

Organic pesticides not always 'greener' choice, study finds

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Consumers shouldn't assume that, because a product is organic, it's also environmentally friendly.

A new University of Guelph study reveals some organic pesticides can have a higher environmental impact than conventional pesticides because the organic product may require larger doses.

Environmental sciences professor Rebecca Hallett and PhD candidate Christine Bahlai compared the effectiveness and environmental impact of organic pesticides to those of conventional and novel reduced-risk synthetic products on soybean crops.

"The consumer demand for organic products is increasing partly because of a concern for the environment," said Hallett. "But it's too simplistic to say that because it's organic it's better for the environment. Organic growers are permitted to use pesticides that are of natural origin and in some cases these organic pesticides can have higher environmental impacts than synthetic pesticides often because they have to be used in large doses."

The study, which is published today in the journal [PloS One](#), involved testing six pesticides and comparing their environmental impact and effectiveness in killing [soybean aphids](#) - the main pest of soybean crops across North America.

The two scientists examined four synthetic pesticides: two conventional

products commonly used by soybean farmers and two new, reduced-risk pesticides. They also examined a mineral oil-based organic pesticide that smothers aphids and another product containing a fungus that infects and kills insects.

The researchers used the environmental impact quotient, a database indicating impact of active ingredients based on such factors as leaching rate into soil, runoff, toxicity from skin exposure, consumer risk, toxicity to birds and fish, and duration of the chemical in the soil and on the plant.

They also conducted field tests on how well each pesticide targeted aphids while leaving their predators -- ladybugs and flower bugs -- unharmed.

"We found the [mineral oil](#) organic pesticide had the most impact on the environment because it works by smothering the aphids and therefore requires large amounts to be applied to the plants," said Hallett.

Compared to the synthetic pesticides, the mineral oil-based and fungal products were less effective, as they also killed ladybugs and flower bugs, which are important regulators of aphid population and growth.

These predator insects reduce environmental impact because they naturally protect the crop, reducing the amount of pesticides that are needed, she added.

"Ultimately, the organic products were much less effective than the novel and conventional pesticides at killing the aphids and they have a potentially higher environmental impact," she said. "In terms of making pest management decisions and trying to do what is best for the environment, it's important to look at every compound and make a selection based on the environmental impact quotient rather than if it's

simply natural or synthetic. It's a simplification that just doesn't work when it comes to minimizing [environmental impact](#)."

More information: The paper will be available here:
[dx.plos.org/10.1371/journal.pone.0011250](https://doi.org/10.1371/journal.pone.0011250)

Provided by University of Guelph

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