

# Neonicotinoids in New Zealand

September 2019

## Background

The EPA held an open call for information on the neonicotinoids: clothianidin, imidacloprid and thiamethoxam, and their use in New Zealand. The call for information started on 13 August 2018 and closed at the end of December 2018. This document summarises some of the key information provided in the 22 responses that were received.

## Overseas Regulatory Action

The European Food Safety Authority (EFSA) published updated risk assessments on neonicotinoid plant protection products in February 2018; these assessments were based on European agricultural use patterns, exclusively as seed treatments, and for particular crops and application rates. Previous regulatory action in Europe restricted foliar uses of neonicotinoids, and uses on crops that are attractive to pollinators.

The Health Canada Pest Management Regulatory Agency (PMRA) published pollinator re-evaluations decisions for all three neonicotinoids in April 2019, and consulted on reviews of clothianidin and thiamethoxam risks to aquatic invertebrates during August-November 2018. The technical assessments are based on agricultural use patterns in Canada, which are more diverse than those assessed in Europe, including seed treatments, foliar sprays, and soil treatments (e.g. soil drenches and cell transplant/seedling drenches), with multiple crop types and application rates. The aquatic invertebrate risk assessments were informed by Canadian fresh water monitoring data which showed neonicotinoid concentrations above a level of concern for chronic risks to certain aquatic species.

## Purpose of the call for information

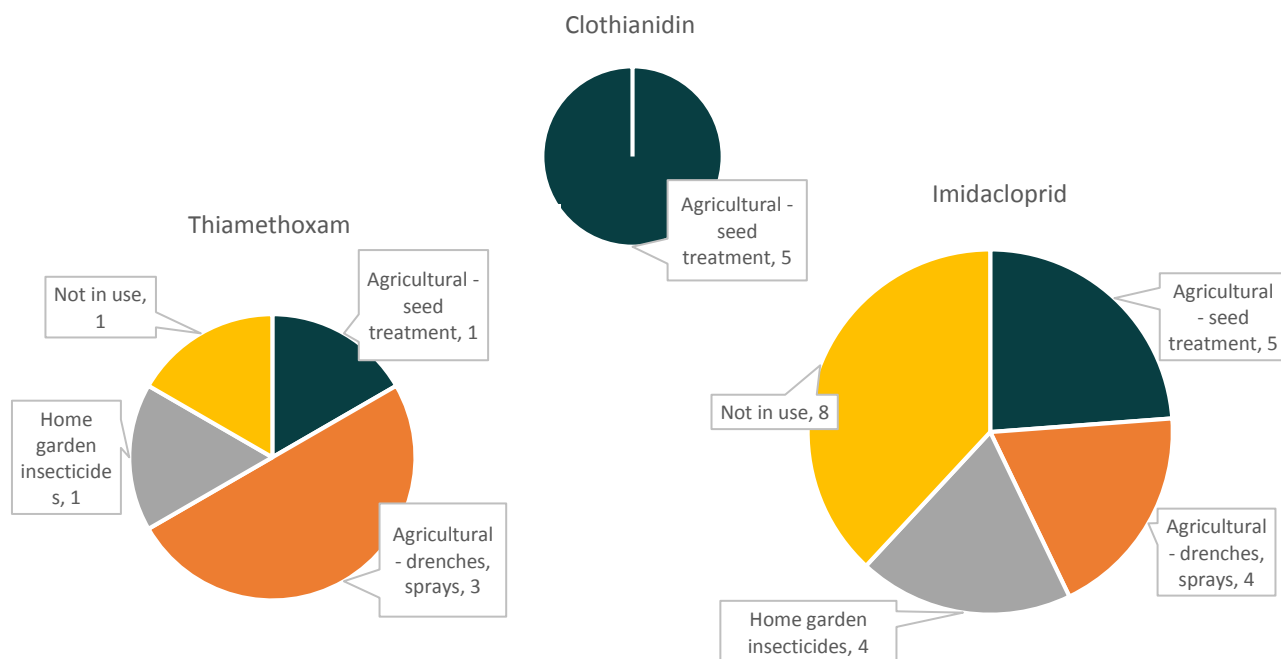
In order to inform our understanding of potential risks in the New Zealand context, we need to ensure that we have the most up-to-date and accurate information about the use of neonicotinoids here. We can then consider which aspects of the overseas risk assessments may be of relevance to use patterns in New Zealand, and which aspects may require further analysis.

## What types of neonicotinoid products are present in New Zealand?

There are 65 approved substances that contain clothianidin, imidacloprid or thiamethoxam, of which 33 are intended for use as plant protection products. The 32 non-plant protection products include one thiamethoxam-containing ant bait gel, and 31 imidacloprid-containing substances, used as timber treatments or wood preservatives, veterinary medicines (flea treatments and lice control), and pest control products (termiticides, ant and fly baits).

For the 33 plant protection substances, these can be broadly divided by active ingredient, and by use into home garden insecticides, agricultural insecticides used as seed treatments, and agricultural insecticides directly applied as soil drenches, cell transplant seedling drenches or foliar sprays. A number of approved substances no longer appear to be in use (no responses from the call for information and/or no current ACVM registration) but still have approvals as agricultural or home garden insecticides.

The numbers of approved plant protection substances by product type are shown below for each of the neonicotinoid active ingredients.



Some responses noted that several New Zealand retailers phased out the sale of neonicotinoid-containing home garden insecticides, which limits the range of products available and the amounts used.

## How are neonicotinoids used in New Zealand agriculture?

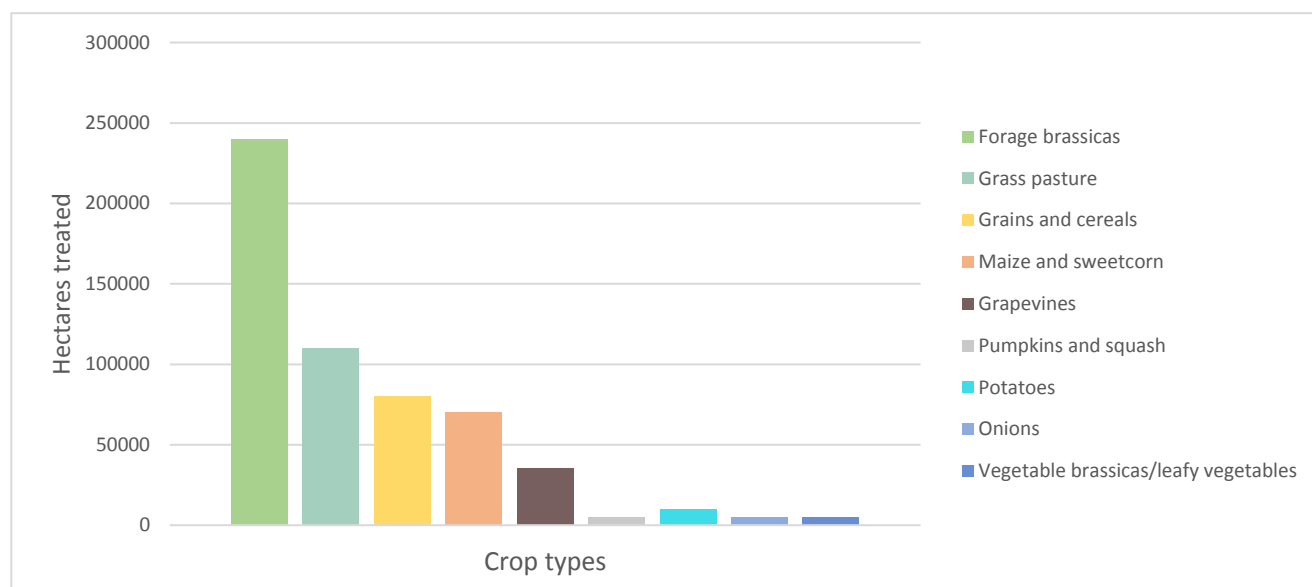
Based on information received on the agricultural uses, neonicotinoid treatment is mainly used for the specific crop types shown in the Table below.

	Active Ingredient		
	Thiamethoxam	Clothianidin	Imidacloprid
<b>Seed treatment</b>	Forage brassicas <i>Hybrid maize and sweetcorn *</i>	Forage brassicas Grass Grain and cereal crops Maize and sweetcorn	Forage brassicas Grass Cereals Maize and sweetcorn Potatoes Pumpkin and squash
<b>Foliar spray</b>	Onions <i>Kiwifruit *</i> <i>Pipfruit *</i>	-	Onions
<b>Seedling transplant drench</b>	Leafy vegetables Brassica leafy vegetables Vegetable brassicas	-	Lettuce Vegetable brassicas
<b>In-furrow drench</b>	Potatoes	-	-
<b>Soil drench</b>	-	-	Grapevines

\* Not currently used for these crop types by the majority of New Zealand growers, despite being listed on product labels

These generally correspond to the crops listed on ACVM registered product labels, but notably some label uses are now uncommon in New Zealand and/or have been phased out by growers based on export market requirements or other considerations (e.g. use of thiamethoxam sprays on pipfruit or kiwifruit). The majority of the crops treated are not reliant on bees for pollination or are not attractive to bees.

Various different responses provided estimates of the crop areas planted with treated seed or treated with a foliar spray or soil/seedling drench annually. This information came from a variety of sources including the Fresh Facts report<sup>1</sup>, information from Statistics New Zealand combined with industry estimates of the percentages of treated and untreated crops, and the 2014 AgCarm BERL Economics Report<sup>2</sup>. Estimated treated areas per year from these sources for the different crop types (to the nearest 5000 hectares) are represented below.



The predominant uses by agricultural area are forage brassicas and pasture, both applied as seed treatments. This differs significantly from use patterns in Europe and Canada where seed treatment of maize, sweetcorn, grain and cereal crops are the major use patterns, and neonicotinoid seed treatments for forage brassicas and grass seed are absent. Use patterns for grass and forage brassicas may require a different assessment approach, since both are planted for grazing by livestock, rather than for cropping and harvesting, and may be re-planted infrequently (such as when land is converted to pasture) rather than annually. The sowing of treated grass seed in combination with other pasture species (eg clover) that are attractive to bees was also highlighted as a concern.

The foliar sprays, soil drenches and seedling drenches are generally used on horticultural crops with lower planting areas than for the seed-treated crops. Many of these use patterns are included within the Canadian pollinator risk assessments. The area planted with grapevines is significant and predicted to continue expanding. No information was received on the proportion of grapevines treated, but label instructions for many imidacloprid-containing soil drenches have recently changed to include regular post-harvest use, rather than being restricted to use on young non-bearing vines and vines for removal, so the frequency of use may have increased. This change and relatively high application rates for grapevines may justify some further review and assessment of these use patterns.

## What new scientific data is available?

The key manufacturers of neonicotinoid active ingredients provided comprehensive information on the available toxicological and ecotoxicological studies, endpoint values, and other relevant scientific literature. The new studies provided to the EPA do not support major changes to the hazard classifications, but would assist in refining the active ingredient endpoint values. This information will assist in informing any risk assessments the EPA conducts.

<sup>1</sup> <https://www.freshfacts.co.nz/files/freshfacts-2018.pdf>

<sup>2</sup> [http://agcarm.co.nz/wp-content/uploads/Economic-value-of-neonicotinoid-seed-treatment-to-New-Zealand-180314\\_Final.pdf](http://agcarm.co.nz/wp-content/uploads/Economic-value-of-neonicotinoid-seed-treatment-to-New-Zealand-180314_Final.pdf)

## Where are neonicotinoids found in the New Zealand environment?

We received both anecdotal information and scientific study reports relating to the presence of neonicotinoids in water, soil, pollen and honey in New Zealand. In all cases the data sets were limited in terms of the number of samples analysed, and the number of locations within New Zealand that were tested. A study of neonicotinoid levels in New Zealand maize field soils<sup>3</sup> highlighted the persistence of neonicotinoids in the soil environment.

The levels of neonicotinoids detected in fresh water samples from New Zealand streams<sup>4</sup> were significantly lower than in a comparable US report<sup>5</sup>, and were also lower than the concentrations in Canadian water bodies as reported in the PMRA proposed special review decisions for thiamethoxam and clothianidin. Other studies<sup>6</sup> highlighted that water temperature and food shortage may affect the sensitivity of New Zealand aquatic invertebrate species to neonicotinoid toxicity.

The EPA proposes to evaluate further environmental monitoring data from New Zealand as it becomes available.

## What environmental risk mitigation measures are used?

Different risk mitigation measures are employed by users, including growers and specialist seed treatment companies, dependent on the way in which products are used.

Environmental risk mitigation measures we were informed about are summarised below.

Seed treatment	Foliar spray	Soil/seedling drenches
industry/manufacturer product stewardship programme	using drift reducing nozzles	applying drenches indoors in a seedling house/nursery
purpose-built seed coating machines in enclosed treatment facilities	using appropriate spray droplet sizes, spray pressures, and water rates	using delivery nozzles close to the bottom of the furrow
adding polymers to form a film coating	using drift retardants	covering the furrow with soil directly after in-furrow treatment
adding fluency powders to treated seed (for maize/sweetcorn planters)	monitoring environmental conditions / timing for favourable wind conditions	
using seed hoppers with precision seed drills	Growsafe accreditation of applicators	

Some approvals for neonicotinoid-containing substances include one or more of these measures as controls, but these controls are inconsistently applied. A review and standardisation of controls on approved substances may assist in accurately reflecting use patterns and implementing best practice environmental risk mitigation measures.

## Next steps

Following the review of responses to the 2018 call for information, we made an application for grounds to reassess the neonicotinoids, clothianidin, imidacloprid, thiamethoxam, thiacloprid and acetamiprid – this is the first step towards a reassessment under the HSNO Act. In December 2019, a Decision Making Committee of the EPA

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<sup>3</sup> <https://doi.org/10.1016/j.envpol.2019.113075>

<sup>4</sup> <https://doi.org/10.1016/j.envpol.2019.112973>

<sup>5</sup> <https://doi.org/10.1021/acs.est.7b00012>

<sup>6</sup> <https://doi.org/10.1080/00288330.2019.1614961>

determined that there were grounds to reassess the neonicotinoids. Meanwhile, the Australian Pesticides and Veterinary Medicines Authority (APVMA) announced details of their neonicotinoids review in November 2019. We intend to work collaboratively with our counterparts at the APVMA on some technical aspects of the reassessment and review processes. Since the scope of our work has expanded to include thiacloprid and acetamiprid, we plan to open a follow-up call for information on the use of these two neonicotinoids in New Zealand.