

# THE WESTERN PRODUCER

## New study finds no neonic impact on bees

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Bee experts Cynthia Scott-Dupree of the University of Guelph and Chris Cutler of Dalhousie University concluded that canola grown from seed coated with a neonicotinoid insecticide does not pose a risk to honeybee colonies. | File photo

## **Ten canola fields in trial | Researchers found bee winter losses and honey production not affected by exposure**

A major Canadian study on neonicotinoids was released in late October with little pomp or circumstance.

Bee experts Cynthia Scott-Dupree of the University of Guelph and Chris Cutler of Dalhousie University concluded that canola grown from seed coated with a neonicotinoid insecticide does not pose a risk to honeybee colonies.

“Although various laboratory studies have reported sub-lethal effects in individual honeybees exposed to low doses of neonicotinoid insecticides, the results of the present study suggest that foraging on clothianidin seed-treated crops, under realistic conditions, poses low risk to honeybee colonies,” Cutler and Scott-Dupree wrote in a paper published in PeerJ, an online scientific journal.

Neonicotinoids are applied to almost of the corn and canola and some of the soybeans grown in North America. Numerous studies and media reports have linked the class of insecticides to bee deaths and colony losses in Canada, particularly in Ontario.

Two beekeepers in Ontario filed a class action suit in September on behalf of all beekeepers in the province, claiming \$450 million in production losses because of neonicotinoids.

The study by Scott-Dupree and Cutler was conducted at 10 canola fields in Ontario in the summer of 2012. It confirms what they found in two previous field experiments on honeybees and clothianidin: clothianidin, a Bayer Crop Science neonicotinoid, has no significant impact on bee colony health under realistic field conditions.

Cutler and Scott-Dupree placed honeybee colonies in fields of canola grown from seed treated with clothianidin when the crop reached 25 percent bloom.

The bees remained there for 11 to 13 days and then were transported to a military base near Meaford, Ont., on a peninsula that extends into Lake Huron, to isolate the bees from neonicotinoids for the remainder of the summer.

After taking samples and crunching the data, the scientists found:

- The honeybees were exposed to .5 to 1.9 parts per billion of clothianidin in pollen.
- The number of dead bees from colonies exposed to neonic-treated canola was similar to the control group of colonies that weren't exposed to clothianidin.
- Colonies exposed to clothianidin produced the same amount of honey as the control.
- Exposure to clothianidin had no effect on the number of bees in the colony. The overwinter losses were the same for the treatment and control groups.

“The results are also in agreement with semi-field — field cage, Tier 2 — and field studies that have found that individual bees and colonies are not adversely impacted when foraging on neonicotinoid seed-treated crops,” the authors said.

The paper’s conclusions are the opposite of numerous and highly publicized studies on neonicotinoids.

Many scientists have said the chemical hampers bees’ ability to forage, hinders colony reproduction and has a detrimental impact on bee brain functions.

In an interview, Cutler said it’s difficult to compare laboratory work to field studies on bees.

“In the lab you have a high level of control and precision, but you have uncertainty as to how well the (pesticide) exposure reflects reality,” he said.

“In the field you have much less control and you have a lot more variability because you’re dealing with nature. But you have much better exposure ... and a lot more confidence in what the bees are being exposed to is real.”

Laboratory studies typically claim that bees were exposed to realistic field doses, but Cutler said lab scientists often apply pesticide doses based on a worst-case scenario.

“Even though they say they’re realistic, I would say they’re too high.... In reality for clothianidin, in canola it’s around two parts per billion for pollen, even less so in nectar,” he said.

“Some people have been doing things with bumblebees where they expose them to six to 10 parts per billion.... Yes, those concentrations have been detected in the field, but they’re certainly not common.”

Laboratory experiments on bees may have flaws, but so do field studies, said Chris Mullin, an entomologist who studies pesticides and pollinator health at Penn State.

“Unfortunately, the colony is so incredibly complex in regards as to how it interacts with chemicals in the natural system,” he said.

The 2012 study, funded by Bayer Crop Science, cost nearly \$1 million and was one of the largest bee experiments in the world that year.

- A fuel tank of a Boeing 747 can hold more than 50,000 gallons of fuel. One part per billion is comparable to adding four drops of liquid to the tank.
- One millilitre of water in an Olympic sized swimming pool is about one part per billion.
- Half of a drop of oil in a super tanker carrying six million gallons of oil is equivalent to one part per trillion.
- Two revolutions of a golf ball on a putting green represents a part per trillion relative to the distance from the Earth to the sun.