

Flies show pollen power

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By TIM CRONSHAW

The skills of native flies in pollinating South Island crops may shed more light in evaluating the potential of cross contamination from genetically modified plants.

A study by Crop & Food Research is monitoring the behaviour of native flies in arable plants and has found they could be major pollinators.

Until now it was assumed bees do most of the crop pollination and arable farmers have traditionally placed honey bee hives next to crops for this purpose.

Native flies have, however, been found in some crops carrying up to 19,000 pollen grains – as many as honey bees.

The observations are hoped to give greater knowledge of the pollinators ability to move genes so scientists can accurately predict what would happen if modified plants were at some stage commercially introduced into the country.

"If New Zealand was ever to allow commercial transgenic crops we must first examine any possibility of gene flow from these crops to other crops, weeds and native flora," said Crop & Food Research entomologist Dr Brad Howlett.

Over the last two summers he and fellow entomologist Melanie Walker have spent 14-hour days watching bees, flies and other pollinators in fields of onions and brassicas in Marlborough, Canterbury and Central Otago.

Definite patterns have yet to emerge, but they are surprised about several findings, including the numbers of native flies in onion and brassica crops.

Howlett said there were more native flies found to be carrying similar pollen loads to honey bees in some areas. The bigger and hairier flies carry the most pollen, while the small, less hairy ones carry fewer than 10 grains.

The range of pollinators in crops, however, varies widely even on sites that are close together.

In Central Otago it was found that two onion fields about 17km apart attracted completely different ranges of insects.

In one site where honey bees were introduced to help with pollination, there were the same number of native fly pollinators as there were honey bees.

On crops of pak choi (Chinese cabbage) near Lincoln and Gore, a bionid fly was found in numbers 10 times more than honey bees and carrying the same amount of pollen.

Howlett said it was unknown whether fly populations varied yearly and more research was needed to

monitor geographic variations.

Little was known about the role of native pollinators in transferring pollen in crops before this study. Kiwifruit is the only other crop where pollinators have been surveyed to a wide extent in New Zealand, he said.

While the research funded by the Foundation for Research Science and Technology until 2008 is still at an early stage, scientists hope to learn more about the potential of bees and flies to move pollen from genetically modified plants to traditional plants.

Howlett said there was international concern that genes modified for herbicide tolerance could be transferred to weeds or non-crop plants via pollen and make control more difficult.

"But to evaluate the likelihood of the movement of transgenic genes via pollen away from genetically modified plants, we must first understand the mechanisms that cause pollen movement. That is what this research is all about."

Over the next three years the research will attempt to confirm initial observations by measuring the distance pollen is moved from crops and the effectiveness of pollinators.

Howlett said the research could be useful if the varroa bee-mite disease arrived in the South Island and native flies were found to be effective as alternative pollinators.

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