Southeastern Regional Peach Newsletter

Volume 2, No. 2 May 2002

In this issue…

Editor's Note
Focal Points
Pathology Updates
Weed Control Updates

Editors Note

We are in the middle of yet another "thrill ride" of a peach season. Depending on location, you have likely already had a low-chill hour "panic" or a freeze-damage "panic" -- sometimes both. If rainfall patterns continue, we have yet another "panic" coming – brown rot. Ralph Waldo Emerson once stated, "he has not learned the lesson of life who does not every day surmount a fear." If this is true, I would think that peach producers have learned well the lesson of life. For this issue, we concentrate our pathology efforts on brown rot – surmounting one of our fears. We also cover major weed-control issues of timely significance as we head into summer.

I hope all goes well for each of you as the season unfolds, and I hope yours fears will not be realized.

Phillip M. Brannen
Editor

Focal Points – New Information for the Peach Industry

❈ **Ziram public comment period.** EPA is reviewing Ziram, as it will establish the Reregistration Eligibility Decision (RED) in 2002. Public comment is invited by EPA through 28 May, 2002. Documents associated with Ziram can be found at: http://www.epa.gov/pesticides/reregistration/ziram/

❈ **Cancellation of Nemacur.** All domestic uses of fenamiphos (Nemacur) will cease as of 31 May, 2005. Bayer Ag has voluntarily cancelled the registration. During the three-year phaseout, Bayer will continue to produce and sell Nemacur. After the cancellation date, dealers can continue to sell the material as long as it remains in the channels of trade. The reason given for cancellation is the escalating costs of defending the material relative to limited use. Loss of Nemacur will mean that it is even more important for us to concentrate on root stock and fumigation before establishing a new orchard. No post-plant options will be available after this cancellation.

❈ **Scholar™ available for SC and GA post-harvest application.** Once again, Scholar is available through Section 18 registrations for peach in SC and GA. Scholar provides excellent control of brown rot and Rhizopus rot.

Summer Weed Control in the Orchard

Wayne Mitchem
North Carolina State

Weed competition with trees is greatest in late spring and summer. Winter annual weeds are hosts to cat-facing insects, reduce the radiant heat benefit, and can be somewhat competitive in early spring. However, summer weeds can compete heavily with trees trying to size fruit. Ideally, a spring preemergence herbicide spray will keep orchards clean through harvest. Unfortunately we do not live in an idea world. Difficult to control annual weeds like Palmer amaranth (a type of pigweed), morningglory, and sometimes annual grasses, like crabgrass, can be a problem in mid and late summer maturing varieties. Perennial grass weeds like bermudagrass, johnsongrass, and bahiagrass may be the most competitive weeds in fruit trees and are not controlled with preemergence herbicides.

Paraquat controls most annual broadleaf weeds 2 to 4" in height. Poast is an effective herbicide for johnsongrass and crabgrass. In the event bermudagrass or bahiagrass are a problem, Fusilade would be an excellent choice. Poast is pretty good on bermudagrass as well. Postemergence applications of Poast or Fusilade should be applied to bermudagrass and bahiagrass with 4 to 6" of new growth in early summer. Johnsongrass should be treated when it has reached a height of 8 to 15". Always follow the initial application with a second application when regrowth occurs. Failing to make a second application will result in less than desirable control.

Providing good summer weed control increases fruit size, therefore marketable fruit yield. MacRae et. al. (unpublished data) reported increases in fruit size to be directly related to weed competition (Figures 1 and 2). A logical conclusion since weeds compete with fruit loaded trees for water. Each week the orchard was maintained weed-free marketable fruit yield increased by 255 lbs/acre or nearly 3.5 % (Figures 3 and 4). This data suggests that weeds emerging 3 or 4 weeks prior to harvest should be removed to maximize fruit size and yield.

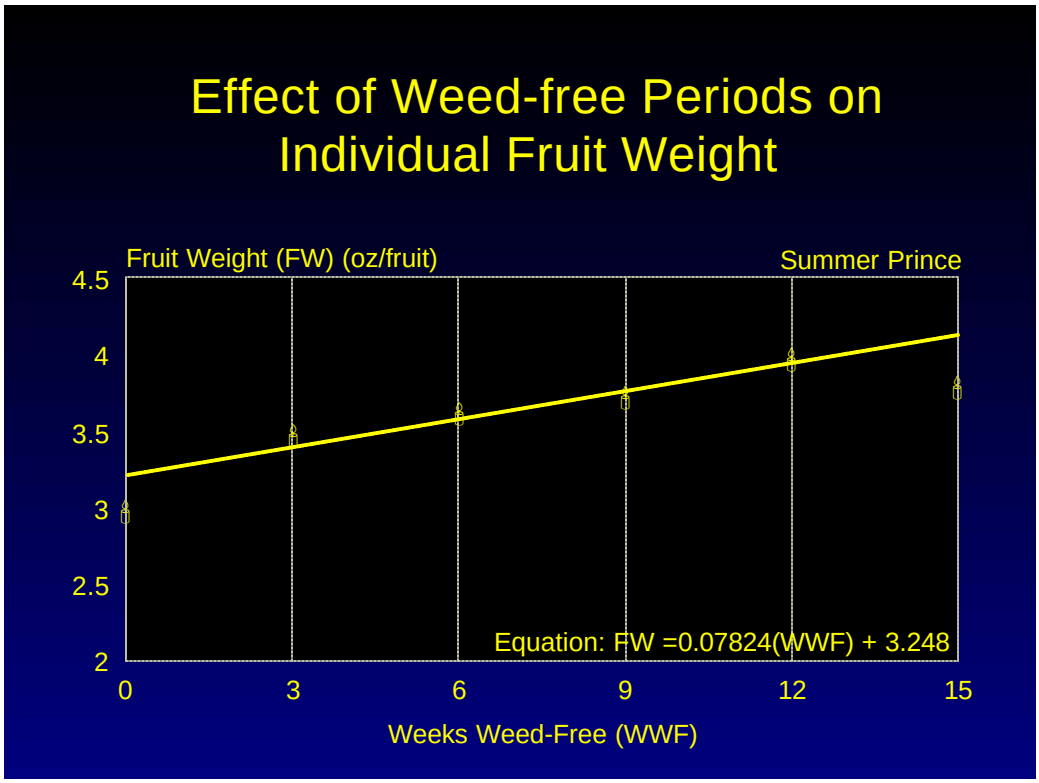

Figure 1. Fruit weight as related to weed-free periods.

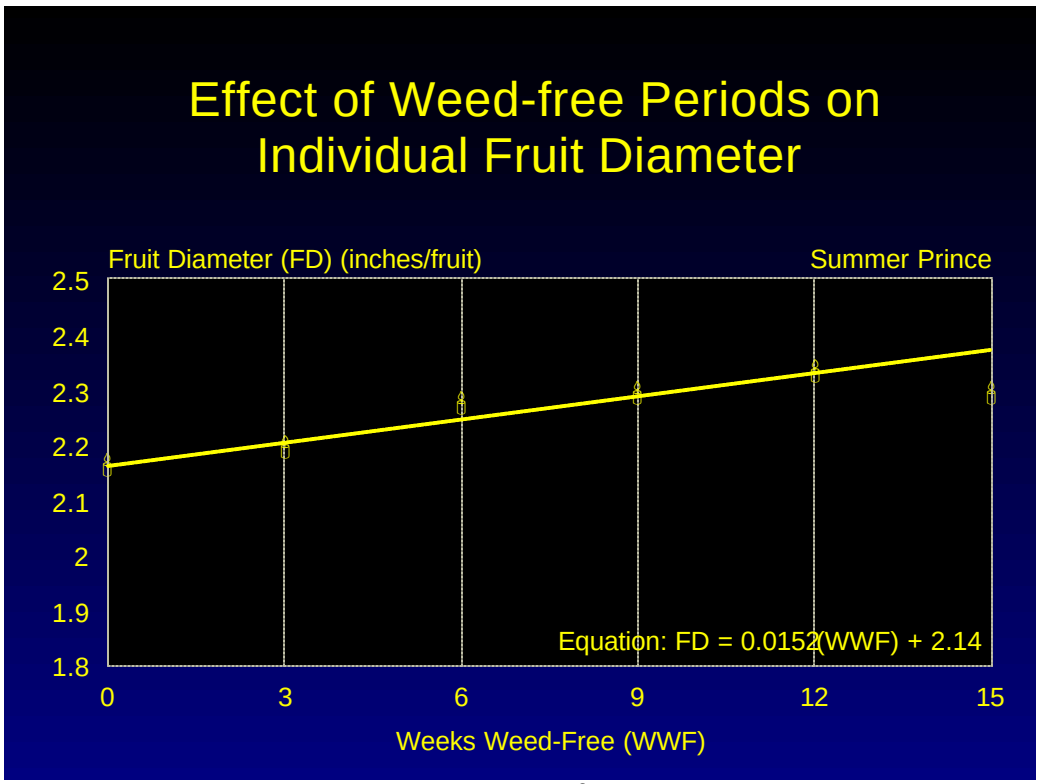

Figure 2. Fruit diameter as related to weed-free periods.

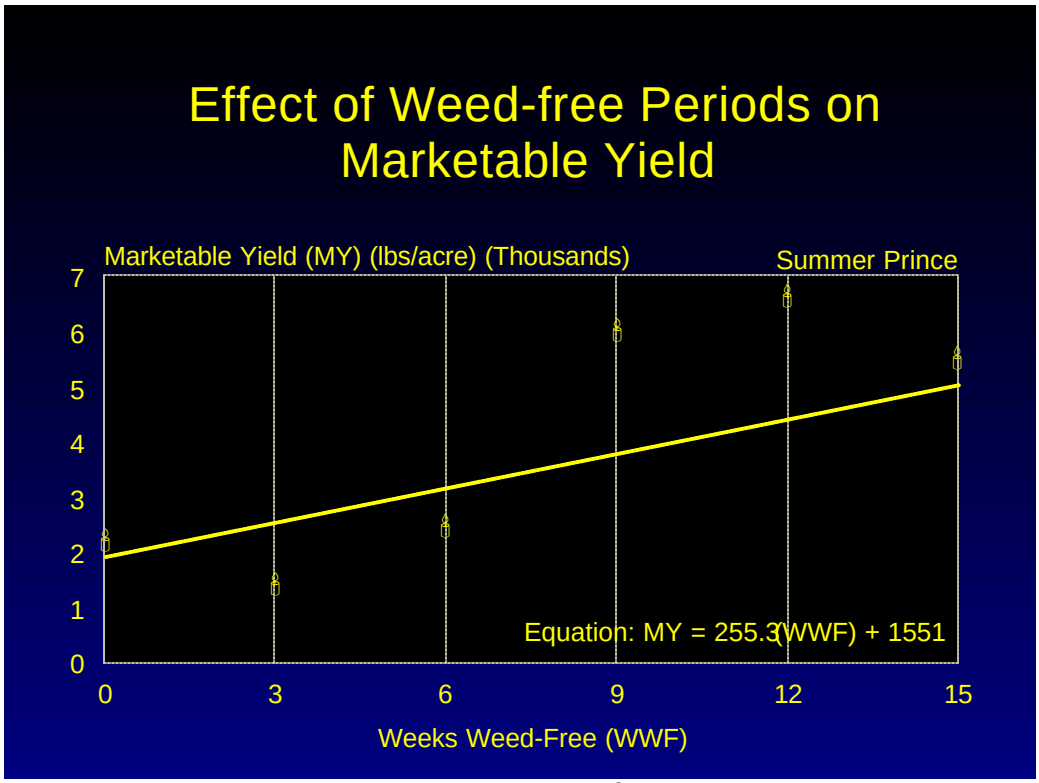

Figure 3. Marketable yield as related to weed-free periods.

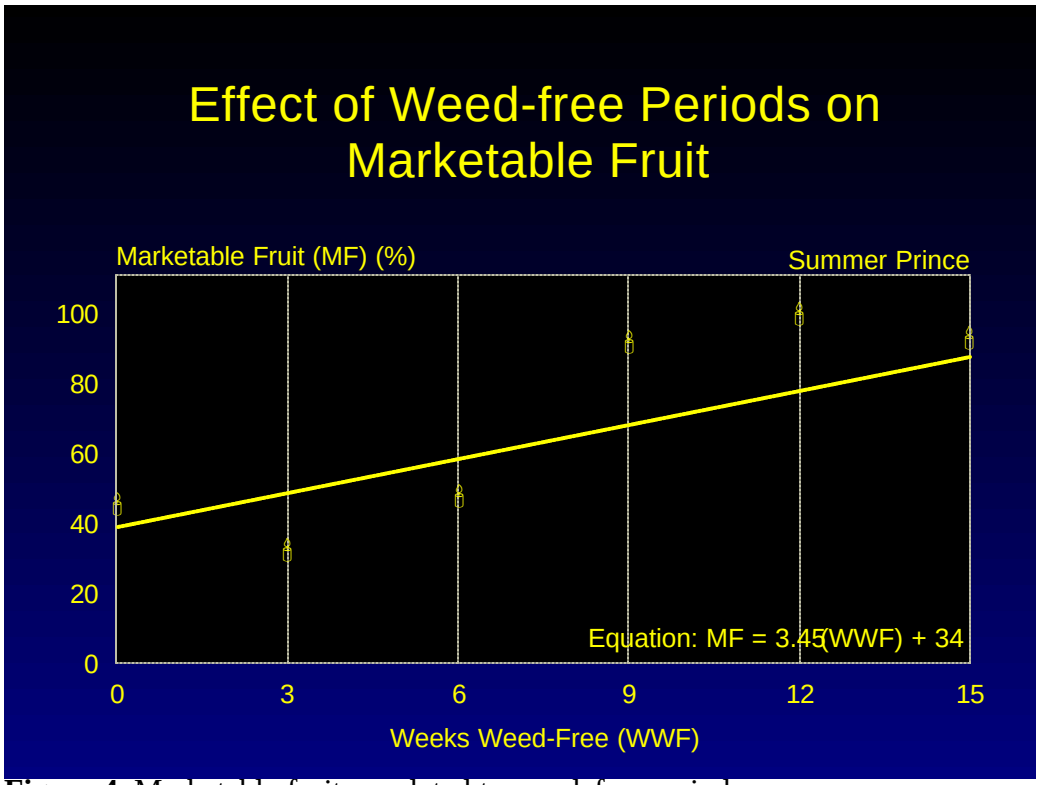

Figure 4. Marketable fruit as related to weed-free periods.

Plant Pathology Updates

Management of Preharvest and Postharvest Brown Rot of Peach in the Southeast -- Overview of Brown Rot Control Options

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Clemson University

Management of Preharvest and Postharvest Brown Rot of Peach in the Southeast

Brown rot of peach (Figure 1), caused by *Monilinia fructicola* (G. Wint.) Honey, continues to be the disease of peach which most consistently limits both fruit yield and quality on a yearly basis. When environmental conditions are conducive, brown rot losses can be staggering to producers. Estimates of disease losses in Georgia for 2001 were $4.3 million in direct losses and $1.5 million in fungicide costs. When blossom blight occurs during bloom (Figure 2), this sets the stage for extensive brown rot infections later in the season, especially if rainfall is prevalent during the growing season leading up to harvest. However, even in the absence of early-season blossom blight, residual inoculum from old cankers, peduncles, mummified fruit (Figure 3) and green fruit rot (mid-season fruit infections; Figure 4) is sufficient to produce epidemic levels of brown rot in any wet year. The prolific production of conidial spores (Figure 5), which are spread through wind and rain, allows for rapid epidemic development within an orchard or a region.

Figure 1. Brown-rot infected fruit. The fruit on the right shows the characteristic firm, tan-brown decay with associated spore (conidia) production. A single infected fruit can produce massive numbers of "powdery" spores which are released and spread by wind, rain splash, or insects.

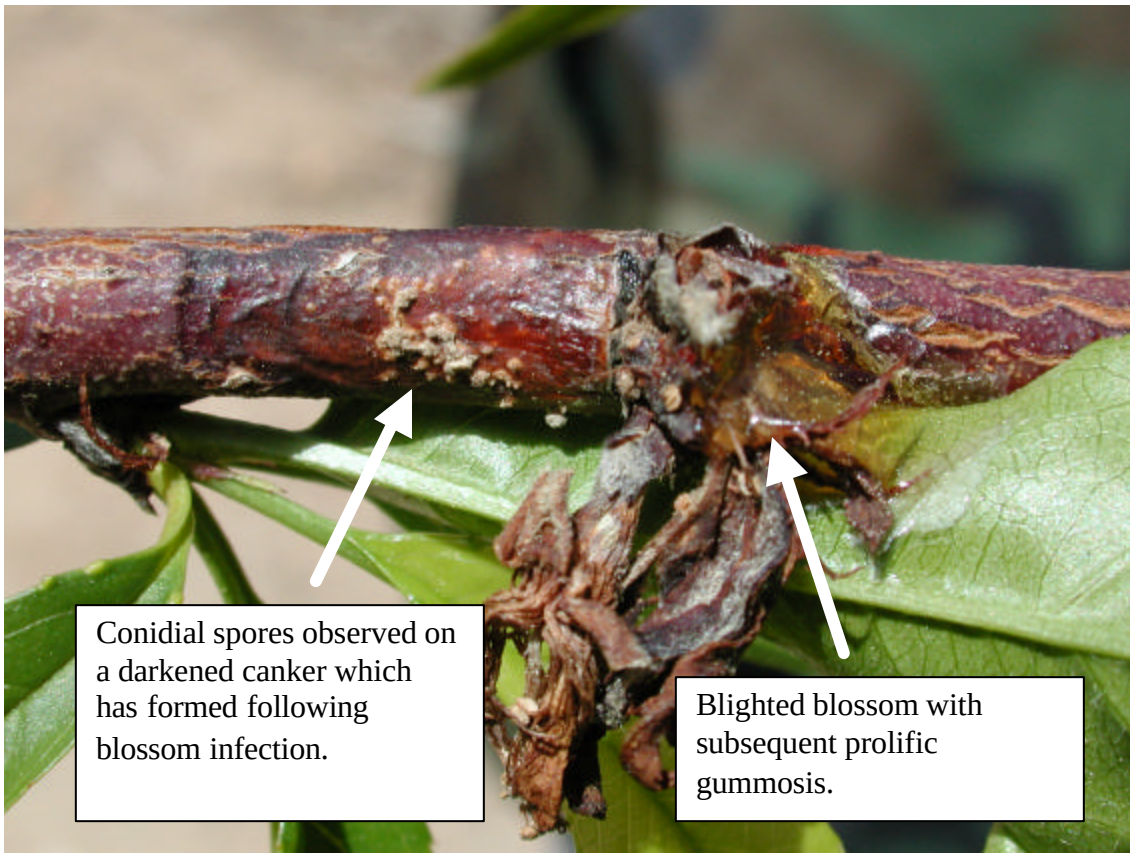

Figure 2. Blossom blight infection and subsequent production of spores on adjacent stem. Sporodochia (fruiting platform) of *Monilinia fructicola* can occur on both blossoms and twigs, producing conidial spores which are viable throughout the growing season. These spores can infect green or ripening fruit.

Figure 3. Mummified peach fruit on the ground. "Mummies," especially those which remain on the tree, serve as an important inoculum source from one year to the next.

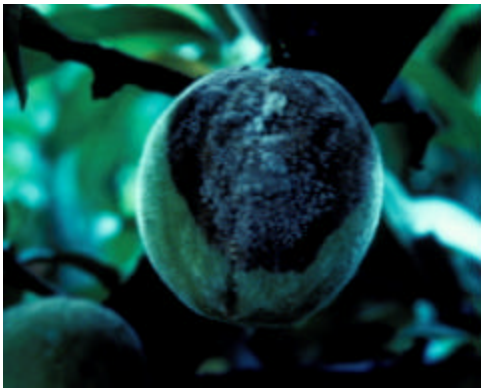

Figure 4. Green fruit rot. *Monilinia fructicola* can infect fruit early in the growing season. Under wet conditions, green fruit rot will provide inoculum for severe late-season and postharvest epidemics.

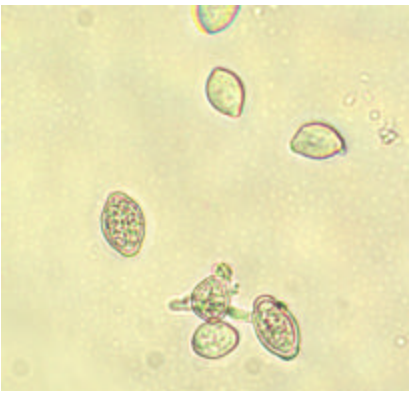

Figure 5. Spores (conidia) of *Monilinia fructicola*. Brown rot infected blossoms, peduncles, cankers, or fruit can produce these spores.

Management of late-season and post-harvest brown rot can present quite a challenge to producers. Currently, the predominant late-season fungicides fall within a few, limited mode-of-action classes. The predominant class, demethylation inhibitors (DMIs), includes Orbit®, Indar®, Nova®, and Elite®. Of these materials, Orbit, Indar, and Elite are generally considered to be superior to Nova in terms of efficacy against brown rot. Since these materials fall within the same class, there is a possibility that resistance will build up if these materials are utilized exclusively for late-season brown rot control. Though registered and possibly efficacious, neither DMI nor strobilurin materials are recommended for control of blossom blight, since overuse in the early season may result in resistance buildup in the pathogen populations, and other materials are readily available for blossom blight control (i.e. Topsin-M®, Chlorothalonil-containing products, etc.). Thus far, there is no substantive evidence of DMI resistance in South Carolina orchards (Table 1); hopefully, the same may be true throughout the southeast, and with good resistance management techniques, we should be able to maintain the efficacy of DMI fungicides for an extended period of time.

What are the additional fungicide classes which are currently available, and where do they fit in resistance management? Captan-containing materials (Captan or Captec) are not as efficacious as the better DMIs, and they have potential to cause "inking" or spotting of fruit when used in pre-harvest applications. Captan-containing materials are best utilized for either control of blossom blight or mid-season green fruit rot. Elevate®, which contains Fenheximid, is currently the sole representative of a new class of chemistry, the hydroxyanilids. When combined with Captan, Elevate has shown promise as a brown rot material (Table 2) and it is registered for brown rot control. However, it is too weak to stand on its own, and the same Captan issues apply. Therefore, Elevate is not currently recommended for use in southeastern peach production.

Currently, Abound® is the only registered representative of the strobilurin class. Abound is recommended as a resistance management tool for the DMI fungicides. It has generally proven itself to be equivalent to the DMI materials – especially when applied at the high rate. Use of Abound for the first preharvest application, followed by one or two DMI applications (depending on late-season brown rot pressure) should give excellent control of brown rot, while imposing a resistance-management strategy for preharvest sprays.

If all goes well, a new product will soon be on the market for brown rot control.

The product safety profile is excellent, and efficacy has also been excellent in field trials. The material will be named Pristine™ (BAS 516), and it contains strobilurin (pyraclostrobin; BAS 500F) and anilide (nicobifen; BAS 510F) active ingredients. With the addition of this new product, we will have another excellent resistance-management tool, since nicobifen adds an additional class of chemistry with a mode-of-action which is not related to the DMIs or strobilurins.

For post-harvest brown rot control, we currently only have one viable fungicide, Scholar™. Scholar contains Fludioxonil, an active ingredient from yet another class of fungicides, the phenylpyrroles. Scholar is currently available only through Section 18 state registrations. However, it should receive a full registration within the next year – in theory. Scholar provides excellent control of post-harvest brown rot, but we are in dire need of additional materials for this use pattern. If *M. fructicola* develops resistance to Fludioxanil, we do not have a good option for post-harvest management.

Needless to say, brown rot control will continue to be a major issue for peach production during the foreseeable future. However, the advent of new materials will help us to control this disease. The newer classes of chemistry, when utilized in a resistance management program, will help us to preserve the DMI fungicides – hopefully for many years to come.

Table 1. Sensitivity of isolates of *Monilinia fructicola* to propiconazole in South Carolina peach orchards.

		ED_{50} (mg/l)[a]		
Source of isolates	Isolates (no.)	Range	Median	Mean
Musser Farm, initial[b]	44	0.02-0.15	0.03	0.04
Commercial peach, 1995[b]	47	0.01-1.82	0.085	0.15
Commercial peach, 1996[b]	29	0.02-1.09	0.04	0.13
Commercial peach (CC), 2001[c]	13	0.002-0.034	0.014	0.013
Commercial peach (EZ), 2001[c]	9	0.003-0.014	0.01	0.011
Commercial peach (SY), 2001[c]	15	0.003-0.027	0.013	0.009

[a]Concentration of propiconazole in potato dextrose agar required to suppress radial growth of mycelium 50%

[b]Data from Zehr et al. (1999). Musser Farm site received no demethylation-inhibiting (DMI) fungicides prior to 1993. Commercial peach, 1995 and 1996 were sites where DMI fungicides were the principal fungicides used.

[c]The commercial sites CC, EZ and SY were established orchards (at least 7 years old) and had been treated with DMI fungicides every year (2-5 applications per year). Isolates were collected from areas with commercially unacceptable brown rot control.

Table 2. Evaluation of preharvest fungicide sprays to control brown rot in peach and nectarine orchards from Georgia (GA) and South Carolina (SC).

		Brown Rot incidence after 7 days of storage (% Infected Fruit)[1]				
		Musser Farm, SC[2]		GA[3]		
Treatment	Rate/acre	Red Gold	Red Skins	Blake	93P4371	88P2251
Nontreated check (no preharvest sprays)	---	60 a	23.4 a	41.9 a	90.0 a	86.3 a
Indar 75WSP	2 oz	1.4 c	2.8 a	---	---	---
Orbit 3.6EC	4 fl oz	2.8 c	2.8 a	10.0 b	40.0 b	41.3 bc
BAS 516 02F	0.656 lb	9 c	3 a	23.5 ab	40.3 b	26.3 c
BAS 516 02F	0.92 lb	8.3 c	1 b	13.7 b	42.2 b	32.5 bc
Captan 50W	8 lb	17.4 bc	2.8 a	---	---	---
Elevate 50WDG	1.5 lb	21.9 b	0.3 b	---	---	---
Elevate 50WDG +	1 lb	---	---	5.0 b	----	45.0 b
Captan 4L	8pt					
Abound 2.08F	15.4 fl oz	11.1 bc	1.7 a	---	---	---
Abound 2.08F (first spray);	15.4 fl oz	---	---	---	---	41.3 bc
Orbit 3.6EC (Second Spray)	4 fl oz					

[1] Means within the same column followed by the same letter do not differ significantly (a = 0.05), FLSD.

[2] Latron B1956 (16 flozs) was added to the Indar 75WSP treatment. Treatments were replicated four times in a randomized complete block design, one tree per replicate. Trees were sprayed to runoff (1.5 gallons/tree) at 250 psi by handgun on June 28 and July 9 (Red Gold nectarines) and July 11 and July 18 (Red Skin peaches). On July 2 (nectarines) and on July 16 (peaches), two fruits per tree were inoculated with brown rot taken from several M. fructicola infected Coronet peach to encourage uniform inoculum levels. When mature (nectarines July 12 and peaches July 25), 72 fruit per tree were picked (ripe fruit only), placed on fiber trays which then were packed in cardboard boxes, and stored in an air-conditioned room at 22-24 ^{o}C.

[3]Variety 'Blake' was located at the UGA Hort Farm, Athens GA. Test varieties 93P4371 and 88P2251 were located at the USDA Southeastern Fruit and Nut Research Station, Byron, GA.

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PUTTING KNOWLEDGE TO WORK

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