Southeastern Regional Peach Newsletter

Volume 6, No. 2 April 2006

In this issue…

Editor's Note
Focal Points – PHI reduction for Karmex DF and Direx 4L
Brown rot control suggestions for 2006
Plant Pathology Updates
New DMI resistance information
Update on Guardian rootstock and nematode management
Regulatory Update
Interesting peach web sites

Editor's Note

We are largely through bloom in much of the Southeast, and it has actually been relatively dry during the bloom and shuck split growth stages -- at least to date and certainly by comparison to last year. I am hopeful that this will translate into reduced disease pressure, especially from bacterial spot. Of course, predicting the weather is difficult.

I mentioned the review of copper materials in the last newsletter, and I appreciate the solid response of the peach industry to the copper reregistration process. Many of the DMI materials, such as propiconazole and oxytetracycline, are also undergoing reregistration at this time. Dan Horton, my entomology counterpart, has indicated that it is now our turn – referencing the fact that insecticides have been under fire for some time, and now the fungicides, bactericides, and antibiotics are on the table for review. Nonetheless, I feel relatively confident that we will come through with these disease-control products intact, though there may be some moderate changes to use requirements. Of course, predicting EPA actions is also difficult – close to that of the weather.

In this issue, the articles are largely limited to plant pathology issues. Andy Nyczepir and his cronies at USDA and Clemson have written an article which furthers our knowledge of Guardian rootstock. In addition, Guido Schnabel shares the most recent information in the ongoing battle with DMI-resistant strains of brown rot.

Also, Bob Bellinger shares several interesting web sites which may be of interest to the peach industry.

I hope you learn something of value to you in this issue, and of course, we all hope the season continues to progress well.

Phillip M. Brannen
Editor

Focal Points – New Information for the Peach Industry

❈ **PHI Reduction for Karmex DF and Direx 4L.** Several years ago, a request was made to IR-4 to conduct residue trials to support a reduction in the preharvest interval (PHI) for diuron (Karmex DF and Direx 4L) use in peach orchards from 90 days to 20 days. After several years of work by IR-4, the EPA ruled in February in favor of shortening the PHI for diuron in peach orchards to 20 days. This change is available as a supplemental label and can be viewed at www.cdms.net . States approving the supplemental label for the 20 day PHI for peach orchards include AL, AR, GA, IL, MD, MI, MO, NJ, NC, OK, PA, SC, TX, VA, and WV.

The shorter PHI for diuron will offer growers greater flexibility and extended residual control later into the summer. If growers use a fall application of simazine, a diuron application can now be delayed well into the spring. Fall applied preemergence herbicides will provide residual control into late April or early May in the Carolinas and Georgia; therefore, a preemergence herbicide is not needed until control from the fall preemergence herbicide begins to fail. Having the ability to delay a spring diuron application until early May will result in extended residual control into mid and late summer. Currently, the PHI for Sinbar is 60 days, and therefore, a diuron/Sinbar tank mix can not be used in early May for varieties maturing in June or early July. However, Solicam would be an excellent substitute as a tank-mix partner with diuron for early maturing varieties. The Sinbar situation will hopefully change, since IR-4 is developing data to support a reduction in PHI for Sinbar to 20 days in peach orchards as well.

(Submitted by Wayne Mitchem, North Carolina State University)

❈ **Brown rot control suggestions for 2006.** As we have mentioned before, we have observed resistance to propiconazole or a strong shift towards resistance in Georgia, and it is likely occurring or will occur soon throughout the Southeast. As such, we have changed our recommendations to take this into account. Guido Schnabel (Clemson University) has developed lab data which would suggest that Elite is the DMI material of choice at this time (see article below). This would indicate that the cross resistance within this class of fungicides may not be complete, in that tebuconazole (Elite) is moderately more efficacious than either propiconazole (Propimax, Orbit, etc.) or Indar (fenbuconazole) in the presence of resistant strains of the brown rot fungus. Elite is currently recommended in our spray guide at a rate of 4 oz per acre. However, as per the label, we can apply up to 8 oz per acre. Currently, we are set at 2 oz per acre on Indar and 4 oz per acre on propiconazole, and there is no option to increase the rates at this time. We are pursuing a potential label change with Indar, which would allow for a substantial increase in the Indar rate, but this may take some time, and there is nothing definite relative to this action.

What does this mean relative to brown rot control where resistance has been observed? Consider an application of Pristine at the high rate for the ~14-day before harvest application, and follow this with Elite at the ~7-day before harvest application (see 2006 SOUTHEASTERN PEACH, NECTARINE AND PLUM PEST MANAGEMENT AND CULTURE GUIDE for further explanation; http://entomology.ent.uga.edu/peach/peach_guide/title.htm). Alternate these materials as needed and as per label till harvest is complete. The costs of these materials are greater than those of generic propiconazoles. However, even if this is not a high-pressure brown rot year, the use of propiconazole alone will increase the potential for heavy brown rot pressure in the following year, due to a continued shift towards stronger resistance. In addition, I would definitely use Scholar in the packing line if possible.

Though one can not necessarily extrapolate from one fungus or plant system to another, a recent scientific article on sugar beet leaf spot, caused by *Cercospora beticola*, indicates that use or strobilurin fungicides is very helpful relative to managing DMI resistance, reducing the number of DMI-resistant fungi in a field population (Karaoglandis and Bardas [April 2006] Plant Disease 90:419-424). **Bottom line – we need to preserve the DMI and strobilurin chemical classes until something else comes along, and very little is coming along at this time. Keep this in mind as you plan your brown rot control measures for the next few months. Do not depend on the DMI fungicides alone for effective late-season brown rot control!**

Plant Pathology Updates

Maximize brown rot control in areas with DMI fungicide resistance problems

Guido Schnabel
Clemson University

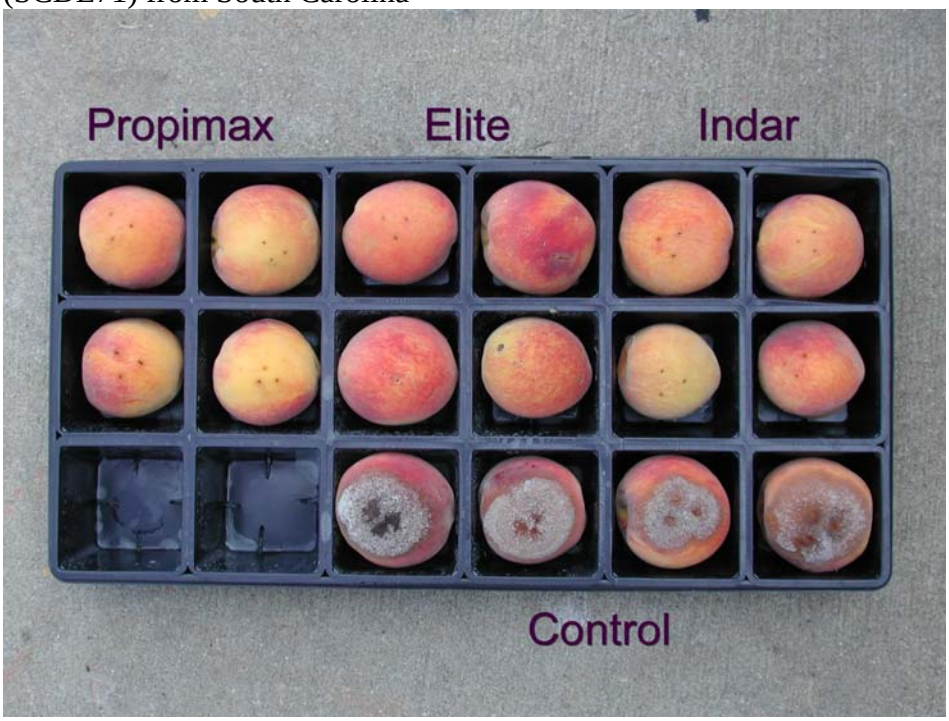
Resistance to DMI fungicides (i.e.Orbit, Propimax, Indar, or Elite) in the brown rot fungus *Monilinia fructicola* is well documented, and although the problem is not yet widespread, it poses a serious threat to commercial peach production in the Southeast. Growers in areas with documented resistance problems (mostly in middle Georgia) are urged to rotate respiration inhibitor fungicides (i.e. Pristine or Abound) with DMIs during the preharvest season. This strategy seemed to have paid off last year (2005), because no major disease outbreaks were reported despite weather conditions favorable for disease epidemics.

It is VERY important to keep using the DMIs in alternation with the respiration inhibitor (RI) fungicides, because sole reliance on the latter chemical group would eventually result in catastrophic RI resistance in the brown rot fungal population. Does it matter what DMI you use? We think so. Research at Clemson University conducted by guest scientist Imre Holb (University of Debrecen, Hungary) has shown that not all DMIs are equally effective. It turned out that isolates from middle Georgia were significantly better controlled with tebuconazole (Elite) and fenbuconazole (Indar) compared to propiconazole (Orbit, Propimax) in protective applications. In curative applications (fungicides applied after infection), it came down to only one fungicide – Elite. Tebuconazole (Elite) was significantly better when compared to both propiconazole and fenbuconazole (Figure 1). In this study we also included an isolate from an area with no history of DMI resistance. This isolate was effectively controlled by all three DMIs (Figure 2). I should mention at this point that this study was conducted under controlled conditions, using detached peach fruit. Therefore, we cannot be absolutely certain that the same results can be expected in field settings when using airblast sprayers. However, this is the best data we currently have, and it is certainly worth consideration when making disease control decisions this spring and summer.

Assuming that the controlled detached-fruit experiments somewhat reflect what might happen in the field, we can conclude that Elite may be the best rotation partner for RI fungicides (i.e. Pristine and Abound) in areas with documented DMI-resistance problems. In all other areas where no resistance is suspected, including South Carolina, Orbit and Propimax should do just as well as Indar or Elite for rotation with the RI fungicides.

Figure 1. Efficacy of three DMI fungicides in curative applications against a Brown rot isolate (GADL193.04) from middle Georgia

Figure 2. Efficacy of three DMI fungicides in curative applications against a Brown rot isolate (SCDL71) from South Carolina



Taking a closer look at Guardian® peach rootstock susceptibility to root-knot nematode

Andy Nyczepir
USDA-ARS

Tom Beckman
USDA-ARS

Greg Reighard
Clemson University

Root-knot nematodes, *Meloidogyne* spp., are considered to be the most damaging nematodes in the world and are distributed in the temperate, tropical and equatorial areas. Root-knot nematodes reduce fruit production in several economically important *Prunus* species, including peach. The most economic and environmentally sound method for managing this nematode pest in *Prunus* species is the use of resistant rootstocks, where available. The search for peach rootstock root-knot resistance began in the United States, but has since been investigated in other countries, such as France and Spain.

Briefly, in 1983 peach rootstock line 'BY520-9' was identified as providing greater tree survival than Lovell on two peach tree short life (PTSL) sites through eight years of evaluation. Guardian® Brand 'BY520-9' was first made commercially available in 1993 as a bulked seed lot collected from the surviving seedling of 'BY520-9', and has since become the preferred rootstock for peach growers in the Southeast. During the early greenhouse evaluations of Guardian® for root-knot nematode resistance, it was reported that in the presence of *M. incognita*, root galling was just as abundant on Guardian® as on Lovell. However, the majority of galls on Lovell was associated with egg masses (i.e., reproductive galls), whereas many of the galls produced on Guardian® were not (i.e., non-reproductive galls). Since Guardian®'s release, researchers have been evaluating the individual lines that make up the bulked seed lot, looking for those with superior horticultural characteristics that would result in a superior seed lot. One such Guardian® line that was initially identified as having superior horticulture characteristics was SC 3-17-7; however, information on root-knot nematode susceptibility on this advanced line was unknown until 2005 (see SE Regional Peach Newsletter; July 2005). It was found that after 23 months in a field microplot trial that SC 3-17-7 tree growth was not affected by *M. incognita* infection even though root galls were detected.

Since these reports, it has been observed that larger than normal root galls were detected on certain trees of Guardian® line SC 3-17-7 under commercial orchard conditions. Furthermore, it also appeared that these galls may be supporting egg mass production. The objective of this follow-up research was to evaluate the effect of *M. incognita* (GA-peach isolate) on susceptibility of SC 3-17-7 using increased replication (i.e., 50 reps/treatment) under greenhouse conditions. Root systems were also rated for number of egg masses produced (Taylor & Sasser). The egg mass index consisted of a 0 to 5 scale, with 0 = no egg masses, 1 = 1 to 2 egg masses, 2 = 3 to 10 egg masses, 3 = 11 to 30 egg masses, 4 = 31 to 100 egg masses, and 5 = > 100 egg masses. Host susceptibility was determined according to the rating system as follows: 0 = immune, 1-2 = a poor host (resistant), and $\geq$ 3 = a good host (susceptible). The experiment was repeated one time.

In Test 1, root galling was just as abundant on SC 3-17-7 as on Lovell, with fewer ($P < 0.0001$) galls detected on Nemaguard 111 days after inoculation (Table 1). In Test 2, galls were most abundant on Lovell roots, intermediate on SC 3-17-7, and fewest on Nemaguard. However, the majority of galls on Lovell were associated with egg masses (i.e., reproductive galls), whereas many of the galls produced on SC 3-17-7 were not associated with egg masses (i.e., non-reproductive galls) in both tests. These results indicate that SC 3-17-7 is a poor host to the population of *M. incognita* tested. Reproduction by *M. incognita* as indicated by number of egg masses per plant, number of eggs per gram of dry root, and number of eggs per egg mass was significantly less ($P < 0.0001$) on SC 3-17-7 and Nemaguard (known resistant) than on Lovell (known susceptible). There were no differences in reproduction between Nemaguard and SC 3-17-7 in Test 1, but differences were detected

in number of egg masses per plant and number of eggs per egg mass in Test 2. One explanation for this may have been increased soil temperature, which is known to break root-knot nematode resistance in Nemaguard. Test 1 was conducted during January to May (i.e., cooler ambient temperatures) and Test 2 during April to July (warmer ambient temperatures). Since Nemaguard is in the pedigree of SC 3-17-7, it would not be surprising to see Guardian® respond to high soil temperatures in a manner similar to that of Nemaguard. Nonetheless, in both tests SC 3-17-7 would still be rated resistant to *M. incognita* infection based on the number of egg masses recovered per plant (i.e., 1-2 egg masses).

Evaluations of Guardian® rootstock under continual nematode pressure are underway. It is also important to note that preplant fumigation in combination with a nematode resistant rootstock has been and still is recommended for increased tree longevity and maximum protection against root-knot nematodes [refer to 2006 Southeastern Peach, Nectarine and Plum Pest Management and Culture Guide for recommended nematicide(s)].

Table 1. Susceptibility of Lovell, SC 3-17-7, and Nemaguard peach seedlings to *Meloidogyne incognita* (GA-peach isolate) grown in the greenhouse for 111 days after inoculation in Byron, Georgia (n=50)[1]

	Egg masses per plant		Galls per plant[2]		Eggs per g^{-1} dry root		Eggs per egg mass	
Rootstock	Test 1	Test 2	Test 1	Test 2	Test 1	Test 2	Test 1	Test 2
Lovell	97 a	100 a	100 a	100 a	22,680 a	18,145 a	852 a	431 a
SC 3-17-7	1 b	1 b	100 a	91 b	7 b	50 b	14 b	93 b
Nemaguard	0 b	0 c	1 b	3 c	0 b	1 b	0 b	2 c

[1]Initial population density of *M. incognita* was 3,000 eggs/450 cm^3 sand-vermiculite medium.
[2]The egg mass and root gall index consisted of a 0 to 5 scale, with 0 = no egg masses, 1 = 1 to 2 egg masses, 2 = 3 to 10 egg masses, 3 = 11 to 30 egg masses, 4 = 31 to 100 egg masses, and 5 = > 100 egg masses.
[3]Means within a column followed by the same letter are not different ($P < 0.0001$) according to Fisher's LSD.

Regulatory Updates

Recent Web sites of interest to the peach indusry

Bob Bellinger
Clemson University

The following are the latest reports online for peaches, nectarines and plums (and other stone fruits) from the USDA/FAS.

The U.S. Stone Fruit Industry Situation and Outlook (April 2003)
http://www.fas.usda.gov/htp/horticulture/stonefrt/Master%20Stone%20Fruit%20Presentation%202003.pdf

The U.S. Peach and Nectarine Situation (April 2003)
http://www.fas.usda.gov/htp/horticulture/stonefrt/Master%20peach%20and%20nectarine%20presentation%206-25-03.pdf

The U.S. and World Stone Fruit Situation - 2004 (October 2005)
http://www.fas.usda.gov/htp/Commodity_Pages/Fruits/2005%20Stone%20Fruits.pdf

Stone Fruit Situation and Outlook in Selected Countries (includes U.S.) **- 2004** (August 2005)
http://www.fas.usda.gov/htp/Hort_Circular/2005/08-05/_08-03-05_%20Stone%20Fruit%20Situation%20and%20Outlook.pdf

The following are the latest reports online for peaches, nectarines and plums (and other stone fruits) or fruits from the USDA/ERS.

How Expensive are Fruits and Vegetables?
http://www.ers.usda.gov/publications/aib790/aib790d.pdf
This is a section of this report:
How Much Do Americans Pay for Fruits and Vegetables? (July 2004)
http://www.ers.usda.gov/publications/aib790/ *or* as a PDF at:
http://www.ers.usda.gov/publications/aib790/aib790.pdf

Fruit and Tree Nuts: Policy
http://www.ers.usda.gov/Briefing/FruitAndTreeNuts/policy.htm

China's Rising Fruit and Vegetable Exports Challenge U.S. Industries
http://www.ers.usda.gov/publications/fts/feb06/fts32001/fts32001.pdf

Pesticides in the Nation's Streams and Ground Water, 1992–2001—A Summary. USGS Fact Sheet 2006–3028. March 2006.
http://pubs.usgs.gov/fs/2006/3028/
As a six-page pdf:
http://pubs.usgs.gov/fs/2006/3028/pdf/fs2006-3028.pdf

Southeastern Regional Peach Newsletter

Volume 6, No. 2 April 2006

Editor, Phillip M. Brannen
Horticulture Assistant Editor, Kathy Taylor
Entomology Assistant Editor, Dan Horton
Weed Science Assistant Editor, Wayne Mitchem

Published quarterly. The Southeastern Regional Peach Newsletter is available through the following website http://resources.caes.uga.edu/publications/newsletters/SRPN/. If a hardcopy is desired, please contact your local county agent. Your local County Extension Agent is a source of additional information on these and other subjects.

Learning for Life

The University of Georgia and Ft. Valley State University, the U.S. Department of Agriculture and counties of the state cooperating. The Cooperative Extension Service offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, sex or disability. An equal opportunity/affirmative action organization committed to a diverse work force.