



18 November 2011

Environmental Protection Authority
PO Box 131
Wellington 6140

Submission on Application ERMA200886

1.0 Submission Summary

This submission is made for and on behalf of the National Beekeepers Association of New Zealand.

This submission is not in favour of the importation and release of GF-2032 due to the lack of data presented in the submission that may affect the safety and health of bees.

We believe that the applicant needs to supply more data in the application with supporting information that this product is safe to beneficial pollinators especially the honey bee.

Our concerns are with what information the applicant does not present in this application (publicly available documents) may present adverse risks to bees and other beneficial pollinators.

2.0 Application ERMA200886

This application is for a new substance GF-2032, which has an intended use as an insecticide. The applicant is Dow Agro-Sciences (NZ) Limited.

GF-2032 contains a new active ingredient Sulfoxaflor and is formulated as a liquid suspension concentrate.

The active ingredient triggers the carcinogenic, target organ/systemic and reproductive/development hazard classes of the HSNO Act classification.

But the formulated product shows low toxicity when using the six pack of tests.

With respect to this submission supporting beneficial pollinators such as the honey bee and bumble bee this product shows a high level of toxicity.

Reference Table 3.3.2.5 of the application where the $LD_{50} = 0.0515 \times 10^{-6}$ grams active ingredient per bee for the formulated product.

The applicant identifies that the product triggers the following Hazard Classes; 6.1D, 6.1C, 6.3B ,6.7B, 6.8B ,6.9B, 9.3B, 9.4A

3.0 The Use of GF-2032 and its mode of action

The application ERMA200886 is very deficient on how GF-2032 is intended to be used and the mode of action of the active ingredient.

According to Paragraph 5 of Section 3.5 of the application it will be used by farmers as a liquid insecticide sprayed directly to bare ground (soil) prior to sowing the crops.



This suggests (although not stated) that GF-2032 is a soil residual type insecticide that lies in the soil and provides insect protection during the germination and early growth stages of the crop from seed to plant. We note that there is no mention of using the product as a seed treatment.

It should be noted that we had to identify four sections of the application to determine where and what crops this product will be used on. See Table 1.

Table 1 – Crops where GF-2032 will be used.

	Application Section	Crops Mentioned
1	Paragraph 5, Section 3.5, page 10	Bare soil application, pre planting of crop seed
2	Section 4.1.3, Page 16	Cereals, Fruit and vegetables
3	Section 4.2.2, Page 19	Orchards, vine crops, fodder brassicas, pastures,
4	Section 7.4, Page 25	Greenhouse crops

Table 1; shows that the applicant intends to use this product over a large range of various crops in New Zealand which includes many flowering species. We note that there is no reference to using this product or the active ingredient XDE-208 as a seed treatment, but do accept this may be subject to another EPA application.

According to the application Section 4.1.1, Lifecycle Risks, the product will be applied by ground spray and aerial spray.

Section 4.1.3 details the identified benefits of using GF-2032, and points out that the product will be used for aphid control in cereal crops and control of sucking insects in fruits and vegetables. It should be noted that the applicant does not provide a full summary of insects controlled until Section 7.4 of the application.

The identity of the GF-2032 being effective against sucking insects suggests strongly that this product is systemic within the plant, and that sucking insects can access it whilst the chemical or its metabolites flow through the xylem or phloem. It would be expected that the active ingredient or its metabolites will travel through the phloem (up the plant) if GF-2032 is soil applied.



If soil applied it can be expected that the product is quite persistent in the soil with a long half-life and is mobile in the soil, to enable it to be absorbed by the plant roots.

There is no mention of how long the active ingredient works when it or its metabolites are in the plant, and for a Class 9.4A substance we believe this is very important. See Section 8 (2) of this submission.

There is no mention of whether the active ingredient or its metabolites are present in pollen or nectar of plants sprayed with GF-2032.

I believe that for the EPA and the public to properly assess a new pesticide a discussion on the mode of action of the chemical, how it works and the residues it may leave in the plant, pollen and nectar need to be included.

This is a serious omission of the present ER-AH-01-1 07/2001 form supplied by the EPA for pesticides.

It is noted that in the Executive Summary of the application that a claim that this product controls, dimpling bug, *Campylomma austrina Malipatil*, a known pest of Northern Australia, especially of mangos. Landcare Research has no record of *Campylomma austrina Malipatil* being present in New Zealand.

One has to ask the EPA if Dow Agro Sciences has written this application to mislead or are just plainly incompetent in putting together a coherent application.

4.0 Disposal of GF-2032

The application is conflicting when it discusses disposal of this product.

4.1 In Section 3.5 of the application, spray equipment rinsing should be disposed of in a designated disposal area or on waste land, and to avoid desirable plants which are not described.

4.2 In Section 4.2.1 of the application, disposal is mentioned to “only occur at a local authority landfill...” and diluted substance including spray equipment rinsing at the site of application. There is no mention or definition of desirable plants.

4.3 In Section 4.2.2 of the application, there is no mention of a licensed landfill, waste land and only a mention of the site of application for diluted substances to be applied to non-grazed land.

4.4 In Section 7.4 of the executive summary, none of the above disposal methods are mentioned, but any landfill will be okay.

We would like to point out to the EPA that not having a draft label makes commenting on this application very difficult.

Our recommendation to the EPA is that the draft label recommendations should be included with all pesticide application documents open to public scrutiny.



5.0 Soil activity of GF-2032

There is some concern that the applicant Dow Agro Sciences Limited has made some conflicting statements with respect to the activity of GF-2032 in the soil which we believe should be made clearer. Clearly the product is to be applied directly to the soil (ref Table 1 of the this submission), and it has some active life in the soil where plants presumably absorb the product and use the active ingredient to control sucking insects – that is clearly stated in various parts of the application, as noted above.

The applicant though states it '**expects**' in Section 4.2.2 that repetitive spraying will not result in soil accumulation of the active ingredient or the formulated product. This is of concern, as it shows that no soil half-life studies have been conducted of the substance, the active ingredient and or the metabolites it forms. The applicant's data does not note any toxicity to a soil dwelling organism.

The applicant does not mention the minimum or maximum number of applications to a crop in a season for an assessment of the likelihood of prolonged soil effects that may carry over to a subsequent crop.

The applicant does not discuss the likelihood of this insecticide being absorbed by flowering plants (ornamentals, wild flowers and food crops) and presenting a risk to pollinating bees.

Example; GF-2032 could be safe to bees if used to control thrips in table onions from sowing of the seed to harvest as harvest is normally just prior to onion flowering. But is GF-2032 safe to use to control aphids in Squash where flowering and pollination occurs well before harvest?

This is of a primary concern to beekeepers where it is noted that (in Table 1 of this submission) the applicant states that the product could be used on pasture but there is no mention of the effects on flowering clover which may have absorbed the product from the soil.

The application presents no discussion on the effects of foliar spraying of the insecticide on growing plants where we believe it is intended for use.

The major concern to beekeepers is that this product is a persistent soil active insecticide with strong systemic activity against sucking insects in the plant.

There is no discussion on the effects that GF-2032 may have on plants before and during flowering, the residues in pollen and nectar and the likely effects on bees from the active ingredient or its metabolites at sub lethal doses.

New Zealand Beekeepers need more data on this substance to determine its safety on crops and their hardworking bees.

6.0 What we have learnt from the application

Based on the above data in the application we can identify the following properties of GF-2032, which we note are not referenced in the application document;

- Active in the soil – the applicant suggests direct soil applications prior to planting.
- Has a long soil life – to be effective against sucking insects such as aphids it has to remain in the soil until the plant seed has germinated and grown above the ground surface.



- That its soil activity and perhaps its soil half-life is considerable as the applicant recommends the disposal of the product to waste areas only.
- Can be absorbed by plant roots and become systemic in the plant.
- Can be absorbed by the plant as a foliar spray (ground or aerial) and be effective against sucking insect pests.
- Controls sucking insects such as aphids, thrips and mealy bugs – confirms that the product is systemic in the plant.

7.0 **Toxicity to Honey Bees**

The applicant supplies data on a 48 hour oral acute toxicity to bees and bumble bees in Section 3.3.2.5. The test protocol which was conducted is not referenced.

There is no discussion or data mentioning the impact of the product, its active ingredient or metabolites in the plant or in pollen, and the possible toxicity to bees. Internet research shows that Sulfoxaflor has a mode of action similar to the neonicotinoid insecticides¹ in that it affects the insect's "*nicotinic acetylcholine receptors (nAChRs) using electrophysiological and radioligand binding techniques.*"¹ This is of concern as that suggests it may in fact be very similar to the neonicotinoid insecticides which at sub lethal doses may lead to behaviour modification of insects, especially colony forming insects such as termites, ants and honeybees making them more susceptible to diseases, pathogens, and or pests.

This submission would like to see further testing on the impact this product through its enduses on honeybees before it is released to the environment. Testing of pollen of flowering plants for the active ingredient and its metabolites to eliminate the risk of bees taking the insecticide back to the hive. We also ask the EPA to seek data from the applicant based on the test US EPA 850.3030 – Honey Bee Toxicity of Residues on Foliage. This data is not submitted with this application but we believe that Dow Agro Sciences will be submitting it with their US EPA registration data package.

The applicant has not proposed any controls for the substance or supplied a draft label for review. This is disappointing as we do not know if they propose application of GF-2032 on flowering plants and if there is a proposed withholding period when GF-2032 should not be applied before plant flowering.

Of concern is that the applicant proposes a number of management measures that could be harmful to bees. These include the following;

¹ **Novel nicotinic action of the sulfoximine insecticide sulfoxaflor.** by Gerald B Watson, Michael R Loso, Jonathan M Babcock, James M Hasler, Theodore J Letherer, ...



- a) Disposal of rinsing and washing including the active ingredient on waste areas where flowering plants and weeds could be present and present a direct risk to bees. Reference Section 3.5 of the application.
- b) Soil applications and the soil transfer to plant activity of the product. This we believe is a significant issue with flowering plants before harvest.
- c) Details about the foliar activity of the active ingredient and the length of time it is active as a systemic insecticide.
- d) Testing to show that pollen or nectar is not made toxic to bees due to the systemic activity of the active ingredient and its metabolites.
- e) Proposed use in pasture and the effects of the systemic insecticide in clover. No testing data is shown that this product is safe to pollinating insects.
- f) There is no data to show that there are no residues in pollen or nectar of any flowering plant. There is no draft label advising how Dow Agro Sciences will manage and prevent application to plants during flowering or close to flowering.

7.0 **Recommendations to the NZ EPA**

Our principle recommendation to the NZ EPA is that this product, GF-2032 is not approved for release in the NZ environment for the reasons outlined in this submission and the severe information deficiencies with respect to the safety and health of beneficial pollinating insects such as the honey bee.

It is our submission that there is insufficient data to suggest that this product when in use is not without risk to the well-being of the honey bee in New Zealand.

We request that the NZ EPA ask the applicant for the following details;

- 1) Analysis data on residues of the active ingredient Sulfoxaflor and its metabolites in the pollen and nectar of flowering plants.
- 2) Proposed controls and withholding periods before flowering of treated plants.
At the present moment Hazard Class 9.4 substances cannot be sprayed within 10 days of expected flowering date, as determined by the EPA. Class 9.4 substances should not then be applied until after complete petal fall. We do not know if this 10 day period is safe for bees for the active ingredient or its metabolites, as we do not understand its degradation within the sap of the plant. Is 10 days suitable or should this no spray period be longer before flowering so we do request more information on the substance to ensure that flowers are safe for pollination by bees. We request that the NZ EPA examine this 10 day interval for hazard Class 9.4
- 3) substances and determine if it is suitable and safe for bees for this new family of insecticide active ingredients.



- 4) This application does not include a draft label for an assessment of how the applicant will inform users of the product on how to ensure that the product is safely used to protect beneficial insects. We believe the EPA should request this and circulate it with the application.
- 5) Evidence or not of the effect of sub lethal doses on colony forming insect behaviour. The neonicotinoid insecticides have demonstrated this property
- 6) and in fact have utilised it to control some insect pests. We need to know if GF-2032 has similar properties so that its safety to bee hive populations can be determined. The beekeepers Association would like to see a behaviour response test for bees to sub lethal doses to ensure the safety of beneficial insects especially colony forming insects.
- 7) That Dow Agro Sciences be directed (as a control) by the NZ EPA to permit access to their Sulfoxaflor residue analysis technology (at approved laboratories) for NZ Beekeepers and Bee Researchers to research and assess residues in pollen and nectar.
- The NZ EPA should note that many agrichemical manufacturers already permit growers to use their residue analysis technology/methodology to measure pesticide residues in their fruits and vegetables to protect the consuming public. To date there has been restrictions placed by agrichemical companies on access to residue analysis methodologies for research into pesticide residues in pollen and nectar (both foods) where bee keepers have believed that pesticides have adversely affected their hives. This has prevented the effective enforcement of the HSNO Act, the monitoring of growers spraying activity and the effective management of hive health when used for pollination of crops. The reason is that the actual evidence of the specific pesticide involved in bee poisoning cannot be obtained.
- The National Beekeepers Association strongly believes that the NZ EPA can put in place such a control as permitted under either Section 77 (3) (c) of the HSNO Act or Section 77A (1) directing Dow Agro Sciences to provide open access to their residue analysis methodology for detecting residues of Sulfoxaflor in pollen and nectar for beekeepers and bee researchers.

Public Hearing of this Application

The National Beekeepers Association requests that their representatives are heard at a public hearing of the Authority when considering this application.

This application has been prepared and edited by
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Member of the Technical Committee of the National Beekeepers Association.