

# Researchers find natural product that boosts plant defense against root pests

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(Phys.org) -- University of Florida researchers have discovered a natural compound to battle insect pests that plague gardeners and growers.

The compound boosts [crops](#)' resistance to pest attacks on their roots by recruiting microscopic worms that kill the insects by eating them from the inside out.

Researchers, including members of UF's Institute of Food and Agricultural Sciences, made the discovery by studying chemicals released by citrus roots when they are attacked by citrus root weevil larvae. Their results are published in the June 27 edition of the online journal *PLoS ONE*.

Citrus root weevils are a problem in Central and South Florida, and at one time were estimated to cause \$70 million in damage annually. Florida's citrus industry is valued at \$9 billion and provides about 76,000 full- and part-time jobs.

The researchers found that a chemical called pregeijerene, which is released by citrus roots when attacked by pests, is an attractant that signals worms, known as nematodes, to move in and attack pests.

But not only does pregeijerene protect citrus roots, it also can protect the roots of blueberry plants and possibly other crops, said study author Lukasz Stelinski, an assistant professor of entomology and nematology at UF's Citrus Research and Education Center in Lake Alfred.

In the study, the researchers found that when pregeijerene was applied to soil in citrus groves, larvae control by nematodes was three times greater than when pregeijerene was not used.

And when the researchers applied pregeijerene to a blueberry field in New Jersey, larval control by nematodes was two times greater than when pregeijerene was not used.

“The results are important because they occurred in vastly different agricultural habitats,” Stelinski said. “Therefore, they may have broad application in biological control of root pests in agriculture.”

This is the first time pregeijerene has been shown to have an important role in protecting plants, Stelinski said, and he believes the compound could be useful in other production settings where root pests are a problem.

The citrus root weevil, in particular, is a pest of many plants including sugarcane, sweet potatoes and ornamentals. It was accidentally introduced to Florida in 1964, possibly from a shipment of ornamental plants from Puerto Rico.

Larry Duncan, also a study author and a nematology professor based at the CREC, said before citrus greening, citrus root weevils were one of the biggest problems in citrus production.

But now, he said, pesticide programs used to control the Asian citrus psyllid, the insect that spreads greening, are also helping control the weevils.

“However the intensive citrus greening spraying regimen won’t be sustainable over the really long term,” Duncan said. “And eventually we’ll have to address managing citrus root weevils again when we’re not

spraying so heavily for psyllids.” address managing [citrus](#) root weevils again when we’re not spraying so heavily for psyllids.”

Provided by University of Florida

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