 L 0.4 kg 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.2 kg + 0.4 L 0.1 kg + 0.2 L	Post-em
KCP 6.2-14	Untreated Atlantis 12 OD + Actirob 842 EC Atlatis 12 OD Atlantis 12 OD + Actirob 842 EC Atlatis 12 OD GLOB289H GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC	- 14.4 + 505 14.4 7.2 + 505 7.2 14.4 14.4 + 674 10.8 + 505 7.2 + 337 3.6 + 168	- 1.2 L + 0.6 L 1.2 L 0.6 L + 0.6 L 0.6 L 0.4 kg 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.2 kg + 0.4 L 0.1 kg + 0.2 L	Post-em
KCP 6.2-15 – 16	Untreated Atlantis 12 OD + Actirob 842 EC Atlatis 12 OD Atlantis 12 OD + Actirob 842 EC Atlatis 12 OD GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC	- 14.4 + 505 14.4 7.2 + 505 7.2 14.4 + 674 10.8 + 505 7.2 + 337 3.6 + 168	- 1.2 L + 0.6 L 1.2 L 0.6 L + 0.6 L 0.6 L 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.2 kg + 0.4 L 0.1 kg + 0.2 L	Post-em
KCP 6.2-18 – 20	Untreated GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H GLOB289H + Actirob B Atlantis WG + Actirob B Atlantis WG + Actirob B	- 18 + 840 14.4 + 674 10.8 + 505 10.8 6.84 + 337 10.8 + 505 18 + 840	- 0.5 kg + 1 L 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.3 kg 0.19 kg + 0.4 L 0.3 kg + 0.6 L 0.5 kg + 1 L	Post-em
KCP 6.2-21	Untreated GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H GLOB289H + Actirob B Atlantis WG + Actirob B Atlantis WG + Actirob B	- 18 + 840 14.4 + 674 10.8 + 505 10.8 6.84 + 337 10.8 + 505 14.4 + 840	- 0.5 kg + 1 L 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.3 kg 0.19 kg + 0.4 L 0.3 kg + 0.6 L 0.4 kg + 1 L	Post-em
KCP 6.2-22	Untreated GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H GLOB289H + Actirob B Atlantis WG + Actirob B Atlantis OD	- 18 + 840 14.4 + 674 10.8 + 505 10.8 6.84 + 337 10.8 + 505 14.4	- 0.5 kg + 1 L 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.3 kg 0.19 kg + 0.4 L 0.3 kg + 0.6 L 1.2 L	Post-em
KCP 6.2-23 – 24	Untreated GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H GLOB289H + Actirob B	- 14.4 + 674 10.8 + 505 10.8 6.84 + 337	- 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.3 kg 0.19 kg + 0.4 L	Post-em

	GLOB289H + Actirob B Atlantis WG + Actirob B	4.3 + 337 10.8 + 505	0.12 kg + 0.4 L 0.3 kg + 0.6 L	
KCP 6.2-25 – 26	Untreated GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H GLOB289H + Actirob B GLOB289H + Actirob B Atlantis WG + Actirob B Atlantis WG + Actirob B	- 14.4 + 674 10.8 + 505 10.8 6.84 + 337 4.3 + 337 10.8 + 505 14.4 + 840	- 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.3 kg 0.19 kg + 0.4 L 0.12 kg + 0.4 L 0.3 kg + 0.6 L 0.4 kg + 1 L	Post-em
KCP 6.2-27	Untreated GLOB289H + Actirob B GLOB289H + Actirob B GLOB289H GLOB289H + Actirob B GLOB289H + Actirob B Atlantis WG + Actirob B Atlantis OD	- 14.4 + 674 10.8 + 505 10.8 6.84 + 337 4.3 + 337 10.8 + 505 14.4	- 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.3 kg 0.19 kg + 0.4 L 0.12 kg + 0.4 L 0.3 kg + 0.6 L 1.2 L	Post-em
KCP 6.2-28 – 29	Untreated GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC Atlantis 36 WG + Actirob 842 EC Atlantis 12 OD Atlantis 12 OD	- 18 + 840 14.4 + 674 10.8 + 505 7.2 + 337 7.2 + 253 7.2 10.8	- 0.5 kg + 1 L 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.2 kg + 0.4 L 0.2 kg + 0.3 L 0.6 L 0.9 L	Post-em
KCP 6.2-30 – 32	Untreated GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC GLOB289H + Actirob 842 EC Atlantis 36 WG + Actirob 842 EC Atlantis 12 OD Atlantis 12 OD	- 14.4 + 674 10.8 + 505 7.2 + 337 5.4 + 253 7.2 10.8	- 0.4 kg + 0.8 L 0.3 kg + 0.6 L 0.2 kg + 0.4 L 0.15 kg + 0.3 L 0.6 L 0.9 L	Post-em
KCP 6.2-33 – 35	Untreated GLOB289H + Actirob B GLOB289H + Biopower GLOB289H + Vexzone GLOB289H GLOB289H GLOB289H + Actirob B GLOB289H + Biopower GLOB289H + Vexzone Atlantis 36 WG + Actirob B	- 18 + 840 18 + 270 18 + 650 18 10.8 10.8 + 505 10.8 + 162 10.8 + 390 10.8 + 505	- 0.5 kg + 1 L 0.5 kg + 1 L 0.5 kg + 1 L 0.5 kg 0.3 kg 0.3 kg + 0.6 L 0.3 kg + 0.6 L 0.3 kg + 0.6 L 0.3 kg + 0.6 L	Post-em
KCP 6.2-36 – 37	Untreated GLOB289H + Actirob B GLOB289H + Biopower GLOB289H + Vexzone GLOB289H GLOB289H GLOB289H + Actirob B Atlantis 36 WG + Actirob B Atlantis OD	- 14.4 + 672 14.4 + 216 14.4 + 520 14.4 10.8 10.8 + 505 10.8 + 505 14.4	- 0.4 kg + 0.8 L 0.4 kg + 0.8 L 0.4 kg + 0.8 L 0.4 kg 0.3 kg 0.3 kg + 0.6 L 0.3 kg + 0.6 L 1.2 L	Post-em

Assessment methods:

1) Visual estimate of the weed control was made (%), 0 (no effect) to 100 % (plant dead)

Statistical analysis:

1) Before using a one-way ANOVA in the individual trials, homogeneity and normality were tested. If these assumptions were valid, a mean comparison test was performed using the NEWMAN-KEULS test (5%).

Trials from the Maritime EPPO Zone

In these tables, the final assessment of trials containing enough weeds per square meters are used. In the UK Data Requirements Handbook Chapter 8, it is stated that in the Maritime EPPO Zone for weeds a minimum population of 5 plants/m² is required. Alternatively, for measurements of ground cover, 2 % is considered to be the minimum required. In the tables below, weeds with a density between 4 and 5 plants/m² are shown in grey because they are valid for the North-East EPPO zone.

Additional tables per weed showing the orthogonal comparison between the different doses of GLOB289H and reference products are also shown.

Table 3.2-15: Efficacy against *Alopecurus myosuroides* (ALOMY)

ALOMY							KCP 6.2-1		KCP 6.2-5		KCP 6.2-6		KCP 6.2-7		KCP 6.2-11		KCP 6.2-17		KCP 6.2-18	
Weed population in untreated (#/m²)							61,3		33		6		5		9,3		58		14,3	
Days after appliaction							47		49		46		64		65		66		68	
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		% eff	
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		*0*	
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		-		-		-		-		99	b
	Actirob B	842	g/L	EC	0,6	L/ha														
3	Atlantis WG	3,6	%	WG	0,4	kg/ha	96	a	-		-		-		-		-		-	
	Actirob B	842	GA/L	EC	0,8/1	L/ha														
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		38	ab	33	de	99	a	100	a	70	a	99	b
	Actirob B/Mero	842	GA/L	EC	1	L/ha														
5	Atlantis OD	12	g/L	OD	1,2	L/ha	-		-		-		-		-		-		-	
7	GLOB289H	3,6	%	WG	0,19	kg/ha	-		-		-		-		-		-		99	b
	Actirob B	842	g/L	EC	0,4	L/ha														
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**90**	**a**	**24**	**b**	**26**	**e**	**97**	**a**	**100**	**a**	**60**	**ab**	**99**	**b**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**														
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**92**	**a**	**35**	**ab**	**43**	**bc**	**99**	**a**	**100**	**a**	**79**	**a**	**99**	**b**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**														
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**91**	**a**	**55**	**a**	**49**	**ab**	**98**	**a**	**100**	**a**	**78**	**a**	**100**	**a**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**														
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		-		-		-	
	Biopower				0,6	L/ha														
12	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		-		-		-	
	Vexzone				0,6	L/ha														
13	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		-		-		-	
	Biopower				1	L/ha														
14	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		-		-		-	
	Vexzone				1	L/ha														
15	GLOB289H	3,6	%	WG	0,3	kg/ha	74	a	23	b	16	f	94	a	83	b	40	bc	99	b
16	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		-		-		-	

ALOMY							KCP 6.2-19		KCP 6.2-20		KCP 6.2-21		KCP 6.2-22		KCP 6.2-33		KCP 6.2-35	
Weed population in untreated (#/m²)							23,3		81		5,5		25		623		180	
Days after appliaction							69		41		28		33		42		42	
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff	
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*	
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	28	d	49	c	79	a	88	ab	30	a	75	ab
	Actirob B	842	g/L	EC	0,6	L/ha												
3	Atlantis WG	3,6	%	WG	0,4	kg/ha	-		-		91	a	-		-		-	
	Actirob B	842	GA/L	EC	0,8/1	L/ha												
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	85	a	50	c	-		-		-		-	
	Actirob B/Mero	842	GA/L	EC	1	L/ha												
5	Atlantis OD	12	g/L	OD	1,2	L/ha	-		-		-		94	a	-		-	
7	GLOB289H	3,6	%	WG	0,19	kg/ha	3	e	31	d	80	a	68	c	-		-	
	Actirob B	842	g/L	EC	0,4	L/ha												
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**43**	**c**	**64**	**b**	**73**	**a**	**79**	**b**	**79**	**c**	**64**	**d**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**												
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**58**	**b**	**61**	**b**	**82**	**a**	**84**	**ab**	**-**	**-**	**-**	**-**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**												
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**68**	**b**	**89**	**a**	**83**	**a**	**93**	**a**	**93**	**a**	**74**	**ab**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**												
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		94	a	74	ab
	Biopower				0,6	L/ha												
12	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		94	a	67	cd
	Vexzone				0,6	L/ha												
13	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		99	a	77	a
	Biopower				1	L/ha												
14	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		99	a	79	a
	Vexzone				1	L/ha												
15	GLOB289H	3,6	%	WG	0,3	kg/ha	23	d	0	e	85	a	68	c	72	c	11	e
16	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		84	b	69	bc

ALOMY Weed population in untreated (#/m²) Days after appliaction							Summary						
No.	Treatment				Rate		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						-		*13*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	64	de	7	28	99	28	75
	Actirob B	842	g/L	EC	0,6	L/ha							
3	Atlantis WG	3,6	%	WG	0,4	kg/ha	94	a	2	91	96	3	94
	Actirob B	842	GA/L	EC	0,8/1	L/ha							
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	72	de	8	33	100	28	78
	Actirob B/Mero	842	GA/L	EC	1	L/ha							
5	Atlantis OD	12	g/L	OD	1,2	L/ha	94	ab	1	94	94	-	94
7	GLOB289H	3,6	%	WG	0,19	kg/ha	56	e	5	3	99	39	68
	Actirob B	842	g/L	EC	0,4	L/ha							
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**69**	**de**	**13**	**24**	**100**	**26**	**73**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**							
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**76**	**bcd**	**11**	**35**	**100**	**23**	**82**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**							
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**82**	**a-d**	**13**	**49**	**100**	**17**	**89**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**							
11	GLOB289H	3,6	%	WG	0,3	kg/ha	84	-	2	74	94	14	84
	Biopower				0,6	L/ha							
12	GLOB289H	3,6	%	WG	0,3	kg/ha	81	-	2	67	94	19	80,5
	Vexzone				0,6	L/ha							
13	GLOB289H	3,6	%	WG	0,5	kg/ha	88	-	2	77	99	16	88
	Biopower				1	L/ha							
14	GLOB289H	3,6	%	WG	0,5	kg/ha	89	-	2	79	99	14	89
	Vexzone				1	L/ha							
15	GLOB289H	3,6	%	WG	0,3	kg/ha	53	e	13	0	99	35	68
16	GLOB289H	3,6	%	WG	0,5	kg/ha	77	-	2	69	84	11	76,5

Note that the results for trial KCP 6.2-5 and 6.2-6 are marked in grey. In these trials, the efficacy of all products is very low. Further investigations have shown that the blackgrass in these trials is resistant blackgrass (KCP 6.2-5b and 6b). Removing these trial from the summary increases the efficacy to the following results:

ALOMY Weed population in untreated (#/m²) Days after appliaction							Summary		
No.	Treatment				Rate		Mean		n
1	*Untreated Check*						-		*11*
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	84	de	8
	Actirob B/Mero	842	GA/L	EC	1	L/ha			
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**77**	**de**	**11**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**			
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**84**	**bcd**	**9**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**			
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**88**	**a-d**	**11**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**			

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3, 0.4 and 0.5 kg/ha:

ALOMY	**Number of trials**	**Efficacy (%)**						**No of trials where product is >, <, = compared to standard(s) <u>at the same dose rate</u> <u>Min. 5 % difference</u>**
		GLOB289H + oil 0.3 kg/ha	**GLOB289H + oil 0.4 kg/ha**	**GLOB289H + oil 0.5 kg/ha**	**Atlantis WG + oil 0.3 kg/ha**	**Atlantis WG + oil 0.4 kg/ha**	**Atlantis WG + oil 0.5 kg/ha**	
Orthogonal comparison at the same dose rate	7	72	-	-	64	-	-	3x <, 1x =, 3x >
	2	-	87	-	-	92	-	1x <, 1x =
	8	-	-	80	-	-	72	1x <, 3x =, 4x >

Table 3.2-16: Efficacy against *Apera spica-venti* (APESV)

APESV							KCP 6.2-12		KCP 6.2-24		KCP 6.2-27		KCP 6.2-26		KCP 6.2-36		KCP 6.2-37		Summary						
Weed population in untreated (#/m²)							113		20,2		6		15,5		8		19								
Days after appliaction							54		53		14		55		60		59								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		-		*6*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		99	a	95	b	99	a	100	a	100		99	a	5	95	100	2	99
	Actirob B	842	g/L	EC	0,6	L/ha																			
3	Atlantis WG	3,6	%	WG	0,4	kg/ha	-		-		-		99	a	-		-		99	a	1	99	99	-	99
	Actirob B	842	GA/L	EC	0,8/1	L/ha																			
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	100	a	-		-		-		-		-		100	a	1	100	100	-	100
	Actirob B/Mero	842	GA/L	EC	1	L/ha																			
5	Atlantis OD	12	g/L	OD	1,2	L/ha	-		-		98	a	-		100	a	100		99	a	3	98	100	1	100
6	GLOB289H	3,6	%	WG	0,12	kg/ha	-		76	c	60	f	94	b	-		-		77	b	3	60	94	17	76
	Actirob B	842	G/L	EC	0,4	L/ha																			
7	GLOB289H	3,6	%	WG	0,19	kg/ha	-		90	b	63	e	99	a	-		-		84	ab	3	63	99	19	90
	Actirob B	842	g/L	EC	0,4	L/ha																			
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**98**	**a**	**99**	**a**	**70**	**d**	**99**	**a**	**80**	**c**	**100**		**91**	**ab**	**6**	**70**	**100**	**13**	**98,5**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**																			
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**99**	**a**	**99**	**a**	**80**	**c**	**99**	**a**	**75**	**d**	**100**		**92**	**ab**	**6**	**75**	**100**	**11**	**99**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**																			
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**100**	**a**	**-**		**-**		**-**		-		-		**100**	**a**	**1**	**100**	**100**	**-**	**100**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**																			
13	GLOB289H	3,6	%	WG	0,4	kg/ha	**-**		**-**		**-**		**-**		85	b	100		93	-	2	85	100	11	92,5
	Biopower				0,8	L/ha																			
14	GLOB289H	3,6	%	WG	0,4	kg/ha	**-**		**-**		**-**		**-**		80	c	100		90	-	2	80	100	14	90
	Vexzone				0,8	L/ha																			
15	GLOB289H	3,6	%	WG	0,4	kg/ha	**-**		**-**		**-**		**-**		70	e	50		60	-	2	50	70	14	60
16	GLOB289H	3,6	%	WG	0,3	kg/ha	69	c	90	b	70	d	99	a	70	e	0		66	ab	6	0	99	35	70

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3, 0.4 and 0.5 kg/ha:

APSEV	Number of trials	Efficacy (%)						No of trials where product is >, <, = compared to stand-ard(s) at the same dose rate Min. 5 % difference
		GLOB289H + oil 0.3 kg/ha	GLOB289H + oil 0.4 kg/ha	GLOB289H + oil 0.5 kg/ha	Atlantis WG + oil 0.3 kg/ha	Atlantis WG + oil 0.4 kg/ha	Atlantis WG + oil 0.5 kg/ha	
Orthogonal comparison at the same dose rate	5	90	-	-	99	-	-	2x <, 3x =
	1	-	99	-	-	99	-	1x =
	1	-	-	100	-	-	100	1x =

Table 3.2-17: Efficacy against *Galium aparine* (GALAP)

GALAP							KCP 6.2-11		KCP 6.2-7		KCP 6.2-8		KCP 6.2-19		KCP 6.2-35		KCP 6.2-37		Summary						
Weed population in untreated (#/m²)							53,8		4,25		17		4		31		10								
Days after appliaction							65		64		52		69		42		59								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		-		*6*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		-		98	a	76	b	100		91	a	3	76	100	13	98
	Actirob B	842	g/L	EC	0,6	L/ha																			
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	80	c	81	ab	83	ab	100	a	-		-		86	ab	4	80	100	9	82
	Actirob B/Mero	842	GA/L	EC	1	L/ha																			
5	Atlantis OD	12	g/L	OD	1,2	L/ha	-		-		-		-		-		100		100	-	1	100	100	-	100
7	GLOB289H	3,6	%	WG	0,19	kg/ha	-		-		-		49	c	-		-		49	b	1	49	49	-	49
	Actirob B	842	g/L	EC	0,4	L/ha																			
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**60**	**d**	**58**	**c**	**65**	**d**	**85**	**a**	**93**	**a**	**99**		**77**	**ab**	**6**	**58**	**99**	**18**	**75**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**																			
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**60**	**d**	**71**	**b**	**-**		**94**	**a**	**-**		**75**		**75**	**ab**	**4**	**60**	**94**	**14**	**73**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**																			
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**80**	**c**	**81**	**ab**	**76**	**bc**	**99**	**a**	**95**	**a**	**-**		**86**	**ab**	**5**	**76**	**99**	**10**	**81**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**																			
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		94	a	-		94	-	1	94	94	-	94
	Biopower				0,6	L/ha																			
12	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		93	a	-		93	-	1	93	93	-	93
	Vexzone				0,6	L/ha																			
13	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		33		33	-	1	33	33	-	33
	Biopower				0,8	L/ha																			
14	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		100		100	-	1	100	100	-	100
	Vexzone				0,8	L/ha																			
15	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		98	a	-		98	-	1	98	98	-	98
	Biopower				1	L/ha																			
16	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		97	a	-		97	-	1	97	97	-	97
	Vexzone				1	L/ha																			
17	GLOB289H	3,6	%	WG	0,3	kg/ha	**63**	**d**	**30**	**d**	**60**	**d**	**66**	**b**	**15**	**c**	0		39	b	6	0	66	28	45
18	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		100		100	-	1	100	100	-	100
19	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		95	a	-		95	-	1	95	95	-	95

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3 and 0.5 kg/ha:

GALAP	Number of trials	Efficacy (%)						No of trials where product is >, <, = compared to stand-ard(s) at the same dose rate Min. 5 % difference
		GLOB289H + oil 0.3 kg/ha	GLOB289H + oil 0.4 kg/ha	GLOB289H + oil 0.5 kg/ha	Atlantis WG + oil 0.3 kg/ha	Atlantis WG + oil 0.4 kg/ha	Atlantis WG + oil 0.5 kg/ha	
Orthogonal comparison at the same dose rate	3	92	-	-	91	-	-	1x <, 1x =, 1x >
	-	-	-	-	-	-	-	-
	4	-	-	84	-	-	86	1x <, 3x =

Table 3.2-18: Efficacy against *Matricaria chamomille* (MATCH)

MATCH							KCP 6.2-18		KCP 6.2-3		KCP 6.2-7		KCP 6.2-19		KCP 6.2-33		Summary					
Weed population in untreated (#/m²)							4,3		22		12,3		6		19							
Days after appliaction							68		29		64		69		42							
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		-		*5*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	100	-	-		-		100	-	100	a	100	-	3	100	100	0	100
	Actirob B	842	g/L	EC	0,6	L/ha																	
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	100	-	75	ab	100	a	100	-	-		94	-	4	75	100	13	100
	Actirob B	842	GA/L	EC	1	L/ha																	
7	GLOB289H	3,6	%	WG	0,19	kg/ha	100	-	-		-		100	-	-		100	-	2	100	100	0	100
	Actirob B	842	g/L	EC	0,4	L/ha																	
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**100**	**-**	**50**	**ab**	**33**	**c**	**100**	**-**	**100**	**a**	**77**	**-**	**5**	**33**	**100**	**33**	**100**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**																	
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**100**	**-**	**65**	**ab**	**99**	**a**	**100**	**-**	**-**		**91**	**-**	**4**	**65**	**100**	**17**	**99,5**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**																	
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**100**	**-**	**58**	**ab**	**100**	**a**	**100**	**-**	**100**	**a**	**92**	**-**	**5**	**58**	**100**	**19**	**100**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**																	
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		100	a	100	-	1	100	100	-	100
	Biopower				0,6	L/ha																	
12	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		100	a	100	-	1	100	100	-	100
	Vexzone				0,6	L/ha																	
13	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		100	a	100	-	1	100	100	-	100
	Biopower				1	L/ha																	
14	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		100	a	100	-	1	100	100	-	100
	Vexzone				1	L/ha																	
15	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		100	a	99	-	1	99	99	-	99
16	GLOB289H	3,6	%	WG	0,3	kg/ha	100	-	75	ab	100	a	100	-	99	a	95	-	5	75	100	11	100

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3 and 0.5 kg/ha:

MATCH	Number of trials	Efficacy (%)						No of trials where product is >, <, = compared to stand-ard(s) at the same dose rate Min. 5 % difference
		GLOB289H + oil 0.3 kg/ha	GLOB289H + oil 0.4 kg/ha	GLOB289H + oil 0.5 kg/ha	Atlantis WG + oil 0.3 kg/ha	Atlantis WG + oil 0.4 kg/ha	Atlantis WG + oil 0.5 kg/ha	
Orthogonal comparison at the same dose rate	3	100	-	-	100	-	-	3x =
	-	-	-	-	-	-	-	-
	4	-	-	89	-	-	94	1x <, 3x =

Table 3.2-19: Efficacy against CHEAL *(Chenopodium album*)

CHEAL							KCP 6.2-1		KCP 6.2-11		KCP 6.2-24		KCP 6.2-27		Summary						
Weed population in untreated (#/m²)							5		14,5		11,5		9								
Days after appliaction							54		65		53		14								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		-		*4*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		88	b	81	b	84	a	2	81	88	4	84
	Actirob B	842	g/L	EC	0,6	L/ha															
3	Atlantis WG	3,6	%	WG	0,4	kg/ha	100	a	-		-		-		100	a	1	100	100	1	100
	Actirob B	842	GA/L	EC	0,8/1	L/ha															
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		100	-	-		-		100	a	1	100	100	-	100
	Actirob B/Mero	842	GA/L	EC	1	L/ha															
5	Atlantis OD	12	g/L	OD	1,2	L/ha	-		-		-		90	a	90	a	1	90	90	-	90
6	GLOB289H	3,6	%	WG	0,12	kg/ha	-		-		68	f	33	f	50	b	2	33	68	25	50
	Actirob B	842	G/L	EC	0,4	L/ha															
7	GLOB289H	3,6	%	WG	0,19	kg/ha	-		-		74	e	40	e	57	b	2	40	74	24	57
	Actirob B	842	g/L	EC	0,4	L/ha															
8	GLOB289H	3,6	%	WG	0,3	kg/ha	100	a	100	-	84	c	55	d	85	a	4	55	100	21	92
	Actirob B	842	GA/L	EC	0,6	L/ha															
9	GLOB289H	3,6	%	WG	0,4	kg/ha	100	a	100	-	99	a	65	c	91	a	4	65	100	17	100
	Actirob B	842	GA/L	EC	0,8	L/ha															
10	GLOB289H	3,6	%	WG	0,5	kg/ha	100	a	100	-	-		-		100	a	2	100	100	0	100
	Actirob B	842	GA/L	EC	1	L/ha															
11	GLOB289H	3,6	%	WG	0,3	kg/ha	98	a	100	-	78	d	60	cd	84	a	4	60	100	19	87,9

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3, 0.4 and 0.5 kg/ha:

CHEAL	Number of trials	Efficacy (%)						No of trials where product is >, <, = compared to stand-ard(s) <u>at the same dose rate</u> <u>Min. 5 % difference</u>
		GLOB289H + oil 0.3 kg/ha	GLOB289H + oil 0.4 kg/ha	GLOB289H + oil 0.5 kg/ha	Atlantis WG + oil 0.3 kg/ha	Atlantis WG + oil 0.4 kg/ha	Atlantis WG + oil 0.5 kg/ha	
Orthogonal comparison at the same dose rate	2	70	-	-	84	-	-	1x <, 1x =
	1	-	100	-	-	100	-	1x =
	1	-	-	100	-	-	100	1x =

Table 3.2-20: Efficacy against *Poa annua* (POAAN)

POAAN							KCP 6.2-24		KCP 6.2-25		KCP 6.2-27		KCP 6.2-23		KCP 6.2-26		KCP 6.2-34		KCP 6.2-36		KCP 6.2-37	
Weed population in untreated (#/m²)							8,25		21,2		6		111		20,5		22		6		11	
Days after appliaction							53		56		14		57		55		80		60		59	
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		% eff		% eff	
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		*0*		*0*	
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	97	a	93	-	91	b	84	ab	99	a	84	b	100	a	90	
	Actirob B	842	g/L	EC	0,6	L/ha																
3	Atlantis WG	3,6	%	WG	0,4	kg/ha	-		91	-	-		-		98	a	-		-		-	
	Actirob B	842	GA/L	EC	0,8/1	L/ha																
5	Atlantis OD	12	g/L	OD	1,2	L/ha	-		-		96	a	-		-		-		100	a	100	
6	GLOB289H	3,6	%	WG	0,12	kg/ha	79	d	88	-	68	d	28	d	84	b	-		-		-	
	Actirob B	842	G/L	EC	0,4	L/ha																
7	GLOB289H	3,6	%	WG	0,19	kg/ha	85	c	88	-	70	d	58	c	96	a	-		-		-	
	Actirob B	842	g/L	EC	0,4	L/ha																
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**96**	**a**	**95**	**-**	**73**	**cd**	**81**	**b**	**97**	**a**	**88**	**b**	**80**	**c**	**100**	
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**																
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**99**	**a**	**94**	**-**	**78**	**c**	**91**	**a**	**96**	**a**	**-**		**75**	**d**	**100**	
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**																
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**-**		**-**		**-**		**-**		**-**		**97**	**a**	**-**		**-**	
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**																
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		-		94	a	-		-	
	Biopower				0,6	L/ha																
12	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		-		99	a	-		-	
	Vexzone				0,6	L/ha																
13	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		-		85	b	100	
	Biopower				0,8	L/ha																
14	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		-		80	c	100	
	Vexzone				0,8	L/ha																
15	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		-		100	a	-		-	
	Biopower				1	L/ha																
16	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		-		99	a	-		-	
	Vexzone				1	L/ha																
17	GLOB289H	3,6	%	WG	0,3	kg/ha	93	b	93	-	78	c	58	c	97	a	43	d	70	e	90	
18	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		-		70	e	100	
19	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		-		71	c	-		-	

POAAN Weed population in untreated (#/m²) Days after appliaction							Summary						
No.	Treatment				Rate		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						-		*8*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	92	-	8	84	100	6	92
	Actirob B	842	g/L	EC	0,6	L/ha							
3	Atlantis WG	3,6	%	WG	0,4	kg/ha	95	-	2	91	98	5	95
	Actirob B	842	GA/L	EC	0,8/1	L/ha							
5	Atlantis OD	12	g/L	OD	1,2	L/ha	99	-	3	96	100	2	100
6	GLOB289H	3,6	%	WG	0,12	kg/ha	69	-	5	28	88	24	79
	Actirob B	842	G/L	EC	0,4	L/ha							
7	GLOB289H	3,6	%	WG	0,19	kg/ha	79	-	5	58	96	15	85
	Actirob B	842	g/L	EC	0,4	L/ha							
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**89**	**-**	**8**	**73**	**100**	**10**	**92**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**							
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**90**	**-**	**7**	**75**	**100**	**10**	**94**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**							
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**97**	**-**	**1**	**97**	**97**	**-**	**97**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**							
11	GLOB289H	3,6	%	WG	0,3	kg/ha	94	-	1	94	94	-	94
	Biopower				0,6	L/ha							
12	GLOB289H	3,6	%	WG	0,3	kg/ha	99	-	1	99	99	-	99
	Vexzone				0,6	L/ha							
13	GLOB289H	3,6	%	WG	0,4	kg/ha	93	-	2	85	100	11	93
	Biopower				0,8	L/ha							
14	GLOB289H	3,6	%	WG	0,4	kg/ha	90	-	2	80	100	14	90
	Vexzone				0,8	L/ha							
15	GLOB289H	3,6	%	WG	0,5	kg/ha	100	-	1	100	100	-	100
	Biopower				1	L/ha							
16	GLOB289H	3,6	%	WG	0,5	kg/ha	99	-	1	99	99	-	99
	Vexzone				1	L/ha							
17	GLOB289H	3,6	%	WG	0,3	kg/ha	78	-	8	43	97	19	84
18	GLOB289H	3,6	%	WG	0,4	kg/ha	85	-	2	70	100	21	85
19	GLOB289H	3,6	%	WG	0,5	kg/ha	71	-	1	71	71	-	71

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3 and 0.4 kg/ha:

POAAN	Number of trials	Efficacy (%)						No of trials where product is >, <, = compared to stand-ard(s) at the same dose rate Min. 5 % difference
		GLOB289H + oil 0.3 kg/ha	GLOB289H + oil 0.4 kg/ha	GLOB289H + oil 0.5 kg/ha	Atlantis WG + oil 0.3 kg/ha	Atlantis WG + oil 0.4 kg/ha	Atlantis WG + oil 0.5 kg/ha	
Orthogonal comparison at the same dose rate	8	89	-	-	92	-	-	2x <, 5x =, 1x >
	2	-	95	-	-	95	-	2x =
	-	-	-	-	-	-	-	-

Table 3.2-21: Efficacy against *Stellaria media* (STEME)

STEME							KCP 6.2-1		KCP 6.2-5		KCP 6.2-22		KCP 6.2-27		KCP 6.2-26		KCP 6.2-37		Summary						
Weed population in untreated (#/m²)							8		10		7		12		6,5		11								
Days after appliaction							54		49		64		14		55		59								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		-		*6*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		76	b	91	b	99	-	80	-	86,5	-	4	76	99	10	85,5
	Actirob B	842	g/L	EC	0,6	L/ha																			
3	Atlantis WG	3,6	%	WG	0,4	kg/ha	100	a	-		-		-		99	-	-	-	99,5	-	2	99	100	-	99,5
	Actirob B	842	GA/L	EC	0,8/1	L/ha																			
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		98	a	-		-		-		-		98	-	1	98	98	-	98
	Actirob B/Mero	842	GA/L	EC	1	L/ha																			
5	Atlantis OD	12	g/L	OD	1,2	L/ha	-		-		75	b	97	a	-		100		90,7	-	3	75	100	14	97
6	GLOB289H	3,6	%	WG	0,12	kg/ha	-		-		-		45	f	99	-	-	-	72	-	2	45	99	38	72
	Actirob B	842	G/L	EC	0,4	L/ha																			
7	GLOB289H	3,6	%	WG	0,19	kg/ha	-		-		73	b	50	e	99	-	-	-	74	-	3	50	99	25	73
	Actirob B	842	g/L	EC	0,4	L/ha																			
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**100**	**a**	**95**	**a**	**79**	**b**	**60**	**d**	**99**	**-**	**100**	**-**	**88,8**	**-**	**6**	**60**	**100**	**16**	**97**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**																			
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**100**	**a**	**95**	**a**	**89**	**a**	**76**	**c**	**99**	**-**	**100**	**-**	**93,2**	**-**	**6**	**76**	**100**	**9**	**97**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**																			
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**100**	**a**	**100**	**a**	**93**	**a**	**-**		**-**		**-**		**97,7**	**-**	**3**	**93**	**100**	**4**	**100**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**																			
11	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		100		100	-	1	100	100	-	100
	Biopower				0,8	L/ha																			
12	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		100		100	-	1	100	100	-	100
	Vexzone				0,8	L/ha																			
13	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		100		100	-	1	100	100	-	100
14	GLOB289H	3,6	%	WG	0,3	kg/ha	100	a	94	a	68	b	50	e	99	-	0	-	68,5	a-d	6	0	100	39	81

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3, 0.4 and 0.5 kg/ha:

STEME	Number of trials	Efficacy (%)						No of trials where product is >, <, = compared to stand-ard(s) at the same dose rate Min. 5 % difference
		GLOB289H + oil 0.3 kg/ha	GLOB289H + oil 0.4 kg/ha	GLOB289H + oil 0.5 kg/ha	Atlantis WG + oil 0.3 kg/ha	Atlantis WG + oil 0.4 kg/ha	Atlantis WG + oil 0.5 kg/ha	
Orthogonal comparison at the same dose rate	4	85	-	-	87	-	-	1x <, 2x =, 1x >
	2	-	100	-	-	100	-	2x =
	1	-	-	100	-	-	98	1x =

Table 3.2-22: Efficacy against *Lamium purpureum* (LAMPU)

LAMPU							KCP 6.2-3		KCP 6.2-20		Summary						
Weed population in untreated (#/m²)							22		5,75								
Days after appliaction							29		41								
No.	Treatment				Rate		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*			-	*2*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		99	a	99	-	1	99	99	-	99
	Actirob B	842	g/L	EC	0,6	L/ha											
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	80	ab	85	b	82	-	2	80	85	3	82
	Actirob B/Mero	842	GA/L	EC	1	L/ha											
7	GLOB289H	3,6	%	WG	0,19	kg/ha	-		50	c	50	-	1	50	50	-	50
	Actirob B	842	g/L	EC	0,4	L/ha											
8	GLOB289H	3,6	%	WG	0,3	kg/ha	65	ab	99	a	82	-	2	65	99	24	82
	Actirob B	842	GA/L	EC	0,6	L/ha											
9	GLOB289H	3,6	%	WG	0,4	kg/ha	28	ab	99	a	63	-	2	28	99	51	63
	Actirob B	842	GA/L	EC	0,8	L/ha											
10	GLOB289H	3,6	%	WG	0,5	kg/ha	43	ab	99	a	71	-	2	43	99	40	71
	Actirob B	842	GA/L	EC	1	L/ha											
11	GLOB289H	3,6	%	WG	0,3	kg/ha	100	a	49	c	74	-	2	49	100	36	74

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3 and 0.5 kg/ha:

LAMPU	**Number of trials**	**Efficacy (%)**						**No of trials where product is >, <, = compared to stand-ard(s) <u>at the same dose rate</u> <u>Min. 5 % difference</u>**
		GLOB289H + oil 0.3 kg/ha	**GLOB289H + oil 0.4 kg/ha**	**GLOB289H + oil 0.5 kg/ha**	**Atlantis WG + oil 0.3 kg/ha**	**Atlantis WG + oil 0.4 kg/ha**	**Atlantis WG + oil 0.5 kg/ha**	
Orthogonal comparison at the same dose rate	1	99	-	-	99	-	-	1x =
	-	-	-	-	-	-	-	-
	2	-	-	71	-	-	82	1x <, 1x >

Table 3.2-23: Efficacy against *Veronica persica* (VERPE)

VERPE							KCP 6.2-1		KCP 6.2-3		KCP 6.2-17		KCP 6.2-20		KCP 6.2-22		KCP 6.2-25		Summary						
Weed population in untreated (#/m²)							5		31		8		6,5		11		6,5								
Days after appliaction							54		39		39		41		33		56								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		-		*6*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		-		94	ab	68	a	99	-	87	b	3	68	99	17	94
	Actirob B	842	g/L	EC	0,6	L/ha																			
3	Atlantis WG	3,6	%	WG	0,4	kg/ha	100	a	-		-		-		-		99	-	100	a	2	99	100	1	100
	Actirob B	842	GA/L	EC	0,8/1	L/ha																			
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		100	a	100	a	94	ab	-		-		98	a	3	94	100	3	100
	Actirob B/Mero	842	GA/L	EC	1	L/ha																			
5	Atlantis OD	12	g/L	OD	1,2	L/ha	-		-		-		-		54	b	-		54	d	1	54	54	-	54
6	GLOB289H	3,6	%	WG	0,12	kg/ha	-		-		-		-		-		99	-	99	a	1	99	99	-	99
	Actirob B	842	G/L	EC	0,4	L/ha																			
7	GLOB289H	3,6	%	WG	0,19	kg/ha	-		-		-		87	d	64	ab	99	-	83	bc	3	64	99	18	87
	Actirob B	842	g/L	EC	0,4	L/ha																			
8	GLOB289H	3,6	%	WG	0,3	kg/ha	100	a	100	a	100	a	90	c	69	a	99	-	93	ab	6	69	100	12	100
	Actirob B	842	GA/L	EC	0,6	L/ha																			
9	GLOB289H	3,6	%	WG	0,4	kg/ha	100	a	100	a	100	a	92	bc	69	a	99	-	93	ab	6	69	100	12	100
	Actirob B	842	GA/L	EC	0,8	L/ha																			
10	GLOB289H	3,6	%	WG	0,5	kg/ha	100	a	100	a	100	a	97	a	75	a	-		94	ab	5	75	100	11	100
	Actirob B	842	GA/L	EC	1	L/ha																			
11	GLOB289H	3,6	%	WG	0,3	kg/ha	100	a	100	a	100	a	72	e	64	ab	99	-	89	bc	6	64	100	17	99

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3, 0.4 and 0.5 kg/ha:

VERPE	Number of trials	Efficacy (%)						No of trials where product is >, <, = compared to stand-ard(s) at the same dose rate Min. 5 % difference
		GLOB289H + oil 0.3 kg/ha	GLOB289H + oil 0.4 kg/ha	GLOB289H + oil 0.5 kg/ha	Atlantis WG + oil 0.3 kg/ha	Atlantis WG + oil 0.4 kg/ha	Atlantis WG + oil 0.5 kg/ha	
Orthogonal comparison at the same dose rate	3	86	-	-	87	-	-	3x =
	2	-	100	-	-	100	-	2x =
	3	-	-	99	-	-	98	3x =

Table 3.2-24: Efficacy against *Viola arvensis* (VIOAR)

VIOAR							KCP 6.2-18		KCP 6.2-25		KCP 6.2-4		KCP 6.2-37		KCP 6.2-1		Summary						
Weed population in untreated (#/m²)							22,5		97,5		46,3		13		8								
Days after appliaction							28		56		61		59		54								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		-		*5*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	71	b	87	-	-		25		-		61	-	3	25	87	32	71
	Actirob B	842	g/L	EC	0,6	L/ha																	
3	Atlantis WG	3,6	%	WG	0,4	kg/ha	-		85	-	-		-		97	a	91	-	2	85	97	-	91
	Actirob B	842	GA/L	EC	0,8/1	L/ha																	
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	86	a	-		78	-	-		-		82	-	2	78	86	6	82
	Actirob B/Mero	842	GA/L	EC	1	L/ha																	
5	Atlantis OD	12	g/L	OD	1,2	L/ha	-		-		-		50		-		50	-	1	50	50	-	50
6	GLOB289H	3,6	%	WG	0,12	kg/ha	-		71	-	-		-		-		71	-	1	71	71	-	71
	Actirob B	842	G/L	EC	0,4	L/ha																	
7	GLOB289H	3,6	%	WG	0,19	kg/ha	55	c	84	-	-		-		-		70	-	2	55	84	21	69,5
	Actirob B	842	g/L	EC	0,4	L/ha																	
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**70**	**b**	**88**	**-**	**64**	**-**	**50**		**100**	**a**	**74**	**-**	**5**	**50**	**100**	**20**	**70**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**																	
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**81**	**ab**	**84**	**-**	**68**	**-**	**50**		**100**	**a**	**77**	**-**	**5**	**50**	**100**	**19**	**81**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**																	
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**81**	**ab**	**-**		**77**	**-**	**-**		**98**	**a**	**85**	**-**	**3**	**77**	**98**	**11**	**81**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**																	
11	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		50		-		50	-	1	50	50	-	50
	Biopower				0,8	L/ha																	
12	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		90		-		90	-	1	90	90	-	90
	Vexzone				0,8	L/ha																	
13	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		80		-		80	-	1	80	80	-	80
14	GLOB289H	3,6	%	WG	0,3	kg/ha	50	c	82	-	66	-	25		98	a	64	-	5	25	98	28	66

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3, 0.4 and 0.5 kg/ha:

VIOAR	Number of trials	Efficacy (%)						No of trials where product is >, <, = compared to stand-ard(s) at the same dose rate Min. 5 % difference
		GLOB289H + oil 0.3 kg/ha	GLOB289H + oil 0.4 kg/ha	GLOB289H + oil 0.5 kg/ha	Atlantis WG + oil 0.3 kg/ha	Atlantis WG + oil 0.4 kg/ha	Atlantis WG + oil 0.5 kg/ha	
Orthogonal comparison at the same dose rate	3	69	-	-	61	-	-	2x =, 1x >
	2	-	92	-	-	91	-	2x =
	2	-	-	79	-	-	82	2x =

Table 3.2-25: Efficacy against *Polygonum aviculare* (POLAV)

POLAV							KCP 6.2-8		KCP 6.2-12		Summary						
Weed population in untreated (#/m²)							6		254								
Days after appliaction							52		54								
No.	Treatment				Rate		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		-		*2*	-	-	-	-
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	89	a	30	b	30	-	1	30	30	-	30
	Actirob B/Mero	842	GA/L	EC	1	L/ha											
8	GLOB289H	3,6	%	WG	0,3	kg/ha	89	a	3	d	46	-	2	3	89	61	46
	Actirob B	842	GA/L	EC	0,6	L/ha											
9	GLOB289H	3,6	%	WG	0,4	kg/ha	-		68	a	68	-	1	68	68	-	68
	Actirob B	842	GA/L	EC	0,8	L/ha											
10	GLOB289H	3,6	%	WG	0,5	kg/ha	91	a	73	a	82	-	2	73	91	13	82
	Actirob B	842	GA/L	EC	1	L/ha											
11	GLOB289H	3,6	%	WG	0,3	kg/ha	71	b	8	c	39	-	2	8	71	45	39

Table 3.2-26: Efficacy against *Papaver rhoeas* (PAPRH)

PAPRH							KCP 6.2-1		KCP 6.2-4		KCP 6.2-8		KCP 6.2-19		KCP 6.2-33		Summary						
Weed population in untreated (#/m²)							21		40		17		9,8		6								
Days after appliaction							54		61		52		69		42								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		-		*5*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		-		100	-	95	a	98	a	2	95	100	4	98
	Actirob B	842	g/L	EC	0,6	L/ha																	
3	Atlantis WG	36	G/KG	WG	0,4	kg/ha	97	a	-		-		-		-		97	a	1	97	97	-	97
	Actirob B	842	g/L	EC	0,8	L/ha																	
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		77	ab	97	a	100	-	-		91	a	3	77	100	13	97
	Actirob B/Mero	842	GA/L	EC	1	L/ha																	
7	GLOB289H	3,6	%	WG	0,19	kg/ha	-		-		-		100	-	-		100	a	1	100	100	-	100
	Actirob B	842	g/L	EC	0,4	L/ha																	
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**99**	**a**	**61**	**bc**	**93**	**ab**	**100**	**-**	**89**	**a**	**88**	**a**	**5**	**61**	**100**	**16**	**93**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**																	
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**99**	**a**	**68**	**abc**	**-**		**100**	**-**	**-**		**89**	**a**	**3**	**68**	**100**	**18**	**99**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**																	
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**98**	**a**	**75**	**ab**	**94**	**ab**	**100**	**-**	**93**	**a**	**92**	**a**	**5**	**75**	**100**	**10**	**94**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**																	
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		89	a	89	a	1	89	89	-	89
	Biopower				0,6	L/ha																	
12	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		-		-		95	a	95	a	1	95	95	-	95
	Vexzone				0,6	L/ha																	
13	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		98	a	98	a	1	98	98	-	98
	Biopower				1	L/ha																	
14	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		93	a	93	a	1	93	93	-	93
	Vexzone				1	L/ha																	
15	GLOB289H	3,6	%	WG	0,3	kg/ha	99	a	51	c	86	b	100	-	92	a	86	a	5	51	100	20	92
16	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		-		-		95	a	95	a	1	95	95	-	95

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3, 0.4 and 0.5 kg/ha:

PAPRH	Number of trials	Efficacy (%)						No of trials where product is >, <, = compared to stand-ard(s) at the same dose rate Min. 5 % difference
		GLOB289H + oil 0.3 kg/ha	GLOB289H + oil 0.4 kg/ha	GLOB289H + oil 0.5 kg/ha	Atlantis WG + oil 0.3 kg/ha	Atlantis WG + oil 0.4 kg/ha	Atlantis WG + oil 0.5 kg/ha	
Orthogonal comparison at the same dose rate	2	95	-	-	98	-	-	1x >, 1x =
	1	-	99	-	-	97	-	1x =
	3	-	-	90	-	-	91	3x =

Table 3.2-27: Efficacy against *Tripleurospermum inodorum* (MATIN)

MATIN							KCP 6.2-11		KCP 6.2-12		KCP 6.2-20		KCP 6.2-22		KCP 6.2-24		KCP 6.2-27		KCP 6.2-5		KCP 6.2-8		KCP 6.2-23		KCP 6.2-37
Weed population in untreated (#/m²)							77,5		75		6,75		12		23,2		14		13		6		4,5		22
Days after appliaction							65		54		41		64		53		14		49		52		29		59
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		% eff		% eff		% eff		% eff
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		*0*		*0*		*0*		*0*
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		100	a	93	a	88	b	90	b	-		-		100	a	100
	Actirob B	842	g/L	EC	0,6	L/ha																			
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	100	-	91	b	100	a	-		-		-		93	ab	97	-	-		-
	Actirob B/Mero	842	GA/L	EC	1	L/ha																			
5	Atlantis OD	12	g/L	OD	1,2	L/ha	-		-		-		90	a	-		96	a	-		-		-		90
6	GLOB289H	3,6	%	WG	0,12	kg/ha	-		-		-		-		76	d	41	g	-		-		100	a	-
	Actirob B	842	G/L	EC	0,4	L/ha																			
7	GLOB289H	3,6	%	WG	0,19	kg/ha	-		-		98	b	71	b	84	c	51	f	-		-		100	a	-
	Actirob B	842	g/L	EC	0,4	L/ha																			
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**100**	**-**	**54**	**e**	**99**	**ab**	**90**	**a**	**84**	**c**	**73**	**d**	**86**	**ab**	**93**	**-**	**100**	**a**	**100**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**																			
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**100**	**-**	**59**	**d**	**100**	**a**	**92**	**a**	**99**	**a**	**80**	**c**	**94**	**ab**	**-**		**100**	**a**	**100**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**																			
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**100**	**-**	**98**	**a**	**100**	**a**	**98**	**a**	**-**		**-**		**95**	**ab**	**95**	**-**	**-**		**-**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**																			
11	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		-		-		-		-		100
	Biopower				0,8	L/ha																			
12	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		-		-		-		-		100
	Vexzone				0,8	L/ha																			
13	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		-		-		-		-		-		-		-		75
14	GLOB289H	3,6	%	WG	0,3	kg/ha	100	-	44	f	99	a	71	b	78	d	58	e	76	b	94	-	100	a	0

MATIN Weed population in untreated (#/m²) Days after appliaction							Summary						
No.	Treatment				Rate		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						-		*10*	-	-	-	-
2	Atlantis WG	36	G/KG	WG	0,3	kg/ha	95	a	6	88	100	6	97
	Actirob B	842	g/L	EC	0,6	L/ha							
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	96	a	5	91	100	4	97
	Actirob B/Mero	842	GA/L	EC	1	L/ha							
5	Atlantis OD	12	g/L	OD	1,2	L/ha	92	a	3	90	96	3	90
6	GLOB289H	3,6	%	WG	0,12	kg/ha	72	bc	3	41	100	30	76
	Actirob B	842	G/L	EC	0,4	L/ha							
7	GLOB289H	3,6	%	WG	0,19	kg/ha	81	abc	5	51	100	20	84
	Actirob B	842	g/L	EC	0,4	L/ha							
8	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**88**	**ab**	**10**	**54**	**100**	**15**	**92**
	Actirob B	**842**	**GA/L**	**EC**	**0,6**	**L/ha**							
9	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**92**	**a**	**9**	**59**	**100**	**14**	**99**
	Actirob B	**842**	**GA/L**	**EC**	**0,8**	**L/ha**							
10	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**98**	**a**	**6**	**95**	**100**	**2**	**98**
	Actirob B	**842**	**GA/L**	**EC**	**1**	**L/ha**							
11	GLOB289H	3,6	%	WG	0,4	kg/ha	100	-	1	100	100	-	100
	Biopower				0,8	L/ha							
12	GLOB289H	3,6	%	WG	0,4	kg/ha	100	-	1	100	100	-	100
	Vexzone				0,8	L/ha							
13	GLOB289H	3,6	%	WG	0,4	kg/ha	75	-	1	75	75	-	75
14	GLOB289H	3,6	%	WG	0,3	kg/ha	72	abc	10	0	100	32	77

Orthogonal comparison between GLOB289H and Atlantis WG at 0.3 and 0.5 kg/ha:

MATIN	Number of trials	Efficacy (%)						No of trials where product is >, <, = compared to stand-ard(s) at the same dose rate Min. 5 % difference
		GLOB289H + oil 0.3 kg/ha	GLOB289H + oil 0.4 kg/ha	GLOB289H + oil 0.5 kg/ha	Atlantis WG + oil 0.3 kg/ha	Atlantis WG + oil 0.4 kg/ha	Atlantis WG + oil 0.5 kg/ha	
Orthogonal comparison at the same dose rate	6	91	-	-	95	-	-	1x <, 5x =
	-	-	-	-	-	-	-	-
	5	-	-	98	-	-	96	4x =, 1x >

Conclusion

From the results above it can be very clearly concluded that GLOB289H + oil and Atlantis WG + oil applied at the same dose rate have approximately the same efficacy against the different weeds with very comparable results. Furthermore, depending on the weed species and pressure, an increasing dose rate shows an increased efficacy. Finally, for most weed species, the addition of oil to 0.3 kg/ha of GLOB289H increases the efficacy by approximately 5-10 %, however sometimes 0.3 kg/ha of GLOB289H without oil is sufficient. For these results, reference is made to the table below showing the susceptibility spectrum of the different dose rates.

In conclusion, these results support to the use of GLOB289H against grassy weeds and annual dicotyledonous weeds in cereals.

In the tables below the minimum dose showing a good efficacy is underlined based on the criteria used in Europe. It can be observed that the advised dose is depending on the weed species. Note that increasing the dose can still increase the efficacy to an even higher level.

Table 3.2-28: Susceptible weed spectrum based on EU criteria

EPPO code	0.3 kg/ha GLOB289H		0.3 kg/ha GLOB289H + oil			0.4 kg/ha GLOB289H + oil			0.5 kg/ha GLOB289H + oil		
	# trials	Eff. (%)	# trials	Eff. (%)	Susc.	# trials	Eff. (%)	Susc.	# trials	Eff. (%)	Susc.
ALOMY	11	59	11	77	*MS*	9	84	*MS*	11	88	*S*
APESV	6	66	6	91	*S*	6	92	*S*	1	100	*HS*
CHEAL	4	84	4	85	*S*	4	91	*S*	2	100	*HS*
GALAP	6	39	6	77	*MS*	4	75	*MS*	5	85	*S*
LAMPU	2	74	2	82	*MS*	2	63	*MT*	2	71	*MS*
MATCH	5	95	5	77	*MS*	4	91	*S*	5	92	*S*
MATIN	10	72	10	88	*S*	9	92	*S*	6	98	*HS*
PAPRH	5	86	5	88	*S*	3	89	*S*	5	92	*S*
POAAN	8	78	8	89	*S*	7	90	*S*	1	97	*HS-*
POLAV	2	39	2	46	*T*	1	68	*MT*	2	82	*MS*
STEME	6	69	6	89	*S*	6	93	*S*	3	98	*HS*
VERPE	6	89	6	93	*S*	6	93	*S*	5	94	*S*
VIOAR	5	64	5	74	*MS*	5	77	*MS*	3	85	*S*

*T=Tolerant; MT=Moderately Tolerant; MS=Moderately Susceptible; S=Susceptible; HS=Highly Susceptible

Trials from the North-East EPPO Zone

10 trials were performed in Poland (North-East EPPO zone) to support the efficacy of GLOB289H in this zone (these are underlined in the tables below). These were combined with the results of te German and Czech trials. The combined results are shown in the tables below, the underlined trials are the Polish trials. Due to the extensive number of products and dose rates (which do not correspond), an orthogonal comparison could not made for these trials. Such a comparison would split the results to much, resulting in averages which would not be representative anymore. Furthermore, in the Polish trials, the reference product was an OD formulation and not a WG formulation, making the orthogonal comparison unnecessary. However it can be observed that GLOB289H performs very similar to the different reference products. Reference is also made to the summary table at the end.

Table 3.2-29: Efficacy against *Alopecurus myosuroides* (ALOMY)

ALOMY							KCP 6.2-11		KCP 6.2-16		KCP 6.2-18		KCP 6.2-19		KCP 6.2-20		KCP 6.2-22	
Weed population in untreated (#/m²)							9,3		56		14,3		23,3		81		25	
Days after appliaction							65		56		68		69		41		33	
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff	
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*	
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	100	a	-		99	b	85	a	50	c	-	
	Actirob B/Mero	842	GA/L	EC	1	L/ha												
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		99	b	28	d	49	c	88	ab
	Actirob B	842	g/L	EC	0,6	L/ha												
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		-		-		-		-		-	
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha												
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**100**	**a**	**-**		**100**	**a**	**68**	**b**	**89**	**a**	**93**	**a**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**												
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**100**	**a**	**78**	**ab**	**99**	**b**	**58**	**b**	**61**	**b**	**84**	**ab**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**												
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**100**	**a**	**75**	**ab**	**99**	**b**	**43**	**c**	**64**	**b**	**79**	**b**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**												
8	GLOB289H	3,6	%	WG	0,2	kg/ha	-		73	ab	99	b	3	e	31	d	68	c
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha												
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	-		58	d	-		-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha												
11	GLOB289H	3,6	%	WG	0,3	kg/ha	83	b	-		99	b	23	d	0	e	68	c
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		80	a	-		-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha												
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		68	bc	-		-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha												
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		63	cd	-		-		-		-	
	Mero	842	gA/L	EC	1	L/ha												
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		76	ab	-		-		-		94	a
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	-		-		-		-		-		-	

ALOMY							KCP 6.2-29		KCP 6.2-33		KCP 6.2-35		Summary							
Weed population in untreated (#/m²)							39,7		623		180									
Days after appliaction							49		42		42									
No.	Treatment				Rate		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		-	-	*10*	-	-	-	-
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		-		-		84	-	4	50	100	23	92
	Actirob B/Mero	842	GA/L	EC	1	L/ha													
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		30	a	75	ab	62	-	6	28	99	30	62
	Actirob B	842	g/L	EC	0,6	L/ha													
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	84	ab	-		-		74	-	2	63	84	15	74
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha													
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**89**	**a**	**93**	**a**	**74**	**ab**	**90**	**-**	**9**	**68**	**100**	**12**	**93**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**													
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**85**	**ab**	**-**		**-**		**83**	**-**	**8**	**58**	**100**	**16**	**85**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**													
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**83**	**ab**	**79**	**c**	**64**	**d**	**78**	**-**	**10**	**43**	**100**	**17**	**79**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**													
8	GLOB289H	3,6	%	WG	0,2	kg/ha	80	b	-		-		60	-	7	3	99	32	68
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha													
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	-		-		-		58	-	1	58	58	-	58
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha													
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		72	c	11	e	51	-	7	0	99	39	68
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		-		-		80	-	1	80	80	-	80
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha													
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		-		-		68	-	1	68	68	-	68
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha													
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	83	ab	-		-		81	-	3	63	98	18	81
	Mero	842	gA/L	EC	1	L/ha													
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		-		-		85	-	2	76	94	13	85
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	85	ab	-		-		92	-	2	85	100	10	92

Table 3.2-30: Efficacy against *Apera spica-venti* (APESV)

APESV							KCP 6.2-12		KCP 6.2-14		KCP 6.2-15		KCP 6.2-16		KCP 6.2-24		KCP 6.2-27		KCP 6.2-30	
Weed population in untreated (#/m²)							113		17,7		72		5		20,2		6		15	
Days after appliaction							54		58		56		56		53		14		40	
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		% eff	
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		*0*	
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	100	a	-		-		-		-		-		-	
	Actirob B/Mero	842	GA/L	EC	1	L/ha														
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		-		-		99	a	95	b	-	
	Actirob B	842	g/L	EC	0,6	L/ha														
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		-		-		-		-		-		58	b
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha														
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**100**	**a**	**-**		**-**		**-**		**-**		**-**		**-**	
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**														
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**99**	**a**	**100**	**a**	**100**	**a**	**99**	**-**	**99**	**a**	**80**	**c**	**83**	**a**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**														
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**98**	**a**	**97**	**ab**	**98**	**a**	**99**	**-**	**99**	**a**	**70**	**d**	**71**	**ab**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**														
8	GLOB289H	3,6	%	WG	0,2	kg/ha	-		93	c	89	b	99	-	90	b	63	e	58	b
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha														
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	-		83	d	84	c	99	-	76	c	60	f	-	
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha														
10	GLOB289H	3,6	%	WG	0,4	kg/ha	-		96	b	-		-		-		-		-	
11	GLOB289H	3,6	%	WG	0,3	kg/ha	69	c	-		-		-		90	b	70	d	-	
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		100	a	99	a	99	-	-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha														
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		100	a	97	a	99	-	-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha														
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		93	c	95	a	99	-	-		-		70	ab
	Mero	842	gA/L	EC	1	L/ha														
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		100	a	98	a	99	-	-		98	a	-	
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	-		-		-		-		-		-		68	ab

APESV							KCP 6.2-31		KCP 6.2-32		KCP 6.2-36		KCP 6.2-37		Summary						
Weed population in untreated (#/m²)							50		13		8		19								
Days after appliaction							56		35		60		59								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		-		*11*	-	-	-	-
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		-		-		-		100	a	1	100	100	-	100
	Actirob B/Mero	842	GA/L	EC	1	L/ha															
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		100	a	100	a	99	a	4	95	100	2	100
	Actirob B	842	g/L	EC	0,6	L/ha															
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	16	e	30	-	-		-		35	g	3	16	58	21	30
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha															
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**-**		**-**		**-**		**-**		**100**	**a**	**1**	**100**	**100**	**-**	**100**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**															
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**94**	**a**	**90**	**-**	**75**	**d**	**100**	**a**	**93**	**a**	**11**	**75**	**100**	**9**	**99**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**															
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**81**	**b**	**70**	**-**	**80**	**c**	**100**	**a**	**88**	**a**	**11**	**70**	**100**	**13**	**97**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**															
8	GLOB289H	3,6	%	WG	0,2	kg/ha	43	d	50	-	-		-		73	b-e	8	43	99	22	76
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha															
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	-		-		-		-		80	cde	5	60	99	14	83
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha															
10	GLOB289H	3,6	%	WG	0,4	kg/ha	-		-		70	e	50	b	72	a	3	50	96	23	70
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		70	e	0	c	60	a	5	0	90	35	70
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		-		-		-		99	a-d	3	99	100	1	99
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha															
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		-		-		-		99	a-d	3	97	100	2	99
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha															
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	53	c	40	-	-		-		75	e	6	40	99	25	81,5
	Mero	842	gA/L	EC	1	L/ha															
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		-		100	a	100	a	99	a-d	4	98	100	1	98,5
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	90	a	85	-	-		-		81	b-e	3	68	90	11	85

Table 3.2-31: Efficacy against *Avena fatua* (AVEFA)

AVEFA							KCP 6.2-30		KCP 6.2-31		KCP 6.2-32		Summary						
Weed population in untreated (#/m²)							8		113		6,5								
Days after appliaction							40		56		35								
No.	Treatment				Rate		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		-		*3*	-	-	-	-
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	68	ab	13	e	20	-	33	f	3	13	68	30	20
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha													
6	GLOB289H	3,6	%	WG	0,4	kg/ha	78	a	96	a	90	-	88	a	3	78	96	10	90
	Actirob B/842 EC	842	GA/L	EC	0,8	L/ha													
7	GLOB289H	3,6	%	WG	0,3	kg/ha	65	ab	83	c	70	-	73	c	3	65	83	9	70
	Actirob B/842 EC	842	GA/L	EC	0,6	L/ha													
8	GLOB289H	3,6	%	WG	0,2	kg/ha	63	b	39	d	30	-	44	e	3	30	63	17	39
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha													
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	74	ab	41	d	40	-	52	d	3	40	74	19	41
	Mero	842	gA/L	EC	1	L/ha													
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	74	ab	88	b	80	-	80	b	3	74	88	7	80

Table 3.2-32: Efficacy against *Capsella Bursa-Pastoris* (CAPBP)

CAPBP							KCP 6.2-15		KCP 6.2-16		Summary						
Weed population in untreated (#/m²)							6		6								
Days after appliaction							56		56								
No.	Treatment				Rate		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		-		*2*	-	-	-	-
6	GLOB289H	3,6	%	WG	0,4	kg/ha	100	a	96	ab	98	ab	2	96	100	3	98
	Actirob B/842 EC	842	GA/L	EC	0,8	L/ha											
7	GLOB289H	3,6	%	WG	0,3	kg/ha	100	a	95	ab	97	ab	2	95	100	4	97
	Actirob B/842 EC	842	GA/L	EC	0,6	L/ha											
8	GLOB289H	3,6	%	WG	0,2	kg/ha	89	b	92	b	90	c	2	89	92	2	90
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha											
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	83	c	92	b	87	d	2	83	92	7	87
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha											
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	100	a	99	a	99	a	2	99	100	1	99
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha											
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	100	a	92	b	96	b	2	92	100	6	96
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha											
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	100	a	93	b	97	ab	2	93	100	5	97
	Mero	842	gA/L	EC	1	L/ha											
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	100	a	97	ab	98	ab	2	97	100	2	98

Table 3.2-33: Efficacy against *Galium aparine* (GALAP)

GALAP							KCP 6.2-11		KCP 6.2-14		KCP 6.2-19		KCP 6.2-28		KCP 6.2-8		KCP 6.2-35		KCP 6.2-37	
Weed population in untreated (#/m²)							53,8		11,2		4		4,5		17		31		10	
Days after appliaction							65		58		69		49		52		42		59	
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		% eff	
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		*0*	
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	80	c	-		100	a	-		83	ab	-		-	
	Actirob B/Mero	842	GA/L	EC	1	L/ha														
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		98	a	-		-		76	b	100	-
	Actirob B	842	g/L	EC	0,6	L/ha														
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		-		-		63	ab	-		-		-	
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha														
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**80**	**c**	**-**		**99**	**a**	**73**	**a**	**76**	**bc**	**95**	**a**	**-**	
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**														
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**60**	**d**	**100**	**a**	**94**	**a**	**76**	**a**	**-**		**-**		**75**	**-**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**														
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**60**	**d**	**100**	**a**	**85**	**a**	**64**	**ab**	**65**	**d**	**93**	**a**	**99**	**-**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**														
8	GLOB289H	3,6	%	WG	0,2	kg/ha	-		100	a	49	c	55	b	-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha														
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	-		100	a	-		-		-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha														
10	GLOB289H	3,6	%	WG	0,4	kg/ha	-		100	a	-		-		-		-		100	-
11	GLOB289H	3,6	%	WG	0,3	kg/ha	63	d	-		66	b	-		60	d	15	c	0	-
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		100	a	-		-		-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha														
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		100	a	-		-		-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha														
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		90	b	-		69	ab	-		-		-	
	Mero	842	gA/L	EC	1	L/ha														
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		100	a	-		-		88	ab	-		-	
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	-		-		-		69	ab	-		-		-	

GALAP Weed population in untreated (#/m²) Days after appliaction							Summary						
No.	Treatment				Rate		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						-		*7*	-	-	-	-
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	88	abc	3	80	100	11	88
	Actirob B/Mero	842	GA/L	EC	1	L/ha							
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	91	ab	3	76	100	13	98
	Actirob B	842	g/L	EC	0,6	L/ha							
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	63	c-f	1	63	63	-	63
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha							
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**85**	**ab**	**5**	**73**	**99**	**12**	**80**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**							
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**81**	**ab**	**5**	**60**	**100**	**16**	**76**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**							
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**81**	**ab**	**7**	**60**	**100**	**17**	**85**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**							
8	GLOB289H	3,6	%	WG	0,2	kg/ha	68	b-f	3	49	100	28	55
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha							
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	100	a	1	100	100	-	100
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha							
10	GLOB289H	3,6	%	WG	0,4	kg/ha	100	ab	2	100	100	0	100
11	GLOB289H	3,6	%	WG	0,3	kg/ha	41	ab	5	0	66	31	60
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	100	a	1	100	100	-	100
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha							
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	100	a	1	100	100	-	100
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha							
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	80	-	2	69	90	15	79,5
	Mero	842	gA/L	EC	1	L/ha							
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	94	-	2	88	100	8	94
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	69	a-f	1	69	69	-	69

Table 3.2-34: Efficacy against *Chenopodium album* (CHEAL)

CHEAL							KCP 6.2-11		KCP 6.2-24		KCP 6.2-27		Summary						
Weed population in untreated (#/m²)							14,5		11,5		9								
Days after appliaction							65		53		14								
No.	Treatment				Rate		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		-		*3*	-	-	-	-
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	100	-	-		-		100	a	1	100	100	-	100
	Actirob B/Mero	842	GA/L	EC	1	L/ha													
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		88	b	81	b	84	a	2	81	88	4	84
	Actirob B	842	g/L	EC	0,6	L/ha													
5	GLOB289H	3,6	%	WG	0,5	kg/ha	100	-	-		-		100	a	1	100	100	-	100
	Actirob B/842 EC	842	GA/L	EC	1	L/ha													
6	GLOB289H	3,6	%	WG	0,4	kg/ha	100	-	99	a	65	c	88	a	3	65	100	20	99
	Actirob B/842 EC	842	GA/L	EC	0,8	L/ha													
7	GLOB289H	3,6	%	WG	0,3	kg/ha	100	-	84	c	55	d	80	a	3	55	100	23	84
	Actirob B/842 EC	842	GA/L	EC	0,6	L/ha													
8	GLOB289H	3,6	%	WG	0,2	kg/ha	-		74	e	40	e	57	b	2	40	74	24	57
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha													
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	-		68	f	33	f	50	b	2	33	68	25	50
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha													
11	GLOB289H	3,6	%	WG	0,3	kg/ha	100	-	78	d	60	cd	79	a	3	60	100	20	78
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		-		90	a	90	a	1	90	90	-	90

Table 3.2-35: Efficacy against *Matricaria chamomilla* (MATCH)

MATCH							KCP 6.2-18		KCP 6.2-19		KCP 6.2-33		Summary						
Weed population in untreated (#/m²)							4,3		6		6								
Days after appliaction							68		69		69								
No.	Treatment				Rate		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		-		*3*	-	-	-	-
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	100	a	100	a	100	a	100	a	2	100	100	0	100
	Actirob B/Mero	842	GA/L	EC	1	L/ha													
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	100	a	100	a	-		100	a	2	100	100	0	100
	Actirob B	842	g/L	EC	0,6	L/ha													
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**100**	**a**	**100**	**a**	**100**	**a**	**100**	**a**	**3**	**100**	**100**	**0**	**100**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**													
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**100**	**a**	**100**	**a**	**-**		**100**	**a**	**3**	**100**	**100**	**0**	**100**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**													
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**100**	**a**	**100**	**a**	**100**	**a**	**100**	**a**	**2**	**100**	**100**	**0**	**100**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**													
8	GLOB289H	3,6	%	WG	0,2	kg/ha	100	a	100	a	-		100	a	2	100	100	0	100
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha													
11	GLOB289H	3,6	%	WG	0,3	kg/ha	100	a	100	a	99	a	100	a	3	99	100	0	100

Table 3.2-36: Efficacy against *Tripleurospermum inodorum* (MATIN)

MATIN							KCP 6.2-11		KCP 6.2-12		KCP 6.2-15		KCP 6.2-16		KCP 6.2-20		KCP 6.2-22		KCP 6.2-23		KCP 6.2-24	
Weed population in untreated (#/m²)							77,5		75		7		4		6,75		12		4,5		23,2	
Days after appliaction							65		54		56		56		41		64		29		53	
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		% eff		% eff	
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		*0*		*0*	
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	100	-	91	b	-		-		100	a	-		-		-	
	Actirob B/Mero	842	GA/L	EC	1	L/ha																
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		-		-		100	a	93	a	100	a	88	b
	Actirob B	842	g/L	EC	0,6	L/ha																
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		-		-		-		-		-		-		-	
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha																
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**100**	**-**	**98**	**a**	**-**		**-**		**100**	**a**	**98**	**a**	**-**		**-**	
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**																
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**100**	**-**	**59**	**d**	**99**	**a**	**94**	**b**	**100**	**a**	**92**	**a**	**100**	**a**	**99**	**a**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**																
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**100**	**-**	**54**	**e**	**88**	**b**	**93**	**bc**	**99**	**ab**	**90**	**a**	**100**	**a**	**84**	**c**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**																
8	GLOB289H	3,6	%	WG	0,2	kg/ha	-		-		66	d	92	bc	98	b	71	b	100	a	84	c
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha																
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	-		-		53	e	89	c	-		-		100	a	76	d
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha																
11	GLOB289H	3,6	%	WG	0,3	kg/ha	100	-	44	f	-		-		99	a	71	b	100	a	78	d
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		-		100	a	98	a	-		-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha																
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		-		96	a	93	bc	-		-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha																
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		-		78	c	91	bc	-		-		-		-	
	Mero	842	gA/L	EC	1	L/ha																
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		-		98	a	93	bc	-		90	a	-		-	
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	-		-		-		-		-		-		-		-	

MATIN							KCP 6.2-27		KCP 6.2-29		KCP 6.2-31		KCP 6.2-37		KCP 6.2-8		Summary						
Weed population in untreated (#/m²)							14		5,5		45		22		6								
Days after appliaction							14		49		56		59		52								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		-		*13*	-	-	-	-
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		-		-		-		97	-	97	ab	4	91	100	4	98,5
	Actirob B/Mero	842	GA/L	EC	1	L/ha																	
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	90	b	-		-		100	-	-		95	ab	6	88	100	6	96,5
	Actirob B	842	g/L	EC	0,6	L/ha																	
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		84	a	55	d	-		-		70	e	2	55	84	21	70
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha																	
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**-**		**89**	**a**	**-**		**-**		**95**	**-**	**97**	**a**	**6**	**89**	**100**	**4**	**98**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**																	
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**80**	**c**	**88**	**a**	**99**	**a**	**100**	**-**	**-**		**93**	**ab**	**12**	**59**	**100**	**12**	**99**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**																	
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**73**	**d**	**84**	**a**	**78**	**b**	**100**	**-**	**93**	**-**	**87**	**ab**	**13**	**54**	**100**	**13**	**90**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**																	
8	GLOB289H	3,6	%	WG	0,2	kg/ha	51	f	83	a	64	c	-		-		79	a-e	9	51	100	17	83
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha																	
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	41	g	-		-		-		-		72	e	5	41	100	25	76
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha																	
11	GLOB289H	3,6	%	WG	0,3	kg/ha	58	e	-		-		0	-	94	-	72	ab	9	0	100	34	78
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		-		-		-		-		99	a	2	98	100	1	99
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha																	
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		-		-		-		-		95	ab	2	93	96	2	94,5
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha																	
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		84	a	65	c	-		-		80	b-e	4	65	91	11	81
	Mero	842	gA/L	EC	1	L/ha																	
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	96	a	-		-		90		96	-	94	ab	6	90	98	3	94,5
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	-		88	a	95	a	-		-		92	ab	2	88	95	5	91,5

Table 3.2-37: Efficacy against *Papaver rhoeas* (PAPRH)

PAPRH							KCP 6.2-15		KCP 6.2-19		KCP 6.2-28		KCP 6.2-31		KCP 6.2-8		KCP 6.2-33		Summary						
Weed population in untreated (#/m²)							8		9,8		5,75		40		17		6								
Days after appliaction							56		69		49		56		52		42								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		*0*		*6*	*0*	*0*	*0*	*0*
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		100	-	-		-		97	a	-		99	-	2	97	100	2	98,5
	Actirob B/Mero	842	GA/L	EC	1	L/ha																			
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		100	-	-		-		-		95	a	98	-	2	95	100	-	97,5
	Actirob B	842	g/L	EC	0,6	L/ha																			
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		-		63	c	75	d	-		-		69	-	2	63	75	8	69
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha																			
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**-**		**100**	**-**	**93**	**a**	**-**		**94**	**ab**	**89**	**a**	**94**	**-**	**4**	**89**	**100**	**-**	**93,5**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**																			
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**88**	**a**	**100**	**-**	**94**	**a**	**100**	**a**	**-**		**-**		**96**	**-**	**4**	**88**	**100**	**-**	**97**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**																			
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**81**	**abc**	**100**	**-**	**83**	**b**	**81**	**c**	**93**	**ab**	**93**	**a**	**89**	**-**	**6**	**81**	**100**	**-**	**88**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**																			
8	GLOB289H	3,6	%	WG	0,2	kg/ha	76	c	100	-	63	c	64	e	-		-		76	-	4	63	100	17	70
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha																			
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	71	d	-		-		-		-		-		71	-	1	71	71	-	71
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha																			
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		100	-	-		-		86	b	92	a	93	-	3	86	100	-	92
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	86	a	-		-		-		-		-		86	-	1	86	86	-	86
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha																			
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	80	bc	-		-		-		-		-		80	-	1	80	80	-	80
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha																			
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	79	bc	-		83	b	54	f	-		-		72	-	3	54	83	16	79
	Mero	842	gA/L	EC	1	L/ha																			
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	84	ab	-		-		-		94	ab	-		89	-	2	84	94	7	89
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	-		-		85	b	86	b	-		-		86	-	2	85	86	1	85,5

Table 3.2-38: Efficacy against *Poa annua* (POAAN)

POAAN							KCP 6.2-23		KCP 6.2-24		KCP 6.2-27		KCP 6.2-29		KCP 6.2-34		KCP 6.2-36	
Weed population in untreated (#/m²)							111		8,25		6		5,5		22		6	
Days after appliaction							57		53		14		49		80		60	
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff	
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*	
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	84	ab	97	a	91	b	-		84	b	100	a
	Actirob B	842	g/L	EC	0,6	L/ha												
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		-		-		83	b	-		-	
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha												
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**-**		**-**		**-**		**92**	**a**	**97**	**a**	**-**	
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**												
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**91**	**a**	**99**	**a**	**78**	**c**	**88**	**ab**	**-**		**75**	**d**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**												
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**81**	**b**	**96**	**a**	**73**	**cd**	**84**	**ab**	**88**	**b**	**80**	**c**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**												
8	GLOB289H	3,6	%	WG	0,2	kg/ha	58	c	85	c	70	d	81	b	-		-	
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha												
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	28	d	79	d	68	d	-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha												
11	GLOB289H	3,6	%	WG	0,3	kg/ha	58	c	93	b	78	c	-		43	d	70	e
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		-		-		84	ab	-		-	
	Mero	842	gA/L	EC	1	L/ha												
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		-		96	a	-		-		-	
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	-		-		-		89	ab	-		-	

POAAN							KCP 6.2-37		Summary						
Weed population in untreated (#/m²)							11								
Days after appliaction							59								
No.	Treatment				Rate		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		-		*7*	-	-	-	-
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	90	-	91	a	6	84	100	7	90,5
	Actirob B	842	g/L	EC	0,6	L/ha									
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		83	a	1	83	83	-	83
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha									
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**-**		**95**	**a**	**2**	**92**	**97**	**4**	**94,5**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**									
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**100**	**-**	**89**	**a**	**6**	**75**	**100**	**10**	**89,5**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**									
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**100**	**-**	**86**	**a**	**7**	**73**	**100**	**9**	**84**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**									
8	GLOB289H	3,6	%	WG	0,2	kg/ha	-		74	a	4	58	85	12	76
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha									
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	-		58	a	3	28	79	27	68
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha									
11	GLOB289H	3,6	%	WG	0,3	kg/ha	90	-	72	a	6	43	93	19	74
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		84	a	1	84	84	-	84
	Mero	842	gA/L	EC	1	L/ha									
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		96	a	1	96	96	-	96
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	-		89	a	1	89	89	-	89

Table 3.2-39: Efficacy against *Polygonum aviculare* (POLAV)

POLAV							KCP 6.2-12		KCP 6.2-8		Summary						
Weed population in untreated (#/m²)							254		6								
Days after appliaction							54		52								
No.	Treatment				Rate		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		-		*2*	-	-	-	-
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	30	b	89	a	60	-	2	30	89	42	60
	Actirob B/Mero	842	GA/L	EC	1	L/ha											
5	GLOB289H	3,6	%	WG	0,5	kg/ha	73	a	91	a	82	-	2	73	91	13	82
	Actirob B/842 EC	842	GA/L	EC	1	L/ha											
6	GLOB289H	3,6	%	WG	0,4	kg/ha	68	a	-		68	-	1	68	68	-	68
	Actirob B/842 EC	842	GA/L	EC	0,8	L/ha											
7	GLOB289H	3,6	%	WG	0,3	kg/ha	3	d	89	a	46	-	2	3	89	61	46
	Actirob B/842 EC	842	GA/L	EC	0,6	L/ha											
11	GLOB289H	3,6	%	WG	0,3	kg/ha	8	c	71	b	39	-	2	8	71	45	39
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		91	a	91	-	1	91	91	-	91

Table 3.2-40: Efficacy against *Stellaria media* (STEME)

STEME							KCP 6.2-15		KCP 6.2-16		KCP 6.2-22		KCP 6.2-24		KCP 6.2-27		KCP 6.2-28		KCP 6.2-29	
Weed population in untreated (#/m²)							6		4		7		3,25		12		5,75		5,5	
Days after appliaction							56		56		64		53		14		49		49	
No.	Treatment				Rate		% eff		% eff		% eff		% eff		% eff		% eff		% eff	
1	*Untreated Check*						*0*		*0*		*0*		*0*		*0*		*0*		*0*	
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		76	b	90	b	91	b	-		-	
	Actirob B	842	g/L	EC	0,6	L/ha														
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		-		-		-		-		100	-	99	a
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha														
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**-**		**-**		**93**	**a**	**-**		**-**		**100**	**-**	**99**	**a**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**														
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**100**	**a**	**97**	**a**	**89**	**a**	**99**	**a**	**76**	**c**	**100**	**-**	**99**	**a**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**														
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**100**	**a**	**93**	**ab**	**79**	**b**	**89**	**b**	**60**	**d**	**100**	**-**	**99**	**a**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**														
8	GLOB289H	3,6	%	WG	0,2	kg/ha	97	b	90	bc	73	b	82	c	50	e	100	-	98	a
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha														
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	89	c	88	c	-		75	d	45	f	-		-	
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha														
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		68	b	84	c	50	e	-		-	
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	100	a	97	a	-		-		-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha														
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	100	a	93	ab	-		-		-		-		-	
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha														
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	100	a	93	ab	-		-		-		100	-	99	a
	Mero	842	gA/L	EC	1	L/ha														
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	100	a	94	ab	75	b	-		97	a	-		-	
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	-		-		-		-		-		100	-	99	a

STEME							KCP 6.2-30		KCP 6.2-37		Summary						
Weed population in untreated (#/m²)							6		11								
Days after appliaction							40		59								
No.	Treatment				Rate		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		-		*9*	-	-	-	-
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		80	-	84	bcd	4	76	91	7	85
	Actirob B	842	g/L	EC	0,6	L/ha											
4	Atlantis WG	36	G/KG	WG	0,15	kg/ha	60	-	-	-	86	a	3	60	100	23	99
	Actirob B/842 EC	842	GA/L	EW	0,3	L/ha											
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**-**		**-**	**-**	**97**	**ab**	**3**	**93**	**100**	**4**	**99**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**											
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**69**	**-**	**100**	**-**	**92**	**bcd**	**9**	**69**	**100**	**12**	**99**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**											
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**66**	**-**	**100**	**-**	**87**	**cde**	**9**	**60**	**100**	**16**	**93**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**											
8	GLOB289H	3,6	%	WG	0,2	kg/ha	65	-	-		82	def	8	50	100	18	86
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha											
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	-		-		74	ef	4	45	89	21	81,5
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha											
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		0	-	51	fg	4	0	84	36	59
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		-		99	cde	2	97	100	2	98,5
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha											
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	-		-		97	def	2	93	100	5	96,5
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha											
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	70	-	-		92	bcd	5	70	100	13	99
	Mero	842	gA/L	EC	1	L/ha											
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	-		100	-	93	cde	5	75	100	10	97
16	Atlantis 12 OD	12	GA/L	EC	0,9	L/ha	78	-	-		92	abc	3	78	100	12	99

Table 3.2-41: Efficacy against *Veronica persica* (VERPE)

VERPE							KCP 6.2-13		KCP 6.2-14		KCP 6.2-20		KCP 6.2-22		Summary						
Weed population in untreated (#/m²)							5		13		6,5		11								
Days after appliaction							48		58		41		33								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		-		*4*	-	-	-	-
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		-		94	ab	-		94	ab	1	94	94	-	94
	Actirob B/Mero	842	GA/L	EC	1	L/ha															
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		94	ab	68	a	81	b-e	2	68	94	19	81
	Actirob B	842	g/L	EC	0,6	L/ha															
5	GLOB289H	3,6	%	WG	0,5	kg/ha	-		-		97	a	75	a	86	a-d	2	75	97	15	86
	Actirob B/842 EC	842	GA/L	EC	1	L/ha															
6	GLOB289H	3,6	%	WG	0,4	kg/ha	63	c	100	-	92	bc	69	a	81	b-e	4	63	100	18	80
	Actirob B/842 EC	842	GA/L	EC	0,8	L/ha															
7	GLOB289H	3,6	%	WG	0,3	kg/ha	53	d	100	-	90	c	69	a	78	b-f	4	53	100	21	79
	Actirob B/842 EC	842	GA/L	EC	0,6	L/ha															
8	GLOB289H	3,6	%	WG	0,2	kg/ha	52	d	100	-	87	d	64	ab	77	b-f	4	52	100	22	75
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha															
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	80	a	100	-	-		-		90	abc	2	80	100	14	90
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha															
10	GLOB289H	3,6	%	WG	0,4	kg/ha	-		100	-	-		-		52	gh	2	4	100	68	52
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		72	e	64	ab	68	d-g	2	64	72	6	68
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	51	d	100	-	-		-		76	b-f	2	51	100	34	76
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha															
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	55	d	100	-	-		-		78	b-f	2	55	100	32	78
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha															
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	67	bc	100	-	-		-		59	fg	3	11	100	45	67
	Mero	842	gA/L	EC	1	L/ha															
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	79	a	100	-	-		54	b	63	efg	4	21	100	34	66

Table 3.2-42: Efficacy against *Viola arvensis* (VIOAR)

VIOAR							KCP 6.2-14		KCP 6.2-16		KCP 6.2-18		KCP 6.2-37		Summary						
Weed population in untreated (#/m²)							17,7		5		22,5		13								
Days after appliaction							58		56		28		59								
No.	Treatment				Rate		% eff		% eff		% eff		% eff		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*0*		*0*		*0*		*0*		-		*4*	-	-	-	-
2	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		-		86	a	-		86	abc	1	86	86	-	86
	Actirob B/Mero	842	GA/L	EC	1	L/ha															
3	Atlantis WG	36	G/KG	WG	0,3	kg/ha	-		-		71	b	25	-	48	a-d	2	25	71	33	48
	Actirob B	842	g/L	EC	0,6	L/ha															
5	**GLOB289H**	**3,6**	**%**	**WG**	**0,5**	**kg/ha**	**-**		**-**		**81**	**ab**	**-**		**81**	**abc**	**1**	**81**	**81**	**-**	**81**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**1**	**L/ha**															
6	**GLOB289H**	**3,6**	**%**	**WG**	**0,4**	**kg/ha**	**95**	**a**	**55**	**ab**	**81**	**ab**	**50**	**-**	**70**	**a-d**	**4**	**50**	**95**	**21**	**68**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,8**	**L/ha**															
7	**GLOB289H**	**3,6**	**%**	**WG**	**0,3**	**kg/ha**	**94**	**a**	**53**	**ab**	**70**	**b**	**50**	**-**	**67**	**a-d**	**4**	**50**	**94**	**20**	**61,5**
	Actirob B/842 EC	**842**	**GA/L**	**EC**	**0,6**	**L/ha**															
8	GLOB289H	3,6	%	WG	0,2	kg/ha	91	ab	53	ab	55	c	-		66	bcd	3	53	91	22	55
	Actirob B/842 EC	842	gA/L	EC	0,4	L/ha															
9	GLOB289H	3,6	%	WG	0,1-0,12	kg/ha	85	bc	48	ab	-		-		66	bcd	2	48	85	27	66
	Actirob B/842 EC	842	gA/L	EC	0,2	L/ha															
10	GLOB289H	3,6	%	WG	0,4	kg/ha	94	a	-		-		80	-	87	ab	2	80	94	10	87
11	GLOB289H	3,6	%	WG	0,3	kg/ha	-		-		50	c	25	-	38	d	2	25	50	18	37,5
12	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	96	a	63	a	-		-		79	abc	2	63	96	24	79
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha															
13	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	91	ab	48	ab	-		-		69	a-d	2	48	91	31	69
	Actirob B/842 EC	842	gA/L	EC	0,6	L/ha															
14	Atlantis 12 OD	12	gA/L	OD	0,6	L/ha	80	c	45	b	-		-		63	cd	2	45	80	25	63
	Mero	842	gA/L	EC	1	L/ha															
15	Atlantis 12 OD	12	gA/L	OD	1,2	L/ha	93	a	60	ab	-		50	-	68	a-d	3	50	93	23	60

Conclusion

From the results above it can again be concluded that GLOB289H + oil and Atlantis WG + oil applied at the same dose rate have approximately the same efficacy against the different weeds with very comparable results. Furthermore, depending on the weed species and pressure, an increasing dose rate shows an increased efficacy (for this, reference is made to the table below showing the susceptibility spectrum of the different dose rates).
In conclusion, these results support to the use of GLOB289H against grassy weeds and annual dicotyledonous weeds in cereals. In the North-East EPPO Zone, GLOB289H is always applied with oil.

In the tables below the minimum dose showing a good efficacy is underlined based on the criteria used in Europe. It can be observed that the advised dose is depending on the weed species. Note that increasing the dose can still increase the efficacy to an even higher level.

Table 3.2-43: Susceptible weed spectrum based on EU criteria

EPPO code	0.1 kg/ha GLOB289H + oil			0.2 kg/ha GLOB289H + oil			0.3 kg/ha GLOB289H + oil			0.4 kg/ha GLOB289H + oil		
	# trials	Eff. (%)	Susc.	# trials	Eff. (%)	Susc.	# trials	Eff. (%)	Susc.	# trials	Eff. (%)	Susc.
ALOMY	1	58	*MT*	~~7~~ 6	60	*MT*	~~10~~ 9	78	*MS*	~~8~~ 7	83	*MS*
APESV	5	80	*MS*	8	73	*MS*	11	88	*S*	11	93	*S*
AVEFA	-	-	-	3	44	*T*	3	73	*MS*	3	88	*S*
CAPBP	2	87	*S*	2	90	*S*	2	97	*HS*	2	98	*HS*
CHEAL	2	50	*MT*	2	57	*MT*	3	80	*MS*	3	88	*S*
GALAP	1	100	-	3	68	*MT*	7	81	*MS*	5	81	*MS*
MATCH	-	-	-	2	100	*HS*	2	100	*HS*	3	100	*HS*
MATIN	5	72	*MS*	9	79	*MS*	13	87	*S*	12	93	*S*
PAPRH	1	71	-	4	76	*MS*	6	89	*S*	4	96	*HS*
POAAN	3	58	*MT*	4	74	*MS*	7	86	*S*	6	89	*S*
POLAV	-	-	-	-	-	-	2	46	*T*	1	68	-
STEME	4	74	*MS*	8	82	*MS*	9	87	*S*	9	92	*S*
VERPE	2	90	*S*	4	77	*MS*	4	78	*MS*	4	81	*MS*
VIOAR	2	66	*MT*	3	66	*MT*	4	67	*MT*	4	70	*MS*

*T=Tolerant; MT=Moderately Tolerant; MS=Moderately Susceptible; S=Susceptible; HS=Highly Susceptible

Furthermore, in trials KCP 6.2-33-37, the effect of different oils/wetting agents on the efficacy of GLOB289H is compared for the different dose rates. The results show that GLOB289H is compatible with different kinds of adjuvants, all of them improving the efficacy of GLOB289H (reference is made to the table below). Next to this, STEME, MATCH and MATIN were only observed in 1 trial with an efficacy of 100% for all adjuvants. For these results, reference is also made to the tables: 6.2-13 - 6.2-25.
In conclusion, it is advised to use GLOB289H with an adjuvant, without further specifications.

Product	ALOMY		APESV		POAAN	
	# trials	Eff. (%)	# trials	Eff. (%)	# trials	Eff. (%)
0.3 L/ha GLOB289H 0.6 L/ha Actirob	2	72	-	-	1	88
0.3 L/ha GLOB289H 0.6 L/ha Biopower	2	84	-	-	1	94
0.3 L/ha GLOB289H 0.6 L/ha Vexzone	2	81	-	-	1	99
0.4 L/ha GLOB289H 0.8 L/ha Actirob	-	-	2	88	2	88
0.4 L/ha GLOB289H 0.8 L/ha Biopower	-	-	2	93	2	93
0.4 L/ha GLOB289H 0.8 L/ha Vexzone	-	-	2	90	2	90
0.5 L/ha GLOB289H 1 L/ha Actirob	2	84	-	-	1	97
0.5 L/ha GLOB289H 1 L/ha Biopower	2	88	-	-	1	100
0.5 L/ha GLOB289H 1 L/ha Vexzone	2	89	-	-	1	99

Comments of zRMS:	EPPO Standard PP 1/226 Number of efficacy trials provides guidance on the number of trials in target crops needed to demonstrate the efficacy of a plant protection product at the recommended dose. Where authorization is sought across a range of diverse conditions, such as across an authorization zone (PP 1/278 Principles of zonal data production and evaluation), then the number of trials conducted may need to increase. These trials should be done across the range of climatic and environmental conditions likely to be encountered, and over at least 2 years. The applicant was notified that according to PP 1/226 at least 6 trials from each climatic zone are required (in case of reduced number of trials in major pest on major crop). Number of trials for efficacy from North-east EPPO zone (10 trials carried out on winter cereals) and Maritime EPPO zone (25 trials carried out on winter cereals) is sufficient, according to EPPO rules. For winter wheat Applicant submiited in total – 23 trials from Maritime and 6 trials from N-E EPPO zone. For winter triticale Applicant submitted 1 trial from Maritime EPPO zone (DE) and 4 trials carried out in N-E EPPO zone (PL). For winter barley Applicant submitted only one trial performed in Maritime EPPO zone (DE). According to EPPO extrapolation tables, results from any winter cereal can be

	extrapolated to other winter cereal (wheat TRZSS, barley HORSS, rye SECCE, triticale TTLWI, TTLSO, spelt TRZSP, durum TRZDU, oat AVESA, AVESW, grassland, amenity grassland). In the opinion of Evaluator, such cereals as winter durum wheat or spelt can be registered in cMS according to possibility of extrapolation results. Also, uses in winter cereals can be further supported by the nationally registered reference products (on Member State level) based on the same active ingredients: iodosulfuron-methyl-sodium, mesosulfuron-methyl and safener mefenpyr-diethyl. So, **extrapolation decisions for winter cereals, supported by the EPPO extrapolation tables, should be made on national level by the cMS**. In Poland at least 3-4 selectivity trials carried out on cereals on which we extrapolate the results are required. So, registered the winter durum wheat and spelt is not possible. However, Poland can accept winter rye according to extrapolating results from winter wheat, triticale and barley and submitted selectivity trials. ~~Spring cereals should be excluded from GAP table and label project due to~~ Lack of trials carried out on ~~them~~ spring cereals. At least 6 trials carried out on spring wheat in the Maritime EPPO zone ~~is required~~ should been presented and 6 trials performed in Poland (or neighbouring countries, ex. DE, CZ) in the opinion of ZRMS. Also, for registration in Poland is require at least 3-4 selectivity trials for spring durum wheat, spring spelt and spring triticale. However, we should remember that most spring cereal uses included in GAP table by Applicant e.g. spring durum wheat, spring spelt, spring triticale and spring rye (and possibly spring wheat) are considered as minor crops in different concerned member states. Furthermore, member states such as the Netherlands have their own extrapolation tables for cereal uses. Therefore **the applicant believes and ZRMs agree that spring cereal uses should be evaluated on cMS level, especially since only the lower dose rate is applied for**. This is in accordance with nationally registered reference products based on the same active ingredients: iodosulfuron-methyl-sodium, mesosulfuron-methyl and safener mefenpyr-diethyl. **Concerned Member States will need to consider the relevance of the submitted formulation comparability data in relation to the current authorized uses for the reference product in their own Member State. The evaluation was conducted in accordance with Uniform Principles.** For Poland we can consider results from neighbouring countries (ex. DE, CZ). So, Applicant properly presented efficacy results separately for Maritime and N-E EPPO zone. In the tables presented by Applicant are presented results from UK, FR, BE, DE and CZ for Maritime EPPO zone and results from PL, CZ and DE for Poland as N-E EPPO zone. Considering GAP and registration from N-E only in PL, the Applicant correctly presented those results. Only trials with greater than 5 weeds/m^2 or over 2% ground cover should be taken for assessment. According to EPPO PP 1/226 at least 6 fully supportive results for major weeds and 2 trials for minor weeds should be required. Therefore, based on knowledge of major/minor status of weeds in each country, weeds with insufficient results should be excluded. Considering comparable results in all zones, it is recommended to take into account results from all zones to get more reliable set of data. The results should be adjusted to known efficacy from long term use of iodosulfuron-methyl-sodium and mesosulfuron-methyl standard products by cMS. Therefore, the sufficiency of results should be considered on the national level based on importance of weed in their country. For Poland, as we are dealing with the active substances used commonly for many years in many countries, in the list of weeds controlled should include only those species that occurred (with appropriate intensity) a minimum of two localizations,

and in the case of the species with the highest hazard of the plants at least in four locations.

Applicant presented sensitivity of studied weeds according to SANCO scale. cMS should decide if SANCO is acceptable. If not, **cMS should determine the sensitivity of the accepted weed species in accordance with their applicable internal regulations.** For Poland the classification of weed sensitivity differ to SANCO. Accepted weed species for Poland (N-E EPPO zone) should be presented to following scale of sensitivity: S (susceptible) > 85%; MS (moderately susceptible) 70-85%; MT (mod-erately tolerant) 60-70%; T (tolerant) < 60%.

The cite of the original registrant's data on iodosulfuron-methyl-sodium and mesosulfuron-methyl now out of protection in support of those recommendations on the draft label that are not adequately supported. Such extrapolations should be considered by individual member states on a national level based on current registration, data protection and experience with similar iodosulfuron-methyl-sodium and mesosulfuron-methyl products. The spectrum of weeds should be checked with label claims on these reference products.

In the opinion of Evaluator, results of weed sensitivity from winter wheat, winter triticale and winter barley can be assessed together as winter cereals group.

Below we present a list of weed species for each zone separately for which at least two studies have been submitted:

- **ALOMY**

For Maritime and Poland – number of trials is sufficient for registration. In 2 trials carried out in North France – the efficacy was very low at all studied doses. Further investigations have shown that the blackgrass in these trials is resistant (KCP 6.2-5b and 6b). Those results were excluded from the assessment. ALOMY can be accepted for PL and Maritime EPPO zone in GAP table and label project.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	13	-	-	MS (11)	MS (9)	S (11)
Poland	9	MT (1)	MT (6)	MS (9)	MS (4)	-

In brackets it is given the number of trials for each studied dose.

- **APESV** (all trials were valid)

APESV can be accepted for PL and Maritime EPPO zone in GAP table and label project.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	6	-	-	S (6)	S (6)	HS (1)
Poland	11	MS (5)	MS (8)	S (11)	S (11)	-

In brackets it is given the number of trials for each studied dose.

- **AVEFA** (all trials were valid)

AVEFA is a serious threat to winter cereals, so at least 4 valid trials are required. Due to not enough trials this weed should be excluded from GAP table and label project.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	-	-	-	-	-	-
Poland	3	-	T (3)	MS (3)	S (3)	-

In brackets it is given the number of trials for each studied dose.

- **CAPBP** (all trials were valid)

This weed overwinters, troublesome during mass occurrence. It occurs on various types of soil. It prefers plump and airy soils. In the opinion of Evaluator, 2 trials should be sufficient for registration in Poland. In the Maritime EPPO zone registration is not possible due to lack of trials.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	-	-	-	-	-	-
Poland	2	S (2)	S (2)	S (2)	S (2)	-

In brackets it is given the number of trials for each studied dose.

- **GALAP** (all trials were valid)

This weed can be registered in PL and in the Maritime EPPO zone.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	6	-	-	MS (6)	MS (4)	S (5)
Poland	7	S (1)	MT (3)	MS (7)	MS (5)-	

In brackets it is given the number of trials for each studied dose.

- **MATCH** (In one trial from DE – not enough level of infestation).

A fast-growing, competitive species - it takes up water and nutrients, and shades heavily in the early stages of growth. It is an indicator of clay soils. In the opinion of Evaluator at least 4 valid trials are required. On the basis on submitted documentation, MATCH can be registered in Maritime EPPO zone. In PL – it should be excluded from GAP table and label project.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	5	-	-	MS (5)	S (4)	S (5)
Poland	3	-	S (2)	S (2)	S (2)	-

In brackets it is given the number of trials for each studied dose.

- **CHEAL** (all trials were valid)

It is a fast-growing, highly competitive plant that draws water and nutrients and also shades heavily. In winter crops it is dangerous during long warm autumns, although it eventually dies out. Spring emergence are also very competitive for both spring and winter cereals. In the opinion of Evaluator, at least 4 valid trials are required for CHEAL. On the basis on submitted documentation it can be registered in Maritime EPPO zone. In Poland, CHEAL should be excluded drom GAP table and label project.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	4	-	-	S (4)	S (4)	HS (2)
Poland	3	MT (2)	MT (2)	MS (3)	S (3)	-

In brackets it is given the number of trials for each studied dose.

- **POAAN** (all trials were valid)

POAAN can be accepted for PL and Maritime EPPO zone in GAP table and label project.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	8	-	-	S (8)	S (7)	HS (1)
Poland	7	MT (3)	MS (4)	S (7)	S (6)	-

In brackets it is given the number of trials for each studied dose.

- **STEME** (all trials were valid)

STEME can be accepted for PL and Maritime EPPO zone in GAP table and label

project.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	6	-	-	S (6)	S (6)	HS (3)
Poland	9	MS (4)	MS (8)	S (9)	S (9)	-

In brackets it is given the number of trials for each studied dose.

- **LAMPU** (all trials were valid)

cMS should decide if LAMPU can be accepted on the basis on 2 trials. In Poland this weed should be excluded from GAP table and label project due to lack of trials.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	2	-	-	MS (2)	MT (2)	MS (2)
Poland	-	-	-	-	-	-

In brackets it is given the number of trials for each studied dose.

- **VERPE** (all trials were valid)

VERPE can be accepted for PL and Maritime EPPO zone in GAP table and label project.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	6	-	-	S (6)	S (6)	S (5)
Poland	4	S (2)	MS (4)	MS (4)	MS (4)	-

In brackets it is given the number of trials for each studied dose.

- **VIOAR** (all trials were valid)

VIOAR can be accepted for PL and Maritime EPPO zone in GAP table and label project. All doses in PL can be accepted in the label.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	5	-	-	MS (5)	MS (5)	S (3)
Poland	4	MT (2)	MT (3)	MT (3)	MS (4)	-

In brackets it is given the number of trials for each studied dose.

- **POLAV** (all trials were valid)

Typically light-loving, in winter cereals less common and not very competitive weed. In the opinion of Evaluator 2 trials can be accepted. POLAV can be registered in Maritime EPPO zone and Poland. In Poland only at dose 0,3 kg/ha POLAV can be included in label. Dose 0,4 kg/ha was supported only by 1 trials, whilst dose 0,2 kg/ha – lack of trials.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	2	-	-	T (2)	MT (1)	MS (2)
Poland	2	-	-	T (2)	MT (1)	-

In brackets it is given the number of trials for each studied dose.

- **PAPRH** (all trials were valid)

PAPRH can be accepted for PL and Maritime EPPO zone in GAP table and label project.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	5	-	-	S (5)	S (3)	S (5)
Poland	6	MS (1)	MS (4)	S (6)	S (4)	-

In brackets it is given the number of trials for each studied dose.

- **MATIN**

MATIN can be accepted for PL and Maritime EPPO zone in GAP table and label project.

EPPO zone/ Country	Number of trials	Eff. 0,1-0,14 kg/ha	Eff. 0,2 kg/ha	Eff 0,3 kg/ha	Eff. 0,4 kg/ha	Eff. 0,5 kg/ha
Maritime	10	-	-	S (10)	S (9)	HS (6)
Poland	13	MS (5)	MS (9)	S (13)	S (12)	-

In brackets it is given the number of trials for each studied dose.

GLOB289H can be used in combination with an oil (estherified rapseseed oil) to ensure the optimal uptake of the active ingredients by the weeds. For the lower dose of 0.3 kg/ha, the addition of oil is optional. For the higher dose is it obligatory since dose is expacially used against difficult weeds that are also capable of developing resistance. Therefore the trials are also performed like this with different estherified rapeseed oils tested. Furthermore, the reference product Atlantis WG is also sprayed in combination with this oil.

Recommended dose for Maritime EPPO zone is 0,3 -0,5 kg/ha and for Poland is 0,2-0,4 kg/ha. Use the higher of the recommended rates for heavy weed infestation and for weeds more advanced in development. Only for CAPBP Applicant in the GAP table proposed 0,1 kg/ha as max dose, however in Polish label recommended dose are 0,2-0,4 kg/ha. Also, in MED trials in conlusion is mentioned that dose 0,12-0,19 kg/ha in the case of some weed species can be characterized by sufficient efficacy. So, in the opinion of Evaluator in Poland dose 0,2 kg/ha, should be recommended as the lowest effective for CAPBP. Especially since the minimum effective dose for the remaining weed species is dose 0,2 kg/ha.

Accepted volume: 200-300 L/ha.

Studied BBCH: winter wheat -23-32, winter triticale 25-30, winter barley 30. In the opinion of Evaluator, designated application window on BBCH 21-32 is correct and should be accepted.

Final decision about list of accepted weed and their sensitivity classification is left to each cMS. Below, Evaluator presented the list of weed sensitivity for Polish label:

- *dose 0,2 kg/ha:*

- *susceptible weed* – CAPBP
- *moderately susceptible weeds* – APESV, POAAN, STEME, VERPE, PAPRH, MATIN
- *moderately tolerant weeds*- ALOMY, GALAP, VIOAR

- *dose 0,3 kg/ha:*

- *susceptible weed*s – CAPBP, APESV, POAAN, STEME, PAPRH, MATIN
- *moderately susceptible* weeds – ALOMY, GALAP, VERPE
- moderately tolerant weeds- VIOAR
- *tolerant weeds* - POLAV

- dose 0,4 kg/ha

- *susceptible weeds*– CAPBP, APESV, POANN, STEME, PAPRH, MATIN
- *moderately susceptible weeds* – ALOMY, GALAP, VRERPE, VIOAR

3.3 Information on the occurrence or possible occurrence of the development of resistance (KCP 6.3)

A resistance risk analysis is carried out in accordance with the EPPO guideline 1/213 (2). The intended uses of GLOB289H are summarized in the table below:

Uses		Member State	Requested rate(s)	Comments / Other relevant details on GAPs
Crop(s)	**Target(s)**			
Cereals (winter/spring soft wheat, winter/spring durum wheat, triticale, spelt and winter rye)	grasses and dicotyledonous weeds	PL	~~0.1~~ 0.2– 0.4* kg/ha	1 application POST-EMERGENCE **REQUESTED** *appliaction always with oil
Cereals (winter/spring soft wheat, winter/spring durum wheat, triticale, spelt and winter rye)	grasses and dicotyledonous weeds	BE, NL, DE, UK, CZ	0.3* – 0.5** kg/ha	1 application POST-EMERGENCE **REQUESTED** *0.3 kg/ ha with or without oil **0.4 and 0.5 kg/ha always with oil

Mode of action and resistance events

GLOB289H has two different compounds iodosulfuron and mesosulfuron. Both active substances belong to the Sulfonylureas belong to group B of the Herbicide Resistance Action Comitee (HRAC). Their herbicidal action is made through inhibition of ALS and interference with the amino acid chain synthesis.

ALS herbicides are readily absorbed by both roots and foliage and translocated in both the xylem and phloem to the site of action at the growing points. These herbicides inhibit acetolactate synthase, a key enzyme in the pathway of biosynthesis of the branched-chain amino acids isoleucine, leucine, and valine. Plant deaths result from events occurring in response to inhibition of branched-chain amino acids, but the actual sequence of phytotoxic processes is unclear. In general, injury symptoms caused by ALS inhibiting herbicides are not apparent until several days after treatment. Diagnostic symptoms arising from ALS Inhibitors generally begin with chlorosis. Chlorosis associated with such ALS exposure is shiny or mottled, sometimes with discolored foliage vein. The lower sides of the leaves usually develop a purplish/reddish color. Finally, leaves may die and become necrotic. Symptoms of ALS Inhibitor injury are usually minimal on leaves that are fully expanded before exposure. Fully expanded leaves will appear wilted, crinkled, and chlorotic. Leaves that develop after treatment are chlorotic, crinkled, stunted, and distorted. Affected plants also can exhibit interveinal chlorosis, chlorotic banding on grass leaves, red leaf venation, purpling, necrotic (brown) leaf margins, and gradual death. ALS Inhibitors may stop terminal and lateral growth and cause shoot tips to die. Stems may develop a dark red color with necrotic lesions and cracks (http://herbicidesymptoms.ipm.ucanr.edu, August 2018).

Resistance events have been reported in Europe for the two active substances and weed species target of GLOB289H. Following table summarizes these events (Source; ~~www.weedspecies.org~~ www.weedscience.org; August 2018).

Table 3.3-1: Resistance events reported to both active ingredients on GLOB289H

Weed species	Iososulfuron	Mesosulfuron	Iososulfuron + Mesosulfuron	Total
Alopecurus myosuroides	0	2	9	**11**
Apera spica-venti	5	0	5	**10**
Avena fatua	1	2	2	**5**
Avena sterilis	0	0	4	**4**
Bromus sterilis	0	0	1	**1**
Conyza sumatrensis	0	0	2	**2**
Lolium perenne	2	6	0	**8**
Lolium perenne ssp. multiflo-rum	0	1	5	**6**
Lolium rigidum	0	0	1	**1**
Papaver rhoeas	4	0	2	**6**
Senecio vulgaris	0	0	1	**1**
Sinapis alba	1	0	0	**1**
Sinapis arvensis	2	0	0	**2**
Sonchus asper	1	0	0	**1**
Stellaria media	2	0	2	**4**
Tripleurospermum perforatum (=T. inodorum)	2	0	0	**2**
Total	**20**	**11**	**34**	**65**

Thus, although it is well-known the presence of different resistance events at both active substance in Europe, it is remarkable that only 16 weed species have been reported resistance events from the placing on the market of both active substances (iodosulfuron, 1999; mesosulfuron, 2001). But of course, this product must be used in regions where resistance events to sulfonylureas have not been reported.

Proposed resistance management strategy

The main resistance management strategies currently recommended are: monitoring the field regularly, follow the conditions indicated in the product label (do not apply at a rate higher or lower than the recommended rate or too early or too late), integrating chemical and agronomical methods, rotating crops with different cycles, selecting more competitive varieties, delaying the date of planting, conventional tillage, mechanical weeding. Wherever feasible, several strategies should be used together.

Thus the proposed resistance strategy should follow the general principles of weed resistance management: (source: HRAC website):

1. Apply integrated weed management practices. Use multiple herbicide modes-of-action with overlapping weed spectrums in rotation, sequences, or mixtures.
2. Use the full recommended herbicide rate and proper application timing for the hardest to control weed species present in the field.
3. Scout fields after herbicide application to ensure control has been achieved. Avoid allowing weeds to reproduce by seed or to proliferate vegetatively.
4. Monitor site and clean equipment between sites.

Comments of zRMS:

Final assessment of the resistance risk has to be carried out on member state level since the agronomic factors influencing the risk of resistance development tend to vary between the Member States.

Resistance events have been reported in Europe for the two active substances and weed species target of GLOB289H / SAP63H. Following table summarizes these events (Source; www.weedscience.org February 2022).

- Iodosulfuron-methyl-sodium

#	Year	Species	Country	MOAs	Actives	Situations
1	2008	*Raphanus sativus*	Argentina	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	imazethapyr, imazapyr, bispyribac-sodium, chlorimuron-ethyl, metsulfuron-methyl, diclosulam, flumetsulam, imazamox, iodosulfuron-methyl-Na, flucarbazone-Na	Wheat, Sunflower, Canola
2	2010	*Lolium perenne ssp. multiflorum*	Argentina	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G)	glyphosate, iodosulfuron-methyl-Na, pyroxsulam	Wheat
3	2017	*Poa annua*	Australia (New South Wales)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	bispyribac-sodium, rimsulfuron, iodosulfuron-methyl-Na, foramsulfuron	Golf courses
4	2017	*Poa annua*	Australia (New South Wales)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G), Inhibition of Microtubule Assembly 2 HRAC Group 3 (Legacy K1), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2), Unknown HRAC Group 0 (Legacy Z)	endothall, bispyribac-sodium, rimsulfuron, simazine, glyphosate, propyzamide/pronamide, iodosulfuron-methyl-Na, foramsulfuron	Golf courses
5	1998	*Raphanus raphanistrum*	Australia (South Australia)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	chlorsulfuron, metosulam, iodosulfuron-methyl-Na	Spring Barley, Wheat
6	2005	*Avena sterilis ssp. ludoviciana*	Australia (South Australia)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na	Wheat
7	2010	*Lolium rigidum*	Australia (South Australia)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G), PS I Electron Diversion HRAC Group 22 (Legacy D), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	haloxyfop-methyl, clethodim, imazapyr, chlorsulfuron, atrazine, paraquat, glyphosate, iodosulfuron-methyl-Na	Pasture seed
8	2012	*Galium tricornutum*	Australia (South	Inhibition of Acetolactate Synthase HRAC	imazapyr, imazamox, iodosulfuron-methyl-Na,	Spring Barley,

				Australia)	Group 2 (Legacy B)	pyroxsulam	Wheat
	9	2017	*Poa annua*	Australia (South Australia)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	bispyribac-sodium, rimsulfuron, iodosulfuron-methyl-Na, foramsulfuron	Golf courses
	10	2017	*Poa annua*	Australia (Victoria)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	bispyribac-sodium, rimsulfuron, iodosulfuron-methyl-Na, foramsulfuron	Golf courses
	11	2009	*Apera spica-venti*	Austria	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	isoproturon, iodosulfuron-methyl-Na	Cereals
	12	2019	*Apera spica-venti*	Belgium	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, foramsulfuron, mesosulfuron-methyl	Wheat
	13	2004	*Parthenium hysterophorus*	Brazil	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	imazethapyr, chlorimuron-ethyl, cloransulam-methyl, iodosulfuron-methyl-Na, foramsulfuron	Soybean
	14	2006	*Bidens subalternans*	Brazil	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	atrazine, iodosulfuron-methyl-Na, foramsulfuron	Corn (maize)
	15	2010	*Lolium perenne ssp. multiflorum*	Brazil	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na	Wheat
	16	2013	*Raphanus raphanistrum*	Brazil	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	imazapyr, chlorimuron-ethyl, metsulfuron-methyl, sulfometuron-methyl, cloransulam-methyl, iodosulfuron-methyl-Na, imazapic	Spring Barley, Wheat
	17	2016	*Lolium perenne ssp. multiflorum*	Brazil	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	clethodim, iodosulfuron-methyl-Na	Wheat
	18	2017	*Lolium perenne ssp. multiflorum*	Brazil	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G)	glyphosate, iodosulfuron-methyl-Na, pyroxsulam	Corn (maize), Soybean, Wheat
	19	2002	*Lolium perenne ssp. multiflorum*	Chile	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G)	glyphosate-trimesium, glyphosate, iodosulfuron-methyl-Na, flucarbazone-Na	Wheat
	20	2003	*Lolium rigidum*	Chile	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	haloxyfop-methyl, clodinafop-propargyl, diclofop-methyl, clethodim, iodosulfuron-methyl-Na, flucarbazone-Na, tepraloxydim, pinoxaden	Wheat
	21	2005	*Lolium perenne ssp. multiflorum*	Chile	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl	clodinafop-propargyl, diclofop-methyl, clethodim, iodosulfuron-methyl-Na, flucarbazone-Na, tepralox-	Wheat, Lupins, Canola

					CoA Carboxylase HRAC Group 1 (Legacy A)	ydim, pinoxaden	
	22	2007	*Lolium perenne ssp. multiflorum*	Chile	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G)	haloxyfop-methyl, clethodim, glyphosate, iodosulfuron-methyl-Na, flucarbazone-Na, tepraloxydim, pinoxaden	Spring Barley
	23	2010	*Raphanus sativus*	Chile	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	imazapyr, metsulfuron-methyl, triasulfuron, imazamox, iodosulfuron-methyl-Na, flucarbazone-Na, pyroxsulam	Wheat
	24	2010	*Anthemis cotula*	Chile	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	metsulfuron-methyl, iodosulfuron-methyl-Na, pyroxsulam	Wheat
	25	2010	*Anthemis arvensis*	Chile	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	26	2012	*Silene gallica*	Chile	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	imazapyr, metsulfuron-methyl, imazamox, iodosulfuron-methyl-Na, pyroxsulam	Wheat
	27	2005	*Apera spica-venti*	Czech Republic	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	sulfosulfuron, chlorsulfuron, isoproturon, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Cereals, Winter wheat
	28	1991	*Stellaria media*	Denmark	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	chlorsulfuron, tribenuron-methyl, florasulam, iodosulfuron-methyl-Na	Spring Barley, Wheat
	29	2001	*Alopecurus myosuroides*	Denmark	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), Inhibition of Microtubule Assembly 2 HRAC Group 3 (Legacy K1)	clodinafop-propargyl, fenoxaprop-ethyl, cycloxydim, flupyrsulfuron-methyl-Na, pendimethalin, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Winter wheat
	30	2003	*Papaver rhoeas*	Denmark	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, florasulam, iodosulfuron-methyl-Na	Wheat
	31	2010	*Tripleurospermum perforatum (=T. inodorum)*	Denmark	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, florasulam, iodosulfuron-methyl-Na	Spring Barley, Winter wheat
	32	2010	*Lolium perenne ssp. multiflorum*	Denmark	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	clodinafop-propargyl, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Winter wheat
	33	2011	*Apera spica-venti*	Denmark	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	sulfosulfuron, iodosulfuron-methyl-Na	Winter wheat
	34	2016	*Lolium perenne*	Denmark	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B),	clodinafop-propargyl, iodosulfuron-methyl-Na	Wheat

					Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)		
	35	2016	*Apera spica-venti*	Denmark	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fenoxaprop-ethyl, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Wheat
	36	2003	*Alopecurus myosuroides*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	clodinafop-propargyl, diclofop-methyl, fenoxaprop-ethyl, sethoxydim, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	37	2003	*Lolium perenne ssp. multiflorum*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	haloxyfop-methyl, clodinafop-propargyl, diclofop-methyl, sethoxydim, flupyrsulfuron-methyl-Na, iodosulfuron-methyl-Na, mesosulfuron-methyl, propoxycarbazone-Na	Wheat
	38	2006	*Apera spica-venti*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	39	2006	*Avena sterilis*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	metsulfuron-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	40	2006	*Avena fatua*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	metsulfuron-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	41	2006	*Alopecurus myosuroides*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	imazamethabenz-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	42	2006	*Lolium rigidum*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	flupyrsulfuron-methyl-Na, iodosulfuron-methyl-Na, mesosulfuron-methyl, propoxycarbazone-Na	Wheat
	43	2007	*Papaver rhoeas*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	metsulfuron-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	44	2009	*Senecio vulgaris*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, prosulfuron, metsulfuron-methyl, flazasulfuron, imazamox, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, thiencarbazone-methyl	Grapes, Wheat
	45	2009	*Bromus sterilis*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam, propoxycarbazone-Na	Wheat
	46	2012	*Poa trivialis*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	47	2012	*Stellaria media*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, metsulfuron-methyl, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	48	2015	*Poa annua*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat

	49	2016	*Papaver rhoeas*	France	Auxin Mimics HRAC Group 4 (Legacy O), Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	metsulfuron-methyl, MCPA, 2,4-D, iodosulfuron-methyl-Na, mesosulfuron-methyl, aminopyralid	Cereals
	50	2016	*Conyza sumatrensis*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	flazasulfuron, iodosulfuron-methyl-Na, mesosulfuron-methyl, penoxsulam	Grapes
	51	2016	*Conyza sumatrensis*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G)	flazasulfuron, glyphosate, iodosulfuron-methyl-Na, mesosulfuron-methyl, penoxsulam	Grapes
	52	2005	*Apera spica-venti*	Germany	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	sulfosulfuron, chlorsulfuron, flupyrsulfuron-methyl-Na, sulfometuron-methyl, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	53	2008	*Lolium perenne*	Germany	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	iodosulfuron-methyl-Na, pinoxaden, pyroxsulam	Wheat
	54	2009	*Apera spica-venti*	Germany	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	fenoxaprop-ethyl, sulfosulfuron, isoproturon, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden, pyroxsulam	Spring Barley, Winter wheat
	55	2011	*Stellaria media*	Germany	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, amidosulfuron, triflusulfuron-methyl, tribenuron-methyl, nicosulfuron, imazamox, florasulam, iodosulfuron-methyl-Na, tritosulfuron, mesosulfuron-methyl, pyroxsulam	Spring Barley, Wheat, Rapeseed
	56	2002	*Papaver rhoeas*	Greece	Auxin Mimics HRAC Group 4 (Legacy O), Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	2,4-D, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	57	2013	*Phalaris minor*	India	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	58	2014	*Rumex dentatus*	India	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	59	2009	*Sinapis arvensis*	Iran	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	sulfosulfuron, tribenuron-methyl, metsulfuron-methyl, iodosulfuron-methyl-Na	Winter wheat
	60	2009	*Avena sterilis*	Iran	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	61	2009	*Avena sterilis ssp. ludoviciana*	Iran	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	62	2010	*Avena sterilis ssp. ludoviciana*	Iran	Inhibition of Acetolactate Synthase HRAC	clodinafop-propargyl, iodosulfuron-methyl-Na,	Winter wheat

					Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	mesosulfuron-methyl	
	63	2017	*Galium aparine*	Iran	Auxin Mimics HRAC Group 4 (Legacy O), Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	sulfosulfuron, tribenuron-methyl, MCPA, 2,4-D, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	64	2021	*Alopecurus myosuroides*	Ireland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	propaquizafop, cycloxydim, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	65	2021	*Lolium perenne ssp. multiflorum*	Ireland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	propaquizafop, cycloxydim, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Wheat
	66	2007	*Lolium rigidum*	Israel	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G)	clodinafop-propargyl, imazapyr, chlorsulfuron, tribenuron-methyl, sulfometuron-methyl, flumetsulam, metosulam, glyphosate, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden, propoxycarbazone-Na	Wheat
	67	2008	*Amaranthus palmeri*	Israel	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	pyrithiobac-sodium, rimsulfuron, iodosulfuron-methyl-Na, foramsulfuron, trifloxysulfuron-Na, mesosulfuron-methyl	Corn (maize), Cotton, Watermelon
	68	2013	*Lolium rigidum*	Israel	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	haloxyfop-methyl, clodinafop-propargyl, clethodim, cycloxydim, sulfometuron-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden, propoxycarbazone-Na	Carrots, Wheat
	69	1998	*Papaver rhoeas*	Italy	Auxin Mimics HRAC Group 4 (Legacy O), Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, 2,4-D, iodosulfuron-methyl-Na	Wheat
	70	1998	*Papaver rhoeas*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, florasulam, iodosulfuron-methyl-Na	Durum wheat
	71	2002	*Lolium perenne ssp. multiflorum*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	clodinafop-propargyl, diclofop-methyl, sethoxydim, tralkoxydim, cycloxydim, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Durum wheat
	72	2004	*Avena sterilis*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	clodinafop-propargyl, cycloxydim, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Durum wheat

	73	2005	*Lolium perenne ssp. multiflorum*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Durum wheat
	74	2006	*Sinapis arvensis*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, florasulam, iodosulfuron-methyl-Na	Durum wheat
	75	2007	*Avena sterilis*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Durum wheat
	76	2012	*Lolium perenne ssp. multiflorum*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G)	glyphosate, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	77	2015	*Apera spica-venti*	Latvia	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na	Wheat, Winter wheat
	78	2013	*Apera spica-venti*	Lithuania	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na	Winter wheat
	79	2010	*Alopecurus myosuroides*	Netherlands	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Winter wheat
	80	2014	*Lolium perenne*	New Zealand	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, chlorsulfuron, tribenuron-methyl, iodosulfuron-methyl-Na, pyroxsulam	Wheat
	81	2002	*Stellaria media*	Norway	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, metsulfuron-methyl, iodosulfuron-methyl-Na	Cereals
	82	2006	*Tripleurospermum perforatum (=T. inodorum)*	Norway	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, iodosulfuron-methyl-Na	Winter wheat
	83	2006	*Sonchus asper*	Norway	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, iodosulfuron-methyl-Na	Spring Barley, Spring wheat
	84	2019	*Capsella bursa-pastoris*	Norway	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na	Wheat
	85	2005	*Apera spica-venti*	Poland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	sulfosulfuron, chlorsulfuron, iodosulfuron-methyl-Na, procarbazone-Na	Winter wheat
	86	2010	*Alopecurus myosuroides*	Poland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Winter wheat
	87	2011	*Avena fatua*	Poland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	sulfometuron-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl, propoxycarbazone-Na	Spring Barley, Spring wheat
	88	2011	*Avena fatua*	Poland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fenoxaprop-ethyl, metsulfuron-methyl, sulfometuron-methyl, iodosulfuron-methyl-Na, pinoxaden, propoxycarbazone-Na	Spring Barley, Spring wheat
	89	2012	*Alopecurus myosuroides*	Poland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fenoxaprop-ethyl, sulfometuron-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Winter wheat
	90	1986	*Avena fatua*	South Africa	Inhibition of Acetolactate Synthase HRAC	clodinafop-propargyl, diclofop-methyl, fluazifop-	Wheat

					Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	butyl, fenoxaprop-ethyl, sethoxydim, tralkoxydim, sulfosulfuron, imazamox, iodosulfuron-methyl-Na	
	91	1997	*Raphanus raphanistrum*	South Africa	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, chlorsulfuron, tribenuron-methyl, metsulfuron-methyl, triasulfuron, iodosulfuron-methyl-Na	Spring Barley, Wheat
	92	1999	*Phalaris minor*	South Africa	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	haloxyfop-methyl, clodinafop-propargyl, diclofop-methyl, propaquizafop, quizalofop-ethyl, fenoxaprop-ethyl, sulfosulfuron, iodosulfuron-methyl-Na, mesosulfuron-methyl	Pastures, Wheat
	93	2007	*Sinapis alba*	Spain	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, iodosulfuron-methyl-Na	Winter wheat
	94	2011	*Sinapis arvensis*	Spain	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, iodosulfuron-methyl-Na	Cereals
	95	2015	*Alopecurus myosuroides*	Spain	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	clodinafop-propargyl, cloransulam-methyl, isoproturon, chlorotoluron, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Wheat, Canola, Peas, Winter barley, Faba beans
	96	2018	*Rapistrum rugosum*	Spain	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, iodosulfuron-methyl-Na	Winter wheat, Winter barley
	97	2010	*Apera spica-venti*	Sweden	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	sulfosulfuron, iodosulfuron-methyl-Na, pyroxsulam	Winter wheat
	98	2011	*Papaver rhoeas*	Sweden	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	amidosulfuron, iodosulfuron-methyl-Na, propoxycarbazone-Na	Winter wheat
	99	2014	*Alopecurus myosuroides*	Sweden	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fenoxaprop-ethyl, cycloxydim, flupyrsulfuron-methyl-Na, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Spring wheat, Winter wheat, Winter barley
	100	2018	*Lolium perenne ssp. multiflorum*	Switzerland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	quizalofop-ethyl, iodosulfuron-methyl-Na, mesosulfuron-methyl	Sugar beets, Triticale
	101	2018	*Lolium perenne ssp. multiflorum*	Switzerland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	chlorotoluron, iodosulfuron-methyl-Na, mesosulfuron-methyl	Peas
	102	2019	*Alopecurus myosuroides*	Switzerland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase	quizalofop-ethyl, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat, Winter barley

				HRAC Group 1 (Legacy A)		
103	2008	*Galium aparine*	Turkey	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, chlorsulfuron, tribenuron-methyl, triasulfuron, iodosulfuron-methyl-Na, mesosulfuron-methyl	Winter wheat
104	2008	*Bifora radians*	Turkey	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, chlorsulfuron, tribenuron-methyl, triasulfuron, iodosulfuron-methyl-Na, mesosulfuron-methyl	Winter wheat
105	2020	*Amaranthus retroflexus*	Ukraine	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	imazethapyr, thifensulfuron-methyl, tribenuron-methyl, flumetsulam, imazamox, florasulam, iodosulfuron-methyl-Na, foramsulfuron, thiencarbazone-methyl	Corn (maize), Sunflower
106	1984	*Alopecurus myosuroides*	United Kingdom	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	imazamethabenz-methyl, chlorsulfuron, flupyrsulfuron-methyl-Na, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam, propoxycarbazone-Na	Wheat
107	1993	*Avena sterilis*	United Kingdom	Antimicrotubule mitotic disrupter HRAC Group 0 (Legacy Z), Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fluazifop-butyl, fenoxaprop-ethyl, tralkoxydim, imazamethabenz-methyl, flamprop-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl	Cereals, Wheat
108	2005	*Ambrosia artemisiifolia*	United States (Delaware)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Protoporphyrinogen Oxidase HRAC Group 14 (Legacy E)	imazethapyr, imazapyr, imazaquin, pyrithiobac-sodium, chlorimuron-ethyl, metsulfuron-methyl, halosulfuron-methyl, primisulfuron-methyl, cloransulam-methyl, oxyfluorfen, fomesafen, lactofen, acifluorfen, flumioxazin, flumiclorac-pentyl, carfentrazone-ethyl, sulfentrazone, imazamox, pyraflufen-ethyl, iodosulfuron-methyl-Na, trifloxysulfuron-Na	Soybean
109	2011	*Conyza canadensis*	United States (Kansas)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, chlorsulfuron, tribenuron-methyl, metsulfuron-methyl, rimsulfuron, iodosulfuron-methyl-Na, thiencarbazone-methyl	Corn (maize), Cotton, Soybean, Wheat
110	2004	*Rottboellia cochinchinensis (=R. exaltata)*	Venezuela	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	nicosulfuron, iodosulfuron-methyl-Na, foramsulfuron	Corn (maize)
111	2010	*Sorghum halepense*	Venezuela	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	nicosulfuron, iodosulfuron-methyl-Na, foramsulfuron	Corn (maize)

- Mesosulfuron-methyl

	Year	Species	Country	MOAs	Actives	Situations
1	2006	*Avena fatua*	Australia (New South Wales)	Antimicrotubule mitotic disrupter HRAC Group 0 (Legacy Z), Inhibition of Acetolactate Synthase	clodinafop-propargyl, diclofop-methyl, flamprop-methyl, mesosulfuron-methyl	Spring Barley, Wheat, Chickpea

					HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)		
	2	2012	*Phalaris paradoxa*	Australia (New South Wales)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	clodinafop-propargyl, mesosulfuron-methyl	Spring Barley, Wheat
	3	2011	*Bromus diandrus ssp. rigidus (=B. rigidus)*	Australia (South Australia)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	mesosulfuron-methyl, pyroxsulam	Wheat
	4	2011	*Bromus diandrus*	Australia (South Australia)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	mesosulfuron-methyl, pyroxsulam	Wheat
	5	2011	*Bromus diandrus ssp. rigidus (=B. rigidus)*	Australia (Western Australia)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	mesosulfuron-methyl, pyroxsulam	Wheat
	6	2019	*Apera spica-venti*	Belgium	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, foramsulfuron, mesosulfuron-methyl	Wheat
	7	2010	*Anthemis arvensis*	Chile	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	8	2014	*Alopecurus aequalis*	China	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	quizalofop-ethyl, fenoxaprop-ethyl, nicosulfuron, flucarbazone-Na, mesosulfuron-methyl, penoxsulam, pinoxaden	Wheat
	9	2014	*Alopecurus japonicus*	China	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fenoxaprop-ethyl, pyribenzoxim, sulfosulfuron, nicosulfuron, mesosulfuron-methyl, pyroxsulam	Wheat
	10	2005	*Apera spica-venti*	Czech Republic	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	sulfosulfuron, chlorsulfuron, isoproturon, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Cereals, Winter wheat
	11	2001	*Alopecurus myosuroides*	Denmark	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), Inhibition of Microtubule Assembly 2 HRAC Group 3 (Legacy K1)	clodinafop-propargyl, fenoxaprop-ethyl, cycloxydim, flupyrsulfuron-methyl-Na, pendimethalin, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Winter wheat
	12	2010	*Lolium perenne ssp. multiflorum*	Denmark	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	clodinafop-propargyl, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Winter wheat
	13	2016	*Apera spica-venti*	Denmark	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fenoxaprop-ethyl, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Wheat
	14	2003	*Alopecurus myosuroides*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	clodinafop-propargyl, diclofop-methyl, fenoxaprop-ethyl, sethoxydim, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	15	2003	*Lolium perenne ssp. multiflorum*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	haloxyfop-methyl, clodinafop-propargyl, diclofop-methyl, sethoxydim, flupyrsulfuron-methyl-Na, iodosulfuron-	Wheat

						methyl-Na, mesosulfuron-methyl, propoxycarbazone-Na	
	16	2006	*Avena sterilis*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	metsulfuron-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	17	2006	*Avena fatua*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	metsulfuron-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	18	2006	*Apera spica-venti*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	19	2006	*Alopecurus myosuroides*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	imazamethabenz-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	20	2006	*Lolium rigidum*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	flupyrsulfuron-methyl-Na, iodosulfuron-methyl-Na, mesosulfuron-methyl, propoxycarbazone-Na	Wheat
	21	2007	*Papaver rhoeas*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	metsulfuron-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	22	2009	*Bromus sterilis*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam, propoxycarba-zone-Na	Wheat
	23	2009	*Senecio vulgaris*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	tribenuron-methyl, prosul-furon, metsulfuron-methyl, flazasulfuron, imazamox, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, thiencarbazone-methyl	Grapes, Wheat
	24	2012	*Stellaria media*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, metsulfuron-methyl, flo-rasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	25	2012	*Poa trivialis*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	26	2015	*Poa annua*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	27	2016	*Papaver rhoeas*	France	Auxin Mimics HRAC Group 4 (Legacy O), Inhi-bition of Acetolactate Synthase HRAC Group 2 (Legacy B)	metsulfuron-methyl, MCPA, 2,4-D, iodosulfu-ron-methyl-Na, mesosulfu-ron-methyl, aminopyralid	Cereals
	28	2016	*Conyza sumatrensis*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	flazasulfuron, iodosulfuron-methyl-Na, mesosulfuron-methyl, penoxsulam	Grapes
	29	2016	*Conyza sumatrensis*	France	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G)	flazasulfuron, glyphosate, iodosulfuron-methyl-Na, mesosulfuron-methyl, penoxsulam	Grapes
	30	2005	*Apera spica-venti*	Germany	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	sulfosulfuron, chlorsulfu-ron, flupyrsulfuron-methyl-Na, sulfometuron-methyl, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	31	2007	*Alopecurus myosuroides*	Germany	Inhibition of Acetolactate Synthase HRAC Group 2	fenoxaprop-ethyl, isopro-turon, chlorotoluron, flufe-	Wheat

					(Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2), Very Long-Chain Fatty Acid Synthesis inhibitors HRAC Group 15 (Legacy K3 N)	nacet, mesosulfuron-methyl, pinoxaden	
	32	2009	*Alopecurus myosuroides*	Germany	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fenoxaprop-ethyl, cycloxydim, flupyrsulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Cereals
	33	2009	*Apera spica-venti*	Germany	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	fenoxaprop-ethyl, sulfosulfuron, isoproturon, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden, pyroxsulam	Spring Barley, Winter wheat
	34	2009	*Avena fatua*	Germany	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fenoxaprop-ethyl, cycloxydim, flupyrsulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Sugar beets
	35	2011	*Stellaria media*	Germany	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, amidosulfuron, triflusulfuron-methyl, tribenuron-methyl, nicosulfuron, imazamox, florasulam, iodosulfuron-methyl-Na, tritosulfuron, mesosulfuron-methyl, pyroxsulam	Spring Barley, Wheat, Rapeseed
	36	2002	*Papaver rhoeas*	Greece	Auxin Mimics HRAC Group 4 (Legacy O), Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	2,4-D, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	37	2006	*Phalaris minor*	India	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	clodinafop-propargyl, fenoxaprop-ethyl, sulfosulfuron, isoproturon, mesosulfuron-methyl, pinoxaden, pyroxsulam	Wheat
	38	2013	*Phalaris minor*	India	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	39	2014	*Rumex dentatus*	India	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Wheat
	40	2009	*Avena sterilis ssp. ludoviciana*	Iran	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	41	2009	*Avena sterilis*	Iran	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	42	2010	*Avena sterilis ssp. ludoviciana*	Iran	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	clodinafop-propargyl, iodosulfuron-methyl-Na, mesosulfuron-methyl	Winter wheat
	43	2017	*Galium aparine*	Iran	Auxin Mimics HRAC Group 4 (Legacy O), Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	sulfosulfuron, tribenuron-methyl, MCPA, 2,4-D, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat

	44	2021	*Alopecurus myosuroides*	Ireland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	propaquizafop, cycloxydim, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	45	2021	*Lolium perenne ssp. multiflorum*	Ireland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	propaquizafop, cycloxydim, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Wheat
	46	2007	*Lolium rigidum*	Israel	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G)	clodinafop-propargyl, imazapyr, chlorsulfuron, tribenuron-methyl, sulfometuron-methyl, flumetsulam, metosulam, glyphosate, florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden, propoxycarbazone-Na	Wheat
	47	2008	*Amaranthus palmeri*	Israel	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	pyrithiobac-sodium, rimsulfuron, iodosulfuron-methyl-Na, foramsulfuron, trifloxysulfuron-Na, mesosulfuron-methyl	Corn (maize), Cotton, Watermelon
	48	2013	*Lolium rigidum*	Israel	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	haloxyfop-methyl, clodinafop-propargyl, clethodim, cycloxydim, sulfometuron-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden, propoxycarbazone-Na	Carrots, Wheat
	49	2002	*Lolium perenne ssp. multiflorum*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	clodinafop-propargyl, diclofop-methyl, sethoxydim, tralkoxydim, cycloxydim, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Durum wheat
	50	2004	*Avena sterilis*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	clodinafop-propargyl, cycloxydim, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Durum wheat
	51	2005	*Lolium perenne ssp. multiflorum*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Durum wheat
	52	2007	*Avena sterilis*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Durum wheat
	53	2012	*Lolium perenne ssp. multiflorum*	Italy	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G)	glyphosate, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat
	54	2002	*Limnophila erecta*	Malaysia	Auxin Mimics HRAC Group 4 (Legacy O), Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	bensulfuron-methyl, cinosulfuron, pyrazosulfuron-ethyl, 2,4-D, mesosulfuron-methyl	Rice
	55	2010	*Alopecurus myosuroides*	Netherlands	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	florasulam, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Winter wheat
	56	2010	*Alopecurus myosuroides*	Poland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	iodosulfuron-methyl-Na, mesosulfuron-methyl	Winter wheat
	57	2011	*Avena fatua*	Poland	Inhibition of Acetolactate Synthase HRAC Group 2	sulfometuron-methyl, iodosulfuron-methyl-Na,	Spring Barley, Spring

					(Legacy B)	mesosulfuron-methyl, propoxycarbazone-Na	wheat
	58	2012	*Alopecurus myosuroides*	Poland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fenoxaprop-ethyl, sulfometuron-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Winter wheat
	59	1999	*Phalaris minor*	South Africa	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	haloxyfop-methyl, clodinafop-propargyl, diclofop-methyl, propaquizafop, quizalofop-ethyl, fenoxaprop-ethyl, sulfosulfuron, iodosulfuron-methyl-Na, mesosulfuron-methyl	Pastures, Wheat
	60	2015	*Alopecurus myosuroides*	Spain	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	clodinafop-propargyl, cloransulam-methyl, isoproturon, chlorotoluron, iodosulfuron-methyl-Na, mesosulfuron-methyl, pinoxaden	Wheat, Canola, Peas, Winter barley, Faba beans
	61	2014	*Alopecurus myosuroides*	Sweden	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fenoxaprop-ethyl, cycloxydim, flupyrsulfuron-methyl-Na, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam	Spring wheat, Winter wheat, Winter barley
	62	2018	*Lolium perenne ssp. multiflorum*	Switzerland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	quizalofop-ethyl, iodosulfuron-methyl-Na, mesosulfuron-methyl	Sugar beets, Triticale
	63	2018	*Lolium perenne ssp. multiflorum*	Switzerland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), PSII inhibitors - Serine 264 Binders HRAC Group 5 (Legacy C1 C2)	chlorotoluron, iodosulfuron-methyl-Na, mesosulfuron-methyl	Peas
	64	2019	*Alopecurus myosuroides*	Switzerland	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	quizalofop-ethyl, iodosulfuron-methyl-Na, mesosulfuron-methyl	Wheat, Winter barley
	65	2008	*Bifora radians*	Turkey	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, chlorsulfuron, tribenuron-methyl, triasulfuron, iodosulfuron-methyl-Na, mesosulfuron-methyl	Winter wheat
	66	2008	*Galium aparine*	Turkey	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, chlorsulfuron, tribenuron-methyl, triasulfuron, iodosulfuron-methyl-Na, mesosulfuron-methyl	Winter wheat
	67	1984	*Alopecurus myosuroides*	United Kingdom	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	imazamethabenz-methyl, chlorsulfuron, flupyrsulfuron-methyl-Na, iodosulfuron-methyl-Na, mesosulfuron-methyl, pyroxsulam, propoxycarbazone-Na	Wheat
	68	1993	*Avena sterilis*	United Kingdom	Antimicrotubule mitotic disrupter HRAC Group 0 (Legacy Z), Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fluazifop-butyl, fenoxaprop-ethyl, tralkoxydim, imazamethabenz-methyl, flamprop-methyl, iodosulfuron-methyl-Na, mesosulfuron-methyl	Cereals, Wheat
	69	1994	*Avena fatua*	United Kingdom	Antimicrotubule mitotic disrupter HRAC Group 0 (Legacy Z), Inhibition of	fluazifop-butyl, fenoxaprop-ethyl, tralkoxydim, imazamethabenz-methyl,	Cereals, Wheat, Canola

					Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	flamprop-m, mesosulfuron-methyl, pinoxaden, pyroxsulam	
	70	2012	*Lolium perenne ssp. multiflorum*	United Kingdom	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	mesosulfuron-methyl, pyroxsulam	Cereals
	71	2003	*Lolium perenne ssp. multiflorum*	United States (Arkansas)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	chlorsulfuron, sulfometuron-methyl, imazamox, mesosulfuron-methyl	Wheat
	72	2016	*Lolium perenne ssp. multiflorum*	United States (California)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A), Inhibition of Enolpyruvyl Shikimate Phosphate Synthase HRAC Group 9 (Legacy G), PS I Electron Diversion HRAC Group 22 (Legacy D)	cyhalofop-butyl, fluazifop-butyl, fenoxaprop-ethyl, sethoxydim, clethodim, paraquat, glyphosate, imazamox, mesosulfuron-methyl	Alfalfa, Orchards
	73	2012	*Lolium perenne ssp. multiflorum*	United States (Delaware)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	mesosulfuron-methyl	Wheat
	74	2009	*Lolium perenne ssp. multiflorum*	United States (Georgia)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	diclofop-methyl, mesosulfuron-methyl	Wheat
	75	2013	*Lolium perenne ssp. multiflorum*	United States (Kentucky)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	mesosulfuron-methyl, pyroxsulam	Wheat
	76	2009	*Stellaria media*	United States (Maryland)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, chlorsulfuron, tribenuron-methyl, mesosulfuron-methyl	Wheat
	77	2013	*Lolium perenne ssp. multiflorum*	United States (Missouri)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	mesosulfuron-methyl, pinoxaden	Corn (maize), Soybean, Wheat
	78	2007	*Lolium perenne ssp. multiflorum*	United States (North Carolina)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	mesosulfuron-methyl	Wheat
	79	2007	*Lolium perenne ssp. multiflorum*	United States (North Carolina)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	diclofop-methyl, imazamox, mesosulfuron-methyl, pinoxaden, pyroxsulam	Wheat
	80	2010	*Lolium perenne ssp. multiflorum*	United States (South Carolina)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	diclofop-methyl, mesosulfuron-methyl, pyroxsulam	Wheat
	81	2011	*Avena fatua*	United States (South Dakota)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	mesosulfuron-methyl	Cereals
	82	2012	*Avena fatua*	United States (South Dakota)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B), Inhibition of Acetyl CoA Carboxylase HRAC Group 1 (Legacy A)	fenoxaprop-ethyl, mesosulfuron-methyl	Wheat
	83	2015	*Arabidopsis thaliana*	United States (Virginia)	Inhibition of Acetolactate Synthase HRAC Group 2 (Legacy B)	thifensulfuron-methyl, tribenuron-methyl, flucarbazone-Na, mesosulfuron-methyl, pyroxsulam	Wheat

	For the use of ZEPPOS (product code:GLOB289H) against target weeds it can be concluded, that: • The product has a high inherent and agronomical risk for resistance weed development. • To decrease the risk of selecting resistant weeds, the application of an additional herbicide belonging to a different mode of action and having high efficacy on the species to be controlled is recommendable. • It is recommended to use the product in alternation or in combinations with compounds having a different mode of action. • To avoid the selection of resistance it is recommended to perform one application of GLOB289H at the recommended dose(s) per season **In order to minimize the risk of occurrence and development of herbicide weed resistance we should follow Good Agricultural Practice:** • follow strictly the directions provided in the plant protection product label, • plant protection product should been used at the recommended dose in the recommended time to ensure optimum weed control • use integrated weed control practices covering fields such as history crop rotation, herbicides used and various tillage (mechanical, cultural, biological and chemical) • use rotation of herbicides (active substances) with different mechanisms of action, • use a mixture of herbicides (active substances) with different mechanisms of action, • use herbicides acting on several life processes in rotation and / or a mixture weeds (with different mechanisms of action). **Label for the plant protection product ZEPPOS (product code:GLOB289H):** • observe the field after applying the herbicide to ensure that weeds are being controlled, • use different methods of weed control, including crop rotations, etc., • inform the authorization holder of unsatisfactory weed control, • for more information please contact your advisor, holder permit or a representative of the permit holder. **Resistance management strategy proposed by the applicant is acceptable** and the applicant has to continue with intensive monitoring after reregistration of GLOB289H as well. However, in the opinion of Evaluator each of cMS can change or adjust risk assessment considering the national requirements and may designate additional measures relating to resistance prevention on the national level. Where there is evidence of changed sensitivity of the target organisms to this product then the cMS should review the effectiveness of the product against these targets.

3.4 Adverse effects on treated crops (KCP 6.4)

Adverse effects on the treated crops were assessed in separate selectivity trials. Phytotoxicity was also determined in most of the efficacy trials described above in 3.2 (KCP 6.2).
~~24~~ 29 selectivity trials were carried out in 2016, 2017 and 2018 in the Maritime EPPO zone – 24 trials (France, UK, Belgium, Czech Republic and Germany) and 5 in the North-East EPPO zone (Poland). An overview of the selectivity trials is presented in the table below. The trials were carried out by officially recognised organisations in accordance with the principles of Good Experimental Practice.

Table 3.4-1a: Presentation of selectivity trials

Crop	Country	Type of trial**	Number of trials		Years	GEP, non-GEP, official***	Comments
			Maritime zone	North-East zone			
Winter wheat	CZ	S+Y+Q	1	-	2017	GEP	
	DE	S+Y+Q	3	-	2016	GEP	
		S+Y+Q	1	-	2017	GEP	
	FR	S+Y+Q	1	-	2017	GEP	
	UK	S+Y+Q	1		2017	GEP	
	BE	S+Y+Q	1	-	2017	GEP	
	PL	S+Y+Q	-	3	2018	GEP	
Winter triticale	FR	S+Y+Q	2	-	2017	GEP	
	DE	S+Y+Q	2	-	2016	GEP	
		S+Y+Q	1	-	2017	GEP	
		S+Y+Q	1	-	2018	GEP	
	CZ	S+Y+Q	2	-	2016	GEP	
	PL	S+Y+Q	-	1	2018	GEP	
Winter rye	FR	S+Y+Q	2	-	2017	GEP	
	DE	S+Y+Q	2	-	2016	GEP	
		S+Y+Q	1	-	2017	GEP	
		S+Y+Q	1	-	2018	GEP	
	CZ	S+Y+Q	2	-	2017	GEP	
	PL	S+Y+Q	-	1	2018	GEP	
TOTAL		**29**	**24**	**5**			

** S= selectivity trial, Y= trial with yield assessment, Q= trial with quality assessment

5 selectivity trials were carried out in France, 12 in Germany, 5 in the Czech Republic, 1 in the UK and 1 in Belgium. 5 selectivity trials were carried out in Poland. Application and location details of these trials are summarized in Table 3.4-1a **Błąd! Nie można odnaleźć źródła odwołania.**. Details on the treatments are provided in Table 3.4-1b **Błąd! Nie można odnaleźć źródła odwołania.**, details on application rates and timings are provided in Table 3.4-4 **Błąd! Nie można odnaleźć źródła odwołania.**. Both the highest target dose and the double dose rate of GLOB289H were tested and compared to the standard treatment.

Table 3.4-1b: Details on trial methodology

Guidelines	General guidelines	EPPO PP 1/152 (4), 1/135 (4), 1/181 (4)
	Specific guidelines	EPPO PP 1/93 (3)
Experimental design	Plot design	RCBD
	Plot size	14 - 36 m²
	Number of replications	4
Crop	Trials per crop	Cereals (30 trials) Winter wheat: 11 Winter rye: 9 Winter triticale: 9
	Varieties per crop	29 varieties Winter wheat: Hermann, Musik, Santiago, Avatar, Bohemia, Bamberka, Tobak, Markiza, Allez-Y, Mulan, Elixer Winter rye: SU Mephisto, Daniello, Brasetto, SU Santini, Matador, KWS Gatano, Antoninskie, Performer, Mephisto, Winter triticale: Grenado, Exagon, Eleac, Adverdo, SW Talentro, Lombardo, Meloman, Silverado,
Application	Crop stage (BBCH) at application	Post-emergence (weed-free)
	Number of applications Intervals	1
	Spray volumes	200-300 L/ha
Assessment	Assessment types	Crop safety trials: Phytotoxicity & Quality/Yield
	Assessment dates	During the season for phytotoxicity After harvest for quality and yeild parameters
	Field / Greenhouse...	Field trials
	GEP	All trials were performed according to GEP

Table 3.4-2: Summary form of information concerning trial sites and application details

Reference is made to the Biological Assessment Dossier.

Details of the formulations tested are provided in the table 3.4-3 while details of application rates and timings are provided in table 3.4-4.

Table 3.4-3: Formulations included in selectivity trials

Product	Active substance	Active substance content	Formulation type
GLOB289H	Iodosulfuron + Mesosulfuron	6+30 g/kg	WG
Actirob B/842 EC & Mero	Esterified rapeseed oil	842 g/L	EC
Atlantis WG	Iodosulfuron + Mesosulfuron	6+30 g/kg	WG
Atlantis OD	Iodosulfuron + Mesosulfuron	2+10 g/L	OD

***Note: These products are not used further in the dosier**

Table 3.4-4: Rates of application (dose range applied for is indicated in bold)

Trial reference number	Product	Application rate		
		g as/ha	Product/ha	Timing
KCP 6.4-1	Untreated	-	-	Post-emergence
KCP 6.4-9	GLOB289H + Actirob B	18 + 842	0,5 + 1	
	GLOB289H + Actirob B	36 + 1684	1 + 2	
	Atlantis WG + Actirob B	18 + 842	0,5 + 1	
	Atlantis WG + Actirob B	36 + 1684	1 + 2	
	GLOB1302H + Actirob B	30 + 842	0,375 + 1	
	GLOB1302H + Actirob B	60 + 1684	0,75 + 2	
	GLOB1303H + Actirob B	30 + 842	0,25 + 1	
	GLOB1303H + Actirob B	60 + 1684	0,5 + 2	
KCP 6.4-2	Untreated	-	-	Post-emergence
KCP 6.4-3	GLOB289H + Actirob B	18 + 842	0,5 + 1	
	GLOB289H + Actirob B	36 + 1684	1 + 2	
	Atlantis WG + Actirob B	10,8 + 505,5	0,3 + 0,6	
	Atlantis WG + Actirob B	12,6 + 1010,4	0,6 + 1,2	
KCP 6.4-4	Untreated	-	-	Post-emergence
KCP 6.4-5	GLOB289H + Actirob B	18 + 842	0,5 + 1	
KCP 6.4-6	GLOB289H + Actirob B	36 + 1684	1 + 2	
KCP 6.4-7	*Atlantis WG + Actirob B*	18 + 842	0,5 + 1	
KCP 6.4-8	*Atlantis WG + Actirob B*	36 + 1684	1 + 2	
KCP 6.4-10				
KCP 6.4-11	Untreated	-	-	Post-emergence
KCP 6.4-12	GLOB289H + Actirob B	18 + 842	0,5 + 1	
KCP 6.4-13	GLOB289H + Actirob B	36 + 1684	1 + 2	
KCP 6.4-14	*Atlantis OD + Mero*	14,4 + 842	1,2 + 1	
KCP 6.4-15	*Atlantis OD + Mero*	28,8 + 1684	2,4 + 2	
KCP 6.4-16	Untreated	-	-	Post-emergence
	GLOB289H + Actirob B	18 + 842	0,5 + 1	
	GLOB289H + Actirob B	36 + 1684	1 + 2	
	Atlantis WG + Actirob B	5,4 + 253	0,15 + 0,3	
	Atlantis WG + Actirob B	10,8 + 505	0,3 + 0,6	
KCP 6.4-17	Untreated	-	-	Post-emergence
	GLOB289H + Actirob B	18 + 842	0,5 + 1	
	GLOB289H + Actirob B	36 + 1684	1 + 2	
	Atlantis WG + Actirob B	10,8 + 505	0,3 + 0,6	
	Atlantis WG + Actirob B	21,6 + 1010	0,6 + 1,2	
KCP 6.4-18	Untreated	-	-	Post-emergence
KCP 6.4-19	GLOB289H + Actirob 842 EC	18 + 842	0,5 + 1	
KCP 6.4-20	GLOB289H + Actirob 842 EC	36 + 1684	1 + 2	
KCP 6.4-21	*Atlantis 12 OD*	14,4	1,2	
KCP 6.4-22	*Atlantis 12 OD*	28,8	2,4	

KCP 6.4-23	Untreated	-	-	Post-emergence
KCP 6.4-24	GLOB288H	282	2	
KCP 6.4-25	GLOB288H	564	4	
KCP 6.4-26	Starane XL	185	1,8	
	Starane XL	370	3,6	
	GLOB289H + Actirob B	18 + 840	0,5 + 1	
	GLOB289H + Actirob B	36 + 1680	1 + 2	
	Atlantis WG + Actirob B	18 + 840	0,5 + 1	
	Atlantis WG + Actirob B	36 + 1680	1 + 2	
KCP 6.4-27	Untreated	-	-	Post-emergence
KCP 6.4-28	GLOB288H	282	2	
KCP 6.4-29	GLOB288H	564	4	
	GLOB289H + Actirob B	18 + 840	0,5 + 1	
	GLOB289H + Actirob B	36 + 1680	1 + 2	
	Atlantis WG + Actirob B	18 + 840	0,5 + 1	
	Atlantis WG + Actirob B	36 + 1680	1 + 2	

3.4.1 Phytotoxicity to host crop (KCP 6.4.1)

For the description of the trials, reference is made to the trials in the efficacy tests under section 3.2 and the trials mentiond above (crop safety) under section 3.4.
In this part, crop phytotoxicity was visually assessed regularly during the season after application in the crop safety trials and efficacy trials.
For the crop safety trials, results of phytotoxicity to the host crop caused by GLOB289H + oil at the highest dose of 0.5 L/ha GLOB289H with 1 L/ha of oil as well as the double dose are shown in the table below. For the efficacy trials, results of the highest dose rate as well as the reference product are shown.

Maritime EPPO Zone

Table 3.4-5a: Phytotoxicity of GLOB289H in <u>winter wheat</u>: highest phytotoxicity and phytotoxicity at final assessment

Number of trials with…		Selectivity trials (8)				Efficacy trials (18)			
		GLOB289H		Reference		GLOB289H		Reference	
		N	2N	N	2N	N	2N	N	2N
Highest phytotoxicity	0% to 5%	8	7	8	5	18	-	18	-
	>5% to 10%		1		3		-		-
	>10% to 15%						-		-
	>15 %						-		-
Phytotoxicity at final assessment	0% to 5%	8	8	8	7	18	-	18	-
	>5% to 10%				1		-		-
	>10% to 15%						-		-
	>15 %						-		-

In the efficacy trials, no phytotoxic effects were observed.
In the selectivity trials, for the N dose, no phytotoxic effects were observed. Furthermore, for the 2N dose, no phytotoxicity was observed in 7 of the 8 trials for GLOB289H. In the other trial being KCP 6.4-1, a small amount of growth reduction was observed. In KCP 6.4-11 some stunted growth was observed, but only for the reference product Atlantis 12 OD. The effect observed for GLOB289H disappeared to the end of the season, which is confirmed in the yield data (see further).
Overall, these results show that only the double dose of GLOB289H shows a slight risk in phytotoxicity, observed as growth reduction. However, this is not observed for the N dose. For correct interpretation of the relevance of these effects however, reference is made to section 3.4.2 where the yield of these treatments is measured. It can be concluded there is no need to mention a warning on the label.

Table 3.4-6b: Phytotoxicity of GLOB289H in winter triticale: highest phytotoxicity and phytotoxicity at final assessment

Number of trials with…		Selectivity trials (8)				Efficacy trials (1)			
		GLOB289H		Reference		GLOB289H		Reference	
		N	2N	N	2N	N	2N	N	2N
Highest phytotoxicity	0% to 5%	8	8	8	7	1	-	1	-
	>5% to 10%				1		-		-
	>10% to 15%						-		-
	>15 %						-		-
Phytotoxicity at final assessment	0% to 5%	8	8	8	8	1	-	1	-
	>5% to 10%						-		-
	>10% to 15%						-		-
	>15 %						-		-

In the selectivity or efficacy trials, no phytotoxic effects were observed for GLOB289H. Only in trial 6.4-8, a discoloration was observed for the 2N dose of the reference product Atlantis WG.

Table 3.4-7c: Phytotoxicity of GLOB289H in winter rye: highest phytotoxicity and phytotoxicity at final assessment

Number of trials with…		Selectivity trials (8)			
		GLOB289H		Reference	
		N	2N	N	2N
Highest phytotoxicity	0% to 5%	2	2	2	1
	>5% to 10%	1		1	
	>10% to 15%	1		2	
	>15 %	4	6	3	7
Phytotoxicity at final assessment	0% to 5%	6	4	5	3
	>5% to 10%	1	2	2	2
	>10% to 15%				
	>15 %	1	2	1	3

In the selectivity trials, for the N dose, phytotoxicity was observed in 6 of the 8 trials during the season as growth reduction (KCP 6.4-2, 6, 16 & 26) or leaf chlorosys/deformation (KCP 6.4-13 & 25). At the final assessment, this growth reduction was still observed in trial KCP 6.4-2 and the leaf deformation in KCP 6.4-25, these results were comparable to the reference products based on the same active ingredients. Application with Atlantis 12 OD also caused growth reduction in trial 6.4-12.
Furthermore, for the 2N dose, phytotoxicity was observed in the same 6 trials during the season. Even at the final assessment, 5 of these trials still showed some phytotoxic symptoms, especially growth reduction. Overall, these results show that especially the double dose of GLOB289H and the reference products shows an increased risk in phytotoxicity, observed as growth reduction or leaf deformation/discoloration. For correct interpretation of the relevance of these effects however, reference is made to the table below. It can be considered to mention a warning on the label to avoid overlap of sprays.

In the table below, the phytotoxic effects observed in the different trials (described above) are compared to the effects on yield of these trials.

Test report	Variety	Maximum phyto. at 1N rate (%) (DAA)		Maximum phyto. at 2N (or other) rate (%) (DAA)		Yield in the untreated control Absolute figures (ton/ha)	Yield at 1N as % of untreated		Yield at 2N rate as % of untreated	
		GLOB289H	Standard	GLOB289H	Standard		GLOB289H	Standard	GLOB289H	Standard
Winter wheat										
KCP 6.4-1	Hermann	2.5 (26)	3.8 (26)	10 (26)	10 (26)	9.44	100.7	101.3	100.9	99.9
Winter rye										
KCP 6.4-2*	SU Mephisto	17.5 (14)	13.8 (14)	52.5 (14)	20 (14)	8.85	96.4	100.2	90.4	91.8
KCP 6.4-6	Brasetto	12.5 (23)	25 (23)	12.5 (23)	26.3 (23)	6.10	109.4	98.6	104.3	104.9
KCP 6.4-13	Matador	10 (13)	20 (13)	20 (13)	20 (13)	2.46	92	84.4	91.9	74.3
KCP 6.4-16**	KWS Gatano	18.75 (14)	0 (14)	30 (14)	16.25 (14)	8.72	97.3	95.11	79.62	94.80
KCP 6.4-25	Performer	40 (42)	30 (42)	40 (42)	50 (42)	10.06	82.6	86.7	65.9	65.9
KCP 6.4-26	SU Mephisto	20 (22)	28.8 (22)	50 (22)	47.5 (22)	10.79	92.3	89.4	87.8	84.1

*In trial KCP 6.4-2, the reference product Atlantis WG was sprayed at 0.3 & 0.6 kg/ha while GLO289H was sprayed at 0.5 and 1 kg/ha
**In trial KCP 6.4-16, the reference product Atlantis WG was sprayed at 0.15 & 0.3 kg/ha while GLO289H was sprayed at 0.5 and 1 kg/ha

It can be observed that in a few cases (only in rye) the double dose rate causes a minor decrease in yield, especially after application of the 2N dose. For this reason it could be advised on the label to avoid spray overlap. For more details reference is made to the yield data below.

North-East EPPO Zone

Table 3.4-8d: Phytotoxicity of GLOB289H in winter wheat: highest phytotoxicity and phytotoxicity at final assessment

Number of trials with…		Selectivity trials (3)				Efficacy trials (6)			
		GLOB289H		Reference		GLOB289H		Reference	
		N	2N	N	2N	N	2N	N	2N
Highest phytotoxicity	0% to 5%	3	3	3	3	6	-	6	-
	>5% to 10%						-		-
	>10% to 15%						-		-
	>15 %						-		-
Phytotoxicity at final assessment	0% to 5%	3	3	3	3	6	-	6	-
	>5% to 10%						-		-
	>10% to 15%						-		-
	>15 %						-		-

In the selectivity or efficacy trials, no phytotoxic effects were observed.

Table 3.4-9e: Phytotoxicity of GLOB289H in winter triticale: highest phytotoxicity and phytotoxicity at final assessment

Number of trials with…		Selectivity trials (1)				Efficacy trials (4)			
		GLOB289H		Reference		GLOB289H		Reference	
		N	2N	N	2N	N	2N	N	2N
Highest phytotoxicity	0% to 5%	1	1	1	1	4	-	4	-
	>5% to 10%						-		-
	>10% to 15%						-		-
	>15 %						-		-
Phytotoxicity at final assessment	0% to 5%	1	1	1	1	4	-	4	-
	>5% to 10%						-		-
	>10% to 15%						-		-
	>15 %						-		-

In the selectivity or efficacy trials, no phytotoxic effects were observed.

Table 3.4-10f: Phytotoxicity of GLOB289H in winter rye: highest phytotoxicity and phytotoxicity at final assessment

Number of trials with…		Selectivity trials (1)			
		GLOB289H		Reference	
		N	2N	N	2N
Highest phytotoxicity	0% to 5%	1	1	1	1
	>5% to 10%				
	>10% to 15%				
	>15 %				
Phytotoxicity at final assessment	0% to 5%	1	1	1	1
	>5% to 10%				
	>10% to 15%				
	>15 %				

In the selectivity trial, no phytotoxic effects were observed.

Conclusion of selectivity trials

In conclusion it can be observed that it is necessary to avoid spraying overlap (2N dose) in winter rye during treatment with GLOB289H. Furthermore, a very few times growth reduction can be also observed in the other cereals bot only for the double dose. However, this always disappears to the end of the season and as will be shown further, this has no effect on the yield of the different winter cereals, except for rye.

Comments of zRMS:	In the evaluation process the fact that the active ingredients – iodosulfuron-methyl-sodium and mesosulfuron-methyl are used in many plant protection products and has been commonly used in crop protection were taken into consideration by Evaluator. The Applicant submitted in total 29 selectivity studies (Maritime – 24 trials, N-E EPPO zone – 5 trials) conducted in three different seasons (2016, 2017 and 2018) on herbicide (ZEPPOS) containing this two active substances. The selectivity evaluation of the herbicide is to be performed according to listed below EPPO guidelines. The evaluation of herbicide selectivity was carried out 4-5 per season. Results were described in percent of destruction of plant for herbicides treatment compared to plant for untreated, where 0% means no phytotoxicity and 100% - complete destruction. Phytotoxicity assessment was carried out with the use of different cultivars (commercially grown varieties). Dosages N (recommended) and 2N (doubled recommended) were studied in all trials. Experimental details and assessments methods were in accordance to EPPO standards. Detailed information's are presented by Applicant in the tables above and BAD. The trials were conducted on following winter cereals: - winter wheat – Maritime: 8 trials (CZ-1, DE-4, FR-1, UK-1, BE-1); N-E EPPO zone : 3 trials (PL); - winter triticale – Maritime: 8 trials (FR-2, DE-4, CZ-2); N-E EPPO zone: 1 trial (PL); - winter rye – Maritime: 8 trials (FR-2, DE-4, CZ-2); N-E EPPO zone: 1 trial (PL).

	N-E EPPO zone: In the selectivity or efficacy trials, no phytotoxic effects were observed on studied winter wheat, winter triticale and winter rye. Maritime EPPO zone: - *winter rye:* In the selectivity trials, for the N dose, phytotoxicity was observed in 6 of the 8 trials during the season as growth reduction or leaf chlorosys/deformation. At the final assessment, this growth reduction was still observed in trial KCP 6.4-2 and the leaf deformation in KCP 6.4-25, these results were comparable to the reference products based on the same active ingredients. Application with Atlantis 12 OD also caused growth reduction in trial KCP 6.4-12. Furthermore, for the 2N dose, phytotoxicity was observed in the same 6 trials during the season. Even at the final assessment, 5 of these trials still showed some phytotoxic symptoms, especially growth reduction. Overall, these results show that especially the double dose of GLOB289H and the reference products shows an increased risk in phytotoxicity, observed as growth reduction or leaf deformation/discoloration. - *winter triticale*: In the selectivity or efficacy trials, no phytotoxic effects were observed for GLOB289H. Only in trial 6.4-8, a discoloration was observed for the 2N dose of the reference product Atlantis WG. - *winter wheat*: In the selectivity trials, for the N dose, no phytotoxic effects were observed. Furthermore, for the 2N dose, no phytotoxicity was observed in 7 of the 8 trials for GLOB289H. In the other trial being KCP 6.4-1, a small amount of growth reduction was observed. In KCP 6.4-11 some stunted growth was observed, but only for the reference product Atlantis 12 OD. The effect observed for GLOB289H disappeared to the end of the season, which is confirmed in the yield data (see further). Overall, these results show that only the double dose of GLOB289H shows a slight risk in phytotoxicity, observed as growth reduction. However, this is not observed for the N dose. In most of the assessments no phytotoxicity symptoms were observed for any tested dosage for all tested winter cereals. In addition, the crop developed normally and did not involve a loss in yield at harvest. The same phytotoxicity symptoms were observed at standard referenece treatment. **In the opinion of Evaluator, the warning should be put on the label: E.g. ~~Phytotoxicity cannot be excluded. Sensitivity of varieties should be consulted with the authorization holder.~~** Spray overlap should be avoided, especially in Winter/Spring Rye. Sensitivity of varieties should be tested or consulted with the authorization holder.

Effect on the yield of treated plants or plant product (KCP 6.4.2)

The effect on yield and quality (moisture content, TKW and HLW) was also determined in the crop safey trials discussed in section 3.4 in accordance with the EPPO standard PP 1/135 requirements, mentioning the use of a double dose 2N, in these trials being 1 L/ha GLOB289H with 2 L/ha of oil as worst case.

Plots were harvested individually to give results in kg per plot, and then converted to kg per ha. The percentage relative to the control is shown in the tables below.

A separate mean for the Maritime and North-East EPPO Zone has been calculated. Since Poland accepts results from it's neigbouring countries, the results of the North-East EPPO zne are a combination of Polish, German and Czech trials. The Polish trials representing the North-East EPPO Zone are shown in grey in the tables below for the North-East EPPO Zone.

Where possible, statistical analysis was made as letter test based on Student-Newman-Keuls (P = 0.05).

Maritime EPPO Zone

Table 3.4-11a: Impact on yield of GLOB289H in winter wheat

TRZAW: YIELD								KCP 6.4-1		KCP 6.4-4		KCP 6.4-9		KCP 6.4-10		KCP 6.4-11		KCP 6.4-27		KCP 6.4-28		KCP 6.4-29		Summary						
No.	Treatment				Rate			%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*							*11*	-	*10,5*	-	*13,5*	-	*12*	-	*6*	*a*	*7*	-	*9,5*	-	*11*	-	-		*8*	-	-	-	-
2	GLOB289H	3,6	%	WG	0,5	kg/ha		101	-	100	-	98	-	99	-	98	a	100	-	91	-	100	-	98	bc	8	91	101	3	99,5
	Actirob B	842	GA/L	EC	1	L/ha																								
3	GLOB289H	3,6	%	WG	1	kg/ha		101	-	101	-	98	-	98	-	100	a	97	-	93	-	96	-	98	bcd	8	93	101	3	98
	Actirob B	842	GA/L	EC	2	L/ha																								
4	Atlantis WG	3,6	%	WG	0,5	kg/ha		102	-	100	-	100	-	99	-	-		103	-	95	-	97	-	99	bc	7	95	103	3	100
	Actirob B	842	GA/L	EC	1	L/ha																								
5	Atlantis WG	3,6	%	WG	1	kg/ha		100	-	100	-	100	-	97	-	-		93	-	91	-	99	-	97	bcd	7	91	100	3	99
	Actirob B	842	GA/L	EC	2	L/ha																								
6	Atlantis OD	12	gA/L	OD	1,2	L/ha		-		-		-		-		95	a	-		-		-		95	d	1	95	95	-	95
	Mero	842	gA/L	EC	1	L/ha																								
7	Atlantis OD	12	gA/L	OD	2,4	L/ha		-		-		-		-		89	b	-		-		-		89	e	1	89	89	-	89
	Mero	842	gA/L	EC	2	L/ha																								

Table 3.4-12b: Impact on yield of GLOB289H in winter rye

SECCW: YIELD								KCP 6.4-2		KCP 6.4-5		KCP 6.4-6		KCP 6.4-12		KCP 6.4-13		KCP 6.4-16		KCP 6.4-25		KCP 6.4-26		Summary						
No.	Treatment					Rate		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*							*9*	-	*4,5*	-	*6*	-	*7*	-	*2,5*	-	*9*	-	*10*	-	*6*	-	-		*8*	-	-	-	-
2	GLOB289H	3,6	%	WG	0,5	kg/ha		97	-	95	-	114	-	98	-	92	-	97	a	83	b	93	bcd	96	bc	8	83	114	9	96
	Actirob B	842	GA/L	EC	1	L/ha																								
3	GLOB289H	3,6	%	WG	1	kg/ha		91	-	94	-	107	-	100	-	92	-	80	b	66	c	88	cd	90	bcd	8	66	107	12	91,5
	Actirob B	842	GA/L	EC	2	L/ha																								
4	Atlantis WG	3,6	%	WG	0,5	kg/ha		-		94	-	101	-	-		-		-		87	ab	89	cd	93	bc	4	87	101	6	91
	Actirob B	842	GA/L	EC	1	L/ha																								
5	Atlantis WG	3,6	%	WG	1	kg/ha		-		96	-	108	-	-		-		-		66	c	84	d	89	cd	4	66	108	18	90
	Actirob B	842	GA/L	EC	2	L/ha																								
6	Atlantis OD	12	gA/L	OD	1,2	L/ha		-		-		-		98	-	84	-	-		-		-		91	bcd	2	84	98	10	91
	Mero	842	gA/L	EC	1	L/ha																								
7	Atlantis OD	12	gA/L	OD	2,4	L/ha		-		-		-		91	-	74	-	-		-		-		83	d	2	74	91	12	83
	Mero	842	gA/L	EC	2	L/ha																								
8	Atlantis WG	36	G/KG	WG	0,15	kg/ha		-		-		-		-		-		95	a	-		-		95	bc	1	95	95	-	95
	Actirob B	842	g/L	EC	0,3	L/ha																								
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha		101	-	-		-		-		-		95	a	-		-		98	bc	2	95	101	4	98
	Actirob B	842	g/L	EC	0,6	L/ha																								
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha		92	-	-		-		-		-		-		-		-		92	bcd	1	92	92	-	92
	Actirob B	842	g/L	EC	1,2	L/ha																								

Table 3.4-13c: Impact on yield of GLOB289H in winter triticale

TTLWI: YIELD							KCP 6.4-3		KCP 6.4-7		KCP 6.4-8		KCP 6.4-14		KCP 6.4-15		KCP 6.4-17		KCP 6.4-23		KCP 6.4-24		Summary						
No.	Treatment				Rate		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*6*	-	*7*	-	*9*	-	*7,5*	-	*8*	-	*6*	-	*7,5*	-	*8*	-	-	-	*8*	-	-	-	-
2	GLOB289H	3,6	%	WG	0,5	kg/ha	98	-	107	-	95	b	100	a	98	-	105	-	96	-	102	-	100	ab	8	95	107	4	99
	Actirob B	842	GA/L	EC	1	L/ha																							
3	GLOB289H	3,6	%	WG	1	kg/ha	98	-	103	-	96	ab	101	a	98	-	100	-	96	-	95	-	98	bc	8	95	103	3	98
	Actirob B	842	GA/L	EC	2	L/ha																							
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		104	-	97	ab	-		-		-		96	-	102	-	100	bc	4	96	104	4	99
	Actirob B	842	GA/L	EC	1	L/ha																							
5	Atlantis WG	3,6	%	WG	1	kg/ha	-		103	-	94	b	-		-		-		96	-	95	-	97	bc	4	94	103	4	96
	Actirob B	842	GA/L	EC	2	L/ha																							
6	Atlantis OD	12	gA/L	OD	1,2	L/ha	-		-		-		99	a	98	-	-		-		-		99	bc	2	98	99	0	99
	Mero	842	gA/L	EC	1	L/ha																							
7	Atlantis OD	12	gA/L	OD	2,4	L/ha	-		-		-		81	b	98	-	-		-		-		90	e	2	81	98	12	90
	Mero	842	gA/L	EC	2	L/ha																							
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha	96	-	-		-		-		-		108	-	-		-		102	ab	2	96	108	8	102
	Actirob B	842	g/L	EC	0,6	L/ha																							
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha	93	-	-		-		-		-		102	-	-		-		98	bc	2	93	102	6	98
	Actirob B	842	g/L	EC	1,2	L/ha																							

North-East EPPO Zone

Table 3.4-14d: Impact on yield of GLOB289H in winter wheat

TRZAW: YIELD							KCP 6.4-1		KCP 6.4-11		KCP 6.4-18		KCP 6.4-19		KCP 6.4-20		KCP 6.4-27		KCP 6.4-28		KCP 6.4-29		PL + CZ + DE					
No.	Treatment				Rate		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		Mean	n	Min	Max	StDev	Median
1	*Untreated Check*						*11*	-	*6*	*a*	*8*	-	*7*	-	*3*	-	*7*	-	*9,5*	-	*11*	-	-	*8*	-	-	-	-
2	GLOB289H	3,6	%	WG	0,5	kg/ha	101	-	98	a	96	-	103	-	111	-	100	-	91	-	100	-	100	8	91	111	6	100
	Actirob B	842	GA/L	EC	1	L/ha																						
3	GLOB289H	3,6	%	WG	1	kg/ha	101	-	100	a	95	-	102	-	107	-	97	-	93	-	96	-	99	8	93	107	5	98,5
	Actirob B	842	GA/L	EC	2	L/ha																						
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	102	-	-		-		-		-		103	-	95	-	97	-	99	4	95	103	4	99,5
	Actirob B	842	GA/L	EC	1	L/ha																						
5	Atlantis WG	3,6	%	WG	1	kg/ha	100	-	-		-		-		-		93	-	91	-	99	-	96	4	91	100	4	96
	Actirob B	842	GA/L	EC	2	L/ha																						
6	Atlantis OD	12	gA/L	OD	1,2	L/ha	-		95	a	-		-		-		-		-		-		95	1	95	95	-	95
	Mero	842	gA/L	EC	1	L/ha																						
7	Atlantis OD	12	gA/L	OD	2,4	L/ha	-		89	b	-		-		-		-		-		-		89	1	89	89	-	89
	Mero	842	gA/L	EC	2	L/ha																						
8	Atlantis 12 OD	12	g/L	OD	1,2	L/ha	-		-		96	-	101	-	116	-	-		-		-		105	3	96	116	11	101
9	Atlantis 12 OD	12	g/L	OD	2,4	L/ha	-		-		94	-	99	-	104	-	-		-		-		99	3	94	104	5	99

Table 3.4-15e: Impact on yield of GLOB289H in winter rye

SECCW: YIELD							KCP 6.4-2		KCP 6.4-12		KCP 6.4-13		KCP 6.4-16		KCP 6.4-21		KCP 6.4-25		KCP 6.4-26		PL + CZ + DE					
No.	Treatment				Rate		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		Mean	n	Min	Max	StDev	Median
1	*Untreated Check*						*9*	-	*7*	-	*2,5*	-	*9*	-	*2,5*	-	*10*	-	*6*	-	-	*7*	-	-	-	-
2	GLOB289H	3,6	%	WG	0,5	kg/ha	97	-	98	-	92	-	97	a	119	-	83	b	93	bcd	97	7	83	119	11	97
	Actirob B	842	GA/L	EC	1	L/ha																				
3	GLOB289H	3,6	%	WG	1	kg/ha	91	-	100	-	92	-	80	b	113	-	66	c	88	cd	90	7	66	113	15	91
	Actirob B	842	GA/L	EC	2	L/ha																				
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		-		-		-		-		87	ab	89	cd	88	2	87	89	1	88
	Actirob B	842	GA/L	EC	1	L/ha																				
5	Atlantis WG	3,6	%	WG	1	kg/ha	-		-		-		-		-		66	c	84	d	75	2	66	84	13	75
	Actirob B	842	GA/L	EC	2	L/ha																				
6	Atlantis OD	12	gA/L	OD	1,2	L/ha	-		98	-	84	-	-		-		-		-		91	2	84	98	10	91
	Mero	842	gA/L	EC	1	L/ha																				
7	Atlantis OD	12	gA/L	OD	2,4	L/ha	-		91	-	74	-	-		-		-		-		82,5	2	74	91	12	82,5
	Mero	842	gA/L	EC	2	L/ha																				
8	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		-		-		95	a	-		-		-		95	1	95	95	-	95
	Actirob B	842	g/L	EC	0,3	L/ha																				
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha	101	-	-		-		95	a	-		-		-		98	2	95	101	4	98
	Actirob B	842	g/L	EC	0,6	L/ha																				
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha	92	-	-		-		-		-		-		-		92	1	92	92	-	92
	Actirob B	842	g/L	EC	1,2	L/ha																				
13	Atlantis 12 OD	12	g/L	OD	0,45	L/ha	-		-		-		-		109	-	-		-		109	1	109	109	-	109
14	Atlantis 12 OD	12	g/L	OD	0,9	L/ha	-		-		-		-		111	-	-		-		111	1	111	111	-	111

Table 3.4-16f: Impact on yield of GLOB289H in winter triticale

TTLWI: YIELD							KCP 6.4-3		KCP 6.4-14		KCP 6.4-15		KCP 6.4-17		KCP 6.4-22		KCP 6.4-23		KCP 6.4-24		PL + CZ + DE						
No.	Treatment				Rate		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		%UNCK		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*6*	-	*7,5*	-	*8*	-	*6*	-	*6*	-	*7,5*	-	*8*	-	-	-	*7*	-	-	-	-
2	GLOB289H	3,6	%	WG	0,5	kg/ha	98	-	100	a	98	-	105	-	109	a	96	-	102	-	101		7	95	109	5	100
	Actirob B	842	GA/L	EC	1	L/ha																					
3	GLOB289H	3,6	%	WG	1	kg/ha	98	-	101	a	98	-	100	-	106	ab	96	-	95	-	99		7	95	106	4	98
	Actirob B	842	GA/L	EC	2	L/ha																					
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		-		-		-		-		96	-	102	-	99		2	96	102	4	99
	Actirob B	842	GA/L	EC	1	L/ha																					
5	Atlantis WG	3,6	%	WG	1	kg/ha	-		-		-		-		-		96	-	95	-	96		2	94	95	1	95,5
	Actirob B	842	GA/L	EC	2	L/ha																					
6	Atlantis OD	12	gA/L	OD	1,2	L/ha	-		99	a	98	-	-		-		-		-		99		2	98	99	1	98,5
	Mero	842	gA/L	EC	1	L/ha																					
7	Atlantis OD	12	gA/L	OD	2,4	L/ha	-		81	b	98	-	-		-		-		-		90		2	81	98	12	89,5
	Mero	842	gA/L	EC	2	L/ha																					
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha	96	-	-		-		108	-	-		-		-		102		2	96	108	8	102
	Actirob B	842	g/L	EC	0,6	L/ha																					
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha	93	-	-		-		102	-	-		-		-		98		2	93	102	6	97,5
	Actirob B	842	g/L	EC	1,2	L/ha																					
11	Atlantis 12 OD	12	g/L	OD	1,2	L/ha	-		-		-		-		94	b	-		-		94		1	94	94	-	94
12	Atlantis 12 OD	12	g/L	OD	2,4	L/ha	-		-		-		-		106	ab	-		-		106		1	106	106	-	106

There are almost no significant differences in yield between GLOB289H and the reference product Atlantis WG. Only the double dose of GLOB289H caue a slight decrause in yield for winter rye. For the other cereals, no decrease in yield caused by GLOB289H can be observed. Overall, these results confirms that there is no risk for negative side effects on yield of the treated cereals, although for winter rye the label should mention to avoid spray overlap as discussed in the phytotoxicity results.

Although no data on selectivity of spring cereals is shown in this dossier, reference is made to data out of protection of existing products on the market e.g. Atlantis WG. For these products, the maximum dose in spring cereals is limited to 0.3 kg/ha. It is known that spring cereals tend to be more sensitive to herbicides. Therefore, 0.3 kg/ ha will also be the maximum application rate of GLOB289H in spring cereals.

Comments of zRMS:	Submitted trials are sufficient. Influence of ZEPPOS (product code: GLOB289H) on yield was evaluated during selectivity research. Summary of the data on yield can be found at tables above and in BAD. The Applicant submitted in presented reports the results of yield, carried out in different growing seasons in winter cereals (winter wheat, winter rye and winter triticale). The evaluation was carried out in accordance with EPPO guidelines. <u>Maritime EPPO zone:</u> - winter wheat – 8 trials - winter rye – 8 trials - winter triticale – 8 trials <u>N-E EPPO zone (PL) and neighbouring countries (PL, CZ, DE):</u> - winter wheat – 8 trials - winter rye – 7 trials - winter triticale – 7 trials There are almost no significant differences in yield between GLOB289H and the reference product Atlantis WG. Only the double dose of GLOB289H caue a slight decrause in yield for winter rye. For the other cereals, no decrease in yield caused by GLOB289H can be observed. Overall, these results confirms that there is no risk for negative side effects on yield of the treated cereals, although for winter rye the label should mention to avoid spray overlap as discussed in the phytotoxicity results.

3.4.2 Effects on the quality of plants or plant products (KCP 6.4.3)

The effect on yield and quality (moisture content, TKW, HLW) was also determined in the crop safey trials discussed in section 3.4 in accordance with the EPPO standard PP 1/135 requirements, mentioning the use of a double dose 2N, in these trials being 1 L/ha GLOB289H with 2 L/ha of oil as worst case.

For more information about the trials (testing facility, sites experimental details & methods, analyses), reference is made to section 3.4.

Assesment methods:
- moisture content (%) measured at harvest
- TKW (g) measured at harvest
- HLW (kg) measured at harvest

A separate mean for the Maritime and North-East EPPO Zone has been calculated. Since Poland accepts results from it's neigbouring countries, the results of the North-East EPPO zone are a combination of Polish, German and Czech trials. The Polish trials representing the North-East EPPO Zone are shown in grey in the tables below for the North-East EPPO Zone.

Where possible, statistical analysis was made as letter test based on Student-Newman-Keuls (P = 0.05).

Maritime EPPO Zone

Table 3.4-9: Impact on moisture content (%) of GLOB289H in winter wheat

TRZAW: MOICON							KCP 6.4-1	KCP 6.4-4	KCP 6.4-9	KCP 6.4-10	KCP 6.4-11	KCP 6.4-27	KCP 6.4-28	KCP 6.4-29	Maritime					
No.	Treatment				Rate		%	%	%	%	%	%	%	%	Mean	n	Min	Max	StDev	Median
1	*Untreated Check*						*12* -	*15* -	*11* -	*14* -	*12* -	*12* -	*16* -	*14* -	*13*	*8*	*11*	*16*	*2*	*13*
2	GLOB289H	3,6	%	WG	0,5	kg/ha	12 -	15 -	12 -	14 -	13 -	12 -	16 -	14 -	14	8	12	16	2	13,5
	Actirob B	842	GA/L	EC	1	L/ha														
3	GLOB289H	3,6	%	WG	1	kg/ha	12 -	15 -	11 -	14 -	11 -	12 -	16 -	14 -	13	8	11	16	2	13
	Actirob B	842	GA/L	EC	2	L/ha														
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	12 -	15 -	11 -	14 -	-	12 -	16 -	14 -	13	7	11	16	2	14
	Actirob B	842	GA/L	EC	1	L/ha														
5	Atlantis WG	3,6	%	WG	1	kg/ha	12 -	15 -	11 -	14 -	-	12 -	16 -	14 -	13	7	11	16	2	14
	Actirob B	842	GA/L	EC	2	L/ha														
6	Atlantis OD	12	gA/L	OD	1,2	L/ha	-	-	-	-	12 -	-	-	-	12	1	12	12	-	12
	Mero	842	gA/L	EC	1	L/ha													-	
7	Atlantis OD	12	gA/L	OD	2,4	L/ha	-	-	-	-	12 -	-	-	-	12	1	12	12	-	12
	Mero	842	gA/L	EC	2	L/ha														

Table 3.4-10: Impact on HLW (kg) of GLOB289H in winter wheat

TRZAW: HLW								KCP 6.4-1		KCP 6.4-4		KCP 6.4-9		KCP 6.4-10		KCP 6.4-27		KCP 6.4-28		KCP 6.4-29		Maritime					
No.	Treatment				Rate			kg		kg		kg		kg		kg		kg		kg		Mean	n	Min	Max	StDev	Median
1	*Untreated Check*							*73*	-	*76*	-	*74*	-	*75*	*a*	*76*	*bc*	*77*	*ab*	*74*	-	*75*	*7*	*73*	*77*	*1*	*75*
2	GLOB289H	3,6	%	WG	0,5	kg/ha		72	-	75	-	73	-	74	b	77	abc	76	d	74	-	74	7	72	77	2	74
	Actirob B	842	GA/L	EC	1	L/ha																					
3	GLOB289H	3,6	%	WG	1	kg/ha		72	-	75	-	73	-	73	b	77	a	76	d	74	-	74	7	72	77	2	74
	Actirob B	842	GA/L	EC	2	L/ha																					
4	Atlantis WG	3,6	%	WG	0,5	kg/ha		71	-	76	-	73	-	74	b	76	abc	76	d	75	-	74	7	71	76	2	75
	Actirob B	842	GA/L	EC	1	L/ha																					
5	Atlantis WG	3,6	%	WG	1	kg/ha		71	-	75	-	73	-	73	b	77	abc	76	d	75	-	74	7	71	77	2	75
	Actirob B	842	GA/L	EC	2	L/ha																					

Table 3.4-11: Impact on TKW (g) of GLOB289H in winter wheat

TRZAW: TKW							KCP 6.4-27		KCP 6.4-28		KCP 6.4-29		Summary						
No.	Treatment				Rate		g		g		g		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*51*	-	*50*	*a*	*44*	-	*48*	-	*3*	*44*	*51*	*4*	*50*
2	GLOB289H	3,6	%	WG	0,5	kg/ha	52	-	45	c	42	-	46	-	3	42	52	5	45
	Actirob B	842	GA/L	EC	1	L/ha													
3	GLOB289H	3,6	%	WG	1	kg/ha	52	-	45	bc	42	-	46	-	3	42	52	5	45
	Actirob B	842	GA/L	EC	2	L/ha													
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	50	-	47	abc	43	-	47	-	3	43	50	4	47
	Actirob B	842	GA/L	EC	1	L/ha													
5	Atlantis WG	3,6	%	WG	1	kg/ha	50	-	45	bc	44	-	46	-	3	44	50	3	45
	Actirob B	842	GA/L	EC	2	L/ha													

Table 3.4-12: Impact on moisture content (%) of GLOB289H in winter rye

SECCW: MOICON							KCP 6.4-2		KCP 6.4-6		KCP 6.4-12		KCP 6.4-13		KCP 6.4-16		KCP 6.4-25		KCP 6.4-26		Maritime					
No.	Treatment				Rate		%		%		%		%		%		%		%		Mean	n	Min	Max	StDev	Median
1	*Untreated Check*						*11*	-	*14*	-	*14*	*a*	*13*	-	*14*	-	*14*	-	*18*	-	*14*	*7*	*11*	*18*	*2*	*14*
2	GLOB289H	3,6	%	WG	0,5	kg/ha	10	-	14	-	13	b	13	-	14	-	14	-	18	-	14	7	10	18	2	14
	Actirob B	842	GA/L	EC	1	L/ha																				
3	GLOB289H	3,6	%	WG	1	kg/ha	10	-	14	-	13	b	13	-	14	-	13	-	18	-	14	7	10	18	2	13
	Actirob B	842	GA/L	EC	2	L/ha																				
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		14	-	-		-		-		14	-	18	-	15	3	14	18	2	14
	Actirob B	842	GA/L	EC	1	L/ha																				
5	Atlantis WG	3,6	%	WG	1	kg/ha	-		14	-	-		-		-		13	-	18	-	15	3	13	18	3	14
	Actirob B	842	GA/L	EC	2	L/ha																				
6	Atlantis OD	12	gA/L	OD	1,2	L/ha	-		-		13	b	13	-	-		-		-		13	2	13	13	0	13
	Mero	842	gA/L	EC	1	L/ha																				
7	Atlantis OD	12	gA/L	OD	2,4	L/ha	-		-		12	b	13	-	-		-		-		13	2	12	13	1	12,5
	Mero	842	gA/L	EC	2	L/ha																				
8	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		-		-		-		14	-	-		-		14	1	14	14	-	14
	Actirob B	842	g/L	EC	0,3	L/ha																				
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha	10	-	-		-		-		14	-	-		-		12	2	10	14	3	12
	Actirob B	842	g/L	EC	0,6	L/ha																				
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha	10	-	-		-		-		-		-		-		10	1	10	10	-	10
	Actirob B	842	g/L	EC	1,2	L/ha																				

Table 3.4-13: Impact on HLW (kg) of GLOB289H in winter rye

SECCW: HLW								KCP 6.4-2		KCP 6.4-5		KCP 6.4-6		KCP 6.4-12		KCP 6.4-13		KCP 6.4-16		KCP 6.4-25		KCP 6.4-26		Maritime					
No.	Treatment				Rate			kg		kg		kg		kg		kg		kg		kg		kg		Mean	n	Min	Max	StDev	Median
1	*Untreated Check*							*70*	-	*69*	-	*68*	-	*72*	-	*66*	-	*78*	-	*75*	*a*	*68*	*a*	*71*	*8*	*66*	*78*	*4*	*69,5*
2	GLOB289H	3,6	%	WG	0,5	kg/ha		71	-	69	-	68	-	72	-	66	-	75	-	75	ab	66	b	70	8	66	75	4	70
	Actirob B	842	GA/L	EC	1	L/ha																							
3	GLOB289H	3,6	%	WG	1	kg/ha		69	-	68	-	68	-	72	-	66	-	76	-	73	ab	66	b	70	8	66	76	4	68,5
	Actirob B	842	GA/L	EC	2	L/ha																							
4	Atlantis WG	3,6	%	WG	0,5	kg/ha		-		69	-	68	-	-		-		-		74	ab	66	b	69	4	66	74	3	68,5
	Actirob B	842	GA/L	EC	1	L/ha																							
5	Atlantis WG	3,6	%	WG	1	kg/ha		-		68	-	69	-	-		-		-		72	b	66	b	69	4	66	72	3	68,5
	Actirob B	842	GA/L	EC	2	L/ha																							
6	Atlantis OD	12	gA/L	OD	1,2	L/ha		-		-		-		71	-	65	-	-		-		-		68	2	65	71	4	68
	Mero	842	gA/L	EC	1	L/ha																							
7	Atlantis OD	12	gA/L	OD	2,4	L/ha		-		-		-		71	-	66	-	-		-		-		69	2	66	71	4	68,5
	Mero	842	gA/L	EC	2	L/ha																							
8	Atlantis WG	36	G/KG	WG	0,15	kg/ha		-		-		-		-		-		76	-	-		-		76	1	76	76	-	76
	Actirob B	842	g/L	EC	0,3	L/ha																							
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha		71	-	-		-		-		-		77	-	-		-		74	2	71	77	4	74
	Actirob B	842	g/L	EC	0,6	L/ha																							
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha		71	-	-		-		-		-		-		-		-		71	1	71	71	-	71
	Actirob B	842	g/L	EC	1,2	L/ha																							

Table 3.4-14: Impact on TKW (g) of GLOB289H in winter rye

SECCW: TKW							KCP 6.4-2		KCP 6.4-25		KCP 6.4-26		Summary						
No.	Treatment				Rate		g		g		g		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*29*	*a*	*35*	*a*	*34*	*a*	*33*	*cd*	*3*	*29*	*35*	*3*	*34*
2	GLOB289H	3,6	%	WG	0,5	kg/ha	27	ab	35	a	30	d	31	de	3	27	35	4	30
	Actirob B	842	GA/L	EC	1	L/ha													
3	GLOB289H	3,6	%	WG	1	kg/ha	26	b	30	b	30	d	29	ef	3	26	30	2	30
	Actirob B	842	GA/L	EC	2	L/ha													
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		33	a	31	cd	32	bc	2	31	33	2	32
	Actirob B	842	GA/L	EC	1	L/ha													
5	Atlantis WG	3,6	%	WG	1	kg/ha	-		30	b	30	d	30	de	2	30	30	0	30
	Actirob B	842	GA/L	EC	2	L/ha													
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha	28	ab	-		-		28	f	1	28	28	-	28
	Actirob B	842	g/L	EC	0,6	L/ha													
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha	28	ab	-		-		28	f	1	28	28	-	28
	Actirob B	842	g/L	EC	1,2	L/ha													

Table 3.4-15: Impact on moisture content (%) of GLOB289H in winter triticale

TTLWI: MOICON							KCP 6.4-3		KCP 6.4-8		KCP 6.4-14		KCP 6.4-15		KCP 6.4-17		KCP 6.4-23		KCP 6.4-24		Maritime					
No.	Treatment				Rate		%		%		%		%		%		%		%		Mean	n	Min	Max	StDev	Median
1	*Untreated Check*						*12*	-	*15*	-	*13*	-	*12*	-	*10*	-	*18*	-	*14*	-	*13*	*7*	*10*	*18*	*3*	*13*
2	GLOB289H	3,6	%	WG	0,5	kg/ha	12	-	15	-	13	-	12	-	10	-	18	-	13	-	13	7	10	18	3	13
	Actirob B	842	GA/L	EC	1	L/ha																				
3	GLOB289H	3,6	%	WG	1	kg/ha	12	-	15	-	13	-	11	-	10	-	18	-	14	-	13	7	10	18	3	13
	Actirob B	842	GA/L	EC	2	L/ha																				
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		15	-	-		-		-		19	-	14	-	16	3	14	19	3	15
	Actirob B	842	GA/L	EC	1	L/ha																				
5	Atlantis WG	3,6	%	WG	1	kg/ha	-		15	-	-		-		-		18	-	13	-	15	3	13	18	3	15
	Actirob B	842	GA/L	EC	2	L/ha																				
6	Atlantis OD	12	gA/L	OD	1,2	L/ha	-		-		12	-	11	-	-		-		-		12	2	11	12	1	11,5
	Mero	842	gA/L	EC	1	L/ha																				
7	Atlantis OD	12	gA/L	OD	2,4	L/ha	-		-		13	-	12	-	-		-		-		13	2	12	13	1	12,5
	Mero	842	gA/L	EC	2	L/ha																				
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha	12	-	-		-		-		10	-	-		-		11	2	10	12	1	11
	Actirob B	842	g/L	EC	0,6	L/ha																				
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha	13	-	-		-		-		10	-	-		-		12	2	10	13	2	11,5
	Actirob B	842	g/L	EC	1,2	L/ha																				

Table 3.4-16: Impact on HLW (kg) of GLOB289H in winter triticale

TTLWI: HLW								KCP 6.4-3		KCP 6.4-7		KCP 6.4-8		KCP 6.4-14		KCP 6.4-15		KCP 6.4-17		KCP 6.4-23		KCP 6.4-24		Maritime					
No.	Treatment					Rate		kg		kg		kg		kg		kg		kg		kg		kg		Mean	n	Min	Max	StDev	Median
1	*Untreated Check*							*65*	-	*72*	-	*67*	*a*	*70*	*a*	*77*	-	*81*	-	*69*	-	*68*	-	*71*	*8*	*65*	*81*	*5*	*69,5*
2	GLOB289H	3,6	%	WG	0,5	kg/ha		64	-	72	-	66	bc	70	ab	77	-	81	-	69	-	67	-	71	8	64	81	6	69,5
	Actirob B	842	GA/L	EC	1	L/ha																							
3	GLOB289H	3,6	%	WG	1	kg/ha		64	-	72	-	65	cd	68	b	77	-	80	-	69	-	68	-	70	8	64	80	6	68,5
	Actirob B	842	GA/L	EC	2	L/ha																							
4	Atlantis WG	3,6	%	WG	0,5	kg/ha		-		72	-	66	b	-		-		-		69	-	68	-	69	4	66	72	3	68,5
	Actirob B	842	GA/L	EC	1	L/ha																							
5	Atlantis WG	3,6	%	WG	1	kg/ha		-		72	-	65	d	-		-		-		68	-	68	-	68	4	65	72	3	68
	Actirob B	842	GA/L	EC	2	L/ha																							
6	Atlantis OD	12	gA/L	OD	1,2	L/ha		-		-		-		69	ab	77	-	-		-		-		73	2	69	77	6	73
	Mero	842	gA/L	EC	1	L/ha																							
7	Atlantis OD	12	gA/L	OD	2,4	L/ha		-		-		-		68	b	77	-	-		-		-		73	2	68	77	6	72,5
	Mero	842	gA/L	EC	2	L/ha																							
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha		64	-	-		-		-		-		80	-	-		-		72	2	64	80	11	72
	Actirob B	842	g/L	EC	0,6	L/ha																							
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha		64	-	-		-		-		-		79	-	-		-		72	2	64	79	11	71,5
	Actirob B	842	g/L	EC	1,2	L/ha																							

Table 3.4-17: Impact on TKW (g) of GLOB289H in winter triticale

TTLWI: TKW							KCP 6.4-3		KCP 6.4-23		KCP 6.4-24		Summary						
No.	Treatment				Rate		g		g		g		Mean		n	Min	Max	StDev	Median
1	*Untreated Check*						*40*	-	*51*	-	*47*	-	*46*	*b*	*3*	*40*	*51*	*6*	*47*
2	GLOB289H	3,6	%	WG	0,5	kg/ha	40	-	51	-	45	-	45	b	3	40	51	5	45
	Actirob B	842	GA/L	EC	1	L/ha													
3	GLOB289H	3,6	%	WG	1	kg/ha	40	-	51	-	45	-	45	b	3	40	51	5	45
	Actirob B	842	GA/L	EC	2	L/ha													
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		51	-	46	-	49	a	2	46	51	3	49
	Actirob B	842	GA/L	EC	1	L/ha													
5	Atlantis WG	3,6	%	WG	1	kg/ha	-		51	-	46	-	49	a	2	46	51	4	49
	Actirob B	842	GA/L	EC	2	L/ha													
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha	41	-	-		-		41	c	1	41	41	-	41
	Actirob B	842	g/L	EC	0,6	L/ha													
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha	40	-	-		-		40	c	1	40	40	-	40
	Actirob B	842	g/L	EC	1,2	L/ha													

North-East EPPO Zone

Table 3.4-18: Impact on moisture content (%) of GLOB289H in winter wheat

TRZAW: MOICON							KCP 6.4-1	KCP 6.4-11	KCP 6.4-18	KCP 6.4-19	KCP 6.4-20	KCP 6.4-27	KCP 6.4-28	KCP 6.4-29	North-East (PL+CZ+DE)					
No.	Treatment				Rate		%	%	%	%	%	%	%	%	Mean	n	Min	Max	StDev	Median
1	*Untreated Check*						*12* -	*12* -	*14* -	*13* -	*13* -	*12* -	*16* -	*14* -	*13*	*8*	*12*	*16*	*1*	*13*
2	GLOB289H	3,6	%	WG	0,5	kg/ha	12 -	13 -	14 -	13 -	13 -	12 -	16 -	14 -	13	8	12	16	1	13
	Actirob B	842	GA/L	EC	1	L/ha														
3	GLOB289H	3,6	%	WG	1	kg/ha	12 -	11 -	13 -	13 -	13 -	12 -	16 -	14 -	13	8	11	16	2	13
	Actirob B	842	GA/L	EC	2	L/ha														
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	12 -	-	-	-	-	12 -	16 -	14 -	14	4	12	16	2	13
	Actirob B	842	GA/L	EC	1	L/ha														
5	Atlantis WG	3,6	%	WG	1	kg/ha	12 -	-	-	-	-	12 -	16 -	14 -	14	4	12	16	2	13
	Actirob B	842	GA/L	EC	2	L/ha														
6	Atlantis OD	12	gA/L	OD	1,2	L/ha	-	12 -	-	-	-	-	-	-	12	1	12	12	-	12
	Mero	842	gA/L	EC	1	L/ha														
7	Atlantis OD	12	gA/L	OD	2,4	L/ha	-	12 -	-	-	-	-	-	-	12	1	12	12	-	12
	Mero	842	gA/L	EC	2	L/ha														
8	Atlantis 12 OD	12	g/L	OD	1,2	L/ha	-	-	13 -	13 -	13 -	-	-	-	13	3	13	13	0	13
9	Atlantis 12 OD	12	g/L	OD	2,4	L/ha	-	-	14 -	14 -	13 -	-	-	-	14	3	13	14	1	14

Table 3.4-19: Impact on HLW (kg) of GLOB289H in winter wheat

TRZAW: HLW							KCP 6.4-1		KCP 6.4-18		KCP 6.4-19		KCP 6.4-20		KCP 6.4-27		KCP 6.4-28		KCP 6.4-29		North-East (PL+CZ+DE)					
No.	Treatment				Rate		kg		kg		kg		kg		kg		kg		kg		Mean	n	Min	Max	StDev	Median
1	*Untreated Check*						*73*	-	*73*	-	*71*	-	*72*	-	*76*	*bc*	*77*	*ab*	*74*	-	*74*	*7*	*71*	*77*	*2*	*73*
2	GLOB289H	3,6	%	WG	0,5	kg/ha	72	-	71	-	71	-	71	-	77	abc	76	d	74	-	73	7	71	77	3	72
	Actirob B	842	GA/L	EC	1	L/ha																				
3	GLOB289H	3,6	%	WG	1	kg/ha	72	-	72	-	71	-	71	-	77	a	76	d	74	-	73	7	71	77	2	72
	Actirob B	842	GA/L	EC	2	L/ha																				
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	71	-	-		-		-		76	abc	76	d	75	-	75	4	71	76	2	75,5
	Actirob B	842	GA/L	EC	1	L/ha																				
5	Atlantis WG	3,6	%	WG	1	kg/ha	71	-	-		-		-		77	abc	76	d	75	-	75	4	71	77	3	75,5
	Actirob B	842	GA/L	EC	2	L/ha																				
8	Atlantis 12 OD	12	g/L	OD	1,2	L/ha	-		72	-	71	-	70	-	-		-		-		71	3	70	72	1	71
9	Atlantis 12 OD	12	g/L	OD	2,4	L/ha	-		72	-	71	-	70	-	-		-		-		71	3	70	72	1	71

Table 3.4-20: Impact on moisture content (%) of GLOB289H in winter rye

SECCW: MOICON								KCP 6.4-2		KCP 6.4-12		KCP 6.4-13		KCP 6.4-16		KCP 6.4-21		KCP 6.4-25		KCP 6.4-26		North-East (PL+CZ+DE)					
No.	Treatment					Rate		%		%		%		%		%		%		%		Mean	n	Min	Max	StDev	Median
1	*Untreated Check*							*11*	-	*14*	*a*	*13*	-	*14*	-	*8*	-	*14*	-	*18*	-	*13*	*7*	*8*	*18*	*3*	*14*
2	GLOB289H	3,6	%	WG	0,5	kg/ha		10	-	13	b	13	-	14	-	8	-	14	-	18	-	13	7	8	18	3	13
	Actirob B	842	GA/L	EC	1	L/ha																					
3	GLOB289H	3,6	%	WG	1	kg/ha		10	-	13	b	13	-	14	-	8	-	13	-	18	-	13	7	8	18	3	13
	Actirob B	842	GA/L	EC	2	L/ha																					
4	Atlantis WG	3,6	%	WG	0,5	kg/ha		-		-		-		-		-		14	-	18	-	16	2	14	18	3	16
	Actirob B	842	GA/L	EC	1	L/ha																					
5	Atlantis WG	3,6	%	WG	1	kg/ha		-		-		-		-		-		13	-	18	-	16	2	13	18	4	15,5
	Actirob B	842	GA/L	EC	2	L/ha																					
6	Atlantis OD	12	gA/L	OD	1,2	L/ha		-		13	b	13	-	-		-		-		-		13	2	13	13	0	13
	Mero	842	gA/L	EC	1	L/ha																					
7	Atlantis OD	12	gA/L	OD	2,4	L/ha		-		12	b	13	-	-		-		-		-		13	2	12	13	1	12,5
	Mero	842	gA/L	EC	2	L/ha																					
8	Atlantis WG	36	G/KG	WG	0,15	kg/ha		-		-		-		14	-	-		-		-		14	1	14	14	-	14
	Actirob B	842	g/L	EC	0,3	L/ha																					
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha		10	-	-		-		14	-	-		-		-		12	2	10	14	3	12
	Actirob B	842	g/L	EC	0,6	L/ha																					
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha		10	-	-		-		-		-		-		-		10	1	10	10	-	10
	Actirob B	842	g/L	EC	1,2	L/ha																					
13	Atlantis 12 OD	12	g/L	OD	0,45	L/ha		-		-		-		-		8	-	-		-		8	1	8	8	-	8
14	Atlantis 12 OD	12	g/L	OD	0,9	L/ha		-		-		-		-		8	-	-		-		8	1	8	8	-	8

Table 3.4-21: Impact on HLW (kg) of GLOB289H in winter rye

SECCW: HLW							KCP 6.4-2		KCP 6.4-12		KCP 6.4-13		KCP 6.4-16		KCP 6.4-21		KCP 6.4-25		KCP 6.4-26		North-East (PL+CZ+DE)					
No.	Treatment				Rate		kg		kg		kg		kg		kg		kg		kg		Mean	n	Min	Max	StDev	Median
1	*Untreated Check*						*70*	-	*72*	-	*66*	-	*78*	-	*70*	*a*	*75*	*a*	*68*	*a*	*71*	*7*	*66*	*78*	*4*	*70*
2	GLOB289H	3,6	%	WG	0,5	kg/ha	71	-	72	-	66	-	75	-	68	b	75	ab	66	b	70	7	66	75	4	71
	Actirob B	842	GA/L	EC	1	L/ha																				
3	GLOB289H	3,6	%	WG	1	kg/ha	69	-	72	-	66	-	76	-	68	b	73	ab	66	b	70	7	66	76	4	69
	Actirob B	842	GA/L	EC	2	L/ha																				
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		-		-		-		-		74	ab	66	b	70	2	66	74	6	70
	Actirob B	842	GA/L	EC	1	L/ha																				
5	Atlantis WG	3,6	%	WG	1	kg/ha	-		-		-		-		-		72	b	66	b	69	2	66	72	4	69
	Actirob B	842	GA/L	EC	2	L/ha																				
6	Atlantis OD	12	gA/L	OD	1,2	L/ha	-		71	-	65	-	-		-		-		-		68	2	65	71	4	68
	Mero	842	gA/L	EC	1	L/ha																				
7	Atlantis OD	12	gA/L	OD	2,4	L/ha	-		71	-	66	-	-		-		-		-		69	2	66	71	4	68,5
	Mero	842	gA/L	EC	2	L/ha																				
8	Atlantis WG	36	G/KG	WG	0,15	kg/ha	-		-		-		76	-	-		-		-		76	1	76	76	-	76
	Actirob B	842	g/L	EC	0,3	L/ha																				
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha	71	-	-		-		77	-	-		-		-		74	2	71	77	4	74
	Actirob B	842	g/L	EC	0,6	L/ha																				
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha	71	-	-		-		-		-		-		-		71	1	71	71	-	71
	Actirob B	842	g/L	EC	1,2	L/ha																				
13	Atlantis 12 OD	12	g/L	OD	0,45	L/ha	-		-		-		-		69	ab	-		-		69	1	69	69	-	69
14	Atlantis 12 OD	12	g/L	OD	0,9	L/ha	-		-		-		-		69	b	-		-		69	1	69	69	-	69

Table 3.4-22: Impact on moisture content (%) of GLOB289H in winter triticale

TTLWI: MOICON							KCP 6.4-3	KCP 6.4-14	KCP 6.4-15	KCP 6.4-17	KCP 6.4-22	KCP 6.4-23	KCP 6.4-24	North-East (PL+CZ+DE)					
No.	Treatment				Rate		%	%	%	%	%	%	%	Mean	n	Min	Max	StDev	Median
1	*Untreated Check*						*12* -	*13* -	*12* -	*10* -	*10* -	*18* -	*14* -	*13*	*7*	*10*	*18*	*3*	*12*
2	GLOB289H	3,6	%	WG	0,5	kg/ha	12 -	13 -	12 -	10 -	10 -	18 -	13 -	13	7	10	18	3	12
	Actirob B	842	GA/L	EC	1	L/ha													
3	GLOB289H	3,6	%	WG	1	kg/ha	12 -	13 -	11 -	10 -	11 -	18 -	14 -	13	7	10	18	3	12
	Actirob B	842	GA/L	EC	2	L/ha													
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-	-	-	-	-	19 -	14 -	17	2	14	19	4	16,5
	Actirob B	842	GA/L	EC	1	L/ha													
5	Atlantis WG	3,6	%	WG	1	kg/ha	-	-	-	-	-	18 -	13 -	16	2	13	18	4	15,5
	Actirob B	842	GA/L	EC	2	L/ha													
6	Atlantis OD	12	gA/L	OD	1,2	L/ha	-	12 -	11 -	-	-	-	-	12	2	11	12	1	11,5
	Mero	842	gA/L	EC	1	L/ha													
7	Atlantis OD	12	gA/L	OD	2,4	L/ha	-	13 -	12 -	-	-	-	-	13	2	12	13	1	12,5
	Mero	842	gA/L	EC	2	L/ha													
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha	12 -	-	-	10 -	-	-	-	11	2	10	12	1	11
	Actirob B	842	g/L	EC	0,6	L/ha													
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha	13 -	-	-	10 -	-	-	-	12	2	10	13	2	11,5
	Actirob B	842	g/L	EC	1,2	L/ha													
11	Atlantis 12 OD	12	g/L	OD	1,2	L/ha	-	-	-	-	10 -	-	-	10	1	10	10	-	10
12	Atlantis 12 OD	12	g/L	OD	2,4	L/ha	-	-	-	-	10 -	-	-	10	1	10	10	-	10

Table 3.4-23: Impact on HLW (kg) of GLOB289H in winter triticale

TTLWI: HLW							KCP 6.4-3		KCP 6.4-14		KCP 6.4-15		KCP 6.4-17		KCP 6.4-22		KCP 6.4-23		KCP 6.4-24		North-East (PL+CZ+DE)					
No.	Treatment				Rate		kg		kg		kg		kg		kg		kg		kg		Mean	n	Min	Max	StDev	Median
1	*Untreated Check*						*65*	-	*70*	*a*	*77*	-	*81*	-	*66*	-	*69*	-	*68*	-	*71*	*7*	*65*	*81*	*6*	*69*
2	GLOB289H	3,6	%	WG	0,5	kg/ha	64	-	70	ab	77	-	81	-	67	-	69	-	67	-	71	7	64	81	6	69
	Actirob B	842	GA/L	EC	1	L/ha																				
3	GLOB289H	3,6	%	WG	1	kg/ha	64	-	68	b	77	-	80	-	68	-	69	-	68	-	71	7	64	80	6	68
	Actirob B	842	GA/L	EC	2	L/ha																				
4	Atlantis WG	3,6	%	WG	0,5	kg/ha	-		-		-		-		-		69	-	68	-	69	2	68	69	1	68,5
	Actirob B	842	GA/L	EC	1	L/ha																				
5	Atlantis WG	3,6	%	WG	1	kg/ha	-		-		-		-		-		68	-	68	-	68	2	68	68	0	68
	Actirob B	842	GA/L	EC	2	L/ha																				
6	Atlantis OD	12	gA/L	OD	1,2	L/ha	-		69	ab	77	-	-		-		-		-		73	2	69	77	6	73
	Mero	842	gA/L	EC	1	L/ha																				
7	Atlantis OD	12	gA/L	OD	2,4	L/ha	-		68	b	77	-	-		-		-		-		73	2	68	77	6	72,5
	Mero	842	gA/L	EC	2	L/ha																				
9	Atlantis WG	36	G/KG	WG	0,3	kg/ha	64	-	-		-		80	-	-		-		-		72	2	64	80	11	72
	Actirob B	842	g/L	EC	0,6	L/ha																				
10	Atlantis WG	36	G/KG	WG	0,6	kg/ha	64	-	-		-		79	-	-		-		-		72	2	64	79	11	71,5
	Actirob B	842	g/L	EC	1,2	L/ha																				
11	Atlantis 12 OD	12	g/L	OD	1,2	L/ha	-		-		-		-		68	-	-		-		68	1	68	68	-	68
12	Atlantis 12 OD	12	g/L	OD	2,4	L/ha	-		-		-		-		67	-	-		-		67	1	67	67	-	67

Conclusion

Together, the above studies revealed no significant differences in quality parameters such as moisture content, HLW and TKW between corresponding treatments of GLOB289H, the reference products and the untreated control, even at a double dose rate in cereals. These results were worst case since oil was always included. Overall, these results confirms that there is no risk for negative side effects on the quality parameters of the treated cereals after treatment with GLOB289H.

Comments of zRMS:	In all trials no detrimental effect on the quality of yield was recorded at the proposed dose rate and even at the double dose rate. Application of ZEPPOS (product code: GLOB289H) provided a quality of yield similar to the untreated plots and to those treated with the reference products. No statistical differences were observed between untreated and treated plots and also between the tested product and the standard product. Parameters such as moisture content, HLW and TKW was assessed during selectivity trials. Detailed results were presented by Applicant in table above.

3.4.3 Effects on transformation processes (KCP 6.4.4)

According to EPPO PP1/243 "*Effects of plant protection products on transformation processes*", wheat and barley are crops used for industrial processes (such as bread making or brewing). However, according also to this EPPO guideline, if the applicant can demonstrate that residues are undetectable, or that any residues will not affect yeasts, a reasoned case may be sufficient to address these requirements.

GLOB289H is a formulated product equivalent to several other products authorised in EU for long ago, with no negative effects known on transformation processes on the target crops. Additionally, no residues of any of the active ingredients are found at harvest. Therefore, according to EPPO guideline PP 1/243, no further data is deemed to be necessary. A safe use of GLOB289H can be considered for crops involved on transformation processes.

Comments of zRMS:	ZRMS accepted Applicant statement for lack of trials against transformation processes for wheat (barley is not included in the GAP table for registration). Howcver, each cMS should decide if this statement can be accepted.

3.4.4 Impact on treated plants or plant products to be used for propagation (KCP 6.4.5)

According to EPPO guideline PP 1/135 "*Phytotoxicity assessment*", trials on plinentants products to be used for propagation would be required in case of post-emergence of the crop when application is made at or after inflorescence initiation e.g. for cereals when the first node is detectable (BBCH 30) or where detectable residues occur in harvested seed.

GLOB289H has shown to be completely similar to old formulations authorised for long ago in EU. No negative impact of this equivalent formulations has ever been detected on products to be used for propagation. GLOB289H, similarly to the references products to which was compared, has shown to be selective to treated crops, showing negligible phytotoxicity symptoms and with no effect on yield at the N dose. Additionally, no residues are detected at harvest. Therefore, no further data is deemed to be necessary. A safe use of GLOB289H can be considered for plant products to be used for propagation.

Summary and conclusion

GLOB289H is a formulated product equivalent to several other products authorised in EU for long ago. Enough data to study the adverse effects on treated crops of GLOB289H has been submitted.

30 efficacy trials and 29 specific selectivity trials demonstrates the safe use of GLOB289H at target rates on cereals, with the absence of negative effects on treated crops. Only in winter rye the double dose had a small phytotoxic effect. These trials demonstrates the equivalent behaviour in terms of effects on treated crops compared to the reference products.

Comments of zRMS:	ZRMS accepted Applicant statement for lack of trials against propagation. However, each cMS should decide if this statement can be accepted.

3.5 Observations on other undesirable or unintended side-effects (KCP 6.5)

3.5.1 Impact on succeeding crops (KCP 6.5.1)

The impact on succeeding crops is calculated in accordance with the EPPO 1/217(2) - Effects on succeeding crops by comparing the PECsoil values to the lowest EC10 from the seedling emergence study (KCP 6.5-1), discussed in Part B9 of the Registration Report.

The seedling emergence study was performed with GLOB289H in a worst-case scenario. In this seedling emergence study of non-target plants ten different crops are tested. The following results were obtained when the final weight was measured:

Table 3.5-1: Results of the study

Species	**EC_{10} (mg product/kg of soil)**	**EC_{10} (mg ai/kg of soil)**
Wheat	0.23741	0,02991
Maize	0.01229	0,00155
Barley	0.10048	0,01266
Sorghum	0.00462	0,00058
Potato	0.00712	0,00090
Sugar beet	0.00274	0,00035
Oilseed rape	0.00504	0,00064
Sunflower	0.00262	0,00033

The most sensitive species was Sunflower with an EC_{10} value of 0.00262 mg product/kg soild. Since 1000 g of GLOB289H contains 126 g ai, 0.00262 mg product contains 0.00033 mg ai. This was also calculated for the other species.

Calculation of the PEC_{soil} for the intended use of GLOB289H

The initial and actual PEC_{soil} are calculated with equation 1 and 2 respectively:

PEC initial

$$PEC_{ini} = \frac{A \cdot (1 - f_{int})}{100 \cdot d \cdot bd} \qquad (1)$$

where
A = application rate [g/ha]
f_{int} = fraction intercepted by plant cover
d = depth of the soil layer [cm]
bd = bulk soil density [g/cm³]

PEC actual

$$PEC_{act}(t) = PEC_{ini} \cdot e^{-kt} = PEC_{ini} \cdot e^{-\frac{t \cdot \ln 2}{DT50}} \qquad (2)$$

PEC_{ini} was calculated for a dose rate of 0.5 kg/ha of GLOB289H and considering a crop interception of 25% in accordance with the GAP. The soil bulk density was set to 1.5 g/cm³. For the depth of the soil layer, both 5 cm and 20 cm were used.

For the calculation of the PEC_{act}, the DT_{50} of mesosulfuron-methyl was used, which is 47.72 days. This is the worst-case situation, as the DT_{50} of iodosulfuron-methyl sodium is only 2.7 days. The DT50 of the safener mefenpyr-diethyl was 4.6 days.

The PEC_{soil} values over time for a post-emergence application of GLOB289H are shown in Table 3.5-2.

Table 3.5-2: PEC_{soil} calculations

Days after application	GLOB289H (mg/kg soil)	
	PEC_{soil} 5 cm (no soil cultivation)	**PEC_{soil} 20 cm (soil cultivation)**
0 (initial)	0,0630	0,0158
1	0,0621	0,0155
2	0,0612	0,0153
4	0,0594	0,0149
7	0,0569	0,0142
21	0,0464	0,0116
28	0,0419	0,0105
50	0,0305	0,0076
100	0,0147	0,0037
200	0,0034	0,0009
300	0,0008	0,0002
365	0,0003	0,0001

Calculation of the TER for the intended use of GLOB289H

The TER_{ini} are calculated for the different crops by dividing the EC_{10} by the PEC_{ini}. When the TER is > 1, the toxicity exposure rate is considered acceptable.

Table 3.5-3: TER_{ini} calculations based on the EC_{10} per crop and the PEC_{ini}

Common Name	EC_{10} (mg ai/kg soil)	TER (5cm) (without soil cultivation)	TER (20cm) (with soil cultivation)
Wheat	0,02991	0,474761905	1,893037975
Maize	0,00155	0,024603175	0,098101266
Barley	0,01266	0,200952381	0,801265823
Sorghum	0,00058	0,009206349	0,036708861
Potato	0,00090	0,014285714	0,056962025
Sugar beet	0,00035	0,005555556	0,022151899
Oilseed rape	0,00064	0,01015873	0,040506329
Sunflower	0,00033	0,005238095	0,020886076

From the results in Table 3.5-3 can be concluded that without soil cultivation, the initial concentration in the soil is too low. The minimum waiting period to sow the succeeding crops is calculated in Table 3.5-5.

Table 3.5-5: Calculation of the waiting period per crop

Days after application	PEC_{soil} 5 cm (no soil cultivation)	TER >1	PEC_{soil} 20 cm (soil cultivation)	TER >1
0 (initial)	0,0630	/	0,0158	Wheat
1	0,0621	/	0,0155	/
2	0,0612	/	0,0153	/
4	0,0594	/	0,0149	/
7	0,0569	/	0,0142	/
21	0,0464	/	0,0116	Barley
28	0,0419	/	0,0105	/
50	0,0305	/	0,0076	/
100	0,0147	Wheat	0,0037	/
140	0,0082	Barley	0,0021	/
200	0,0034		0,0009	Maize, Potato
270	0,0012	Maize	0.0003	Sorghum, Sugar beet, oilseed rape, sunflower
310	0,0007	Potato	0,0002	/
365	0,0003	Sorghum, Sugar beet, Sunflower, oilseed rape	0,0001	/

Following waiting periods were calculated without soil cultivation:

- Wheat: 100 days
- Barley: 140 days
- Maize: 270 days
- Potato: 310 days
- Sorghum, Sugar beet, Sunflower and oilseedrape: 1 year

When the field is ploughed (soil cultivation):

- **Wheat: immediately**
- **Barley: 21 days**
- Maize & potato: 200 days
- Sorghum, Sugar beet, Sunflower and oilseedrape: 270 days

Iodosulfuron and mesosulfuron are well known active ingredients approved to control weeds in cereals for a long time in the most EU countries. Furthermore, similar formulations have already been registered in EU.
However, two trials (01-SC-2017-FR01 and 01-SC-2017-FR02) were started in France in 2017 to evaluate application of GLOB289H at N and 2N dose on winter wheat in different succeeding crops. Trials were stabilised in order to permit the evaluation of any effect on succeeding crops following two different types of soil cultivation, superficial and deep. The standard product used was ATLANTIS WG (iodosulfuron 6 g/kg + mesosulfuron 30 g/kg, WG) and was applied under similar conditions. The main characteristics of these trials are shown in the table below.

Trial	Country	Succeeding crops	GLOB289H rates	ATLANTIS WG rates
KCP 6.5-2 01-SC-2017-FR01	France	Winter oil seed rape, Winter barley, maize, potato	0.5 and 1 kg/ha	0.5 and 1 kg/ha
KCP 6.5-3 01-SC-2017-FR02	France	Winter oil seed rape, Winter barley, field pea, sunflower	0.5 and 1 kg/ha	0.5 and 1 kg/ha

Materials and methods:

- Three main factors are studied in the trial:

• A: The herbicides (GLOB289H and the standard) applied at doses N and 2N on bare soil,
• B: The succeeding test crops (rotational crops: winter OSR, winter barley, maize, potato, field pea, sunflower),
• C: The soil cultivations (superficial or deep).
The factors A and B are arranged perpendicularly with respect to each other. For practical reasons, the factor C is studied in distinct sub-blocks.
The trial is conducted with 2 blocks. Untreated control is adjacent.

Results:

Selectivity of GLOB289H on the succeeding crops after two types of soil cultivation: No phytotoxicity is observed on winter oilseed rape, winter barley, maize, potato, field pea and sunflower (no emergence delay, no thinning, no flowering delay or any other symptoms), whatever the dose of GLOB289H applied and either after a superficial soil cultivation or a deep soil cultivation. The results of GLOB289H are similar to those obtained with the standard ATLANTIS WG.
To conclude, in both trials, GLOB289H was selective of all the tested succeeding crops, even with a superficial soil cultivation. We observed no difference with the standard ATLANTIS WG.

Summary and conclusion on the Impact on succeeding crops

Components of GLOB289H are old active ingredients authorised for cereal production for long time ago. Restrictions on rotational crops are well-known. Two trials to ensure the crop safety on 6 usual cereals succeeding crops has been performed. Data shows no negative effect on winter oilseed rape, winter barley, maize, potato, field pea and even sunflower (worst case crop in the seedling emergence study), even with a superficial soil cultivation.

Comments of zRMS:	The EU requirements on plant protection products requires, that sufficient data must be reported to permit an evaluation of possible adverse effects of a treatment with the plant protection product on succeeding crops if studies and evaluations presented in the other part of the dossier, show that significant residues of the active substance, its metabolites or degradation products, which have or may have biological activity on succeeding crops, remain in soil or in plant materials up to sowing or planting time of possible succeeding crops. Therefore, the Applicant should present the assessment of the possible effect of ZEPPOS (product code: GLOB289H) on crops grown as rotational or replacement crops following crops treated with that product, prepared in accordance to the EPPO Standard Efficacy evaluation of plant protection products. Effects on succeeding crops (PP 1/207 (2)). This standard is intended as a general standard on the methods used to examine whether the active substance of a plant protection product can cause negative effects on crops grown after a crop treated with that product. These crops can be grown as normal rotational crops as well as replacement crops in case of crop failure. Information's presented by Applicant are accepted by Evaluator. Components of GLOB289H are old active ingredients authorised for cereal production for long time ago. Restrictions on rotational crops are well-known. Two trials to ensure the crop safety on 6 usual cereals succeeding crops has been performed. **Data shows no negative effect on winter oilseed rape, winter barley, maize, potato, field pea and even sunflower (worst case crop in the seedling emergence study), even with a superficial soil cultivation.**

3.5.2 Impact on other plants including adjacent crops (KCP 6.5.2)

The impact on adjacent crops is calculated in accordance with the EPPO 1/256(1) – Effects on adjacent crops by comparing the drift rates to the lowest EC_{50} from the vegetative vigour study (KCP 6.5-4), discussed in the ecotox section.

The drift rates are calculated for the highest rate of 0.5 kg/ha using the 90th percentile estimates derived by the BBA (2000) from the spray-drift predictions of Ganzelmeier & Rautmann (2000).

Distance to adjacent crop (m)	% drift	Drift test product (g/ha)
1	2.77	13.85

Table 3.5-2 TER calculations for each species based on the vegetative-vigour-test

Test species	ER_{50} (g/ha)	PEC (g/ha)	TER at 1 m
Maize	>70	13.85	> 1
Oats	>70	13.85	> 1
Onion	>70	13.85	> 1
Cucumber	>70	13.85	> 1
Oilseed rape	>70	13.85	> 1
Radish	43.393	13.85	> 1
Soybean	>70	13.85	> 1
Sugar beat	>70	13.85	> 1
Sunflower	>70	13.85	> 1

Tomato	>70	13.85	> 1

Conclusion
It can be seen from the above table that a standard 1 meter buffer zone to adjacent crops is sufficient to exceed the trigger of 1 for the TER. A 1m buffer zone is the lowest value and thus no buffer zone is required on the label.

Tank cleaning

To confirm the safe use of GLOB289H on the following applications, several tank cleaning tests have been performed. Two different tests are submitted, one (EF/303/19: KCP 6.5-5) to study the tank cleaning of GLOB289H + a non-ionic surfactant and a second one (EF/304/19: KCP 6.5-6) to test the tank cleaning of GLOB289H + vegetal oil adjuvant. Results of both tests are summarized below (in the studies, the product is mentioned as SAP63H).

Table 3.5-3: Results on tank cleaning tests

Determinations		Test reference:	
		EF/303/19	EF/304/19
Mesosulfuron-methyl	% found	0.000	0.014
	% removed	100.000	99.986
Iodosulfuron-methylsodium	% found	0.000	0.000
	% removed	100.000	100.000
Mefenpyr-diethyl	% found	0.005	0.039
	% removed	99.995	99.961

Based on these results and considering only the two active ingredients can produce any negative effect on plants (Mesosulfuron-methyl and Iodosulfuron-methylsodium), the main residues on GLOB289H are related to Mesosulfuron-methyl, with a maximum 0.014% fond depending on the tank cleaning test. Considering this value, a maximum of 0.014% of the initial concentration (500g F.P./100L as the most concentrated one), a remaining of 0,070 g F.P./100L may be found.

The following table summarizes the remaining of GLOB289H per tank considering different tank volumes (from 1000 to 5000 L) and TER values (calculated considering the lowest ER50 for a single species (ER50 shoot fresh weight = 3.67 g/ha for *Helianthus annuus* as worst case) and also considering that all the remaining of the tank is applied on the next application)

Table 3.5-4: TER-values on tank cleaning

Tank capacity	Remining GLOB289H g/tank	Lower ER50 (g/ha)	TER
1000	0,7	3.67	5,24
2000	1,4	3.67	2,62
5000	3,5	3.67	1,05

In all cases, TER vales are > 1 so a save use can be assumed.

Comments of zRMS:	It can be seen from the above table that a standard 1 meter buffer zone to adjacent crops is sufficient to exceed the trigger of 1 for the TER. A 1m buffer zone is the lowest value and thus no buffer zone is required on the label.

3.5.3 Effects on beneficial and other non-target organisms (KCP 6.5.3)

Detailed studies on the possible adverse effects to beneficial organisms are submitted and summarised in Part B, Section 9 (Ecotoxicology).

Comments of zRMS:	Detailed studies on the possible adverse effects to beneficial organisms are submitted and summarised in Ecotoxicology section.

Compatibility with current management practices including IPM

No trials were carried out.

3.6 Other/special studies

No other studies were carried out.

Comments of zRMS:	Statement accepted.

3.7 List of test facilities including the corresponding certificates

Reference is made to the Biological Assessment Dossier

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 6.2	Kerim Schellingen	2019	Biological Assessment Dossier: GLOB289H Globachem NV	N	Y