Southeastern Regional Peach Newsletter

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Editor's Note

This year provided plant pathologists throughout the Southeast with more than enough to keep them busy, while also showing us that diseases can develop which are not expected. The photo below is representative of anthracnose, which was relatively prevalent in late-season peaches in Georgia. Normally a cooler-climate issue of peaches, the prolonged, wet, cool spring obviously played a part in increased disease. In this issue, Guido Schnabel (Clemson University) has taken the lead on a couple of articles relative to some of the less-often observed pathogens which caused damage in 2005.

Not to leave out the entomologists, Marie Guilhamoulat, a summer intern from France, has developed an excellent San Jose scale insect article, with the guidance and help of Dan Horton and Gerard Krewer (University of Georgia). This article gives the state of the art for control of this insect (also see Volume 4, No. 1 [March 2004] for additional scale information). It is a good time to be considering scale control measures for 2006, so this is very timely.

On another negative note, hurricanes are once again wreaking havoc throughout much of the Southeast, and a review of the last newsletter (Volume 5, No. 2) may be warranted by some, especially in Alabama and other hard-hit areas. I suspect that root rots will damage peach trees again this fall, and some regions will see increased tree death in the spring.

As you might have guessed from past newsletters, I enjoy clever quotes. With the excess of negative news, I decided that I would conduct a computer search for "optimism" quotes, since I wanted to end the Editor's Note on an upbeat. The first quote that popped up was "an optimist is a guy who has never had much experience." Not to be deterred, the one I liked most was from P. J. O'Rourke (Rolling Stone Magazine). "Nothing bad's going to happen to us. If we get fired, it's not failure; it's a midlife vocational reassessment." I suppose it is all in your perspective; keep on truckin!

Phillip M. Brannen
Editor

Focal Points – New Information for the Peach Industry

Pristine™ has shown its value in a 2005 Georgia research field trial. In the presence of DMI-insensitive *Monilinia fructicola* (brown rot) in middle Georgia, Pristine provided excellent suppression of brown rot, whereas the DMI standard, Propimax, failed to adequately control brown rot. The use of Pristine followed by Propimax was as effective as two Pristine applications, and this is good news, since it may allow us to manage resistance development in both the DMI and strobilurin classes of chemistry. We are currently encouraging the incorporation of Pristine in the preharvest sprays, but we would prefer that it be limited to ~14 days before harvest, with Propimax, Orbit and other DMIs utilized at ~7 days before harvest. The theory is that Pristine helps to reduce the DMI-insensitive *M. fructicola* populations to a level which will then allow a DMI to work in the second application. Keep in mind that this is only a theory at this point, but it looks good in research trials – so far.

Also, strobilurins work best as protectants, and resistance is more likely to develop for this class if its members are utilized in a curative manner. Strobilurin resistance will also develop less rapidly if the materials are utilized at their highest rates; though a rate range is given on the label, use at the maximum rate is encouraged. This will "hurt wallets" in the short term, but it will hopefully "maintain wallets" for years to come. Once strobilurin resistance develops, it will be overnight and complete, and this class of chemistry develops resistance easily and in multiple ways. We are "hanging by a thread" at this time relative to brown rot control; only proper management will turn a thread into a rope.

We strongly encourage the use of both brown rot controlling strobilurins (Pristine and Abound) and DMIs (Orbit, Indar, Elite, Propimax, etc.) only for the preharvest sprays. We likewise discourage the use of Flint, another strobilurin, for scab control. The DMIs and strobilurins are the only effective brown rot control materials in the market, and if we lose them, the industry may not be able to recover from the disease levels we would incur. Though it is legal to use both DMIs and strobilurins at other times in the season, there are other materials (classes) which are available to control pathogens which occur from bloom through cover sprays, so please, use these instead. **(click here for the full PDF report and additional details on this field trial)**

Pathology Updates

A summer disease complex causes severe damage on 'Babygold' peach

Guido Schnabel and Kerik D. Cox
Clemson University

'Babygold' peaches are known to be susceptible to summer diseases and significant yield losses are commonplace. In the Piedmont area of South Carolina, a recent summer disease epidemic caused significant damage to fruit in 2004, despite regular applications of fungicides. Two common fruit diseases, Anthracnose and Phomopsis fruit rot, were implicated as the causes of the disaster, but the symptoms on many fruit did not look like either disease. We decided to investigate and identify the organisms truly responsible for the 2004 epidemic. We also subjected the organisms isolated from the infected fruit to strobilurin fungicides – an effort to develop better management answers.

Using molecular and microscopic techniques, three pathogens were identified that caused Sour rot, Anthracnose, and Botryosphaeria fruit rot disease. The pathogens were *Geotrichum candidum* (a yeast fungus), *Colletotrichum acutatum* and *Botryosphaeria dothidea*, respectively (see Figure 1). Phomopsis was actually not found.

Abound (azoxystrobin) and Pristine (a mixture of pyraclostrobin and boscalid) were evaluated for their efficacy against five isolates of each of the three pathogens. Azoxystrobin only inhibited the Anthracnose fungus, and was ineffective against the fungi causing Sour rot and Botryosphaeria fruit rot. Pristine was highly effective against the Anthracnose and Botryosphaeria fruit rot fungi, but was only marginally effective against the Sour rot yeast. The differential sensitivity of the pathogens to fungicides indicates that growers need to properly identify these diseases to be able to choose the best material for management. The pictures shown in this article may help in this respect.

Summer diseases, like the ones detected here, have to be controlled with the cover sprays. If the yeast *G. candidum* becomes one of the pathogens causing disease in 'Babygold' peaches, cover sprays with captan in tight intervals are your best choice. Pristine will likely improve the efficacy of cover sprays if Anthracnose and Botryosphaeria fruit rot are the main disease problems.

When environmental conditions warrant (prolonged wet, cool, and overcast days), the use of Captan in cover sprays, as opposed to sulfur, should also be of great value for Anthracnose control. Captan is probably not quite as efficacious as either strobilurin product, but use of Captan in cover sprays will result in excellent scab control, give good green fruit rot suppression, and it is an excellent resistance-management tool. With concerns about resistance in both DMI fungicides and strobilurins, strobilurins should only be used in cover sprays as a last resort.

Sour rot on ‘Contender’

Anthracnose on ‘Babygold’

Botryosphaeria fruit rot on ‘Babygold’

Anthracnose and Sour rot on ‘Babygold”

Figure 1. Various unusual fruit rot diseases observed in 2005.

New outbreak of the red spot disorder on peach fruit

Guido Schnabel
Clemson University

Phil Brannen
University of Georgia

Similar to last year, many growers experienced severe fruit damage during 2005 due to the “mystery” disease called “red spot disorder” (see Figure 2). Although the red spots are merely cosmetic skin defects, buyers rejected loads, and consequently, many blocks of peaches were not picked. In a previous article (Southeastern Regional Peach Newsletter Vol. 4, No. 3), we reported a preventive control strategy consisting of 2-3 applications of Ziram 76W at 2 lbs per acre at two week intervals, beginning three weeks after pit hardening. This strategy was developed from 1995 field data, and it is still our best bet to manage the disorder (see below for 2005 regional guide notes).

Whether or not the disorder is really associated with a pathogen is unknown. We still do not know what actually causes the disorder, but this year we added a few more pieces to the puzzle. The disorder has only been observed during wet years. No symptoms have been reported during dry years, but red spot caused severe damage in years characterized by frequent rainfall during the summer, such as throughout much of the Southeast this year. The disorder seems to be specific to certain midseason varieties. Among the most severely affected varieties in 2005 were Winblo, Redglobe, Monroe, Cresthaven, Calred, and Flameprince. Curiously, the disease only caused damage in orchards older than 10 years. Nearby orchards with younger trees of the same variety often did not show symptoms.

Some possible causes can be eliminated based on observational data. We do not think the disorder is linked to skin damage by sand, because we observed the symptoms in areas with sandy and clay soil. The disorder is not linked to copper damage, because some orchards with heavy symptoms were not sprayed with copper-based products during the growing season. We could probably list ten ideas of what could possibly cause the disorder, but all of them are speculative at this time. Obviously, additional research is needed.

One question you might have is, "if this is not caused by a pathogen, why would Ziram help to control it?" First, it could be caused by a pathogen, and while that is a good question, it is not without precedent in other fruit commodities. Ziram is also utilized to suppress necrotic leaf blotch in apples, which is similarly an ill-defined, physiological disease without a known pathogen. Ziram is also helpful for control of sooty peach (see below), which was also prevalent in some orchards in 2005, again due to near-daily rainfall and overcast conditions.

Figure 2. Red spot disorder as observed in 2005.

Notes from 2005 Southeastern Peach, Nectarine and Plum Pest Management and Culture Guide

Peach red spot is a disease suspected to be caused by *Alternaria* species. Red spot appears as distinct 1/16 to 1/8 inch red spots, with occasional dead brown tissue in the center. **Ziram applied 2nd to 4th or 5th cover provides red spot suppression. Red spot is more severe on mid- to late-season yellow cultivars during periods of high humidity and extended morning fog.**

Sooty peach may be caused by a complex of several epiphytic fungi that produce dark mycelial growth. They grow on the surface of fruits using nutrients and plant juices. Periods of high humidity and extended morning fog are conducive to sooty peach. Scale, mites, aphids and other insects can contribute to sooty peach development by damaging foliage and fruit, or producing honeydew, accumulating nutrients on the fruit surface which may be colonized by sooty peach fungi. **Ziram is the preferred fungicide for sooty peach.** Captan will suppress some, but not all, of the fungi in the sooty peach complex.

Entomology Update

Observations of San Jose scale on peach at the Univ. of Georgia's Attapulgus Experiment Station

Marie Ghilhamoulat
Ecole Nationale Superieure d'Agronomie de Montpellie, France

Edited by Gerard Krewer and Dan Horton
University of Georgia

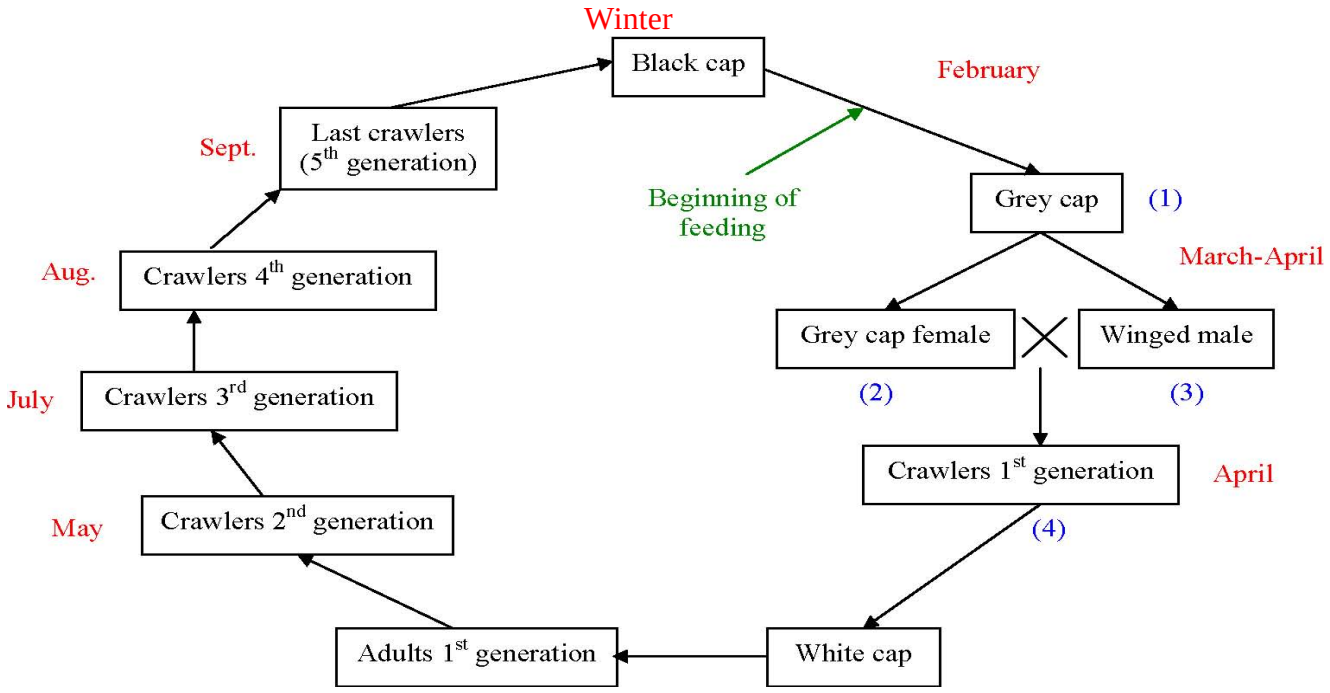
San Jose scale [SJS, *(Quadraspidiotus perniciosus)*] is a major pest of peaches and other woody deciduous plants, worldwide. This past summer I interned at UGA's Attapulgus Experiment Station. As part of my summer program I studied SJS.

Breeder blocks are unusual in ways which truly favor scale infestations. Trees are often closely planted, and they may receive minimal pruning. Selections in-evaluation, only a few of each, flower and mature from very early to quite late. Managing scale in a breeder block is complicated, but hopefully some of my observations will apply to producer orchards.

San Jose scale life cycle. SJS pass through multiple life stages during each of their several generations each year. Armored scale, such as SJS, spend most of their life stages on their host plants beneath a protective, shell-like armor made up of waxes and cast skins. SJS do not move, save for the first nymphal, or crawler stage, and the short-lived adult males.

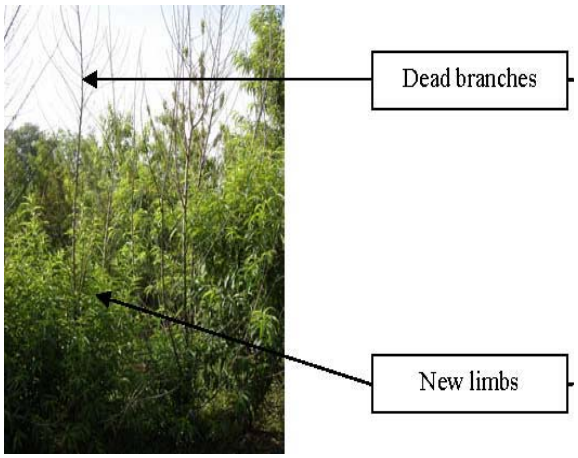
Control opportunities for SJS and other armored scale are dictated by life cycle events. **Annual dormant season applications of superior oil are the foundational element of scale control in peach.** Other control options are more timing-sensitive, meaning insecticides will only be effective if applied to sensitive scale life stages. **In blocks with truly heavy scale infestation, pink to early bloom is the application window for application of the growth regulator insecticides pyriproxyfen (Esteem or Knack) or buprofezin (Centaur)**. Subsequent control efforts for SJS adult males, and the more often targeted crawler generations, are dependent on proper timing of insecticides and selective use of high rate applications. **Phosmet (Imidan) is a very poor scale material within its normal rate range, but higher rates, 3.5 to 4 lbs Imidan 70W/acre, will provide good control of adult males or crawler scale.**

Orchard monitoring is the only reliable way to know when susceptible stages are present. A 'typical' SJS life cycle for middle Georgia follows. It is offered purely to illustrate SJS's life cycle progression. Do not assume scale life cycle events in any given year will mirror the examples offered. Assumptions as to when scale will reach susceptible life stages are frequently ill-founded, leading to poor control.



'Typical' San Jose scale life cycle in middle Georgia

Symptoms of SJS attack in peach are described and illustrated below. Frequent, careful observation is the key to catching scale infestations before injury becomes severe. Be aware that even modest speckling or measles on the fruit indicates the trees are heavily infested and in need of corrective action.



SJS Symptoms on shoots, twigs, limbs and trunks:flagging/dieback leading to the death of fruiting wood, scaffolds and trees. Bark often develops small bumpy spots, may be cracked, gummy, corky, discolored or water soaked.

Leaves: spotting, color change

Fruits: discolored spots, halos-distorted/shriveled / bumpy, small or odd sized, reduced yields, small pits/depressions/dimples

San Jose scale life stages

Tiny orange crawler (right)

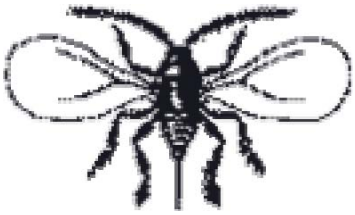
www.nysipm.cornell.edu

http://www.ent.uga

Winged adult males

www.agf.gov

www.viarural.



San Jose scale life cycle stages

In-season monitoring for scale crawlers is a challenging, tedious endeavor, but it can precisely indicate when scale crawler generations begin to move, greatly enhancing control opportunities.

Two similar trapping approaches were compared. **During the dormant season we located and flagged limbs with obvious infestations of live scale.** Materials for monitoring crawlers were black electrical tape, petroleum jelly, petri dishes (to hold the electrical tape traps once they are cut from the trees), and a hand lens.

Two different trap styles were established at each location. They were composed of:
1) black tape wrapped around a branch and covered by petroleum jelly
2) black tape, sticky side on the outside
Monitoring began at petal fall and continued through October. The electrical tape/petroleum jelly trap worked better than the "inside out" electrical tape, because the "stickum" of the "inside out" trap tended to dry out in the sun.

How do you make a petroleum jelly trap?
1) Wrap the branch with the tape, overlapping slightly. The tape bands must be tight enough to create a smooth surface for the tiny crawlers.
2) Apply a thin layer of petroleum jelly on the trap. Do not apply petroleum jelly on the bark or on the edge of the trap (the jelly can flow off the trap in the heat).
3) Traps must be removed and replaced once a week until the fall to count the number of crawlers caught. To observe crawlers, a hand lens is necessary. The yellow body of a crawler is quite easy to see on the black tape. Captured crawlers must be counted in the field because they disappear rapidly in the petroleum jelly.
4) Each crawler caught must be recorded.

Control of the San Jose scale is challenging. SJS has natural enemies, which include several lady beetle species, the four-winged fly (actually a parasitic wasp which lays eggs in the scale), and *Sphaerostilbe coccophila* (a weather-dependent, but sometimes efficacious fungal pathogen). **Natural enemies can dramatically reduce scale populations, unfortunately we don't know enough to successfully manipulate them for our management ends**.

Realistic control for SJS in southeastern peaches is chemical dependent, relying first on dormant oil applications, followed by as-needed use of the insect growth regulator Esteem/Knack to clean up difficult scale infestations just before bloom. And finally as-needed application of higher than normal rates of standard cover spray insecticide such as phosmet (Imidan), carefully timed by monitoring for the onset of crawler emergence by capturing crawlers on sticky traps.

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Learning for Life

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