REGISTRATION REPORT

Part B
Section 7: Efficacy Data and Information

Detailed summary of the risk assessment

CLOSER (GF-2626)

120 g/L Sulfoxaflor

Southern Zone

Zonal Rapporteur Member State: France

(Field F)

CORE ASSESSMENT

Applicant: DOW AgroSciences

Date: October 2017

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IIIA 6.1.1 EFFICACY DATA AND INFORMATION (INCLUDING VALUE DATA) ON THE PLANT PROTECTION PRODUCT

This document was evaluated and commented by zRMS France. zRMS has also made some corrections in the applicant text. At the end of each chapter, a commenting box has been formulated by the zRMS.

Modifications and/or precisions following the comments phase were highlighted in orange by zRMS.

Text in yellow was submitted by the petitioner following the request of concerned authorities for further efficacy data.

GF-2626 contains the active substance sulfoxaflor (120 g/l), a sulfoximine insecticide, which acts as an agonist at the nicotinic acetyl-cholin receptor; death follows ingestion and/or absorption by the target insect pests.

GF-2626 is intended to control aphids, whiteflies and scales in fruit crops (citrus, pome fruits and stone fruits), vegetables (solanaceous, leguminous, cucurbits, brassicas, leafy vegetables) and ornamentals (rose trees, trees and shrubs, outdoor and indoor plants, flowers and bulbs).

An other dRR was submitted concerning crops grown under controlled condition (greenhouse). Data provided in the current dRR and in the other one could be considered as complementary.

The table below was reviewed by zRMS on the basis of the uses claimed by the petitioner (according to the provided GAP) and indicates the dose rate and number of applications per use.

Country	**Crops**	**Pests**	**Maximum application rate (l product/ha)**	**Maximum number of applications per season**
Southern zone (FR, IT, ES, PT, EL, BG, HR)	Apples	*Eriosoma lanigerum* (in apple)	0.4	0.4 * 1 application
		Other aphids	0.2	0.2 * 1-2 applications
	Pears	Scales	0.4	0.4 * 1 application
Southern zone (ES, IT, FR, PT, EL, BG, HR, CY, ~~GR~~)	Peaches and nectarines	Aphids	0.2 or 0.3	0.2 * 1-2 applications or 0.3 * 1 application
		Scales	0.4	0.4 * 1 application
Southern zone (FR, IT, ES, PT, EL, BG, HR)	Plums and cherries	Aphids	0.2 or 0.3	0.2 * 1-2 applications or 0.3 * 1 application
		Scales	0.4	0.4 * 1 application
Southern zone (EL, ES, PT, IT, FR)	Citrus (Lemon, Mandarin, Orange, Grapefruit)	Aphids	0.2	0.2 * 1-2 applications
		Scales including mealybugs	0.4	0.4 * 1 application
Southern zone (FR, IT, ES, PT, EL, BG, CY, MA, HR)	Aubergine	Aphids	0.2	0.2 * 1-2 applications
	Tomatoes	Whiteflies	0.4	0.2 * 2 or 0.4 * 1
	Pepper			
Southern zone (FR, IT, ES, PT, EL, BG)	Beans (fresh with/without pods)	Aphids	0.2	0.2 * 1-2 applications
	Peas (fresh with/without pods)			
Southern zone (FR, IT, ES, EL, BG)	Brassicas (Brocolli, Cabbage, Cauliflower, Brussels sprouts, Leafy	Aphids	0.2	0.2 * 1 application

Country	Crops	Pests	Maximum application rate (l product/ha)	Maximum number of applications per season
	brassicas like Chinese cabbage, Kale, others)			
Southern zone (IT, ES, PT, EL, BG, FR)	Ornamentals (Flowers and roses, bulbs, trees and shrubs, outdoor and indoor plants)*****	Aphids	0.2	0.2 * 1-2 applications
		Whiteflies	0.4	0.2 * 2 or 0.4 * 1
Southern zone (FR, IT, ES, PT, EL, BG)	Cucurbits (edible peel: cucumber, cocurgette/zuccini, gherkin AND inedible peel: melon. pumpkin, squash, watermelon, ~~zuccini~~)	Aphids	0.2	0.2 * 1-2 applications
		Whiteflies	0.4	0.2 * 2 or 0.4 * 1
Southern zone (FR, IT, ES, EL, BG)	Leaf vegetables (lettuce and other salad plants including Brassicacea, spinach and similar, herbes)	Aphids	0.2	0.2 * 1 application
Southern zone (FR, IT, ES, EL, BG, PT)	Potatoes	Aphids	0.2	0.2 * 1-2 applications

***for France, outdoor and indoor ornamentals plants are not considered as professional use.**

This application is submitted under Regulation (EC) 1107/2009 by Dow AgroSciences to the zonal RMS France in line with Articles 33-39 of mentioned EU regulation. The applicant is asking for approval of this insecticide, code name GF-2626, containing the new active ingredient sulfoxaflor to be used in field condition in solanaceous, cucurbit and leafy vegetable crops, in brassica and legume crops and potatoes, in pome fruits, stone fruits and citrus crops in the Southern EU Regulation 1107/2009 zone.

Sulfoxaflor is a new active substance which is currently undergoing evaluation for active substance approval in the EU. Ireland (Pesticide Registration and Control Division, PRCD) is the Rapporteur Member State (RMS). A dossier for the active substance was submitted by Dow AgroSciences, under Regulation (EC) 1107/2009, to the RMS in July 2011 with an application to obtain its approval in the EU.

The Draft Assessment Report (DAR) on sulfoxaflor was finalised and distributed by Ireland in November 2012, with a recommendation for approval of the active substance according to Regulation (EC) 1107/2009. The EFSA peer review process was conducted and the EFSA conclusion was published in May 2014.

This current submission is for one of the representative formulations, GF-2626 (120 g/L SC). This is the first submission for authorisation of plant protection products containing sulfoxaflor in EU Member States. The proposed zonal RMS for evaluating the uses in protected situations across the European Union is France.

Sulfoxaflor is a new systemic sap-feeding insecticide, discovered by Dow AgroSciences, and the first commercialized member of the sulfoximine chemical family. It is being registered globally on a wide range of crops and is now on sale in the USA, Canada and parts of Asia, Africa and Latin America.

The sulfoximines, as exemplified by sulfoxaflor ([N-[methyloxido[1-[6-(trifluoromethyl)-3-pyridinyl]ethyl]-k4-sulfanylidene] cyanamide] represent a new class of insecticides. Sulfoxaflor exhibits a high degree of efficacy against a wide range of sap-feeding insects, including those resistant to neonicotinoids and other insecticides. Sulfoxaflor is an agonist at insect nicotinic acetylcholine receptors (nAChRs) and functions in a manner distinct from other insecticides acting at nAChRs. The sulfoximines also exhibit structure activity relationships (SAR) that are different from other nAChR agonists such as the neonicotinoids (Sparks *et al*., 2013). IRAC assigned nicotinic acetylcholine receptor agonists to Group 4 in their classification system. The neonicotinoids (acetamiprid, clothianidin, dinotefuran, imidacloprid, nitenpyram, thiacloprid and thiamethoxam) were assigned to sub group 4A. Nicotine was assigned to sub group 4B and sulfoximines, including sulfoxaflor, were assigned to sub group 4C.

Information on the detailed composition of GF-2626 and physico-chemical properties of sulfoxaflor, reference should be made to Registration Report Part B Section 1: Identity, physical and chemical properties, other information.

The data presented in this dRR fully support the label claims for the sulfoxaflor formulation, GF-2626, for the control of a wide range of sap feeding insect species in many crops grown in fields in the Southern EU Regulation 1107/2009 zone within the European Union. Proposed uses for this product are supplied in **Appendix 2**.

The detailed assessment of the individual trial and study data is located in the following report: IIIA 6. Biological Assessment Dossier for GF-2626 (sulfoxaflor) Field uses in the the Southern EU Regulation 1107/2009 zone.

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

The table below shows the English and scientific names of crops and pests and their codes EPPO as well.

English name	**Scientific name**	**Bayer-code**
pea	*Pisum sativum*	PIBSA
bean	*Phaseolus vulgaris*	PHSVN
cabbage	*Brassica oleracea L var capitata L.f alba*	BRSOL
cauliflower	*Brassica oleracea (Botrytis cultivar group)*	BRSOB
potato	*Solanum tuberosum*	SOLTU
beach	*Fagus sylvatica*	FAUSY
Savoy cabbage	*Brassica oleracea L.var.sabauda L.*	BRSOS
broccoli	*Brassica oleracea (Italica Group)*	BRSOI
lettuce	*Lactuca sativa*	LACSA
potato	*Solanum tuberosum*	SOLTU
apple	*Malus domestica*	MABSD
peach	*Prunus persica*	PRNPS
plum	*Prunus domestica*	PRNDO
sweet cherry	*Prunus avium*	PRNAV
sauer cherry	*Cerasus vulgaris*	PRNCE
Euphorbia	*Euphorbia hypericifolia*	EPPHY
Lantana	*Lantana L.spec*	LANSS
Gerbera	*Gerbera L. spp.*	GEBBS
Melon and cotton aphid,	*Aphis gossypii*	APHIGO
Green peach aphid/ peach-potato aphid	*Myzus persicae*	MYZUPE
Blackfly/bean aphid/beet leaf aphid	*Aphis fabae*	APHIFA
Potato aphid	*Macrosiphum euphorbiae*	MACSEU
Buckthorn aphid	*Aphis nasturtii*	APHINA
Rose aphid	*Macrosiphum rosae*	MACSRO
Silverleaf whitefly	*Bemisia tabaci*	BEMITA
Greenhouse whitefly	*Trialeurodes vaporariorum*	TRIAVA

Currant-lettuce aphid	*Nasonovia ribisnigri*	NASORN
Cabbage aphid	*Brevicoryne brassicae*	BRVCBR
Foxglove aphid	*Aulacorthum solani*	AULASO
Plum aphid	*Rhopalosiphum padi,*	RHOPPA
Rosy apple aphid	*Dysaphis plantaginea*	DYSAPL
Woolly apple aphid	*Eriosoma lanigerum*	ERISLA
Spirea aphid	*Aphis spireacola*	APHISI
White peach scale	*Pseudalacaspis pentagona*	PSEAPE
San Jose scale	*Quadraspidiotus perniciosus*	QUADPE
Black citrus aphid	*Toxoptera aurantii*	TOXOAU
Citrus aphid	*Aphis citricidus*	APHICI
Black cherry aphid	*Myzus cerasi*	MYZUCE
Mealy plum aphid	*Hyalopterus pruni*	HYALPR
Leaf curl plum aphid	*Brachycaudus helichrysi*	ANURHE
California red scale	*Aonidiella aurantii*	AONDAU
Citrus mealybug	*Planococcus citri*	PSECCI

IIIA 6.1.2 EFFICACY DATA

ZRMS drew the table below so possibilities of extrapolations (according to EPPO extrapolation tables) are shown and used when judged necessary. The table below referred only to common uses claimed for both controlled conditions and field.

Crops	**Pests**	**Number of efficacy trials indoor/pest/crop**	**Number of efficacy trials outdoor/pest/crop**	**EPPO extrapolation tables (for minor uses)**
Cucurbits (edible peel: cucumber, Gherkin, zucchini AND inedible peel: watermelon, squash, melon)	Aphids	dRR Greenhouse: 12 Mediterranean (Med) trials against *Aphis gossypii* in cucumber (6 trials), zucchini (4 trials) and watermelon (2 trials). *The same trials were provided for minimum effective dose trials.*	dRR Greenhouse: 4 Med trials were carried out against *Aphis fabae* (1 trial), *Myzus persicae* (2 trials) and *Aphis nasturtii* (1 trial) in melon (2 trials) and zucchini (2 trials) in France (1 trial), Portugal (1 trial) and Spain (2 trials). *Trials provided only for efficacy evaluation in dRR Greenhouse* dRR Field: 24 Med trials were carried out in France 2 trials, in Spain 10 trials, in Italy 10 trials, in Greece 2 trials against *Aphis gossypii* (APHIGO) in	No need for extrapolation table. Otherwise, this is the appropriate table, if needed: PP 1/257 IEET 37 (2). This table allows extrapolating data from solanaceous to cucurbits, concerning *Myzus persicae*.

			cucumber (4 trials), zucchini (9 trials), melon (8 trials) and watermelon (3 trials). 4 Med trials were carried out against *Aphis fabae* (1 trial), *Myzus persicae* (2 trials) and *Aphis nasturtii* (1 trial) in melon (2 trials) and zucchini (2 trials) in France (1 trial), Portugal (1 trial) and Spain (2 trials). *24 trials for the minimum effective dose evaluation. All the 28 trials were provided for efficacy evaluation.*	
	Whiteflies	dRR Greenhouse: 13 trials (12 Med + 1 Mar) against *Trialeurodes vaporariorum* (6 trials) and *Bemisia tabaci* (7 trials) in cucumber (9 trials) and zucchini (4 trials). *The same trials were provided for minimum effective dose trials.*	dRR Field: 12 Med trials were conducted in Italy (8 trials) and Greece (4 trials), and 1 not GEP trial from Cyprus, on zucchini (8) and cucumber (5) against *Trialeurodes vaporariorum* (8) and *Bemisia tabaci* (4).	No need for extrapolation table. Otherwise, this is the appropriate table, if needed: PP 1/257 IEET 72 (1).
Ornamentals (Flowers and roses, bulbs, trees and shrubs, outdoor and indoor plants)	Aphids	dRR Greenhouse: 9 Med trials against *Aphis gossypii* (2 trials), *Myzus persicae* (2 trials), *Macrosiphum euphorbiae* (3 trials), *Aphis fabae* (1 trial) and a mixed population of aphids (APHISP, 1 trial) in *Chrysanthemum* (4 trials), *Calendula officinalis*, *Bellis perennis* (2 trials), *Geranium* spp. and *Nicotiana rustica*. *The same trials were provided for minimum effective dose trials.*	dRR Field: 6 trials, carried out in Belgium (1 trial) and Italy (5 trials). Trial in Belgium was carried out on *Fagus sylvatica*, all trials in Italy on roses. The aphid species were *Phyllaphis fagi* – PHYAFA (1 trial) and *Macrosiphum rosae* – MACSRO (5 trials). *Only 5 Italian trials were presented in the minimum effective dose evaluation.*	The EPPO extrapolation table permits to use data obtained with *Aphis gossypii* and *Myzus persicae* in cucurbits and in solanaceous for the same aphid in ornamentals (PP 1/257 IEET 27 (3)).
	Whiteflies	dRR Greenhouse: 3 Med trials in *Euphorbia*, *Lantana* and *Gerbera* for the control of *Trialeurodes vaporariorum*.	dRR Greenhouse: 2 Med trials outdoor for the control of *Trialeurodes vaporariorum* in *Euphorbia*	The EPPO extrapolation table permits to use data obtained with *Bemisia tabaci* in solanaceous or cucurbits for the

		The same trials were provided for minimum effective dose trials.	*pulcerrima*. *The same trials were provided for minimum effective dose trials.* dRR Field: The same 2 outdoor trials.	same whitefly in ornamentals (PP 1/257 IEET 72 (1)).
Pepper Tomatoes	Aphids	dRR Greenhouse: 15 trials (14 MED + 1 SE) in pepper (9 trials), tomato (2 trials) and eggplant (4 trials) against *Aphis gossypii* (10 trials) and *Myzus persicae* (6 trials). One trial had both species evaluated. *The same trials were provided for minimum effective dose trials.*	dRR Field: 12 trials - 2 trials in France (1 Med + 1 Mar), 7 in Italy, 3 in Spain in pepper (1), tomato (7) and eggplant (4) against *Aphis gossypii* (5), *Myzus persicae* (3) and *Macrosiphum euphorbiae* (4). *The same trials were provided for minimum effective dose trials.*	The use of EPPO extrapolation table (PP 1/257 IEET 17 (2)) is considered as not necessary.
Aubergine	Whiteflies	dRR Greenhouse: 22 Med trials against *Trialeurodes vaporariorum* (9 trials) and *Bemisia tabaci* (13 trials) in tomato (12 trials), pepper (5 trials) and eggplant (5 trials). *The same trials were provided for minimum effective dose trials.*	dRR Field: 6 trials on *Bemisia tabaci* and 6 trials on *Trialeurodes vaporariorum* in 2 trials on bell pepper, 9 trials in tomato, 1 trial in eggplant.	No need for extrapolation table. Otherwise, this is the appropriate table, if needed: PP 1/257 IEET 72 (1).

This draft registration report aims to demonstrate that GF-2626 deliver high level of control of aphids in legume, brassica, potato and leafy vegetable crops, aphids and whiteflies in solanaceous and cucurbit vegetable crops and ornamentals and aphids and scales in pome and stone fruit crops and aphids, maelybugs and scales in citrus crops grown in field conditions and comparable to common competitor insecticides currently approved and used for the control of above pests in the Southern EU Regulation 1107/2009 zone.

Climatic considerations

Regulation EC 1107/2009 specifies that the assessment of plant protection products should be conducted on a zonal basis. In the EU regulatory Southern zone there are two climatic zones, the Maritime and the Mediterranean climatic zones, according to EPPO Standard PP1/241. For the purpose of this dossier, efficacy data are presented from trials that are conducted in both zones but most trials are from one region only, the Mediterranean EPPO climatic zone. We think those trials data are directly relevant to the the other EPPO climatic zones, as the (growing) conditions in the Mediterranean EPPO climatic zone represent the extremes of the (growing) conditions encountered across all zones in which authorisation is sought. Higher light intensity is more likely to occur in the Mediterranean Climate zone, causing rapid growth of the crop with development of new, untreated leaves, which represents more challenging conditions regarding the efficacy of an insecticide. The warmer temperatures from the Mediterranean climatic zone are associated with a higher number of generations and faster propagation of insect pests, higher infestation levels, and thus more challenging conditions for the product, as compared to the Maritime Climate Zone. Therefore, data set presented in this section comply with the EPPO standard PP 1/278 Principles of zonal data production and evaluation directives.

Formulations

The formulation of sulfoxaflor proposed for the use is GF-2626 (120 g a.s./L, SC) but before 2010 another formulation - GF-2032 (240 g a.s./L, SC) – was used exclusively in the trials. In order to create a robust database using all available data from the 2 formulations, a data analysis is presented for demonstrating the comparability (efficacy and selectivity) of the 2 sulfoxaflor formulations. The comparability trial details and the results are available at the beginning of the minimum effective dose sections in the biological dossier (BAD).

Background information on the target crops and pests

CUCURBIT CROPS (cucumbers, zucchini, melons, watermelons) are important crops in the regulatory Southern zone of the European Union. FAO (Food and Agriculture Organisation of the UN) production statistics (http://faostat.fao.org/site/567/default.aspx#ancor) indicated that over 5.3 million tonnes of cucurbit vegetables from more than 168,000 hectares were produced in 2011 in this region.

In cucurbit vegetables *Aphis gossypii* (the cotton or melon aphid, APHIGO) is the most important aphid pest but *Myzus persicae* (green peach aphid or peach potato-aphid, MYZUPE) also attacks cucurbits (Webb 2007). Other species such as *Aphis fabae* (black bean aphid, APHIFA) and *Aphis nasturtii* (buckthorn aphid, APHINA) are occasionally found in the crop. Direct damage to the crop occurs with heavy infestations leading to direct yield losses. Excretion of honeydew leads to sooty moulds developing on the leaves and fruits (Webb 2007). **Aphids** are also virus transmitters. There were surveyed that Spanish melons for cucumber mosaic virus (CMV), papaya ringspot virus watermelon strain (PRSV-W), watermelon mosaic virus-2 (WMV-2), and zucchini yellow mosaic virus (ZYMV) CMV and WMV-2 were the most frequently found viruses. In some regions up to 100% of plants had a least one aphid transmitted virus present and up to 30% double infections (2 viruses).

Whiteflies are also important sap feeding insects on cucurbits causing also high yield loss every year in greenhouse conditions. The most common whitefly species damaging cucurbit crops are *Trialeurodes vaporariorum* and *Bemisia tabaci*. Whiteflies cause serious crop damage through direct feeding but the genus of Bemisia is important also in the transmission of plant diseases. Generally *Bemisia* whiteflies are more difficult to control than be killed than *Trialeurodes*.

LEGUMINOUS CROPS (peas and beans) are important crops in the Southern EU Regulation 1107/2009 zone. FAO (Food and Agriculture Organisation of the UN) production statistics (http://faostat.fao.org/site/567/default.aspx#ancor) indicate that over 2.3 Mio tonnes of legumes (peas and beans) were harvested in 2011 in this region on approx. 580.000 ha growing area.

Pea **aphid** (*Acyrthosiphon pisum,* ACYRON) and black bean aphid (*Aphis fabae,* APHIFA) are considered the 2 most important aphid pests in legumes. Aphids cause both direct and indirect damage to the crop. Direct damage to the crop is distortion of the shoots, stunted plants, reduced yield and spoiled crops.

On leguminous crops such as peas, *Acyrthosiphon pisum* is considered among the aphid species of major agronomical importance. Yields can be affected by the sap intake that directly weakens plants and it can significantly reduce crop production. However, like many aphid species, *Acyrthosiphon pisum* can be a vector of viral diseases to the leguminous plants.

Aphis fabae is a major pest on beans occasionally at an epidemic scale, principally by causing direct feeding damage. The plants lose vigour, flowers are damaged and pod development in beans may be retarded or even prevented. This species is known to transmit more than 30 viruses, mainly of the non-persistent variety. Large populations can cause significant secondary spread, even when it did not provide the initial primary infection. A by-product of such large colonies of aphid is contamination of the plant surface with sticky secretions, which promote the growth of sooty moulds. This superficial damage can reduce the sales value of the horticultural bean crops (resource: http://www.rothamsted.ac.uk/insect-survey/STAphis_fabae.html).

SOLANACEOUS CROPS (tomato, pepper and eggplant) are also very important crops in the European Union where eighteen million tonnes fruits are produced on more than 400,000 hectares including a significant production under greenhouse conditions. Solanaceous crops (tomato, pepper and eggplant/aubergine) cultivated in open field situations are important crops in the Southern zone of the European Union. FAO (Food and Agriculture Organisation of the UN) production statistics (http://faostat.fao.org/site/567/default.aspx#ancor) indicated that more than 9, 7 million tonnes of Solanaceae from more than 155.285 hectares were produced in 2011 in this region

In solanaceous vegetables, *Aphis gossypii* and a lesser extent *Myzus persicae* are the most important **aphids**. Other species such as *Aphis fabae* or *Aphis nasturtii* are occasionally also found in the crop. *Myzus persicae* is the most significant vector for the transport of potato virus Y (PVY) and potato leaf roll virus (PLRV) and various mosaic viruses damaging the solanaceous crops like tomato and pepper but also attacks a broad range of other crops and a variety of ornamentals. It has been implicated in the transmission of over 180 plant viruses.

The most common **whitefly** species damaging solanaceous crops are *Trialeurodes vaporariorum* and *Bemisia tabaci*. The adults and especially the larvae release a sweet liquid, the honeydew that makes the leaves and the fruits sticky. Then a black fungus develops on this honeydew which causes the development of sooty moulds, which is a major quality problem in the vegetable and ornamental crops. *B. tabaci* and a lesser extent *T. vaporariorum* transmit viruses (TYLCV, ToCV, TiCV...) to several solanaceous crops. The larvae of B biotype of *B. tabaci (B. argentifolia*) cause physiological disorders on certain plants: silvering of pepper and eggplant as well as irregular maturation of tomato.

LEAFY VEGETABLE CROPS (lettuce, endive, withloaf, spinach and similar) are important crops in the regulatory Southern Zone of the European Union. FAO (Food and Agriculture Organisation of the UN) production statistics (http://faostat.fao.org/site/567/default.aspx#ancor) indicated that more than 1.5 million tonnes of lettuce and chicory from more than 61,000 hectares were produced in 2011 in this region.

In leafy vegetables, *Nasonovia ribisnigri* (NASORN) and *Myzus persicae* (Green peach aphid, MYZUPE) are among the most important insect pests, similarly to thrips and lepidopterans. They are the most significant **aphid** pests causing decreased growth, shrivelling of the leaves and the death of various tissues. They are also hazardous because they act as a vector for the transport of plant viruses, such as potato virus Y and potato leafroll virus to members of the nightshade/potato family *Solanaceae*, and various mosaic viruses to many other food crops.

BRASSICA CROPS are important crops in the European Union with 2012 production at ~ 7 million tonnes when 37% of this production was made in the Southern EU Regulation 1107/2009 zone mainly in France http://faostat3.fao.org/faostat-gateway/go/to/download/Q/QC/E.Various **aphids** may attack cole crops, the most common being the grey cabbage aphid, *Brevicoryne brassicae*, and the green peach aphid, *Myzus persicae*. Aphids cause damage by sucking the sap, and are also serious pests because they contaminate the edible product. The cabbage aphid tends to form colonies of a dense mass of these insects, and their feeding causes a chlorosis and malformation of the leaf. The green peach aphid tends to be solitary. Large colonies can stunt or kill small plants, but the most serious problem is contamination of the harvested crop. Dense populations cause leaves to curl around them, making them harder to reach with pesticide applications

POTATOES are important crops in the European Union with 2011 production at ~ 62.5 million tonnes; 20.7% of this production was made in the Southern EU Regulation 1107/2009 zone and 11.8% were produced in France http://faostat3.fao.org/faostat-gateway/go/to/download/Q/QC/E.

The green peach **aphid** *Myzus persicae* (MYZUPE) is considered the most serious aphid pest in potatoes. Further aphid pests colonising potatoes are the potato aphid (*Macrosiphum euphorbiae*, MACSEU), the buckthorn-potato aphid (*Aphis nasturtii*, APHINA), the foxglove aphid (*Aulacorthum solani*, AULASO), and the bean aphid *(Aphis fabae*, APHIFA). (W.Kuerzinger, 2011; S.Fabich, 2010). Occasionally the cotton aphid (*Aphis gossypii*, APHIGO) also can be found on potatoes. Direct damage to the crop occurs with heavy infestations leading to direct yield losses. Excretion of honeydew leads to sooty moulds developing on the leaves. The major damage caused by aphids in potatoes is through transmission of plant viruses. *Myzus persicae* is considered to be the most important vector of plant viruses all over the world, but all of the above mentioned aphids can spread persistent and non-persistent viruses within the crop. Potato leafroll virus (PLRV) and strains of Potato virus Y (PVY^O, PVY^N) are consistently the most prevalent and harmful viruses damaging potato.

ORNAMENTAL PLANTS AND FOWERS are produced mainly in the Mediterranean (Italy, Spain) and the Maritime (Netherlands, Germany) climatic zones in the European Union. In the EU regulatory Southern zone more than 20 000 hectares are used for growing different ornamental crops in fields and generate billions of dollars value each year.

Ornamentals have many different pests damaging them and **aphids** are probably the most important sap feeding insects, which cause the highest yield loss in general under greenhouse conditions. The most common aphid species are: *Aphis gossypii*, *Myzus persicae*, *Aphis fabae*, *Macrosiphum rosae* and *Macrosiphum euphorbiae*. Secondary aphid species are *Myzus ascalonicus, Brachycaudus helichrysi*, *Aulocorthum solanii* and *Rhodobium porosum*. Very often, mixed populations are present. Probably the most important consequences of aphids attacking ornamental plants is the transmission of virus diseases especially on carnation, chrysanthemum, gladiolus, tulip, lilies, hyacinth, iris, narcissus, daphne, lilac, philodendron and many of the Araceae. Other types of damage are the leaf distortion, gall production, discoloration and the honey dew, which symptoms are destroying the value of ornamentals.

Whiteflies caused losses are also very high, not necessarily by direct feeding damage but because of plant diseases spread mainly by *Bemisia tabaci* and the honey dew production, which cause serious cosmetic problems on the flowers.

POME FRUITS are important crops in the European Union with 2011 production at ~ 14.144 million tonnes; 50.2% of this production was made in the Southern EU Regulation 1107/2009 zone. The main pome productions were apple with 5.258 million tonnes and pear with 1.843 million tonnes in Southern Europe (http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tag00036&plugin=1).

There are several **aphid** species registered as significant pest of pome fruit crops in South Europe. *Dysaphis plantaginea* (DYSAPL) colonies appear early in spring settle on leaves and blossom and propagating fast. Even few aphids can cause permanent leaf distortion and chlorosis. They also can impact the fruits to be small and distorted. On young shoots, they induce a reduction of flowers for the next season. *Dysaphis pyri* (DYSAPY), pear aphid, is the most dangerous aphid on pear. Affected leaves undergo severe transverse curling, rapidly becoming yellowish-green in colour. Aphids produce considerable quantities of honeydew, thus causing a scorching of leaves which, moreover, become covered with sooty moulds. Growth is suddenly interrupted. In addition, curled leaves attract the pear psylla (*Cacopsylla pyri*). *Eriosoma lanigerum* (ERISLA), woolly apple aphid, which is also very harmful to apple. Probing and the injection of toxic saliva cause blisters and cankers to appear which can reach the size of a walnut and interfere with the circulation of the sap. Affected trees decline and can be attacked by secondary pests. *Aphis pomi* (APHIPO), green apple aphid, and *Aphis spiraecola* (APHISI), the spirea aphid, also appear sometimes as important aphid species in pome fruits.

There are plenty of different **scale** species damaging pome orchards in South Europe. In France, 110 different species were counted some of them are highly economically important The most important species in pome fruits are: *Lepidosaphes ulmi* (Linnaeus), *Quadraspidiotus perniciosus* (Comstock) and *Epidiaspis leperii* (Signoret) belonging to *Diaspididae* family. *Pseudococcus cosmtocki* (Kuwana) and *Pseudococcus viburni* (Signoret) are in Pseudococcidae family. It is currently difficult to quantify the agro-economic importance of scale insects that after the injurious invasions of the early twentieth century seemed to have become secondary pests. The reduction of allowed substances for the control, changes in farming techniques and recent climatic changes likely take the scale insects as injurious pests .The San Jose Scale (QUADPE), *Quadiaspidiotus perniciosus*, is the most frequent scale in orchards. It is present on lots of tree species and attacks branches and fruit by sucking plant sap and injecting toxic saliva which provokes wood crack, leaf fall, purplish-red coloration on fruits and death of branches.

STONE FRUITS (peaches, nectarines, plums and cherries) are important crops in the Southern zone of the European Union. FAO (Food and Agriculture Organisation of the UN) production statistics (http://faostat.fao.org/site/567/default.aspx#ancor) indicated that more than 5,48 million tonnes of stone fruits from more than 628,000 hectares were produced in 2011 in this region.

In stone fruits, *Myzus persicae* (MYZUPE), known as the Green Peach Aphid, is the most significant **aphid** pest of peach trees, causing decreased growth, shrivelling of the leaves and the death of various tissues. This aphid is the most difficult to control due to the fact that is historically resistant to carbamate and pyrethroids and to the presence of two new different mechanism of resistances to neonicotinoids in many of the stone fruit orchards of southern France, Spain and Italy, confirmed by several reports since 2011. Another relevant aphid, *Hyalopterus pruni*, (HYALPR) known as the Mealy Plum Aphid host-alternates between its winter host - *Prunus* species, mainly plum but also can be found in peach and almond, and its summer hosts. Some aphids remain on plum all the year round. *Brachycaudus helichrysi* (ANURHE), the Leaf-Curling Plum Aphid host alternates between various plum (*Prunus*) species and a wide range of *Asteraceae*. This aphid is a serious pest on fruit trees causing the leaves to roll up tightly perpendicular. *Aphis spiraecola* (APHISI) known as the Green Citrus Aphid, is particularly important on species of citrus, but also attacks a broad range of other crops such as *Prunus* species. *Myzus cerasi* (MYZUCE), the Black Cherry Aphid (BCA) is the most common aphid attacking cherry. It is a European species that can cause serious injury to sweet cherries and may occasionally cause injury to tart cherries. This species is very fast in propagating in the curled leaves, which protect the colonies against the environmental effects including insecticides.

Numerous **scale** species attack stone fruits, though the most common and important are white peach scale, *Pseudalacaspis pentagona*, and the San Jose scale, *Quadraspidiotus perniciosus* (Comstock). Each species is capable of causing direct injury to the fruit and/or injuring the host tree by sap feeding thus reducing tree vigour and possibly causing death of limbs. Although the type of injury caused by each scale is similar, the biology and their ability to reproduce differ between the species making effective control decisions important.

CITRUS CROPS are also important in the European Union with 2010 production at ~ 11.1 million tonnes; 100% of this production was made in the Southern EU Regulation 1107/2009 zone. The main citrus production was orange with 6.694 million tonnes, clementine with 2.334 and lemon with 1.309 million tonnes. In 2010, the cultivated citrus surface was 584, 984 ha in Southern Europe

There are several **aphid** species registered in the Mediterranean Basin as citrus pests like *Aphis gossypii* (APHIGO, cotton aphid), *Aphis spiraecola* (APHISI, apple aphid), *Toxoptera aurantii* (TOXOAU, black citrus aphid) and *Toxoptera citricida* (TOXOCI, brown citrus aphid) .The direct feeding damages could be very important in spring on young shoots, buds, flowers, grafts and young plants where the growth could be inhibited. During flowering, aphid's attacks cause flower fall. Large quantities of honeydew are also produced and make the leaves and fruit often black with sooty mould fungus.The most important damage is caused indirectly by the transmission of citrus tristeza virus (CTV) by the main aphid species visiting citrus: *T. citricida*, *A. gossypii*, *A. spiraecola* and *T. aurantii*. CTV is the most economically important and damaging virus of citrus trees.

Aonidiella aurantii or **red scale** is an armoured scale insect and a major pest of citrus. It has been widely dispersed by the agency of man through the movement of infected plant material. Citrus is the main crop attacked by red scale. Scale insects of all ages feed by sucking sap. They are found on all parts of the plant but are most noticeable on the fruit. Heavy infestations may cause discolouration, shoot distortion and leaf drop. The fruit may become pitted and unmarketable.Chemical control is difficult because the insects are protected by their hard waxy covers. The only vulnerable and mobile stage of red scale is the first instar crawler. It can move about a metre but may also be dispersed to other plants by wind, flying insects and birds as well as human activities

Planococcus citri, commonly known as the **citrus mealybug**, is a species of mealybugs native to Asia. By now, it has been introduced to the rest of the world, including Europe, the Americas, and Oceania, as an agricultural pest associated with citrus, but it attacks a wide range of plants including crop and ornamental plants and plants in the wild flora. Adult females and nymphs suck sap with their piercing mouthparts. This leads to plant damage in the form of wilting and chlorosis of the foliage, leaf drop, stunted growth, and sometimes the death of the plant. Fruits such as oranges become lumpy and discoloured when the insect feeds on them, and they may fall off the tree. Insects packed with harvested fruits continue to feed, causing more losses during shipping. The mealybug secretes honeydew, which coats leaves and fruits and causes the growth of sooty moulds. A layer of mould can reduce the ability of a leaf to perform photosynthesis, and makes fruit unmarketable. The citrus mealybug is also a vector for plant viruses.

IIIA 6.1.3 PRELIMINARY RANGE-FINDING TESTS

Herbicidal activity

Two preliminary laboratory studies were conducted by Dow AgroSciences Discovery Research and Stockbridge Technology Centre Ltd laboratories to evaluate pre-emergent herbicidal activity of sulfoxaflor across a range of crop and weed species. Sulfoxaflor was applied in various rates up to 4,500 and 96 g a.s./ha respectively. The test species included twelve monocotyledon species (Oats, Maize, Rice, Spring wheat and Onion crops and Ryegrass (*Lolium* *spp*.), Blackgrass (*Alopecurus myosuroides*), Wild oat (*Avena spp*.), Crabgrass (*Digitaria spp*.), Barnyardgrass (*Echinochloa spp*.), Giant foxtail (*Setaria faberi*), and Johnsongrass (*Sorghum halepense*) weeds) and fifteen dicotyledon species (Soybean, Oilseed rape, Cabbage, Tomato, Lettuce, Carrot, Sugar beet, Cotton, Sunflower and Cucumber crops and Velvetleaf (*Abutilon theophrasti*), Pigweed (*Amaranthus spp.)*, Lambsquarter (*Chenopodium album*), Wild poinsettia (*Euphorbia heterophylla*) and Ivyleaf morningglory (*Ipomoe hederacea*) weeds) representing many important plant families. No effects were observed in the pre-emergence tests at rates less than or equal to 563 g a.s./ha, well in excess of the proposed label rate for sulfoxaflor products, which is maximum 48 g a.s./ha in Europe (Schmitzer and Donely, 2008; Rockcliff, 2011a).

Two preliminary laboratory studies were conducted by Dow AgroSciences Discovery Research and Stockbridge Technology Centre Ltd laboratories to evaluate post-emergent herbicidal activity of sulfoxaflor across a range of crop and weed species. Sulfoxaflor was applied in various rates up to 400 and 96 g a.s./ha respectively. The test species included twelve monocotyledon species (Oats, Maize, Rice, Spring wheat and Onion crops and Ryegrass, Blackgrass, Wild oat, Crabgrass, Barnyardgrass, Giant foxtail, and Johnsongrass weeds) and nineteen dicotyledon species (Soybean, Oilseed rape, Cabbage, Tomato, Lettuce, Carrot, Canola, Sugar beet, Cotton, Sunflower and Cucumber crops and Canada thistle, Velvetleaf, Pigweed, Lambsquarter, Wild poinsettia, Wild buckwheat, Viola and Ivyleaf morningglory weeds) representing many important plant families. No effects were observed in the post-emergence tests at rates less than or equal to 96 g a.s./ha, well in excess of the proposed label rate for sulfoxaflor products, which is maximum 48 g a.s./ha in Europe (Schmitzer and Donely, 2008; Rockcliff, 2011b).

It was concluded, sulfoxaflor does not pose any phytotoxicity risk to crops including succeeding or adjacent crops if applied according to the label recommendations. It is already proved by the practice as several commercial formulations have been tested and sold all around the world and no phytotoxicity was reported on target or succeeding crops.

Fungicidal activity

The insecticidal compound X11422208 (sulfoxaflor) was evaluated in Dow AgroSciences Fungicide Discovery laboratory in vitro high-throughput screens (HTS) against four fungal species (*Phytophthora infestans*, *Pyricularia oryzae*, *Septoria tritici*, *Ustilago maydis*) representing three fungal phyla (Oomycota, Ascomycota, Basidiomycota) to assess its potential effects on fungi. 5 ppm rate of sulfoxaflor was tested in 96 well polystyrene microtiter plates and its effect was compared to azoxystrobin and tebuconazole rates of 5 and 0.05 ppm. After an incubation period of one to three days depending on the fungus, growth (G) was determined by measurement of light scattering using a nephelometer (Nephelostar Galaxy, BMG Laboratories, Offenburg, Germany) and growth inhibition (%GI) was then calculated.

The observed values of growth inhibition for sulfoxaflor ranged from zero percent for USTIMA to 20 percent for PHYTIN. Percent growth inhibition values of up to 20 percent are common in untreated but inoculated wells in these HTS assays, likely a result of unequal evaporation, especially in wells near edges of the plate. Hence, with background growth inhibition of this level, the values observed for sulfoxaflor do not indicate fungicidal activity against these fungi at the rates tested (Davis, 2013).

In conclusion, as sulfoxaflor did not demonstrate activity on representative fungi from a wide range of genera and taxonomic classes, it is unlikely that sulfoxaflor has any fungicidal activity applied at label rates.

Insecticidal activity:

Laboratory trials

Sulfoxaflor is a member of a novel class of insecticides, the sulfoximines, which act through a unique interaction with the nicotinic acetylcholine receptor (nAChR) in insects. Early stage screening results of sulfoxaflor were obtained on a wide spectrum of arthropods and use patterns. Sulfoxaflor activity was tested according to different level of Dow AgroSciences early stage insecticide testing protocols against aphids (*Myzus persicae, Aphis gossypii)*, whiteflies (*Bemisia tabaci)*, plant hoppers (*Nilaparvata lugens, Nephotettix cintceps)*, plant bugs (*Lygus hesperus)*, caterpillars (*Spodoptera exigua, Heliothis zea)*, beetles (*Leptinotarsus decemlineata*, *Popillia japonica, Diabrotica virgifera*

virgifera), flies (*Drosophila melanogaster),* termites (*Reticulitermes flavipes),* cockroaches *(Blatta germanica)*, mites (*Tetranychus urticae)* and nematodes *(Caenorhabditis elegans and Meloidogyne incognita).*

Sulfoxaflor showed very high potency against aphids and also other sap feeding insects such as plant and leafhoppers, *Lygus* bugs as well as whiteflies (*Bemisia tabaci*) were also controlled effectively by sulfoxaflor, its efficacy was comparable to commercial standards. In some tests termites and cockroaches also proved to be susceptible to sulfoxaflor. However, sulfoxaflor showed little activity against pests in the orders *Coleoptera, Lepidoptera, Diptera* as well as the nematodes (Babcock *et al*., 2007).

In several laboratory trials, sulfoxaflor was active on the sap feeding pests by both ingestion and contact activity and demonstrated good systemic activity. Studies demonstrated that, through root uptake, sulfoxaflor redistributed to both foliage present at the time of treatment and new foliage appearing after a pulsed treatment. Speed of action studies, as measured by the reduction in honeydew production showed that sulfoxaflor has very fast feeding cessation effect and probably this effect was measured in some virus transmission trials where significant reduction in virus symptoms was demonstrated in cucurbits and in winter barley.

Field trials:

One preliminary field trial was set up in 2008 in field bean to evaluate the efficacy of sulfoxaflor applied at various rates (6 to 36 g a.s./ha) against *Aphis fabae* (APHIFA) in the United Kingdom. The performance was compared to standard reference actives acetamiprid, lambda-cyhalotrin, pirimicarb and pymetrozine. A flat dose response with no statistical differences was observed between the tested dose rates (6-36 g a.s./ha) of sulfoxaflor against *Aphis fabae* in knock down effect and the control became 100 % by the later evaluations for all treatments. Sulfoxaflor at all tested dose rates delivered very good aphid control being comparable to the standards.

In 2006, two preliminary field trials were set up on tomato and one on eggplant to evaluate the efficacy of sulfoxaflor against aphids (*Aphis gossypii)* and whitefly (*Trialeurodes vaporariorum)* in solanaceous vegetables and to compare the performance to standard reference products. In one tomato trial there was one application carried out and in another one two applications. Sulfoxaflor was tested at various dose rates up to 100 g a.s./ha. In the trial carried out on eggplant, no statistical difference was observed between the tested dose rates (6,25- 50 g a.s./ha) of sulfoxaflor against *Aphis gossypii* in any assessment delivering high efficacy being comparable to standards. Similarly high performance was seen against *Trialeurodes vaporariorum* where again no significant difference was observed between the treatments. In the tomato whitefly trials various results were observed but in both trials 50 g a.s./ha rate of sulfoxaflor was at least as good as the standard imidacloprid (50 g a.s./ha).

Two preliminary field trials were set up in 2006 in pome fruits (apple) to evaluate the efficacy of sulfoxaflor applied at various rates (25 to 100 g a.s./ha) against *Aphis spiraecola* (APHISI) in Hungary. The performance was compared to standard reference actives acetamiprid and thiamethoxam. A dose response was observable on the applied rates of sulfoxaflor but there was no statistical difference between the rates. 25 g a.s./ha rate of sulfoxaflor provided sufficient level of aphid control comparable to the standard products.

Based on data from the preliminary laboratory and field trial results it can be concluded that sulfoxaflor at the proposed label rates (24-48 g a.s./ha) has high potency against aphids and whiteflies without significant impact on the nematodes or insects in the orders of *Coleoptera, Lepidoptera* and *Diptera*. In the preliminary trials sulfoxaflor did not produce any visual injury and phytotoxic effect on the crops during the duration of the trials, which proved its safety on crops.

ZRMS conclusion about preliminary range-finding tests

The laboratory and field trials showed that the sulfoxaflor had an interesting control against aphids and whiteflies at the claimed dose rates ranging between 24 and 48 g sulfoxaflor/ha. On pests (*Aphis fabae, Aphis gossypii, Trialeurodes vaporariorum*) were much lower dose rates were tested in 3 field preliminary tests (from 6 g a.s./ha), no significant dose effect was seen between 6 and 36 g a.s./ha, and between 6 and 50 g a.s./ha.

IIIA 6.1.4 MINIMUM EFFECTIVE DOSE TESTS

Field trials were established in order to determine the minimum effective dose for the control of the target pests claimed in this dRR. Sulfoxaflor was tested at several rates between 6 and 72 g a.s/ha in the target crops for the control of the target pest species. The rates reflected the proposed label rate of sulfoxaflor and some lower and higher rates, in accordance with the EPPO standard PP 1/225 'Minimum effective dose'. Efficacy was tested under a range of environmental conditions to fully challenge the product. All trials were conducted by officially recognized testing organizations with the Good Experimental Practices (GEP) and followed the appropriate EPPO standards PP 1/135, PP 1/152, PP 1/181, PP 1/225 and the pest specific guidelines.

Aphid control in cucurbits

Between 2008 and 2010 a series of 24 trials were carried out in the EU regulatory Southern zone to determine the efficacy of sulfoxaflor against aphids in cucurbit crops grown in open fields. The trials were set up in Spain (10 trials), Italy (10 trial), France (2 trials) and Greece (2 trials) in zucchini (9 trials), melon (8 trials), cucumber (4 trials) and watermelon (3 trials) crops. The application timing was between 12th February and 10th September and 1 application was performed at the development stage of BBCH 20-89, depending on the crop and the situation. The water volume used was 200-1500 L/ha, sprayed with a backpack sprayer. Only the dominant aphid species, cotton aphid (*Aphis gossypii;* APHIGO), was tested in the trials when the infestation level at application was between 0.4 and 513.1 aphids/leaf, depending on the trial.

Sulfoxaflor showed a dose response reaching the plateau at 24 g a.s./ha. This is the recommended dose rate (24 g a.s./ha), which provided sufficient "knock down" effect (83% control) and excellent residual efficacy (95-98% control) keeping the crop clean up to 3 weeks after application (**Table 6.1.4-1**). A reduction of dose rates below 24 g a.s./ha increased the variation of efficacy and also the average control. Therefore, the minimum effective rate and the recommended dose rate for sulfoxaflor is 24 g a.s./ha against aphids in cucurbit crops grown in open fields.

Table 6.1.4-1 Efficacy of sulfoxaflor at rates of 6, 12 and 24 g a.s./ha against aphids (APHIGO) in cucurbit crops grown in fields (2008-2010).

Days after appl.	**Efficacy in % control on aphid mobile forms** All trials carried out in the EPPO Mediteranean zone (24 trials)								
	sulfoxaflor								
	6 g a.s./ha			**12 g a.s./ha**			**24 g a.s./ha**		
	mean	*limits*	trials	mean	*limits*	trials	mean	*limits*	trials
1-2	66.3	*10.8- 94.7*	5	75	39.8-99.5	5	83.4	*49.5- 100*	5
3-4	91.4	*45.5 - 100*	12	95	*79.3-100*	12	96.7	*87-1-100*	12
6-10	87-9	*66.7-100*	16	92.3	*74.6-100*	16	95.5	*57.6- 100*	16
13-16	88	*55.6 - 100*	12	92.7	*45.8- 100*	12	96.7	*62.5- 100*	12
20-21	95.8	*82 - 100*	4	97.5	*89.9- 100*	4	98.4	*91.9- 100*	4

Efficacy data in minimum effective dose trials showing the performance of sulfoxaflor against aphids (APHIGO – *Aphis gossypii*) in cucurbits (field crops) at 13-16 DAA

Test report	**Pest species**	**Days after the application**	**Pests nr/unit at appl'n**	**Efficacy (% control Tukey mean comparison)** **Sulfoxaflor g a.s./ha**		
				6	**12-12.5**	**24-25**
IT08C1C106ET01C	APHIGO (*Aphis gossypii*)	14	7 aphids/leaf	68 b	76.7 b	93 a
IT08C1C106ET02C	APHIGO (*Aphis gossypii*)	14	14.9 aphids/leaf	89.7 c	93.2 b	95.5 ab
ES08C1C004MT03C	APHIGO (*Aphis gossypii*)	14	21 aphids/leaf	87.2 a	78.5 a	89 a
ES08C1C003MT03C	APHIGO (*Aphis gossypii*)	14	19.3 aphids/leaf	100 a	100 a	100 a
ES08C1C003MT04C	APHIGO (*Aphis gossypii*)	16	4.3 aphids/leaf	100 a	100 a	100 a
ES08C1C004JM01	APHIGO (*Aphis gossypii*)	13	29-46.6 aphids/leaf	92.9 a	97.4 a	99.1 a

Test report	Pest species	Days after the application	Pests nr/unit at appl'n	Efficacy (% control Tukey mean comparison) Sulfoxaflor g a.s./ha		
				6	12-12.5	24-25
IT10C1C014ET01C	APHIGO (*Aphis gossypii*)	14	11.6-15.7 aphids/leaf	98.2 d	99 b	100 a
IT10C1C014ET03C	APHIGO (*Aphis gossypii*)	14	50.5-72.8 aphids/shoot	73.1 e	93.8 d	99.9 b
IT10C1C014LA02	APHIGO (*Aphis gossypii*)	13	2.3-5.7 aphids/leaf	70.5 e	74.2 d	86.6 a
PT10C1C014MT02C	APHIGO (Aphis gossypii)	14	513.1 aphids/leaf	87.7 f	97.2 d	98.8 c
General mean				88	92.7	96.7
Min				55.6	45.8	62.5
Max				100	100	100
Number of trials				12	12	12

<u>ZRMS conclusion: Aphids control in cucurbits</u>

Between 2008 and 2010, 24 Mediterranean trials were carried out in Spain (10 trials), Italy (10 trial), France (2 trials) and Greece (2 trials) in zucchini (9 trials), melon (8 trials), cucumber (4 trials) and watermelon (3 trials) crops for the control of *Aphis gossypii*.

The results get on zucchini, melon, cucumber and watermelon crops against *Aphis gossypii* (APHIGO) showed globally that the difference of efficacy levels between 12 g sulfoxaflor/ha (0.5N) and 24 g sulfoxaflor/ha (N) is low. However, 24 g sulfoxaflor/ha (N) was statistically better than the half dose (12 g sulfoxaflor/ha) in 5 trials out of 10 (at the assessment 13-14 DAA).

For information, under indoor conditions, the same tendency is seen (on same pest and same crops).

Consequently, zRMS concludes that 24 g sulfoxaflor/ha is the effective dose for the control of *Aphis gossypii* in cucurbits grown in field situations. A dose range of 12-24 g/ha is judged appropriate.

At the commenting stage for the controlled conditions dRR, some cMS (NL, ES…) commented that the minimum effective dose on aphids (cucurbits, solanaceous and ornamentals) can be reduced from 24 to 12 g a.s./ha, considering the low difference of efficacy seen between these 2 rates (0.5 N and N).

Aphid control in solanaceous vegetable crops

During 2007, 2008, 2009 and 2010, 12 trials were conducted in different solanaceous crops such as pepper (1 trial), tomato (7 trials) and eggplant (4 trials) grown in fields to determine the minimum effective dose rate for sulfoxaflor on the most important aphid species - *Aphis gossypii* (5 trials in Spain and Italy), *Myzus persicae* (3 trials in France and Italy) and *Macrosiphum euphorbiae* (4 trials in France, Spain and Italy). In all of these trials sulfoxaflor was tested at 6, 12 and 24 g a.s./ha. All trials were sprayed one time in spring or early summer between crop stages of BBCH-29 and BBCH-89. The water volume used was 200-1500 L/ha, sprayed with a backpack sprayer. The infestation level at application was between 2 and 100 aphids/leaf, depending on the trial.

In most trials the dose response was observable where sulfoxaflor efficacy reached a plateau at 24 g a.s./ha rate. Decreasing the rates increased the variability and decreased the efficacy especially in the knockdown effect (**Table 6.1.4-2**). There was slight difference between the species sensitivity to sulfoxaflor especially on the knock down activity but the 24 g a.s./ha rate provided sufficient initial and residual efficacy on all 3 tested species. Therefore, the minimum effective rate and the recommended dose rate for sulfoxaflor is 24 g a.s./ha for the control of aphids in solanaceous vegetable crops grown in fields.

Table 6.1.4-2 Efficacy of sulfoxaflor at rates of 6, 12 and 24 g a.s./ha against different aphid species in solanaceous crops grown in fields (2007-2010).

Pest	Days	Efficacy in %

species	after appl.	SULFOXAFLOR								
		6 g a.s./ha			12-12.5 g a.s./ha			24-25 g a.s./ha		
		Mean	***Limits***	**nr of trials**	**mean**	***Limits***	**nr of trials**	**mean**	***limits***	**nr of trials**
APHIGO	1-4	94.9	87.4-100	4	95.3	89.9-100	4	98.6	95.8-100	4
	7-8	97.6	94.1-99.6	4	98.2	95.0-100	4	99.7	98.8-100	4
	13-14	95.3	90.4-98.1	4	96.9	94.6-99.0	4	98.6	95.6-100	4
	20-22	81.6	65.5-97.6	2	88.7	78.9-98.5	2	92.7	85.4-100	2
MYZUPE	1-4	52.6	39.8-65.3	2	64.1	45.5-96.9	2	73.7	70.9-96.4	2
	7-8	81.8	81.8-81.8	1	85.4	85.4-85.4	1	92.4	92.4-92.4	1
	13-14	91	91.0-91.0	1	92.1	92.1-92.1	1	96.5	96.5-96.5	1
MACSEU	1-4	80.2	72.1-86.6	3	76.0	52.5-88.4	3	89.3	86.7-93.6	3
	7-8	91.8	90.4-92.8	3	94.7	94.0-95.6	3	95.8	92.1-98.9	3
	13-14	82.2	71.4-93.0	2	95.4	93.5-97.2	2	99.1	98.1-100	2
	20-22	94.9	92.8-97.0	2	94.3	92.9-95.6	2	94.2	91.5-96.9	2
TOTAL DATA	1-4	80.6	39.8-100	9	81.9	45.5-100	9	90.0	70.9-100	9
	7-8	93.5	81.8-99.6	8	95.3	85.4-100	8	97.3	92.1-100	8
	13-14	90.9	71.4-98.1	7	95.8	92.1-99.0	7	98.4	95.6-100	7
	20-22	88.2	65.5-97.6	4	91.5	78.9-98.5	4	93.5	85.4-100	4

Summary of sulfoxaflor efficacy data carried out in 2007-2010 in the EU regulatory South zone against aphids (APHIGO-*Aphis gossypii*, MYZUPE-*Myzus persicae* and MACEU-*Macrosiphum euphorbiae*) at assessments 13-14 DAA

Test report	Pest species	Days after appl.	sample size per plot	Nr. of aphids in untreated	Efficacy in %, Student-Newman-Keuls		
					6 g a.s./ ha	12 g a.s./ ha	24 g a.s. /ha
FR07X03016MT02	MACSEU	13	25 leaves	223.3		99.6 a	99.6 a
IT08C1C103ET03C	MACSEU	14	25 leaves	25.3/leaf	93.0 b	97.2 a	98.1 a
ES09X03006JM02	APHIGO	14	10 shoots	29.6/shoot		84.7 b	72.6 b
ES10C1C013MT03C	APHIGO	14	25 leaves	8.0/ leaf	90.4 a	94.6 a	95.6 a
IT10C1C013ET01C	MYZUPE	14	10 shoots	184.9/ shoot	91.0 d	92.1 d	96.5 b
IT10C1C013ET04C	APHIGO	14	10 leaves	23.5/leaf	98.1 a	98.3 a	100.0 a
Mean					90.91	93.58	95.74
Min					71.4	84.7	72.6
Max					98.1	99.6	100.0
Nr. of trials					7	10	10

ZRMS conclusion: Aphids control in solanaceous crops

Between 2007 and 2010, 12 trials were conducted in pepper (1 trial), tomato (7 trials) and eggplant (4 trials) grown in field to determine the minimum effective dose rate for sulfoxaflor for the control of aphids:
Aphis gossypii (5 trials in Spain (2) and Italy (3)) in eggplant (3trials), pepper (1 trial) and tomato (1 trial),
Myzus persicae (3 trials in France (1 Maritime) and Italy (2)) in tomato (3 trials),
And *Macrosiphum euphorbiae* (4 trials in France (1 Mediterranean), Spain (1) and Italy (2)) in tomato (3 trials) and eggplant (1 trial).

The results get on pepper, tomato and eggplant against *Aphis gossypii* (APHIGO), *Myzus persicae* (MYZUPE) and *Macrosiphum euphorbiae* ((MACEU) showed globally that the difference of efficacy levels between 12 g sulfoxaflor/ha (0.5N) and 24 g sulfoxaflor/ha (N) is low. Although the dose rate of 24 g sulfoxaflor/ha (N) was statistically better than the half dose (12 g as/ha) in only 1 trial out of 6 (at the assessment 13-14 DAA), zRMS concludes that 24 g/ha is the minimum effective dose for the control of aphids in solanaceous crops grown in field because this dose rate showed numerically more interesting control.

For information, under indoor conditions, the same tendency is seen (on common pests and same crops).

Consequently, zRMS concludes that 24 g/ha is the minimum effective dose for the control of aphids in solanaceous crops grown in field. A dose range between 12 and 24 g a.s./ha is judged appropriate.

At the commenting stage for the controlled conditions dRR, some cMS (NL, ES…) commented that the minimum effective dose on aphids (cucurbits, solanaceous and ornamentals) can be reduced from 24 to 12 g a.s./ha, considering the low difference of efficacy seen between these 2 rates (0.5 N and N).

Aphid control in leafy vegetable crops

Between 2007 and 2012, 19 trials were carried out in the EU regulatory Southern zone to determine the minimum effective dose rate for sulfoxaflor against aphids (*Nasonovia ribisnigri-16 trials* and *Myzus persicae-3 trials*) in leafy vegetables. In the trials set up in France (4 trials), Italy (5 trials), Spain (9 trials) and Portugal (1 trial) sulfoxaflor was tested at several dose rates between 6 and 36 g a.s./ha in lettuce for the control of the dominant aphid species *Nasonovia ribisnigri* and *Myzus persicae*. The rates reflected the proposed label rate of 24 g a.s./ha and also lower and higher rates in accordance with the EPPO standard PP 1/225 '*Minimum effective dose.* 'Efficacy was tested under a range of environmental conditions to fully challenge the product. The 19 trials had sufficient level of natural infestation of aphids (1-590 aphids/plant) to obtain reliable results. One application of sulfoxaflor was carried out at development stage of BBCH 13-48 of the crop.
Sulfoxaflor showed a dose response against both NASORN and MYZUPE reaching a plateau at the dose rate of 24 g a.s./ha delivering sufficient "knock down" and residual efficacy up to 2 weeks (

Table 6.1.4-3). A reduction of dose rates below 24 g a.s./ha increased the variation and the efficacy decreased while 36 g a.s./ha of sulfoxaflor did not provide better efficacy than the 24 g a.s./ha. Therefore, 24 g a.s./ha is claimed as the minimum effective rate for sulfoxaflor against aphids in leafy vegetable crops grown in fields.

Table 6.1.4-3 Efficacy of sulfoxaflor at rates of 12, 18 and 24 g a.s./ha against *Nasonovia ribisnigri* (NASORN) and *Myzus persicae* (MYZUPE) in lettuce grown in open fields.

Pest species	Days after appl.		Efficacy of sulfoxaflor in %		
			12 g a.s./ha	**18 g a.s./ha**	**24 g a.s./ha**
			1 spray	1 spray	1 spray
NASORN	2-3DAAA	nr of trials	9	9	9
		mean	68.5	69.8	71.7

		limits	*33.7-98.5*	*40.6-88.6*	*5.2-94.7*
	7DAAA	nr of trials	9	9	9
		mean	87.1	88.2	93.2
		limits	*70.6-100.0*	*76.8-100*	*85.8-100.0*
	14DAAA	nr of trials	9	9	9
		mean	74.4	85.1	89.6
		limits	*34.5-98.3*	*60.5-100.0*	*73.0-100.0*
	21DAAA	nr of trials	3	3	3
		mean	59.3	68.0	79.6
		limits	*26.7-80.3*	*57.0-74.6*	*70.3-88.1*
MYZUPE	2-3DAAA	nr of trials	2	2	2
		mean	68.6	64.6	68.5
		limits	*39.5-97.7*	*29.3-100*	*36.9-100*
	7DAAA	nr of trials	2	2	2
		mean	87.2	91.9	94.6
		limits	*77-6-96.8*	*83.8-100*	*89.3-100*
	14DAAA	nr of trials	2	2	2
		mean	89.6	92.6	93.2
		limits	*87.1-92.0*	*88.7-96.5*	*87.9-98.5*
	21DAAA	nr of trials	1	1	1
		mean	87.9	96.5	98.1
		limits	*87.9-87.9*	*96.5-96.5*	*98.1-98.1*

Summary of efficacy trial results for the control of *Nasonovia ribisnigri* (NASORN) in lettuce

Trial number	**Assessment (days after the application)**	**Pest code**	**Untreated pest level at evaluation**	**Efficacy treatments (*Henderson-Tilton & Abbot*) in %, Tukey's mean comparison (P: 5%)**				
				6 g a.s./ha	**12 g a.s./ha**	**18 g a.s./ha**	**24 g a.s./ha**	**36 g a.s./ha**
ES07X03006JM02	6-8 DAA	NASORN	2.73/leaf	92.0 ab	95.2 a	n.a.	91.2 a	98.4 a
	14-16 DAA	NASORN	19.0/leaf	89.9 a	91.8 a	n.a.	95.4 a	97.8 a
	21-23 DAA	NASORN	37.5/leaf	86.0 ab	97.6 a	n.a.	97.1 a	98.8 a
ES11C1C012JM01	2-4 DAA	NASORN	7.84/leaf	26.2 a	41.0 a	65.7 a	59.4 a	n.a.
	6-8 DAA	NASORN	13.02/leaf	56.7 a	84.5 a	88.8 a	97.2 a	n.a.
	14-16 DAA	NASORN	8.93/leaf	80.6 ab	87.7 ab	96.7 a	85.4 ab	n.a.
	21-23 DAA	NASORN	2.66/leaf	84.5 a	80.3 a	74.6 a	88.1 a	n.a.
IT11C1C012ET01C	2-4 DAA	NASORN	5.2/plant	56.8 a	65.7 ab	71.1 a	84.4 a	n.a.
	6-8 DAA	NASORN	22.7/plant	69.0 b	75.4 ab	87.5 ab	88.3 ab	n.a.
	14-16 DAA	NASORN	51.4/plant	41.2 b	55.7 ab	73.7 a	73.0 a	n.a.
ES12C1C012SC02	2-4 DAA	NASORN	2.1/plant	n.a.	33.7 ab	40.6 ab	5.2 b	14.2 ab
	6-8 DAA	NASORN	6.9/plant	n.a.	96.8 a	88.2 a	91.4 a	88.9 a
	14-16 DAA	NASORN	14.5/plant	n.a.	34.5 ab	60.5 ab	89.7 a	54.4 ab
	21-23 DAA	NASORN	116.5/plant	n.a.	70.7 a	72.3 a	80.5 a	68.3 a
IT11C1C012ET02C	2-4 DAA	NASORN	198.8/plant	71.4 ab	69.0 b	73.6 ab	71.3 ab	n.a.
	6-8 DAA	NASORN	105.0/plant	71.6 b	70.6 b	76.8 ab	85.8 a	n.a.
	14-16 DAA	NASORN	57.5/plant	70.0 b	73.5 b	100 a	100 a	n.a.
IT11C1C012ET03C	2-4 DAA	NASORN	342.5/plant	83.3 ab	84.5 ab	84.4 ab	85.6 ab	n.a.

	6-8 DAA	NASORN	295.3/plant	80.8 ab	79.5 ab	82.2 ab	89.3 a	n.a.
	14-16 DAA	NASORN	126.3/plant	86.4 ab	87.5 a	86.4 ab	92.2 a	n.a.

Summary of efficacy trial results for the control of aphids (MYZUPE) in lettuce

Trial number	Assessment (days after the application)	Pest code	Untreated pest level at evaluation	Efficacy treatments (Henderson-Tilton & Abbot) in %, Tukey's mean comparison (P: 5%)			
				6 g a.s./ha	12 g a.s./ha	18 g a.s./ha	24 g a.s./ha
ES07X03006SC02	7 DAA	MYZUPE	6.0 / leaf	n.a.	100 a	n.a.	100 a
	14-15 DAA	MYZUPE	14.8/leaf	n.a.	100 a	n.a.	100 a
	21-22 DAA	MYZUPE	27.8/leaf	n.a.	100 a	n.a.	100 a

ZRMS conclusion: Aphids control in leafy vegetable crops

Between 2007 and 2012, 19 trials were conducted in lettuce. 17 trials were conducted against *Nasonovia ribisnigri* in Spain (8 trials), in Italy (5 trials), in Portugal (1 trial) and France (1 Mediterranean + 2 Maritime) and 3 trials against *Myzus persicae* in Spain (2 trials) and in France-Maritime (1 trial). 1 trial was common for both aphids.

The results obtained (at the assessment 14-23 DAA) against *Nasonovia ribisnigri* (NASORN) in lettuce grown in open field (6 trials) showed that the claimed dose rate of 24 g sulfoxaflor/ha (compared to 12 and 18 g/ha) could be considered as the minimum effective dose. Actually, the results obtained at 12, 18 and 24 g/ha showed that the difference between these doses is low. However, the dose rate of 24 g/ha seemed to be the most appropriate one because it presented numerically more interesting control against aphids.

For *Myzus persicae* (MYZUPE, 1 trial), the doses of 12 and 24 g sulfoxaflor/ha provided a statistically and numerically comparable control. The extrapolation table PP 1/257 IEET 38 (2) for minor uses allows extrapolating data from solanaceous, and other similar crops, to lettuce concerning *Myzus persicae*, if judged necessary.

Based on the whole data, zRMS concludes that 24 g/ha is the minimum effective dose for the control of aphids in leafy vegetables grown in field.

Aphid control in leguminous crops

Between 2007 and 2012, 10 trials were conducted in the EU regulatory Southern zone to determine the minimum effective dose rate for sulfoxaflor against aphids in legume crops grown in fields. Those trials were carried out in France (5 trials), Greece (3 trials) and in Spain (2 trials) and sulfoxaflor was tested at various dose rates from 6 to 36 g a.s./ha in pea and bean crops for the control of aphids (*Acyrthosiphon pisum* and *Aphis fabae)*. Due to low number of pea trials in the EU regulatory Southern zone, 3 additional pea trials from Czech Republic were used from the EU regulatory Central zone in this section to support label claims. All Czech and French pea trials came from the Maritime EPPO climatic zone and from similar agronomic circumstances so to discuss them together is reasonable. Efficacy was tested under a range of environmental conditions to fully challenge the product. All 13 trials had sufficient level of natural aphid infestation to obtain reliable results (1-270 aphids/plant). In all trials, one application was carried out at the development stage of BBCH 18-89, depending on the crop and the country. Spray volume ranged between 200-1000 L/ha. The trials were carried out under GEP and in accordance with the relevant EPPO guidelines. Seven trials were set up in peas and six in beans.

Sulfoxaflor treatments ~~resulted~~ showed a dose response against both species with decreasing increments as the rates became higher and the time longer. Sulfoxaflor at 36 g a.s./ha dose rate provided slightly better efficacy than the lower rates against ACYRON but not against APHIFA where the dose response reached the plateau at 24 g a.s./ha rate (**Table 6.1.4-4** and **Table 6.1.4-5**). The individual trials showed similar results by the 24 and 36 g a.s./ha rates in efficacy, both providing sufficient overall aphid control considered effective against the two major aphid species (*Acyrthosiphon pisum* in peas and *Aphis fabae* in beans) for which activity of sulfoxaflor is claimed. The performance of 24 g a.s./ha sulfoxaflor was comparable to the applied standards as well (see efficacy section), which fact also justify there is no need to increase the rate above 24 g a.s./ha, which is therefore considered as the minimum effective dose rate of sulfoxaflor against aphid species in leguminous crops grown in fields.

Table 6.1.4-4 Efficacy of sulfoxaflor at rates of 6, 12, 24 and 36 g a.s./ha against *Aphis fabae* (APHIFA) in beans (summary across 6 field trials).

Days after appl.		Efficacy of sulfoxaflor in %			
		6 g a.s./ha	12 g a.s./ha	24 g a.s./ha	36 g a.s./ha
2-4DAA	**mean**	**80.6**	**90.8**	**92.8**	**91.6**
	limits	*27.3-100*	*36.8-100*	*46.8-100*	*30.4-100*
6-7DAA	**mean**	**99.6**	**98.0**	**98.4**	**99.5**
	limits	*97.3-100*	*55.2-100*	*78.6-100*	*92.6-100*
13-14DAA	**mean**	**99.1**	**100.0**	**100.0**	**100.0**
	limits	*99.01-99.19*	*100-100*	*100-100*	*100-100*
2-4DAA	**nr of trials**	na	4	4	na
	mean	**na**	**88.00**	**89.14**	**na**
	limits	*na*	*59.35-99.965*	*62.82-99.98*	*na*
6-7DAA	**nr of trials**	na	4	4	na
	mean	**na**	**97.05**	**97.66**	**na**
	limits	*na*	*88.675-100*	*90.8-100*	*na*
13-14DAA	**nr of trials**	na	3	3	na
	mean	**na**	**100.0**	**100.0**	**na**
	limits	*na*	*100-100*	*100-100*	*na*

DAA = days after application

Table 6.1.4-5 Efficacy of sulfoxaflor at rates of 6, 12, 24 and 36 g a.s./ha against *Acyrthosiphon pisum* (ACYRON) in peas (summary across 7 field trials).

Days after appl.		Efficacy of sulfoxaflor in %			
		6 g a.s./ha	12 g a.s./ha	24 g a.s./ha	36 g a.s./ha
1-2DAA	**mean**	**31.97**	**43.15**	**54.30**	**66.52**
	limits	*0-82.3*	*0-96.2*	*0-95.24*	*0-93.35*
3-4DAA	**mean**	**80.90**	**85.91**	**93.27**	**95.43**
	limits	*59.77-96.25*	*46.88-95.93*	*78.81-98.9*	*84.29-99.58*
6-7DAA	**mean**	**83.78**	**78.43**	**79.62**	**89.08**
	limits	*19.4-98.25*	*0-100*	*0-100*	*0-100*
14-15DAA	**mean**	**85.57**	**88.62**	**89.57**	**94.84**
	limits	*36.36-100*	*0-99.59*	*22.5-100*	*54.55-100*
1-2DAA	**nr of trials**	6	6	6	6
	mean	31.97	44.86	58.12	68.36
	limits	*12.34-56.87*	*14.88-74.21*	*19.43-90.23*	*27.06-88.46*
3-4DAA	**nr of trials**	3	3	3	3

	mean	80.90	85.91	93.27	95.43
	limits	*68.6-93.05*	*74.47-95.01*	*87.03-97.58*	*89.87-99.27*
6-7DAA	**nr of trials**	6	6	6	6
	mean	83.78	86.44	87.60	94.1
	limits	*56.35-97.8*	*65.3-98.57*	*74.44-99.32*	*76.45-99.74*
14-15DAA	**nr of trials**	5	5	5	5
	mean	85.57	88.62	89.57	94.84
	limits	*73.38-97.53*	*67.81-98.86*	*77.58-99.18*	*84.07-99.6*

Data highlighted yellow come from an orthogonal comparison from the same trials. Mean range show the minimum and maximum single trial means and not the single data as seen in the non highlighted part of the table which shows all data available.

Summary of efficacy data in sulfoxaflor efficacy trials carried out in 2007-2013 in leguminous crops grown in open fields against pea aphids (ACYRON)

Trial number	**Assessment (days after the application)**	**Untreated pest level at evaluation**	**Efficacy treatments (*Henderson-Tilton & Abbot*) in %, Tukey's mean comparison (P: 5%)**			
			6 g a.s./ha	**12 g a.s./ha**	**24 g a.s./ha**	**36 g a.s./ha**
FR08C1C068CR03C	1DAA	16.49 adult/shoot	52.18 b	66.83 ab	65.35 ab	83.26 ab
	6DAA	15.19 adult/shoot	93.74 a	93.76 a	75.67 a	98.19 a
FR08C1C068CR04C	2DAA	9.44 adult/shoot	16.07 c	14.88 c	37.35 bc	52.13 abc
	7DAA	15.2 adult/shoot	56.3 c	**65.3 abc**	**82.3 abc**	76.5 abc
	14DAA	2.2 adult/shoot	80.9 ab	96.6 ab	77.6 ab	99.6 a
FR08C1C068FO01	2DAA	12.02 adult/plant	21.27 c	51.74 b	73.71 ab	85.61 a
	7DAA	36.7 adult/plant	72.19 bc	72.47 bc	74.44 abc	93.63 ab
	15DAA	85.39 adult/plant	73.4 cd	**83.6 bc**	**89.2 ab**	91.8 ab
HU12C1C016JP03C	4DAAA	35.33 adult/leaf	na	91.92 ab	96.56 ab	na
	7DAAA	31.12 adult/leaf	na	**87.5 abc**	**97.7 ab**	na
	14DAAA	31.48 adult/leaf	na	**77.69 ab**	**92.87 a**	na
HU12C1C016JP04C	1DAAA	55 adult/plant	na	16.9	47.5 ab	na
	3DAAA	60 adult/plant	na	39.68 d	83.1 a	na
	7DAAA	90 adult/plant	na	80 c	92.5 ab	na
	14DAAA	225 adult/plant	na	86.69	94.06 abc	na

Summary of efficacy data in sulfoxaflor efficacy trials carried out in 2007-2013 in beans grown in open fields against aphids (APHIFA)

Trial number	**Assessment (days after the application)**	**Untreated pest level at evaluation**	**Efficacy treatments (Henderson-Tilton & Abbott) in %, Tukey's mean comparison (P:5%)**			
			6 g a.s./ha	**12 g a.s./ha**	**24 g a.s./ha**	**36 g a.s./ha**
GR07C1C005NK01	3DAA	114.63 adult/leaf	na	na	100 a	100 a
	7DAA	123.5 adult/leaf	na	na	100 a	100 a
GR07C1C005NK02	3DAA	102 adult/leaf	na	na	100 a	100 a
	7DAA	110 adult/leaf	na	na	100 a	100 a
GR08C1C056VA01	4DAA	135.75 adult/shoot	99.93 a	99.96 a	99.98 a	100 a
	7DAA	270 adult/shoot	99.9 a	**100 a**	**100 a**	100 a
	14DAA	172.5 adult/shoot	99.1 a	**100 a**	**100 a**	100 a
FR08C1C069YC03	2DAA	191.88 adult/plant	61.3 abc	59.4 abc	62.8 abc	66.5 ab
	7DAA	72.23 adult/plant	99.3 a	**88.7 a**	**90.8 a**	98.1 a
ES12C1C016MT03C	3DAA	27.79 adult/shoot	na	98.8 a	98.53 a	na

	7DAA	21.5 adult/shoot	na	**99.58 a**	**99.85 a**	na
	14DAA	17 adult/shoot	na	100 a	100 a	na
ES12C1C016JP04C	2DAA	14.97 adult/shoot	na	93.58 a	94.42 a	na
	6DAA	12.53 adult/shoot	na	**99.93 a**	**100 a**	na
	13DAA	9.53 adult/shoot	na	**100 a**	**100 a**	na

ZRMS conclusion: Aphids control in leguminous crops

Between 2007 and 2012, 13 trials were conducted to determine the dose response of sulfoxaflor against aphids in peas and beans crops.
6 trials (3 in Greece, 2 in Spain and 1 in France-Maritime) were conducted in bean on *Aphis fabae*. 4 trials were carried out in pea on *Acyrthosiphon pisum* in France-Maritime. Due to the low number of pea trials, 3 additional trials from Czech Republic were used from the EU regulatory Central zone but Maritime EPPO climatic zone. The Czech pea trials were kept as supportive data.

For *Aphis fabae* (APHIFA, 6 trials) and *Acyrthosiphon pisum* (ACYRON, 5 trials) tested on beans and peas in field, the dose of 12 g sulfoxaflor/ha provided statistically sufficient efficacy. However, zRMS concluded that the results obtained with the dose rate of 24 g a.s./ha showed numerically more interesting control than the half dose. A dose range between 12 and 24 g a.s./ha is judged appropriate.

Based on the whole data set, zRMS concludes that 24 g/ha is the minimum effective dose for the control of aphids in bean and pea grown in field.

Aphid control in brassica crops

Between 2008 and 2012, 18 trials were carried out in the EU regulatory Southern zone to determine the minimum effective dose rate for sulfoxaflor against aphids in brassica crops. The trials were conducted in Italy (14 trials) and Spain (4 trials) testing sulfoxaflor at rates of 6, 12, 18, 24 and 36 g a.s./ha for the control of *Brevicoryne brassicae (16 trials)* and *Myzus persicae (2 trials)* in cauliflower (12 trials), cabbage (3 trials), broccoli (2 trials) and savoy cabbage (1 trial) crops at their development stages of BBCH 14-72. The applied spray volume was between 500 and 1000 L/ha. The natural infestation level at the date of application was sufficient to obtain reliable results having 2-395 aphids/leaf.
The summary across trials (
Table 6.1.4-6) showed clear dose response of sulfoxaflor and demonstrated that 24 g a.s./ha has sufficient knock down and long lasting activity on both tested species. The lower rates provided less consistent efficacy results delivering insufficient control in some trials. As there was no significant difference between the 2 species in sensitivity to sulfoxaflor and both was controlled sufficiently by the 24 g a.s./ha rate, the minimum effective dose rate for aphid control in brassica crops is 24 g a.s./ha in the EU regulatory Southern Zone.

Table 6.1.4-6 Efficacy of sulfoxaflor (GF-2626) at proposed label rate and 50% & 75% dose rate on *Brevicoryne brassicae (6 trials) and Myzus persicae (2 trials)* in brassica crops (ortogonal comparison).

Evaluation time	Efficacy of sulfoxaflor in %					
	12 g a.s./ha		18 g a.s./ha		24 g a.s./ha	
	Mean	*Min & Max*	Mean	*Min & Max*	Mean	*Min & Max*
MYZUPE 3daa	69.3	*66.2-72.3*	76.1	*74.1-78.0*	83.3	*75.5-91.0*
MYZUPE 6-7daa	78.4	*72.0-84.8*	80.1	*73.0-87.2*	92.5	*91.4-93.5*
MYZUPE 14daa	65.5	*57.3-73.6*	74.4	*64.1-84.6*	86.6	*85.9-87.2*
BRVCBR 3-4daa	87.7	72.0-91.1	92.3	81.0-99.8	95.1	86.3-100
BRVCBR 7-8daa	85.6	62.7-99.1	90.5	74.6-99.8	97.6	94.2-100

BRVCBR 14-15daa	91.8	76.5-99.4	95.6	92.3-98.3	98.3	93.5-100

Summary of efficacy data in efficacy trials carried out in 2008 in Italy and Spain showing the performance of sulfoxaflor against aphids in brassicas at assessment 14 DAA

Test report	Pest Bayer Code	nr. of aphids in untreated	Days after appl.	Efficacy in %, Tukey mean comparison			
				6 g a.s./ha	12 g a.s./ha	24 g a.s./ha	36 g a.s./ha
ES08C1C015JM01	BRVCBR	579 aphids/leaf	14	85.2 b	**96.0** **b**	**98.5** **b**	99.5 b
ES08C1C015MT01C	BRVCBR	7.5 aphids/leaf	4	92.9 a	**99.1** **a**	**100** **a**	100 a
ES08C1C015MT02C	BRVCBR	27 aphids/leaf	2	67.0 a	**100** **a**	**100** **a**	100 a
IT08C1C107ET02C	BRVCBR	87.0 aphids/leaf	14	98.9 b	**99.4** **a**	**99.8** **a**	

Summary of efficacy data in efficacy trials carried out in 2011-2013 in Italy showing the performance of sulfoxaflor against aphids in brassicas at assessment 14 DAA

Test report	Pest Bayer Code	nr. of aphids in untreated	Days after appl.	Efficacy in %, Tukey mean comparison			
				6 g a.s./ha	12 g a.s./ha	18 g a.s./ha	24 g a.s./ha
IT11C1C006DC01	BRVCBR	2036 aphid/plant	14	87.6 cd	90.8 bc	92.3 abc	99.3 a
IT11C1C006ET01C	BRVCBR	159 aphids/leaf	14	87.4 b	**97.1** **a**	**98.2** **a**	**99.7** **a**
IT11C1C006ET03C	BRVCBR	66.3 aphids/plant	14	64.0 c	76.5 b	92.8 a	98.1 a
IT11C1C006ET04C	BRVCBR	252 aphids/plant	15	94.5 e	96.1 cd	98.3 b	99.4 a
IT11C1C006ET05C	BRVCBR	97.3aphids/leaf	15	79.3 d	**99.4 ab**	**98.3 ab**	**100 a**
IT11C1C006ET06C	BRVCBR	532 aphids/plant	14	89.5 b	**90.8 b**	**93.6 ab**	**93.5 ab**
IT12C1C014ET02C	BRVCBR	41.3 aphids/plant	14	-	**98.87 c**	**97.07 c**	**96.10 c**
IT12C1C014ET03C	BRVCBR	271	14	-	**99.9 a**	**99.6 a**	**100 a**
IT12C1C014ET04C	BRVCBR	1689 aphids/plant	14	-	**100 a**	**100 a**	**100 a**
IT12C1C014LA01	BRVCBR	1195 aphis/plant	14	-	**99.9 a**	**100 a**	**100 a**
IT12C1C014AF01	MYZUPE	659 aphid/plant	14	-	**73.9 b**	**85.1 ab**	**86.1 ab**

<u>ZRMS conclusion: Aphids control in brassicas crops</u>

Between 2008 and 2012, 18 trials were carried out in Italy (14 trials) and Spain (4 trials) for the control of *Brevicoryne brassicae* (16 trials) and *Myzus persicae* (2 trials) in cauliflower (12 trials), cabbage (3 trials), broccoli (2 trials) and savoy cabbage (1 trial) crops.

The results obtained against *Brevicoryne brassicae* (BRVCBR, 14 trials) and *Myzus persicae* (MYZUPE, 1 trial) at 14 DAA in brassicas showed that the dose rates of 12 and 24 g sulfoxaflor/ha were statistically comparable. However, zRMS concludes that the results obtained with the dose rate of 24 g a.s./ha showed numerically more interesting control than the lower doses (12 and 18 g a.s./ha).

The extrapolation table PP 1/257 IEET 15 (3) for minor uses allows extrapolating data from lettuce to cabbage concerning *Myzus persicae*, if judged necessary.

Based on the whole data set, zRMS concludes that 24 g/ha is the minimum effective dose for the control of aphids in brassicas crops grown in field.

Aphid control in potatoes

There were 12 trials considered to determine the minimum effective dose rate of sulfoxaflor against aphid pests in potatoes. Trials were carried out between 2008 and 2012 in France (2 trials), Germany (5 trials) and the United

Kingdom (5 trials) in the Maritime EPPO climatic zone. No differentiation between aphid species was made for the minimum effective dose rate analysis as there was no significant difference between their susceptibility to sulfoxaflor. The species considered were: potato aphid (*Macrosiphum euphorbiae,* MACSEU-2trials), buckthorn aphid (*Aphis nasturtii,* APHINA-1 trial), bean aphid *(Aphis fabae,* APHIFA-1 trial), cotton aphid (*Aphis gossypii*, APHIGO-1 trial), green peach aphid (*Myzus persicae*, MYZUPE-5 trials), foxglove aphid (*Aulacorthum solani*, AULASO-1 trial) and 1 trials with a mixed population. Sulfoxaflor was sprayed at rates 6, 12, 18 and 24 g a.s./ha at the development stage of BBCH 15-69 on potatoes. All trials had sufficient level of natural aphid infestation (3-15 aphid/leaf or plant) to obtain reliable results. Spray volume used for application ranged between 200 and 300 L/ha.
The summary across trials showed a dose response of sulfoxaflor reaching a plateau at the dose rate of 24 g a.s./ha delivering sufficient aphid control comparable to commercial standards (see efficacy section). The initial activity was slow having a “knock down” efficacy at 4DAA of 75 %, but the residual efficacy 1 and 2 weeks after application was about 90 %, which ensures the required aphid control (

Table 6.1.4-7). A reduction of the dose rate below 24 g a.s./ha increased the variation of efficacy for both the knockdown and the residual activity of the product. There was no significant difference between the sensitivity of the different aphid species, which is good as they occour sometimes together at the same time in the crop. In order to achieve a robust product performance delivering reliable long lasting activity, the dose rate of 24 g a.s./ha of sulfoxaflor is claimed as the minimum effective dose rate for sulfoxaflor against aphids in potatoes.

Table 6.1.4-7 Efficacy of sulfoxaflor applied at dose rates of 12, 18 and 24 g a.s./ha against aphids in potatoes.

Days after appl.	**Efficacy in %**									**18/24 g sulfoxaflor/ha**
	sulfoxaflor									
	12 g a.s./ha			**18 g a.s./ha**			**24 g a.s./ha**			
	mean	***limits***	**nr of trials**	**mean**	***limits***	**nr of trials**	**mean**	***limits***	**nr of trials**	
1-4	**70.5**	*38.7-97.3*	12	**73.1**	*4.2-95.8*	12	**75.5**	*7.1-96.2*	12	**/+3 points (the variability of individual values was less marked)**
6-8	**87.5**	*72-99.4*	10	**90.8**	*72-100*	10	**91.9**	*71.2-100*	10	**/+1 point**
13-15	**90.3**	*66.4-100*	9	**92.0**	*76.9-99.6*	9	**92.6**	*78.1-100*	9	**/+1 point (the variability of individual values was less marked)**
20-21	**82.7**	*37.5-98.7*	8	**85.5**	*55.1-98.8*	8	**83.1**	*48.5-98.7*	8	**/-3 points**

Summary of efficacy data in efficacy trials carried out in 2008-2012 in Germany, United Kingdom and Northern France showing the performance Sulfoxaflor against aphids in potatoes at assessment 13-15DAA

Test report	Pest	nr. of aphids in untreated	Days after appl.	Efficacy in %, Tukey mean comparison				
				6 g/ha	12 g/ha	18 g/ha	24 g/ha	36 g/ha
DE08C1C121AZ01C	**APHISP**	7,6 aphids/leaf	14	68,2	70,7		85,1	88
				ab	ab		a	a
DE08C1C121AZ02C	**APHISP**	41,6 aphids/leaf	14	79,3	81,5		89,5	94,4
				d	cd		bc	ab
DE11C1C011AZ01C	**MYZUPE**	10,5 aphids/leaf	14	82,7	93,9	95	95,9	
				cd	abc	ab	ab	
DE11C1C011AZ03C	**MYZUPE**	12,9 aphids/leaf	14	93,2	93	94,5	97,2	
				a	a	a	a	
DE11C1C011AZ04C	**APHIGO**	5,3 aphids/leaf	13	46,8	66,4	76,9	78,1	
				bc	ab	a	a	
DE12C1C015AZ02C	**MACSEU**	11,7 aphids/leaf	14		99,4	99,4	99,4	
					a	a	a	
FR08C1C069CR05C	**APHINA**	14,5 aphids/leaf	14	83,2	96,6		97,9	99,1
				bc	ab		a	a
FR12C1C015FO01	**AULASO**	1273 aphids/leaf	14		90,8	95,7	83,8	
					a	a	ab	
GB08C1C083SE01C	**APHIFA**	12,7 aphids/3 leaf	14	55	78,1	77	85,2	83,5
				bc	ab	abc	a	ab
GB08C1C083SE02C	**MACSEU**	33,6 aphids/leaf	13	72,3	91,6	92,7	95	94,3
				ab	a	a	a	a

ZRMS conclusion: Aphids control in potatoes

There were 12 trials carried out between 2008 and 2012 in France (2 trials), Germany (5 trials) and the United Kingdom (5 trials) in the Maritime EPPO climatic zone against *Macrosiphum euphorbiae*, MACSEU (2trials), *Aphis nasturtii*, APHINA (1 trial), *Aphis fabae*, APHIFA (1 trial), *Aphis gossypii*, APHIGO (1 trial), *Myzus persicae*, MYZUPE (5 trials), *Aulacorthum solani*, AULASO (1 trial) and 1 trial with a mixed population.

The results obtained in potatoes against aphids at 13-14 DAA (10 trials) showed globally that there is not statistically significant dose effect between the claimed dose rate of 24 g sulfoxaflor/ha and the lower dose rate of 18 g sulfoxaflor/ha. However, zRMS concludes that the results obtained with the dose rate of 24 g a.s./ha showed numerically more interesting control than the lower doses (12 and 18 g a.s./ha).

Based on the whole data set, zRMS concludes that 24 g sulfoxaflor/ha is the effective dose for the control of aphids in potatoes crop grown in field situations. A dose range of 18-24 g/ha is judged appropriate.

It is to be stressed that zRMS reckoned that potatoes crop represents a weighty crop in France, Germany and United Kingdom (Maritime EPPO climatic zone) and that the 4 submitted French Maritime trials could be considered as acceptable for France.
Otherwise, zRMS agrees about comments made by southern zone MS (EL, ES,…) concerning the absence of efficacy trials (allowing minimum effective dose assessment) carried out in the Mediterranean and South-East EPPO zone on this use (potato * aphids) which is not in line with EPPO requirements. This can be considered as not acceptable for MS belonging to this EPPO zones (EL, ES,…):

- Acceptable for France

-	Not acceptable for other SZ MS.

Aphid control in pome fruits

43 field trials were used to determine the minimum effective dose rate of sulfoxaflor for the control of aphids in pome fruits (41 trials in apple and 2 trials in pear) in South Europe (France 13 trials, Greece 7 trials, Italy 10 trials, Portugal 4 trials, Spain 9 trials). Sulfoxaflor was tested at 6, 12, 24 and 36 g a.s./ha (2008 trials) or at 12, 18 and 24 g a.s./ha (2011-2012 trials: France 6 trials, Greece 2 trials, Italy 7 trials, Portugal 4 trials, Spain 5 trials) against *Dysaphis plantaginea* (DYSAPL-13 trials) and *Aphis pomi* (APHIPO-22 trials). Sulfoxaflor was also tested against *Eriosoma lanigerum* (ERISLA-6 trials), at 24, 36 and 48 g a.s./ha rates. Treatments were applied using a spray gun, a compressed air backpack sprayer, a mist blower, an airblast sprayer, pneumatic applicator or a tractor plot sprayer calibrated to apply a spray volume of 635-1,600 L/ha using adjustable adapted nozzles. At the time of application the growth stage of crop ranged between BBCH 32 and BBCH 74 (depending on the crop and country). The applications were performed in preventative or in curative situations when the level of natural aphid populations was sufficient to obtain reliable results. The curative applications were done after flowering stage in April-May when the aphids were already present at sufficient number (from 5 to 182 aphids per shoot for DYSAPL or APHIPO and from 3 to 68 colonies per shoot for ERISLA). Both APHIPO and DYSAPL are spread across Europe where apple is grown, they are good representatives of common aphids feeding on pome fruit leaves several cases together and at the same time. ERISLA attacks pome fruits later in the season (end of May-June) and need special attention for the good timing of treatments as the established colonies are pretty difficult to control with any insecticides.

There was no significant difference between the efficacy applied in curative and preventative situations against DYSAPL and APHIPO. The dose response was observable against both species where the efficacy reached a plateau at 18-24 g a.s./ha rate delivering sufficient knock down and excelent long lasting efficacy. As **Table 6.1.4-8** and

Table 6.1.4-9 show there was no significant difference between the 18 and 24 g a.s./ha rate but the 24 g a.s./ha rate provided more consistent results especially on APHIPO. On the basis of the comprehensive trial program, the minimum effective dose for sulfoxaflor on DYSAPL and APHIPO proved to be 24 g a.s./ha for preventative applications (before flowering) as well as for curative applications considering that these 2 species are good representatives for most aphids living on the leaves and young shoots.

ERISLA tolerated much more the sulfoxaflor treatments and even there was significant difference betwen the curative and preventative application results. When sulfoxaflor was sprayed against established colonies protected by the aphids' wax a mediocore efficacy was observable while when it was applied as preventative application (before or at the beginning of nymphs migration) the efficacy was much better. As

Table 6.1.4-10 shows there was a clear dose response between 24 and 48 g a.s./ha, which reached 86-87% control at 6-14 days after application and started decreasing later. This level of aphid control is considered sufficient proving the minimum effective dose for sulfoxaflor on ERISLA is 48 g a.s. /ha. Spraying is possible at the beginning of migration before colonization.

Table 6.1.4-8 Efficacy of sulfoxaflor against APHIPO in pome fruits.

Days after application	**Efficacy of sulfoxaflor in % on APHIPO**								
	12 g a.s. /ha			**18 g a.s. /ha**			**24 g a.s. /ha**		
	means	**limits**	**no of trials**	**means**	**limits**	**no of trials**	**means**	**limits**	**no of trials**
2-3	79.3	22.0-100	7	83.8	26.6-100	7	87.3	12.4-100	7
5-9	92.7	69.9-100	11	95.6	79.6-100	11	98.8	93.8-100	11
10-17	91.8	74.4-100	11	92.9	57.8-100	11	94.6	57.8-100	11
19-22	91.8	77.7-100	7	92.7	59.7-100	7	93.4	69.1-100	7

Table 6.1.4-9 Efficacy of sulfoxaflor against DYSAPL in pome fruits.

Days	**Efficacy of sulfoxaflor in % on DYSAPL**

after application	12 g a.s. /ha			18 g a.s. /ha			24 g a.s. /ha		
	means	limits	no of trials	means	limits	no of trials	means	limits	no of trials
2-3	61.0	0-100	9	71.2	0-100	9	70.3	0-99.7	9
5-9	87.8	58.8-100	10	90.9	0-100	10	91.1	45.3-100	10
10-17	93.2	28.4-100	10	96.1	33.6-100	10	94.4	46.5-100	10
19-22	80.5	0-100	8	90.0	0-100	8	87.6	8.04-100	8

Table 6.1.4-10 Efficacy of sulfoxaflor against ERISLA in pome fruits

Days after application	Efficacy of sulfoxaflor in % on ERISLA			
	24 g a.s. /ha		48 g a.s. /ha	
	means	limits	means	limits
6-8	**73.3**	(68.4-78.2)	**87.1**	(74.2-100)
13-14	**75.7**	(69.6-86.2)	**86.1**	(75-99.8)
18-22	**62.0**	(35.4-88.5)	**76.4**	(60.3-91.1)

ZRMS conclusion: Aphids control in pome fruits

43 field trials were conducted in pome fruits (41 trials in apple and 2 trials in pear) in France (13 Mediterranean trials), Greece (7 trials), Italy (10 trials), Portugal (4 trials) and Spain (9 trials) against *Dysaphis plantaginea* (DYSAPL-13 trials) and *Aphis pomi* (APHIPO-22 trials). Sulfoxaflor was also tested against *Eriosoma lanigerum* (ERISLA-6 trials).
The applications were performed in preventative or in curative situations.

The results presented in the present dRR and in the BAD showed that:
For *Dysaphis plantaginea* (DYSAPL, 10 trials) and *Aphis pomi* (APHIPO, 11 trials), the statistical difference between 18 and 24 g a.s./ha was low.
For these 2 aphids, zRMS concluded that the dose rate of 24 g a.s./ha should be the minimum effective dose because there was numerically a better control at this dose rate than the lower one (18 g sulfoxaflor/ha). A dose range 18-24 g/ha is judged appropriate.

For *Eriosoma lanigerum* (ERISLA): the dose rate of 48 g sulfoxaflor/ha provided better efficacy levels compared to 24 g/ha. To achieve good efficacy results, the product should be applied as a preventive treatment.

As a conclusion: in presence of the most difficult to control aphid, *Eriosoma lanigerum* (ERISLA), the dose of 48 g a.s./ha is considered as justified on pome fruits. When other aphids are the main target (APHIPO and/or DYSAPL), a dose range 18-24 g/ha is judged appropriate.

Aphid control in stone fruits

Between 2008 and 2014, 32 trials were conducted in the EU regulatory Southern zone to determine the minimum effective dose rate for sulfoxaflor against aphids in stone fruits. In the minimum effective dose trials conducted in Italy (9 trials), France (6 trials), Greece (1 trial), Portugal (2 trials) and Spain (14 trials) sulfoxaflor was tested at various dose rates from 6 to 48 g a.s./ha in several stone fruit crops (peach (14), nectarine (10), plum (3) and cherry (5) for controlling the most important aphid species like *Myzus persicae* (MYZUPE), *Myzus cerasi* (MYZUCE), *Brachycaudus helichrysi* (ANURHE), *Aphis spiraecola* (APHISI) and *Hyalopterus pruni* (HYALPR). One application was carried out at the development stage of BBCH 51-89, depending on situation either preventative or curative. All trials were carried out under GEP and in accordance with the relevant EPPO guidelines. Treatments were applied to all trials using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 300-1,319 L/ha using conventional nozzles.

Sulfoxaflor delivered sufficient efficacy on all tested species in stone fruits and showed a dose response in both preventative and curative situations. The efficacy of sulfoxaflor reached a plateau at 36 g a.s./ha against *Myzus persicae*, which species has the largest data base having data on both NNI resistant and non resistant populations (**Table 6.1.4-11**). The dose response on *Myzus cerasi* was similar, showing again the superiority of the 36 g a.s./ha especially in the preventative applications (

Table 6.1.4-12). There are only a few trials available against *Brachycaudus helichrysi* (ANURHE), *Hyalopterus pruni* (HYALPR) and *Aphis spiraecola* (APHISI) and in those trials the dose response was also observable and sulfoxaflor efficacy reached a plateau at 24 g a.s./ha delivering sufficient knock down and long lasting efficacy. The efficacy at the minimum effective rates was always sufficient and comparable therefore, the rate of 36 g a.s./ha is claimed as the minimum effective dose rate for sulfoxaflor against MYZUPE and MYZUCE, and 24 g a.s./ha is claimed against thel other aphid species attacking stone fruits in the EU regulatory Southern zone.

Table 6.1.4-11 Efficacy of sulfoxaflor against *Myzus persicae* (MYZUPE) in peach and nectarine (summary across 13 post-flowering open field trials).

Days after appl.		Efficacy of sulfoxaflor in %			
		18 g a.s./ha	24 g a.s./ha	36 g a.s./ha	48 g a.s./ha
		1 spray	1 spray	1 spray	1 spray
2-3 DAA	**Mean**	**65.9**	**73.6**	**81.3**	**72.7**
	Limits	*62.5-68.9*	*36.8-96.3*	*38.3-100*	*40.6-87.0*
7 DAA	**Mean**	**88.7**	**90.5**	**91.5**	**94.0**
	Limits	*79.4-95.1*	*59.5-100*	*74.1-100*	*87.6-99.1*
14 DAA	**Mean**	**84.2**	**79.8**	**94.4**	**92.2**
	Limits	*77.7-94.9*	*47.5-100*	*75.0-100*	*75.0-99.6*
21 DAA	**Mean**	**69.0**	**85.8**	**92.7**	**83.9**
	Limits	*64.2-89.7*	*56.7-100*	*75.0-100*	*49.9-99.3*
28 DAA	**Mean**	**64.6**	**80.3**	**87.7**	**79.0**
	Limits	*72.6-91.6*	*60.9-97.8*	*73.4-97.8*	*75.0-98.5*
2-3 DAA	**nr of trials**	5	5	5	
	Mean	66.0	69.7	79.3	
	Limits	*62.5-68.9*	*62.2-79.4*	*66.0-88.1*	
7 DAA	**nr of trials**	6	6	6	
	Mean	88.7	90.4	88.8	
	Limits	*79.4-95.1*	*77.8-98.4*	*74.1-99.5*	
14 DAA	**nr of trials**	5	5	5	
	Mean	84.2	85.9	93.4	
	Limits	73.7-94.9	47.5-95.6	75.0-99.7	
21 DAA	**nr of trials**	5	5	5	
	Mean	78.5	84.5	93.5	
	Limits	*64.2-89.7*	*56.7-96.3*	*75.0-99.5*	
28 DAA	**nr of trials**	3	3	3	
	Mean	79.7	79.0	89.5	

	Limits	*72.6-91.6*	*60.9-95.5*	*75.0-97.7*	

Table 6.1.4-12 Efficacy of sulfoxaflor against *Myzus cerasi* in cherry in pre- and post-flowering open field trials.

Days after appl.		Efficacy of sulfoxaflor			
		12 g a.s./ha	**24 g a.s./ha**	**36 g a.s./ha**	**48 g a.s./ha**
		1 spray	**1 spray**	**1 spray**	**1 spray**
30 DAA1	nr of trials	3	3	3	n.a.
	mean	65.6	90.9	97.7	n.a.
	limits	*42.0-79.76*	*81.8-98.8*	*93.2-100*	n.a.
40 DAA1	nr of trials	3	3	3	n.a.
	mean	52.1	78.7	97.7	n.a.
	limits	*32.1-78.82*	*62.93-92.4*	*93.0-100*	n.a.
3 DAA	nr of trials	1	1	1	n.a.
	mean	58.2	93.2	92.3	n.a.
	limits	*58.2-58.2*	*93.2-93.2*	*92.3-92.3*	n.a.
7 DAA	nr of trials	1	1	1	n.a.
	mean	92.4	99.2	99.3	n.a.
	limits	*92.4-92.4*	*99.2-99.2*	*99.3-99.3*	n.a.
14 DAA	nr of trials	1	1	1	n.a.
	mean	91.3	98.2	99.4	n.a.
	limits	*91.3-91.3*	*98.2-98.2*	*99.4-99.4*	n.a.
21 DAA	nr of trials	1	1	1	n.a.
	mean	44.8	94.4	99.9	n.a.
	limits	*44-8-44.8*	*94.4-94.4*	*99.9-99.9*	n.a.

ZRMS conclusion: Aphids control in stone fruits

Between 2008 and 2014, 32 Mediterranean trials were conducted in Italy (9 trials), France (6 trials), Greece (1 trial), Portugal (2 trials) and Spain (14 trials) in several stone fruit crops (peach (14), nectarine (10), plum (3) and cherry (5) for the control of *Myzus persicae* (MYZUPE, 21 trials: 8 at pre-flowering application + 13 at post-flowering application), *Myzus cerasi* (MYZUCE, 5 trials), *Hyalopterus pruni* (HYALPR, 3 trials), *Aphis spiraecola* (APHISI, 2 trials) and *Brachycaudus helichrysi* (ANURHE). One common trial presented results for both APHISI and ANURHE.

The results obtained in peach, nectarine, plum and cherry to control *Myzus persicae* (MYZUPE) and *Myzus cerasi* (MYZUCE) showed that the claimed dose rate of 36 g sulfoxaflor/ha could be considered as the minimum effective dose on MYZUPE and MYZUCE in stone fruits either at pre- or post-flowering application.

As for the other aphids *Brachycaudus helichrysi* (ANURHE), *Aphis spiraecola* (APHISI) and *Hyalopterus pruni* (HYALPR), data were not sufficient to establish a clear dose response. However, a tendency of an interesting control of the product applied at the dose rate of 24 g sulfoxaflor/ha was observable against these aphids. So, the claimed dose rate of 24 g sulfoxaflor/ha could be considered as the minimum effective dose to control aphids except for MYZUPE and MYZUCE in stone fruits.

As a conclusion: in presence of the most difficult to control aphids, MYZUPE and MYZUCE, the dose of 36 g a.s./ha is considered as justified on stone fruits. When other aphids are the main target (ANURHE and/or APHISI and/or HYALPR), a dose of 24 g/ha provided a sufficient efficacy.

Aphid control in citrus crops
18 trials were conducted in Italy, Portugal and Spain to determine the minimum effective dose for sulfoxaflor. 6 trials were set up in 2008 (Italy 2 trials, Portugal 2 trials, Spain 2 trials) for comparing the sulfoxaflor rates 6, 12, 24 and 36 g a.s./ha and 12 trials in 2011 (Italy 6 trials, Portugal 1 trial, Spain 5 trials) to compare the rates of 6, 12, 18 and 24 g a.s./ha, in accordance with the EPPO standard PP 1/225 '*Minimum effective dose'*. The trials were carried out under GEP and in accordance with the relevant EPPO guidelines. Efficacy was tested under a range of environmental conditions in several citrus species to fully challenge the product. All the 18 trials had a sufficient level of natural infestation of aphids (6-198 aphids per shoot) to obtain reliable results. Time of application ranged between the phenological stages of BBCH 51 and BBCH-81 while the spray volume ranged between 500 and 1,600 L/ha depending on the crop and country. *Aphis spiraecola (*APHISI-13 trials) *Aphis gossypii* (APHIGO-2 trials), *Toxoptera citricida* (TOXOCI-2trials) and *Toxoptera aurantii* (TOXOAU-1 trial) species were tested.

Sulfoxaflor showed clear dose response reaching a plateau at 24 g a.s./ha against all tested aphid species. **Table 6.1.4-13** shows the dose response results on the dominant aphid species, APHISI, where sulfoxaflor delivered both a reliable knock down and long lasting efficacy at 24 g a.s./ha while the lower rates were weaker at least in the residuality. The other species showed similar tendency, there was no significant diffference between their sensitivity to sulfoxaflor. Therefore, 24 g a.s./ha is considered to be the minimum effective dose rate for sulfoxaflor against all aphid species in citrus crops in the EU regulatory Southern zone.

Table 6.1.4-13 Efficacy of sulfoxaflor against APHISI in citrus (ortogonal data comparison across 10 field trials).

Days after application	Efficacy of sulfoxaflor in % on APHISI							
	6 g a.s. /ha		12 g a.s. /ha		18 g a.s. /ha		24 g a.s. /ha	
	means	limits	means	limits	means	limits	means	limits
2-3	**73.3**	(0-100)	**84.6**	(26.4-100)	**87.0**	(0-100)	**88.0**	(32.4-100)
6-9	**89.4**	(0-100)	**96.2**	(55.7-100)	**96.4**	(71.3-100)	**97.4**	(72.7-100)
12-15	**81.2**	(7.0-100)	**87.3**	(0-100)	**91.2**	(46.4-100)	**93.7**	(54.5-100)
20-21	**58.7**	(0-100)	**66.1**	(0-100)	**69.6**	(0-100)	**80.4**	(9.4-100)

ZRMS conclusion: Aphids control in citrus crops

18 Mediterranean trials were conducted: 6 trials were set up in 2008 (Italy 2 trials, Portugal 2 trials, Spain 2 trials) and 12 trials in 2011 (Italy 6 trials, Portugal 1 trial, Spain 5 trials) in several citrus species such as mandarin, orange and lemon against *Aphis spiraecola* (APHISI-13 trials), *Aphis gossypii* (APHIGO-2 trials), *Toxoptera citricida* (TOXOCI-2 trials) and *Toxoptera aurantii* (TOXOAU-1 trial).

The whole data set obtained in several citrus species against APHISI and the other aphids showed that the claimed dose rate of 24 g sulfoxaflor/ha could be considered as the minimum effective dose against aphids in citrus crops.

Aphid control in ornamentals
The most common aphid species in outdoor ornamentals and flowers are: *Myzus persicae*, *Aphis fabae* and *Macrosiphum euphorbiae.* These aphid species are also important pests in other outdoor crops, like legumes (*Myzus persicae, Aphis fabae*), potatoes (*Macrosiphum euphorbiae, Myzus persicae*), brassicas (*Myzus persicae*), etc. The

insecticide sensitivity of a certain species is similar, wether present in ornamentals or in any other outdoor crops. A full data set has been analysed for determining the minimum effective dose against above mentioned aphid species in the relevant crop chapters in the DAS EU Regulatory Southern Zone Sulfoxaflor Biology Dossier (and this dRR). The minimum effective dose rate for sulfoxaflor against *Myzus persicae*, *Aphis fabae* and *Macrosiphum euphorbiae* aphid species proved to be 24 g a.s./ha in the relevant crops across the EU regulatory Southern zone, therefore this rate is considered relevant also in ornamental crops.

In roses, Macrosiphum rosae is the most important aphid pest and there were 5 trials carried out in Italy between 2008 and 2012 to determine the minimum effective dose rate for sulfoxaflor against this species. Sulfoxaflor was tested at several dose rates from 6 to 48 g a.s./ha including the proposed label rate of 24 g a.s./ha and some lower and higher rates, in accordance with the EPPO standard PP 1/225 '*Minimum effective dose*'. Efficacy was tested under a range of environmental conditions to fully challenge the product on sufficient level of natural infestation of aphids (1-48 aphids/shoot). One application was carried out at development stages between BBCH 51 and 65. Treatments were applied using a backpack sprayer (engine or compressed air), calibrated to a spray volume of 800-1,408 L/ha.

Sulfoxaflor showed a dose response in the trials where the efficacy reached a plateau at the rate of 24 g a.s./ha delivering reliable knock down and long lasting activity. Actually all rates provided sufficient knock down effect but the lower rates became unefficient by 2 weeks after application (**Table 6.1.4-14**). These results confirmed the minimum effective rate of sulfoxaflor established also in vegetable crops, potato and legume crops against *Myzus persicae*, *Aphis fabae* and *Macrosiphum euphorbiae* aphid species. As these four very important species proved to be controlled sufficiently by the 24 g a.s./ha rate of sulfoxaflor, this is the recommended dose rate for the control of aphids in ornamental crops grown in open fields.

Table 6.1.4-14 Efficacy of sulfoxaflor at 6, 12, 18, 24 and 48 g a.s./ha dose rates against aphids in flowers (summary across 5 open field trials).

Days after appl.		**Efficacy of sulfoxaflor in %**				
		6 g a.s./ha	**12 g a.s./ha**	**18 g a.s./ha**	**24 g a.s./ha**	**48 g a.s./ha**
1-3DAA	mean	87.8	89.7	95.2	93.6	96
	limits	*23.4-100*	*38.8-100*	*74.1-100*	*54.2-100*	*85.8-100*
7DAA	mean	92	97.5	97.3	99	97
	limits	*62-100*	*92.4-99.8*	*85.6-100*	*89.1-100*	*92-100*
14DAA	mean	74.7	82.2	82.7	90.1	89.6
	limits	*0-99*	*37.3-98.9*	*57.1-100*	*73.6-99.5*	*71.8-100*
1-3DAA1	nr of trials	*4*	*4*	-	*4*	-
	mean	*88.2*	*90.1*	-	*92.4*	-
	limits	*60.2-100*	*62.4-100*	-	*70.5-100*	-
7DAA1	nr of trials	*3*	*3*	-	*3*	-
	mean	*91.2*	*98.1*	-	*99.6*	-
	limits	*83.3-98*	*97.2-99.6*	-	*99.4-99.9*	-
14DAA1	nr of trials	*3*	*3*	-	*3*	-
	mean	*84.2*	*85.7*	-	*96.4*	-
	limits	*75-94.3*	*81.7-90*	-	*93.5-98.4*	-

21-30DAA1	nr of trials	*5*	*5*	-	*5*	-
	mean	*57.7*	*60.8*	-	*67.3*	-
	limits	*41.9-69.6*	*49-75.2*	-	*55.4-74.4*	-

Efficacy comparison of sulfoxaflor sprayed at different rates to commercial standards against aphids in ornamental crops grown in fields

Trial number	**Assessment (days after the application)**	**Pest code**	**Untreated pest level at evaluation**	**Efficacy treatments (Henderson-Tilton & Abbot) in %, Tukey's mean comparison (P:5%)**				
				6 g a.s./ha	**12 g a.s./ha**	**18 g a.s./ha**	**24 g a.s./ha**	**48 g a.s./ha**
IT08C1C109ET01C	1DAA1	MACSRO	1.7 mobile forms/shoot	60.2 a	**62.4 a**	**na**	**70.5 a**	na
IT08C1C109ET01C	3DAA1	MACSRO	3 mobile forms/shoot	96.8 c	98.1 b	na	99.2 a	na
IT08C1C109ET01C	7DAA1	MACSRO	3.9 mobile forms/shoot	83.3 b	99.6 a	na	99.5 a	na
IT08C1C109ET01C	14DAA1	MACSRO	10.5 mobile forms/shoot	94.3 b	**90 a**	**na**	**97.4 a**	na
IT08C1C109ET01C	21DAA1	MACSRO	13.1 mobile forms/shoot	69.6 a	75.2 a	na	74.4 a	na
IT08C1C109ET01C	27DAA1	MACSRO	14.5 mobile forms/shoot	65.8 a	70.1 a	na	68.1 a	na
IT11C1C007ET03C	3DAA1	MACSRO	48.3 mobile forms/shoot	95.9 b	100 a	100 a	100 a	na
IT11C1C007ET03C	7DAA1	MACSRO	28.0 mobile forms/shoot	92.4 c	97.2 b	98.5 ab	99.4 a	na
IT11C1C007ET03C	14DAA1	MACSRO	46.3 mobile forms/shoot	75 e	**85.4 c**	**90.4 ab**	**93.5 a**	na
IT11C1C007ET03C	21DAA1	MACSRO	14.1 mobile forms/shoot	52.8 ab	52.9 ab	53.4 ab	55.4 ab	na
IT11C1C007ET03C	28DAA1	MACSRO	9.9 mobile forms/shoot	58.3 ab	**56.9 ab**	**67.8 ab**	**73.2 a**	na
IT11C1C007ET05C	2DAA1	MACSRO	8.4 mobile forms/plant	100 a	100 a	100 a	100 a	na
IT11C1C007ET05C	7DAA1	MACSRO	14.5 mobile forms/plant	98.0 b	97.6 b	99.6 a	99.9 a	na
IT11C1C007ET05C	14DAA1	MACSRO	11.0 mobile forms/plant	83.4 b	**81.7 b**	**94 a**	**98.4 a**	na
IT11C1C007ET05C	22DAA1	MACSRO	9.3 mobile forms/plant	41.9 b	**49.0 b**	**61.7 ab**	**65.6 ab**	na
IT12C1C013ET01C	3DAA1	MACSRO	0.28 mobile forms/shoot	96.8 a	na	99.3 a	100 a	99.4 a
IT12C1C013ET01C	7DAA1	MACSRO	0.23 mobile forms/shoot	96.5 a	na	100 a	100 a	96.3 a
IT12C1C013ET01C	15DAA1	MACSRO	0.18 mobile forms/shoot	89.0 a	na	85.8 a	87 a	89.4 a
IT12C1C013ET01C	21DAA1	MACSRO	0.31 mobile forms/shoot	80.9 a	na	**83.6 a**	**89.3 a**	93 a
IT12C1C013ET01C	30DAA1	MACSRO	2.16 mobile forms/shoot	20.9 ab	na	7.6 b	11.5 ab	43.8 a
IT12C1C013ET03C	2DAA1	MACSRO	37.9 adults/shoot	77.5 d	na	81.6 cd	84.7 bc	92.5 a
IT12C1C013ET03C	7DAA1	MACSRO	33.9 adults/shoot	90.3 a	na	91.5 a	95.1 a	97.8 a
IT12C1C013ET03C	14DAA1	MACSRO	17.8 adults/shoot	60.2 e	na	66.8 d	76.9 c	89.9 a

ZRMS conclusion: Aphids control in ornamentals

It is to note that the use of sulfoxaflor on indoor and outdoor plants is not considered as valid, for France. This use is considered as non professional one. It is up to each MS to judge about the reliability of this opinion.

In roses, 5 trials were carried out in Italy between 2008 and 2012 against *Macrosiphum rosae* (MACSRO). The results obtained against MACSRO, at the assessment 14 DAA, showed that the claimed dose rate of 24 g sulfoxaflor/ha could be considered as the minimum effective dose in roses grown in field.

As for the other aphids such as *Aphis* sp. (APHISP) and *Macrosiphum* sp. (MACSSP), no data were submitted in ornamentals grown in field. The extrapolation of conclusions established for cucurbits, solanaceous, and/or other crops could be done for ornamentals concerning common pests such as *Aphis gossypii* and *Macrosiphum euphorbiae*. Besides, conclusions obtained indoor could support those established in field situations in ornamentals. The results obtained against aphids like *Aphis fabae* (APHIFA), *Aphis gossypii* (APHIGO) and *Macrosiphum euphorbiae* (MACSEU) in other crops such as vegetable crops showed that the statistical difference between tested dose rates (12, 18 and 24 g a.s./ha) was not always obvious. However, zRMS concludes that the results obtained with the dose rate of 24 g a.s./ha showed numerically more interesting control than the lower dose rates.

Based on the whole data set (outdoor and indoor trials), zRMS concludes that 24 g/ha is the minimum effective dose for the control of aphids in ornamentals. A dose range of 12-24 g/ha is judged appropriate.

At the commenting stage for controlled conditions dRR, some cMS (NL, ES…) commented that the effective dose on aphids (cucurbits, solanaceous and ornamentals) can be reduced from 24 to 12 g a.s./ha, considering the low difference of efficacy seen between these 2 rates (0.5 N and N).

Whitefly control in cucurbits

Between 2008 and 2013, 12 trials were conducted in the Southern EU Regulation 1107/2009 zone to determine the minimum effective dose rate for sulfoxaflor against whiteflies (*Trialeurodes vaporariorum* and *Bemisia tabaci*) in cucurbit crops grown in open field conditions. Sulfoxaflor was tested at various dose rates from 24 to 75 g a.s./ha in 8 cucumber and 4 zucchini trials in Italy (8 trials) and Greece (4 trials). All trials had sufficient level of natural infestation of whiteflies (4 – 469 mobile forms/leaf). One or two applications were carried out at development stages of BBCH 18-88, depending on the crop and country. The trials were carried out under GEP and in accordance with the relevant EPPO guidelines. Treatments were applied to all trials using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 800-1,500 L/ha using conventional nozzles.
Sulfoxaflor showed a dose response on both TRIAVA and BEMITA, which was more obvious on the long lasting activity. ~~The higher the rate higher the efficacy.~~ The single application of sulfoxaflor at a rate of 24 g a.s./ha provided only a short time control of whiteflies and started decreasing after the first week but after repeating the application 1-2 weeks after the first application, the efficacy increased again and became similar in the residual efficacy to the 1x48 g a.s./ha treatment. **Table 6.1.4-15** shows the efficacy results on TRIAVA while

Table 6.1.4-16 shows against BEMITA. TRIAVA was more sensitive to sulfoxaflor than BEMITA but they are occuring sometimes in mixed populations on the fields. As 48 g a.s./ha is the maximum registerable rate for sulfoxaflor in Europe and this rate provided sufficient level of control of whiteflies (at least on TRIAVA), comparable to the applied standards (see efficacy section), the proposed minimum effective rate (registartion rate) is 48 g a.s./ha, which can be split to 2 applications of 24 g as/ha sprayed with a 7-14 days interval against whiteflies in cucurbit crops grown in open field conditions in the EU regulatory Southern zone. These results confirmed the rates established in solanaceous crops in the EU regulatory Southern zone showing that 2x24 g as/ha sulfoxaflor sprayed with a 7-14 days interval or one application of 48 g a.s./ha are the minimum effective dose rates against whiteflies in solanaceous crops grown in fields.

Table 6.1.4-15 Efficacy of sulfoxaflor at rates of 24, 48 and at 75 g a.s./ha against *Trialeurodes vaporariorum* in cucurbit crops (summary across 5 field trials).

Days after appl.		Efficacy of sulfoxaflor in %			
		24 g a.s./ha	24 g a.s./ha	48 g a.s./ha	75 g a.s./ha
		1 sprays	2 sprays*	1 spray	1 spray
6-9DAA1	**mean**	61.3	na	70.2	68.2
	limits	*4.8-93.3*	*na*	*47.8-95.8*	*61.9-77.1*
11-15DAA1	**mean**	63.9	na	83.6	95.1
	limits	*49.2-71.3*	*na*	*61.7-96.7*	*91.8-98.4*
6-9DAA2	**mean**	na	75.9	73.0	na
	limits	*na*	*41.5-93.3*	*33.6-97.8*	*na*
11-15DAA2	**mean**	na	82.0	82.8	na
	limits	*na*	*47.1-97.4*	*65.2-97.4*	*na*
1-3DAA1	nr of trials	5	-	5	-
	mean	49.2	-	60.9	-
	limits	*42-64.7*	-	51.8-70.8	-
6-9DAA1	nr of trials	4	-	4	-
	mean	54.2	-	72.8	-
	limits	*41.2-63.4*	-	*57.1-89.3*	-
1-3DAA2	nr of trials	-	4	4	-
	mean	-	69.6	61.5	-
	limits	-	*60.1-76.1*	*27.1-85.3*	-
6-9DAA2	nr of trials	-	2	2	-
	mean	-	60.6	70.3	-
	limits	-	*36.8-84.5*	*64.2-76.5*	-
11-15DAA2	nr of trials	-	2	2	-
	mean	-	82	81.7	-
	limits	-	*78.9-85.2*	*79.1-84.4*	-

Data highlighted yellow come from an orthogonal comparison from the same trials. Mean range show the minimum and maximum single trial means and not the single data as seen in the non highlighted part of the table which shows all data available.

Table 6.1.4-16 Efficacy of sulfoxaflor at rates of 24, 48 and at 75 g a.s./ha against *Bemisia tabaci* in cucurbit crops (summary across 4 field trials).

Days after appl.		Efficacy of sulfoxaflor in %			
		24 g a.s./ha	24 g a.s./ha	48 g a.s./ha	75 g a.s./ha
		1 sprays	2 sprays*	1 spray	1 spray
6-9DAA1	**mean**	57.1	na	73.1	87.5
	limits	*0-87.7*	*na*	*52.9-94.7*	*80.7-96.4*

11-15DAA1	**mean**	52.9	na	62.1	78.1
	limits	*40.8-63.1*	*na*	*38.7-91.5*	*59.8-99.1*
6-9DAA2	**mean**	na	62.9	61.4	na
	limits	*na*	*42.6-79.5*	*39.2-79.3*	*na*
11-15DAA2	**mean**	na	52.9	62.8	na
	limits	*na*	*0-80.3*	*52.8-70.6*	*na*
1-3DAA1	nr of trials	1	-	1	-
	mean	75.2	-	90.6	-
	limits	*75.2*	-	*90.6*	-
6-9DAA1	nr of trials	1	-	1	-
	mean	51.4	-	80.4	-
	limits	*51.4*	-	*80.4*	-
1-3DAA2	nr of trials	-	1	1	-
	mean	-	77.1	78.1	-
	limits	-	*77.1*	*78.1*	-
6-9DAA2	nr of trials	-	1	1	-
	mean	-	62.9	61.4	-
	limits	-	*62.9*	*61.4*	-
11-15DAA2	nr of trials	-	1	1	-
	mean	-	52.9	62.8	-
	limits	-	*52.9*	*62.8*	-

(*) = 2 sprays at 7 days interval; DAA1 = days after application no. 1; DAA2 = days after application no. 2.

ZRMS conclusion: Whiteflies control in cucurbits

Between 2008 and 2013, 12 trials were conducted against whiteflies (*Trialeurodes vaporariorum* 8 trials and *Bemisia tabaci* 4 trials) in 8 cucumber and 4 zucchini grown in open field conditions trials in Italy (8 trials) and Greece (4 trials).

The results obtained against *Trialeurodes vaporariorum* (TRIAVA) in cucumber and zucchini showed that the claimed dose rate of 48 g sulfoxaflor/ha could be considered as the minimum effective dose.
As for *Bemisia tabaci* (BEMITA), data were not sufficient to establish a clear dose response. However a tendency of an interesting control of the product was observable when the dose rate was equal to 48 g sulfoxaflor/ha against BEMITA. Besides, the extrapolation of data from other similar crops such as solanaceous permits to consolidate this conclusion for BEMITA in cucurbits.

For information, under indoor conditions, the same tendency is seen (on same pests and same crops).

Whitefly control in solanaceous vegetable crops

Between 2007 and 2012, 6 trials on *Bemisia tabaci* (BEMITA) and 6 trials on *Trialeurodes vaporariorum* (TRIAVA) were conducted to determine the minimum effective dose rate for sulfoxaflor for the control of whiteflies in solanaceous vegetable crops (2 trials on bell pepper, 9 trials in tomato, 1 trial in eggplant) grown in open fields. Trials were carried out by Dow AgroSciences and contractor companies, all followed the appropriate EPPO standards and all are officially recognized by the competent authorities to carry out field registration trials in accordance with the principles of Good Experimental Practice (GEP). All trials were of a randomized complete block design with four replicates. Treatments were applied using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 600-1500 L/ha using conventional nozzles. Trials from Italy (6 trials), Greece (4 trials), France (1 trial) and Spain (1 trial) was used to determine the minimum effective rate of sulfoxaflor tested at various dose rates from 12 to 75 g a.s./ha. Efficacy was tested under a range of environmental conditions to fully challenge the product against sufficient level of natural infestation of whiteflies. One or two applications with 7 to 14 days interval were carried out at crop development stages of BBCH 13-48, depending on the crop and country.

Whiteflies are not regular pests in open field conditions in solanaceous crops therefore we do not have many data. However, the results showed, the dose response of sulfoxaflor was visible showing the tendency: the higher the rate higher the efficacy. These findings were in line with the greenhouse uses (Mezei and Tescari, 2014) where whiteflies are more important pests and the same conclusions were made. The efficacy of 24 g a.s./ha sulfoxaflor against the adults was excelent but was weaker against the larvae where the higher rates delivered better efficacy. After the second application of 24 g a.s./ha sulfoxaflor the efficacy increased again having a good knock down effect 3 days after application on larvae slowly decreasing during the time. The efficacy delivered by the 48 g a.s./ha rate delivered sufficient knock down and residual control as well but there was no significant difference between the 1 application of 48 g a.s./ha and the 2 applications of 24 g as/ha in the overall efficacy. Sulfoxaflor was slightly better against *Bemisia tabaci* (**Table 6.1.4-17**) than against *Trialeurodes vaporariorum* (**Table 6.1.4-18**). As 48 g a.s./ha is the maximum registerable rate of sulfoxaflor in Europe and this rate was comparable to the applied standards (see efficacy section), the proposed minimum effective rate and registartion rate is 48 g a.s./ha, which rate can be split as 2 applications of 24 g as/ha sprayed with 7-14 days interval possibly at the egg hatching stage of whiteflies in solanaceous vegetable crops grown in fields in the EU regulatory Southern zone.

Table 6.1.4-17 Efficacy of sulfoxaflor at rates of 12, 24, 36 and 48 g a.s./ha against *Bemisia tabaci* in solanaceous vehetable crops (summary across 4 field trials).

Days after appl.		**Efficacy of sulfoxaflor in %**				
		SULFOXAFLOR				
		12 g a.s./ha	**24 g a.s./ha**		**36 g a.s./ha**	**48 g a.s./ha**
		1 spray	**1 spray**	**2 sprays**	**1 spray**	**1 spray**
1-3 DAA1*	**mean**	**77.8**	**90.3**	**n.a.**	**83.2**	**82.4**
	limits	*71.6-84.1*	*89.2-91.5*	*n.a.*	*77.2-89.3*	*73.8-89.4*
3 DAA1	**mean**	**62.9**	**69.3**	**n.a.**	**73.9**	**85.05**
	limits	*46.6-73.1*	*56.6-79.9*	*n.a.*	*57-84.6*	*79-91.1*
7 DAA1	**mean**	**75.9**	**75.2**	**n.a.**	**80.2**	**84.6**
	limits	*61.1-85.9*	*59.1-88.6*	*n.a.*	*67.8-90.6*	*80.5-88.8*
14 DAA1	**mean**	**55.9**	**71.25**	**n.a.**	**72.5**	**73.6**
	limits	*51.4-61.9*	*54.8-82.2*	*n.a.*	*64.3-82.3*	*67.5-82.7*
3 DAA2	**mean**	**n.a.**	**n.a.**	**92.0**	**n.a.**	**87.1**
	limits	*n.a.*	*n.a.*	*91.0-92.7*	*n.a.*	*86.3-89.3*
7 DAA2	**mean**	**n.a.**	**n.a.**	**88.1**	**n.a.**	**86.0**
	limits	*n.a.*	*n.a.*	*86.1-90.1*	*n.a.*	*80.8-90.6*
14 DAA2	**mean**	**n.a.**	**n.a.**	**72.0**	**n.a.**	**72.4**
	limits	n.a.	n.a.	*69.5-74.6*	*n.a.*	*69.8-75.2*
21 DAA2	**mean**	**n.a.**	**n.a.**	**71.2**	**n.a.**	**85.0**
	limits	*n.a.*	*n.a.*	*28.7-93.1*	*n.a.*	*69-99.1*
1-3 DAA1*	nr of trials	2	2	n.a.	2	n.a.
	mean	77.8	90.3	n.a.	83.2	n.a.
	limits	*71.6-84.1*	*89.2-91.5*	*n.a.*	*77.2-89.3*	*n.a.*
3 DAA1	nr of trials	3	3	n.a.	3	n.a.
	mean	62.9	72.0	n.a.	74.3	n.a.

	limits	*46.6-73.1*	*56.6-79.9*	*n.a.*	*57.0-84.6*	*n.a.*
7 DAA1	nr of trials	3	3	n.a.	3	n.a.
	mean	75.9	80.7	n.a.	84.4	n.a.
	limits	*61.1-85.9*	*65.8-88.6*	n.a.	*74.6-90.6*	n.a.
14 DAA1	nr of trials	3	3	n.a.	3	n.a.
	mean	55.9	76.7	n.a.	75.3	n.a.
	limits	*51.4-61.9*	*67.6-82.2*	*n.a.*	*68.8-82.3*	*n.a.*
3 DAA1	nr of trials	n.a.	2.	n.a.	n.a.	2
	mean	n.a.	72.5	n.a.	n.a.	85.1
	limits	*n.a.*	*61.2-82.9*	*n.a.*	*n.a.*	*79-91.1*
7 DAA1	nr of trials	n.a.	2	n.a.	n.a.	2.
	mean	n.a.	72.1	n.a.	n.a.	84.7
	limits	n.a.	59.1-85.1	n.a.	n.a.	80.5-88.8

n.a. = not available value for this data point; DAA1 = days after application no. 1. All rates were applied one time only. DAA2 = days after application no. 2.;* At very 1st evaluation the knock down activity was evaluated on whitefly (BEMITA) adults. Later only whitefly larvae were evaluated.

Table 6.1.4-18 Efficacy of sulfoxaflor at rates of 24, 48, 62 and 75 g a.s./ha against *Trialeurodes vaporariorum* in solanaceous vegetable crops (summary across 4 field trials).

Days after appl.		**Efficacy of sulfoxaflor in %**			
		SULFOXAFLOR			
		24 g a.s./ha	**48 g a.s./ha**	**62 g a.s./ha**	**75 g a.s./ha**
		2 sprays	**1 spray**	**1 spray**	**1 spray**
3 DAA1	**mean**	**48.075**	**56.43**	**n.a.**	**n.a.**
	limits	*41.2-54.9*	*27.4-78.0*	n.a.	n.a.
7 DAA1	**mean**	**48.4**	**62.17**	**90.5**	**93.4**
	limits	*35.5-56.1*	34.8-83.0	*86.4-92.9*	*92.5-94.7*
14 DAA1	**mean**	**n.a.**	**77.4**	**90.8**	**93.2**
	limits	n.a.	*70.8-84.4*	*88.3-94.1*	*90.5-95.8*
3 DAA2	**mean**	**72.62**	**72.8**	n.a.	n.a.
	limits	*68.6-76.7*	*61.6-84.1*	n.a.	n.a.
7 DAA2	**mean**	**59.4**	**71.5**	n.a.	n.a.
	limits	*40.3-76.3*	*63.8-79.3*	n.a.	n.a.
14 DAA2	**mean**	**57.6**	**57.94**	n.a.	n.a.
	limits	41.8-70.8	48.2-67.7	n.a.	n.a.
3 DAA1 (2trials)	**mean**	48.1	71.0	n.a.	n.a.
	limits	*41.2-54.9*	*63.9-78.0*	n.a.	n.a.
7 DAA1 (2trials)	**mean**	45.7	62.5	n.a.	n.a.
	limits	*35.5-55.8*	*56.2-74.7*	n.a.	n.a.
3 DAA2 (2trials)	**mean**	72.7	72.9	n.a.	n.a.
	limits	*68.6-76.7*	*61.6-84.1*	n.a.	n.a.
7 DAA2 (2trials)	**mean**	60.7	71.6	n.a.	n.a.
	limits	*55.4-66.0*	*63.8-79.3*	n.a.	n.a.
14 DAA2	**mean**	51.1	67.7	n.a.	n.a.

(2trials)	limits	*41.8-60.4*	*48.2-67.7*	n.a.	n.a.

n.a. = not available value for this data point; DAA1 = days after application no. 1. All rates were applied one time only; DAA2 = days after application no. 2. The highlighted part of the data in above table came from 2 trials only as ortogonal data comparison and data show the same tendency as the comparison made by all data.

ZRMS conclusion: Whiteflies control in solanaceous crops

Between 2007 and 2012, 6 Mediterranean trials on *Bemisia tabaci* (BEMITA) and 6 Mediterranean trials on *Trialeurodes vaporariorum* (TRIAVA) were conducted for the control of whiteflies in solanaceous vegetable crops (2 trials on bell pepper, 9 trials in tomato, 1 trial in eggplant) grown in open field Italy (6 trials), Greece (4 trials), France (1 trial) and Spain (1 trial).

The results obtained against *Trialeurodes vaporariorum* (TRIAVA) and *Bemisia tabaci* (BEMITA) in tomato, eggplant and pepper showed that the claimed dose rate of 48 g sulfoxaflor/ha could be considered as the minimum effective dose rate against whiteflies in solanaceous crops grown in field.

For information, under indoor conditions, the same tendency is seen (on same pests and same crops).

Whitefly control in ornamental crops (flowers)

In 2008-2013, 5 trials (2 open field and 3 greenhouse trials) have been conducted to determine the minimum effective dose rate of sulfoxaflor against whiteflies in ornamental crops. All trials have been carried out in Italy, where sulfoxaflor was tested at various dose rates between 12 and 48 g a.s./ha in *Euphorbia*, *Lantana* and *Gerbera* crops for the control of *Trialeurodes vaporariorum* (TRIAVA). The rates reflected the proposed label rates of 2x24 and 48 g a.s./ha, in accordance with the EPPO standard PP 1/225 '*Minimum effective dose*'. Efficacy was tested under a range of environmental conditions to fully challenge the product. All 5 trials had a sufficient level of natural infestation (5.4-60.5 mobile forms/leaf) to obtain reliable results. The trials were carried out under GEP and in accordance with the EPPO Guideline 1/36 and guidelines referenced therein. Applications were carried out at development stages between BBCH 33 and 64 in open field and between BBCH 19 and 67 (BBCH code) in greenhouses. Treatments were applied to all trials using a backpack sprayer (engine air), calibrated to apply a spray volume of 1,100 L/ha for open field trials and 800-1,500 L/ha for GH trials. In both situations, conventional nozzles have been used.

Sulfoxaflor showed a dose response against TRIAVA and the efficacy reached a plateau at 48 g as/ha rate delivering sufficient efficacy especially in the first 2 weeks. The efficacy of 24 g a.s./ha rate started decreasing after the first week but after a second spray 2 weeks after the first application with the 24 g as/ha rate, the efficacy increased again and became even better than the residual efficacy of the 1x48 g a.s./ha (

Table 6.1.4-19). As both of these treatments delivered sufficient level of control of whiteflies, comparable to the applied standards, the proposed registartion rates (minimum effective rate) are 2 applications of 24 g as/ha sprayed with a 7-14 days interval or 1 application of 48 g a.s./ha. These results confirmed the rates established also in solanaceous and cucurbit crops showing that 2x24 g as/ha sprayed with a 7-14 days interval or one application of 48 g a.s./ha are the minimum effective dose rates against whiteflies in ornamental crops grown in fields.

Table 6.1.4-19 Efficacy of sulfoxaflor at 12, 24, 36 and 48 g a.s./ha dose rates against *Trialeurodes vaporariorum* in protected flowers.

Days after appl.		**Efficacy of sulfoxaflor in %**				
		12 g a.s./ha (*)	24 g a.s./ha (*)	24 g a.s./ha (**)	36 g a.s./ha (*)	48 g a.s./ha (*)
1-3DAA1	nr of data points	8	16	na	4	8
	mean	76.4	71.3	na	79.0	82.2
	limits	*47.1-85.8*	*35-94.6*	*na*	*72.7-82*	*66.2-94.7*

7DAA1	nr of data points	4	12	na	4	8
	mean	68.5	73.1	na	89.4	88.0
	limits	*40-7-85*	*42-90.2*	*na*	*78.4-93.9*	*77.4-96.8*
14DAA1	nr of data points	4	8	na	4	4
	mean	54.1	67.8	na	84.9	91.1
	limits	*18.4-72.3*	*0-87*	*na*	*82.6-90*	*85.7-96.7*
7DAA2	nr of data points	na	na	4	na	4
	mean	na	na	79.5	na	65.3
	limits	*na*	*na*	*74.2-83.8*	*na*	*58.2-76.6*
14DAA2	nr of data points	na	na	4	na	4
	mean	na	na	80.5	na	60.5
	limits	*na*	*na*	*70-85.9*	*na*	*54.9-63.7*
1-3DAA1	nr of trials	na	2	na	na	2
	mean	na	64.2	na	na	82.2
	min-max trial means	*na*	*54.1-74.2*	*na*	*na*	*81.6-82.8*
7DAA1	nr of trials	na	2	na	na	2
	mean	na	73.9	na	na	88.0
	min-max trial means	*na*	*64-83.8*	*na*	*na*	*82.7-93.4*
14DAA1	nr of trials	na	1	na	na	1
	mean	na	81.8	na	na	91.1
	min-max trial means	*na*	*81.8*	*na*	*na*	*91.1*

(*) = 1 single spray(**) = 2 sprays at 7 days interval DAA1 = days after application no. 1; DAA2 = days after application no. 2 na = not available value for this data point; Data highlighted yellow came from the same trials. Mean range show the minimum and maximum trial means and not the single data as seen in the non highlighted part, which shows all data available.

ZRMS conclusion: Whiteflies control in ornamental crops

In 2008-2013, 5 trials (2 open field and 3 greenhouse trials) were conducted in Italy in *Euphorbia*, *Lantana* and *Gerbera* crops for against *Trialeurodes vaporariorum* (TRIAVA). ZRMS accepted indoor efficacy trials as additional supportive trials. Besides, the efficacy data set can be completed by results get on the same pest on vegetable crops (cucurbits and solanaceous crops).

The results obtained in *Euphorbia*, *Lantana* and *Gerbera* crops for the control of TRIAVA showed that the claimed dose rate of 48 g sulfoxaflor/ha could be considered as the minimum effective dose rate against TRIAVA in ornamentals crops grown in field.

Bemisia tabaci (BEMITA) was not present in the trials on ornamentals. For data get on *Bemisia tabaci* (BEMITA) on solanaceous and cucurbits in greenhouse conditions, a marked dose effect was seen between 24 and 48 g/ha. It is possible to extrapolate these data on *Bemisia tabaci* for ornamentals. Therefore, the claimed dose rate of 48 g sulfoxaflor/ha could be considered as the minimum effective dose rate against BEMITA in ornamentals crops grown in field.

Scale control in pome fruits

14 trials were conducted between 2010 and 2013 across France (1 trial), Greece (1 trial), Italy (9 trial), Portugal (1 trial), and Spain (2 trials) to determine the minimum effective dose rate for sulfoxaflor tested in various rates between 24 and 48 g a.s./ha against *Quadraspidiotus perniciosus* (QUADPE) in pome fruits (11 trials in apple and 3 trials in pear). Application times ranged between the development stages of BBCH 53 and BBCH 76 and spray volumes between 750 and 1,736 L/ha were used in the trials depending on the crop and country. The trials were carried out under GEP and in accordance with the relevant EPPO Guidelines like PP 1/131 (Efficacy evaluation of insecticides, *Quadraspidiotus perniciosus*). All 14 trials had sufficient level of natural infestation of scales to obtain reliable results (1-442 scales/shoot).

The trials showed dose response reaching an average efficacy close to 80 % at the 48 g a.s./ha sulfoxaflor treatments in both preventative (before flowering-**Table 6.1.4-20**) and curative (after flowering-

Table 6.1.4-21) applications. The reduction of the dose rate below 48 g a.s./ha decreased the efficacy and increased the data variablility to an unacceptable level. As 48 g a.s./ha is also the maximum registerable rate for sulfoxaflor in Europe and this rate provided sufficient control of QUADPE similar to commercial standards (see efficacy section) the proposed minimum effective dose rate for sulfoxaflor is 48 g a.s./ha against scales in pome fruits.

Table 6.1.4-20 Minimum effective dose of sulfoxaflor against QUADPE in pome (preventative application, ortogonal data comparison across 4 field trials).

Days after application	**Efficacy of sulfoxaflor in % on fruits attacked by QUADPE**					
	sulfoxaflor 12 g a.s. /ha		**sulfoxaflor 24 g a.s. /ha**		**sulfoxaflor 48 g a.s. /ha**	
	means	limits	**means**	limits	**means**	limits
121-153	**71.1**	(59.2-83)	**64.8**	(45.6-84.9)	**79.4**	(56.6-92.3)

Table 6.1.4-21 Minimum effective dose of sulfoxaflor against QUADPE in pome fruits (curative application, ortogonal data comparison across 7 field trials).

Days after application	**Efficacy of sulfoxaflor in % on shoots attacked by QUADPE**			
	sulfoxaflor 24 g a.s. /ha		**sulfoxaflor 48 g a.s. /ha**	
	means	limits	**means**	limits
14-35	**64.9**	(22.4-82.9)	**76.4**	(28.3-94.3)

ZRMS conclusion: Scales control in pome fruits

14 Mediterranean trials were conducted between 2010 and 2013 across France (1 trial), Greece (1 trial), Italy (9 trial), Portugal (1 trial) and Spain (2 trials) against *Quadraspidiotus perniciosus* (QUADPE) in pome fruits (11 trials in apple and 3 trials in pear).

The results obtained against *Quadraspidiotus perniciosus* (QUADPE) in apple and pear crops showed that the claimed 48 g sulfoxaflor/ha could be considered as the minimum effective dose against scales in pome fruits.

Scale control in stone fruits

During 2011, 2012 and 2013, 21 trials were conducted in stone fruit crops (peaches (16), nectarine (2) and plums (3)) in France (4 trials), Greece (11 trials), Spain (2 trials) and Italy (4 trials) to determine the minimum effective dose rate for sulfoxaflor against important scale species - *Pseudalacaspis pentagona* (12 trials) and *Quadraspediotus perniciosus* (9 trials) in the EU regulatory Southern zone.

Trials were sprayed one or two times in the spring or summer (March to September) between crop stages of BBCH-69 and BBCH-89. Sulfoxaflor was tested at 12, 18, 24, 36 and 48 g a.s./ha with one application or at 12 and 24 g a.s./ha applied two times. Treatments were applied using a backpack sprayer in all trials (engine or compressed air) calibrated to apply a spray volume of 500-1,500 L/ha using conventional nozzles.

Sulfoxaflor provided a dose response between 12 and 48 g a.s./ha on both species reaching a plateau at 48 g a.s./ha (

Table 6.1.4-22). When sulfoxaflor was applied 2 times the efficacy was higher than in the single applications. The efficacy against scales delivered by the 48 g a.s./ha of sulfoxaflor was sufficient in most trials and comparable to the standards (see efficacy section). When sulfoxaflor was applied 2 times at 24 g a.s./ha rate its efficacy was very similar to the 1 application of 48 g a.s./ha rate delivering sufficient scale control. These tendencies were the most observable in the PSEAPE trials where the efficacy was higher anyway. The trial results revealed the application timing is critical to obtain good efficacy against scales. Significant differences were observed in the efficacies between the application timings. Therefore, we recommend the application should be done against the crawling larvae stage of scales, which are the most susceptible to sulfoxaflor.

As 48 g a.s./ha rate is the maximum registerable rate for sulfoxaflor in Europe and this rate is sufficient when applied at the right time (migration), the proposed minimum effective dose rate for sulfoxaflor is 48 g a.s./ha against scales in stone fruits, which rate can be split as 2 applications of 24 g a.s./ha with a 1-3 weeks spray interval depending on the population dynamics.

Table 6.1.4-22 Efficacy of sulfoxaflor at rates of 12, 18, 24, 36 and 48 g a.s./ha against *Pseudaulacaspis pentagona* (PSEAPE) and *Quadraspidiotus perniciosus* (QUADPE) in stone fruits.

Days after application		Efficacy % of sulfoxaflor		
		12 g a.s./ha	24 g a.s./ha	48 g a.s./ha
PSEAPE 21-45DAA	nr of trials	7	7	7
	Mean	62.8	70.3	78.7
	Limits	*56.7-75.9*	*68.3-71.5*	*72.3-81.9*
QUADPE 21-56DAA	nr of trials	8	8	8
	Mean	43.7	50.2	59.9
	Limits	*22.5-83.9*	*24.7--84.3*	*43.3-87.3*

ZRMS conclusion: Scales control in stone fruits

During 2011, 2012 and 2013, 21 Mediterranean trials were conducted in stone fruit crops (peaches (16), nectarine (2) and plums (3)) in France (4 trials), Greece (11 trials), Spain (2 trials) and Italy (4 trials) against important scale species - *Pseudalacaspis pentagona* (12 trials) and *Quadraspediotus perniciosus* (9 trials).

The results obtained in peaches, nectarine and plums against *Pseudaulacaspis pentagona* (PSEAP) and *Quadraspediotus perniciosus* (QUADPE) showed that the claimed dose rate of 48 g sulfoxaflor/ha could be considered as the minimum effective dose rate against scales control in stone fruits.

Scale control in citrus crops

In 2012 and 2013, 9 trials were carried out in the EU regulatory Southern zone to determine the minimum effective dose rate for sulfoxaflor against red scale (*Aonidiella aurantii*- AONDAU) in citrus. A zonal approach, using data from Greece (5 trials), Spain (1 trial) and Italy (3 trials) was used to test sulfoxaflor applied at 12, 24 and 48 g a.s./ha rates. The rates reflected the proposed label rates of 48 g a.s./ha (single application) or 24 g a.s./ha applied twice with a 7-14 days interval, and the lower rates of 12 and 24 g a.s./ha (single application), in accordance with the EPPO standard PP 1/225 '*Minimum effective dose*'. Efficacy was tested under a range of environmental conditions to fully challenge the product. All of the 9 trials had sufficient level of natural infestation to obtain reliable results (29-69 % infested fruits). The applications were carried out one or two times at development stage of BBCH 69-79 of the orange (4 trials) and mandarin (5 trials) crops. Treatments were applied to all trials using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 1,000 – 3,000 L/ha using conventional nozzles. All trials were carried out under GEP and in accordance with the relevant EPPO guidelines.

Sulfoxaflor showed a dose response against AONDAU, especially for the residual control. The single application of sulfoxaflor at the rates of 12 and 24 g a.s./ha proved to be inferior to the proposed minimum effective dose rate of 48 g a.s./ha, when applied against red scale in citrus. Two applications of sulfoxaflor at the rate of 24 g a.s./ha proved to be superior to the single application of 12 and 24 g a.s./ha and equivalent to the single application of 48 g a.s./ha rate delivering sufficient control of red scales (**Table 6.1.4-23**).

As the maximum registerable rate of sulfoxaflor is 48 g a.s./ha in Europe and this rate delivered comparable efficacy to standards (see efficacy section) the single application of 48 g a.s./ha or a double application of 24 g a.s./ha (7-14 days interval) are claimed as the minimum effective dose rates for sulfoxaflor against red scale (*Aonidiella aurantii)* in citrus.

Table 6.1.4-23 Efficacy of sulfoxaflor at the rate of 12, 24 and 48 g a.s./ha against *Aonidiella aurantii* in citrus.

Days after appl.		**Efficacy of sulfoxaflor in %**			
		12 g a.s./ha	**24 g a.s./ha**	**48 g a.s./ha**	**24 g a.s./ha**
		1 application	**1 application**	**1 application**	**2 applications**
19-46DAAA	**nr of trials**	-	5	5	-
	mean	-	56.0	76.6	-
	limits	-	40.1 – 74.0	58.5 – 93.2	-
19-46DAAA	**nr of trials**	4	4	4	-
	mean	59.5	61.6	81.1	-
	limits	41.1 – 78.1	43.8 – 74.0	72.1 – 93.2	
19-46DAAA	**nr of trials**	2	2	2	2
	mean	45.4	50.5	74.1	82.7
	limits	41.1 – 49.7	43.8 – 57.3	72.1 – 76.1	79.8 – 85.7

<u>ZRMS conclusion: Scales control in citrus crops</u>

In 2012 and 2013, 9 Mediterranean trials were carried out against red scale (*Aonidiella aurantii*-AONDAU) in citrus crops orange (4 trials) and mandarin (5 trials) using data from Greece (5 trials), Spain (1 trial) and Italy (3 trials).

The results obtained against *Aonidiella aurantii* (AONDAU) in orange and mandarin crops showed that the dose rate of 48 g sulfoxaflor/ha could be considered as the minimum effective dose rate against scales control in citrus crops.

Mealybug control in citrus crops

In 2011, 2012 and 2013, 6 trials were carried out in Europe to determine the minimum effective dose for sulfoxaflor against citrus mealybug (*Planococcus citri*) in citrus. A zonal approach, using data from Greece (5 trials) and Spain (1 trial) was used to test sulfoxaflor applied once at 24, 36 and 48 g a.s./ha . The rates reflected the proposed label rate of 48 g a.s./ha (single application) and 2 lower rates of 24 and 36 g a.s./ha (single application), in accordance with the EPPO standard PP 1/225 '*Minimum effective dose'*. Efficacy was tested under a range of environmental conditions to fully challenge the product. The 6 trials had a sufficient level of natural infestation of citrus mealybug to obtain reliable results (27-93 maelybugs/leaf). One application was carried out at development crop stage of BBCH 69-74 of orange (4 trials) and mandarin (2 trials) crops. Treatments were applied to all trials using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 1,000 – 2,800 L/ha using conventional nozzles. The trials were carried out under GEP and in accordance with the relevant EPPO guidelines.
Sulfoxaflor showed a dose response against PSECCI, which was obvious at each evaluation. The single application of sulfoxaflor at the rates of 24 and 36 g a.s./ha proved to be inferior to dose rate of 48 g a.s./ha, which rate provided sufficient control of citrus mealybug in citrus (

Table 6.1.4-24). As the maximum registerable rate of sulfoxaflor is 48 g a.s./ha in Europe and this rate delivered comparable efficacy to standards (see efficacy section) the single application of 48 g a.s./ha should be considered as the minimum effective dose rate against *Planococcus citri* in citrus.

Table 6.1.4-24 Efficacy of sulfoxaflor at the rate of 24, 36 and 48 g a.s./ha against *Planococcus citri* (PSECCI) in citrus.

Days after appl.		**Efficacy of sulfoxaflor in %**		
		24 g a.s./ha	**36 g a.s./ha**	**48 g a.s./ha**
		1 application		
11-21DAAA	**nr of trials**	5	-	5
	mean	49.4	-	67.3
	limits	8 – 89.7	-	31.2 – 91.8
11-21DAAA	**nr of trials**	3	3	3
	mean	22.7	38.8	tendancy
	limits	8 – 46.6	20.7 – 60.1	31.2 – 63.1
28-54DAAA	**nr of trials**	5	-	5
	mean	54.6	-	77.9
	limits	21.1 – 93.5	-	49.6 – 98.1
28-54DAAA	**nr of trials**	3	3	3
	mean	28.7	44.4	64.4
	limits	21.1 – 40.7	32.5 – 57.8	49.6 – 73.6

ZRMS conclusion: Mealybugs control in citrus crops

In 2011, 2012 and 2013, 6 Mediterranean trials were carried out against citrus mealybug (*Planococcus citri*) in citrus crops (orange (4 trials) and mandarin (2 trials)) using data from Greece (5 trials) and Spain (1 trial).

The results obtained against *Planococcus citri* (PSECCI) in orange and mandarin crops showed that the claimed dose rate of 48 g sulfoxaflor/ha could be considered as the minimum effective dose against mealybugs in citrus.

IIIA 6.1.5 EFFICACY TESTS

Field trials were established in order to demonstrate the efficacy of sulfoxaflor in comparison to widely used commercial standards for the control of the target pests claimed for registration. Sulfoxaflor was tested at the proposed label rates (minimum effective rates) in the target crops for the control of important sap feeding pests. Efficacy was tested under a range of environmental conditions to fully challenge the product. All trials were conducted by officially recognized testing organizations with the Good Experimental Practices (GEP) and followed the appropriate EPPO standards PP 1/135, PP 1/152, PP 1/181, and the pest specific guidelines. **Table 6.1.5-25** includes the distribution of trials used for the efficacy analysis showing the number of trials by crop, pest, country, EPPO climatic zone and established year.

Table 6.1.5-25 Distribution of trials included in the efficacy analysis

Crop	Pests	Country / Eppo climatic zone	Year / Number of trials
Cucurbits	Aphids (APHIGO, MYZUPE, APHIGO, APHINA),	Spain/Med.	2008/8, 2010/4
		France/Med. ~~and Maritime~~	2008/2, 2009/1
		Italy/Med.	2008/2, 2009/1, 2010/7
		Portugal/Med.	2008/1
		Greece/Med.	2009/2
Total		**28**	**2008/13; 2009/4; 2010/11**
Cucurbits	Whiteflies (TRIAVA, BEMITA)	Italy/Med.	2008/1, 2009/2, 2011/2, 2012/2, 2013/1
		Greece/Med.	2009/2, 2011/2
		~~Cyprus/Med.~~	~~2012/1~~
Total		**~~13~~ 12**	**2008/1, 2009/4, 2011/4, 2012/~~3~~ 2, 2013/1**
Solanaceous crops	Aphids (APHIGO, MYZUPE, MACSEU)	Spain/Med.	2008/1, 2009/1, 2010/1
		France/Med. and Maritime	2007/1, 2008/1
		Italy/Med.	2008/3, 2009/1, 2010/3
Total		**12**	**2007/1, 2008/5, 2009/2, 2010/4**
Solanaceous crops	Whiteflies (TRIAVA, BEMITA)	Spain/Med.	2011/1
		France/Med.	2008/1
		Italy/Med.	2008/4, 2010/1, 2011/1
		Greece/Med.	2007/1, 2010/1, 2011/1, 2012/1
Total		**12**	**2007/1, 2008/5, 2010/2, 2011/3, 2012/1**
Leafy vegetable (lettuce) crops	Aphids (MYZUPE, NASORN)	Italy/Med.	2011/5
		Spain/Med.	2007/2, 2008/1, 2011/2, ~~2012/3,~~ 2012/4
		France/Med.	2008/3, 2012/1
		Portugal/Med.	2008/1
Total		**12 + 7 = 19**	**2007/2, 2008/5, 2011/2+5, 2012/4+1**
Potato	Aphids (MYZUPE, APHINA, MACSEU, APHIFA, AULASO, APHIGO)	United Kingdom/ Maritime	2008/3, 2010/1, 2011/1
		Germany/Maritime	2008/2, 2011/4, 2012/1
		France/Maritime	2008/2, 2012/2
Total		**16**	**2008/7, 2010/1, 2011/5, 2012/3**
Brassica crops	Aphids (BRVCBR, MYZUPE)	Spain/Med.	2008/4
		Italy/Med.	2008/2, 2011/6, 2012/4, 2013/2
Total		**18**	**2008/6, 2011/6, 2012/4, 2013/2**

Legumes (peas and beans)	Aphids (ACYRON, APHIFA)	Czech Rep./Maritime	2008/3
		France /Maritime	2008/5
		Greece/Med.	2007/2, 2008/1
		Spain/Med.	2012/2
Total		**13**	**2007/2, 2008/9, 2012/2**
Pome fruits	Aphids (DYSAPL, APHIPO, APHIGO, APHISI, APHIFA, ERISLA)	Italy/Med.	2008/2, 2009/2, 2010/1, 2011/5, 2012/2, 2013/1
		France/Med. and Maritime	2008/3, 2009/2, 2011/6, 2012/3, 2013/1
		Spain/Med.	2008/4, 2009/2, 2011/3, 2012/2
		Greece/Med.	2008/3, 2011/2, 2012/2
		Portugal/Med.	2008/2, 2011/4
Total		**52**	**2008/14, 2009/6, 2010/1, 2011/20, 2012/9, 2013/2**
Pome fruits	Scales (QUADPE)	Italy/Med.	2010/1, 2011/3, 2012/3, 2013/2
		France/Med.	2013/1
		Greece/Med.	2012/1
		Portugal/Med.	2012/1
		Spain/Med.	2012/1, 2013/1
Total		**14**	**2010/1, 2011/3, 2012/6, 2013/4**
Stone fruits	Aphids (MYZUPE, ANURHE, HYALPR, APHISI, MYZUCE)	Spain/Med.	2008/6, 2011/2, 2013/4, 2014/2
		France/Med.	2008/3, 2011/1, 2013/2
		Italy/Med.	2008/2, 2011/2, 2013/1, 2014/4
		Portugal/Med.	2008/2
		Greece/Med.	2008/1
Total		**32**	**2008/14, 2011/5, 2013/7, 2014/6**
Stone fruits	Scales (PSEAPE, QUADPE)	France/Med. and Maritime	2011/2, 2012/1, 2013/1
		Greece/Med.	2011/3, 2012/6, 2013/2
		Spain/Med.	2012/2
		Italy/Med.	2012/3, 2013/1
Total		**21**	**2011/5, 2012/12, 2013/4**
Citrus	Aphids (APHISI, APHIGO, TOXOAU, APHICI)	Spain/Med.	2008/2, 2011/5
		Italy/Med.	2008/2, 2011/6
		Portugal/Med.	2008/2, 2011/1
Total		**18**	**2008/6, 2011/12**
Citrus	Scales (AONDAU)	Spain/Med.	2012/1
		Greece/Med.	2012/2, 2013/3
		Italy/Med.	2012/2, 2013/1
Total		**9**	**2012/5, 2013/4**
Citrus	Mealybugs (PSECCI)	Spain/Med.	2013/1
		Greece/Med.	~~2011/2, 2012/2, 2013/3, 2014/1~~ 6 trials
Total		**~~9~~ 6**	**2011/2, 2012/2, 2013/~~4~~ 3, ~~2014/1~~**
Ornamentals	Aphids (MACSRO, PHYAFA)	Belgium/ Maritime	2008/1
		Italy/Med.	2008/1, 2011/2, 2012/2
Total		**6**	**2008/2, 2011/2, 2012/2**

Ornamentals	Whiteflies (TRIAVA, BEMITA)	Italy/Med.	2008/2, 2012/1, 2013/2
Total		**5**	**2008/2, 2012/1, 2013/2**

Med. means Mediterranean EPPO climatic zone

Aphid control in cucurbits

Between 2008 and 2010, a series of 24 trials were carried out in the Southern EU Regulation 1107/2009 zone in France 2 trials, in Spain 10 trials, in Italy 10 trials, in Greece 2 trials to determine the efficacy of sulfoxaflor in comparison to widely used reference products like acetamiprid against *Aphis gossypii* (APHIGO) in cucurbit crops grown in open field situations. One application was done at the development stage of BBCH 17-89 of cucurbit crops, depending on the crop and the situation. Infestation level at application ranged between 1 and 513 aphids/leaf ensuring sufficient level to obtain reliable results. The tested crops were cucumber (4 trials), zucchini (9 trials), melon (8 trials) and watermelon (3 trials) grown in open fields. 200-1500 litre/ha spray volume was used for the trials applied by backpack sprayers.

Some minor aphid species like *Aphis fabae* (APHIFA), *Myzus persicae* (MYZUPE) and *Aphis nasturtii* (APHINA) have been also found in a few cucurbit trials and sulfoxaflor was tested against them. Between 2008 and 2010, 4 trials were carried out in the EU regulatory Southern zone to determine the efficacy of sulfoxaflor in comparison to the reference acetamiprid against MYZUPE (2 trials), APHINA (1 trial) and APHIFA (1 trial) in melon and zucchini crops grown in open fields.

In general, efficacy of sulfoxaflor at 24 g a.s./ha, which is the recommended rate, was comparable to acetamiprid at each assessment intervals against all tested species delivering sufficient knock down and residual activity very close to acetamiprid applied at 75 g a.s./ha. **Table 6.1.5-26** shows the efficacy comparison results against APHIGO, which is the dominant species in cucurbit crops. The individual trial results against MYZUPE (2 trials), APHINA (1 trial) and APHIFA (1 trial) showed similar results to APHIGO. With the limited number of trials it is not possible to set specific rates for these minor species but it can be concluded that applications of 24 g a.s./ha of sulfoxaflor, which is the minimum effective dose rate for *Aphis gossypii,* also sufficient on the other aphid species present in cucurbit crops. In the case of a high level infestation or continuous immigration, the 24 g a.s./ha rate can be repeated if necessary.

Table 6.1.5-26 Performance of sulfoxaflor in comparison to the reference acetamiprid against aphids (APHIGO) in cucurbit crops.

Days after appl.	Efficacy % of sulfoxaflor			Efficacy % of acetamiprid		
	24 g a.s./ha			75 g a.s./ha		
	mean	*limits*	nr of trials	mean	*limits*	nr of trials
1-2	88.2	*78-98.4*	2	94.8	*91.6-98*	2
3-4	98.9	*92.6-100*	9	99.3	*96-100*	9
6-10	99.7	*98.4-100*	8	99.7	*98.4-100*	8
13-16	99	*96-100*	5	99.7	*98.8-100*	5
20-21	99.9	*99.8-100*	3	100	*99.9-100*	3

ZRMS conclusion: Aphids control in cucurbits

Between 2008 and 2010, 24 Mediterranean trials were carried out in Spain (10 trials), Italy (10 trial), France (2 trials) and Greece (2 trials) in zucchini (9 trials), melon (8 trials), cucumber (4 trials) and watermelon (3 trials) crops for the control of *Aphis gossypii*.

Moreover, 4 additional Mediterranean trials were carried out between 2008 and 2010 against *Aphis fabae* (1 trial), *Myzus persicae* (2 trials) and *Aphis nasturtii* (1 trial) in melon (2 trials) and zucchini (2 trials) grown in open field in France (1 trial), Portugal (1 trial) and Spain (2 trials).

The results obtained against *Aphis gossypii* (APHIGO) and the other aphids, *Aphis fabae* (APHIFA), *Myzus persicae* (MYZUPE) and *Aphis nasturtii* (APHINA), in cucumber, zucchini, melon and watermelon showed that the efficacy of CLOSER applied at the claimed dose of 24 g sulfoxaflor/ha was comparable to that of the reference based on acetamiprid (75 g/ha).
Aphis gossypii is the aphid the most common on cucurbits. The extrapolation table PP 1/257 IEET 37 (2) for minor uses allows extrapolating data from solanaceous to cucurbits, concerning *Myzus persicae,* if judged necessary.

For information, under indoor conditions (12 trials), the same tendency is seen (on same pest *Aphis gossypii* and same crops).

The efficacy level of CLOSER could be considered as satisfactory in cucurbits grown in field to control aphids.

Aphid control in solanaceous vegetable crops

Between 2007 and 2010, 12 trials -2 trials in France, 7 in Italy, 3 in Spain- were conducted in solanaceous vegetable crops (pepper (1), tomato (7) and eggplant (4)) grown in fields using 300-1,000 L/ha spray volume, to demonstrate the efficacy of sulfoxaflor on important aphid species, *Aphis gossypii, Myzus persicae* and *Macrosiphum euphorbiae,* in comparison to commercial standards, mainly acetamiprid. Trials were sprayed one time between crop growth stages of BBCH-29 and BBCH-89. Infestation level at the time of application was sufficient to obtain reliable results (2-40 aphids/leaf).

Sulfoxaflor applied at the recommended dose rate of 24 g a.s./ha provided sufficient knock down effect, as well as a residual control up to 21 days after application being at least as good as the standard acetamiprid at 75 g a.s./ha on all 3 tested aphid species. The efficacy trials justified the proposed dose rate of 24 g a.s./ha for sulfoxaflor, which was comparable to standards and delivered the required level of knock down and residual efficacy on the 3 most important aphid species (*Aphis gossypii, Macrosiphum euphorbiae* and *Myzus persicae)* damaging solanaceous vegetable crops grown in open field conditions.

Table 6.1.5-27 Performance of sulfoxaflor against different aphid species in solanaceous vegetable crops.

Pest species	Days after appl.	Efficacy in %					
		sulfoxaflor 24 g a.s./ha			acetamiprid 75 g a.s./ha		
		mean	*Limits*	nr of trials	mean	*limits*	nr of trials
APHIGO	1-4	99.6	*99.1-100*	3	99.8	*99.6-100*	3
	7-8	99.7	*99.3-100*	3	99.1	*98.7-99.6*	3
	13-14	89.4	*72.6-100*	3	92.8	*88.8-99.0*	3
	20-22	92.7	*85.4-100*	2	87.2	*74.3-100*	2
MYZUPE	1-4	83.7	*70.9-96.4*	2	93.5	*92.5-94.4*	2
	7-8	94.2	*92.4-96.0*	2	96.9	*95.7-98.1*	2
	13-14	96.5	*96.4-96.5*	2	94.3	*90.1-98.5*	2
MACSEU	1-4	93.7	*93.6-93.8*	2	82.2	*67.7-96.7*	2
	7-8	99.2	*98.9-99.4*	2	84.0	*68.2-99.8*	2
	13-14	99.8	*99.6-100*	2	99.9	*99.7-100*	2
	20-22	97.2	*97.2-97.2*	1	94.1	*94.1-94.1*	1
TOTAL	1-4	93.4	*70.9-100*	7	93.0	*67.7-100*	7

DATA	7-8	98.0	*92.1-100*	7	94.2	*68.2-99.8*	7
	13-14	94.4	*72.6-100*	7	95.2	*88.8-100*	7
	20-22	94.2	*85.4-100*	3	89.5	*74.3-100*	3

ZRMS conclusion: Aphids control in solanaceous crops

Between 2007 and 2010, 12 trials were conducted in pepper (1 trial), tomato (7 trials) and eggplant (4 trials) grown in field to determine the minimum effective dose rate for sulfoxaflor for the control of aphids:
Aphis gossypii (5 trials in Spain (2) and Italy (3)) in eggplant (3trials), pepper (1 trial) and tomato (1 trial),
Myzus persicae (3 trials in France (1 Maritime) and Italy (2)) in tomato (3 trials),
And *Macrosiphum euphorbiae* 4 trials (in France (1 Mediterranean), Spain (1) and Italy (2)) in tomato (3 trials) and eggplant (1 trial).

The results obtained in pepper, tomato and eggplant against *Aphis gossypii* (APHIGO), *Myzus persicae* (MYZUPE) and *Macrosiphum euphorbiae* (MACSEU) showed that the efficacy of CLOSER applied at the claimed dose of 24 g sulfoxaflor/ha was comparable to that of the reference based on acetamiprid (75 g/ha).

For information, under indoor conditions (15 trials), the same tendency is seen (on same pests and same crops).

The efficacy level of CLOSER could be considered as satisfactory in solanaceous crops grown in field to control aphids.

Aphid control in leafy vegetable crops (lettuce)

From one hand, the petitioner provided 12 efficacy trials to demonstrate the comparability of the two sulfoxaflor formulations GF-2032 (240 g a.s./L) and GF-2626 (proposed dose rate 120 g a.s./L). The comparability testing was carried out at dose rates of 12g a.s/ha and 24 g a.s./ha in Spain (6 trials), France (1 trial) and Italy (5 trials). One application was carried out at development stage of BBCH 20 – 89 of the crop. All trials were set up in open field lettuce crop against Nasonovia ribisnigri (10) and Myzus persicae (2), the most common aphid species in lettuce.

Efficacy trials used for the biological comparability of formulations.

Political/Administrative Zone	EPPO Zone	Country	Year	Trial number	Official Testing Organization	EPPO Guideline	Trial status
Efficacy trials against *Nasonovia ribisnigri*							
Southern	Mediterranean	Spain	2011	ES11C1C012JM01	Dow AgroSciences (SP)	PP 1/24	GEP
Southern	Mediterranean	Spain	2011	ES11C1C012JM02	Dow AgroSciences (SP)	PP 1/24	GEP
Southern	Mediterranean	Italy	2011	IT11C1C012AF01	Dow AgroSciences (SP)	PP 1/24	GEP
Southern	Mediterranean	Italy	2011	IT11C1C012ET01C	A.S.T.R.A. (IT)	PP 1/24	GEP
Southern	Mediterranean	Italy	2011	IT11C1C012ET05C	Agrobiocontrol (IT)	PP 1/24	GEP
Southern	Mediterranean	Italy	2011	IT11C1C012ET02C	Agrobiocontrol (IT)	PP 1/24	GEP
Southern	Mediterranean	Italy	2011	IT11C1C012ET03C	Dow AgroSciences (IT)	PP 1/24	GEP
Southern	Mediterranean	Spain	2012	ES12C1C012MT02C	Métodos y Servicios (SP)	PP 1/24	GEP
Southern	Mediterranean	Spain	2012	ES12C1C012SC02	Dow AgroSciences (SP)	PP 1/24	GEP
Southern	Mediterranean	Spain	2012	ES12C1C012SC03	Dow AgroSciences (SP)	PP 1/24	GEP
Efficacy trials against *Myzus persicae*							
Southern	Mediterranean	Spain	2012	ES12C1C012MT01C	Métodos y Servicios (SP)	PP 1/24	GEP

Southern	Mediterranean	France	2012	FR12C1C012JG02	Dow AgroSciences (FR)	PP 1/24	GEP

On the other hand, 19 trials (including the 12 trials mentioned above) were conducted between 2007 and 2012 to determine the minimum effective dose for sulfoxaflor against aphids in leafy vegetables (lettuce, field crop).

Efficacy trials used for determining the minimum effective dose rate of sulfoxaflor against aphids in lettuce.

Political / Administrative Zone	EPPO Zone	Country	Year	Trial number	Official Testing Organization	EPPO Guideline	Trial status
Efficacy trials against *Nasonovia ribisnigri*							
Southern	Mediterranean	Spain	2007	ES07X03006JM02	Dow AgroSciences (SP)	PP 1/24	GEP
Southern	Mediterranean	Spain	2007	ES07X03006SC02	Dow AgroSciences (SP)	PP 1/24	GEP
Southern	Mediterranean	Spain	2008	ES08C1C013MT01C	Agrotécnica del Sur S.L. (SP)	PP 1/24	GEP
Southern	Mediterranean	Portugal	2008	PT08C1C013MT01C	Agrotfile (PT)	PP 1/24	GEP
Southern	Mediterranean	France	2008	FR08C1C063CR02C	S.F.R. (FR)	PP 1/24	GEP
Southern	Maritime	France	2008	FR08C1C063CR03C	Solevi (FR)	PP 1/24	GEP
Southern	Maritime	France	2008	FR08C1C063CR04C	Eurofins Agroscience Service Sarl (FR)	PP 1/24	GEP
Southern	Mediterranean	Spain	2011	ES11C1C012JM01	Dow AgroSciences (SP)	PP 1/24	GEP
Southern	Mediterranean	Spain	2011	ES11C1C012JM02	Dow AgroSciences (SP)	PP 1/24	GEP
Southern	Mediterranean	Italy	2011	IT11C1C012AF01	Dow AgroSciences (SP)	PP 1/24	GEP
Southern	Mediterranean	Italy	2011	IT11C1C012ET01C	A.S.T.R.A. (IT)	PP 1/24	GEP
Southern	Mediterranean	Italy	2011	IT11C1C012ET05C	Agrobiocontrol (IT)	PP 1/24	GEP
Southern	Mediterranean	Italy	2011	IT11C1C012ET02C	Agrobiocontrol (IT)	PP 1/24	GEP
Southern	Mediterranean	Italy	2011	IT11C1C012ET03C	Dow AgroSciences (IT)	PP 1/24	GEP
Southern	Mediterranean	Spain	2012	ES12C1C012MT02C	Métodos y Servicios (SP)	PP 1/24	GEP
Southern	Mediterranean	Spain	2012	ES12C1C012SC02	Dow AgroSciences (SP)	PP 1/24	GEP
Southern	Mediterranean	Spain	2012	ES12C1C012SC03	Dow AgroSciences (SP)	PP 1/24	GEP
Efficacy trials against *Myzus persicae*							
Southern	Mediterranean	Spain	2007	ES07X03006SC02	Dow AgroSciences (SP)	PP 1/24	GEP
Southern	Mediterranean	Spain	2012	ES12C1C012MT01C	Métodos y Servicios (SP)	PP 1/24	GEP
Southern	Maritime	France	2012	FR12C1C012JG02	Dow AgroSciences (FR)	PP 1/24	GEP

The lines highlighted in green present 12 efficacy trials.
The lines highlighted in purple present 7 efficacy trials (the trial ES07X03006SC02 was used twice).
19 trials were conducted to demonstrate the biological equivalence of two sulfoxaflor formulations, the minimum effective dose and the efficacy too.

Table 6.1.5-28 Efficacy of sulfoxaflor at proposed label rate in comparison to reference products against *Nasonovia ribisnigri* (NASORN) in lettuce (open field crops). Summary across 15 field trials.

Days after appl.		**Efficacy of sulfoxaflor and references in %**			
		sulfoxaflor	**imidacloprid**	**acetamiprid**	**flonicamid**
		24 g a.s./ha	**90-150 g a.s./ha**	**75 g a.s./ha**	**60 g a.s./ha**
		1 spray	**1 spray**	**1 spray**	**1 spray**
2-3DAAA	Mean	71.2	83.0	68.4	55.6
	Limits	*5.2-94.7*	*73.2-93.6*	*50.2-99.6*	*25.0-87.0*
7DAAA	Mean	91.4	91.4	77.7	79.2
	Limits	*58.6-100.0*	*70.7-98.6*	*47.4-87.9*	*68.1-99.4*
14DAAA	Mean	86.4	81.4	66.1	76.6
	Limits	*34.1-100.0*	*70.2-100*	*27.6-100*	*50.2-93.3*
21DAAA	Mean	82.7	84.3	74.1	75.4

	Limits	*57.2-100.0*	*69.5-100*	*61.3-100*	*70.7-80.15*
2-3DAAA	nr of trials	9		9	
	Mean	71.7		68.1	
	Limits	*5.2-94.7*		*41.5-99.6*	
7DAAA	nr of trials	9		9	
	Mean	93.2		77.1	
	Limits	*85.8-100*		*47.4-92.5*	
14DAAA	nr of trials	9		9	
	Mean	89.6		62.4	
	Limits	*73.0-100*		*27.6-93.8*	
21DAAA	nr of trials	3		3	
	Mean	79.6		65.6	
	Limits	*70.3-88.1*		*61.3-68.9*	

DAAA = days after application no. A

Table 6.1.5-29 Efficacy of sulfoxaflor at proposed label rate in comparison to reference products against *Myzus persicae* (MYZUPE) in lettuce (open field crops). Summary across 3 field trials.

Days after appl.		**Efficacy of sulfoxaflor and references in %**			
		sulfoxaflor	**imidacloprid**	**acetamiprid**	**flonicamid**
		24 g a.s./ha	**90-150 g a.s./ha**	**75 g a.s./ha**	**60 g a.s./ha**
		1 spray	**1 spray**	**1 spray**	**1 spray**
2-3DAAA	Mean	68.4	99.6	78.0	81.5
	Limits	*36.9-100.0*	*99.6-100*	*56.16-100*	*81.5*
7DAAA	Mean	94.6	99.0	90.9	90.8
	Limits	*89.2-100.0*	*98.1-100*	*72.7-100*	*90.8*
14DAAA	Mean	93.2	94.7	77.0	81.8
	Limits	*87.9-98.5*	*89.4-100*	*57.54-98.5*	*81.8*
21DAAA	Mean	98.1	94.4	98.5	75.5
	Limits	*98.1*	*89.0-100*	*97.2-100*	*75.3*
2-3DAAA	nr of trials	2		2	
	Mean	68.5		78.1	
	Limits	*37.0-100*		*56.2-100*	
7DAAA	nr of trials	2		2	
	Mean	94.6		86.4	
	Limits	*89.3-100*		*72.7-100*	
14DAAA	nr of trials	2		2	
	Mean	93.2		78.0	
	Limits	*87.9-98.5*		*57.5-98.5*	

21DAAA	nr of trials	1		1	
	Mean	98.1		97.2	
	Limits	*98.1-98.1*		*97.2-97.2*	

DAAA: days after application No. A

ZRMS conclusion: Aphids control in leafy vegetables crops

Between 2007 and 2012, 19 trials were conducted in lettuce. 17 trials were conducted against *Nasonovia ribisnigri* in Spain (8 trials), in Italy (5 trials), in Portugal (1 trial) and France (1 Mediterranean + 2 Maritime) and 3 trials against *Myzus persicae* in Spain (2 trials) and in France-Maritime (1 trial). 1 trial was common for both aphids.
The results obtained in lettuce against *Nasonovia ribisnigri* (NASORN) and *Myzus persicae* (MYZUPE) showed that the efficacy of CLOSER applied at the claimed dose of 24 g sulfoxaflor/ha was comparable or superior to that of the reference based on acetamiprid (75 g/ha).

The efficacy level of CLOSER could be considered as satisfactory in leafy vegetables grown in field to control aphids.

Aphid control in leguminous crops (peas and beans)

Between 2007 and 2012, 10 trials were conducted in the EU regulatory Southern zone to demonstrate the efficacy of sulfoxaflor against aphids in legume crops grown in fields. Those trials were carried out in France (5 trials), Greece (3 trials) and Spain (2 trials) and sulfoxaflor was tested at 24 g a.s./ha in pea and bean crops for the control of aphids (*Acyrthosiphon pisum*- ACYRON and *Aphis fabae*- APHIFA*)* and the efficacy was compared to different commercial standard products. Due to low number of pea trials in the EU regulatory Southern zone, 3 additional pea trials from Czech Republic were used from the EU regulatory Central zone in this section to support label claims. All Czech and French pea trials came from the Maritime EPPO climatic zone and from similar agronomic circumstances so to discuss them together is reasonable. Efficacy was tested under a range of environmental conditions to fully challenge the product. All 13 trials had sufficient level of natural aphid infestation (3-284 aphids/shoot or plant) to obtain reliable results. In all trials, one application was carried out at growth stages of BBCH 18-89. Spray volume ranged between 200 and 1,000 L/ha. The trials were carried out under GEP and in accordance with the relevant EPPO guidelines. In total, 7 trials were set up in peas and 6 in beans.

In general, efficacy of sulfoxaflor applied at the recommended rate, 24 g a.s./ha, was sufficient and comparable to the tested reference products (acetamiprid, flonicamid, imidacloprid, pirimicarb and lambda-cyhalotrin) for the control of aphids in leguminous crops (**Table 6.1.5-30 and**

Days after appl.		**Efficacy in %**		
		sulfoxaflor 24 g a.s./ha	lambda-cyhalotrin 5-7.5 g a.s./ha	pirimicarb 375 g a.s./ha
1-2DAA	nr of trials	3	3	na
	mean	57.44	45.45	na
	limits	*19.43-90.23-*	*15.07-87.00*	*na*
3-4DAA	nr of trials	3	3	na
	mean	93.26	73.72	na
	limits	*87.03-97.58*	*60.31-91.39*	*na*
6-7DAA	nr of trials	3	3	na
	mean	97.74	77.08	na

	limits	*96.55-99.32*	*58.37-88.29*	*na*
14-15DAA	nr of trials	3	3	na
	mean	93.69	71.71	na
	limits	*83.03-99.18*	*45.28-93.1*	*na*
1-2DAA	nr of trials	4	na	4
	mean	51.95	na	91.88
	limits	*31.38-73.71*	*na*	*84.18-99.72*
3-4DAA	nr of trials	na	na	na
	mean	na	na	na
	limits	*na*	*na*	*na*
6-7DAA	nr of trials	4	na	4
	mean	66.02	na	79.06
	limits	*31.73-82.25*	*na*	*24.05-100*
14-15DAA	nr of trials	2	na	2
	mean	83.38	na	94.96
	limits	*77.58-89.18*	*na*	*93.78-96.15*

Table 6.1.5-31).

All products delivered generally a lower level of control against ACYRON than against APHIFA, which does not mean necessarily susceptibility difference but rather coming from the crop as peas are waxy plants and farmers are using some adjuvants in the practice to enhance the insecticides' activity. In our trials there were no adjuvants included. The available data support our label claims to register sulfoxaflor at 24 g a.s./ha rate against aphids in leguminous crops grown in fields in the EU regulatory Southern zone.

Table 6.1.5-30 Efficacy of sulfoxaflor at proposed label rate in comparison to reference products against *Acyrthosiphon pisum* (ACYRON) in peas.

Days after appl.		**Efficacy in %**		
		sulfoxaflor 24 g a.s./ha	lambda-cyhalotrin 5-7.5 g a.s./ha	pirimicarb 375 g a.s./ha
1-2DAA	nr of trials	3	3	na
	mean	57.44	45.45	na
	limits	*19.43-90.23-*	*15.07-87.00*	*na*
3-4DAA	nr of trials	3	3	na
	mean	93.26	73.72	na
	limits	*87.03-97.58*	*60.31-91.39*	*na*
6-7DAA	nr of trials	3	3	na
	mean	97.74	77.08	na
	limits	*96.55-99.32*	*58.37-88.29*	*na*
14-15DAA	nr of trials	3	3	na
	mean	93.69	71.71	na

	limits	*83.03-99.18*	*45.28-93.1*	*na*
1-2DAA	nr of trials	4	na	4
	mean	51.95	na	91.88
	limits	*31.38-73.71*	*na*	*84.18-99.72*
3-4DAA	nr of trials	na	na	na
	mean	na	na	na
	limits	*na*	*na*	*na*
6-7DAA	nr of trials	4	na	4
	mean	66.02	na	79.06
	limits	*31.73-82.25*	*na*	*24.05-100*
14-15DAA	nr of trials	2	na	2
	mean	83.38	na	94.96
	limits	*77.58-89.18*	*na*	*93.78-96.15*

Table 6.1.5-31 Efficacy of sulfoxaflor at proposed label rate in comparison to reference products against *Aphis fabae* (APHIFA) in beans.

Days after appl.		Efficacy in %			
		sulfoxaflor 24 g a.s./ha	acetamiprid 50-75 g a.s./ha	flonicamid 60-80 g a.s./ha	imidacloprid 60-150 g a.s./ha
2-4DAA	nr of trials	5	5	na	5
	mean	98.75	98.4	na	98.52
	limits	*94.42-100*	*94.14-100*	*na*	*94.61-99.80*
6-7DAA	nr of trials	5	5	na	5
	mean	99.97	99.95	na	99.95
	limits	*99.86-100*	*99.73-100*	*na*	*99.86-100*
13-14DAA	nr of trials	3	3	n.a	3
	mean	100	100	n.a	100
	limits	*100-100*	*100-100*	*n.a*	*100-100*
2-4DAA	nr of trials	3	na	3	na
	mean	87.61	na	78.65	na
	limits	*62.83-100*	na	*61.93-87.05*	na
6-7DAA	nr of trials	3	na	3	na
	mean	96.93	na	93.30	na
	limits	*90.80-100*	na	*91.68-95.95*	na

ZRMS conclusion: Aphids control in leguminous crops

Between 2007 and 2012, 13 trials were conducted to determine the dose response of sulfoxaflor against aphids in peas and beans crops.
6 trials (3 in Greece, 2 in Spain and 1 in France-Maritime) were conducted in bean on *Aphis fabae*. 4 trials were carried out in pea on *Acyrthosiphon pisum* in France-Maritime. Due to the low number of pea trials, 3

additional trials from Czech Republic were used from the EU regulatory Central zone but Maritime EPPO climatic zone. The Czech pea trials were kept as supportive data.

The results obtained in pea and bean against *Acyrthosiphon pisum* (ACYRON) and *Aphis fabae* (APHIFA) showed that the efficacy of CLOSER applied at the claimed dose of 24 g sulfoxaflor/ha was comparable or superior to that of the references based respectively on lambda-cyhalotrin (5-7.5 g/ha), pirimicarb (375 g/ha), acetamiprid (50-75 g/ha), flonicamid (60-80 g/ha) and imidacloprid (60-150 g/ha).

The efficacy level of CLOSER could be considered as satisfactory in leguminous crops grown in field to control aphids.

Aphid control in brassica crops

18 trials were conducted between 2008 and 2012 in Italy (14 trials) and Spain (4 trials) as representative countries within the EU regulatory Southern zone for demonstrating the efficacy of sulfoxaflor for the control of *Brevicoryne brassicae* (16 trials) and *Myzus persicae* (2 trials) in various brassica crops. The biological performance of sulfoxaflor was evaluated and compared to the main European standard references (acetamiprid, spirotetramat, flonicamid, pirimicarb, deltamethrin, lambda cyhalothrin and tau fluvalinate). One single application was carried out at crop stages ranging between BBCH-14 and BBCH-72 in head cabbage (3 trials), cauliflower (11 trials), broccoli (3 trials) and Savoy cabbage (1 trial) crops. The natural infestation level at application ranged between 2 and 395 aphids/leaf ensuring sufficient level to obtain reliable results. Treatments were applied to all trials using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 500 – 1,000 L/ha using conventional nozzles. All trials were carried out under GEP and in accordance with the relevant EPPO guidelines.

The summary across trials in

Table 6.1.5-32 and **Table 6.1.5-33** clearly demonstrated that sulfoxaflor applied at the proposed dose rate of 24 g a.s./ha sufficiently controlled both *Brevicoryne brassicae* and *Myzus persicae* being at least as good as the best reference product (Epik) in the field trials. Sulfoxaflor perfromed better than Teppeki or Movento standards in the overall activity. The data clearly demonstrated that GF-2626 controls the two most common aphid species damaging brassica crops and supports the proposed label statement: One application of sulfoxaflor at 24 g a.s./ha (GF-2626 at 200 mL Product/ha) per crop may be applied between BBCH 20 and BBCH 49 against aphids in brassica crops grown in field conditions within the EU regulatory Southern zone.

Table 6.1.5-32 Efficacy comparison of sulfoxaflor to main standards for the control of *Brevicoryne brassicae* in trials set up in the EU regulatory Southern zone in brassica crops. Summary across 16 field trials.

Evaluation	Efficacy of sulfoxaflor and references in %							
	sulfoxaflor (24 g a.s./ha)		Epik (75 g a.s./ha)		Teppeki (60 g a.s./ha)		Movento (75 g a.s./ha)	
	Mean	Min & Max	Mean	Min & Max	Mean	Min & Max	Mean	Min & Max
1daa	82.7	32.9-99.6	62.4	19.3-97.5	68.7	16.5-98.1	72.5	19.8-95.6
3-4daa	91.2	17.5-100	92.8	84.7-99.8	86.8	65.7-99.3	88.1	79.8-97.6
7-8 daa	96.5	87.6-100	93.1	64.1-99.4	90.6	68.7-99.8	93.9	77.9-99.4
14-15 daa	96.5	72.8-100	95.6	88.5-99.9	93.3	68.3-100	96.0	82.3-99.8
19-21 daa	92.2	74.2-100	93.8	71.1-99.7	87.9	52.0-100	93.9	72.7-100
1 daa: Mean 8 trials	71.6	27.8-99.6	63.9	24.8-97.5	70.6	34.4-98.1	73.6	37.5-95.6
3-4 daa: Mean 9 trials	92.9	77.4-100	92.6	84.7-99.8	86.6	65.7-99.3	87.9	82.1-97.6
7-8 daa: Mean 10 trials	97.6	90.9-100	93.0	64.1-99.4	90.5	68.7-99.8	93.9	77.9-99.4

14-15 daa: Mean 10 trials	98.6	93.5-100	95.6	88.5-99.9	93.3	68.3-100	96.0	82.3-99.8
19-21 daa: Mean 10 trials	96.4	78.4-100	93.8	71.1-999.7	90.8	700-100	92.7	72.7-100

The highlighted part of the data in above table came from ortogonal data comparison.

Table 6.1.5-33 Efficacy comparison of sulfoxaflor to main standards for the control of *Myzus persicae* in Italy in brassica crops. Summary across 2 field trials in ortogonal comparison.

Evaluation	Efficacy of sulfoxaflor and references in %							
	sulfoxaflor (24 g a.s./ha)		Epik (75 g a.s./ha)		Teppeki (60 g a.s./ha)		Movento (75 g a.s./ha)	
	Mean	Min & Max	Mean	Min & Max	Mean	Min & Max	Mean	Min & Max
1daa	51.4	39.9-62.8	43.1	30.7 – 55.4	31.2	22.3 - 40.1	22.7	40.1 - 24.3
3 daa	83.3	75.5 – 91.0	77.1	72.7 - 81.5	66.5	57.4 - 75.6	59.9	75.6 - 48.0
6-7 daa	92.5	91.4 – 93.5	88.6	87.2 – 89.9	71.5	54.0 – 88.9	77.2	54.0 - 84.4
14 daa	86.6	85.9 – 87.2	74.7	66.0 - 83.4	73.7	65.5 – 81.8	71.2	65.5 - 87.8
20-21 daa	79.5	73.7- 85.3	71.7	61.7 - 81.7	79.1	70.3 – 87.8	71.9	70.3 - 87.8

ZRMS conclusion: Aphids control in brassicas crops

Between 2008 and 2012, 18 trials were carried out in Italy (14 trials) and Spain (4 trials) for the control of *Brevicoryne brassicae* (16 trials) and *Myzus persicae* (2 trials) in cauliflower (12 trials), cabbage (3 trials), broccoli (2 trials) and savoy cabbage (1 trial) crops.

The results obtained in head cabbage, cauliflower, broccoli and Savoy cabbage against *Brevicoryne brassicae* (BRVCBR) and *Myzus persicae* (MYZUPE) showed that the efficacy of CLOSER applied at the claimed dose of 24 g sulfoxaflor/ha was comparable or superior to that of the references Epik (75 g/ha), Teppeki (60 g/ha) and Movento (75 g/ha).

The efficacy level of CLOSER could be considered as satisfactory in brassicas crops grown in field to control aphids.

Aphid control in potatoes

Between 2008 and 2012 a total of 16 trials were conducted to demonstrate the efficacy of sulfoxaflor when sprayed at a dose rate of 24 g a.s./ha against aphids in potatoes. Trials were carried out in France (4 trials), Germany (7 trials) and the United Kingdom (5 trials) in the Maritime EPPO climatic zone. The biological performance of sulfoxaflor was evaluated and compared to the main European standard reference actives thiacloprid, lambda-cyhalothrin, flonicamid and pirimicarb. One single application was carried out at development stage BBCH 15-69 on potatoes. The natural infestation level at application ranged between 2 and 17 aphids/leaf ensuring sufficient level to obtain reliable results. Treatments were applied to all trials using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 200 – 400 L/ha using conventional nozzles. All trials were carried out under GEP and in accordance with the relevant EPPO guidelines. Green peach aphid *Myzus persicae* (MYZUPE) was the dominant species found in the trials. Further aphid species present in the trials were the potato aphid (*Macrosiphum euphorbiae*, MACSEU), buckthorn aphid (*Aphis nasturtii*, APHINA), foxglove aphid (*Aulacorthum solani*, AULASO), cotton aphid (*Aphis gossypii*, APHIGO) and the bean aphid (*Aphis fabae*, APHIFA).

There was no difference in the susceptibility of the tested aphid species to sulfoxaflor, the 24 g a.s./ha rate provided sufficient level of control on all above mentioned species, which are the most important ones in the European potato growing areas. **Table 6.1.5-34** is the summary across 15 trials including all species data. It was clear that sulfoxaflor applied at the proposed dose rate of 24 g a.s./ha sufficiently controlled aphids being at least as good as the best reference actives thiacloprid and flonicamid and better than the lambda-cyhalothrin or pirimicarb standards. In two trials set up in Germany, sulfoxaflor applied at 24 g a.s./ha rate provided a high level of control of virus vector aphids in potatoes when applied over the high risk period of virus transmission. The level of control was superior to the main standard reference lambda-cyhalothrin not only in aphid control but also on the virus infection level detected in tubers by ELISA test. The data clearly demonstrated that GF-2626 controls the most common aphid species damaging potato and supports the proposed label statements: Apply sulfoxaflor at 24 g a.s./ha (GF-2626 at 200 mL Product/ha) between BBCH 20 and BBCH 95 against aphids in potato grown in field conditions within the EU regulatory Southern zone.

Table 6.1.5-34 Summary of efficacy trials showing the performance of sulfoxaflor against aphids in potatoes at assessment dates 1-4, 6-8, 13-15 and 20-21 DAA in comparison to the main references lambda-cyhalothrin and flonicamid.

Days after appl.	sulfoxaflor			flonicamid			lambda-cyhalothrin		
	24 g a.s./ha			60-80 g a.s./ha			7,5-12,5 g a.s./ha		
	mean	*limits*	nr of trials	mean	*limits*	nr of trials	mean	*limits*	nr of trials
1-4	71.8	*7,1-96,2*	12	66.2	*17,5-96,4*	12	58.2	*5,2-94,8*	12
6-8	90.3	*72.9-99.8*	10	85.2	*70,8-99,5*	10	62.2	*14,4- 99*	10
13-15	92.6	*78,1-100*	10	94.4	*86,8-99,7*	10	59.8	*23,1- 97,9*	10
20-21	88.8	*48,5-98,7*	9	91	*73,8-99,2*	9	56.3	*12,1- 97*	9

ZRMS conclusion: Aphids control in potatoes

Between 2008 and 2012 a total of 16 trials were conducted in France (4 trials), Germany (7 trials) and the United Kingdom (5 trials) in the Maritime EPPO climatic zone against *Myzus persicae*, MYZUPE (6 trials), *Macrosiphum euphorbiae*, MACSEU (2trials), *Aphis nasturtii*, APHINA (2 trial), *Aphis fabae*, APHIFA (1 trial), *Aphis gossypii*, APHIGO (1 trial), *Aulacorthum solani*, AULASO (1 trial) and 3 trials with a mixed population.

The results obtained in potatoes against *Myzus persicae* (MYZUPE), *Macrosiphum euphorbiae* (MACSEU), *Aphis nasturtii* (APHINA), *Aulacorthum solani* (AULASO), *Aphis gossypii* (APHIGO) and *Aphis fabae* (APHIFA) showed that the efficacy of CLOSER applied at the claimed dose of 24 g sulfoxaflor/ha was comparable or superior to that of the references based on lambda-cyhalotrin (7.5-12.5 g/ha) and flonicamid (60-80 g/ha).

The efficacy level of CLOSER could be considered as satisfactory in potato crops grown in field to control aphids.

It is to be stressed that zRMS reckoned that potatoes crop represents a weighty crop in France, Germany and United Kingdom (Maritime EPPO climatic zone) and that the 4 submitted French Maritime trials could be considered as acceptable for France.
Otherwise, zRMS agrees about comments made by southern zone MS (EL, ES,…) concerning the absence of efficacy trials (allowing minimum effective dose assessment) carried out in the Mediterranean and South-East EPPO zone on this use (potato * aphids) which is not in line with EPPO requirements. This can be considered as not acceptable for MS belonging to this EPPO zones (EL, ES,…):

- Acceptable for France
- Not acceptable for other SZ MS.

Aphid control in pome fruits

A zonal approach, using data from 52 trials set up between 2008 and 2013 in France, Greece, Italy, Portugal and Spain in apple and pear crops was used to demonstrate the efficacy of sulfoxaflor in comparison to commercial standards. Sulfoxaflor applied at the proposed label rates of 24 or 48 g a.s./ha - was compared to acetamiprid, imidacloprid, flonicamid, chlorpyrifos, clothianidin, spirotetramat and pirimicarb standards. Infestation level at application ranged between 1 and 182 aphid/shoot (APHIPO 182, APHIGO 129, APHIFA 55, DYSAPL 120, ERISLA 48 max). One single application was carried out at crop growth stages ranging between BBCH-32 and BBCH-78, which cover the preventative and curative application times as well. Different aphid species were tested: *Dysaphis plantaginea* (DYSAPL), *Aphis pomi* (APHIPO), *Eriosoma lanigerum* (ERISLA), *Aphis fabae* (APHIFA), *Aphis gossypii* (APHIGO) and *Aphis spireacola* (APHISI). Treatments were applied to all trials using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 500 – 1,500 L/ha using conventional nozzles. All trials were carried out under GEP and in accordance with the relevant EPPO guidelines.

Sulfoxaflor applied before flowering at 24 g a.s./ha provided excellent control of DYSAPL, (96-99% control for 2 months as preventative application). Sulfoxaflor applied after flowering at 24 g a.s./ha provided 70% control as knock down effect and 90-95% as residual control on DYSAPL in curative applications. Sulfoxaflor (24 g a.s./ha) was comparable to imidacloprid and acetamiprid and superior to flonicamid (.

There was no difference between the susceptibility of the 5 tested species (APHIPO, DYSAPL, APHISI, APHIGO, APHIFA), which are representatives of the major aphid species living on green parts of the pome fruit trees, therefore 24 g a.s./ha is the recommended label rate for sulfoxaflor against aphids living on the leaves in pome fruits within the EU regulatory Southern zone.

Table 6.1.5-35 and

Table 6.1.5-36).

On APHIPO applied in curative application, sulfoxaflor at 24 g a.s./ha gave also an excellent control of 90-99% for three weeks after the application. Sulfoxaflor was equal to imidacloprid (88-97% control) and acetamiprid (91-99% control) and superior to flonicamid (**Table 6.1.5-37).**

APHIGO, APHIFA and APHISI were evaluated only in few trials but the tendency was the same, sulfoxaflor at 24 g a.s./ha provided sufficient knock down effect (74-98%) and excelent residual control (94-100%). In general, sulfoxaflor was comparable to the standards against all 3 species.

There was no difference between the susceptibility of the 5 tested species (APHIPO, DYSAPL, APHISI, APHIGO, APHIFA), which are representatives of the major aphid species living on green parts of the pome fruit trees, therefore 24 g a.s./ha is the recommended label rate for sulfoxaflor against aphids living on the leaves in pome fruits within the EU regulatory Southern zone.

Table 6.1.5-35 Efficacy of sulfoxaflor sprayed at 24 g a.s./ha against DYSAPL in pome fruits in preventative applications.

Days after application	**Efficacy of sulfoxaflor and references in % on DYSAPL**							
	sulfoxaflor, 24 g a.s. /ha		acetamiprid, 75 g a.s. /ha		flonicamid, 60-70 g a.s. /ha		imidacloprid, 120-150 g a.s. /ha	
	means	limits	means	limits	means	limits	means	limits
28-36	99.9	(98.0-100)	96.6	(54.5-100)	97.2	(62.5-100)	98.1	(92.3-100)
41-49	95.7	(52.1-100)	82.2	(0-100)	90.9	(62.0-100)	93.8	(77.4-100)
60-64	95.7	(63.4-100)	91.1	(50.2-100)	65.6	(10.3-99.0)	100.0	(100-100)
71-75	92.1	(77.6-100)	91.9	(83.7-100)	-	-	92.7	(78.1-100)
34-57 daa across 8 trials	96.5	82.6-100	88.9	75-100				

ortogonal								
34-57 daa across 5 trials ortogonal	94.4	82.6-100			90.9	79.5-100		

Table 6.1.5-36 Efficacy of sulfoxaflor sprayed at 24 g a.s./ha against DYSAPL in pome fruits in curative applications.

Days after application	**Efficacy of sulfoxaflor and references in % on DYSAPL**							
	sulfoxaflor, 24 g a.s. /ha		acetamiprid, 50-75 g a.s. /ha		flonicamid, 70 g a.s. /ha		imidacloprid, 120-150 g a.s. /ha	
	means	limits	means	limits	means	limits	means	limits
2-3	70.7	(0-100)	64.5	(0-100)	54	(7.55-94.6)	73.4	(33.3-100)
5-9	93.5	(45.3-100)	81.8	(0-100)	85	(29.4-100)	91.8	(64.6-100)
10-17	94.8	(46.5-100)	91.8	(22.1-100)	92.4	(47.6-100)	96.7	(91.3-100)
19-22	90.6	(8.04-100)	86.6	(43.7-100)	83.9	(0-100)	95.0	(76.2-100)
5-9daa across 18 trials ortogonal	94.5	76-100	83.4	46.5-100				
5-9daa across 12 trials ortogonal	92.2	76-100	76.2	46.5-98	81.6	62.5-100)		

Table 6.1.5-37 Efficacy of sulfoxaflor sprayed at 24 g a.s./ha against APHIPO in pome fruits in curative applications.

Days after application	**Efficacy of sulfoxaflor and references in % on APHIPO**							
	sulfoxaflor, 24 g a.s. /ha		acetamiprid, 75 g a.s. /ha		flonicamid, 70 g a.s. /ha		imidacloprid, 120-150 g a.s. /ha	
	means	limits	means	limits	means	limits	means	limits
2-3	89.5	(12.4-100)	90.5	(0-100)	49.1	(0-91.0)	93.8	(59.3-100)
5-9	98.7	(87.5-100)	98.8	(84.8-100)	92.6	(0-100)	96.7	(71.5-100)
10-17	94	(0.44-100)	98	(88.4-100)	92	(56.2-100)	90	(0-100)
19-22	89	(0-100)	94	(63.2-100)	83	(25.1-100)	88	(16.7-100)
5-9 daa across 19 trials ortogonal	98.8	94.8-100	97.1	85.4-100				
10-17 daa across 12 trials ortogonal	98.9	95.4-100	98	88.4-100	88.8	60.1-98.8		

Sulfoxaflor applied at 48 g a.s./ha against established *Eriosoma lanigerum* colonies delivered 60-76% control which was superior to pirimicarb but inferior to clothianidin. In preventative application, sprayed just before the crawler migration sulfoxaflor at 48 g a.s./ha provided sufficient efficacy up to 2 weeks delivering 86-87% control and being comparable to the best standards clothianidin and chlorpyrifos and better than pirimicarb and spirotetramat. After 2 weeks, the efficacy of sulfoxaflor decreased to 53-76% being still superior to pirimicarb, equal to spirotetramat but inferior to clothianidin and chlorpyrifos (**Table 6.1.5-38**). As 48 g a.s./ha is the maximum registerable rate for sulfoxaflor in Europe and this rate proved to be effective and comparable to some commercial standards, 48 g a.s./ha is the recommended label rate of sulfoxaflor against *Eriosoma lanigerum.* The timing of application proposed to be preventative or at least before the formation of colonies to achieve good results.

Table 6.1.5-38 Efficacy of sulfoxaflor sprayed at 48 g a.s./ha against ERISLA in pome fruits in preventative application.

Days after application	sulfoxaflor, 48 g a.s. /ha		pirimicarb, 375 g a.s. /ha		clothianidin, 75 g a.s./ha		chlorpyrifos, 640-750 g a.s. /ha		spirotetramat, 150-190 g a.s. /ha	
	mean	limits	mean	limits	mean	limits	mean	limits	mean	limits
6-8	87.1	(74.2-100)	59.3	-	86.7	(73.5-100)	46.2	-	-	-
13-14	86.1	(75-99.8)	71.1	-	98.4	(97.2-99.5)	86.7	(75-98.4)	50	-
18-22	76.4	(60.3-91.1)	67.6	(47.6-87.5)	98.9	(98.5-99.2)	90.8	(81.6-100)	51.5	(24.2-78.7)
27-48	52.7	(32.3-72)	65.3	(59.5-71.1)	83.5	(75.2-93.7)	91.4	(83.6-99.6)	63.1	(61.1-65.2)
13-20 daa across 3 trials ortogonal	91.5	83.6-99.8	-	-	98.6	97.2-99.5	-	-	-	-
13-20 daa across 3 trials ortogonal	83.2	75-91.1	-	-	-	-	85	75-98.4	-	-

The highlighted part of the data in above tables came from ortogonal data comparison and data show the same tendency as the comparison made by all data above.

ZRMS conclusion: Aphids control in pome fruits

52 Mediterranean trials set up between 2008 and 2013 in France (15 trials), Greece (7 trials), Italy (13 trials), Portugal (6 trials) and Spain (11 trials) in apple (48 trials) and pear (4 trials) crops against *Dysaphis plantaginea* (DYSAPL, 27 trials), *Aphis pomi* (APHIPO, 14 trials), *Eriosoma lanigerum* (ERISLA, 5 trials), *Aphis gossypii* (APHIGO, 1 trial) and *Aphis spireacola* (APHISI, 1 trial) and 4 trials of a mixed aphids population (DYSAPL, APHIPO and *Aphis fabae*-APHIFA).

The product was tested in preventative and curative application.

The results obtained in apple and pear against *Dysaphis plantaginea* (DYSAPL) and *Aphis pomi* (APHIPO) showed that the efficacy of CLOSER applied at the claimed dose of 24 g sulfoxaflor/ha was comparable or superior to that of the references based on acetamiprid (50-75 g/ha) and flonicamid (70 g/ha).
As for the other aphids *Aphis fabae* (APHIFA), *Aphis gossypii* (APHIGO) and *Aphis spireacola* (APHISI), data were not sufficient to conclude but a tendency of an interesting control of the product applied at the claimed dose rate of 24 g sulfoxaflor/ha was observed.
The results obtained in apple and pear against *Eriosoma lanigerum* (ERISLA) showed that the efficacy of CLOSER applied at the claimed dose of 48 g sulfoxaflor/ha was comparable to that of the references based on clothianidin (75 g/ha) and chlorpyrifos (640-750 g/ha).

Consequently, the efficacy level of CLOSER could be considered as satisfactory in pome fruits crops to control aphids.

Aphid control in stone fruits
Between 2008 and 2014, 32 trials were conducted in the EU regulatory Southern zone to demonstrate the efficacy of sulfoxaflor against aphids in stone fruits in comparison to commercial standards. In the efficacy trials conducted in Italy (9 trials), France (6 trials), Greece (1 trial), Portugal (2 trials) and Spain (14 trials) sulfoxaflor was tested at various dose rates from 6 to 48 g a.s./ha in several stone fruit species (peach (14), nectarine (10), plum (3) and cherry (5)) for controlling the most important aphid species like *Myzus persicae* (MYZUPE), *Brachycaudus helichrysi* (ANURHE), *Aphis spiraecola* (APHISI), *Hyalopterus pruni* (HYALPR) and *Myzus cerasi* (MYZUCE) and the efficacy was compared to widely used commercial standards like flonicamid (60-75 g a.s./ha), imidacloprid (70-150 g a.s./ha), acetamiprid (50-75 g a.s./ha) and pirimicarb (400 g a.s./ha). One application was carried out at the crop growth stage of BBCH 51-89 and the applied spray volumes ranged between 300 and 1319 L/ha depending on the crop and country. All trials were carried out under GEP and in accordance with the relevant EPPO guidelines. Infestation level at the time of application ranged between 1 and 1889 aphids/shoot ensuring a wide range of sufficient pest pressure to obtain reliable results.

Sulfoxaflor at the recommended minimum effective dose rates provided sufficient control of all targeted aphid species (MYZUPE, ANURHE, APHISI, MYZUCE, HYALPR) being at least as good as the standards. **Table 6.1.5-39** show the efficacy results across 13 trials, where sulfoxaflor at 36 g a.s./ha rate was compared to the main reference products against *Myzus persicae*, which data base includs neonicotinoid-resistant MYZUPE populations as well. Sulfoxaflor delivered sufficient control of aphids while the neonicotinoid treatments were weak, even flonicamid was weaker than sulfoxaflor. These results proved sulfoxaflor is efficacious on the NNI resistant populations as well and this fact is explained more in the Resistancy section.

Table 6.1.5-40 is a summary across 4 trials showing the efficacy of sulfoxaflor at 36 g a.s./ha rate in comparison to reference products against *Myzus cerasi*. Sulfoxaflor delivered sufficient control of aphids either in preventative or curative situations being at least as good as the standards.

In the case of *Brachycaudus helichrysi, Aphis spiraecola* and *Hyalopterus pruni* similar observations were done but in those cases the 24 g a.s./ha rate is the minimum effective rate, which proved to be comparable to the reference products. As an example to demonstrate the comparability, DAA1 =days after the preventative application; DAA =days after the curative application; n.a = not available value for this data point

Table 6.1.5-41 shows the efficacy against APHISI in a summary across 2 field trials.

The 32 efficacy trials justified sulfoxaflor applied at the proposed label rates is comparable to standards and delivers the required level of knock down and residual efficacy on the most important aphid species damaging stone fruits. Therefore, the recommendation is registering sulfoxaflor in both preventative and curative situations at 24 g a.s./ha for the control of all aphid species in stone fruits with the exception of *Myzus persicae* and *Myzus cerasi*, where 36 g a.s./ha is the recommended label rate in the EU regulatory Southern zone.

Table 6.1.5-39 Efficacy of sulfoxaflor at proposed label rate in comparison to reference products against *Myzus persicae* (MYZUPE) populations in stone fruits applied post-flowering as curative application. Summary across 13 field trials.

Days after appl.		**Efficacy of sulfoxaflor and references in %**			
		sulfoxaflor	**acetamiprid**	**flonicamid**	**imidacloprid**
		36 g a.s./ha	**50-75 g a.s./ha**	**60-75 g a.s./ha**	**70-150 g a.s./ha**
		1 spray	**1 spray**	**1 spray**	**1 spray**
2-3 DAA	Mean	81.3	74.1	68.6	78.0
	Limits	*38.3-100*	*55.4-95.6*	*25.2-98.2*	*27.8-99.9*
7 DAA	Mean	91.5	72.0	90.3	83.0
	Limits	*74.1-100*	*42.2-96.7*	*58.6-99.6*	*50.4-100*
14 DAA	Mean	94.4	65.4	75.6	82.5
	Limits	*75.0-100*	*26.0-100*	*50.0-100*	*36.3-100*
21 DAA	Mean	92.7	25.3	84.2	75.4
	Limits	*75.0-100*	*23.9-72.5*	*46.0-100*	*45.7-100*
28 DAA	Mean	87.7	38.1	79.6	75.4
	Limits	*73.4-97.8*	*4.3-78.9*	*63.9-99.6*	*33.5-94.1*
2-3 DAA	nr of trials	7	7	7	7

	Mean	81.1	70.9	62.3	73.6
	Limits	*66.0-96.5*	*55.4-77.4*	*25.2-86.3*	*27.8-96.7*
7 DAA	nr of trials	7	7	7	7
	Mean	90.8	71.0	87.7	78.5
	Limits	*74.1-99.5*	*42.2-86.3*	*58.6-99.6*	*51.7-98.6*
14 DAA	nr of trials	7	7	7	7
	Mean	95.3	65.4	86.5	76.4
	Limits	*75.0-100*	*26.0-100*	*50.0-100*	*36.3-96.4*
21 DAA	nr of trials	6	6	6	6
	Mean	94.6	40.0	80.3	70.3
	Limits	*75.0-100*	*23.9-50.0*	*46.0-100*	*45.7-100*
28 DAA	nr of trials	3	3	3	3
	Mean	89.5	39.5	78.6	62.0
	Limits	*75.0-97.7*	*4.3-78.9*	*63.9-96.4*	*33.5-86.7*

Table 6.1.5-40 Efficacy of sulfoxaflor at proposed label rate in comparison to reference products against *Myzus cerasi* (MYZUCE) in cherries. Summary across 4 field trials.

Days after appl.		**Efficacy of sulfoxaflor and references in %**				
		sulfoxaflor	**acetamiprid**	**flonicamid**	**imidacloprid**	**pirimicarb**
		36 g a.s./ha	**50-75 g a.s./ha**	**60-75 g a.s./ha**	**110-150 g a.s./ha**	**400 g a.s./ha**
		1 spray	**1 spray**	**1 spray**	**1 spray**	**1 spray**
30 DAA1	Mean	97.7	n.a.	78.8	66.5	99.3
	Limits	*93.2-100*	n.a.	*78.8*	*77.6-55.6*	*98.1-100*
40 DAA1	Mean	97.6	n.a.	78.2	34.7	96.4
	Limits	*93.0-100*	n.a.	*78.3*	*16.8-52.7*	*89.3-100*
3 DAA	Mean	85.2	93.1	n.a.	97.3	97.3
	Limits	*80.0-92.3*	*93.1*	n.a.	*97.3*	*97.3*
7 DAA	Mean	84.6	98.0	n.a.	99.7	98.2
	Limits	*74-99.3*	*98.0*	n.a.	*99.7*	*98.2*
14 DAA	Mean	99.2	99.7	n.a.	66.6	96.9
	Limits	*99-99.4*	*99.7*	n.a.	*66.6*	*96.9*
30 DAA1	nr of trials	2	n.a.	n.a.	2	2
	Mean	100	n.a.	n.a.	66.7	100
	Limits	*100-100*	n.a.	n.a.	*55.7-77.7*	*100-100*
40 DAA1	nr of trials	2	n.a.	n.a.	2	2
	Mean	100	n.a.	n.a.	34.8	100

	Limits	*100-100*	n.a.	n.a.	*16.9-52.7*	*100-100*
3 DAA	nr of trials	1	n.a.	n.a.	1	1
	Mean	92.3	n.a.	n.a.	97.3	97.9
	Limits	*92.3-92.3*	n.a.	n.a.	*97.3-97.3*	*97.9-97.9*
7 DAA	nr of trials	1	n.a.	n.a.	1	1
	Mean	99.3	n.a.	n.a.	99.7	98.2
	Limits	*99.3-99.3*	n.a.	n.a.	*99.7-99.7*	*98.2-98.2*

DAA1 =days after the preventative application; DAA =days after the curative application; n.a = not available value for this data point

Table 6.1.5-41 Efficacy of sulfoxaflor at proposed label rate in comparison to reference products against *Aphis spiraecola* (APHISI) in plums. Summary across 2 field trials.

Days after appl.		**Efficacy of sulfoxaflor and references in %**				
		sulfoxaflor	**acetamiprid**	**flonicamid**	**imidacloprid**	**pirimicarb**
		24 g a.s./ha	**50-75 g a.s./ha**	**60-75 g a.s./ha**	**110-150 g a.s./ha**	**400 g a.s./ha**
		1 spray	1 spray	1 spray	1 spray	1 spray
3 DAA	Mean	74.6	89.6	68.1	78.8	48.6
	Limits	*50.0-88.0*	*89.6*	*68.1*	*63.6-94.1*	*48.6*
7 DAA	Mean	99.6	94.9	98.2	69.9	48.0
	Limits	*99.2-100.0*	*94.9*	98.2	*41.7-98.1*	*48.0*
14 DAA	Mean	94.3	90.1	98.8	81.8	37.0
	Limits	85.6-98.1	90.1	98.8	67.2-96.6	37.0
3 DAA	nr of trials	2	n.a.	n.a.	2	n.a.
	Mean	69.0	n.a.	n.a.	78.9	n.a.
	Limits	*50.0-88.0*	n.a.	n.a.	*63.6-94.1*	n.a.
7 DAA	nr of trials	2	n.a.	n.a.	2	n.a.
	Mean	99.8	n.a.	n.a.	69.9	n.a.
	Limits	*99.7-100*	n.a.	n.a.	*41.7-98.2*	n.a.
14 DAA	nr of trials	2	n.a.	n.a.	2	n.a.
	Mean	92.5	n.a.	n.a.	81.9	n.a.

<u>ZRMS conclusion: Aphids control in stone fruits</u>

Between 2008 and 2014, 32 Mediterranean trials were conducted in Italy (9 trials), France (6 trials), Greece (1 trial), Portugal (2 trials) and Spain (14 trials) in several stone fruit crops (peach (14), nectarine (10), plum (3) and cherry (5) for the control of *Myzus persicae* (MYZUPE, 21 trials: 8 at pre-flowering application + 13 at post-flowering application), *Myzus cerasi* (MYZUCE, 5 trials), *Hyalopterus pruni*

(HYALPR, 3 trials), *Aphis spiraecola* (APHISI, 2 trials) and *Brachycaudus helichrysi* (ANURHE). One common trial presented results for both APHISI and ANURHE.

The results obtained in peach, nectarine, plum and cherry against *Myzus persicae* (MYZUPE) and *Myzus cerasi* (MYZUCE) showed that the efficacy of CLOSER applied at the claimed dose of 36 g sulfoxaflor/ha was comparable or superior to that of the references based on acetamiprid (50-75 g/ha), flonicamid (60-75 g/ha) and imidacloprid (70-150 g/ha).

As for the other aphids *Brachycaudus helichrysi* (ANURHE), *Aphis spiraecola* (APHISI) and *Hyalopterus pruni* (HYALPR), data were not sufficient to establish a clear conclusion. However, a tendency of an interesting control of the product applied at the claimed dose rate of 24 g sulfoxaflor/ha was observable against these aphids, compared to the reference imidacloprid (110-150 g/ha).
The efficacy level of CLOSER could be considered as satisfactory.

Consequently, the efficacy level of CLOSER could be considered as satisfactory in stone fruits crops to control aphids.

Aphid control in citrus
18 trials were conducted in Italy, Portugal and Spain to demonstrate the efficacy of sulfoxaflor against aphids in citrus. The trials were conducted between 2008 and 2011 as 7 trials in Spain, 3 trials in Portugal, 8 trials in Italy on clementine (2), mandarin (1), lemon (2), sweet orange (4), sauer orange (4) and citrus (5) - where sulfoxaflor was applied at 24 g a.s./ha using 500-1,600 L/ha spray volume and compared to different commercial standards (flonicamid, pymetrozine, acetamiprid, imidacloprid and pirimicarb). The trials were carried out under GEP and in accordance with the relevant EPPO guidelines. Efficacy was tested under a range of environmental conditions in several citrus species to fully challenge the product. All the 18 trials had a sufficient level of natural infestation of aphids (6-198 aphids per shoot) to obtain reliable results. Time of application ranged between the phenological stages of BBCH 51 and BBCH-81. *Aphis spiraecola (*APHISI), *Aphis gossypii* (APHIGO),*Toxoptera citricida* (TOXOCI) and *Toxoptera aurantii* (TOXOAUl) species were tested.

The overall efficacy of sulfoxaflor applied at the recommended dose rate of 24 g a.s./ha was comparable to the best standards - acetamiprid and imidacloprid - and was superior to pymetrozine, flonicamid and pirimicarb delivering a reliable knock down effect and residual control. **Table 6.1.5-42** shows the efficacy comparison against the dominant species *Aphis spiraecola,* but the other species situation was similar as there was no significant difference between their susceptibility to sulfoxaflor. The data clearly demonstrated that GF-2626 controls the most common aphid species damaging citrus crops and supports the proposed label statement: Apply sulfoxaflor at 24 g a.s./ha (GF-2626 at 200 mL Product/ha) against aphids in citrus crops grown in the EU regulatory Southern zone.

Table 6.1.5-42 Efficacy of sulfoxaflor sprayed at 24 g a.s./ha against *Aphis spiraecola* in citrus. Summary across 13 field trials.

Days after application	Efficacy of sulfoxaflor and references in %							
	sulfoxaflor, 24 g a.s. /ha		acetamiprid, 75 g a.s. /ha		flonicamid, 70 g a.s. /ha		imidacloprid, 100 g a.s. /ha	
	means	limits	means	limits	means	limits	means	limits
2-3	85.6	(0-100)	87.5	(0-100)	80.4	(23.9-100)	42.2	(0-92.6)
6-9	96.6	(72.7-100)	94.9	(17.4-100)	94.4	(42.8-100)	74.0	(17.6-100)
12-15	92.7	(54.5-100)	93.9	(36.7-100)	89.8	(41.6-100)	53.8	(0-97.7)
20-21	82.9	(9.44-100)	82.2	(0-100)	69.1	(0-99.5)	36.8	(0-97.4)
6-9 daa across 11 trials ortogonal	96.2	(80.3-100)	94.3	(62.4-99.8)	n.a.	n.a.	n.a.	n.a.
6-9 daa across 10 trials ortogonal	97.4	(80.3-100)	94.9	(62.4-99.8)	94.4	(82.1-100)	n.a.	n.a.

6-9 daa across 7 trials ortogonal	96.2	(80.3-100)	n.a.	n.a.	n.a.	n.a.	73.9	(55.3-97.7)

ZRMS conclusion: Aphids control in citrus crops

18 Mediterranean trials were conducted: 6 trials were set up in 2008 (Italy 2 trials, Portugal 2 trials, Spain 2 trials) and 12 trials in 2011 (Italy 6 trials, Portugal 1 trial, Spain 5 trials) in several citrus species such as mandarin, orange and lemon against *Aphis spiraecola* (APHISI-13 trials), *Aphis gossypii* (APHIGO-2 trials), *Toxoptera citricida* (TOXOCI-2 trials) and *Toxoptera aurantii* (TOXOAU-1 trial).

The results obtained in citrus against *Aphis spiraecola* (APHISI) showed that the claimed dose of 24 g sulfoxaflor/ha was comparable or superior to that of the references based on acetamiprid (50-75 g/ha) and imidacloprid (100 g/ha).
The efficacy level of CLOSER could be considered as satisfactory in citrus crops to control aphids.

Aphid control in ornamental crops (flowers)

Data to support the label claims of aphid control in ornamental and flower crops, which are summarized in this biological dossier, were generated in a total of 6 trials, carried out in Belgium (1 trial) and Italy (5 trials) during the period of 2008 to 2012. Trial in Belgium was carried out on beech (*Fagus sylvatica*), all others in Italy on roses. The trials were carried out under GEP and in accordance with the EPPO Guideline 1/23 (2) “Aphids on ornamental plants” and guidelines referenced therein.

The aphid species were *Phyllaphis fagi* – PHYAFA and *Macrosiphum rosae* – MACSRO. On *Phyllaphis fagi*, two consecutive applications were carried out at development stage of 16-19 (BBCH code) of beech tree nursery. On *Macrosiphum rosae*, one application was carried out at development stage of 51-65 (BBCH code) of the roses (dog rose, Heidetraum fucsia, Dama di cuori varieties). Sulfoxaflor was tested at multiple dose rates, ranging from 6 up to 48 g a.s./ha. Reference products were acetamiprid at 60-75 g a.s./ha, flonicamid at 60-70 g a.s./ha, spirotetramat at 75-120 g a.s./ha, imidacloprid at 100 g a.s./ha. Efficacy was tested under a range of environmental conditions to fully challenge the product. All trials had sufficient levels of natural infestation of aphids to obtain reliable results (1 – 67 aphids/shoot). Spray volume ranged between 800-1,408 L/ha water depending on the local circumstances.

Sulfoxaflor applied at 24 g as/ha rate delivered sufficient aphid control during the whole evaluation period (2-3 weeks) being at least as good as the reference products (acetamiprid, imidachloprid, flonicamid, spirotetramat) against *Macrosiphum rosae* and *Phyllaphis fagi* in open field conditions (**Table 6.1.5-43**,

Table 6.1.5-44).

Table 6.1.5-43 Efficacy of sulfoxaflor against *Phyllaphis fagi* in ornamental crops in 1 open field trial.

Assessment (days after application)	**Untreated pest level at evaluation**	**Efficacy treatments (Henderson-Tilton) in %, Tukey's mean comparison (P=5%)**				
		sulfoxaflor	imidacloprid	thiamethoxam	flonicamid	spirotetramat
		24 g a.s./ha	100 g a.s./ha	62.5 g a.s./ha	70 g a.s./ha	75 g a.s./ha
7DAA1	77 insects/shoot	60.8 ab	70.3 a	77.5 a	1.1 d	36.0 a-d
6DAA2	174 insects/shoot	99.9 a	92.7 a	99.7 a	16.0 c	72.9 ab
13DAA2	75 insects/shoot	96.6 a	88.1 a	98.5 a	37.7 b	64.4 ab
21DAA2	36 insects/shoot	83.0 ab	13.8 d	78.7 abc	28.2 cd	43.0 bcd

Table 6.1.5-44 Efficacy of sulfoxaflor at proposed label rate in comparison to reference products against *Macrosiphum rosae* in flowers (open field crops). Summary across 5 open field trials.

Days after appl.		**Efficacy in %**			
		sulfoxaflor	acetamiprid	flonicamid	spirotetramat
		24 g a.s./ha	60-75 g a.s./ha	60-70 g a.s./ha	120 g a.s./ha
1-3DAA1	mean	93.6	96.3	95.6	61.2

	limits	*54.2-100*	*77.3-100*	*83.3-100*	*45-93.4*
7DAA1	mean	99	95.7	98.9	69.4
	limits	*89.1-100*	*67.8-100*	*96.7-100*	*41.7-100*
14-15DAA1	mean	90.1	88.3	89.6	71.2
	limits	*73.6-99.5*	*62.7.100*	*63.7-100*	*47.5-100*
21-30DAA1	mean	62.1	53.6	57.8	54.7
	limits	*0-100*	*0-100*	*0-100*	*0-90.8*
1-3DAA1	nr of trials	4	4	4	-
	mean	93.0	89.9	82.8	-
	limits	67.1-100	54-100	47.3-100	-
7DAA1	nr of trials	4	4	4	-
	mean	98.2	94.5	92	-
	limits	93.3-100	67.5-100	64-100	-
14DAA1	nr of trials	4	4	4	-
	mean	98.4	94.2	93.4	-
	limits	91.4-100	56.9-100	50.8-100	-
20-28DAA1	nr of trials	4	4	4	-
	mean	97.3	89.9	88.6	-
	limits	91.4-100	56.9-100	50.8-100	-

DAA1 = days after the first application; DAA2 = days after the second application

Additionally to the data presented the following extrapolations are considered applicable: Extrapolation from the efficacy of GF-2626 at 24 g a.s./ha on *Myzus persicae*, *Aphis fabae* and *Macrosiphum euphorbiae* as demonstrated in this biological dossier on major outdoor crops such as solanaceous, leafy and cucurbit vegetable crops, legumes and potatoes. The efficacy can be validly extrapolated towards the same aphid species in flowers and ornamental crops grown in open field.

Extrapolation from the efficacy of GF-2626 at 24 g a.s./ha on *Aphis gossypii* in ornamental and flower crops grown in greenhouses. The efficacy can be validly extrapolated towards *Aphis gossypii* in ornamental and flower crops grown in open field.

In conclusion, efficacy of sulfoxaflor applied at 24 g a.s./ha has been demonstrated on troublesome aphids like *Phyllaphis fagi* and *Aphis gossypii*, as well as on *Myzus persicae*, *Aphis fabae*, *Macrosiphum euphorbiae* and *Macrosiphum rosae.* The data set is considered sufficiently large to claim control of all aphid species in ornamental and flower crops grown in open field in the EU regulatory Southern zone.

ZRMS conclusion: Aphids control in ornamentals

6 trials, carried out in Belgium (1 Maritime trial) and Italy (5 Mediterranean trials). Trial in Belgium was carried out on *Fagus sylvatica*, all trials in Italy on roses. The aphid species were *Phyllaphis fagi* – PHYAFA (1 trial) and *Macrosiphum rosae* – MACSRO (5 trials).

The results obtained against *Macrosiphum rosae* (MACSRO) in ornamental crops showed that the efficacy of CLOSER applied at the claimed dose of 24 g sulfoxaflor/ha was comparable or superior to that of the references acetamiprid (60-75 g/ha) and flonicamid (60-70 g/ha). As for *Phyllaphis fagi* – PHYAFA, data were not sufficient to conclude. However, a tendency of an interesting control when the product is applied at the dose rate of 24 g sulfoxaflor/ha was observed.

As for the other aphids such as *Aphis* sp. (APHISP) and *Macrosiphum* sp. (MACSSP), no data were submitted in ornamentals grown in field. The extrapolation of conclusions established for cucurbits, solanaceous, and/or other crops could be done for ornamentals concerning common pests such as *Aphis gossypii* and *Macrosiphum euphorbiae*. Besides, conclusions obtained indoor could support those established in field situations in ornamentals.

The efficacy level of CLOSER could be considered as satisfactory in ornamentals crops grown in field to control aphids.

Whitefly control in cucurbits

A total of 12 GEP trials were conducted in Italy (8 trials) and Greece (4 trials) between 2008 and 2013 and 1 not GEP trial from Cyprus (following the relevant EPPO guidelines) in 2012 on zucchini (8) and cucumber (5) crops to demonstrate the efficacy of sulfoxaflor for the control of whiteflies in cucurbit crops in open field conditions. A single application of sulfoxaflor at 24 and 48 g a.s./ha was compared to two applications of 24 g a.s./ha and different commercial standards (acetamiprid, flonicamid and spirotetramat) against *Trialeurodes vaporariorum* and *Bemisia tabaci.* Infestation level at the time of application ranged between 2 and 469 mobile forms/leaf ensuring sufficient natural infestation for getting reliable results. Treatments were applied to all trials using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 800-1,500 L/ha using conventional nozzles.

The level of control of one single application of the dose rate of 24 g a.s./ha was significant but did not meet farmer's expectations because, in the case of a high pest pressure, the survivors still caused significant damages to crop. To close this gap the 24 g a.s./ha treatment should have been repeated after 7-14 days depending on the species and pest pressure. This technology delivered sufficient efficacy against TRIAVA and was similar to commercial standards against BEMITA too.

As 48 g a.s./ha is the maximum registerable rate for sulfoxaflor in Europe and this rate provided sufficient level of control of whiteflies (at least on TRIAVA), comparable to the applied standards, the proposed label rate is 48 g a.s./ha, which can be split to 2 applications of 24 g as/ha sprayed with a 7-14 days interval against whiteflies in cucurbit crops grown in open field conditions in the EU regulatory Southern zone. These results confirmed the rates established in solanaceous crops in the EU regulatory Southern zone.

Table 6.1.5-45 shows that a single application of sulfoxaflor at 48 g a.s./ha provides similar efficacy to the 2 applications of 24 g a.s./ha rate (with 7-14 days spray interval) and these two applications are comparable to the applied standard products acetamiprid, flonicamid and spirotetramat for the control of whiteflies (*Trialeurodes vaporariorum)* in cucurbits grown in open field conditions. The efficacy of the applied products was slightly weaker against *Bemisia tabaci* but the tendency was the same. As 48 g a.s./ha is the maximum registerable rate for sulfoxaflor in Europe and this rate provided sufficient level of control of whiteflies (at least on TRIAVA), comparable to the applied standards, the proposed label rate is 48 g a.s./ha, which can be split to 2 applications of 24 g as/ha sprayed with a 7-14 days interval against whiteflies in cucurbit crops grown in open field conditions in the EU regulatory Southern zone. These results confirmed the rates established in solanaceous crops in the EU regulatory Southern zone.

Table 6.1.5-45 Efficacy of sulfoxaflor at proposed label rate in comparison to reference products against *Trialeurodes vaporariorum* in cucurbit crops (summary across 6 field trials).

Days after appl.		Efficacy of sulfoxaflor and references in %				
		sulfoxaflor	sulfoxaflor	acetamiprid	flonicamid	spirotetramat
		24 g a.s./ha	48 g a.s./ha	75 g a.s./ha	50 g a.s./ha	72 g a.s./ha
		2 sprays*	1 spray	1 spray	1 spray	1 spray
1-3DAA1	**mean**	73.1	72.0	66.6	78.7	43.5
	limits	*30.6-98*	*0-98.6*	*0-95.3*	*10.4-97.6*	*0-92.7*

6-9DAA1	**mean**	61.3	70.2	65.1	50.6	57.1
	limits	*4.8-93.3*	*47.8-95.8*	*0-94.1*	*0-96*	*0-95.8*
11-15DAA1	**mean**	63.9	83.6	62.7	61.2	53.8
	limits	*49.2-71.3*	*61.7-96.7*	*27.8-78.7*	*19.1-95.6*	*9.6-85.7*
1-3DAA2	**mean**	75.8	71.7	74.9	na	na
	limits	*36.2-93.8*	*17.6-89.2*	*73.6-76.8*	*na*	*na*
6-9DAA2	**mean**	75.9	73.0	77.7	na	na
	limits	*41.5-93.3*	*33.6-97.8*	*72.2-85.3*	*na*	*na*
1-3DAA1	nr of trials	5	5	5	-	-
	mean	49.2	60.9	58.2	-	-
	limits	42-64.7	51.8-70.8	39.1-93.2	-	-
6-9DAA1	nr of trials	4	4	4	-	4
	mean	35.4	55.7	48.6	-	42.8
	limits	23.4-58.6	21.1-78.9	14-74.3	-	18.9-53.4
11-15DAA1	nr of trials	-	3	3	-	-
	mean	-	83.6	62.7	-	-
	limits	-	65.6-92.6	38.5-75	-	-
21DAA1	nr of trials	-	3	3	-	-
	mean	-	79.2	57.7	-	-
	limits	-	68.2-85	48.1-63.5	-	-
1-3DAA2	nr of trials	4	4	4	-	4
	mean	69.6	61.5	54.1	-	50.4
	limits	60.1-76.1	27.1-85.3	16.5-68.6	-	23-64.2
6-9DAA2	nr of trials	3	3	3	3	3
	mean	73.9	72.8	66.5	78.6	66.1
	limits	61.3-84.5	64.2-84.2	56.2-77.8	76.6-82.1	60.2-72.3

(*) = 7 days interval; DAA1 = days after the 1stapplication; DAA2 = days after the 2nd application

The highlighted part of the data came from orthogonal data comparison when the limits show the minimum and maximum trial mean values not individual data limits as above.

ZRMS conclusion: Whiteflies control in cucurbits

Between 2008 and 2013, 12 trials were conducted against whiteflies (*Trialeurodes vaporariorum* 8 trials and *Bemisia tabaci* 4 trials) in 8 cucumber and 4 zucchini grown in open field conditions trials in Italy (8 trials) and Greece (4 trials).

The results obtained against TRIAVA in cucumber and zucchini showed that the efficacy of CLOSER applied at the claimed dose of 48 g sulfoxaflor/ha was superior or equivalent to the reference based on acetamiprid (75 g/ha).

A tendency of an interesting efficacy of the product was observable when the dose rate was equal to the claimed dose of 48 g sulfoxaflor/ha against BEMITA. The efficacy level of CLOSER against TRIAVA should be as satisfactory as against *Bemisia tabaci* (BEMITA) in cucurbits.

The efficacy level of CLOSER could be considered as satisfactory in cucurbits grown in field to control whiteflies.

Whitefly control in solanaceous vegetable crops
Between 2007-2012, 6 trials on *Bemisia tabaci* and 6 trials on *Trialeurodes vaporariorum* were conducted to demonstrate the efficacy of sulfoxaflor (GF-2626) for the control of whiteflies in solanaceous crops grown in open fields (2 trials on bell pepper, 9 trials in tomato, 1 trial in eggplant). Trials were carried out by Dow AgroSciences and contractor companies, all followed the EPPO standards (PP 1/135, PP 1/152, PP 1/181 and the specific EPPO Guideline PP 1/36: Whiteflies) and all are officially recognized by the competent authorities to carry out field registration trials in accordance with the principles of Good Experimental Practice (GEP). All trials were of a randomized complete block design with four replicates. Treatments were applied using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 600-1000 L/ha using conventional nozzles. A single application of sulfoxaflor at 48 g a.s./ha was compared to two applications of 24 g a.s./ha and commercial standards in trials from Italy (6 trials), Greece (4 trials), France (1 trial) and Spain (1 trial). Efficacy was tested under a range of environmental conditions to fully challenge the product against sufficient level of natural infestation of whiteflies. One or two applications with 7 to 14 days interval were carried out at crop development stage of BBCH 52-81, depending on the crop and country.

Summing up all the results sulfoxaflor at dose rate of 24 g a.s./ha applied two times or 48 g a.s./ha applied one time, showed sufficient overall efficacy at least on *Bemisia tabaci* as the efficacy was slightly weaker on *Trialeurodes vaporariorum (*

Table 6.1.5-46 and **Table 6.1.5-47**). In comparison to the standard products sulfoxaflor delivered similar whitefly control to acetamiprid and spirotetramat, which actives are important tools for whitefly control in the practice. As 48 g a.s./ha is the maximum registerable rate for sulfoxaflor in Europe and this rate provided sufficient level of control of whiteflies (at least on BEMITA), comparable to the applied standards, the proposed label rate is 48 g a.s./ha, which can be split to 2 applications of 24 g as/ha sprayed with a 7-14 days interval against whiteflies in solanaceous crops grown in open field conditions in the EU regulatory Southern zone. These results confirmed the rates established in cucurbit crops in the EU regulatory Southern zone showing that 2x24 g as/ha sulfoxaflor sprayed with a 7-14 days interval or one application of 48 g a.s./ha are comparable to widely used standards against whiteflies in scucurbit crops grown in fields. These conclusions were confirmed also by 22 greenhouse trials as well summarized in the GF-2626 Protected Crops BAD.

Table 6.1.5-46 Efficacy of sulfoxaflor at proposed label rates in comparison to reference products against *Trialeurodes vaporariorum* (TRIAVA) in solanaceous crops. Summary across 4 open field trials.

Days after appl.		Efficacy of sulfoxaflor and references in %			
		sulfoxaflor		acetamiprid	spirotetramat
		24 g a.s./ha	48 g a.s./ha	75-100 g a.s./ha	72-100 g a.s./ha
		2 sprays*	1 spray	1 spray	1 spray
3DAA1	mean	48.075	56.43	49.66	29.7
	limits	*41.2-54.9*	*27.4-78.0*	*16.1-83.2*	*15.8-37.7*
7DAA1	mean	48.4	62.17	54.2	26.3
	limits	*35.5-56.1*	34.8-83.0	*27.6-93.4*	*20.1-35.5*
14 DAA1	mean	n.a.	77.4	42.2	n.a.
	limits	n.a.	*70.8-84.4*	*37.8-46.8*	n.a.
3 DAA2	mean	72.62	72.8	59.8	54.7

	limits	*68.6-76.7*	*61.6-84.1*	*52.9-67*	*46.5-65.5*
7 DAA2	mean	59.4	71.5	43.3	42.9
	limits	*40.3-76.3*	*63.8-79.3*	*35.4-48.6*	*34-51.9*
14 DAA2	mean	57.6	57.94	38.4	38.4
	limits	41.8-70.8	48.2-67.7	*31.7-46.2*	*28.2-45.6*
all evaluations	nr of trials	4	n.a.	4	n.a.
	mean	57.3	n.a.	64.6	n.a.
	limits	35.5-76.7	n.a.	20.9-94.5	n.a.
all evaluations	nr of trials	n.a.	4	4	n.a.
	mean	n.a.	65.2	52.9	n.a.
	limits	n.a.	27.2-84.4	16.1-94.5	n.a.

DAA1 = days after application no. 1 DAA2 = days after application no. 2

Table 6.1.5-47 Efficacy of sulfoxaflor at proposed label rate in comparison to reference products against *Bemisia tabaci* (BEMITA) in solanaceous crops. Summary across 3 open field trials.

Days after appl.		**Efficacy of sulfoxaflor and references in %**			
		sulfoxaflor		**acetamiprid**	**spirotetramat**
		24 g a.s./ha	**48 g a.s./ha**	**75 g a.s./ha**	**72 g a.s./ha**
		2 sprays	**1 sprays**	**1 spray**	**1 spray**
1-3 DAA1	**Mean**	**62.8**	**82.4**	**77.7**	**66.2**
	Limits	*57.7-66.2*	*73.8-89.4*	*70.8-73.3*	62.3-69.6
3 DAA1	**Mean**	**82.9**	**85.05**	**93.7**	**80.5**
	Limits	*80.6-85.6*	*79-91.1*	*90.7-96.6*	*77.3-83.6*
7DAA1	**Mean**	**85.1**	**84.6**	**91.8**	**83.6**
	Limits	*80.4-88.4*	*80.5-88.8*	*87.3-95.5*	*81.8-85.1*
3 DAA2	**mean**	**92.0**	**87.1**	**87.0**	**76.6**
	limits	*91.0-92.7*	*86.3-89.3*	*85.8-88.7*	*73.3-79.5*
7 DAA2	**mean**	**88.1**	**86.0**	**79.1**	**75.5**
	limits	*86.1-90.1*	*80.8-90.6*	*77.2-81.4*	*69.3-82.7*
14DAA2	**mean**	**72.0**	**72.4**	**60.4**	**55.5**
	limits	*69.5-74.6*	*69.8-75.2*	*57-64.4*	*45.9-62.6*
All evaluations	no of trials	3	3	3	n.a.
	mean	72.9	81.7	77.5	n.a.
	limits	54.8-92	69.8-91.1	43-98.6	n.a.

DAA1 = days after application no. 1 DAA2 = days after application no. 2

ZRMS conclusion: Whiteflies control in solanaceous crops

Between 2007 and 2012, 6 Mediterranean trials on *Bemisia tabaci* (BEMITA) and 6 Mediterranean trials on *Trialeurodes vaporariorum* (TRIAVA) were conducted for the control of whiteflies in solanaceous vegetable crops (2 trials on bell pepper, 9 trials in tomato, 1 trial in eggplant) grown in open field Italy (6 trials), Greece (4 trials), France (1 trial) and Spain (1 trial).

The results obtained against *Trialeurodes vaporariorum* (TRIAVA) and *Bemisia tabaci* (BEMITA) in tomato, pepper and eggplant showed that the efficacy of CLOSER applied at the claimed dose of 48 g sulfoxaflor/ha was all in all comparable to the reference based on acetamiprid (75-100 g/ha).

The efficacy level of CLOSER could be considered as satisfactory in solanaceous crops grown in field to control whiteflies.

Whitefly control in ornamental crops (flowers)
The most common whitefly species in outdoor ornamentals and flowers are: *Trialeurodes vaporariorum* and *Bemisia tabaci*. These species are polyphagous and important pests also in other outdoor crops especially in solanaceous and cucurbit vegetable crops. A full data set has been delivered to demonstrate the efficacy and comparability of sulfoxaflor, applied as one single application at 48 g a.s./ha or 2 applications of 24 g a.s./ha, against whiteflies in the relevant chapters in the "EU regulatory Southern zone" and the "Protected use" Biology Assessment Dossiers. All of these data can be validly extrapolated to whiteflies damaging ornamental and flower crops grown in open fields in the EU regulatory Southern zone as the pest biology and envinronmental conditions are similar in all those crops, even the protected uses can be considered as the worse case scenarios covering challanging situations in the field conditions.

In 2008-2013, 2 open field and 3 greenhouse trials were conducted in Italy to demonstrate the efficacy of sulfoxaflor against whiteflies in ornamental crops. Sulfoxaflor was tested at 24 and 48 g a.s./ha in *Euphorbia*, *Lantana* and *Gerbera* crops for the control of *Trialeurodes vaporariorum (*TRIAVA) and compared to widely used EU standard products like acetamiprid, flonicamid, imidacloprid and spirotetramat. All 5 trials (*Lantana camara* in 2 trials, *Euphorbia pulcerrima* in 2 trials, *Gerbera* in 1 trial) had sufficient level of natural infestation to obtain reliable results (0.5- 21.2 mobile forms/leaf). The trials were carried out under GEP and in accordance with the EPPO Guideline 1/36 and guidelines referenced therein. Applications were carried out at development stages between BBCH 33 and 64 in open field and between BBCH 19 and 67 in greenhouses. Treatments were applied by backpack sprayers (engine air), calibrated to spray volume of 1,100 L/ha for the open field trials and 800-1,500 L/ha for the greenhouse trials.

Sulfoxaflor applied at 48 g as/ha rate delivered significant whitefly control especially in the first 2 weeks. Later, its efficacy decreased but was similar to the standard products. The efficacy of 24 g a.s./ha rate started decreasing after the first week but after repeating the application of the 24 g as/ha rate, the efficacy increased again and became even better than the residual efficacy of the 1x48 g a.s./ha sulfoxaflor or that of the standard products (**Table 6.1.5-48**). These results confirmed the whitefly results obtained in solanaceous and cucurbit crops across Europe. As both 2x24 g a.s./ha and 1x48 g a.s./ha treatments delivered similar level of whitefly control being at least as good as the applied standards, the proposed registration rates for sulfoxaflor against whiteflies in ornamental crops and flowers are 2 applications of 24 g a.s./ha sprayed with 7-14 days interval or 1 application of 48 g a.s./ha in the EU regulatory Southern zone.

Table 6.1.5-48 Efficacy of sulfoxaflor at proposed label rates in comparison to reference products against adults of TRIAVA in flowers in ortogonal comparison in 2 open field trials in 2013.

Days after appl.		Efficacy of sulfoxaflor and references in %				
		sulfoxaflor	sulfoxaflor	acetamiprid	flonicamid	spirotetramat
		24 g a.s./ha (**)	48 g a.s./ha (*)	75 g a.s./ha (*)	70 g a.s./ha (*)	72 g a.s./ha (*)
3DAA1	mean	66.3	67.7	49.6	45.6	32.9
	limits	*37.5-93.2*	*37.9-89.8*	*5.7-98.1*	*28.5-64.8*	*10.7-66*
7DAA1	mean	72.6	74.9	62.7	60.4	49.1
	limits	*50.6-93*	*43.4-94.2*	*0-98.3*	*35.6-79.6*	*0-74.9*
10DAA1	mean	83.2	73.3	64.4	65.3	52.5

	limits	*69.4-97.3*	*41.7-97.8*	*3.1-97.3*	*55.4-72.7*	*0-89.8*
14DAA1	mean	74.6	67.9	66.3	53.8	49.8
	limits	*58.1-93.4*	*30.2-89*	*0-96.2*	*15.1-81.4*	*0-79.4*
21DAA1 (14DAA2)	mean	68.9	64.1	63.2	53.8	50.6
	limits	*55.7-83.6*	*40.6-80.9*	*9-91.9*	*33.7-70.8*	*7.5-77.6*

(*) = 1 single spray); (**) = 2 sprays 7 days interval; DAA1 = days after the 1st application; DAA2 = days after the 2nd application

ZRMS conclusion: Whiteflies control in ornamental crops

In 2008-2013, 5 trials (2 open field and 3 greenhouse trials) were conducted in Italy in *Euphorbia*, *Lantana* and *Gerbera* crops for the control of *Trialeurodes vaporariorum* (TRIAVA). ZRMS accepted indoor efficacy trials as additional supportive trials. Besides, the efficacy data set can be completed by results get on the same pest on vegetable crops (cucurbits and solanaceous crops).

The results obtained in *Euphorbia*, *Lantana* and *Gerbera* crops for the control of TRIAVA showed that the efficacy of CLOSER applied at the claimed dose of 48 g sulfoxaflor/ha was superior or equivalent to the reference based on acetamiprid (75 g/ha), flonicamid (70 g/ha) and spirotetramat (72 g/ha).

No efficacy data were provided against *Bemisia tabaci* (BEMITA) in ornamental crops. The extrapolation of conclusions obtained with *Bemisia tabaci* in solanaceous or cucurbits permits to cover the use of the product for the same whitefly in ornamentals, if judged reliable. In fact, in other crops such as solanaceous crops, the efficacy level of CLOSER against BEMITA was considered as satisfactory. Therefore, this conclusion remains valid for ornamental crops.

The efficacy level of CLOSER could be considered as satisfactory in ornamentals crops grown in field to control whiteflies.

Scale control in pome fruits

14 trials were conducted between 2010 and 2013 within the EU regulatory Southern zone in France, Greece, Italy, Portugal and Spain as representative countries for demonstrating the efficacy of sulfoxaflor for the control of *Quadraspidiotus perniciosus* (QUADPE) scales in various pome fruit crops (11 trials in apple and 3 trials in pear). The biological performance of sulfoxaflor was evaluated and compared to main European standard references like spirotetramat, pyriproxifen and chlorpyrifos. One single application was carried out at crop stages ranging between BBCH-53 and BBCH-76 of apple or pear crops and spray volumes between 750 and 1,736 L/ha were used. All 14 trials had sufficient level of natural infestation of scales to obtain reliable results (1-442 scales/shoot).

When applied before flowering stage of the crop against overwintered QUADPE larvae, sulfoxaflor gave 79% control on the fruit damages being comparable to spirotetramat and chlorpyrifos + oil and inferior to pyriproxyfen (**Table 6.1.5-49**). When applied in curative conditions at the beginning of the first or second generation against first instar larvae, sulfoxaflor gave 73% control on the fruit damages and was slightly better than spirotetramat and inferior to chlorpyrifos + oil (

Days after application	Efficacy of sulfoxaflor and references in % on fruits attacked by QUADPE in preventative application											
	sulfoxaflor, 48 g a.s. /ha			spirotetramat, 150 g a.s. /ha			pyriproxyfen, 60 g a.s./ha			chlorpyrifos + oil*, 790 g a.s. /ha		
	means	limits	nb of trials	means	limits	nb of trials	means	limits	nb of trials	means	limits	nb of trials
121-153	79.4	56.6-92.3	4				96.4	93.6-98	4			
121-153	77.7	56.6-92.3	3	76.7	53.2-89.7	3	96.2	93.6-98	3	87.0	65.8-97.8	3

Table 6.1.5-50). As 48 g a.s./ha is the maximum registerable rate for sulfoxaflor in Europe and this rate proved to be effective and comparable to some commercial standards, 48 g a.s./ha is the recommended label rate of sulfoxaflor for

claiming efficacy against *Quadraspidiotus perniciosus.* The timing of application proposed to be preventative or at least before establishing the colonies to achieve good results.

Table 6.1.5-49. Efficacy of sulfoxaflor sprayed at 48 g a.s./ha against QUADPE in pome fruits (Summary across 4 field trials in preventative applications).

Days after application	Efficacy of sulfoxaflor and references in % on fruits attacked by QUADPE in preventative application											
	sulfoxaflor, 48 g a.s. /ha			spirotetramat, 150 g a.s. /ha			pyriproxyfen, 60 g a.s./ha			chlorpyrifos + oil*, 790 g a.s. /ha		
	means	limits	nb of trials	means	limits	nb of trials	means	limits	nb of trials	means	limits	nb of trials
121-153	79.4	56.6-92.3	4				96.4	93.6-98	4			
121-153	77.7	56.6-92.3	3	76.7	53.2-89.7	3	96.2	93.6-98	3	87.0	65.8-97.8	3

Table 6.1.5-50 Efficacy of sulfoxaflor sprayed at 48 g a.s./ha against QUADPE in pome fruits (Summary across 4 field trials in curative situations).

Days after application	Efficacy of sulfoxaflor and references in % on fruits attacked by QUADPE in curative application								
	sulfoxaflor, 48 g a.s. /ha			spirotetramat, 150 g a.s. /ha			chlorpyrifos + oil*, 780-790 g a.s. /ha		
	means	limits	nb of trials	means	limits	nb of trials	means	limits	nb of trials
33-121	80.5	(64.8-96.3)	4	71.3	(59.9-84.8)	4	*83.1*	*(69.2-92.4)*	*3*

CHP was applied only in 3 trials, so data here are just for additional info
(*) Oliocin at 0.25 L/100L or M-PEDE at 7350 g a.s./ha

<u>ZRMS conclusion: Scales control in pome fruits</u>

14 Mediterranean trials were conducted between 2010 and 2013 across France (1 trial), Greece (1 trial), Italy (9 trial), Portugal (1 trial) and Spain (2 trials) against *Quadraspidiotus perniciosus* (QUADPE) in pome fruits (11 trials in apple and 3 trials in pear).

The results obtained against *Quadraspidiotus perniciosus* (QUADPE) in apple and pear crops showed that the efficacy of CLOSER applied at the claimed dose of 48 g sulfoxaflor/ha was equivalent or superior to the references based on spirotetramat (150 g/ha) and chlorpyrifos + oil (790 g/ha) but inferior to the reference based on pyriproxyfen (60 g/ha).
The efficacy level of CLOSER could be considered as satisfactory in pome fruits to control scales.

Scale control in stone fruits

In the years of 2011, 2012 and 2013, 12 trials against *Pseudaulacaspis pentagona* and 9 trials against *Quadraspidiotus perniciosus*, were carried out in Italy (4), Greece (11), France (4) and Spain (2) in stone fruit crops on peach (16), plum (3) and nectarine (2) crops. Sulfoxaflor was applied at 48 g. a.s./ha applied one time and 24 g a.s./ha applied two times and the efficacy was compared to that of the standard spirotetramat and pyriproxifen. Crop stages at application varied between BBCH-69 to BBCH-79. Treatments were applied to all trials using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 1000-3000 L/ha. All trials were carried out under GEP and in accordance with the relevant EPPO guidelines.

Table 6.1.5-51 and

Table 6.1.5-52 show that sulfoxaflor applied once at 48 g. a.s./ha or two times at 24 g. a.s./ha provided sufficient overall control of both *Quadraspidiotus perniciosus and Pseudalacaspis pentagona* in the stone fruit trials being comparable to the standard treatments spirotetramat (150 g a.s./ha) and pyriproxifen (60 g a.s./ha). The trials revealed some important factor impacting efficacy of the products. The application timing seemed to be critical to obtain good efficacy on scales, the best timing is targeting the egg hatching stage, later the efficacy decreased. Therefore, the target dose rate of sulfoxaflor against scales is recommended to be 48 g a.s./ha, which can be applied once at egg hatching stage or in a split application with a 1-3 weeks interval depending on the dynamics of egg hatching.

Another factor was the addition of oil to sulfoxaflor which was tested at 24 g. a.s./ha with a single application. The addition of oil significantly enhanced sulfoxaflor activity against *Quadraspediotus perniciosus*. The use of oil in mixtures is a common practice for several actives, like chlorpyrifos and spirotetramat, and should be an option for the farmers for sulfoxaflor as well as trials proved the beneficial effect in some South European trials.

Table 6.1.5-51 Efficacy of sulfoxaflor sprayed at 2 x 24 and 1 x 48 g a.s./ha against *Quadraspidiotus perniciosus* (QUADPE) in stone fruit crops.

Days after appl.		Efficacy in %				
		SULFOXAFLOR (GF-2626)		spirotetramat	chlorpyrifos	pyriproxyfen
		24 g a.s./ha	48 g a.s./ha	150 g a.s./ha	530-940 g a.s./ha	60 g a.s./ha
		2 sprays	1 spray	1 spray	1 spray	1 spray
One evaluation per trial with best overall	nr of trials	3	3	n.a.	3	n.a.
	Mean	58.4	57.6	n.a.	65.4	n.a.
	Limits	*41.8-86.3*	*45.1-80.5*	*n.a.*	*48.1-76.4*	*n.a.*
One evaluation per trial with best overall	nr of trials	n.a.	9	n.a.	9	n.a.
	Mean	n.a.	62.2	n.a.	65	n.a.
	Limits	*n.a.*	*43.3-87.3*	*n.a.*	*29.1-99.4*	*n.a.*
One evaluation per trial with best overall	nr of trials	n.a.	6	6	n.a.	n.a.
	Mean	n.a.	64.8	73	*n.a.*	n.a.
	Limits	*n.a.*	*45.1-87.3*	*29.1-90.1*	n.a.	*n.a.*
One evaluation per trial with best overall	nr of trials	n.a.	4	n.a.	n.a.	4
	Mean	n.a.	82.5	n.a.	n.a.	79.6
	Limits	*n.a.*	*76-87.3*	*n.a.*	*n.a.*	*66.7-99.3*

Table 6.1.5-52 Efficacy of sulfoxaflor applied at 2 x 24 and 1 x 48 g a.s./ha and compared to spirotetramat and pyriproxyfen against *Pseudaulacaspis pentagona* (PSEAPE) in stone fruit crops.

Days after appl.		Efficacy of sulfoxaflor and references in %		
		sulfoxaflor	spirotetramat	pyriproxyfen

		24 g a.s./ha 2 sprays	48 g a.s./ha 1 spray	150 g a.s./ha 1 spray	60 g a.s./ha 1 spray
14-21DAA	mean	37,8	45,0	52,9	n.a.
	limits	*32,7-44,2*	*42,3-48,4*	*50,8-57,2*	*n.a.*
21-45DAA	mean	78,4	75,3	74,6	49,8
	limits	*75,8-82,8*	*46,4-82,7*	*24,9-96,0*	*22,4-71,6*
14-21DAA	nr of trials	4	4	4	n.a.
	mean	37.8	45.3	51.8	n.a.
	limits	32.7-44.2	42.3-48.4	50.8-53.8	n.a.
21-45DAA	nr of trials	4	4	4	n.a.
	mean	77.3	80.4	82.5	n.a.
	limits	75.8-79.9	79.5-81.9	81.9-83.2	n.a.

n.a. = not available value for this data points

ZRMS conclusion: Scales control in stone fruits

During 2011, 2012 and 2013, 21 Mediterranean trials were conducted in stone fruit crops (peaches (16), nectarine (2) and plums (3)) in France (4 trials), Greece (11 trials), Spain (2 trials) and Italy (4 trials) against important scale species - *Pseudalacaspis pentagona* (12 trials) and *Quadraspediotus perniciosus* (9 trials).

The results obtained in stone fruits against *Quadraspediotus perniciosus* (QUADPE) and *Pseudaulacaspis pentagona* (PSEAPE) showed that the efficacy of CLOSER applied at the claimed dose of 48 g sulfoxaflor/ha was all in all comparable to the references based on spirotetramat (150 g/ha), chlorpyrifos (530-940 g/ha) and pyriproxyfen (60 g/ha).

The efficacy level of CLOSER could be considered as satisfactory in stone fruits to control scales.

Scale control in citrus crops

Data from 9 GEP trials conducted in Greece (5 trials), Spain (1 trials) and Italy (3 trials) in 2012 and 2013 were used for demonstrating the comparability of sulfoxaflor to standard products against *Aonidiella aurantii* (AONDAU) in different citrus crops. Sulfoxaflor applied once at 48 g a.s./ha or two application of 24 g a.s./ha (7-14 days interval) were applied to red scale at the presence of crawlers (mobile forms) and the efficacy was compared to that of the standard spirotetramat and pyriproxyfen. All of the 9 trials had sufficient level of natural infestation to obtain reliable results (29-69 % infested fruits). The applications were carried out one or two times at development stage of BBCH 69-79 of the orange (4 trials) and mandarin (5 trials) crops. Treatments were applied to all trials using a backpack sprayer (engine or compressed air), calibrated to apply a spray volume of 1,000 – 3,000 L/ha using conventional nozzles. All trials were carried out under GEP and in accordance with the relevant EPPO guidelines.

There was no difference between the sulfoxaflor treatments and the standard spirotetramat and pyriproxyfen. Sulfoxaflor at both tested rates (single application of 48 g a.s./ha and double application of 24 g a.s./ha) proved to be comparable to the reference products and provided sufficient control of *Aonidiella auranti* in citrus (
Table 6.1.5-53).

In some trials, the addition of a paraffinic oil type adjuvant to sulfoxaflor increased the efficacy in comparison to the straight treatments without causing any phytotoxicity. Therefore, we also recommend an addition of a paraffinic oil type adjuvant applied at the local registered rate to sulfoxaflor to enhance the efficacy against citrus scales where local practice is suggesting it.

Table 6.1.5-53

As the maximum registerable rate of sulfoxaflor is 48 g a.s./ha in Europe and this rate delivered comparable efficacy to standards the single application of 48 g a.s./ha or a double application of 24 g a.s./ha (7-14 days interval) are claimed as the recommended label rates for sulfoxaflor against red scale (*Aonidiella aurantii)* in citrus in the EU regulatory Southern zone. In some trials, the addition of a paraffinic oil type adjuvant to sulfoxaflor increased the efficacy in comparison to the straight treatments without causing any phytotoxicity. Therefore, we also recommend an addition of a paraffinic oil type adjuvant applied at the local registered rate to sulfoxaflor to enhance the efficacy against citrus scales where local practice is suggesting it.

Table 6.1.5-53 Efficacy of sulfoxaflor at proposed label rates in comparison to reference products against *Aonidiella aurantii* (AONDAU) in citrus. Summary across 9 field trials.

Days after appl.		**Efficacy in %**			
		sulfoxaflor (single application)	**sulfoxaflor (double application)**	**spirotetramat (single application)**	**pyriproxyfen (single application)**
		48 g a.s./ha	**24 g a.s./ha (2x)**	**150 g a.s./ha**	**60 g a.s./ha**
19-46DAAA	nr of data points	36	8	28	*8*
	Mean	74.3	82.7	79.5	78.4
	Limits	*23.6 – 100*	*67.1 – 89.9*	*52.3 – 100*	*16.5 – 98.8*
19-46DAAA	**nr of trials**	7	-	7	-
	mean	67.3	-	79.5	-
	limits	53.9 – 76.5	-	63.8 - 100	-
19-46DAAA	**nr of trials**	2	2	2	-
	mean	74.1	82.7	83.6	-
	limits	72.1 – 76.1	79.8 – 85.7	77.2 - 90	-
19-46DAAA	**nr of trials**	2	-	-	2
	mean	74	-	-	78.4
	limits	73.5 – 74.5	-	-	73.5 – 83.2

DAAA = days after the application

<u>ZRMS conclusion: Scales control in citrus crops</u>

In 2012 and 2013, 9 Mediterranean trials were carried out against red scale (*Aonidiella aurantii*-AONDAU) in citrus crops orange (4 trials) and mandarin (5 trials) using data from Greece (5 trials), Spain (1 trial) and Italy (3 trials).

The results obtained against *Aonidiella aurantii* (AONDAU) in orange and mandarin crops showed that the efficacy of CLOSER applied at the claimed dose of 48 g sulfoxaflor/ha was all in all comparable to the references based on spirotetramat (150 g/ha) and pyriproxyfen (60 g/ha).

The efficacy level of CLOSER could be considered as satisfactory in citrus to control scales.

Mealybug control in citrus

All together 7 trials trials were conducted in Greece (6 trials) and Spain (1 trial) between 2011 and 2014 for demonstrating the efficacy and comparability of sulfoxaflor against *Planococcus citri* (PSECCI) in citrus crops. The trials were sprayed with sulfoxaflor at 48 g. a.s./ha and compared to spirotetramat (150 g a.s./ha) and other standard products. Treatments were applied by backpack sprayers, calibrated to apply a spray volume of 1,000-2,800 L/ha using conventional nozzles. All trials had sufficient level of natural infestation of citrus mealybug to obtain reliable results when the applications were done at development stages of BBCH 69-74 of orange and mandarin crops. All trials were of a randomized complete block design with four replicates and a minimum plot size of 25 m2. In 5 trials out of 7, at least 1 rate of sulfoxaflor was used alone and also in combination with an oil type of adjuvant. In 3 trials sulfoxaflor was applied at 48 g. a.s./ha once and also as split application as two times spray of 24 g a.s./ha using 1-3 weeks spray interval depending on the egg hatching dinamics in the trials.

These trials showed that a single application of the rate 48 g a.s./ha of sulfoxaflor provided sufficient control of the citrus mealybugs and was at least as good as the reference product (spirotetramat) when applied against the crawlers. When the application was split to two sprays of 24 g a.s./ha using 1-3 weeks spray interval, the delivered efficacy by the full rate sulfoxaflor was equal to the 2 applications of 24 g a.s./ha and also to the standard spirotetramat (**Table 6.1.5-54**). Therefore, both application types applying the sum of 48 g a.s./ha of sulfoxaflor are the recommended label rates in citrus crops against maelybugs targeting the intensive egg hatching stage as the young crawlers are the most sensitive to the insecticde

The efficacy results of the straight treatments and the adjuvant mixtures summarized in **Table 6.1.5-55** show that the addition of a paraffinic oil to sulfoxaflor slightly increased the efficacy, which observation was very clear in few of the trials. It is not a surprise as most of the insecticides are applied with an adjuvant in the practice against difficult to control pests like scales or maelybugs in citrus crops. Therefore, we also recommend an addition of a paraffinic oil kind adjuvant applied at the local registered rate to sulfoxaflor to enhance the efficacy against citrus mealybug where local practice is suggesting it.

Table 6.1.5-54 Efficacy of sulfoxaflor at proposed label rates (1 x 48 or 2 x 24 g a.s./ha) in comparison to reference product against *Planococcus citri* in citrus (summary across 3 trials, ortogonal).

Days after appl.		**Efficacy of sulfoxaflor and references in %**		
		sulfoxaflor	**sulfoxaflor**	**spirotetramat**
		single application	split application	single application
		48 g a.s./ha	2 x 24 g a.s./ha	150 g a.s./ha
21-54DAAA (0-33DAAB)	Mean	94.5	93.8	94.5
	Limits	*91.5 – 99.5*	*89.6 – 99.8*	*83.6 - 99*

Table 6.1.5-55 Efficacy of sulfoxaflor at proposed label rate (48 g a.s./ha) against *Planococcus citri* in citrus either applied alone or tank mixed with paraffinic oil adjuvant (summary across 5 trials, ortogonal).

Days after appl.		**Efficacy of sulfoxaflor and references in %**	
		sulfoxaflor	**sulfoxaflor + paraffinic oil ***
		Single application	
		48 g a.s./ha	48 g a.s./ha + (country rate) **
28-54DAAA	**Mean**	**76.6**	**78.8**
	Limits	*20 – 98.5*	*38.2 – 99.8*

DAAA = days after the application; * Paraffinic Oil: Greece & Spain (Summer Oil);** Country Registered Rates: Greece (0.5% v/v), Spain (1 L pr/100L)

ZRMS conclusion: Mealybugs control in citrus crops

A total of 6 efficacy Mediterranean trials were conducted in Greece (5 trials) and Spain (1 trial) between 2011 and 2013 against *Planococcus citri* (PSECCI) in citrus crops (orange and mandarin).

The results obtained against *Planococcus citri* (PSECCI) in citrus showed that the claimed dose of 48 g sulfoxaflor/ha was comparable to the reference based on spirotetramat (150 g/ha).

The efficacy level of CLOSER could be considered as satisfactory in citrus to control mealybugs.

ZRMS conclusion about efficacy data of the product CLOSER

The overall data showed that the efficacy level of the product CLOSER is considered as satisfactory for all claimed uses; to be confirmed at MS level considering:
- Extrapolations possibilities on minor uses and/or pest group,
- The distribution of trials considering the EPPO climatic zones.

For information, efficacy data submitted for uses in field (current dRR) and those in greenhouse (the other dRR) are complementary. The conclusions obtained in this dRR are in line with those obtained in the other one.

Regarding the use of the product for the control of whiteflies, where the petitioner proposed the split application of the claimed dose rate (24 g sulfoxaflor * 2), zRMS does not understand the interest of the comparison between 48 g sulfoxaflor * 1 application and 24 g sulfoxaflor * 2 applications. Actually, in practice, the product will not be applied at a 7 day interval (the time interval is too short). However, the product could be applied twice (24 g sulfoxaflor * 2 applications) in the aim to target 2 different pest generations (2 consecutive applications are to avoid for resistance management).
For example, following the comments stage for the controlled conditions dRR, Poland (PL) proposed to increase this interval to 10-21 days between 2 applications.

Following the comment of Greece (EL) concerning scales, the efficacy submitted data were done with *Quadraspidiotus perniciosus* and *Pseudaucalaspis pentagona*, and *Aonidiella aurantii*. These scales are respectively the major pests in pome fruits, stone fruits and citrus crops. The efficacy of the product was shown against these pests. A similar efficacy level is expected against scale species belonging to the family of Diaspididae such as *Epidiaspis leperii*, *Lepidosaphes ulmi*, *Quadraspidiotus ostraeiformis* and *Q. piri*.
Other efficacy trials are required to evaluate the efficacy of the product on scales belonging to other families (Coccidae, for instance).

Effect of the product CLOSER on the yield – efficacy trials

It was deduced that the application of the product CLOSER in peas, apple and plum fruits provided a tendency (low number of trials per crop) of a positive effect on the yield of treated crops compared to the untreated and the standard products.

It is to note that the yield assessment coming from efficacy trials, in presence of pests, should be presented and discussed in the efficacy part because they give information on the control of the pest.

IIIA 6.1.6 EFFECTS ON YIELD AND QUALITY

IIIA 6.1.7 IMPACT ON THE QUALITY OF PLANTS AND PLANT PRODUCTS

CUCURBITS

In 2010, 1 trial was conducted in the EU regulatory Southern zone in Italy to determine the impact of sulfoxaflor on the quality of cucurbit products. The taint test was done on cucumber to evaluate the possible effects of sulfoxaflor (GF-2626) applied 1 or 3 days before harvest at 48 g a.s./ha dose rate on the taste and smell of the final product (cucumber fruits).The method applied for taint tests was based on the EPPO (European and Mediterranean Plant Protection Organization) standard PP 1/242 that provides general guidance on the requirements for testing whether harvested plants or plant products are tainted by plant protection products. The test was conducted on a commercial variety of cucumber (Modam) cultivated under a glass-house in Italy, San Vito di Ostellato, Strada per Portomaggiore 14 (Ferrara).

A quality evaluation was carried out at CNR-IBIMET laboratory by a group of specialists on sensory analysis, agronomic science and statistics, before the taint test. Cucumbers were evaluated according to the Part A of Annex I to the Commission Regulation (EC) No 1221/2008, laying down the general marketing standards for Fruit and vegetables not covered by a specific marketing standard. The evaluation carried out in this preliminary session concerned quality, size and uniformity. Firmness was measured with a penetrometer “Fruit tester FG”. TSS was measured on vegetable juice by using a portable reflectometer (Brixstix, Techniquip Corporation, Livermore, CA, USA). TA was measured with an automatic titrator (Titroline 96, Schott, Mainz, Germany). The colorimeter model is Chroma Meter CR 400 (Konica Minolta, CIE L*a*b*).

The sensory analysis were conducted as 3 triangle test by 34 judges. The judges were scheduled in groups of six to ensure full randomization within groups. They noted the presence of any taint or any significant difference in flavour they found between the samples.

No significant differences between the two samples (produce harvested either 1 or 3 days after application) treated with GF-2626 at a rate of 48 g a.s./ha, and the untreated sample, were detected through the instrumental and sensory analysis. No perceived "taint" was recorded by any assessor.

Tasting tests performed according to EPPO protocol produced the unequivocal outcome of excluding the presence of any taint to cucumbers arising from the use of GF-2626 from tomato product harvested at either 1 DAA or 3 DAA.

SOLANACEOUS VEGETABLES

In 2010, 1 trial was conducted in the EU regulatory Southern zone in Italy to determine the impact of sulfoxaflor on the quality of solanaceous vegetable products. The taint test was done on tomato to evaluate the possible effects of sulfoxaflor (GF-2626) applied 1 or 3 days before harvest at 48 g a.s./ha dose rate on the taste and smell of the final product (tomato fruits).The method applied for taint tests was based on the EPPO (European and Mediterranean Plant Protection Organization) standard PP 1/242 that provides general guidance on the requirements for testing whether harvested plants or plant products are tainted by plant protection products. The test was conducted on a commercial variety of tomato (Tirsa) cultivated under a glass-house in Italy, San Vito di Ostellato, Strada per Portomaggiore 14 (Ferrara).

A quality evaluation was carried out at CNR-IBIMET laboratory by a group of specialists on sensory analysis, agronomic science and statistics, before the taint test. The visual evaluation concerned quality, size and uniformity of fruits. The sensory analysis were conducted as 3 triangle tests by 39 judges. The judges were scheduled in groups of six to ensure full randomization within groups. They noted the presence of any taint or any significant difference in flavour they found between the samples.

No significant differences between the two samples (produce harvested either 1 or 3 days after application) treated with GF-2626 at a rate of 48 g a.s./ha, and the untreated sample, were detected through the instrumental and sensory analysis. No perceived "taint" was recorded by any assessor.

Tasting tests performed according to EPPO protocol produced the unequivocal outcome of excluding the presence of any taint to tomatoes arising from the use of GF-2626 from tomato product harvested at either 1 DAA or 3 DAA.

POME FRUITS

There was no phytotoxicity symptoms in the efficacy trials and most residue data were below the LOQ, which indicates no impact on the quality of fruits but there were few trials conducted to prove the safety.

Effect on fruitfall

In 2008, two trials were undertaken in the EU regulatory Central zone to determine crop tolerance of GF-2626 on different pome fruit varieties. The purpose of those trials was to determine the crop safety on leaves and fruits of sulfoxaflor at 3 dose rates 12 g a.s./ha; 24 g a.s./ha; 48 g a.s./ha) on 13 apple varieties and on 9 pear varieties. In both trials number of fruits per tree was counted to determine a possible effect of the test product on June fruit fall.

There were no statistical differences in number of fruits on the treated and untreated trees and also no quality differences was observed therefore sulfoxaflor can be considered safe with no impact on the fruit fall of apple and pear fruits.

Russeting tests

In 2008, 2011 and 2012, 8 trials were undertaken in the EU regulatory Central and Southern zones to determine the impact of sulfoxaflor on the quality of pome fruits products-russeting test. The purpose of those tests was to check if sulfoxaflor cause a russeting on sensitive apples and pears varieties. The russeting effect was tested on apples in 6 trials and on pears in 2 trials, considered 1 or 2 applications of sulfoxaflor (GF-2626) at 24 and 48 g a.s./ha (at the proposed label rates) in 7 trials and in one apple trial at 24 and 48 g a.s./ha but applied three times. The applied method was based on EPPO (European and Mediterranean Plant Protection Organization) standards mainly PP 1/35(2) that provides general guidance on the requirements for selectivity trials and also guideline M045 – CEB russeting. The procedures demonstrates whether the fruits form the crop treated with plant protection product are different, and increase russeting effect in comparison to control coming from an untreated crop. The test was conducted on commercial varieties of apples and pears (Golden delicious, Conference). The crops were cultivated following the good agriculture practices of the area.

The results form all 8 trials confirmed, that GF-2626 applied at rates of 200 and 400 mL pr/ha (24 and 48 g a.s./ha) did not increase the level of russeting on sensitive pome fruit varieties, therefore sulfoxaflor can be considered safe with no impact on the russeting of apple and pear fruits.

Bronzing effect on the fruits

In 2008, there was one trial set up in pear in Belgium, for examine bronzing effect on the fruits (variety Concorde). Each fruit was quoted with a value according to a scale having six classes showing the degree of bronzing.

The analysis confirmed the visual observations, no statistical differences between the treatments and the untreated check were found; therefore sulfoxaflor can be considered safe with no impact on the fruit skin bronzing of pome fruits when applied according to label recommendations.

Taint test

In 2012, 1 trial was undertaken in the EU regulatory Southern zone to determine the impact of sulfoxaflor on the taste of products made of treated apple. The test was conducted on a commercial variety of apple (Oregon) widely cultivated in Southern France. One application of sulfoxaflor (GF-2626) applied at 48 g a.s./ha, which is the maximum registered rate in Europe, was tested. The method applied for the taint test was based on the EPPO standard PP 1/242, that provides general guidance on the requirements for testing whether harvested plants or plant products are tainted by plant protection products. These procedures demonstrate whether the food product from a crop treated with a plant protection product is different in flavour from a control one coming from an untreated crop.

Under the different trial conditions and according to the results of the sensory tests, significant organoleptic difference was found between the apple juice stemming from the untreated plot and the apple juice stemming from the experimental treatment GF-2626, with the rate of 48 g a.s./ha applied 7 days before the harvest. However, there was no preference to any direction, which means no negative evaluation result. There was no any difference found when the same application was done 3 days before the harvest. According to the tester comments and conclusions, the experimental treatment GF-2626, with the rate of 0.4 L/ha doesn't have impact on the gustatory qualities of the fresh apple and apple juice as no defect or no preferences were detected between the treated and untreated samples.

It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the plants or plant products.

STONE FRUITS

In 2012, 1 trial was undertaken in the EU regulatory Southern zone to determine the impact of sulfoxaflor on the quality of stone fruits product. The taint test was done on nectarines and the protocol considered 1 application of sulfoxaflor (GF-2626) at 48 g a.s./ha, which is the maximum recommended rate in Europe. The objective of the test was to evaluate the possible effects of sulfoxaflor applied once at 48 g a.s./ha dose rate on the taste and smell of the final product (nectarines for fresh food consumption). The method applied for taint tests was based on the EPPO standard PP 1/242.

No differences between the treated and untreated samples were detected during the instrumental and sensory analysis. Tasting tests performed according to EPPO protocol produced the unequivocal outcome of excluding the presence of any taint arising from the use of GF-2626 applied at 48 g a.s./ha rate either 3 or 7 days before harvest.

It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the plants or plant products.

LEGUME, BRASSICA AND LEAFY VEGETABLE CROPS

As there were no phytotoxicity symptoms in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the plants or plant products.

POTATO

As there was no residue found in the tubers at harvest and no phytotoxicity symptoms in the efficacy trials were found, no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the plants or plant products.

ORNAMENTALS AND FLOWERS

As there were no phytotoxicity symptoms in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the plants or plant products.

CITRUS

As there were no phytotoxicity symptoms in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the plants or plant products.

ZRMS conclusion about the impact on the quality of plants and plant products
No negative effects on qualitative parameters should be expected following the application of the product CLOSER in treated crops.

IIIA 6.1.8 EFFECTS ON THE PROCESSING PROCEDURE

CUCURBITS AND SOLANACEOUS VEGETABLES

As there was no taint found in the fruits and its fresh produce either no phytotoxicity symptoms in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the processing procedures.

LEGUMES, LEAFY VEGETABLE AND BRASSICA CROPS

As there were no phytotoxicity symptoms in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the processing procedures.

POTATO

As there was no residue found in the tubers at harvest either no phytotoxicity symptoms in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the processing procedures.

ORNAMENTALS

As there were no phytotoxicity symptoms in the efficacy trials no specific study was conducted. No processing is considered. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the processing procedures.

POME FRUITS

As there was no taint found in the apples and its fresh produce either no phytotoxicity symptoms in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the processing procedures.

STONE FRUITS

As there was no taint found in the fruits and its fresh produce either no phytotoxicity symptoms in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the processing procedures.

CITRUS

As there were no phytotoxicity symptoms in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the processing procedures.

ZRMS conclusion about the effects on the processing procedure
No negative effects on the processing procedure should be expected following the application of the product CLOSER in treated crops.

IIIA 6.1.9 EFFECTS ON THE YIELD OF TREATED PLANTS AND PLANT PRODUCTS

LEGUMES

As no phytotoxicity was observed in any trials, no specific crop yield trials were established in non infested crops. However, in 2008, two efficacy trials in peas were established in Czech Republic where yield was also assessed to see crop safety of sulfoxaflor and the impact on yield. The yield data from the trials showed that applications of GF-2032 at the proposed label rate of 24 g a.s./ha did not have negative effect on the crop yield. Yield in the sulfoxaflor treatments were higher than in the standard control treated by lambda cyhalothrin or in the untreated plots. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the treated plants and plant products.

POME FRUITS

As no phytotoxicity was observed in any trials, no specific crop yield trials were established in non infested pome fruit crops. However, yield was measured in 1 efficacy trial in Poland established in 2012 in apple. The yield data from the trial showed that applications of GF-2626 at the proposed label rate of 24 g a.s./ha did not have negative effect on the crop yield. Yield in the sulfoxaflor treatments was similar to the standard controls and the untreated. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the treated plants and plant products.

STONE FRUITS

As no phytotoxicity was observed in any trials, no specific crop yield trials were established in non infested stone fruit crops. However, yield was measured in 1 efficacy trial established in 2012 in Poland in sweet cherry. The data from this trial conducted in sweet cherry show that one application of sulfoxaflor at the proposed maximum label rate of 48 g a.s./ha did not have negative effect on crop yield. Yield in the sulfoxaflor treatments was similar to the standard controls and the untreated. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the treated plants and plant products.

ORNAMENTALS, POTATO, LEAFY VEGETABLE AND BRASSICA CROPS

As there was no phytotoxicity detected in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the treated plants and plant products. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the treated plants and plant products. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the treated plants and plant products.

CUCURBITS AND SOLANACEOUS VEGETABLES

As there was no phytotoxicity detected in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the treated plants and plant products. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the treated plants and plant products.

CITRUS CROPS

As there were no phytotoxicity symptoms in the efficacy trials no specific study was conducted. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the treated plants and plant products.

ZRMS conclusion about the effects on the yield of treated plants and plant products
No negative effects on the yield should be expected following the application of the product CLOSER in treated crops.

IIIA 6.1.10 ADVERSE EFFECTS

IIIA 6.1.11 PHYTOTOXICITY TO HOST CROP

CUCURBITS

During the development program between 2008 and 2013, many cucurbit crops (cucumber, zucchini, melon and watermelon) and varieties were tested across the EU regulatory Southern zone to evaluate the efficacy and selectivity of sulfoxaflor against aphids and whiteflies in open field situations. Sulfoxaflor was tested in two different formulations (GF-2032 and GF-2626) and at various dose rates up to 75 g a.s./ha. In the 41 trials selectivity assessments were carried out routinely during the evaluation period of the trials in accordance with the EPPO guideline PP 1/135 (3). **Table 6.1.11-56** gives an overview on the crops, crop varieties, sulfoxaflor formulations and sulfoxaflor dose rates for which phytotoxicity assessments were recorded in trials carried out in cucurbits in the EU regulatory Southern zone in field conditions.

Table 6.1.11-56 Overview of the crops, crop varieties, sulfoxaflor formulations and sulfoxaflor dose rates for which phytotoxicity assessments were recorded in trials carried out in cucurbits in open field situations in Europe.

Trial report No.	Max. sulfoxaflor dose rate in g as/ha	Nr of sprays	Crop	Crop variety	Crop stage at application (BBCH)
ES08C1C003MT03C	36	1	Melon	Indalico	Unknown
ES08C1C003MT04C	36	1	Watermelon	Hibrida negra	59-63
ES08C1C004JM01	36	1	Zucchini	Local	65-77
ES08C1C004MT01C	36	1	Cucumber	Unknown	69-69
ES08C1C004MT02C	36	1	Zucchini	Consul	71-71
ES08C1C004MT03C	36	1	Melon	Unknown	12-14
ES08C1C004MT04C	36	1	Watermelon	Unknown	12-12
FR08C1C065CR01	36	1	Melon	Prestige	14-22
FR08C1C065JG02	36	1	Melon	Arapaho	72-72
IT08C1C106ET01C	36	1	Cucumber	Darina	69-71
IT08C1C106ET02C	36	1	Zucchini	President	14-15
PT08C1C004MT01C	36	1	Melon	Unknown	Unknown

FR09X03002JG01	25	1	Melon	Arapaho	65-75
GR09X03002VA01	25	1	Cucumber	Unknown	51-51
GR09X03002VA02	25	1	Cucumber	Unknown	61-61
GR09X03010VA01	75	1	Cucumber	Z-14	61-63
GR09X03010VA02	75	1	Cucumber	Z-14	71-71
IT09X03002AF01	25	1	Zucchini	Geode	72-73
IT09X03010LA01	75	1	Zucchini	Mikonos	22-23
ES10C1C013MT04C	24	1	Melon	Hilario	89-89
ES10C1C014JM03	24	1	Zucchini	Air libre	65-72
ES10C1C014JM04	24	1	Zucchini	Brillante	65-72
ES10C1C014SK02	24	1	Melon	Unknown	67-71
ES10X03013JM01	75	1	Zucchini	Unknown	65-72
IT10C1C014AF01	24	1	Melon	Talento	64-65
IT10C1C014AF02	24	1	Zucchini	Giromontiina	71-71
IT10C1C014ET01C	24	1	Zucchini	Guelfo	25-26
IT10C1C014ET02C	24	1	Zucchini	Guelfo	19-61
IT10C1C014ET03C	24	1	Zucchini	Guelfo	51-71
IT10C1C014LA01	24	1	Zucchini	Guelfo	24-72
IT10C1C014LA02	24	1	Zucchini	Guelfo	17-23
PT10C1C014MT01C	24	1	Zucchini	Mykonos	79-81
PT10C1C014MT02C	24	1	Zucchini	Mykonos	82-83
PT10C1C014MT03C	24	1	Zucchini	Mykonos	79-81
GR11C1C015ML02C	24	2	Cucumber	Baby	85-87, 86-88
IT11C1C015AF01	24	2	Zucchini	Gheppio	74-74. 75-75
IT11C1C015AF02	24	2	Zucchini	Greyzini	75-75, 76-76
IT12C1C021AF01	24	2	Zucchini	Greyzini	72-72, 77-77
IT12C1C021ET01C	24	2	Zucchini	Gheppio	73-73, 77-77
IT13C1C097ET01C	24	2	Zucchini	Galatea	71-71, 71-72

No incidents of phytotoxicity were recorded in any of the trials carried out in cucurbit crops grown in open field situations during the sulfoxaflor development program between 2008 and 2013 in Europe. Sulfoxaflor proved to be safe up to a dose rate of 75 g a.s./ha or when was applied 2 times of 24 g a.s./ha. It can be concluded that sulfoxaflor (GF-2626), when applied at the proposed dose rates of 48 g a.s./ha with one application or as a split application of 2 x 24 g a.s./ha, perfectly safe to cucurbit crops represented by cucumber, zucchini, melon and watermelon in our trials.

SOLANACEOUS VEGETABLE CROPS

During the development program of sulfoxaflor between 2007 and 2012, a large number of solanaceous vegetable crops (tomato, pepper and eggplant) and varieties were tested in the EU regulatory Southern zone to evaluate its efficacy and selectivity. Sulfoxaflor was tested in a total of 24 trials in two different formulations (GF-2032, 240 g a.s./L SC and GF-2626, 120 g a.s./L SC) and at various dose rates against aphids and whiteflies. In those trials accurate selectivity assessments were also carried out according to relevant EPPO guidelines PP 1/135 (3) (guideline for the efficacy evaluation of plant protection products – phytotoxicity assessment). The phytotoxicity on the crop was visually assessed at regular intervals on a 0-100% scale. The trials were carried out in Spain (4), Italy (13), France (3), Greece (4) on tomato (16), pepper (3) and eggpant (5) which phytotoxicity assessments were recorded. All trials were carried out by officially recognized organizations in accordance with the Principles of Good Experimental Practice (GEP). **Table 6.1.11-57** show the tested solanaceous crops, varieties, sulfoxaflor formulations and sulfoxaflor dose rates for which phytotoxicity assessments were carried out in solanaceous vegetables crops grown in fields in the EU regulatory Southern zone between 2007 and 2012.

Table 6.1.11-57 Overview of solanaceous crops, varieties, their grpwth stages, sulfoxaflor formulations and rates for which phytotoxicity assessments were carried out.

Report No.	Formulation	Max. rate in g a.s./ha	Nr of sprays	Crop (common)	Variety	BBCH at application
FR07X03016MT02	GF-2032	36	1	Eggplant	Vernal	18
ES08C1C002MT01C	GF-2032	36	1	Tomato	Marcia	65
FR08C1C070CR05C	GF-2032	36	1	Tomato	Rimone	51
IT08C1C103ET03C	GF-2032	36	1	Tomato	Talen	21-22
IT08C1C105ET01C	GF-2032	36	1	Eggplant	Violetto	71
IT08C1C105ET02C	GF-2032	36	1	Eggplant	Mission Bel	81-85
ES09X03006JM02	GF-2032	24	1	Pepper	Infante	51-52
IT09X03006AF01	GF-2032	24	1	Tomato	Perfectpeel	73
IT10C1C013AF05	GF-2626	24	1	Tomato	Perfectpeel	53
ES10C1C013MT03C	GF-2626	24	1	Tomato	Boludo	71-79
IT10C1C013ET01C	GF-2626	24	1	Tomato	UG8168	52-53
IT10C1C013ET04C	GF-2626	24	1	Eggplant	Dorhill	51-52
ES11C1C014SK01	GF-2626	48	2	Bell pepper	not stated	Not stated
IT08C1C110AF01	GF-2032	75	2	Bell pepper	*Cornetto*	14-21
IT08C1C111AF01	GF-2032	75	2	Tomato	*Shiren*	17-23
IT08C1C111LA01	GF-2032	75	2	Tomato	*Tombola*	61-63
IT08C1C112LA01	GF-2032	75	2	Tomato	*Top Bell*	Not stated
IT11C1C014LA02	GF-2626	48	2	Tomato	*San Marzano*	75-79
FR08C1C160CR01C	GF-2032	75	2	Tomato	*Cobra*	72/75
GR07C1C003NK01	GF-2032	75	1	Tomato	not stated	71
GR10C1C017VA01	GF-2626	48	2	Tomato	not stated	71/74
GR11C1C064NK01	GF-2626	48	1	Tomato	*Corona F1*	73-75
GR12C1C081NK01	GF-2626	48	1	Tomato	not stated	79-81
IT10C1C017ET01C	GF-2626	48	2	Eggplant	*Danka*	51-54

During the trial programme, no incidents of phytotoxicity were observed at any rate or evaluation time in any variety of the tested solanaceous vegetable crops therefore no additional data was generated. It can be concluded that sulfoxaflor (GF-2626) applied at the recommended dose rates for which registration is sought in the EU regulatory Southern zone against aphids and whiteflies in solanaceous vegetable crops grown in fields as a maximum of 2 applications of 24 g a.s./ha or 1 application of 48g a.s.ha, is perfectly safe to solanaceous vegetable crops represented by tomato, pepper and eggplant crops in our trials.

LEAFY VEGETABLE CROPS

During the development program from 2007 to 2012, 20 trials were carried out in the EU regulatory Southern zone to evaluate the efficacy and/or selectivity of sulfoxaflor in lettuce. Sulfoxaflor was tested in two different formulations (GF-2032, 240 g a.s./L SC and GF-2626, 120 g a.s./L SC) at various dose rates between 12 and 50 g a.s./ha applied at the growth stage of BBCH 15-48 of lettuce crop grown in open fields. In those trials selectivity assessments were also carried out routinely during the evaluation period of the trials in accordance with the EPPO guideline PP 1/135 (3). The phytotoxicity on the crop was visually assessed at regular intervals on a 0-100% scale. The trials were carried out in Spain, Portugal, France and Italy in lettuce. **Table 6.1.11-58** gives an overview of the tested leafy vegetable crops, varieties, sulfoxaflor formulations and sulfoxaflor dose rates for which phytotoxicity assessments were recorded in trials carried out in the EU regulatory Southern zone between 2007 and 2012.

Table 6.1.11-58 Overview of leafy crops, varieties, sulfoxaflor formulations and sulfoxaflor dose rates for which phytotoxicity assessments were recorded in trials carried out in the EU regulatory Southern zone.

Sulfoxaflor formulation	Max. sulfoxaflor dose rate in g a.s./ha	Nr of sprays	Crop	Crop variety	Crop stage at application (BBCH)
GF-2032	50	1	Lettuce	Aitana	41
GF-2032	50	1	Lettuce	Iceberg	17-19
GF-2032	36	1	Lettuce	Filipus	16-17
GF-2032	36	1	Lettuce	Salakis	37-39
GF-2032	36	1	Lettuce	Comice	19
GF-2032	36	1	Lettuce	Bolne+Romana	45
GF-2032	36	1	Lettuce	Maruchka	13-14
GF-2032/GF-26262	24	1	Lettuce	Xanadu	13-14
GF-2032/GF-26262	24	1	Lettuce	Xanadu	13-14
GF-2032/GF-26262	24	1	Lettuce	Volturno	48
GF-2032/GF-26262	24	1	Lettuce	Profeta	19
GF-2032/GF-26262	24	1	Lettuce	Gentile	45
GF-2032/GF-26262	24	1	Lettuce	Romana	33-35
GF-2032/GF-26262	24	1	Lettuce	Baby	18-19
GF-2032/GF-26262	36	1	Lettuce	Yucaipa	18-19
GF-2032/GF-26262	36	1	Lettuce	Romana	15-16
GF-2032/GF-26262	24	1	Lettuce	Sucrine	19
GF-2032/GF-26262	24	1	Lettuce	Annibal	19
GF-2032/GF-26262	24	1	Lettuce	Integral	19

No incidents of phytotoxicity were recorded in any of the trials carried out during the sulfoxaflor development program in lettuce. As no phytotoxicity was ever noticed for any of the tested sulfoxaflor formulations, no further data is presented here. It can be concluded that sulfoxaflor, when applied at the proposed dose rate of 24 g a.s./ha is safe to leafy vegetables represented by lettuce in our trials.

<u>BRASSICA CROPS</u>

Eighteen trials were conducted between 2008 and 2013 in Italy and Spain to demonstrate the efficacy and selectivity of sulfoxaflor in brassica vegetable crops (cauliflower, head cabbage, Savoy cabbage, broccoli) grown in open fields. All trials were conducted by officially recognized testing organizations with the Good Experimental Practices (GEP) and followed the appropriate EPPO standards PP 1/135, PP 1/152, PP 1/181. All trials were of a randomized complete block design with four replicates and a minimum plot size of 12 m^2. Treatments were applied in most trials using a backpack sprayer with compressed air calibrated to apply a spray volume of 500-1250 L/ha. There was only one application either in spring or in autumn using a maximum of 24 or 36 g a.s./ha rate in the trials. **Table 6.1.11-59** gives an overview of the tested brassica crops, varieties, sulfoxaflor formulations and sulfoxaflor dose rates for which phytotoxicity assessments were recorded in trials carried out in the EU regulatory Southern zone.

Table 6.1.11-59 Summary of brassica crops and varieties sprayed with sulfoxaflor at different growth stages.

Sulfoxaflor formulation	Max. Sulfoxaflor (g a.s. /ha)	Crops (Bayer code)	Crop stage at application	Crop variety
GF-2032	36	Broccoli (BRSOK)	BBCH 12-21	Sherydan, Marathon
GF-2032	36	Cauliflower (BRSOB)	BBCH 12-31	Casper, Gitano, Cavalo Broccolo,
GF-2626	24	Cauliflower (BRSOB)	BBCH 14-31	Gitano, Cavalo Broccolo,
GF-2032	24	Cauliflower (BRSOB)	BBCH 15-72	Violetta Siculo, Frisco bianco, Baresse verde, Korlanu F216, Marathon, Broccolo di baresse
GF-2626	24	Cauliflower (BRSOB)	BBCH 15-72	Violetta Siculo, Frisco bianco, Baresse verde, Korlanu F216, Marathon, Broccolo di baresse
GF-2032	24	Head cabbage (BRSOL)	BBCH 41-43	Charmant, Sabauda, Castello F1
GF-2626	24	Head cabbage (BRSOL)	BBCH 41-43	Charmant, Sabauda, Castello F1
GF-2032	24	Savoy cabbage (BRSOS)	BBCH 45-46	Princess

No symptoms were observed in any trials caused by the tested formulations of sulfoxaflor (GF-2032 and GF-2626) when applied in the spring or autumn at any rate. These trials clearly demonstrated that sulfoxaflor is selective to brassica vegetable crops, represented by cabbages, cauliflower and broccoli in our trials, when applied at the proposed dose rate of 24 g a.s./ha for the control of aphids in field conditions and fully supports the proposed label claim.

POTATO

Between 2008 and 2012, 17 trials were conducted in Germany (9), France (4) and the United Kingdom (4) on several potato varieties to evaluate the efficacy and selectivity of sulfoxaflor against aphid species in potatoes. All data were generated in the Maritime climatic zone, which is the main potato growing area in the Southern EU Regulation 1107/2009 zone. In the trials, assessments on phytotoxicity were made routinely during the evaluation period in accordance with the EPPO standard PP 1/135 (3). Sulfoxaflor was tested at various dose rates upto 36 g a.s./ha sometimes repeating the applications several times. In trial DE12C1C043AZ01C, 7 sulfoxaflor applications were carried out, in trial DE12C1C043AZ02C, 6 sulfoxaflor applications were carried out one after the other using 1-3 weeks spray intervals. **Table 6.1.11-60** gives an overview of potato varieties and their growth stages at application (BBCH 15-89) as well as the sulfoxaflor formulations and dose rates for which phytotoxicity assessments were recorded in trials carried out between 2008 and 2012.

No incidents of phytotoxicity were recorded in any of the trials carried out during the sulfoxaflor development program in Europe. Sulfoxaflor proved to be safe when applied with one application at a dose rate up to 36 g a.s./ha or with up to 7 applications at a dose rate of 24 g a.s./ha. Therefore, it can be concluded that GF-2626 (120 g a.s/L sulfoxaflor) when applied at the proposed dose rate of 24 g a.s./ha maximum 2 times per season is perfectly safe to potatoes.

Table 6.1.11-60 Overview of potato varieties, sulfoxaflor formulations and dose rates for which phytotoxicity assessments were recorded in trials between 2008 and 2012.

sulfoxaflor formulation	Nr. of appl'n/. sulfoxaflor max. dose rate in g a.s./ha	Crop	Crop stage at application	Crop variety
GF-2032	1 / 36	potato, *Solanum tuberosum* (SOLTU)	BBCH38-39	Karlena
GF-2032	1 / 36		BBCH36-38	Eljane
GF-2032	1 / 24		BBCH55-61	Agria
GF-2032	1 / 24		BBCH61-65	Satina
GF-2032	1 / 24		BBCH51-61	Marabell
GF-2032	1 / 24		BBCH61-63	Karlena
GF-2032	1 / 36		BBCH61-61	Epona
GF-2032	1 / 36		BBCH68-69	Fontaine
GF-2032	1 / 36		BBCH38-51	Cara
GF-2032	1 / 36		BBCH17-17	Morene
GF-2032	1 / 24		BBCH15-51	Morene
GF-2032	1 / 24		BBCH65-69	Maris Piper
GF-2626	1 / 24	potato, *Solanum tuberosum* (SOLTU)	BBCH55-61	Agria
GF-2626	1 / 24		BBCH61-65	Satina; Agria
GF-2626	1 / 24		BBCH51-61	Marabell
GF-2626	1 / 24		BBCH61-63	Karlena
GF-2626	1 / 24		BBCH60-60	Mona Lisa
GF-2626	1 / 24		BBCH34-34	Fontanne
GF-2626	1 / 24		BBCH15-51	Morene
GF-2626	1 / 24		BBCH65-69	Maris Piper
GF-2626	7 / 24		BBCH55-89	Challanger
GF-2626	6 / 24		BBCH51-85	Challanger

<u>LEGUMINOUS CROPS (LEGUMES)</u>

During the development program from 2007 to 2012, trials on several leguminous crop varieties were conducted to evaluate the efficacy and selectivity of sulfoxaflor against aphid species in different leguminous crops (peas and beans) grown in open fields. Sulfoxaflor was tested in 2 different formulations and at various dose rates between 6 and 50 g a.s./ha. **Table 6.1.11-61** gives an overview of the crop species and varieties, the sulfoxaflor formulations and sulfoxaflor dose rates for which phytotoxicity assessments were recorded in the trials. Assessments of phytotoxicity were made routinely during the duration of the trials in accordance with the EPPO standard PP 1/135 (3) (guidelines for the efficacy evaluation of plant protection products – phytotoxicity assessment).

Table 6.1.11-61 Overview of the crop varieties, sulfoxaflor formulations and sulfoxaflor dose rates for which phytotoxicity assessments were recorded in trials carried out between 2007 and 2012.

EPPO Zone	Sulfoxaflor formulation	Max. sulfoxaflor dose rate in g a.s./ha	Crop	Crop stage at application	Crop variety
Maritime Zone	GF-2032	36	Field bean, *Vicia faba subsp. minor* (VICFM)	BBCH76-77	Diva
	GF-2032	36	Garden pea *Pisum sativum var. sativum* (PIBST)	BBCH18-18	Terno
	GF-2032	36		BBCH51-51	Zekon
	GF-2032	36		BBCH59-59	Zekon
	GF-2032	36	Field pea *Pisum sativum var. arvense* (PIBSA)	BBCH65-67	Panache
	GF-2032	36		BBCH62-64	Lumina
	GF-2032	36		BBCH39-51	Lumina
	GF-2032	48		BBCH65-71	Lumina
Mediterranean Zone	GF-2032	50	Climbing French bean, *Phaseolus vulgaris ssp. vulgaris* (PHSVV)	BBCH88-89	Tribona
	GF-2032	12		BBCH65-89	Reina Blanca
	GF-2032	12		BBCH65-89	Luz de Otono
	GF-2032	36	Dry bean *Phaseolus vulgaris*	BBCH71-71	Trebona
	GF-2626	24	Climbing French bean, *Phaseolus vulgaris ssp. vulgaris* (PHSVV)	BBCH65-89	Reina Blanca
	GF-2626	24		BBCH65-89	Luz de Otono

No incidents of phytotoxicity were recorded in any of the trials carried out during the sulfoxaflor development program in Europe. Sulfoxaflor proved to be safe even at dose rate of 50 g a.s./ha. As no phytotoxicity was noticed for any of the tested sulfoxaflor formulations, no further data is presented here. Therefore, it is concluded that GF-2626 (120 g a.s/l sulfoxaflor) when applied at the recommended dose rate of 24 g a.s./ha is perfectly safe to leguminous crops such as beans and peas grown in fields.

ORNAMENTAL CROPS (FLOWERS)

During the development program of sulfoxaflor between 2008 and 2013, a large number of ornamental crops and varieties were tested to evaluate the efficacy of sulfoxaflor against aphids and whitefly species in both protected situations and open fields. Sulfoxaflor was tested in two different formulations (GF-2032, 240 g a.s./L SC and GF-2626, 120 g a.s./L SC) and at various dose rates between 6 and 48 g a.s./ha in the efficacy trials. Three trials were conducted against whiteflies in protected situations and 2 trials in open field situations. Fourteen trials were conducted against aphids, 9 in protected situations and 5 in open fields. In all these trials selectivity assessments were also carried out in accordance with the EPPO guideline PP 1/135 (3) (guidelines for the efficacy evaluation of plant protection products – phytotoxicity assessment). In addition to these efficacy trials a special selectivity trial (BE08C1C196HE01C) was also carried out in Belgium where many ornamental species and varieties were treated with a very high rate (144 g a.s./ha) of sulfoxaflor applied two times at short interval under low natural light conditions representing an extreme worst case scenario. Ornamental species known to be very sensitive to pesticides were also included in the selectivity trial, such as *Bellis*, *Rosa*, *Chrysanthemum*, *Gerbera*, *Begonia*, *Ficus benjamina*. **Table 6.1.11-62** give an overview of the ornamental crops and varieties, the sulfoxaflor formulations and the applied maximum dose rates and number of applications where phytotoxicity assessments were done in Europe either in protected or field situations.

Table 6.1.11-62 Overview of the crops, crop varieties, sulfoxaflor formulations the maximum dose rates and number of applications in ornamental trials where phytotoxicity assessments were done.

Sulfoxaflor formulation	Max. sulfoxaflor dose rate in g as/ha	Nr of sprays with max rate	Crop	Crop variety	Crop stage at application BBCH)
GF-2032	48	1	Euphorbia pulcherrima	Primero Red	19
GF-2032	48	1	Lantana camara	Radiation	62
GF-2032 / GF-2626	48	1	Gerbera	Spider	65-67
GF-2032	48	1	Nicotiana rustica	Havana	61
GF-2032 / GF-2626	48	1	Calendula officinalis	Calypso	65
GF-2032 / GF-2626	48	1	Bellis perennis	Tasso	65
GF-2032 / GF-2626	48	1	Chrysanthemum	Aloha / Olawa Red / Decora Imperial/	59-65
GF-2026	48	1	Cascading Geranium	Decora Imperial	65
GF-2026	48	1	Bellis perennis	Bellissima Red	61
GF-2032	48	1	Nicotiana rustica	Havana	61
GF-2032 / GF-2626	48	1	Calendula officinalis	Calypso	65
GF-2032 / GF-2626	48	1	Bellis perennis	Tasso	65
GF-2026	48	1	Cascading Geranium	Decora Imperial	65
GF-2026	48	1	Bellis perennis	Bellissima Red	61
GF-2032	144	2	*Aechmea*	Fia	BBCH 55-65
GF-2032	144	2	*Aeschynanthus lobbiatus*	-	BBCH 55
GF-2032	144	2	*Azalea*	Hellmut Vogel	BBCH 55
GF-2032	144	2	*Begonia tuberhybrida*	-	BBCH 55
GF-2032	144	2	*Bellis*	Robella	BBCH 55
GF-2032	144	2	*Bellis*	Snowsylva	BBCH 55
GF-2032	144	2	*Bellis*	Early Sunrise	BBCH 55
GF-2032	144	2	*Calathea*	Ruffibarba	BBCH 55
GF-2032	144	2	*Calathea*	Roseo picta	BBCH 55

GF-2032	144	2	*Chamaedora*	-	BBCH 55
GF-2032	144	2	*Cordyline*	Redstar	BBCH 55
GF-2032	144	2	*Codiaeum*	Pictum,	BBCH 55
GF-2032	144	2	*Codiaeum*	Sunny star	BBCH 55
GF-2032	144	2	*Codiaeum*	Aucubifolia	BBCH 55
GF-2032	144	2	*Codiaeum*	Emma	BBCH 55
GF-2032	144	2	*Codiaeum*	Gold Moon	BBCH 55
GF-2032	144	2	*Dischidia ruscifolia*	-	BBCH 55
GF-2032	144	2	*Dracaena*	Marginata	BBCH 55
GF-2032	144	2	*Dracaena*	purplecompacta	BBCH 55
GF-2032	144	2	*Fargesia*	Muriele	BBCH 55
GF-2032	144	2	*Ficus benjamina*	Golden King	BBCH 55
GF-2032	144	2	*Ficus pulmila*	-	BBCH 55
GF-2032	144	2	*Ficus Guzmania*	Scarlet	BBCH 55
GF-2032	144	2	*Hatiora bambusoides*		BBCH 55
GF-2032	144	2	*Hedera*	Montgomery	BBCH 55
GF-2032	144	2	*Muehlenbeckia*	-	BBCH 55
GF-2032	144	2	*Peperomia rotundifolia*	-	BBCH 55
GF-2032	144	2	*Philodendron scandens*	-	BBCH 55
GF-2032	144	2	*Polyscias balforiana*	-	BBCH 55-65
GF-2032	144	2	*Schleffera arboricola*	Compacta	BBCH 55-65
GF-2032	144	2	*Spatiphyllum*	Alfa	BBCH 55-65
GF-2032	144	2	*Syngonium*	White Butterfly	BBCH 55-65
GF-2032	144	2	*Tillandsia cyanea*	-	BBCH 55-65
GF-2032	144	2	*Vriesea*	Vogue	BBCH 55-65
GF-2032	144	2	*Viola tricolor*	-	BBCH 55-65

None of the trials showed crop injury in any sulfoxaflor treatments. As no phytotoxicity was ever noticed for any of the tested sulfoxaflor formulations, no further data was generated. The recommended maximum dose rate of sulfoxaflor for which registration is sought in ornamentals is 48 g a.s./ha or 2 applications of 24 g a.s./ha, which rates proved to be safe on many ornamental species and varieties not only in open fields but also in greenhouse conditions, in which ornamentals are more sensitive than in open field conditions.

POME FRUITS

Between 2008 and 2013, a zonal approach, using data from France (19 trials), Greece (8 trials), Italy (22 trials), Portugal (7 trials) and Spain (13) was used to demonstrate the efficacy and selectivity of sulfoxaflor in pome fruits against aphids and scales. In all 69 trials phytotoxicity was assessed routenly during the duration of the trials in accordance with the EPPO guidelines PP 1/135 (3). **Table 6.1.11-63** gives an overview by trial on the tested apple

(62) and pear (7) varieties and their growth stages (BBCH 32-78) at application, and the sulfoxaflor maximum dose rates for which phytotoxicity assessments were recorded in the trials carried out in the EU regulatory Southern zone.

Table 6.1.11-63 Summary of crops and varieties sprayed with the highest rates of sulfoxaflor on different pome fruit crops.

Trial Number	BBCH growth stage	Crop (variety)	Sulfoxaflor* maximum rate applied in g a.s./ha	maximum rate applied in g a.s./ha + OIL	maximum rate in g a.s./ha applied twice
ES12C1C001RF01	32 - 32	MABSD(Granny smith)	24		
IT11C1C016ET02C	53-54	MABSD(Stayman)	48	48 (5)	
IT13C1C032ET01C	54-65	PYUCO(Abate fètel)	48	24(6)	24
ES12C1C001MT01C	55 - 56	MABSD(Golden delicious)	24		
ES08C1C008MT01C	56 - 57	MABSD(Golden delicious)	36		
ES08C1C008MT02C	56 - 57	MABSD(Golden Smoothe)	36		
ES11C1C001MT01C	56 - 57	MABSD(Golden delicious)	24**		
ES11C1C001MT02C	56 - 57	MABSD(Golden delicious)	24**		
IT11C1C001ET03C	56 - 57	MABSD(FUJI)	24**		
FR12C1C001CR01	57 - 57	MABSD(Golden)	24		
IT08C1C098ET01C	57 - 57	MABSD(Hearly)	36		
IT12C1C002ET01C	57-57	MABSD(Stark Delicious)	48	24(5)	
IT08C1C098ET02C	59 - 61	MABSD(Stayman)	36		
IT12C1C002ET02C	59-59	MABSD(Stayman)	48	24(5)	
FR08C1C062CR01	67 - 69	MABSD(golden)	25		
PT11C1C001MT01C	67 - 71	MABSD(Gala)	24**		
FR08C1C062CR03C	69 - 69	MABSD(Royal gala)	36		
IT12C1C001DC01	69 - 71	MABSD(morgenduft	24		
FR11C1C001CR04	69 - 72	MABSD(Reine des reinettes)	48	48 (1)	
PT08C1C008MT01C	-	MABSD(Royal Gala)	36		
PT08C1C008MT02C	-	MABSD(Jonagold Red)	36		
PT11C1C001MT02C	-	PYUCO(Rocha)	24**		
PT12C1C002MT01C	-	MABSD()	48		
FR08C1C062JG04	71 - 71	MABSD(fuji)	36	36 (1)	36
GR08C1C061VA01	71 - 71	MABSD(Starking)	36*		
GR11C1C001ML01C	71 - 71	MABSD(Red chief)	24**		
GR12C1C001ML01C	71 - 71	MABSD()	24		
GR12C1C001ML02C	71 - 71	MABSD(Red Chief)	24		
FR08C1C062CR01	71 - 72	MABSD(golden)	36		

GR11C1C001ML02C	71 - 72	MABSD(Red chief)	24**		
IT12C1C001ET01C	71 - 72	MABSD(Fuji)	24		
PT11C1C001MT03C	71 - 72	PYUCO(Rocha)	24**		
PT11C1C001MT04C	71 - 72	MABSD(Royal gala)	24**		
ES08C1C008IG02	71 - 73	MABSD(Golden)	36		
ES09X03005IG01	71 - 75	MABSD()	25		
ES13C1C032MT03C	72 - 72	MABSD(Golden)	48		
FR08C1C062CR02C	72 - 72	MABSD(Gala)	36		
FR11C1C001CR02C	72 - 72	MABSD(galaxy)	24**		
IT11C1C001ET01C	72 - 72	MABSD(Gala)	24**		
FR09X03005CR01	72 - 73	MABSD(golden)	25		
FR09X03005JG02	72 - 73	MABSD(challenger)	25		
FR11C1C001CR01C	72 - 73	MABSD(Golden)	24**		
GR08C1C061CM02C	72 - 73	MABSD(Red chief)	36*		
IT09X03005VB01	72 - 73	MABSD(Red chief)	25		
IT09X03005VB02	72 - 73	MABSD(Pink Lady)	25		
IT10C1C050ET01C	72 - 74	MABSD(FUJI)	24		
ES09X03005IG02	72 - 76	MABSD(Grammy Smith)	25		
GR12C1C002ML01C	72-74	MABSD(Red Chief)	48		24
FR11C1C001JG05	73 - 73	MABSD(fuji)	24**		
FR11C1C016CR02	73 - 73	MABSD(Granny Smith)	48	48 (1)	
GR08C1C061VA02	73 - 73	MABSD(Scarlet)	36*		
FR12A1A006CR01	73 - 74	MABSD(Pink Lady)	48		
FR12C1C001CR02C	73 - 74	MABSD(Gala)	24		
IT11C1C001DC01	73 - 74	MABSD()	24**		
IT11C1C001DC02	73 - 74	MABSD()	24**		
FR13C1C031CR01	73 - 75	MABSD(Granny Smith)	48	48 (3)	24
FR13C1C032CR01C	73-72	MABSD(Oregon)	48		
FR11C1C001CR03C	74 - 74	PYUCO(Pachkram's)	24**		
IT11C1C001ET02C	74 - 74	MABSD(FUJI)	24**		
ES08C1C009MT02C	74 - 75	PYUCO()	36		
ES12C1C002MT01C	74-74	MABSD(Golden)	48		
IT10A1A002ET01C	74-74	MABSD(Stayman)	24	24 (4)	
IT11C1C016DC01	74-75	MABSD()	48	48 (5)	
IT12C1C002DC01	74-75	MABSD(Imperatore	48	24(5)	
IT13C1C032ET02C	74-76	PYUCO(Decana del	48	24(2)	24
ES11C1C001RF03	75 - 77	MABSD(Golden)	24**		
FR08C1C062CR05C	75 - 78	MABSD(Mulstu)	36	36 (1)	
IT11C1C016ET01C	75-75	PYUCO(Abate)	48	48 (5)	
IT13C1C031DC01	76 – 77	MABSD(Golden B)	48	48 (2)	24

* GF-2032 from 2008 to 2009, GF-2626 later, ** both formulations tested; (1) SEPPIC TS at 7 L/ha, (2) Crop oil, (3) Heliosol at 2L/ha, (4) M-PEDE at 1L/hl, (5) OLIOCIN at 0.25 L/hl, (6) CITROLE at 2%w/w

Both tested formulation of sufloxaflor (GF-2032 and GF-2626) proved to be perfectly safe even at the highest tested rate of 48 g a.s./ha on the tested apple and pear varieties. The addition of oil adjuvant did not influence the phytotoxicity. The double applications of sulfoxaflor at 24 g a.s./ha were also safe. As no phytotoxicity symptoms were observed in any of the sulfoxaflor treatments no additional data was generated. It was concluded sulfoxaflor applied at the recommended dose rates, such as 1 application of 48 g a.s./ha or 2 applications of 24 g a.s./ha, is perfectly safe in pome fruit crops represented by apples and pears in our trials. As the addition of different oil adjuvants did not increase the phyto, all mixtures were safe to crop, we recommend to follow the local practice if oil type adjuvants are recommended to enhance the insecticides' activity.

<u>STONE FRUITS</u>

During the development program from 2008 to 2014, 37 aphid trials in Spain (15), France (9), Greece (1), Italy (10), Portugal (2) and 21 scale trials in France (4), Greece (11), Spain (2) and Italy (4) were conducted in various stone fruit crops in the EU regulatory Southern zone to evaluate the efficacy and selectivity of sulfoxaflor. Sulfoxaflor was tested in various rates upto 72 g a.s./ha applied 1 or 2 times in a season in many peach, nectarine, plum and cherry varieties in a wide range of growth stages (BBCH 51-91). Assessments of phytotoxicity were made routinely in accordance with the EPPO guidelines PP 1/135 (3). **Table 6.1.11-64** gives an overview of stone fruit varieties, sulfoxaflor formulations and dose rates for which phytotoxicity assessments were recorded in the aphid trials, while

Table 6.1.11-65 overview the stone fruits crop varieties, sulfoxaflor formulations and dose rates for which phytotoxicity assessments were recorded in the scale trials carried out in the EU regulatory Southern zone.

Table 6.1.11-64 Overview of stone fruit varieties, sulfoxaflor formulations and dose rates for which phytotoxicity assessments were recorded in aphid trials carried out in the EU regulatory Southern zone between 2008 and 2014.

Trial nº	Sulfoxaflor formulation	Max. sulfoxaflor rate in g a.s./ha	Nr of sprays	Crop name (common)	Variety	Crop GS at application (BBCH)
ES08C1C010IG02	GF-2032	36	1	Nectarine	Big top	51-60
ES08C1C010IG03	GF-2032	36	1	Nectarine	Big top	51-61
ES08C1C011BC02	GF-2032	36	1	Plum	Larrain	63-64
ES08C1C011BC03	GF-2032	36	1	Plum	Songold	72-73
ES08C1C011MT01C	GF-2032	36	1	Cherry	Burlat	67-69
ES08C1C011MT02C	GF-2032	36	1	Cherry	Summit	67-69
FR08C1C067CR02C	GF-2032	36	1	Peach	Summum	33-35
FR08C1C067CR04C	GF-2032	36	1	Peach	Symphonie	75
FR08C1C067CR05C	GF-2032	36	1	Peach	May Crest	73-75
GR08C1C059VA02	GF-2032	36	1	Peach	San Claouse	75
IT08C1C101ET02C	GF-2032	36	1	Peach	Big ben	57
IT08C1C101ET03C	GF-2032	36	1	Peach	Springbell	69-71
PT08C1C010MT01C	GF-2032	36	1	Nectarine	Big top	71
PT08C1C010MT02	GF-2032	36	1	Peach	Amarelo	77-79
ES11C1C004SK03	GF-2032/GF-2626	36	1	Plum	Not stated	60-61
ES11C1C037RF02	GF-2032/GF-2626	36	1	Cherry	Not stated	n/a
ES11C1C004RF04	GF-2032/GF-2626	24	1	Nectarine	Not stated	n/a
FR11C1C004CR02C	GF-2032/GF-2626	36	2	Peach	Big band	55-73
FR11C1C004CR04C	GF-2032/GF-2626	36	3	Peach	Maycrest	55-81-91
FR11C1C004CR05	GF-2032/GF-2626	36	2	Nectarine	Big heaven	54-72
FR11C1C004JG06	GF-2032/GF-2626	24	1	Peach	Tendresse	73-75
IT11C1C004DC01	GF-2032/GF-2626	36	1	Peach	Royal glory	75-76

IT11C1C004ET04	GF-2032/GF-2626	36	1	Peach	Sweet red	56-57
IT11C1C004ET05C	GF-2032/GF-2626	36	1	Peach	Maria Emilia	73
ES13C1C035RF01	GF-2626	36	1	Peach	Not stated	n/a
ES13C1C038MT02C	GF-2626	48	1	Nectarine	Nucipersica	60-71
ES13C1C038MT05C	GF-2626	48	1	Peach	Tardibelle	73
ES13C1C038RF01	GF-2626	48	1	Peach	Roig d'Albesa	69-71
FR13C1C035CR01C	GF-2626	36	1	Peach	Local variety	81-87
FR13C1C038CR01C	GF-2626	48	1	Peach	White lady	32-33
IT13C1C038ET01C	GF-2626	48	1	Nectarine	Honey Royal	71-72
ES14C1C006MT01C	GF-2626	48	1	Peach	Corona	54-55
ES14C1C006SC01	GF-2626	48	1	Peach	Platycarpa	60-61
IT14C1C006DC01	GF-2626	48	1	Nectarine	Honey Royal	55-56
IT14C1C006ET01C	GF-2626	48	1	Nectarine	Stark red gold	57-59
IT14C1C007DC01	GF-2626	48	1	Nectarine	Orion	77-78
IT14C1C007ET01C	GF-2626	48	1	Peach	Cresthaven	71-72

Table 6.1.11-65 Overview of stone fruits crop varieties, sulfoxaflor formulations and dose rates for which phytotoxicity assessments were recorded in scale trials carried out in stone fruits crops in the EU regulatory Southern zone between 2011 and 2013.

Report No.	Formulation	Max. sulfoxaflor rate in g a.s./ha	Nr of sprays	Crop name (common)	Variety	Crop GS at application (BBCH)
FR11C1C016CR01C	GF-2626	48	1	Peach	*Ferande*	B91-91
FR11C1C016CR03	GF-2626	24	1	Peach	*Ambre*	B91-92
FR12C1C004CR01	GF-2626	48	2	Peach	*Ambre*	B73-75
FR13C1C036CR01	GF-2626	48	2	Peach	Not stated	Not stated
GR11C1C047NK01	GF-2626	48	1	Peach	*Big Haven*	B69-71
GR11C1C047NK03	GF-2626	48	1	Peach	*Evert*	B73-75
GR11C1C047ML01C	GF-2626	48	1	Peach	*Andross*	B73-73
GR12C1C004VA01	GF-2626	48	2	Peach	*San Cress*	B73-75
GR12C1C004VA02	GF-2626	48	2	Peach	*San Cress*	B73-75
GR12C1C004VA03	GF-2626	48	2	Peach	*San Cress*	B73-75
GR12C1C004VA04	GF-2626	48	2	Peach	*Red Gold*	B75
GR12C1C002VA01	GF-2626	48	2	Peach	*Red Gold*	B75-77
GR12C1C002VA02	GF-2626	48	2	Peach	*San Cress*	B73-76
GR13C1C018NGK01	GF-2626	72	2	Peach	*Gilda Rossa*	B85-87
GR13C1C018NGK02	GF-2626	72	2	Peach	*Bolero*	B85-87
ES12C1C004MT01C	GF-2626	48	1	Plum	*Santa Rosa*	B72-73
ES12C1C004MT02C	GF-2626	48	1	Plum	*Claudia verde*	B72-73
IT12C1C004DC01	GF-2626	48	1	Plum	*Angeleno*	B79-81
IT12C1C004ET01C	GF-2626	48	1	Nectarine	*Big Top*	B71-72
IT12C1C004ET02C	GF-2626	48	1	Peach	*Red Haven*	B73-75
IT13C1C036ET01C	GF-2626	48	2	Nectarine	*Venus*	B79-81

During the evaluation periods, no incident of phytotoxicity was observed at any sulfoxaflor treatments applied at rates even upto 2 applications of 72 g a.s./ha. Therefore, it is concluded that sulfoflaxor applied at the recommended rates, which is maximum one application of 48 g a.s./ha or 2 applications of 24 g a.s./ha, is perfectly safe to stone fruit crops represented by peach, nectarine, plum and cherry in our trials when applied at either pre-flowering or just before harvest. Applications at flowering stage are not allowed, so crop safety tests were not done at that time.

CITRUS CROPS

Between 2008 and 2014, 33 trials were conducted to evaluate the efficacy of sulfoxaflor against aphids, maelybugs and scales in Greece (9 trials), Italy (11 trals), Portugal (3 trials) and Spain (10 trials). In all trials the phytotoxicity was assessed paralell to the efficacy evaluations and we used these trials in this section to demonstarte the safety of sulfoxaflor to citrus crops. **Table 6.1.11-66** shows details on the different crops, crop varieties and their growth stages at application as well as the maximum rate of sulfoxaflor applied.

GF-2626 applied at 24 g a.s./ha (single or double application) or at 48 g a.s./ha (applied with or without a paraffinic oil adjuvant) proved to be safe similarly to GF-2032 applied upto 36 g a.s./ha on all citrus crops tested (clementine, sweet orange, lemon, sour orange, mandarin and other citrus spp.). As no phytotoxicity symptoms were observed in any of the sulfoxaflor treatments no additional data was generated. It was concluded sulfoxaflor applied at the recommended dose rates, such as 1 application of 48 g a.s./ha or 2 applications of 24 g a.s./ha, is perfectly safe in citrus crops. As the addition of different paraffinic oil adjuvants did not increase the phyto, all mixtures were safe to crop, we recommend to follow the local practice if oil type adjuvants are recommended to enhance the insecticides' activity.

Table 6.1.11-66 Crop details (species, varieties, growth stages) and the maximum sulfoxaflor rates applied in the citrus trials.

Trial Number	crop	Varieties	BBCH growth stage at application	Sulfoxaflor maximum rate in g a.s./ha	Sulfoxaflor maximum rate in g a.s./ha - double application	Sulfoxaflor maximum rate in g a.s./ha + oil
ES08C1C012MT01C	CIDCL	Clemenules	56 - 56	36		
ES08C1C012SC01	CIDSS	-	-	36		
IT08C1C102ET01C	CIDSI	Tarocco Gallo	69 - 71	36		
IT08C1C102LA01	CIDSI	Washington	53 - 60	36		
PT08C012MT02C	CIDSS	Encore	-	36		
PT08C1C012MT03C	CIDSS	Clemenule	-	36		
ES11C1C005JM01	CIDRE	Clemenules	61 - 65	24		
ES11C1C005JM02	CIDRE	Clemenules	69 - 71	24		
ES11C1C005RA01	CIDLI	Macrophila,	41566	24		
ES11C1C005SK01	CIDSS	Navelino	79 - 81	24		
ES11C1C005SK02	CIDSS	Navel Powell	79 - 81	24		
IT11C1C005ET01C	CIDAU	Tarocco Scirè	69 - 71	24		
IT11C1C005ET02C	CIDAU	Nova	69 - 71	24		
IT11C1C005ET03C	CIDAU	Tarocco Gallo	69 - 71	24		
IT11C1C005ET04C	CIDAU	Navel	69 - 71	24		
IT11C1C005ET05C	CIDSI	Tarocco	69 - 71	24		
IT11C1C005LA01	CIDSI	Newall	51 - 53	24		
PT11C1C005MT01C	CIDSS	Navelina	65 - 65	24		
ES12C1C006MT02C	CIDSI	Clemenvilla	69-71	48		48 (1)
GR12C1C006ML01C	CIDRE	Nova	74-74	48	24	
GR12C1C006ML02C	CIDRE	Clementine	73-74	48	24	

IT12C1C006ET01C	CIDSI	Tarocco	73-74	48		
IT12C1C006ET02C	CIDSI	Navel	74-74	48		
GR13C1C033NGK01	CIDRE	Satsumes	71-74	48		48 (1)
GR13C1C033NGK02	CIDRE	Satsumes	71-74	48		48 (1)
IT13C1C033ET01C	CIDRE	Monreal	71-73	48		48 (2)
GR13C1C033VA01C	CIDRE	Nova	74-79	48		48 (1)
GR11C1C016NK01	CIDRE	Satsumes	69-71	24	24	24 (1)
GR12C1C006VA01	CIDSI	Merlin	71-72	48	24	
GR13C1C016VA01C	CIDSI	Merlin	71-71	48		
GR13C1C016VA02C	CIDSI	Navalina	71-74	48		48 (1)
ES13C1C016MT01C	CIDSI	Lanel Late	73-74	48		48 (1)
GR14C1C019NGK01	CIDRE	Satsumes	71-74	48	24	48 (1)

ZRMS conclusion about the phytotoxicity of the product CLOSER in treated crops
The phytotoxicity of the product CLOSER could be considered as negligible in treated crops.
At the commenting stage, Greece (EL) asks for selectivity trials on specific pear cultivars (national requirement).

IIIA 6.1.12 ADVERSE EFFECTS ON HEALTH OF HOST ANIMALS

This is not an EC data requirement / not required by Council Directive 91/414/EEC or Regulation (EC 1107/2009).

ZRMS conclusion
ZRMS agrees.

IIIA 6.1.13 ADVERSE EFFECTS ON SITE OF APPLICATION

This is not an EC data requirement / not required by Council Directive 91/414/EEC or Regulation (EC 1107/2009).

ZRMS conclusion
ZRMS agrees.

IIIA 6.1.14 ADVERSE EFFECTS ON BENEFICIAL ORGANISMS (OTHER THAN BEES)

The assessment of the impact on beneficial and other non-target organisms is done in the eco-toxicological part of the dossier.

ZRMS conclusion
ZRMS agrees.

IIIA 6.1.15 ADVERSE EFFECTS ON PARTS OF PLANT USED FOR PROPAGATING PURPOSES

SOLANACEOUS VEGETABLE CROPS (TOMATOES, PEPPER, AUBERGINES)

As phytotoxicity has never been observed by sulfoxaflor on any crops targeted in this submission and solanaceous vegetables' seed is not saved for propagation purpose by farmers no data was generated. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the germination and the seedling development of the harvested seeds.

CUCURBITS (CUCUMBER, WATER MELON, ZUCCINI, MELON, PUMPKIN, SQUASH)

As phytotoxicity has never been observed by sulfoxaflor on any crops targeted in this submission and leafy and cucurbit vegetables' seed is not saved for propagation purpose by farmers no data was generated. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the germination and the seedling development of the harvested seeds.

LEAFY VEGETABLES (LETTUCE AND OTHER SALAD PLANTS INCLUDING BRASSICACEA, SPINACH AND SIMILAR HERBS)

As phytotoxicity has never been observed by sulfoxaflor on any crops targeted in this submission and leafy vegetables' seed is not saved for propagation purpose by farmers no data was generated. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the germination and the seedling development of the harvested seeds.

BRASSICA VEGETABLE CROPS (BROCOLLI, CABBAGE, CAULIFLOWER, BRUSSEL SPROUTS, CHINESE CABBAGE, KALE, OTHERS)

As phytotoxicity has never been observed by sulfoxaflor on any crops targeted in this submission and brassica vegetables' seed is not saved for propagation purpose by farmers no data was generated. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the germination and the seedling development of the harvested seeds.

LEGUMES (BEANS, PEAS)

No data was generated but no any impact is expected as phytotoxicity has never been observed by sulfoxaflor on any crops targeted in this submission and extended studies on cereals detected no any detrimental effect on seed quality and emergence. Therefore, it is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the germination and the seedling development of the harvested seed.

POTATO

No sulfoxaflor residue was detected in tubers, therefore no data was generated. If potato tubers are used for propagation purpuses, it is unlikely to have any effect of a foliar spray with a compound translocating mainly in the xylem towards the growing tips of the plants. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the germination and the seedling development of the harvested tubers.

ORNAMENTALS (BULBS, ORNAMENTALS, FLOWERS)

As phytotoxicity has never been observed by sulfoxaflor on any crops targeted in this submission and ormamentals' seed is generally not saved for propagation purpose by farmers no data was generated. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the germination and the seedling development of the harvested seeds.

POME FRUITS (APPLE, PEARS)

As phytotoxicity has never been observed by sulfoxaflor on any crops targeted in this submission and pome fruits' seed is not saved for propagation purpose by farmers no data was generated. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the germination and the seedling development of the harvested seeds.

STONE FRUITS (PEACHES, NECTARINES, PLUMS, CHERRIES)

As phytotoxicity has never been observed by sulfoxaflor on any crops targeted in this submission and stone fruits' seed is not saved for propagation purpose by farmers no data was generated. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the germination and the seedling development of the harvested seeds.

CITRUS CROPS

As phytotoxicity has never been observed by sulfoxaflor on any crops targeted in this submission and citrus' seed is not saved for propagation purpose by farmers no data was generated. It is concluded that commercial use of sulfoxaflor, when applied as recommended, will not have any deleterious effect on the germination and the seedling development of the harvested seeds.

ZRMS conclusion about the adverse effects on parts of plant used for propagating purposes
No negative impact on the propagating purposes in treated crops should be expected following the application of the product CLOSER.

IIIA 6.1.16 IMPACT ON SUCCEEDING CROPS

A glasshouse study was conducted by Dow AgroSciences to generate dose response data for GF-2032 (sulfoxaflor, 222 g as/l, SC) when applied pre-emergence to 9 monocotyledon and 10 dicotyledon plant species. The methodology for the study was "Dow AgroSciences laboratory methods WB3-PRE", which is regularly used for detecting herbicidal activity of new compounds. In the pre-emergence test, minor crop injury was noted in the monocotyledon crops corn, sorghum and rice at very high application rates (>2,000 g a.s./ha). No effects were observed in the pre-emergence test at rates less than or equal to 563 g a.s./ha, well in excess of the proposed label rate for sulfoxaflor products. No effects were observed on dicotyledonous crop plants such as sugar beet, oilseed rape, sunflower and cotton at rates up to 4,500 g a.s./ha. It was concluded that sulfoxaflor was safe to any potential succeeding or rotational crops.

Another glasshouse study was conducted by Stockbridge Technology Centre Ltd to generate dose response data for of GF-2626 (sulfoxaflor, 120 g as/l, SC) when applied pre-emergence to four monocotyledon and seven dicotyledon crop species. The methodology for the study was based on OECD Guideline 208 (July 2006) Terrestrial (Non-Target) Plant Test: Seedling Emergence and Seedling Growth Test. The test species included four monocotyledon species (Oats, Ryegrass, Maize and Onion) and seven dicotyledon species (Soybean, Oilseed Rape, Cabbage, Tomato, Lettuce, Carrot and Cucumber). Species tested represented the plant families of *Gramineae, Liliaceae, Leguminosae, Brassicaceae, Solonaceae, Compositae, Umbelliferae* and *Cucurbtaceae*. GF-2626 was applied at five rates (6, 12, 24, 48 and 96 g a.s./ha) and compared with an untreated water only control. None of the eleven species displayed visual injury or foliar fresh weight reduction from 'pre-emergence' applications of GF2626 at 96 g a.s./ha rate, well excess the maximum recommended label rates in Europe.

On the basis of these studies it can be concluded that sulfoxaflor, does not pose any risk to succeeding or following crops if applied according to the European label recommendations.

ZRMS conclusion about the impact of the product CLOSER on succeeding crops
No negative effect on succeeding crops should be expected following the application of the product CLOSER.

IIIA 6.1.17 IMPACT ON OTHER PLANTS INCLUDING ADJACENT CROPS

A glasshouse study was conducted by Dow AgroSciences to generate dose response data for sulfoxaflor (GF-2032, 222 g a.s./l, SC) when applied post-emergence to nine monocotyledon and fourteen dicotyledon plant species. The methodology for the study was "Dow AgroSciences laboratory methods WB3-POST", which is regularly used for detecting herbicidal activity of new compounds In the post-emergence herbicidal screening test, minor injury (5%) to wheat at 400 g a.s./ha and slightly more injury to rice at 200 (10%) and 400 g a.s./ha (15%) were noted. No injury was observed in any other species exposed to post-emergent spray of GF-2032 at rates equal to or less than 400 g a.s./ha.

No effects were observed on dicotyledonous crop plants such as sugar beet, oilseed rape, sunflower and cotton at rates up to 400 g a.s./ha. No effects were observed in the test at rates less than or equal to 100 g a.s./ha on any crop tested, well in excess of the proposed label rate for sulfoxaflor products. It was concluded that sulfoxaflor was safe to any potential adjacent crops.

Another glasshouse study was conducted by Stockbridge Technology Centre Ltd to generate dose response data for GF-2626 (sulfoxaflor 120 g as/l, SC) when applied post-emergence to four monocotyledon species and seven dicotyledon species. The methodology for the study was based on OECD Guideline 227 (July 2006) Terrestrial (Non-Target) Plant Test: Vegetative Vigour Test. The dose response data (EC 50 values) was used to assess the risk of GF-2626 (sulfoxaflor 120 g as/l, SC) to terrestrial non-target plants. The test species consisted of four monocotyledon species (Oats, Ryegrass, Maize and Onion) and seven dicotyledon species (Soybean, Oilseed Rape, Cabbage, Tomato, Lettuce, Carrot and Cucumber). Species tested represented the plant families of *Gramineae, Liliaceae, Leguminosae, Brassicaceae, Solonaceae, Compositae,Umbellifera* and *Cucurbitaceae*. GF-2626 was applied at five rates (6, 12, 24, 48 and 96 g a.s./ha) to all eleven species and compared with an untreated water only control. Applications were made post-emergence to all eleven species at growth stage BBCH 12-14 (2 to 4 true leaves).

None of the eleven species displayed visual injury. The high tolerance of all eleven species to post-emergence applications of GF-2626 meant it was not possible to carry out regression analysis and predict EC 50 values based on fresh weight reduction.

On the basis of these studies it can be concluded that sulfoxaflor does not pose any risk to other plants including adjacent crops if applied according to the European label recommendations.

ZRMS conclusion about the impact of the product CLOSER on adjacent crops

No negative effect on adjacent crops should be expected following the application of the product CLOSER.

IIIA 6.1.18 POSSIBLE DEVELOPMENT OF RESISTANCE OR CROSS-RESISTANCE

Sulfoxaflor belongs to the "sulfoximines" chemical family, which represents a new class of insecticides. Sulfoxaflor exhibits a high degree of efficacy against a wide range of sap-feeding insects, including those resistant to neonicotinoids and other insecticides. Sulfoxaflor is an agonist at insect nicotinic acetylcholine receptors (nAChRs) and functions in a manner distinct from other insecticides acting at nAChRs. The sulfoximines also exhibit structure activity relationships (SAR) that are different from other nAChR agonists such as the neonicotinoids. IRAC assigned nicotinic acetylcholine receptor agonists to Group 4 in their classification system. The neonicotinoids (acetamiprid, clothianidin, dinotefuran, imidacloprid, nitenpyram, thiacloprid and thiamethoxam) were assigned to sub group 4A. Nicotine was assigned to sub group 4B and sulfoximines, including sulfoxaflor, were assigned to sub group 4C.

Resistance to neonicotinoid insecticides is usually via metabolism mediated through mixed function oxidases. Studies confirmed that incubation of sulfoxaflor, imidacloprid or acetamiprid with *Drosophila melanogaster*-2 cells lacking the CYP6G1 gene, producing mixed function oxidases, resulted in complete recovery of each of the three compounds. However, when incubated with *Drosophila melanogaster*-2 cells expressing the CYP6G1 gene, there was little recovery of either imidacloprid or acetamiprid. In contrast there was complete recovery of sulfoxaflor in cells expressing CYP6G1 suggesting that sulfoxaflor is a poor substrate for the CYP6G1.

Cross resistance studies in whitefly (*Bemisia tabaci* and *Trialeurodes vaporariorum*), aphids (*Myzus persicae*) and plants hoppers (*Nilaparvata lugens)* using neonicotinoid insecticides such as imidacloprid showed that sulfoxaflor was not cross resistant to this group of insecticides. Cross resistance studies in the aphid *Myzus persicae* showed lack of cross resistance to representative organophosphate, carbamate and pyrethroid insecticides as well. Field studies on neonicotinoid resistant *Myzus persicae* also showed that sulfoxaflor has a good control against *Myzus persicae* where the "target site" mutation was confirmed by genomic analysis. Studies on potential target site resistance to insecticides such as neonicotinoids and spinosyns which target the nACh receptor mutant *Drosophila* target sites resistant to these modes of action showed a lack of target site cross-resistance with sulfoxaflor. It was concluded that sulfoxaflor is differentiated from other insecticides and no cross resistance is likely exist in current populations.

Guidance from the European Plant Protection authorities and interrogation of the Michigan State University resistance database indicated that two aphid species, *Myzus persicae* and *Aphis gossypii*, and 2 whitefly species *Bemisia tabaci* and *Trialeurodes vaporariorum*, which are targets for sulfoxaflor, have a high risk of developing resistance. In accordance with EPPO guidelines a sensitivity baseline was established for these species where no resistant clones were found.

A Resistance Risk Assessment was carried out following EPPO guideline PP 1/213 (3), and Resistance Management Guidelines were established targeting the most exposed species. These Guidelines are underpinned by the current label recommendations, which recommend either one application of sulfoxaflor in a season or 2 applications with 7-14 days interval avoiding consecutive generations of species, which develop resistance easily. Even in those usages where the probability of resistance development is low only 2 applications are allowed within a season. In addition to these restrictions several recommendations exist on the label like always use the recommended dose rate, rotate different MOA insecticides, consult with local extension specialists, and other control measures to reduce the possibility of the development of resistance.

ZRMS conclusion about possible development of resistance or cross-resistance

There is a risk of resistance development or appearance to sulfoxaflor for aphids (*Myzus persicae*, *Aphis gossypii*, *Dysaphis plantaginea*) and whiteflies (*Trialeurodes vaporariorum* and *Bemisia tabaci*) requiring a monitoring in vegetables and/or fruit crops. A sensitivity baseline and a monitoring are requested for those target pests.

For information, the French recommendations are as follows:
-A monitoring of resistance to sulfoxaflor (one monitoring for all products based on sulfoxaflor) should be put in place on aphids: *Myzus persicae*, *Aphis gossypii* and *Dysaphis plantaginea* in vegetables or potato and fruit crops.
-A monitoring of resistance to sulfoxaflor (one monitoring for all products based on sulfoxaflor) should be continued on whiteflies: *Trialeurodes vaporariorum* and/or *Bemisia tabaci* in vegetable crops.

It is up to each cMS to judge about the reliability of these recommendations.

IIIA 6.1.19 ECONOMICS

This is not an EC data requirement / not required by Council Directive 91/414/EEC or Regulation (EC 1107/2009).

ZRMS conclusion

ZRMS agrees.

IIIA 6.1.20 BENEFITS

IIIA 6.1.21 SURVEY OF ALTERNATIVE PEST CONTROL MEASURES

This is not an EC data requirement / not required by Council Directive 91/414/EEC or Regulation (EC 1107/2009).

ZRMS conclusion
ZRMS agrees.

IIIA 6.1.22 COMPATIBILITY WITH CURRENT MANAGEMENT PRACTICES INCLUDING IPM

Sulfoxaflor can be adjusted to IPM technologies easily because of its favorable ecotox profile. Our recommendation in IPM technology is:

- Sulfoxaflor has very low toxicity to most predatory mites (“Harmless”). Direct applications of sulfoxaflor are unlikely to effect populations of predatory mites, recovery will occur soon after any minor effects.
- Sulfoxaflor has slight toxicity to predatory insects (“Harmless”-“Slightly Harmful”). Direct application to existing populations may cause an effect on a small number of predatory insect taxa. Effects will be short lived and populations will recover within 1 month.
- Sulfoxaflor is toxic to parasitic wasps when they are directly sprayed but the toxicity decreases over time and generally disappears within 3 weeks after application. Populations of parasitic wasps are likely to recover within 1 to 2 months after application.

The table below, submitted by the petitioner, showed the effects of the product GF-2626 on the most important beneficial organisms, common in open field crops.

Beneficial type	Species/Taxon	IOBC class	Effects on populations and recovery
Predatory mites	*Amblyseius swirskii* *Typhlodromus pyri* *Amblyseius andersoni*	1-2	Populations of predatory mites are unlikely to be affected by applications of sulfoxaflor.
Predatory insects	*Carabidae, Coccinellidae, Staphylininidae, Lycosidae,* and *Linyphiidae*	2-3	In the majority of taxa, sulfoxaflor has only limited effects on populations of predatory insects. Effects on some species of Coleoptera (*Poecilus* sp., Coccinellidae and Tachyporinae are short lived and populations will recover within 1 month.
Parasitic wasps	*Aphidiinae, Braconidae, Eulophidae, Mymaridae, Pteromalidae, Scelionidae and Ichneumonoidae*	3-4	Effects are evident on Hymenoptera parasitoids, however populations recovery typically occurs 1 to 2 months after application

The petitioner added that rotation with other MOA products is recommended if they are selective to beneficial organism.

ZRMS conclusion about the compatibility with current management practices including IPM

Being an insecticide, zRMS believes that the product can affect IPM strategies and reduce some of the beneficial populations: according to applicant data, mites will not be affected whereas predatory insects and predatory wasps must be impacted.
Following ES comment, Spain ask to the applicant to advice the timing for the application of the product (e.g. a threshold of infestation).

IIIA 6.1.23 CONTRIBUTION TO RISK REDUCTION

This is not an EC data requirement / not required by Council Directive 91/414/EEC or Regulation (EC 1107/2009).

ZRMS conclusion
ZRMS agrees.

IIIA 6.1.24 OTHER/SPECIAL STUDIES

Rainfastness

Two replicated glasshouse study was conducted by Dow AgroSciences scientists based in the company headquarters in Indianapolis USA, to determine the period after application required for 2 sulfoxaflor formulations, GF-2372 (sulfoxaflor 500 g a.s./Kg) and GF-2626 (sulfoxaflor 120 g a.s./L), to be rainfast. Bell pepper (*Capsicum annuum, L.)* plants were treated with 6 and 24 g a.s./ha rates of both sulfoxaflor formulations and a standard product, Provado (imidacloprid). Plants were then subjected to either no rain, or 0.1 inch (2.5 mm) simulated rain at 0.5, 1, 2, 4 hours after insecticide treatment. After drying, plants were infested with green peach aphid (*Myzus persicae, Sulzer*.) and incubated for 3 days in controlled environment before determining aphid control efficacy.

Data from these studies demonstrated GF-2626 proved to be rainfast even at half an hour rain introduction time, while GF-2372 was rainfast after 1 hour rain introduction time. The results of these two trials support label claims on rainfastness for both GF-2372 and GF-2626 formulations, as a minimum of 1 hour rain free time is required for delivering expected efficacy.

ZRMS conclusion
ZRMS agrees.

IIIA 6.1.25 SUMMARY AND ASSESSMENT OF DATA ACCORDING TO POINTS 6.1 TO 6.7

All information included in this dRR (Part B – Section 7) is in the form of summaries of data which are presented and discussed in detail in the following report: Biological Assessment Dossier for GF-2626 (sulfoxaflor) Field Uses in the EU Regulatory Southern Zone. A summary of data is available in that BAD in IIIA 6.6 section and not repeated here.

The table below shows the uses validated by zRMS. On the basis of efficacy data in stone fruits against aphids, the dose rate of 36 g sulfoxaflor/ha should be indicated in the GAP table.

Country	Crops	Pests supported in efficacy trials	Maximum application rate (l product/ha)	Maximum number of applications per season**	zRMS conclusion for efficacy section
Southern zone (FR, IT, ES,	Apples	*Eriosoma lanigerum* (in apple)	0.4	0.4 * 1 application	**Acceptable***
		Other aphids:	0.2	0.2 * 1-2	**Acceptable***

Country	Crops	Pests supported in efficacy trials	Maximum application rate (l product/ha)	Maximum number of applications per season**	zRMS conclusion for efficacy section
PT, EL, BG, HR)		*Dysaphis plantaginea* *Aphis pomi* *Aphis gossypii* *Aphis spireacola*		applications	
	Pears	**Scales:** *Quadraspidiotus perniciosus*	0.4	0.4 * 1 application	**Acceptable***
Southern zone (ES, IT, FR, PT, EL, BG, HR, CY, ~~GR~~)	Peaches and nectarines	**Aphids:** *Myzus persicae* *Myzus cerasi* *Hyalopterus pruni* *Aphis spiraecola* *Brachycaudus helichrysi*	0.2 or 0.3	0.2 * 1-2 applications or 0.3 * 1 application	**Acceptable***
		Scales: *Pseudalacaspis pentagona* *Quadraspediotus perniciosus*	0.4	0.4 * 1 application	**Acceptable***
Southern zone (FR, IT, ES, PT, EL, BG, HR)	Plums and cherries	**Aphids:** *Myzus persicae* *Myzus cerasi* *Hyalopterus pruni* *Aphis spiraecola* *Brachycaudus helichrysi*	0.2 or 0.3	0.2 * 1-2 applications or 0.3 * 1 application	**Acceptable***
		Scales: *Pseudalacaspis pentagona* *Quadraspediotus perniciosus*	0.4	0.4 * 1 application	**Acceptable***
Southern zone (EL, ES, PT, IT, FR)	Citrus (Lemon, Mandarin, Orange, Grapefruit)	**Aphids:** *Aphis spiraecola* *Aphis gossypii* *Toxoptera citricida* *Toxoptera aurantii*	0.2	0.2 * 1-2 applications	**Acceptable***
		Scales: *Aonidiella aurantii* Mealybugs: *Planococcus citri*	0.4	0.4 * 1 application	**Acceptable***
Southern zone (FR, IT, ES, PT, EL, BG, CY, MA, HR)	Aubergine	**Aphids:** *Aphis gossypii* *Myzus persicae* *Macrosiphum euphorbiae*	0.2	0.2 * 1-2 applications	**Acceptable***
	Tomatoes	**Whiteflies:** *Trialeurodes vaporariorum* *Bemisia tabaci*	0.4	0.2 * 2 or 0.4 * 1	**Acceptable***
	Pepper				**Acceptable***
Southern zone (FR, IT, ES,	Beans (fresh with/without pods)	**Aphids:** *Aphis fabae* *Acyrthosiphon pisum*	0.2	0.2 * 1-2 applications	**Acceptable***
	Peas (fresh				**Acceptable***

Country	Crops	Pests supported in efficacy trials	Maximum application rate (l product/ha)	Maximum number of applications per season**	zRMS conclusion for efficacy section
PT, EL, BG)	with/without pods)				
Southern zone (FR, IT, ES, EL, BG)	Brassicas (Brocolli, Cabbage, Cauliflower, Brussels sprouts, Leafy brassicas like Chinese cabbage, Kale, others)	**Aphids:** *Brevicoryne brassicae* *Myzus persicae*	0.2	0.2 * 1 application	**Acceptable***
Southern zone (IT, ES, PT, EL, BG, FR)	Ornamentals (Flowers and roses, bulbs, trees and shrubs, outdoor and indoor plants)*	**Aphids:** *Macrosiphum rosae* *Phyllaphis fagi*	0.2	0.2 * 1-2 applications	**Acceptable***
		Whiteflies: *Trialeurodes vaporariorum*	0.4	0.2 * 2 or 0.4 * 1	**Acceptable***
Southern zone (FR, IT, ES, PT, EL, BG)	Cucurbits (edible peel: cucumber, cocurgette/zuccini, gherkin AND inedible peel: melon. pumpkin, squash, watermelon, ~~zuccini~~)	**Aphids:** *Aphis gossypii* *Aphis fabae* *Myzus persicae* *Aphis nasturtii*	0.2	0.2 * 1-2 applications	**Acceptable***
		Whiteflies: *Trialeurodes vaporariorum* *Bemisia tabaci*	0.4	0.2 * 2 or 0.4 * 1	**Acceptable***
Southern zone (FR, IT, ES, EL, BG)	Leaf vegetables (lettuce and other salad plants including Brassicacea, spinach and similar, herbes)	**Aphids:** *Nasonovia ribisnigri* *Myzus persicae*	0.2	0.2 * 1 application	**Acceptable***
Southern zone (FR, IT, ES, EL, BG, PT)	Potatoes	**Aphids:** *Myzus persicae* *Macrosiphum euphorbiae* *Aphis nasturtii* *Aphis fabae* *Aphis gossypii* *Aulacorthum solani*	0.2	0.2 * 1-2 applications	**Acceptable***

***To be confirmed at MS level considering:**
- Extrapolations possibilities on minor uses and/or pest group,
- The distribution of trials considering the EPPO climatic zones.

****A dose range is proposed by zRMS in the conclusions (Minimum effective dose assessment)**

Considering the data submitted:

- ✓ The efficacy level of CLOSER is considered as satisfactory for all the claimed uses.
- ✓ The risk of phytotoxicity of CLOSER is considered as negligible for all the claimed uses.

- ✓ The risk of negative impact of CLOSER on yield, quality, transformation processes, propagation, succeeding crops and adjacent crops are considered as negligible.
- ✓ There is a risk of resistance development or appearance to sulfoxaflor for aphids (*Myzus persicae*, *Aphis gossypii* and *Dysaphis plantaginea*) and whiteflies (*Trialeurodes vaporariorum* and *Bemisia tabaci*) requiring a monitoring in vegetables and/or fruit crops.

IIIA 6.1.26 LIST OF TEST FACILITIES INCLUDING THE CORRESPONDING CERTIFICATES

The list of test facilities including the corresponding certificates is located in the following report: IIIA 6.7 Biological Assessment Dossier for GF-2626 (sulfoxaflor) Field Uses in the EU Regulatory Southern Zone and not repeated here.

List of test facilities including the corresponding certificates

Testing facilities carrying out all trials across southern European countries were GEP approved. Relevant certificates were submitted.

IIIA 6.1.27 APPENDIX 1: LIST OF DATA SUBMITTED IN SUPPORT OF THE EVALUATION

Annex Point	Author	Report Date	Title	Source	Company Report No.	GLP/GEP Y/N	Published Y/N	Data Protection Claimed Y/N	Owner
IIIA 6.1	S.Webb	2007	IPM Case studies: Cucurbits. in *Aphids as Crop Pests*. ed. by van Emden H and Harrington R.	CABI Wallingford. UK. pp. 639-649		N	Y	N	
IIIA 6.1	Luis-Arteaga. M.et al.	1998	Occurrence. Distribution. and Relative Incidence of Mosaic Viruses Infecting Field-Grown Melon in Spain	Plant Disease 82. pp. 979-982		N	Y	N	
IIIA 6.1	Tatchell. M.	1989	An estimate of the potential economic losses to some crops to aphids	Crop Protection 8. pp. 25-29.		N	Y	N	
IIIA 6.1	Rossing. W.RA.H.	1991	Simulation of damage in winter wheat caused by the grain aphid Sitobium avenae. 3. Calculation of damage at various sustainable yield levels.	European Journal of Plant Pathology. 97. pp. 87-103.		N	Y	N	
IIIA 6.1.1.2	Henderson. C.F Tilton. E.W	1955	Tests with acaricides against the brown wheat mite.	J. Econ. Entomol. 48 . pp. 157–161		N	Y	N	
IIIA 6.1.1	Rossing. W.RA.H.	1991	Simulation of damage in winter wheat caused by the grain aphid Sitobium avenae. 3. Calculation of damage at various sustainable yield levels.	European Journal of Plant Pathology. 97. pp. 87-103.		N	Y	N	
IIIA 6.1.1	Cambra M1. Gorris MT.	2000	Incidence and epidemiology of Citrus tristeza virus in the Valencian	Virus Research. 200 Nov; 71. 85-95.		N	Y	N	

	Marroquín C. Román MP. Olmos A. Martínez MC. de Mendoza AH. López A.Navarro L.		community of Spain.						
IIIA 6.1.1.1 IIIA 6.1.1.2. IIIA 6.2.8.7	Abbott. W.S	1925	A method of computing the effectiveness of an insecticide..	J. Econ. Entomol.; 18 : 265-267		N	Y	N	
IIIA 6.1.1 IIIA 6.2.8.6	Babcock. J.M. et al.	2007	Early stage characterization of XDE-208 in Discovery Insect Biology evaluation programs	Dow AgroSciences	259319	N	N	Y	Dow AgroSciences
IIIA 6.2.8.5	Sparks.T.C. et al.	2012	Differential metabolism of sulfoximine and neonicotinoid insecticides by Drosophila melanogaster monooxygenase CYP6G1	Pesticide Biochemistry and Physiology 103 (2012) 159–165		N	Y	N	
IIIA 6.2.8.5	Sparks.T.C. et al.	2013	Mini Review.Sulfoxaflor and the sulfoximine insecticides: Chemistry. mode of action and basis for efficacy on resistant insects	Pesticide Biochemistry and Physiology 107 (2013) 1-7		N	Y	N	
IIIA 6.1.1.1	Davis .G.E. et al.	2013	Fungicidal Asesement of X11422208 (sulfoxaflor)	Dow AgroSciences		Y	N	Y	Dow AgroSciences
IIIA 6.2.8	Bass.C. et al.	2011	Mutation of a nicotinic acetylcholine receptor b subunit is associated with resistance to neonicotinoid insecticides in the aphid Myzus persicae	BMC Neuroscience 2011. 12:51 http://www.biomedcentral.com/1471-2202/12/51		N	Y	N	
IIIA 6.2.8	Panini.M. et al.	2013	Detecting the presence of target site resistance to neonicotinoids and pyrethroids in Italian populations of *Myzus persicae*	Correspondence to Emanuele Mazzoni. Institute of Entomology and Plant Pathology.		N	Y	N	

				Università Cattolica del Sacro Cuore. Via Emilia Parmense. 84. I-29122 Piacenza. Italy.					
IIIA 6.2.8.6	Longhurst.C et al.	2013	Cross-resistance relationships of the sulfoximine insecticide sulfoxaflor with neonicotinoids and other insecticides in the whiteflies *Bemisia tabaci* and *Trialeurodes vaporariorum*	Accepted article published: 19 October 2012 Published online in Wiley Online Library: 30 November 2012 (wileyonlinelibrary.com) DOI 10.1002/ps.3439		N	Y	N	
IIIA 6.2.8.6	Longhurst.C et al.	2014	Cross-resistance relationships of the sulfoximine insecticide sulfoxaflor with pyrethroid. organophosphate. carbamate and neonicotinoid insecticides in the peach-potato aphid *Myzus persicae*.	Dow AgroSciences		N	Y	N	Dow AgroSciences
IIIA 6.2.8 IIIA 6.2.8.6	Herron.G.A. et al.	2014	Baseline susceptibility and cross-resistance in *Aphis gossypii* Glover (Aphididae:Hemiptera) to phorate and sulfoxaflor	NSW DPI.EMAI.PMB 4008.Narellan.NSW 2567.Australia Austral Entomology (2014) 53.32-35		N	Y	N	
IIIA 6.2.8	IRAG	2013	Knock –down resistance (kdr) in Grain Aphids	Insecticide Resistance Action Group .UK.		N	Y	N	
IIIA 6.2.8 IIIA 6.2.8.9	Forster.S.P et al.	2013	Amutation (L1014F) in the voltage-gatedsodium channel of the grain aphid. *Sitobionavenae*. is associated with resistanceto pyrethroid insecticides	SCI (wileyonlinelibrary.com) DOI 10.1002/ps.3683		N	Y	N	

IIIA 6.2.8.7	Hasler.J.M. ; Watson.G.B.	2014	Identification of R81T nAChR beta subunit mutation in field-collected strains of Myzus persicae from southern Europe	Dow AgroSciences		Y	N	Y	Dow AgroSciences
IIIA 6.1.1.1	Geng. C et al.	2011	Speed of action of Sulfoxaflor on aphid feeding: Inhibition of honeydew production.	Dow AgroSciences	2008723	Y	N	Y	Dow AgroSciences
IIIA 6.1.1.1	Harrewijn. P.; Kayser. H	1997	Pymetrozine. a fast-acting and selective inhibitor of aphid feeding. In-situ studies with electronic monitoring of feeding behavior	Pesticide Science 49(2). 130-140		N	Y	N	
IIIA 6.1.1.1	Kubiszak. M.E.. King. J.E..	2011	Translaminar activity of sulfoxaflor in laboratory leaf paint bioassays on the green peach aphid Myzus persicae.	Dow AgroSciences	TBC	Y	N	Y	Dow AgroSciences
IIIA 6.5.1	Kubiszak. M.E.. Mezei. I.. King. J.E.. Gomez. L.E. and Friar. T.A..	2014	Residual Activity of Sulfoxaflor in Laboratory Rain Fast Bioassays on the Green Peach Aphid. Myzus persicae	Dow AgroSciences	TBC	Y	N	Y	Dow AgroSciences
IIIA 6.1.1.2	Hoffmann.P	2008	XR-208 EFFICACY against aphids in winter barley.	Dow AgroSciences	HU07X03017PH01	Y	N	Y	Dow AgroSciences
IIIA 6.1.1.2	Monsour. C. Richards. C.	2010	Comparison of GF-2032 240 SC with Movento 240 SC and Chess 500 WG for the control of cotton aphid (Aphis gossypii) and the prevention of mosaic virus in cucumbers cv. Redlands Long White. Bowen. Queensland. 2010	Dow AgroSciences	2007893	Y	N	Y	Dow AgroSciences
IIIA 6.1.4.2		2011	EPPO standards PP 1/243(1): Effects of plant protection products on transformation processes).	European and Mediterranean Plant Protection Organization		N	Y	N	
IIIA 6.1.4.2		2000	méthode d'expérimentation pour l'étude des effets non intentionnels des préparations phytopharmaceutiques sur l'élaboration et la	French CEB method 185 (quality malt and beer)		N	Y	N	

			qualité du malt et de la biere. 2000. méthode n° 185. 1ÈRE Édition 1996. RÉVISION						
IIIA 6.1.4.2		2004	Méthode d' expérimentation pour l' étude des effets non intentionnels des préparations phytopharmaceutiques sur la qualité du blé tendre et des produits de transformation	French CEB method 218 (quality of soft wheat)		N	Y	N	
IIIA 6.1.1.1	Morita. M. et al.	2007	Flonicamid. a novel insecticide with a rapid inhibitory effect on aphid feeding.	Pest Management Science. 63(10). 969-973		N	Y	N	
IIIA 6 IIIA 6.2.8.5	Watson.G. et al.	2011	Novel nicotinic action of the sulfoximine insecticide sulfoxaflor.	Ins Biochem Mol Biol in press		N	Y	N	
IIIA 6.2.8.4 IIIA 6	Zhu. Y.et al.	2011	Discovery and Characterization of Sulfoxaflor. a Novel Insecticide Targeting Sap-Feeding Pests.	J Agric Food Chem 59: 2950–2957		N	Y	N	
IIIA 6.1.1.1 IIIA 6.2.7	Schmitzer. P.R Donley. K	2008	Crop safety of XDE-208	Dow AgroSciences	259318	Y	N	Y	Dow AgroSciences
IIIA 6.2.7	Rockcliff. C - a	2011	Effects of GF-2626 on the Seedling Emergence of Non Target Terrestrial Plants	Stockbridge Technology Centre Ltd Cawood Selby North Yorkshire. UK YO8 3TZ		Y	N	Y	Dow AgroSciences
IIIA 6.2.7	Rockcliff. C - b	2011	Effects of GF-2626 on the Vegetative Vigour of Non Target Terrestrial Plants.	Stockbridge Technology Centre Ltd Cawood Selby North Yorkshire. UK YO8 3TZ		Y	N	Y	Dow AgroSciences

IIIA 6.2.8.6	Babcock. J. et al.	2011	Biological characterization of sulfoxaflor. a novel insecticide.	Pest Manag Sci 67: 328–334		N	Y	N	
IIIA 6.2.8.5	Daborn. P. et al.	2002	A single P450 allele associated with insecticide resistance in Drosophila.	Science 2002. 297. 2253-2256		N	Y	N	
IIIA 6.2.8.5	EPPPO	2002	EPPO. Efficacy evaluation of plant protection products – Resistance risk analysis.	PP 1/213(2) pp. 76-93		N	Y	N	
IIIA 6.2.8.7	Fereres. A. Torné. M	2009	Lab evaluation of the efficacy of the experimental product "XDE-208" against the green peach aphid and the cotton aphid (2008).	Dow AgroSciences	2001358	Y	N	Y	Dow AgroSciences
IIIA 6.2.8.7	Fereres. A. Torné. M	2011	Evaluation of the efficacy of the experimental product "GF-2032" against the green peach aphid and the cotton aphid (REPORT 2010)	Dow AgroSciences	2008534	Y	N	Y	Dow AgroSciences
IIIA 6.2.8.7	Fereres. A. Torné. M	2013	Evaluation of the activity of GF-2626 against different populations of aphids andwhiteflies collected in several parts of Europe (Spain. Italy. France and Greece).	Dow AgroSciences		Y	N	Y	Dow AgroSciences
IIIA 6.2.8.6	Gore. J et al.	2010	Bioassays and management of cotton aphids with neonicotinoids and sulfoxaflor.	Proc Beltwide Cotton Conf 2010. pp 1207-1210		N	Y	N	
IIIA 6.2.8.9	Gore.J et al.	2013	Cotton Aphid (Heteroptera: Aphididae) Susceptibility to Commercialand Experimental Insecticides in the Southern United States	Journal of Economic Entomology.Vol.106 .no3 (June 2013) pp 1430-1439		N			
IIIA 6.2.8.6 IIIA 6.2.8.9	Gorman. K.et al.	2006	Whitefly/Aphid Cross Resistance Study Using Dow AgroSciences' Experimental Insecticides at Rothamsted Research. United Kingdom. Stage three report.	Rothamsted Research. United Kingdom. Stage three report	2008457	Y	N	Y	Dow AgroSciences
IIIA 6.2.8.6 IIIA 6.2.8.9	Gorman. K.et al.	2010	Activity of XDE208 against multi-resistant Hemipteran pests.	Rothamsted Research. United Kingdom.	2008458	Y	N	Y	Dow AgroSciences

IIIA 6	IRAC	2010	IRAC (2010) IRAC MoA Classification Scheme (Version 7.0 October 2010).	http://www.irac-online.org/resources-2/document-library/		N	Y	N	
IIIA 6.2.8.5	Jouben.N. et al.	2008	Metabolism of imidacloprid and DDT by P450 CYP6G1 expressed in cell cultures of Nicotiana tabacum suggests detoxification of these insecticides in Cyp6g1-overexpressing strains of Drosophila melanogaster. leading to resistance	Pest. Manag. Sci. 2008. 64. 65-73		N	Y	N	
IIIA 6.2.8.5	Gorman. N.et al.	2008	Metabolism of imidacloprid and DDT by P450 CYP6G1 expressed in cell cultures of Nicotiana tabacum suggests detoxification of these insecticides in Cyp6g1-overexpressing strains of Drosophila melanogaster. leading to resistance.	Pest. Manag. Sci. 2008. 64. 65-73		N	Y	N	
IIIA 6.2.8.5	Karunker. I.et al.	2008	Over-expression of cytochrome P450 CYP6M1 is associated with high resistance to imidacloprid in the B and Q biotypes of Bemisia tabaci (Hemiptera: Aleyrodidae).	Insect. Biochem. Molec. Biol. 2008. 38. 634-644.		N	Y	N	
IIIA 6.2.8.5	Markussen. M.D.K. Kristensen. M	2010	Cytochrome P450 mono-oxygenase-mediated neonicotinoid resistance in the house fly Musca domestica L.	Pesticide Biochemistry and Physiology 98: 50–58		N	Y	N	
IIIA 6.2.8.5	Perry. T. et al.	2007	A Da6 knockout strain of Drosophila melanogaster confers a high level of resistance to spinosad	Insect Biochem. Mol.Biol. 37 (2). 184-188.		N	Y	N	
IIIA 6 IIIA 6.2.8.5	Perry. T.et al.	2012	Effects of mutations in the Drosophila nicotinic acetylcholine receptor subunits on sensitivity to insecticides targeting nicotinic acetylcholine receptors.	Pesticide Biochemistry and Physiology 102 (2012) 56–60		N	Y	N	
IIIA 6.2.8.5	Philippou. D et al.	2010	Metabolic enzyme(s) confer imidacloprid resistance in a clone of Myzus persicae (Sulzer) (Hemiptera: Aphididae) from Greece.	Pest. Manag. Sci. 2010. 66. 390-395.		N	Y	N	

IIIA 6.2.8.5	Puinean. A et al.	2010	Characterization of imidacloprid resistance mechanisms in the brown planthopper. Nilaparvata lugens Stål (Hemiptera: Delphacidae).	Pestic. Biochem. Physiol. 2010. 97. 129-132		N	Y	N	
IIIA 6 IIIA 6.2.8.5	Watson. G.B.et al	2010	A spinosyn-sensitive Drosophila melanogaster nicotinic acetylcholine receptor identified through chemically induced target site resistance. resistance gene identification and heterologous expression	Insect Biochemistry and Molecular Biology 40: 376-384		N	Y	N	
IIIA 6.2.8.5	Wen. Yet al.	2009	Imidacloprid resistance and its mechanisms in fleid populations of brown planthopper. Nilaparvata lugens Stål in China.	Pestici. Biochem. Physiol. 2009. 94. 36-42.		N	Y	N	
IIIA 6.1.2.10 IIIA 6.2.1.1	Torne. Maria	14-May-2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphid populations in citrus in Spain?	TRIALCAMP	ES08C1C012MT01C	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Carrasco. Salvador	28-Oct-2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphid populations in citrus in Spain?	Dow Agrosciences	ES08C1C012SC01	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Melian. Juan	28-Nov-2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphid populations in citrus in Spain?	Dow Agrosciences	ES11C1C005JM01	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Melian. Juan	28-Nov-2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphid populations in citrus in Spain?	Dow Agrosciences	ES11C1C005JM02	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Abad Moyano. Raquel	21-Oct-2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphid populations in citrus in Spain?	Dow Agrosciences	ES11C1C005RA01	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Kerfal. Samir	22-Nov-2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphid populations in citrus in Spain?	Dow Agrosciences	ES11C1C005SK01	Y	N	Y	Dow Agrosciences

IIIA 6.1.2.10 IIIA 6.2.1.1	Kerfal. Samir	23-Nov-2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphid populations in citrus in Spain?	Dow Agrosciences	ES11C1C005SK02	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Tescari. Enzo	19-May-2008	Efficacy and selectivity of xde-208 against aphids in citrus fruits	AGRIGEOS S.R.L.. IT	IT08C1C102ET01C	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Alfarano. Luigi	7-Oct-2008	Efficacy and selectivity of xde-208 against aphids in citrus fruit	Dow Agrosciences	IT08C1C102LA01	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Tescari. Enzo	25-Aug-2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphid populations in citrus?	AGRIGEOS S.R.L.. IT	IT11C1C005ET01C	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Tescari. Enzo	25-Aug-2011	What is the rate of sulfoxaflor (GF -2626) needed to control aphid populations in citrus?	AGRIGEOS S.R.L.. IT	IT11C1C005ET02C	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Tescari. Enzo	25-Aug-2011	What is the rate of sulfoxaflor (GF -2626) needed to control aphid populations in citrus?	AGRIGEOS S.R.L.. IT	IT11C1C005ET03C	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Tescari. Enzo	25-Aug-2011	What is the rate of sulfoxaflor (GF -2626) needed to control aphid populations in citrus?	AGRIGEOS S.R.L.. IT	IT11C1C005ET04C	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Tescari. Enzo	21-Jun-2011	What is the rate of sulfoxaflor (GF -2626) needed to control aphid populations in citrus?	PROAGRI S.R.L.. IT	IT11C1C005ET05C	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Alfarano. Luigi	7-Dec-2011	What is the rate of sulfoxaflor (GF -2626) needed to control aphid populations in citrus?	Dow Agrosciences	IT11C1C005LA01	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Torne. Maria	3-Jun-2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphid populations in citrus in Portugal?	AGRISEARCH	PT08C012MT02C	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.10 IIIA 6.2.1.1	Torne. Maria	11-Jun-2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphid populations in citrus in Portugal?	AGRISEARCH	PT08C1C012MT03C	Y	N	Y	Dow Agrosciences

IIIA 6.1.2.10 IIIA 6.2.1.1	Torne. Maria	6-Sep-2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphid populations in citrus in Spain?	AGRICULTURA Y ENSAYO S.L.. SP	PT11C1C005MT01C	Y	N	Y	Dow Agrosciences
IIIA 6.1.2.16 IIIA 6.1.3.17 IIIA 6.2.1.1	Metodos Servicios Agricola S.A.. Spain	2012	What is the rate of sulfoxaflor (GF-2626) needed to control the most important Mealy Bug and Scale species in citrus?	Metodos Servicios Agricola S.A.. Spain	ES12C1C006MT02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.16 IIIA 6.1.3.17 IIIA 6.2.1.1	Elanco Hellas SACI. Greece	2012	What is the rate of sulfoxaflor (GF-2626) needed to control the most important Mealy Bug and Scale species in citrus?	Elanco Hellas SACI. Greece	GR12C1C006ML01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.16 IIIA 6.1.3.17 IIIA 6.2.1.1	Elanco Hellas SACI. Greece	2012	What is the rate of sulfoxaflor (GF-2626) needed to control the most important Mealy Bug and Scale species in citrus?	Elanco Hellas SACI. Greece	GR12C1C006ML02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.16 IIIA 6.1.3.17 IIIA 6.2.1.1	Agrigeos SRL. Italy	2012	What is the efficacy of sulfoxaflor (GF-2626) against scale and mealy bugs in citrus?	Agrigeos SRL. Italy	IT12C1C006ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.16 IIIA 6.1.3.17 IIIA 6.2.1.1	Eurofins Agroscience Services SRL. Italy	2012	What is the efficacy of sulfoxaflor (GF-2626) against scale and mealy bugs in citrus?	Eurofins Agroscience Services SRL. Italy	IT12C1C006ET02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.16 IIIA 6.1.3.17 IIIA 6.2.1.1	Dow Agrosciences Export SAS. Greece	2013	What is the rate of sulfoxaflor (GF-2626) needed to control the most important Mealy Bug and Scale species in citrus?	Dow Agrosciences Export SAS. Greece	GR13C1C033NGK01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.16 IIIA 6.1.3.17 IIIA 6.2.1.1	Dow Agrosciences Export SAS. Greece	2013	What is the rate of sulfoxaflor (GF-2626) needed to control the most important Mealy Bug and Scale species in citrus?	Dow Agrosciences Export SAS. Greece	GR13C1C033NGK02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.16 IIIA 6.1.3.17 IIIA 6.2.1.1	Agri 2000. Italy	2013	What is the rate of sulfoxaflor (GF-2626) needed to control the most important Mealy Bug and Scale species in citrus?	Agri 2000. Italy	IT13C1C033ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.16 IIIA 6.1.3.17 IIIA 6.2.1.1	Elanco Hellas SACI. Greece	2013	What is the rate of sulfoxaflor (GF-2626) needed to control the most important Mealy Bug and Scale species in citrus?	Elanco Hellas SACI. Greece	GR13C1C033VA01C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.17 IIIA 6.1.3.18 IIIA 6.2.1.1	Dow AgroSciences Export SAS. Greece	2011	What is the rate of sulfoxaflor (GF-2626) needed to control the most important Mealy Bug and Scale species in citrus?	Dow AgroSciences Export SAS. Greece	GR11C1C016NK01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.17 IIIA 6.1.3.18 IIIA 6.2.1.1	Dow AgroSciences Export SAS. Greece	2012	What is the rate of sulfoxaflor (GF-2626) needed to control the most important Mealy Bug and Scale species in citrus?	Dow AgroSciences Export SAS. Greece	GR12C1C006VA01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.17 IIIA 6.1.3.18 IIIA 6.2.1.1	Elanco Hellas SACI. Greece	2013	What is the rate of sulfoxaflor (GF-2626) needed to control the most important Mealy Bug and Scale species in citrus?	Elanco Hellas SACI. Greece	GR13C1C016VA01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.17 IIIA 6.1.3.18 IIIA 6.2.1.1	Elanco Hellas SACI. Greece	2013	What is the rate of sulfoxaflor (GF-2626) needed to control the most important Mealy Bug and Scale species in citrus?	Elanco Hellas SACI. Greece	GR13C1C016VA02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.17 IIIA 6.1.3.18 IIIA 6.2.1.1	Metodos Servicios Agricola S.A.. Spain	2013	What is the efficacy of sulfoxaflor (GF-2626) against scale and mealy bugs in citrus?	Metodos Servicios Agricola S.A.. Spain	ES13C1C016MT01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.3.9	Melian. J.	2008	What is the efficacy of X11422208 on aphids in vegetables in Spain?	Dow AgroSciences Ibérica SA (SP);	ES07X03006JM02	Y	N	Y	Dow AgroSciences
IIIA 6.1.3.9	Carrasco. S.	2008	What is the efficacy of X11422208 on aphids in vegetables in Spain?	Dow AgroSciences Ibérica SA (SP);	ES07X03006SC02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Torne. M.	2008	What is the efficacy of XDE-208 (GF-2032) on aphid populations in lettuce in Spain?	Agrotecnica del Sur. S.L. (SP);	ES08C1C013MT01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4	Torne. M.	2008	What is the efficacy of XDE-208 (GF-2032) on aphid populations in lettuce?	Agrotfile (PT);	PT08C1C013MT01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4	Torne. M.	2008	What is the efficacy of XDE-208 (GF-2032) on aphid populations in lettuce?	Agrotfile (PT);	PT08C1C013MT01C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.4 IIA 6.2.1	Christian. R.	2008	Efficacy of XDE-208 on aphids in lettuce crop. Europe. 2008.	SFR (FR);	FR08C1C063CR02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Christian. R.	2008	Efficacy of XDE-208 on aphids in lettuce crop. Europe. 2008.	Solevi (FR);	FR08C1C063CR03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Blanchier. N.	2008	Efficacy of XDE-208 on aphids in lettuce crop. Europe. 2008.	Eurofins Agroscience Service Sarl (FR);	FR08C1C063CR04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Melian. J.	2008	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in lettuce?	Dow AgroSciences Ibérica SA (SP);	ES11C1C012JM01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Melian. J.	2008	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in lettuce?	Dow AgroSciences Ibérica SA (SP);	ES11C1C012JM02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Fenio. A.	2008	What is the rate of sulfoxaflor (GF-2626) needed to control the most important aphid specie in lettuce?	Dow Agrosciences ITalia Srl (IT);	IT11C1C012AF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Tescari. E.	2011	What is the rate of sulfoxaflor (GF-2626) needed to control the most important aphid specie in lettuce?	ASTRA (IT);	IT11C1C012ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Tescari. E.	2011	What is the rate of sulfoxaflor (GF-2626) needed to control the most important aphid specie in lettuce?	Dow Agrosciences Italia Srl (IT);	IT11C1C012ET05C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Torne. M.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in lettuce?	Métodos Servicios Agrícola S.A. (SP);	ES12C1C012MT01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Torne. M.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in lettuce?	Métodos Servicios Agrícola S.A. (SP);	ES12C1C012MT02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Carrasco. S.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in lettuce?	Dow AgroSciences Ibérica SA (SP);	ES12C1C012SC02	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.4 IIIA 6.2.1	Carrasco. S.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in lettuce?	Dow AgroSciences Ibérica SA (SP);	ES12C1C012SC03	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Grisel. J.	2012	Efficacy of sulfoxaflor (GF-2626) against aphids in lettuce	Dow AgroSciences. Nimes (FR);	FR12C1C012JG02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Tescani. E.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control the most aphid specie in lettuce?	Agrobiocontrol (IT);	IT11C1C012ET02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.4 IIIA 6.2.1	Tescani. E.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control the most aphid specie in lettuce?	Agrobiocontrol (IT);	IT11C1C012ET03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Martial. T.	2007	XR-208. Efficacy against *Myzus persicae* and selectivity in vegetable.	Synthec Nimes Station. France	FR07X03016MT02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Torne. M.	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in tomato grown outdoors in Spain. 2008	TrialCamp. Spain	ES08C1C002MT01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Richard. C.	2008	Efficacy of XDE-208 on aphids in tomato crop. Europe. Spring 2008	Solevi. France	FR08C1C070CR05C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Tescari. E.	2008	Efficacy and selectivity of XDE-208 against aphids in tomato	Proagri S.R.L.. Italy	IT08C1C103ET03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Tescari. E.	2008	Efficacy and selectivity of XDE-208 against aphids in eggplant	G.Z. S.R.L.. Italy	IT08C1C105ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Tescari. E.	2008	Efficacy and selectivity of XDE-208 against aphids in eggplant	Agri 2000. Italy	IT08C1C105ET02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Torne. M.	2009	What is the efficacy of different Solfoxaflor analogs against aphids on solanaceous crops	Dow AgroSciences Ibérica S.A.. Spain	ES09X03006JM02	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.3. IIIA 6.2.1	Fenio. A.	2009	Efficacy and selectivity of sulfoxaflor analogues against aphids *(Aphis gossypii / Myzus persicae / Macrosiphum euphorbiae*) in solanaceous crops	Dow AgroSciences Italia S.r.l.	IT09X03006AF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Torne. M.	2009	What is the efficacy of different Solfoxaflor analogs against aphids on solanaceous crops	Dow AgroSciences Ibérica S.A.. Spain	ES09X03006JM02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Fenio. A.	2009	Efficacy and selectivity of sulfoxaflor analogues against aphids *(Aphis gossypii / Myzus persicae / Macrosiphum euphorbiae*) in solanaceous crops	Dow AgroSciences Italia S.r.l.	IT09X03006AF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Torne. M.	2010	What is the efficacy and selectivity of sulfoxaflor (GF-2626) against aphids in solanaceous crops	Métodos y Servicios Agrícolas S.A.. Spain	ES10C1C013MT03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Fenio. A.	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in solanaceous crops	Dow AgroSciences Italia S.r.l.	IT10C1C013AF05	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Tescari. E.	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in solanaceus crops	Proagri S.R.L.. Italy	IT10C1C013ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.3. IIIA 6.2.1	Tescari. E.	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in solanaceus crops	G.Z. S.R.L.. Italy	IT10C1C013ET04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.7	Kerfal. Samir	2011	What is the relative activity of sulfoxaflor at 2x24 g a.i./ha at 7 days compared to 48 g a.i./ha applied once against *Bemisia tabaci?*	Dow AgroSciences Iberica. Spain	ES11C1C014SK01	Y	N	N	Dow AgroSciences
IIIA 6.1.2.7	Alfarano. Luigi	2008	Efficacy of XDE-208 mixes against whiteflies in solanaceous crops.	Dow AgroSciences Italia S.r.l.. Italy	IT08C1C110LA01	Y	N	N	Dow AgroSciences
IIIA 6.1.2.7	Fenio. Antonio	2008	Efficacy and selectivity of XDE-208 against whiteflies in tomato.	Dow AgroSciences Italia S.r.l.. Italy	IT08C1C111AF01	Y	N	N	Dow AgroSciences

IIIA 6.1.2.7	Alfarano. Luigi	2008	Efficacy and selectivity of XDE-208 against whiteflies in tomato.	Dow AgroSciences Italia S.r.l.. Italy	IT08C1C111LA01	Y	N	N	Dow AgroSciences
IIIA 6.1.2.7	Alfarano. Luigi	2008	Efficacy and selectivity of XDE-208 against whiteflies in tomato.	Dow AgroSciences Italia S.r.l.. Italy	IT08C1C112LA01	Y	N	N	Dow AgroSciences
IIIA 6.1.2.7 IIIA 6.2.1	Alfarano. Luigi	2011	What is the efficacy of sulfoxaflor (GF-262) against sap feeding pests in solanaceous crops?	Dow AgroSciences Italia S.r.l.. Italy	IT11C1C014LA02	Y	N	N	Dow AgroSciences
IIIA 6.1.2.7 IIIA 6.2.1	Richard. Christian	2008	Effect of an wetter addition to XDE-208 on whitefly in tomato. Europe.2008.	SynTech Research FR S.A.S.. France	FR08C1C160CR01C	Y	N	N	Dow AgroSciences
IIIA 6.1.2.7 IIIA 6.2.1	Kavardinas. Nick	2007	Efficacy of X11422208 against TRIAVA in vegetables.	Dow AgroSciences Export S.A.S. Greece	GR07C1C003NK01	Y	N	N	Dow AgroSciences
IIIA 6.1.2.7 IIIA 6.2.1	Apostolidis. Vasilis	2010	Activity of 2x24 g ai/ha of sulfoxaflor at 7 days compared to 48 g a.s./ha applied once against whiteflies in vegetable crops.	Dow AgroSciences Export S.A.S. Greece	GR10C1C017VA01	Y	N	N	Dow AgroSciences
IIIA 6.1.2.7 IIIA 6.2.1	Kavardinas. Nick	2011	Is there any synergy/antagonism between tank-mixes of sulfoxaflor if used to control whiteflies in vegetables?	Dow AgroSciences Export S.A.S. Greece	GR11C1C064NK01	Y	N	N	Dow AgroSciences
IIIA 6.1.2.7 IIIA 6.2.1	Kavardinas. Nick	2012	Is there any synergy/antagonism between tank-mixes of sulfoxaflor + spinetoram if used to control Tuta and whiteflies in tmatoes?	Dow AgroSciences Export S.A.S. Greece	GR12C1C081NK01	Y	N	N	Dow AgroSciences
IIIA 6.1.2.7 IIIA 6.2.1	Tescari. Enzo	2010	Activity of 2x24 g ai/ha of sulfoxaflor at 7 days compared to 48 g a.s./ha applied once against whiteflies in vegetable crops.	Dow AgroSciences Italia S.r.l.. Italy	IT10C1C017ET01C	Y	N	N	Dow AgroSciences
IIA 6.1.2.1 IIIA 6.2.1	G.Z.Srl. Italy	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in cucurbit crops	Dow AgroSciences. Italy	IT10C1C014ET03C	Y	N	Y	Dow AgroSciences
IIA 6.1.2.1 IIIA 6.2.1	G.Z.Srl. Italy	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in cucurbit crops	Dow AgroSciences. Italy	IT10C1C014LA02	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.1	Carrasco. S.	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	ES10C1C014SC01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1	Carrasco S.	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	ES10C1C014SK01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1	Kerfal. S.	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	ES10C1C014SK02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1	Melian. J.	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	ES10C1C014JM01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1	Melian. J.	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	ES10C1C014JM02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1	Metodos Servicios Agricola. Spain	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	ES10C1C014MT02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1	Agrofile. Portugal	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	PT10C1C014MT02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Agrofile. Portugal	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	PT10C1C014MT03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Fenio. A.	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in cucurbit crops	Dow AgroSciences. Italy	IT10C1C014AF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Lopolito. P.	2008	Efficacy and selectivity of XDE 208for the control of aphids in cucurbit crops	Dow AgroSciences. Italy	IT08C1C106ET02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	TrialCamp. Spain	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown outdoors in Spain?	Dow AgroSciences. Spain	ES08C1C004MT03C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.1 IIIA 6.2.1	TrialCamp. Spain	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown outdoors in Spain?	Dow AgroSciences. Spain	ES08C1C004MT04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Metodos Servicios Agricola. Spain	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown in greenhouses in Spain?	Dow AgroSciences. Spain	ES08C1C003MT04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Melian. J.	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown outdoors in Spain?	Dow AgroSciences. Spain	ES08C1C004JM01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	TrialCamp. Spain	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown outdoors in Spain?	Dow AgroSciences. Spain	ES08C1C004MT04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Metodos Servicios Agricola. Spain	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown in greenhouses in Spain?	Dow AgroSciences. Spain	ES08C1C003MT04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Melian. J.	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown outdoors in Spain?	Dow AgroSciences. Spain	ES08C1C004JM01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Apostolidis V.	2009	What is the efficacy of different sulfoxaflor analogs against aphids in cucurbits ?	Dow AgroSciences. Greece	GR09X03002VA01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Apostolidis. V.	2009	What is the efficacy of different sulfoxaflor analogs against aphids in cucurbits ?	Dow AgroSciences. Greece	GR09X03002VA02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Fenio. A.	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in cucurbit crops.	Dow AgroSciences. Italy	IT10C1C014AF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	G.Z.Srl. Italy	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in cucurbit crops	Dow AgroSciences. Italy	IT10C1C014ET01C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.1 IIIA 6.2.1	G.Z.Srl. Italy	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in cucurbit crops	Dow AgroSciences. Italy	IT10C1C014ET03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	G.Z.Srl. Italy	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in cucurbit crops	Dow AgroSciences. Italy	IT10C1C014LA01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Kerfal. S.	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	ES10C1C014SK02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.2.1	Agricultura y Ensayo S.L.. Spain	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	ES10C1C013MT04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.3.5 IIIA 6.2.1	Synthec. France	2008	Efficacy of XDE-208 on aphids in melon and cucumber crops. Europe. 2008.	Dow AgroSciences. France	FR08C1C065CR01	Y	N	Y	Dow AgroSciences
IIIA 6.1.3.5 IIIA 6.2.1	Eurofins Portugal	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown outdoors in Portugal?	Dow AgroSciences. Spain	PT08C1C004MT01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.1 IIIA 6.1.3.5 IIIA 6.2.1	Metodos Servicios Agricola. Spain	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown outdoors in Spain?	Dow AgroSciences. Spain	ES08C1C004MT02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.3.5	Memoli. J.	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	ES10C1C014JM03	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Metodos Servicios Agricola. Spain	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown in greenhouses in Spain?	Dow AgroSciences. Spain	ES08C1C003MT03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Metodos Servicios Agricola. Spain	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown in greenhouses in Spain?	Dow AgroSciences. Spain	ES08C1C003MT04C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.11 IIIA 6.2.1	TrialCamp. Spain	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown outdoors in Spain?	Dow AgroSciences. Spain	ES08C1C004MT01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	TrialCamp. Spain	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown outdoors in Spain?	Dow AgroSciences. Spain	ES08C1C004MT03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	TrialCamp. Spain	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphids in cucurbits grown outdoors in Spain?	Dow AgroSciences. Spain	ES08C1C004MT04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Grisel J.	2008	Efficacy of XDE-208 on aphids in melon and cucumber crops. Europe. 2008.	Dow AgroSciences. France	FR08C1C065JG02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Bucchi. R.	2008	Efficacy and selectivity of XDE 208 against aphids in Cucurbits.	Dow AgroSciences. Italy	IT08C1C106ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Lopolito. P.	2008	Efficacy and selectivity of XDE 208 against aphids in Cucurbits	Dow AgroSciences. Italy	IT08C1C106ET02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Grisel. J.	2009	What is the efficacy of different sulfoxaflor analogs against aphids in cucurbits ?	Dow AgroSciences. France	FR09X03002JG01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Apostolidis. V.	2009	Efficacy of sulfoximine analogues against whiteflies (*Trialeurodes vaporariorum/Bemesia tabaci*) in cucurbit crops .	Dow AgroSciences. Greece	GR09X03010VA01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11	Apostolidis. V.	2009	Efficacy of sulfoximine analogues against whiteflies (*Trialeurodes vaporariorum/Bemesia tabaci*) in cucurbit crops	Dow AgroSciences. Greece	GR09X03010VA02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Fenio. A.	2009	Efficacy and selectivity of sulfoxaflor analogues against aphids (*Aphis gossypii/Myzus persicae*) in cucurbit crops.	Dow AgroSciences. Italy	IT09X03002AF01	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.11 IIIA 6.2.1	Memoli. J.	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	ES10C1C014JM04	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Kerfal. S.	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	ES10C1C014SK02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	G.Z.Srl. Italy	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in Cucurbit crops .	Dow AgroSciences. Italy	IT10C1C014ET02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	G.Z.Srl. Italy	2010	Efficacy and selectivity of sulfoxaflor for the control of aphids in Cucurbit crops	Dow AgroSciences. Italy	IT10C1C014ET03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	G.Z.Srl. Italy	2010	E Efficacy and selectivity of sulfoxaflor for the control of aphids in Cucurbit crops	Dow AgroSciences. Italy	IT10C1C014LA02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Agrofile. Portugal	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	PT10C1C014MT01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Agrofile. Portugal	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	PT10C1C014MT02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Agrofile. Portugal	2010	What is the efficacy of sulfoxaflor (GF-2626) against aphids in cucurbits ?	Dow AgroSciences. Spain	PT10C1C014MT03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Fenio. A.	2011	What is the efficacy of sulfoxaflor (GF-2626) against SAP feeding pests in Cucurbit crops ?	Dow AgroSciences. Italy	IT11C1C015AF02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	J. Memoli	2008	What is the efficacy of XDE-208 (GF-2032) on aphids in broccoli and cauliflower in Spain?	Dow AgroSciences	ES08C1C015JM01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	M. Torne	2008	What is the efficacy of XDE-208 (GF-2032) on aphids in broccoli and cauliflower in Spain?	Dow AgroSciences	ES08C1C015MT01C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.5 IIIA 6.1.3.6	M.Torne	2008	What is the efficacy of XDE-208 (GF-2032) on aphids in broccoli and cauliflower in Spain?	Dow AgroSciences	ES08C1C015MT02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	Recerca Agricola.	2008	What is the efficacy of XDE-208 (GF-2032) on aphids in broccoli and cauliflower in Spain?	Recerca Agricola.	ES08C1C015MT03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	G.Z. S.R.L.. IT	2008	Efficacy and selectivity of XDE-208 against aphids in brassicas	G.Z. S.R.L.. IT	IT08C1C107EET01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	AGRI 2000. IT	2008	Efficacy and selectivity of XDE-208 against aphids in brassicas	AGRI 2000. IT	IT08C1C107ET02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	D.Crestani	2011	What is the efficacy of Sulfoxaflor (GF-2626) for the control of aphids in brassica vegetables? EU 2011	Dow AgroSciences	IT11C1C006DC01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	Agri 2000	2011	What is the efficacy of Sulfoxaflor (GF-2626) for the control of aphids in brassica vegetables? EU 2011	Agri 2000	IT11C1C006ET1C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	Proagri S.R.L	2011	What is the efficacy of Sulfoxaflor (GF-2626) for the control of aphids in brassica vegetables? EU 2011	Proagri S.R.L	IT11C1C006ET03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	G.Z.S.R.L	2011	What is the efficacy of Sulfoxaflor (GF-2626) for the control of aphids in brassica vegetables? EU 2011	G.Z.S.R.L	IT11C1C006ET04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	Agri 2000	2011	What is the efficacy of Sulfoxaflor (GF-2626) for the control of aphids in brassica vegetables? EU 2011	Agri 2000	IT11C1C006ET05C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	L.Alfaronso	2011	What is the efficacy of Sulfoxaflor (GF-2626) for the control of aphids in brassica vegetables? EU 2011	Dow AgroSciences	IT11C1C006ET06C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	Anadiag Italia SRL	2012	What is the efficacy of Sulfoxaflor (GF-2626) against aphids in brassica crops?	Anadiag Italia SRL	IT12C1C014ET02C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.5 IIIA 6.1.3.6	Agri 2000	2012	What is the efficacy of Sulfoxaflor (GF-2626) against aphids in brassica crops?	Agri 2000	IT12C1C014ET03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	Agrolab	2012	What is the efficacy of Sulfoxaflor (GF-2626) against aphids in brassica crops?	Agrolab	IT12C1C014ET04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	L.Alfaronso	2012	What is the efficacy of Sulfoxaflor (GF-2626) against aphids in brassica crops?	Dow AgroSciences	IT12C1C014LA01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	L.Alfaronso	2013	What is the efficacy of Sulfoxaflor (GF-2626) against aphids in brassica crops?	Dow AgroSciences	IT12C1C014ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.5 IIIA 6.1.3.6	L.Alfaronso	2013	What is the efficacy of Sulfoxaflor (GF-2626) against aphids in brassica crops?	Dow AgroSciences	IT12C1C014AF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11	Fenio. Antonio	2008	Efficacy and selectivity of XDE-208 alone and in mix with adjuvants against whiteflies in cucurbits	Dow AgroSciences Italia S.r.l.. Italy	IT08C1C137AF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11	Apostolidis. Vasilis	2009	Efficacy of sulfoximine analogues against whiteflies (*Trialeurodes vaporariorum / Bemisia tabaci*) in cucurbit crops	Dow AgroSciences Export S.A.S.. Thessaloniki. Greece	GR09X03010VA01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Alfarano. Luigi	2009	Efficacy of sulfoximine analogues against whiteflies (*Trialeurodes vaporariorum / Bemisia tabaci*) in cucurbit crops	Dow AgroSciences Italia S.r.l.. Italy	IT09X03010LA01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Fenio. Antonio	2009	Efficacy of sulfoximine analogues against whiteflies (*Trialeurodes vaporariorum / Bemisia tabaci*) in cucurbit crops	Dow AgroSciences Italia S.r.l.. Italy	IT09X03010AF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11	Kavardinas. Nick	2011	Is there any synergy / antagonism between tank-mixes of sulfoxaflor if used to control whiteflies in vegetables?	Dow AgroSciences Export S.A.S.. Thessaloniki. Greece	GR11C1C065NK01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11	Lysandrou. Michael	2011	What is the efficacy and selectivity of sulfoxaflor on SAP feeding insects in cucurbits.	Elanco Hellas Saci. Greece	GR11C1C015ML02C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.11 IIIA 6.2.1	Fenio. Antonio	2011	What is the efficacy of sulfoxaflor (GF-2626) against sap feeding pests in cucurbit crops?	Dow AgroSciences Italia S.r.l.. Italy	IT11C1C015AF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Fenio. Antonino	2012	What is the efficacy of sulfoxaflor (GF-2626) against sap feeding pests in cucurbit crops?	Dow AgroSciences Italia S.r.l.. Italy	IT12C1C021AF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Fenio. Antonino	2012	What is the efficacy of sulfoxaflor (GF-2626) against sap feeding pests in cucurbit crops?	Dow AgroSciences Italia S.r.l.. Italy	IT12C1C021ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.3.1	Lysandrou. Michael	2012	Efficacy of GF-2626 against whiteflies in vegetables - Cyprus 2012	Premier Company. Cyprus	CY12C1C022ML01C	N	N	N	Dow AgroSciences
IIIA 6.1.2.11 IIIA 6.2.1	Fenio. Antonino	2013	Formulation comparability and efficacy of sulfoxaflor against whiteflies in cucurbit crops?	Dow AgroSciences Italia S.r.l.. Italy	IT13C1C097ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	FITOEXPERT	1-Dec-2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on dysaphis plantaginea or aphis pomi in apple trees in Spain?	FITOEXPERT	ES08C1C008MT01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	FITOEXPERT	1-Dec-2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on dysaphis plantaginea or aphis pomi in apple trees in Spain?	FITOEXPERT	ES08C1C008MT02C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	4-Sep-2008	Efficacy of XDE-208 on aphids on apple tree. Europe. 2008.	Dow Agrosciences	FR08C1C062CR01	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	SRF. FR	7-Nov-2008	Efficacy of XDE-208 on aphids on apple tree. Europe. 2008.	SRF. FR	FR08C1C062CR02C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	SOLEVI. FR	4-Dec-2008	Efficacy of XDE-208 on aphids on apple tree. Europe. 2008.	SOLEVI. FR	FR08C1C062CR03C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	SRF. FR	10-Dec-2008	Efficacy of XDE-208 on aphids on apple tree. Europe. 2008.	SRF. FR	FR08C1C062CR05C	Y	N	Y	Dow agrosciences

IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	15-Dec-2008	Efficacy of XDE-208 on aphids on apple tree. Europe. 2008.	Dow Agrosciences	FR08C1C062JG04	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	ELANCO HELLAS SACI. GR	24-Sep-2008	Efficacy of gf-2032 against aphis spp. On pome fruits.	ELANCO HELLAS SACI. GR	GR08C1C061CM02C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	8-Jul-2008	Efficacy of gf-2032 against aphis spp. On pome fruits.	Dow Agrosciences	GR08C1C061VA01	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	8-Jul-2008	Efficacy of gf-2032 against aphis spp. On pome fruits.	Dow Agrosciences	GR08C1C061VA02	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	A.S.T.R.A. S.r.l.	20-Oct-2008	Efficacy and selectivity of xde-208 against aphids (aphis pomi/dysaphis plantaginea) in pome fruits	A.S.T.R.A. S.r.l.	IT08C1C098ET01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	AGRI 2000. IT	23-Oct-2008	Efficacy and selectivity of xde-208 against aphids in pome fruits	AGRI 2000. IT	IT08C1C098ET02C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	8-Jan-2009	What is the efficacy and selectivity of XDE-208 (GF-2032) on dysaphis plantaginea or aphis pomi in apple trees in Spain?	Dow Agrosciences	ES08C1C008IG02	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	METODOS SERVICIOS AGRICOLA S.A.	5-Oct-2009	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphis pomi or dysaphis plantaginacea in pear trees in Spain?	METODOS SERVICIOS AGRICOLA S.A.	ES08C1C009MT02C	Y	N	Y	Dow agrosciences
IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	8-Jun-2009	What is the efficacy and selectivity of different sulfoxaflor analogs against dysaphis plantaginea or aphis pomi in apple trees?	Dow Agrosciences	ES09X03005IG01	Y	N	Y	Dow agrosciences
IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	13-Jul-2009	What is the efficacy and selectivity of different sulfoxaflor analogs against dysaphis plantaginea or aphis pomi in apple trees?	Dow Agrosciences	ES09X03005IG02	Y	N	Y	Dow agrosciences
IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	7-Dec-2009	What is the efficacy and selectivity of different sulfoxaflor analogs against dysaphis plantaginea or aphis pomi in apple trees?	Dow Agrosciences	FR09X03005CR01	Y	N	Y	Dow agrosciences

IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	15-Dec-2009	What is the efficacy and selectivity of different sulfoxaflor analogs against dysaphis plantaginea or aphis pomi in apple trees?	Dow Agrosciences	FR09X03005JG02	Y	N	Y	Dow agrosciences
IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	6-Nov-2009	Efficacy and selectivity of sulfoxaflor analogues against aphids (aphis pomi/dysaphis plantaginea) in pome fruits	Dow Agrosciences	IT09X03005VB01	Y	N	Y	Dow agrosciences
IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	6-Nov-2009	Efficacy and selectivity of sulfoxaflor analogues against aphids (aphis pomi/dysaphis plantaginea) in pome fruits	Dow Agrosciences	IT09X03005VB02	Y	N	Y	Dow agrosciences
IIIA 6.1.3.9 IIIA 6.2.1	AGROFILE	21-Jul-2009	What is the efficacy and selectivity of XDE-208 (GF-2032) on dysaphis plantaginea or aphis pomi in apple trees?	AGROFILE	PT08C1C008MT01C	Y	N	Y	Dow agrosciences
IIIA 6.1.3.9 IIIA 6.2.1	AGROFILE	21-Jul-2009	What is the efficacy and selectivity of XDE-208 (GF-2032) on dysaphis plantaginea or aphis pomi in apple trees in Spain?	AGROFILE	PT08C1C008MT02C	Y	N	Y	Dow agrosciences
IIIA 6.1.3.9 IIIA 6.2.1	A.S.T.R.A. S.r.l.	26-Nov-2010	Efficacy of sulfoxaflor + adjuvants against aphids in pome fruits	A.S.T.R.A. S.r.l.	IT10C1C050ET01C	Y	N	Y	Dow agrosciences
IIIA 6.1.3.9 IIIA 6.2.1	FITOEXPERT	17-Nov-2011	What is the rate of sulfoxaflor (GF-2626) needed to control dysaphis plantaginea or aphis pomi in apple trees in Spain?	FITOEXPERT	ES11C1C001MT01C	Y	N	Y	Dow agrosciences
IIIA 6.1.3.9 IIIA 6.2.1	FITOEXPERT	17-Nov-2011	What is the rate of sulfoxaflor (GF-2626) needed to control dysaphis plantaginea or aphis pomi in apple trees in Spain?	FITOEXPERT	ES11C1C001MT02C	Y	N	Y	Dow agrosciences
IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	23-Nov-2011	What is the rate of sulfoxaflor (GF-2626) needed to control dysaphis plantaginea or aphis pomi in apple trees in Spain?	Dow Agrosciences	ES11C1C001RF03	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	SRF. FR	25-May-2011	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	SRF. FR	FR11C1C001CR01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	SRF. FR	2011	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	SRF. FR	FR11C1C001CR02C	Y	N	Y	Dow agrosciences

IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	PRESTAGRO. FR	11-May-2011	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	PRESTAGRO. FR	FR11C1C001CR03C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	2011	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	Dow Agrosciences	FR11C1C001CR04	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	28-Oct-2011	What is the efficacy and selectivity of different sulfoxaflor analogs against dysaphis plantaginea or aphis pomi in apple trees?	Dow Agrosciences	FR11C1C001JG05	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	ELANCO HELLAS SACI. GR	2011	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	ELANCO HELLAS SACI. GR	GR11C1C001ML01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	ELANCO HELLAS SACI. GR	2011	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	ELANCO HELLAS SACI. GR	GR11C1C001ML02C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	2011	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	Dow Agrosciences	IT11C1C001DC01	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	2011	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	Dow Agrosciences	IT11C1C001DC02	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	AGREA S.R.L.. IT	14-Oct-2011	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	AGREA S.R.L.. IT	IT11C1C001ET01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	A.S.T.R.A. S.r.l.	20-Oct-2011	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	A.S.T.R.A. S.r.l.	IT11C1C001ET02C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	G.Z. S.R.L.. IT	2011	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	G.Z. S.R.L.. IT	IT11C1C001ET03C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	APAS	23-Sep-2011	What is the rate of sulfoxaflor (GF-2626) needed to control dysaphis plantaginea or aphis pomi in apple trees in Spain?	APAS	PT11C1C001MT01C	Y	N	Y	Dow agrosciences

IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	APAS	23-Sep-2011	What is the rate of sulfoxaflor (GF-2626) needed to control dysaphis plantaginea or aphis pomi in apple trees in Spain?	APAS	PT11C1C001MT02C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	AGROFILE	28-Dec-2011	What is the rate of sulfoxaflor (GF-2626) needed to control dysaphis plantaginea or aphis pomi in apple trees in Spain?	AGROFILE	PT11C1C001MT03C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	AGROFILE	28-Dec-2011	What is the rate of sulfoxaflor (GF-2626) needed to control dysaphis	AGROFILE	PT11C1C001MT04C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	FITOEXPERT. SCP	14-Nov-2012	What is the rate of sulfoxaflor (GF-2626) needed to control dysaphis plantaginea or aphis pomi in apple trees?	FITOEXPERT. SCP	ES12C1C001MT01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	5-Dec-2012	Effectiveness of sulfoxaflor (GF-2626) for Dysaphis plantaginea (aphis pomi) in apple trees. Spain. 2012.	Dow Agrosciences	ES12C1C001RF01	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	7-May-2012	What is the rate of sulfoxaflor (gf-2626) needed to control the most important mealy bug and scale species in pome fruits?	Dow Agrosciences	FR11C1C016CR02	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	10-Jul-2012	Efficacy of dursban fluid (ef-1315) against eriosoma lanigerum (wooly aphid) in apple vs competitors and sulfoxaflor (gf-2626).france.2012.	Dow Agrosciences	FR12A1A006CR01	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	28-Jun-2012	Efficacy of sulfoxaflor (gf-2626) on the most important aphid species in pome fruits. Europe. 2012.	Dow Agrosciences	FR12C1C001CR01	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Eurofins Agroscience Services	30-Nov-2012	Efficacy of sulfoxaflor (gf-2626) on the most important aphid species in	Eurofins Agroscience Services	FR12C1C001CR02C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	ELANCO HELLAS SACI	19-Oct-2012	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	ELANCO HELLAS SACI	GR12C1C001ML01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	ELANCO HELLAS SACI	19-Oct-2012	What is the rate of sulfoxaflor (gf-2626) needed to control the most important aphid species in pome fruits?	ELANCO HELLAS SACI	GR12C1C001ML02C	Y	N	Y	Dow agrosciences

IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	13-Nov-2012	What is the efficacy of sulfoxaflor (gf-2626) against aphids in pome fruits?	Dow Agrosciences	IT12C1C001DC01	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	G.Z. Srl	19-Jan-2013	What is the efficacy of sulfoxaflor (gf-2626) against aphids in pome fruits?	G.Z. Srl	IT12C1C001ET01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	2013	Efficacy of GF-2626 on ERISLA in comparison to IMI and CHP/CHPM in pome fruits. Europe. 2013	Dow Agrosciences	FR13C1C031CR01	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	Dow Agrosciences	2013	Efficacy of GF-2626 on ERISLA in comparison to IMI and CHP/CHPM in pome fruits. Europe. 2013	Dow Agrosciences	IT13C1C031DC01	Y	N	Y	Dow agrosciences
IIIA 6.1.2.8 IIIA 6.1.3.9 IIIA 6.2.1	AGRICULTURA Y ENSAYO S.L.. SP	2013	What is the rate of sulfoxaflor (GF-2626) needed to control San Jose scale in pome fruits?	AGRICULTURA Y ENSAYO S.L.	ES13C1C032MT03C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	AGRI 2000. IT	10/22/2013	Efficacy of GF-2626 on scales (3 rates) in pome fruits (pear). eu.	AGRI 2000. IT	IT13C1C032ET01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	Dow Agrosciences	11/5/2013	Efficacy of GF-2626 on scales (3 rates) in pome fruits (pear). eu.	Dow Agrosciences	IT13C1C032ET02C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	STAPHYT. FR	7/23/2013	Efficacy of GF-2626 on scales (3 rates) in pome fruits (pear). eu.	STAPHYT. FR	FR13C1C032CR01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	Agricultura y Ensayo S.L.	12/3/2012	What is the rate of sulfoxaflor (GF-2626) needed to control San Jose scale in pome fruits?	Agricultura y Ensayo S.L.	PT12C1C002MT01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	AGRI 2000. IT	10/25/2012	What is the efficacy of sulfoxaflor (GF-2626) against scales & mealy bug	AGRI 2000. IT	IT12C1C002ET02C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	AGRI 2000. IT	10/25/2012	What is the efficacy of sulfoxaflor (GF-2626) against scales & mealy bugs in pome fruits?	AGRI 2000. IT	IT12C1C002ET01C	Y	N	Y	Dow agrosciences

IIIA 6.1.2.14 IIIA 6.2.1	Dow Agrosciences	11/18/2012	What is the efficacy of sulfoxaflor (GF-2626) against scales & mealy bugs in pome fruits?	Dow Agrosciences	IT12C1C002DC01	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	ELANCO HELLAS SACI	11/22/2012	What is the rate of sulfoxaflor (GF-2626) needed to control san jose in apples?	ELANCO HELLAS SACI	GR12C1C002ML01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	Agricultura y Ensayo S.L.	7/10/2012	What is the rate of sulfoxaflor (GF-2626) needed to control San Jose scale in pome fruits?	Agricultura y Ensayo S.L.	ES12C1C002MT01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	AGRI 2000. IT	10/21/2011	What is the rate of sulfoxaflor (GF-2626) needed to control the most important mealy bug and scale species in pome fruits?	AGRI 2000. IT	IT11C1C016ET02C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	A.S.T.R.A. S.r.l.	11/3/2011	What is the rate of sulfoxaflor (GF-2626) needed to control the most important mealy bug and scale species in pome fruits?	A.S.T.R.A. S.r.l.	IT11C1C016ET01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	Dow Agrosciences	12/4/2011	What is the rate of sulfoxaflor (GF-2626) needed to control the most important mealy bug and scale species in pome fruits?	Dow Agrosciences	IT11C1C016DC01	Y	N	Y	Dow agrosciences
IIIA 6.1.2.14 IIIA 6.2.1	A.S.T.R.A. S.r.l.	11/26/2010	Efficacy of chlorpyrifos ethyl/methyl + adjuvants against scales in pome fruits	A.S.T.R.A. S.r.l.	IT10A1A002ET01C	Y	N	Y	Dow agrosciences
IIIA 6.1.2.6 IIIA 6.1.3.7 IIIA 6.2.1	Egerton. Sally	05.09.2011	What is the efficacy of sulfoxaflor for the control of aphids in potatoes EU 2012	UNITED KINGDOM	GB11C1C011SE01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7 IIIA 6.2.1	Zotz. Agnes	29.07.2012	What is the efficacy of sulfoxaflor for the control of aphids in potatoes EU 2012	GERMANY	DE12C1C015AZ02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7 IIIA 6.2.1	Richard. Christian	23.11.2012	Efficacy of sulfoxaflor (GF-2626) against aphids in potatoes. Europe. 2012.	FRANCE		Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7 IIIA 6.2.1	Olivier. Francoise	18.10.2012	Efficacy of sulfoxaflor (GF-2626) against aphids in potatoes. Europe. 2012	FRANCE	FR12C1C015FO01	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.6 IIIA 6.1.3.7 IIIA 6.2.1	Lourdet. Yves	04.11. 2008	Efficacy of XDE-208 on aphids in potato crop. Europe. Spring 2008.	FRANCE	FR08C1C069YL02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7	Downey. Stephen	12.01. 2009	What is the comparative efficacy of XR-208 when applied for the control of aphids in potato.UK 2008	UNITED KINGDOM	GB08C1C083SD01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7	Egerton. Sally	25.09. 2008	What is the comparative efficacy of XR-208 when applied for the control of aphids in potato.UK 2008	UNITED KINGDOM	GB08C1C083SE01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7	Egerton. Sally		What is the comparative efficacy of XR-208 when applied for the control of aphids in potato.UK 2008	UNITED KINGDOM	GB08C1C083SE02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7	Zotz. Agnes	11.09. 2008	What is the efficacy of XDE-208 when applied for the control of aphids in potato.Germany 2008	GERMANY	DE08C1C121AZ01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7	Zotz. Agnes	11.09. 2008	What is the efficacy of XDE-208 when applied for the control of aphids in potato.Germany 2008	GERMANY	DE08C1C121AZ02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7	Egerton. Sally	02.12. 2010	What is the comparative efficacy of XR-208 when applied for the control of aphids in potato.UK 2010	UNITED KINGDOM	GB10C1C013SE02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7	Zotz. Agnes	12.12. 2011	What is the efficacy of XDE-208 when applied for the control of aphids in potato.Germany 2011	GERMANY	DE11C1C011AZ01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7	Zotz. Agnes	12.12. 2011	What is the efficacy of sulfoxaflor for the control of aphids in potatoes.EU 2011.	GERMANY	DE11C1C011AZ03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7	Zotz. Agnes	12.08. 2011	What is the efficacy of sulfoxaflor for the control of aphids in potatoes.EU 2011.	GERMANY	DE11C1C011AZ04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.6 IIIA 6.1.3.7	Zotz. Agnes	12.09. 2011	What is the efficacy of sulfoxaflor for the control of aphids in potatoes.EU 2011	GERMANY	DE11C1C011AZ05C	Y	N	Y	Dow AgroSciences

IIIA 6.1.3.7 IIIA 6.2.1	Richard. Christian	18.09. 2008	Efficacy of XDE-208 on aphids in potato crop. Europe. Spring 2008.	FRANCE	FR08C1C069CR05C	Y	N	Y	Dow AgroSciences
IIIA 6.1.3.7 IIIA 6.2.1	Zotz. Agnes	23.45. 2013	Blattlaeuse als Vektoren-Kartoffeln 2012. Efficacy of GF-2626 against Aphids in SOLTU. registration trials. Germany 2012	GERMANY	DE12C1C043AZ01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.3.7 IIIA 6.2.1	Zotz. Agnes	7-May-13	Blattlaeuse als Vektoren-Kartoffeln 2012. Efficacy of GF-2626 against Aphids in SOLTU. registration trials. Germany 2012	GERMANY	DE12C1C043AZ02C	Y	N	Y	Dow AgroSciences
IIIA 6.1	FAO (Food and Agriculture Organisation of the UN);	2.5.20 13	http://faostat.fao.org/site/567/default.aspx#ancor	FAO (Food and Agriculture Organisation of the UN);		N	N	N	
IIIA 6.1	Yvon Robert. J.A.Trefor Woodford. Danièle Griblot Ducray-Bourdin	2000	Some epidemiological approaches to the control of aphid-borne virus diseases in seed potato crops in northern Europe. Virus Research. Volume 71. Issues 1–2. November 2000. Pages 33-47. ISSN 0168-1702. 10.1016/S0168-1702(00)00186-6. (http://www.sciencedirect.com/science/article/pii/S0168170200001866			N	Y	N	
IIIA 6.1	Dr. Wolfdieter Kuerzinger		Blattlausbekaempfung zum Schutz von Kartoffelviren	Kartoffelbau 5/2011 (62. Jg.)		N	Y	N	
IIIA 6.1	Dr. Sabine Fabich	2010	Bekaempfung von Blattlaeusen als Virusüberträger	Kartoffelbau 5/2010 (61. Jg.)		N	Y	N	
IIIA 6.1.2.15	Richard. C.	2012	Efficacy of sulfoxaflor (GF-2626) against scales and mealy bugs in stone fruit. Europe. 2012	Dow AgroSciences S.A.S.. France	FR12C1C004CR01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Torné. M.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control San Jose scale in stone fruits?	Métodos Servicios Agrícolas S.L.. Spain	ES12C1C004MT01C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.15	Torné. M.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control San Jose scale in stone fruits?	Métodos Servicios Agrícolas S.L.. Spain	ES12C1C004MT02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Apostolidis. V.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control San Jose in apples or peaches?	Dow AgroSciences Export S.A.S.. Greece	GR12C1C002VA01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Apostolidis. V.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control San Jose in apples or peaches?	Dow AgroSciences Export S.A.S.. Greece	GR12C1C002VA02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Apostolidis. V.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control the most important mealy bug and scale species in stone fruits?	Dow AgroSciences Export S.A.S.. Greece	GR12C1C004VA02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Apostolidis. V.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control the most important mealy bug and scale species in stone fruits?	Dow AgroSciences Export S.A.S.. Greece	GR12C1C004VA03	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Apostolidis. V.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control the most important mealy bug and scale species in stone fruits?	Dow AgroSciences Export S.A.S.. Greece	GR12C1C004VA04	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Crestani. D.	2012	What is the efficacy of sulfoxaflor (GF-2626) against scales and mealy bugs in stone fruits?	Dow AgroSciences Italia S.r.l.. Italy	ITC1C004DC01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Tescari. E.	2012	What is the efficacy of sulfoxaflor (GF-2626) against scales and mealy bugs in stone fruits?	AGRI 2000. Italy	ITC1C004ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Tescari. E	2012	What is the efficacy of sulfoxaflor (GF-2626) against scales and mealy bugs in stone fruits?	G.Z. S.r.l.. Italy	IT12C1C004ET02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Richard. C.	2013	Efficacy of GF-2626 on scales (3 rates) in stone fruits. EU.	Dow AgroSciences S.A.S.. France	FR13C1C036CR01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Tescari. E.	2013	Efficacy of GF-2626 on scales (3 rates) in stone fruits. EU.	Dow AgroSciences Italia S.r.l.. Italy	IT13C1C036ET01C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.15	Karatolos. N.	2013	What is the rate of sulfoxaflor (GF-2626) needed to control the most important scale species in stone fruits?	Dow AgroSciences Export S.A.S.. Greece	GR13C1C018NGK01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.15	Karatolos. N.	2013	What is the rate of sulfoxaflor (GF-2626) needed to control the most important scale species in stone fruits?	Dow AgroSciences Export S.A.S.. Greece	GR13C1C018NGK02	Y	N	Y	Dow AgroSciences
IIIA 6.1.4.1	E. Bangles	2008	Plant Tolerance of GF-2032 on different pear varieties trial 2008	Proefcentrum Fruitteelt	BE08C1C044HE01C	Y	N	Y	Dow Agrosciences
IIIA 6.1.4.1	E. Bangles	2008	Plant Tolerance of GF-2032 on different apple varieties trial 2008	Proefcentrum Fruitteelt	BE08C1C045HE01C	Y	N	Y	Dow Agrosciences
IIIA 6.1.4.1	M. Seidenglanz	2008	Trial Report of Plant Protection Products	AGRITEC	DAS-08-SUM-I-98	Y	N	Y	Dow Agrosciences
IIIA 6.1.4.1	P. Hornik	2008	Trial Report of Plant Protection Products	ZS Nechanice	DAS-NecI-108-08	Y	N	Y	Dow Agrosciences
IIIA 6.1.4.1	Landwirtschaftliches Technologiezentrum Augustenb	2012	Selectivity of Gf-2626 in apple. Germany 2012	Landwirtschaftliches Technologiezentrum	DE12C1C007AZ01C	Y	N	Y	Dow Agrosciences
IIIA 6.1.4.1	Landwirtschaftliches Technologiezentrum Augustenb	2012	Selectivity of Gf-2626 in apple. Germany 2012	Landwirtschaftliches Technologiezentrum Augustenb	DE12C1C007AZ02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.4.1	SFR	2011	Does sulfoxaflor cause russetting on sensitive apple species?	SFR	FR11C1C003CR01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.4.1	SFR	2011	Does sulfoxaflor cause russetting on sensitive apple species?	SFR	FR11C1C003CR02C	Y	N	Y	Dow AgroSciences

IIIA 6.1.4.1	Ch. Richard	2011	Does sulfoxaflor cause russetting on sensitive apple species?	Dow Agrosciences	FR11C1C003CR03	Y	N	Y	Dow AgroSciences
IIIA 6.1.4.1	J. Grisel	2011	Does sulfoxaflor cause russetting on sensitive apple species?	Dow Agrosciences	FR11C1C003JG04	Y	N	Y	Dow AgroSciences
IIIA 6.1.4.1	C. Milhan	2012	Study of unintentional effects of GF-2626 on the organoleptic quality of processed apples. LAB PART. France 2014	Staphyt	FR12C1C040CR01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.4.1	D. Barnabe	2010	Taint test of sulfoxaflor (GF-2626) on cucurbits fruits(cucumber) cultivated under greenhouse. field and lab phases. Italy 2010.	AGRI 2000 Soc. Coop. -Bologna	IT10C1C047ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.4.1	D. Barnabe	2010	Taint test of sulfoxaflor (GF-2626) on solanaceous fruits (tomato) cultivated under greenhouse. field and lab phases. Italy 2010.	AGRI 2000 Soc. Coop. -Bologna	IT10C1C053ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.4.1	D. Barnabe	2012	Taint test of the afrochemical substance sulfoxaflor (GF-26262) on nectarines	AGRI 2000 Soc. Coop. -Bologna	IT12C1C040ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.4.3	M. Zachwieja	2012	Efficacy of sulfoxaflor (GF-2626) on the most important aphid species in pome fruits. Europe 2012	Uniwerstyte Przyrodniczy Poznan	PL12C1C001AS01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.4.3	M. Zachwieja	2012	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in Stonefruits?	Uniwerstyte Przyrodniczy Poznan	PL12C1C003AS01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Ferrer. Rosa Margarita	2011	What is the rate of sulfoxaflor (GF-2626) needed to control myzus persicae and brachycaudus persicae in peaches in Spain?	Dow AgroSciences Ibérica. S..A.. Spain	ES11C1C004RF04	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Richard. Christian	2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in stone fruit ?	SYNTECH RESEARCH FR S.A.S. FR	FR11C1C004CR02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Richard. Christian	2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in stone fruit ?	DOW AGROSCIENCES. FR	FR11C1C004CR05	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.9 IIIA 6.2.1.9	Grisel. Jacques	2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in stone fruit ?	DOW AGROSCIENCES. NIMES. FR	FR11C1C004JG06	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Crestani. Davide	2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in stone fruit ?	DOW AGROSCIENCES ITALIA S.r.l.. MILANO. IT	IT11C1C004DC01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	González. Ignacio	2008	What is the efficacy of XDE-208 (GF-2032) on *Myzus persicae* and *Brachycaudus persicae* in peaches and nectarines in Spain?	Dow AgroSciences Ibérica. S.A.. Spain	ES08C1C010IG02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	González. Ignacio	2008	What is the efficacy of XDE-208 (GF-2032) on *Myzus persicae* and *Brachycaudus persicae* in peaches and nectarines in Spain?	Dow AgroSciences Ibérica. S..A.. Spain	ES08C1C010IG03	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Torné. María	2014	What is the efficacy and selectivity of Isoclast (GF-2626) on NNI resistant *Myzus persicae* in peaches applied at pre-flowering?	Fitoexpert S.A. Spain	ES14C1C006MT01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Carrasco. Salvador	2014	What is the efficacy and selectivity of Isoclast (GF-2626) on NNI resistant *Myzus persicae* in peaches applied at pre-flowering?	Dow AgroSciences Ibérica. S..A.. Spain	ES14C1C006SC01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Tescari. Enzo	2008	Efficacy and selectivity of XDE-208 against aphids in stone fruit.	Agrea SRL. Italy	IT08C1C101ET02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Tescari. Enzo.	2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in stone fruits?	GZ SrL. Italy	IT11C1C004ET04	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Tescari. Enzo	2014	What is the efficacy and selectivity of Isoclast (GF-2626) on NNI resistant *Myzus persicae* in peaches applied at pre-flowering?	Agri 2000. Italy	IT14C1C006ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Crestani. Davide	2014	What is the efficacy and selectivity of Isoclast (GF-2626) on NNI resistant *Myzus persicae* in peaches applied at pre-flowering?	Dow AgroSciences Italia S.r.l.. Italy	IT14C1C006DC01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Torne. Maria	2013	What is the rate of sulfoxaflor (GF-2626) needed to control NNI resistant *Myzus persicae* in peaches and nectarines?	Fitoexpert SCP. Spain	ES13C1C038MT02C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.9 IIIA 6.2.1.9	Torne. Maria	2013	What is the rate of sulfoxaflor (GF-2626) needed to control NNI resistant *Myzus persicae* in peaches and nectarines?	Fitoexpert SCP. Spain	ES13C1C038MT05C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Ferrer. Rosa M.	2013	What is the rate of sulfoxaflor (GF-2626) needed to control NNI resistant *Myzus persicae* in peaches and nectarines?	Dow AgroSciences. Spain	ES13C1C038RF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Torne. Maria	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on *Myzus persicae* and *Brachycaudus persicae* in peaches and nectarines in Portugal?	Dow AgroSciences. Portugal	PT08C1C010MT01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Torne. Maria	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on *Myzus persicae* and *Brachycaudus persicae* in peaches and nectarines in Portugal?	Agrofile. Portugal	PT08C1C010MT02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Richard. Christian	2008	Efficacy of XDE-208 on aphids on peach trees. Europe. 2008.	Solevi. France	FR08C1C067CR02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Richard. Christian	2008	Efficacy of XDE-208 on aphids on peach trees. Europe. 2008.	Syntech Research FR S.A.S. France	FR08C1C067CR04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Richard. Christian	2013	What is the rate of sulfoxaflor (GF-2626) needed to control NNI resistant *Myzus persicae* in peaches and nectarines?	Eurofins AgroScience Services SAL. France	FR13C1C038CR01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Tescari. Enzo	2008	Efficacy of XDE-208 against aphids in stone fruits.	Agri 2000. Italy	IT08C1C101ET03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Tescari.Enzo	2013	What is the rate of sulfoxaflor (GF-2626) needed to control NNI resistant *Myzus persicae* in peaches and nectarines?	Dow AgroSciences Italia S.r.l.. Italy	IT13C1C038ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Fenio.Antonino	2014	What is the efficacy and selectivity of Isoclast (GF-2626) on NNI resistant Myzus persicae in peaches in curative applications post-flowering?	Dow AgroSciences Italia S.r.l.. Italy	IT14C1C007DC01	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.9 IIIA 6.2.1.9	Tescari.Enzo	2014	What is the efficacy and selectivity of Isoclast (GF-2626) on NNI resistant Myzus persicae in peaches in curative applications post-flowering?	Agri 2000. Italy	IT14C1C007ET01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Apostolidis. Vasilis	2008	Efficacy of GF-2032 against *Myzus persicae* on stone fruits.	Dow AgroSciences. France	GR08C1C059VA02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Richard. Christian	2008	Efficacy of XDE-208 on aphids on peach tree. Europe. 2008.	Solevi. France	FR08C1C067CR05C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Richard. Christian	2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in stone fruits?	Prestagro. France	FR11C1C004CR04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Tescari. Enzo	2011	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in stone fruits.?	Agri 2000. Italy	IT11C1C004ET05C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Clemente. Borja	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphid populatioms in plums. peachs and cherries?	Dow AgroSciences. Spain	ES08C1C011BC02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Clemente. Borja	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphid populatioms in plums. peachs and cherries?	Dow AgroSciences. Spain	ES08C1C011BC03	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Torne. María	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphid populatioms in plums. peachs and cherries?	FitoExpert. Spain	ES08C1C011MT01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Torne. María	2008	What is the efficacy and selectivity of XDE-208 (GF-2032) on aphid populatioms in plums. peachs and cherries?	FitoExpert. Spain	ES08C1C011MT02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Kerfal. Samir	2012	What is the rate of sulfoxaflor (GF-2626) needed to control *Myzus persicae* and *Brachycaudus persicae* in peaches in Spain?	Dow AgroSciences. Spain	ES11C1C004SK03	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Ferrer. Rosa M.	2011	What is the rate of sulfoxaflor (GF-2626) needed to control *Myzus cerasi* in cherries in Spain?	Dow AgroSciences. Spain	ES11C1C037RF02	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.9 IIIA 6.2.1.9	Ferrer. Rosa M.	2011	Efficacy of GF-2626 on cherry and plum aphids.	Dow AgroSciences. Spain	ES13C1C035RF01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9 IIIA 6.2.1.9	Richard. Christian	2013	Efficacy of GF-2626 on scales (3 rates) on early aphids in stone fruits. EU.	Syntech Research FR SAS. France	FR13C1C035CR01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9	Zotz. Agnes	2013	Efficacy of GF-2626 (3 rates)on early aphids in stone fruits.EU..	ATC-Agro Trial Center Gerhaus GmbH.	DE13C1C035AZ01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9	Perenyi. Jozsef	2013	Efficacy of GF-2626 (3 rates)on early aphids in stone fruits.EU	Dow AgroSciences Development Station. HU	HU13C1C035JP01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.9	Perenyi. Jozsef	2014	Efficacy and selectivity of GF-2626 on aphids in stone fruit - Eurpoe - 2014	JNSZ Megyei KH NTI	HU14C1C016JP01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	Kavardinas. Nick	2007	Greece : Efficacy of X11422208 against APHIFA in vegetable	Dow AgroSciences Export S.A.S.	GR07C1C005NK01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	Kavardinas. Nick	2007	Greece : Efficacy of X11422208 against APHIFA in vegetable	Dow AgroSciences Export S.A.S.	GR07C1C005NK02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	Apostolidis. Vasilis	2008	Greece : Efficacy of X11422208 against APHIFA in vegetable	Dow AgroSciences Export S.A.S.	GR08C1C056VA01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	Charlot. Yvon	2008	Efficacy of XDE-208 on aphids in Vicia faba. Europe. Spring 2008.	Dow AgroSciences	FR08C1C069YC03	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	Kavardinas. Nick	2007	Greece : Efficacy of X11422208 against APHIFA in vegetable	Dow AgroSciences Export S.A.S.	GR07C1C005NK01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	SynTech Research. France	2008	Efficacy of XDE-208 on aphids in field peas. Europe. Spring 2008.	SynTech Research. France	FR08C1C068CR03C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.2 IIIA 6.2.1.8	SynTech Research. France	2008	Efficacy of XDE-208 on aphids in field peas. Europe. Spring 2008.	SynTech Research. France	FR08C1C068CR04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	Olivier. Francoise	2008	Efficacy of XDE-208 on aphids in field peas. Europe. Spring 2008.	Dow AgroSciences S.A.	FR08C1C068FO01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	Touzet. Francis	2008	Efficacy of XDE-208 on aphids in field peas. Europe. Spring 2008.	Dow AgroSciences S.A.	FR08C1C068FT02	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	Sikora. Karel	2008	What is the rate of sulfoxaflor (GF-2032) needed to control aphids in legumes?	Zkusebni stanice Nechanice s.r.o.	CZ08C1C130KS01C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	Agritec Research. Breeding and Services Ltd	2008	What is the rate of sulfoxaflor (GF-2032) needed to control aphids inlegumes?	Agritec Research. Breeding and Services Ltd	CZ08C1C130KS02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	Vyzkumny ustav picninarsky. spol. S r.o.	2008	What is the rate of sulfoxaflor (GF-2032) needed to control aphids in legumes?	Vyzkumny ustav picninarsky. spol. S r.o.	CZ08C1C130KS03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2	Perényi. József	2012	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in legumes?	Dow AgroSciences Hungary Kft.	HU12C1C016JP01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2	Governmental Office. JNSZ	2012	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in legumes?	Governmental Office. JNSZ	HU12C1C016JP03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2	BioTek Agriculture Hungary Ltd.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in legumes?	BioTek Agriculture Hungary Ltd.	HU12C1C016JP04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.2 IIIA 6.2.1.8	Agricultura Y Ensayo S.L.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in green beans?	Agricultura Y Ensayo S.L.	ES12C1C016MT03C	Y	N	Y	Dow AgroSciences

IIIA 6.1.2.2 IIIA 6.2.1.8	Agricultura Y Ensayo S.L.	2012	What is the rate of sulfoxaflor (GF-2626) needed to control aphids in green beans?	Agricultura Y Ensayo S.L.	ES12C1C016MT04C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.13 IIIA 6.2.1.8	Cavalieri. Guglielmo	2013	What is the selectivity and efficacy of sulfoxaflor against whiteflies in ornamentals?	Fondazione Minoprio	IT13C1C098ET02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.13 IIIA 6.2.1.8	Cavalieri. Guglielmo	2008	Efficacy and selectivity of XDE-208 against whiteflies in ornamentals and flowers	Fondazione Minoprio	IT08C1C115ET01C	Y	Y	Y	Dow AgroSciences
IIIA 6.1.2.13 IIIA 6.2.1.8	Cavalieri. Guglielmo	2008	Efficacy and selectivity of XDE-208 against whiteflies in ornamentals and flowers	Fondazione Minoprio	IT08C1C118ET02C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.13 IIIA 6.2.1.8	Alfarano. Luigi	2012	What is the efficacy of sulfoxaflor (GF-2626) against sap feeding pests in (solanaceous) ornamental crops?	Dow AgroSciences Italy	IT12C1C022LA01	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.13 IIIA 6.2.1.8	Guglielmo Cavalieri	2008	Efficacy and selectivity of XDE-208 against aphids in ornamentals and flowers	Fondazione Minoprio	IT08C1C109ET01C	Y	Y	Y	Dow AgroSciences
IIIA 6.1.2.13 IIIA 6.2.1.8	Alfarano. Luigi	2011	Efficacy and selectivity of sulfoxaflor for the control of aphids in ornamentals	Dow AgroSciences Italy	IT11C1C007ET03C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.13 IIIA 6.2.1.8	Cavalieri. Guglielmo	2011	Efficacy and selectivity of sulfoxaflor for the control of aphids in ornamentals	Fondazione Minoprio	IT11C1C007ET05C	Y	N	Y	Dow AgroSciences
IIIA 6.1.2.13 IIIA 6.2.1.8	Cavalieri. Guglielmo	2012	What is the efficacy of sulfoxaflor (GF-2626) against aphids in ornamentals	Fondazione Minoprio	IT12C1C013ET01C	Y	N	Y	Dow AgroSciences

List of data submitted in support of the evaluation

ZRMS relied on all provided studies.

IIIA 6.1.28 APPENDIX 2: GAP TABLE(S) CHECKED BY ZRMS

GF-2626 South Zone Field uses

GAP rev. 02.
date: 2014-Nov-28

PPP (product name/code)	**GF-2626**	**Formulation type:**	**SC**
active substance 1	**sulfoxaflor**	**Conc. of as 1:**	**120 g/L**
safener NA		**Conc. of safener:**	**NA**
synergist NA		**Conc. of synergist:**	**NA**
Applicant:	**Dow AgoSciences**	**professional use**	**Y**
Zone(s): Southern		**non professional use**	**N**

Verified by zRMS France: yes in july 2017

1	2	3	4	5	6	7	8	10	11	12	13	14
					Application			**Application rate**				
Use-No.	**Member state(s)**	**Crop and/ or situation** (crop destination / purpose of crop)	**F G or I**	**Pests or Group of pests controlled** (additionally: developmental stages of the pest or pest group)	Method / Kind	Timing / Growth stage of crop & season	Max. number (min. interval between applications) a) per use b) per crop/ season	kg. L product / ha a) max. rate per appl. b) max. total rate per crop/season	g. as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min / max	**PHI** (days)	**Remarks:** e.g. safener/synergist per ha e.g. recommended or mandatory tank mixtures
1a	South (FR. IT. PT. ES. BG. EL. HR)	Apples	F	Aphid: *Eriosoma lanigerum* (all stages) ~~Scales (all stages)~~	Ground applied foliar spray. broadcast	BBCH 51-85 Feb-Sep	a) 1 b) 1	a) 0.4 b) 0.4	a) 48 b) 48	300-1500	7	Aphids: Two applications of 24 g a.s./ha would be a minimum 7 days interval. If higher rate than 24 g a.s./ha is applied, only one application is possible in a year either pre or post flowering. No spray is allowed during the flowering. For *Eriosoma lanigerum* (ERISLA), to achieve good efficacy results, the product should be applied as a preventive treatment.
1b	South (FR. IT. PT. ES. BG. EL. HR)	Apples	F	Other aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 51-85 Feb-Sep	a) ~~1~~ 2 b) 2 (7days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	300-1500	7	
1c	South (FR. IT. PT. ES. BG. EL. HR)	Apples	F	Scales (all stages)	Ground applied foliar spray. broadcast	BBCH 51-85 Feb-Sep	a) 1 b) 1	a) 0.4 b) 0.4	a) 48 b) 48	300-1500	7	
2a	South (FR. BG. EL. HR. CY. MA. IT. ES.	Aubergines	F	Aphids (all stages) ~~Whiteflies (all stages)~~	Ground applied foliar spray. broadcast	BBCH 20-87 Apr-Nov	a) ~~1~~ 2 b) 2 (7days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	500 - 1500	1	Aphids: One or two applications of 24 g a.s./ha. Two applications would be minimum 7 days interval.

	PT)											
2b	South (FR. BG. EL. HR. CY. MA. IT. ES. PT)	Aubergines	F	Whiteflies (all stages	Ground applied foliar spray. broadcast	BBCH 20-87 Apr-Nov	a) 1 b) 1 or a) ~~1~~ 2 b) 2 (7 days min. interval)	a) 0.4 b) 0.4 or a) 0.2 b) 0.4	a) 48 b) 48 or a) 24 b) 48	500 - 1500	1	Whiteflies: Either two applications of 24 g a.s./ha with a minimum 7 days interval or only one application of 48 g a.s./ha.
3	South (FR. ES. PT. BG. EL. IT)	Beans (fresh. without pods). beans (fresh. with pods)	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 40-85 Apr-Jul	a) ~~1~~ 2 b) 2 (21 days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	150 - 1000	14	Two applications would be minimum 21 days interval.
4	South (IT. ES. BG. EL. FR)	Brassicas [Brocolli. Cabbage. Cauliflower. Brussels sprouts. Leafy brassicas (Chinese cabbage. Kale. others)]	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 20-49 Apr-Sep	a) 1 b) 1	a) 0.2 b) 0.2	a) 24 b) 24	200 - 1000	7	
5a	South (IT. BG. EL. ES. PT)	Ornamentals (Flowers and roses, bulbs, trees and shrubs, outdoor and indoor plants)*	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 12-59 All year	a) ~~1~~ 2 b) 2 (7days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	200 - 2000	Ground applied foliar spray. broadcast	Aphids: One or two applications of 24 g a.s./ha. Two applications would be minimum 7 days interval. *for France, outdoor and indoor ornamentals plants are not considered as professional use.
5b	South (IT. BG. EL. ES. PT)	Bulbs. Ornamentals. Flowers	F	Whiteflies (all stages	Ground applied foliar spray. broadcast	BBCH 12-59 All year	a) 1 b) 1 or a) ~~1~~ 2 b) 2 (7 days min. interval)	a) 0.4 b) 0.4 or a) 0.2 b) 0.4	a) 48 b) 48 or a) 24 b) 48	200 - 2000	1	Whiteflies: Either two applications of 24 g a.s./ha with a minimum 7 days interval or only one application of 48 g a.s./ha.
6a	South (FR. IT. ES. PT. BG. EL)	Cucurbits (edible peel – cucumbers, zucchini, ~~courgettes~~, gherkins; inedible peel –	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 20-87 Apr-Nov	a) ~~1~~ 2 b) 2 (7days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	500 - 1500	1	Aphids: One or two applications of 24 g a.s./ha. Two applications would be minimum 7 days interval.

		melons. pumpkins/ squash. watermelons. ~~zuccini~~)										
6b	South (FR. IT. ES. PT. BG. EL)	Cucurbits (edible peel – cucumbers. ~~courgettes.~~ zucchini gherkins; inedible peel – melons. pumpkins/ squash. watermelons. ~~zuccini~~)	F	Whiteflies (all stages	Ground applied foliar spray. broadcast	BBCH 20-87 Apr-Nov	a) 1 b) 1 or a) ~~1~~ 2 b) 2 (7 days min. interval)	a) 0.4 b) 0.4 or a) 0.2 b) 0.4	a) 48 b) 48 or a) 24 b) 48	500 - 1500	1	Whiteflies: Either two applications of 24 g a.s./ha with a minimum 7 days interval or only one application of 48 g a.s./ha.
7a	South (ES. IT. PT. FR. EL)	Grapefruit	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 30-85 Mar-Oct	a) ~~1~~ 2 b) 2 (7days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	500 - 2500	7	Aphids: Two applications of 24 g a.s./ha would be minimum 7 days interval. If higher rate than 24 g a.s./ha is applied,only one application is possible in a year.
7b	South (ES. IT. PT. FR. EL)	Grapefruit	F	Scales including mealybugs (all stages)	Ground applied foliar spray. broadcast	BBCH 30-85 Mar-Oct	a) 1 b) 1	a) 0.4 b) 0.4	a) 48 b) 48	500 - 2500	7	
8	South (ES. IT. FR. BG. EL)	Leaf vegetables (Lettuce and other salad plants including Brassicacea. spinach and similar (leaves). herbs)	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 20-49 Apr-Sep	a) 1 b) 1	a) 0.2 b) 0.2	a) 24 b) 24	200-1000	7	
9a	South (ES. IT. FR. PT. EL)	Lemons	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 30-85 Mar-Oct	a) ~~1~~ 2 b) 2 (7days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	500 - 2500	7	Aphids: Two applications of 24 g a.s./ha would be minimum 7 days interval. If higher rate than 24 g a.s./ha is applied,only one application is possible in a year.

9b	South (ES. IT. FR. PT. EL)	Lemons	F	Scales including mealybugs (all stages)	Ground applied foliar spray. broadcast	BBCH 30-85 Mar-Oct	a) 1 b) 1	a) 0.4 b) 0.4	a) 48 b) 48	500 - 2500	7	
10a	South (ES. IT. FR. PT. EL)	Mandarins	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 30-85 Mar-Oct	a) ~~1~~ 2 b) 2 (7days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	500 - 2500	7	Aphids: Two applications of 24 g a.s./ha would be minimum 7 days interval. If higher rate than 24 g a.s./ha is applied,only one application is possible in a year.
10b	South (ES. IT. FR. PT. EL)	Mandarins	F	Scales including mealybugs (all stages)	Ground applied foliar spray. broadcast	BBCH 30-85 Mar-Oct	a) 1 b) 1	a) 0.4 b) 0.4	a) 48 b) 48	500 - 2500	7	
11a	South (ES. IT. FR. PT. EL)	Oranges	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 30-85 Mar-Oct	a) ~~1~~ 2 b) 2 (7days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	500 - 2500	7	Aphids: Two applications of 24 g a.s./ha would be minimum 7 days interval. If higher rate than 24 g a.s./ha is applied,only one application is possible in a year.
11b	South (ES. IT. FR. PT. EL)	Oranges	F	Scales including mealybugs (all stages)	Ground applied foliar spray. broadcast	BBCH 30-85 Mar-Oct	a) 1 b) 1	a) 0.4 b) 0.4	a) 48 b) 48	500 - 2500	7	
12a	South (ES. IT. FR. PT. GR. CY. BG. EL. HR)	Peaches and Nectarines	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 51-85 Feb-Sep	a) ~~1~~ 2 b) 2 (7days min. interval between applications) or a) 1 b) 1	a) 0.2 b) 0.4 or a) 0.3 b) 0.4	a) 24 b) 48 or a) 36 b) 48	300-1500	7	Aphids: Two applications of 24 g a.s./ha would be minimum 7 days interval. If higher rate than 24 g a.s./ha is applied,only one application is possible in a year either pre or post flowering. No spray is allowed during the flowering.
12b	South (ES. IT. FR. PT. GR. CY. BG. EL. HR)	Peaches and Nectarines	F	Scales (all stages)	Ground applied foliar spray. broadcast	BBCH 51-85 Feb-Sep	a) 1 b) 1	a) 0.4 b) 0.4	a) 48 b) 48	300-1500	7	
13a	South (ES. IT. FR. PT. BG. EL. HR)	Pears	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 51-85 Feb-Sep	a) ~~1~~ 2 b) 2 (7days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	300-1500	7	Aphids: Two applications of 24 g a.s./ha would be minimum 7 days interval. If higher rate than 24 g a.s./ha is applied,only one application is possible in a year either

												pre or post flowering. No spray is allowed during the flowering.
13b	South (ES. IT. FR. PT. BG. EL. HR)	Pears	F	Scales (all stages)	Ground applied foliar spray. broadcast	BBCH 51-85 Feb-Sep	a) 1 b) 1	a) 0.4 b) 0.4	a) 48 b) 48	300-1500	7	
14	South (BG. EL. IT. ES. PT. FR)	Peas (fresh without pods). peas (fresh with pods)	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 40-85 Apr-Jul	a) ~~1~~ 2 b) 2 (21 days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	150 - 1000	14	Two applications would be minimum 21 days interval
15a	South (BG. EL. CY. MA. IT. ES. PT. FR. HR)	Pepper	F	Aphids (all stages) ~~Whiteflies (all stages)~~	Ground applied foliar spray. broadcast	BBCH 20-87 Apr-Nov	a) ~~1~~ 2 b) 2 (7days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	500 - 1500	1	Aphids: One or two applications of 24 g a.s./ha. Two applications would be minimum 7 days interval.
15b	South (BG. EL. CY. MA. IT. ES. PT. FR. HR)	Pepper	F	Whiteflies (all stages	Ground applied foliar spray. broadcast	BBCH 20-87 Apr-Nov	a) 1 b) 1 or a) ~~1~~ 2 b) 2 (7 days min. interval)	a) 0.4 b) 0.4 or a) 0.2 b) 0.4	a) 48 b) 48 or a) 24 b) 48	500 - 1500	1	Whiteflies: Either two applications of 24 g a.s./ha with a minimum 7 days interval or only one application of 48 g a.s./ha.
16a	South (PT. ES. BG. EL. FR. HR. IT)	Plums and Cherries	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 51-85 Feb-Sep	a) ~~1~~ 2 b) 2 (7days min. interval between applications) or a) 1 b) 1	a) 0.2 b) 0.4 or a) 0.3 b) 0.4	a) 24 b) 48 or a) 36 b) 48	300-1500	7	Aphids: Two applications of 24 g a.s./ha would be minimum 7 days interval. If higher rate than 24 g a.s./ha is applied,only one application is possible in a year either pre or post flowering. No spray is allowed during the flowering.
16b	South (PT. ES. BG. EL. FR. HR. IT)	Plums and Cherries	F	Scales (all stages)	Ground applied foliar spray. broadcast	BBCH 51-85 Feb-Sep	a) 1 b) 1	a) 0.4 b) 0.4	a) 48 b) 48	300-1500	Scales (all stages)	

17	South (BG. EL. IT. ES. PT. FR)	Potatoes	F	Aphids (all stages)	Ground applied foliar spray. broadcast	BBCH 20-95 May-Aug	a) ~~1~~ 2 b) 2 (21 days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	200 - 600	7	Two applications would be minimum 21 days interval.
18a	South (FR. BG. EL. HR. MA. CY. IT. ES. PT)	Tomatoes	F	Aphids (all stages) ~~Whiteflies (all stages)~~	Ground applied foliar spray. broadcast	BBCH 20-87 Apr-Nov	a) ~~1~~ 2 b) 2 (7days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	500 - 1500	1	Aphids: One or two applications of 24 g a.s./ha. Two applications would be minimum 7 days interval.
18b	South (FR. BG. EL. HR. MA. CY. IT. ES. PT)	Tomatoes	F	Whiteflies (all stages	Ground applied foliar spray. broadcast	BBCH 20-87 Apr-Nov	a) 1 b) 1 or a) ~~1~~ 2 b) 2 (7 days min. interval)	a) 0.4 b) 0.4 or a) 0.2 b) 0.4	a) 48 b) 48 or a) 24 b) 48	500 - 1500	1	Whiteflies: Either two applications of 24 g a.s./ha with a minimum 7 days interval or only one application of 48 g a.s./ha.
19	FR	Protein seeds (beans, lentils, lupines, peas)	F	Aphids (all stages).	Ground applied foliar spray. broadcast	BBCH 40-85	a) 2 b) 2 (21 days min. interval between applications)	a) 0.2 b) 0.4	a) 24 b) 48	150-1000	14	**Extrapolation from leguminous crops (peas and beans)**