



APICULTURE
NEW ZEALAND

SUBMISSION

TO: Environmental Protection Authority (EPA)

FROM: Apiculture New Zealand Science and Research Focus Group

SUBMISSION ON: Information on three neonicotinoid pesticides: clothianidin, imidacloprid and thiamethoxam, and their use in New Zealand.

DATE: 21 December 2018

CONTACT DETAILS: Apiculture New Zealand
PO Box 25207
Wellington 6146
04 471 6254
Email: ceo@apinz.org.nz

Introduction

Apiculture New Zealand (ApiNZ) is the largest organisation representing beekeepers and others in the apicultural industry in New Zealand. New Zealand's beekeepers now own and manage the largest number of hives in our country's relatively short beekeeping history.

The largest threats to this increasing bee population is Varroa and other biosecurity risks, disease, wasps and pesticides.

The neonicotinoid chemistry and its known toxicity to bees has been of prime interest to ApiNZ and before that The National Beekeepers Association. The ApiNZ Science and Research Focus Group has followed overseas experience and research with close interest.

This submission will deal with each of the EPA's Information Requests in order:

1. Manufacture and import volumes

ApiNZ cannot offer any data on the amount of formulated product or imported volumes of the three neonicotinoids. We are somewhat surprised to realise that the EPA has to seek this information from the chemical companies and others. This clearly means that there is no data in New Zealand on how much pesticide is manufactured, imported and used in New Zealand.

We are aware that there were plans under the HSNO Act to link the EPA with the New Zealand Customs' databases so they could get actual data on what hazardous substances, including which pesticides and total volumes are imported into New Zealand.

The EPA uses a data-driven hazardous risk assessment model when looking at pesticide approvals and reassessments. Without import, manufacturing and end-use data this process will forever be flawed as it cannot be updated with actual data.

ApiNZ supports the EPA in seeking and collating pesticide import, manufacturing and end-use data so that all citizens know what is being used in our environment in real time.

2. Use and application information

ApiNZ cannot offer the EPA data any specific information on the use and application of the three neonicotinoids. From our own observations clothianidin, imidacloprid and thiamethoxam have widely been used on cultivated crops and pasture seeds as seed coatings.

Imidacloprid has had probably the widest spread of end uses, from application to kiwifruit, pip fruit and vegetable crops as a broadcast spray and as an insecticide for animals. Imidacloprid has also been spread to the remotest hill country areas when used on sheep to control flystrike and then been washed off the wool by rainfall. Imidacloprid is perhaps the most persistent product in the environment and it has been spread the furthest in our environment.

3. Environmental exposure mitigation measures

3.1 The predecessor to the EPA, ERMA set Environmental Exposure Limits (EELs) for clothianidin, imidacloprid and thiamethoxam. These were set for a number of products but the limit was the measure of active ingredient. Table 1 outlines the EPA summary dated 17/4/2015.

Table 1

Active Ingredient	Environmental Medium	EEL
Clothianidin	Water	0.53 µg/L
Clothianidin	Soil	0.01 mg/kg
Imidacloprid	Soil Sediment	1 µg/kg dry weight soil
Imidacloprid	Water	0.000038 mg /L
Imidacloprid	Sediment	1 µg/kg dry weight Sediment
Thiamethoxam	Freshwater	0.00035 mg/l
Thiamethoxam	Marine	0.069 mg/l

The above table of Environmental Exposure Limits is of particular interest;

- a) The EPA has assessed and set EELs based on an environmental risk assessment but has never provided any data to show that these limits have been tested and are acceptable or should have been reviewed.

Please note the EEL variation between the three chemicals in water from 0.53×10^{-6} mg/l clothianidin; 3.8×10^{-5} mg/l imidacloprid and 3.5×10^{-4} mg/l for thiomethoxam.

It is our understanding thiomethoxam rapidly breaks down to clothianidin in water and soil and they should be the same. Surely the EPA should be testing measuring and monitoring the environment for these products to see if their risk assessments were in fact correct?

- b) We do not know if these limits are realistic based on climatic factors, soil factors and end-use factors, which could mitigate or exacerbate their environmental effects. It is quite possible that freshwater concentrations could be significant in Canterbury groundwater where extensive irrigation is carried out on crops where these products are used. But the EPA has no data on freshwater EEL analysis.
- c) Missing in many HSNO Act application Evaluation and Review Reports for neonicotinoid chemicals has been measuring and monitoring data on products with EELs set by the EPA. There have been a number of applications involving neonicotinoids.
- d) We are aware of only one serious attempt to measure soil and crop levels of neonicotinoids in maize immediately after harvest. This was the work done by Dr C. Pook of AUT and presented to the EPA in 2015 in the application APP202077 hearing in 2015. All soil samples tested by Dr Pook showed clothianidin and imidacloprid residues at concentrations high enough to kill bees. Significantly these soil tests were conducted 11 months after the crop was sown and the seed treatment introduced to the environment.ⁱ

3.2 Bee dead zones

The ApiNZ Science and Research Focus Group remains concerned about the bee dead zones associated with intensive cropping (especially maize cropping) around Gisborne, in the Eastern Bay of Plenty and Waikato.

This is occurring where a single crop, usually maize, is grown in the same ground year after year with no crop rotation. Beekeepers have been aware that bees rapidly die out in these areas if they are left to forage their immediately after harvest. Those beekeepers in the know do not place their hives in these areas for about two to three months after harvest to protect them from dying out.

In 2015 ApiNZ made submissions about this issue to the EPA at the hearing for Poncho Votivo, containing 508 g/l clothianidin and 102 g/l *bacillus firmus*. Reference EPA Application APP202077.

During our research into the possible causative factors we noted that maize growers found that they had residual insecticide left in the soil after two successive crops. This was sufficient to not treat their seed with any insecticide for the third successive crop. Growers were doing this without any soil analysis or measuring the EEL.

Maize growers know that the neonicotinoid seed treatments stick around in their soils and can control pest populations into the next crop growing season, one year after being applied. The EPA needs to be aware of this.

3.3 Consumer pressure reduces use

ApiNZ has been very aware of the effects of measurable neonicotinoid adverse effects on bees and hives overseas. Likewise, overseas consumers of imported fruit from New Zealand have also been fully informed of the links established in North America and Europe between neonicotinoid use and pollinator (honey bees and bumble bees) deaths.

As a result, Zespri and New Zealand pome (pipfruit) fruit exporters have removed neonicotinoid insecticides from their spray programmes at the request of their major overseas customers such as CostCo, ALDI, TESO etc. This buyer pressure has resulted in a substantial drop in risk to bees used to pollinate Kiwifruit and pome fruit in New Zealand. This effect has been much more significant than any EPA control.

Given that consumers are already concerned about neonicotinoid use in relation to harming bees and retailers are taking action as a result, we urge EPA to survey the international regulatory landscape, noting and anticipating potential regulatory intervention over time which would undoubtedly impact on our industry here in New Zealand.

The European ban on the use of neonicotinoid seed treatments is still in place. Canada's Pest Management Regulatory Agency (PMRA) has recently advised Canadian beekeepers of a proposed a 3 to 5 year phase-out of neonicotinoids, used primarily on corn, soy and winter wheat.

3.4 Ryegrass and clover

Neonicotinoid insecticides are registered for use as a seed treatment on ryegrass. New Zealand pastures are also normally dependent on clover. Farmers cannot use neonicotinoids as a seed treatment on clover – it is not registered for that use. But seed merchants and farmers can mix clover with insecticide seed treated ryegrass for sowing. This is a significant risk factor for bees. No one has studied the risk to bees through flowering clover in this situation.

3.5 Product stewardship

Since the introduction of neonicotinoids New Zealanders have not experienced the problems experienced in Europe and North America with bee kills. Some of the factors that may have protected New Zealand could include the following;

- i. EPA Controls. Seed treatment chemicals have to be applied to seeds in designated seed treatment plants with trained personnel (approved handler) in charge and with proper ventilation and process controls. The section 77A controls are specific requiring film coating of the seed treatment to prevent dusting.
- ii. Whilst imidacloprid and clothianidin were under patent protection we have noted that Bayer NZ has had an active seed treatment product stewardship programme. This has included the supply and recommendation of binders, lubricants, polymers and other additives used to effect the seed coating. It is believed that this has also included training of the personnel who operate seed treatment plants. It should be noted that growers in New Zealand do not do their own seed treatment, which is a practice we believe happens overseas. We believe this has meant that we have not experienced the problems of seed dusting at time of sowing as experienced in Europe and North America.

ApiNZ is concerned that this satisfactory state of affairs may not last due to changes to the HSNO Act, the introduction of WorkSafe and the new product suppliers as these three insecticides are now no longer protected by patent.

- iii. An interesting question to ponder is why the neonicotinoid acetamiprid, which has been shown to be relatively safe to honey bees, has never been registered for use in New Zealand.

4. Scientific and technical information

The ApiNZ Science and Research Focus Group and its predecessor the National Beekeepers Association has made a number of submissions to a number of EPA applications for various neonicotinoid insecticides. Much scientific and technical information has already been referenced and debated at these hearings with the EPA and applicants. We refer to the following;

- APP201485 Confidor Tablets for tree planting – containing imidacloprid
- APP201609 Ortus crop insecticide for kiwifruit and potatoes containing thiamethoxam.
- APP202077 Poncho Votivo seed treatment containing clothianidin.
- APP202093 Grizzly Max – a crop insecticide with 3 active ingredients including imidacloprid
- App202892 Celsius seed treatment containing thiamethoxam

5. Alternative information

The ApiNZ Science and Research Focus Group role is not to make recommendations for alternate pesticides in place of neonicotinoids

6. Known bee kills

The ApiNZ Science and Research Focus Group has no documented record of a bee kill being attributed to any neonicotinoid insecticide, although we note the occurrence of bee deaths in 3.2 above (“maize flats disease”). This does not mean it has not happened but possibly due to beekeeper or landowner inaction it has never been reported, investigated and analysed.

We believe that the reason for this bee safety record in New Zealand when compared with other overseas countries has been due to the following;

- HSNO Act controls on the seed treatment industry in New Zealand
- That farmers cannot do their own seed treating due to the HSNO Act Controls.
- The Product Stewardship activities of suppliers of these pesticides when under patent.
- Overseas customer pressure has seen the removal of neonicotinoids from grower spray programmes in New Zealand. Especially kiwifruit and pome fruit both of which are pollinated by honey bees. The problems experienced in Europe and North America have resulted in positive grower action in New Zealand, which protects New Zealand’s pollinators.

7. Summary

The ApiNZ Science and Research Focus Group would like to see the following outcomes from this enquiry into neonicotinoids by the EPA:

- a. The monitoring and measuring the amount of pesticides and other chemicals used in a wide dispersive manner in New Zealand annually by chemistry, type and crop.
- b. The monitoring and measuring of environmental effects, in particular the EELs set by the EPA. We have seen the input into setting an EEL for sodium flouro-acetate and the follow up measuring of the environment to check the EEL. What we should be doing is looking at all biocides in use in NZ.
- c. Continued investigation into the maize area bee deaths experienced by observant beekeepers as outlined in 3.2 of this submission.

The ApiNZ Science and Research Focus Group thanks the EPA for this opportunity to comment on this project and expresses an interest to remain part of the public discussion that the EPA wishes to hold.

Apiculture New Zealand Science and Research Focus Group

Barry Foster (Chair), Dr Oksana Borowik, Dr Mark Goodwin, Don MacLeod, John McKay, Dr John McLean, Martin Laas, Dr Pike Brown.

ⁱ Dr Pook’s testing and results were submitted to the EPA b ApiNZ in 2015 in association with APP202077.