

Bees and neo-nicotinoids: what's the story?

By Graeme Peters

Over the next few months, croppers will sow millions of seeds. Many will be treated with useful products which protect the embryonic plant and seedling from being eaten by nuisance pests.

One treatment option is a group of products called neonicotinoids. Despite being hard to say and even harder to spell, neonicotinoids have whipped up media debate over claims that tiny trace quantities may be picked up by bees, weakening colonies and causing premature bee deaths.

Representatives of the National Beekeepers' Association and the Green Party stood together at Parliament launching a petition asking the government to suspend the sale of neonicotinoids, and for regulators to hold a special inquiry, called a 'reassessment', into the seed protector.

It's convenient to point the finger of blame for bee maladies at neonicotinoids. But this condemnation ignores the fact that international research doesn't support claims that tiny residues of neonicotinoids cause bee deaths.

Denouncing seed treatments is a case of barking up the wrong tree, diverting the bee industry from tackling other, more serious threats to bees which are looming large.

It's clear that beekeepers are passionate about bees and their industry. Both the NBA and Federated Farmers Bee Industry Group have done an admirable job advocating the importance of the six-legged, four-winged insects.

Promoting bee health is - obviously - good for bees, and we vertebrates also have a big stake in their well-being. In addition to making honey, bees help pollinate 35 percent of our crops. The general rule is that any colourful species of fruit and vegetable on our plates is probably pollinated by insects.

For growers, farmers, suppliers or indeed anyone involved in agriculture, keeping bees healthy is a given, so the crop protection industry is naturally concerned about bee health and making sure that proper use of pesticides does not harm bees. Following the label instructions and attending GROWSAFE training courses are two ways to help bees.

Neonicotinoids are similar to the natural insecticide nicotine. They are available as seed treatments and foliar sprays. First introduced to New Zealand in 1992, neonicotinoids are in about two dozen products containing one of four active ingredients (imidacloprid, thiacloprid, thiamethoxam, and clothianidin). Sold by half a dozen companies, neonicotinoids are registered for use on cereals, forage brassicas, pasture, maize and sweetcorn, potatoes, pumpkins, and winter squash.

Systemic pesticides, neonicotinoids are absorbed by the seed and remain effective as an insecticide when the plant is in its early growth stage. But as time passes and the plant grows, the presence of neonicotinoid falls to extremely low levels. Pollen from a mature plant may have traces of neonicotinoid measured in parts per billion, the equivalent of half a teaspoon of water (2.5 millilitres) in an Olympic-sized swimming pool (2.5 million litres). There's no dispute that neonicotinoids are toxic to bees, but not when used correctly and not at levels which are barely detectable.

It's important to know that the majority of neonicotinoids sold in New Zealand are used to treat seeds for crops which are wind pollinated – which means bees are unlikely to be in contact with their pollen. These are cereals, forage brassicas, maize, sweetcorn and New Zealand's biggest crop – pasture.

New Zealand beekeepers are right to be concerned about their bees, and they're right to be alarmed about reports from overseas that bee hives are mysteriously dying due to the unexplained "colony collapse disorder".

Scientists have been studying the unexplained colony losses and most agree that there is no single explanation but interactions between multiple stresses are likely involved. Pests and pathogens appear to be playing a significant role. Research must now determine why honeybees have become vulnerable to these stresses and how they can be protected.

In total the EU budget already dedicated to research related to honeybee and other pollinators amounts to approximately 10 million euros. Current projects deal with the decline of both wild and domesticated pollinators, including honeybee colonies, and its potential causes, as well as the development of appropriate diagnostic tools.

A European Food Safety Authority study found that pesticides, properly used, have not been identified in relation to colony losses such as colony collapse disorder in the United States and winter colony losses in Europe.

And studies performed by the French food safety authority have made it very clear that a multitude of factors are responsible for persistent bee mortality. The authority expressly stated that there is no statistical correlation between bee deaths and neonicotinoid residues in pollen or applications of plant protection products.

Thankfully there have been no reports of colony collapse disorder in New Zealand and – in contrast to the United States - the managed bee population is growing. According to the Ministry of Agriculture and Forestry, beehive numbers have climbed to about 390,000 this year, a 30 percent increase since the middle of last decade. That's about 20 billion bees.

Unfortunately over the same time feral bee hives have almost been wiped out, with the varroa mite getting most of the blame.

In most countries, New Zealand included, the varroa mite poses the biggest danger to the survival of bees. Varroa suck the blood of adult honey bees for sustenance, leaving open wounds. The compromised adult bees are more prone to infections which the mites unwittingly spread.

In a position paper, the German Bee Research Institutes outlined that most of the colony collapses which have occurred in recent years were due directly or indirectly to severe varroa mite infestation. And a study group set up by the institutes considers the varroa situation to be extremely critical and sees an urgent need for action.

Agcarm will leave decisions about reassessments of chemicals up to New Zealand's independent regulator, the Environmental Protection Authority. The agrichemical industry does not oppose or support individual reassessments. But any decision to proceed with a reassessment must be based on sound science and the learned opinions of leading bee researchers.

Those researchers would instead be advising beekeepers to devote their efforts to finding new ways to combat varroa. At present there are three animal health products available to treat varroa but resistance to the mites, which reproduce on a 10-day cycle, has already been observed near Auckland.

Agcarm is in the early staging of a project to bring forward new treatments for varroa. Work on introducing these miticides must begin now before beekeepers are left to struggle with infested bees and no way to treat them.

Though varroa is the most significant influence, bee ill-health is a multi-factorial problem. Pointing the finger of blame and calling for quick fix solutions will not help beekeepers deal with their serious challenges ahead.

- Graeme Peters is chief executive of Agcarm, the industry association for crop protection and animal health.