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Shedding some light

New test helps ID fungicide resistance in Southeastern stone-fruit orchards

By Vicky Boyd
Editor

Fungicide resistance in stone fruit is nothing new to the Southeast, with the first confirmed case of brown rot resistance to benzimidazoles in the 1970s, says Guido Schnabel, an associate professor of fruit pathology at Clemson University in Clemson, S.C.

What is new is the way Extension agents can test to see if growers have resistant brown rot pathogens in their orchards and to which fungicides, he says.

"This will allow county agents and growers to determine their local resistance profile," Schnabel says. "With this information, hopefully, they can make a better decision about what to spray and what not to spray."

Since the brown rot control failure of benzimidazoles, such as Benlate, during the 1970s, researchers also have confirmed resistance to strobilurin and DMI fungicides in the Southeast, although the incidences are spotty, Schnabel says.

DMIs include Orit, Propimax, Nova, Elite and Indar. Strobilurins, also known as Qols, include Gem, Abound and Flint.

Much of the DMI resistance in Georgia appears confined to the central part of the state, although it also has been confirmed in Ohio, New York and South Carolina.

Schnabel attributes the slow growth of fungicide resistance partly to the Southeast's drought, which reduced the humid conditions conducive to brown rot infection during the past two seasons.

Nevertheless, resistance remains a huge concern, says Robert Dickey, a peach grower near Musella, Ga.

"It makes us real nervous," he says. "If we have a really wet

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year, we could really lose a lot of our crop.”

Testing moves to the field

With the help of post-graduate researcher Achour Amiri, Schnabel has developed small, easy-to-use kits that can be used to test for brown rot resistance to benzimidazole, Qol and DMI fungicides. The project is funded by two grants from the Raleigh, N.C.-based Southern Region Integrated Pest Management Program.

Joining them is Phil Brannen, a University of Georgia Extension plant pathologist based in Athens.

The kit consists of a lip-balm-sized tube of the jelly-like substance, agar, that contains the three fungicides. Users simply cut off a slice of the agar and put it in a petri dish with a fruit sample that contains the brown rot fungus, *Monilinia fruticola*. Within three days, the test will show whether the fungicides contained in the agar controlled growth of the fungi mycelia—networks of branching filaments. The mycelia often resemble fuzzy or hairy masses as the fungi grow.

So far, two groups of county agents have been trained to use test kits, Schnabel says.

Brannen says the test results will help county agents and growers make site-specific decisions.

“We know about where [fungicide resistance] is, but not every producer in every part of our state or in South Carolina is going to have it or to the same degree,” Brannen says. “We also think we had benzimidazole resistance, based on some tests we’d done in the field, but we think we still have it. Also, we’re starting to see possibly some strobi resistance, so we’re trying to make sure we’re ahead of the actual curve in the early season.”

Part of an overall management plan

The test results aren’t meant to be used alone, but in conjunction with the orchard spray history and what the grower has sprayed in the past 10 days, Schnabel says.

Dickey says he’s pleased with the test’s prospects.

“It would be a big help to the grower, because we have been pretty much in the dark whether we are [resistant] or not,” he says. “It can really help us make some decisions.”

The agents also will forward the results to Schnabel and Amiri so they can create a database and map of where resistance is found and to what product or products.

Brannen says in the case of Georgia, he knows growers in the state’s central production area have experienced resistance to the DMIs. But the test and mapping should help him find out if the same is true in the state’s other production area to the south.

The tests may be just in time because 2008 already is looking like a hot brown rot season, based on what Schnabel says he's seen so far this spring.

"We're actually seeing [brown rot] blossom blight emerging, and we don't have see blossom blight," Schnabel says.

A frost ruined much of the 2007 peach crop in South Carolina, so growers were hesitant to invest in any inputs beyond what they needed to keep the trees viable.

Damaged fruit was left on the tree. Without fungicide applications, brown rot inoculum built up and overwintered.

The real test will come during the last three weeks before harvest, when fruit is most susceptible to infection and when growers make their initial brown rot treatment, Schnabel says. If there is high humidity, which is conducive to brown rot, he says growers may be in trouble.

Resist temptation by rotating modes of action

Many of the new pesticides target a specific function within a fungal organism, such as interrupting respiration, and are referred to as having a single-site mode of action. Within any population of organisms, a few are naturally tolerant to a particular chemical.

If growers use a product with the same mode of action constantly, it kills off the susceptible organisms, leaving only the tolerant ones to reproduce. Pretty soon, the entire population is resistant to a chemical class.

The University of Georgia provides these tips to help slow the development of brown rot fungicide resistance.

- ◆ Alternate fungicides from different classes or with different modes of action. Simply rotating products may still expose the organism to the same mode of action. Abound and Flint, for example, are both strobilurins and share the same mode of action. The Fungicide Resistance Action Committee has classified pesticides as to their modes of action. They can be found at <http://www.frac.info>.
- ◆ Do not alternate fungicides within the same class or with the same mode of action.
- ◆ Consider using fungicides with multi-site modes of action, such as Captan, Ziram or chlorothalnil, as part of a resistance-management program. They can be used in alternation with single-mode-of-action fungicides or as tankmix partners.
- ◆ Make timely sprays to catch pests when populations are low and haven't yet built up. Rescue treatments applied when populations are out of control increase the chance of resistance.
- ◆ Make sure you have good spray coverage. Do not use

alternate-row spray applications, and use enough spray volume to achieve good coverage. Drive slow enough to achieve good coverage, and do not use airplane applications, especially at full canopy.

Hotlinks:

University of Georgia Fruit Pest Management & Culture
<http://www.ent.uga.edu/fruit.htm>

Southeast Regional Peach, Nectarine and Plum Pest Management and Culture Guide:
<http://www.ent.uga.edu/peach/PeachGuide.pdf>

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