Biopesticide offers hope against citrus psyllids

03/15/2011

By Renee Stern
Contributing Editor

Growers battling the pest that spreads citrus greening disease soon could add another weapon to their arsenal: a fungal pesticide now used in ornamental plants. The naturally occurring fungus, *Isaria fumosorosea*, is marketed by Columbia, Md.-based Certis USA under the name PFR-97.

Although it is used in Europe and Asia on a range of crops against whiteflies, thrips and other pests, the biopesticide's U.S. registration currently prohibits application on food crops.

The company is working to change that.

Mike Dimock, Certis' technical director, projects the U.S. Environmental Protection Agency by this fall will permit PFR-97's use with citrus and other food crops.

Asian citrus psyllid, which vectors the bacterium that causes citrus greening—also known as huanglongbing or HLB—is the highest-profile pest in the crosshairs. But Dimock says the fungus also works against thrips in onions, whiteflies in tomatoes, and other psyllids in tomatoes and potatoes.

“It's not a stand-alone,” says Lance Osborne, an entomology professor at the University of Florida's research center in Apopka. “No biological is a stand-alone.”

**Easy on the good guys**

Osborne discovered the fungus' pestkilling properties by chance while working with mealybug and whitefly colonies that kept dying off unexpectedly. The cause: *Isaria fumosorosea*.

Spores attach to insects and germinate into a fungus deadly to specific hosts.

While attacking a wide range of pests, the fungus is safe for bees as well as wasps and other natural enemies, Osborne says.

PFR-97 contains a modified form of the fungal spores that germinates more quickly and better tolerates drier conditions, Dimock says. Fine granules allow it to flow as a spray application.

The pesticide's success in other countries stems from its combination with the release of beneficial insects, such as parasitic wasps, he says.

That compatibility gives parasitoids and other beneficial insects an edge once the fungus helps knock down pest populations to a manageable level, says Pasco Avery, a post-doctoral research associate in entomology at the University of Florida's Fort Pierce research center.

The biopesticide also might augment sublethal effects from other chemical controls, Avery says.

**Is PFR-97 compatible with fungicides?**

Jim Snively, vice president of grove operations at Southern Gardens Citrus, in Clewiston, Fla., says he's excited about PFR-97's potential.

“Asian citrus psyllid is our big nemesis,” he says. If the biopesticide gains registration for citrus crops and performs as projected, “it will definitely help us a lot.”
Snively raised concerns about how a fungal pesticide would fit into a control program that incorporates several fungicide applications. “It would probably have to be applied by itself” rather than as a tankmix with other sprays, he says. Each sprayer pass through a grove adds to costs.

Dimock says researchers are investigating compatibility issues to determine which pesticides may be mixed safely with PFR-97.

Fungicides in particular would require care. At Southern Gardens, the psyllid control program includes seven or eight spray applications, of which four contain fungicides, Snively says. One of the others, Temik (aldicarb), won’t be available after this year.

A resistance-management tool

The possibility of adding a new tool to the psyllid fight is a bright spot for resistance management, he says.

Resistance to a biopesticide like PFR-97 should be less of a concern, Avery says. “You can’t ever say there will be no resistance,” he says. But pitting one living organism against another means a duel of similar mutation capacities.

In contrast, a chemical pesticide offers only a single protein for the pest to overcome, he says.

PFR-97 provides “added insurance” for resistance management, particularly against thrips and whiteflies where more compounds are needed, Osborne says.

And it could be a boon for organic growers, he says.

Certis plans to apply for organic recognition once the product gains expanded EPA registration, Dimock says. “We see no issues there” for approval by the Organic Materials Review Institute.

The company also is seeking an exemption to residue tolerance rules that would allow growers to apply PFR-97 all the way to harvest. Residues are “a big issue in Europe,” but residue tests don’t pick up any trace of biopesticides, he says.

Survival in groves

Application timing depends on the crop and pest, Dimock says. With Asian citrus psyllid, for example, growers would target egg-laying periods during citrus trees’ spring and fall flushes.

But under optimum conditions, the fungus may survive through more than one germination cycle, sending out spores after killing the first round of pests to multiply its impact.

“You can’t count on that,” Dimock says. “Conditions have to be just right” in terms of heat and humidity.

Growers must take into account other limitations beyond caution with fungicides. Although Certis’ formulation better tolerates drier conditions, the fungus flourishes in hot, humid areas.

One indication of prime conditions is the appearance of sooty mold in fields, Osborne says. Ultraviolet radiation and extreme heat can break down or dry out the biopesticide, Avery says.

Proper storage is critical. “It’s a living organism, so you have to treat it like milk,” Osborne says. Keep it refrigerated, not lying for weeks on a dashboard.

Above all, growers should remember that “it takes a few days to do the job so they’re not going to get instant gratification,” Dimock says.
Biopesticide offers hope against citrus psyllids - The Grower

Find this article at:
http://www.thegrower.com/issues/the-grower/biopesticide_offers_hope_against_citrus_psyllids_117876269.html

☐ Check the box to include the list of links referenced in the article.