

## Effects of chemical pesticides on helpful predatory insects

### What is this research about?

In greenhouses helpful insects are used to reduce and manage outbreaks of pest insects. In addition, chemical pesticides are used to manage fungi and insect problems.

However, chemical pesticides may harm populations of helpful insects. This research was carried out to determine whether several pesticides are toxic to three species of helpful insect used in greenhouses.

### What did the researchers find?

In the lab and the greenhouse, the researchers found that the insecticide abamectin was slightly to moderately harmful (25-75% dead) to the insidious flower bug. In both the lab and greenhouse, the insecticide metaflumizone was slightly harmful (25-50% dead) to a whitefly parasitoid. All other insecticides were classified as harmless (less than 25% dead) for these species. All fungicides were harmless to all species.

The predatory mite, *A. swirskii*, was not susceptible to any of the insecticides and fungicides, in both the lab and greenhouse studies.

The predatory mite, *A. swirskii*, is a good choice for insect pest management in greenhouses, as it is more tolerant of pesticides that are often used.

### What you need to know:

Helpful predatory insects are natural enemies of insect pests, and are widely used in greenhouses.

However, chemicals are still necessary to control certain pests and diseases. These chemicals can have a negative impact on helpful insects.

The predatory mite, *A. swirskii*, is more resistant to many pesticides including the insecticide -chlorantraniliprole and fungicides - myclobutanil, potassium bicarbonate, and cyprodinil + fludioxonil.

Therefore, these pesticides can be used with care before and/or after establishment of the helpful insects.

### How can you use this research?

This research can be beneficial to anyone involved in **crop protection, greenhouse growing, and/or agriculture**. **Greenhouse vegetable producers** can use this research to choose both biological and chemical pest control techniques to improve crop production.

## What did the researchers do?

The insidious flower bug (*Orius insidiosus*), predatory mite (*Amblyseius swirskii*), and whitefly parasitoid (*Eretmocerus eremicus*) were exposed to several insecticides (abamectin, metaflumizone, and chlorantraniliprole) and fungicides (myclobutanil, potassium bicarbonate, and cyprodinil + fludioxonil). Insecticides are chemicals designed to kill specific insects. Fungicides are designed to kill fungal pathogen that grow on plants.

Two experiments were carried out – one in the lab, the other in the greenhouse. The insects were exposed to the pesticides in the lab by eating treated leaves. Survival was assessed after 48 hours. Toxicity of the pesticides was ranked based on the percentage of insects still alive after 48 hours.

In the greenhouse, cucumber plants were sprayed with the pesticides and the insects' cages were attached to the treated plants. Survival was assessed at 24 hours.

## Keywords:

Pesticide, toxicity, *Orius insidiosus*, *Amblyseius swirskii*, *Eretmocerus eremicus*, greenhouse, insect pests, pest control, fungi control.

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