

Effects of insecticides on the alfalfa leaf-cutting bee

What is this research about?

Pollination is the process of moving pollen from the male part of the flower of one plant, to the female part of the flower of another plant. This fertilizes the flower, so that it develops seeds.

Bees are needed to pollinate many fruit and vegetable crops. Pesticides used to control insect pests can have toxic effects on bees and their ability to pollinate. The effect of common insecticides on bees other than honeybees is not well understood.

The purpose of this research was to find out whether several insecticides are toxic to the alfalfa leaf-cutting bee, *Megachile rotunda*. The insecticides tested are all commonly used in growing wild blueberries.

What did the researchers do?

Adult alfalfa leaf-cutting bees were directly treated with the insecticides flubendiamide, phosmet, deltamethrin, spinosad, or spinetoram. Other leaf-cutting bees in the control treatment were treated with water. Insecticides were tested at several concentrations. The numbers of dead bees were counted after 48 hours for each group.

In addition, pollen containing the insecticides flubendiamide, deltamethrin, and spinetoram was fed to larval (immature) alfalfa leaf-cutting bees. Bee development and survival was assessed.

What you need to know:

Many agricultural crops are dependent on bee pollination for proper growth. The alfalfa leaf-cutting bee is an important pollinator of blueberries in Atlantic Canada.

The insecticide flubendiamide appears to be non-toxic to both immature and adult alfalfa leaf-cutting bees.

The insecticides phosmet, deltamethrin, spinosad, and spinetoram may have negative effects on leaf-cutting bees and therefore on crop pollination.

How can you use this research?

This research is beneficial to **wild blueberry growers** and anyone involved in the **agriculture industry**. It provides knowledge of which insecticide(s) are most useful in pest management and least harmful to bees.

Policy makers can use this research to provide recommendations of which pesticides should be used in areas where alfalfa leaf-cutting bees live or are used to pollinate crops.

What did the researchers find?

The alfalfa leaf-cutting bee is sensitive to direct exposure of phosmet, deltamethrin, spinosad, and spinetoram.

The insecticide flubendiamide did not kill adult leaf-cutting bees upon direct contact. Larval (immature) bees exposed to deltamethrin and spinetoram by eating contaminated pollen did not develop properly. Larval bees exposed to flubendiamide did not differ in survival from control group bees that were treated only with water.

These results suggest growers need to be careful selecting the insecticides they use on wild blueberries to ensure minimal impact on leaf-cutting bee populations that may be living in the vicinity of their crops.

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