Southeastern Regional Peach Newsletter

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Editors Note

Good news is sometimes hard to come by, so it is always welcome. With this issue, we can focus on some positive information for a change. Wayne Mitchem (NC State) reports that Chateau herbicide is now available, Dennis Warner (NC State) reports that two new peach varieties are now available, and Captan has been largely cleared as a potential carcinogenic fungicide. Though we need additional research, a collaborative effort between NC State, Clemson University, and UGA may yield cheaper control methods for control of bacterial spot. All of this combines to make for a very positive package.

However, just to keep things balanced, we do have some challenges to report as well. Through collaborative efforts between Clemson and UGA, we have determined that brown rot resistance is relatively widespread in middle Georgia. As such, we have to take this into account us we develop management programs for brown rot in 2005. Resistance may be present in other regions as well, but this has not been reported to date.

As we start the new season, we wish all producers a profitable year in the marketplace. We hope to be of service in making it so.

Phillip M. Brannen
Editor

Focal Points – New Information for the Peach Industry

❋ **Captan cancer potential reviewed and modified by EPA.** Based on the review of an independent panel, the EPA recently moderated its view of captan as a carcinogen (possible cancer causing compound; see http://www.epa.gov/fedrgstr/EPA-PEST/2004/November/Day-24/p26083.htm for additional information). I will give you the official EPA verdict first – followed by my interpretation. "In September 2004, the Agency, in accordance with the EPA 1999 Proposed Guidelines for Carcinogen Risk Assessment, classified captan as 'not likely to be a human carcinogen at dose levels that do not cause cytotoxicity and regenerative cell hyperplasia' and `likely to be carcinogenic to humans following prolonged, high-level exposures causing cytotoxicity and degenerative cell hyperplasia.'" Therefore, "the new cancer classification considers

captan to be a potential carcinogen at prolonged high doses that cause cytotoxicity and regenerative cell hyperplasia. These high doses of captan are many orders of magnitude above those likely to be consumed in the diet, or encountered by individuals in occupational or residential settings."

Unless you are a medical doctor, this probably does not make any sense. My interpretation of the above information and other information from the EPA is that, yes, captan can in fact cause tumors in the small intestine of a mouse, but tumors were not found elsewhere (no kidney or uterine tumors for example), indicating that the cancers were likely directly related to ingestion of the compound and subsequent damage over time to the small intestine. It also appears that captan's ability to cause tumors is limited to ingestion of very large quantities of the material over time. Unless you are sprinkling technical-grade captan on your corn flakes each morning, you should not get cancer from captan – my interpretation of the EPA document.

To quote EPA again, "captan is not likely to be a human carcinogen nor pose cancer risks of concern when used in accordance with approved product labels."

Captan should always be utilized according to the label, as eye irritation is probably the greatest danger it poses to the user. However, if used correctly, it is a safe, effective tool for disease management. If we use this product in accordance with the label, we can be hopeful that it will be around for a long time to come. With the advent of DMI resistance in *Monilinia fructicola*, the brown rot fungus, we need all the tools we can find – old ones and new ones.

❋ **Preharvest intervals and reentry intervals for insecticides.** Dan Horton (UGA and Clemson University) has developed a link to information on the key peach insecticides and their PHIs and REIs. To find this site or bookmark it, go to http://www.ent.uga.edu/extension/fruit.htm.

Pathology Briefs

Brown rot resistance to DMIs. Unfortunately, a survey of Georgia and South Carolina orchards (conducted by Phil Brannen [UGA] and Guido Schnabel [Clemson University]) has once again shown a shift towards DMI (Orbit, Propimax, Nova, Elite, Indar) resistance in Georgia. The shift seems to be widespread within the middle Georgia region, where the preponderance of peaches are grown. Figures 1 and 2 below show the difference observed between a susceptible *Monilinia fructicola* strain and a random assessment of strains from a middle Georgia site (the Byron USDA station in this case), which is representative of the trend observed throughout middle Georgia.

We need to now address the best resistance-management techniques for brown rot. For now, the recommended practices for Georgia are shown in Table 1. This has not changed since last year, but it is critical that Georgia producers adopt these resistance-management spray programs. For producers in other states, asks your county agents and specialists for their recommendations. Where resistance has not been observed to date, use of resistance-management programs may delay DMI resistance.

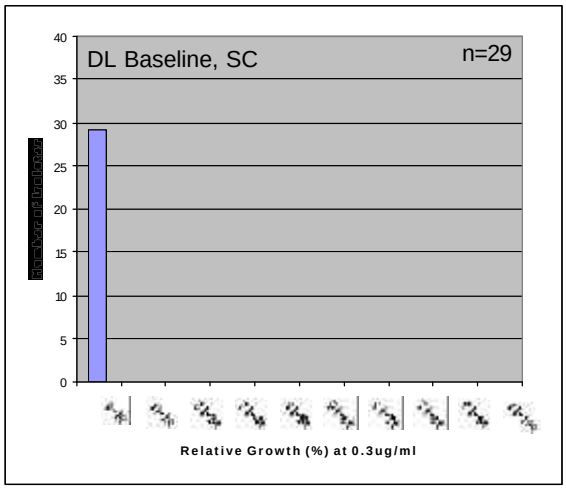

Figure 1. Number of isolates which were susceptible to propiconazole at various levels as observed in media tests when using a baseline, non-resistant strain of *Monilinia fructicola*, the brown rot fungus. All isolates were killed at a relatively low level of propiconazole.

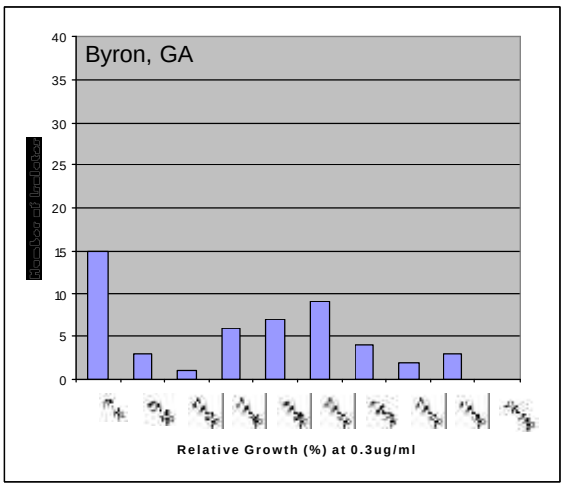

Figure 2. Number of *Monilinia fructicola* isolates which were controlled by various rates of propiconazole in media. Isolates were obtained from the USDA station in Byron, GA. Many isolates from the Byron location were not controlled by low rates of propiconazole, though the level of resistance varied among isolates. This is generally expected with a DMI resistance shift.

Table 1. Suggested spray schedule for maximum brown rot resistance management.

Phenology (Growth) Stage	Dry Periods	Wet Periods
10% Bloom	**----**	**Topsin M[a] + Captan; or Rovral; or Vangard**
50-75% Bloom	**Bravo**	**Bravo**
Petal Fall/Shuck Split	**Bravo**	**Bravo**
Cover Sprays	**Sulfur**	**Captan**
First Preharvest Spray	**Captan**	**Abound or Topsin M[a] + Captan**
Second Preharvest Spray	**Pristine**	**Pristine**
Third Preharvest Spray	**Orbit or Elite or Indar**	**Orbit or Elite or Indar**

[a]Do not use more than one application per year of Topsin M, since resistance develops rapidly with the benzimidazole fungicide class.

Low rates of copper may control bacterial spot as well as Mycoshield. Recent work conducted by a coordinated team from UGA (Henry Ngugi, Harald Scherm, and Phil Brannen), North Carolina State (Dave Ritchie), and Clemson University (Tony Roberts and Guido Schnabel) has indicated that low rates of copper products applied during the cover sprays may be as effective as Mycoshield, the more expensive antibiotic standard. Dave Ritchie initially reported that low rates of coppers successfully reduced bacterial populations. Only one successful field trial was conducted in 2004, but promising results were obtained. Copper treatments, as well as ECCO cleanser, gave statistically equivalent control of bacterial spot to that of the Mycoshield standard; copper treatments actually had numerically lower disease values (Table 2). Additional research is needed before we can recommend this practice, and of more import, the copper products have to be registered for this use pattern (cover sprays). Copper damage was only observed with a higher rate of the copper materials applied at shuck split; STBX-

016, a systemic copper, damaged leaves substantially at this application. Additional research is planned.

Table 2. Cover spray bactericide treatments and their associated phytotoxicity and bacterial spot levels on an O'Henry peach block in South Carolina.

Treatment and rate/A	Cu phytotoxicity, % leaf area affected (14 Apr)	Fruit disease incidence, % (12 Jul)	Average lesion depth on infected fruit, mm (27 Jul)
Untreated control	...	21.20 ± 2.5 a	0.88 ± 0.02 ab
Mycoshield 150 ppm	...	9.40 ± 3.7 bc	0.51 ± 0.11 bc
Cuprofix Disperss 0.5 oz metallic Cu [d]	5.8 ± 0.9 b	6.00 ± 2.6 c	0.50 ± 0.14 bc
Cuprofix Disperss 0.5 oz metallic Cu [d] rotated with Mycoshield 150 ppm	3.3 ± 0.4 b	6.20 ± 1.7 c	0.27 ± 0.05 c
STBX-016 0.5 oz metallic Cu [d]	31.6 ± 1.8 a	5.40 ± 1.5 c	0.72 ± 0.09 ab
ECCO colloidal cleanser 0.6% suspension	...	11.90 ± 4.4 bc	0.76 ± 0.13 ab
Wilt-Pruf 4% suspension	...	17.00 ± 5.5 ab	1.01 ± 0.36 a

Scholar fungicide survey results completed for 2004. When applied to a packing line operation, Scholar is an excellent fungicide for control of brown rot, Rhizopus, and Botrytis. However, adequate residues are required for effective control. For a second year, residues were obtained from peaches pulled directly from packing lines in both Georgia and South Carolina. Though results indicate that Scholar residue levels are improving, we still need to be more consistent, and levels are often too low. One of the key issues associated with poor residues is clogged lines or nozzle applicators (see film below for example). Even moderate clogging can substantially reduce application rates and/or cause inconsistencies. Washing the lines with hot water at the end of every day should help to prevent wax buildup, but lines must be continually inspected as well if the Scholar residues are to be improved. Careful calibration and recommended water:wax ratios are also important points to consider.

stopped line.mpg

Horticulture Update

Two New Peach Varieties Released by North Carolina University

Dennis J. Warner,
North Carolina State

The North Carolina Agricultural Research Service announces the release of two new peach varieties, 'Carolina Gold' and 'Galactica', for trial by growers and nurserymen. A plant patent application has been filed for both 'Carolina Gold' and 'Galactica'. The North Carolina Agricultural Research Service is planning to negotiate a non-exclusive licensing agreement for production, market development, and distribution. Nurserymen having an interest in 'Carolina Gold' and 'Galactica' will

be given the opportunity to be licensed by the North Carolina Agricultural Research Service for production and marketing.

‘Carolina Gold’ was selected at Jackson Springs, NC in 1998 by D.J. Werner and L. Snelling. It originated from the 1995 cross of ‘Biscoe’ x NC-C5S-067. NC-C5S-067 originated from a 1988 cross of ‘Encore’ x ‘Calanda San Miguel 2383’. ‘Calanda San Miquel 2383’ is yellow flesh, clingstone peach grown as a seed propagated land race in Spain. ‘Calanda San Miquel 2383’ was chosen as a parent based on its high quality fruit, late ripening time, and late time of flowering in the spring. ‘Biscoe’ is a high quality peach released by the North Carolina Agricultural Research Service in 1968. ‘Encore’ is a late ripening, cold-hardy peach cultivar that was introduced in 1980 by Rutgers University. ‘Carolina Gold’ was tested in trials at the Sandhills Research Station in Jackson Springs, NC.

'Carolina Gold’ ripens about August 1, about a week after ‘Biscoe’. ‘Carolina Gold’ flowers 1-2 days before ‘Contender’, making it one of the latest flowering commercial peach cultivars commercially available; the chilling requirement to satisfy dormancy is about 1050 hours below 45°F. Late flowering reduces the risk of freeze injury to flower buds in late winter and early spring. ‘Carolina Gold’ has cropped consistently over 6 years of testing.
Fruit of ‘Carolina Gold’ are very large, with many fruit commonly attaining three inches in diameter when properly thinned. Because of its moderate to high flower bud number, heavy thinning is required in years of little natural fruit thinning from freeze events. Fruit are round and have shown no tendency to produce a tip over the six years of evaluation.

‘Carolina Gold’ fruit are yellow fleshed (Figures 3 and 4). Flesh color and quality (texture, flavor, and aroma) are excellent. Fruit flesh is resistant to oxidative browning. Fruit are firm, similar to ‘Contender’. The exterior of the fruit is covered with about equal amounts of a bright red overcolor and a golden yellow ground color. Foliage of ‘Carolina Gold’ is relatively resistant to bacterial spot disease incited by *Xanthomonas campestris* pv. *pruni.* Fruit have shown no evidence of infection in 6 years of observation. Trees of ‘Carolina Gold’ show a growth rate typical of most commercial cultivars. Flowers are pink and non-showy. Pollen is abundant, and trees are self-fertile. Leaf glands are reniform.

In summary, ‘Carolina Gold’ will provide growers with a consistent cropping, late-season ripening cultivar with excellent flesh quality. Its late flowering and high flower bud number should make it an appropriate choice for growers in North Carolina. The name ‘Carolina Gold’ is suggested for this selection because of the attractive golden yellow ground color on the surface of the fruit, and to indicate its origin in North Carolina.

Figure 3. Fruit of ‘Carolina Gold’.

Figure 4. Fruit of ‘Carolina Gold, showing flesh color.

'Galactica'

'Galactica' was selected at Jackson Springs, NC in 1998 by D.J. Werner and L. Snelling. It originated from the 1995 cross of North Carolina breeding selection NCN-4 x 'Hangchow'. NCN-4 originated from a 1987 cross of 'Contender' peach x 'Fantasia' nectarine. 'Hangchow' is a low acid, white flesh "saucer" (flat shape) peach. It was derived as a seedling selection from a Chinese saucer peach of unknown origin. 'Fantasia' is a high quality, yellow flesh, freestone nectarine released by the USDA-ARS in Fresno, CA in 1974. 'Fantasia' was chosen as a parent based on its high quality fruit, bright red skin color, and high fruit firmness. 'Contender' is a high quality, cold-hardy peach released by the North Carolina Agricultural Research Service in 1987. Seedling progeny from these crosses were grown out and evaluated at the Sandhills Research Station, Jackson Springs, NC. 'Galactica' was tested for 6 years in advanced trials at the Sandhills Research Station in Jackson Springs, NC.

'Galactica' ripens about July 2, about 2-3 weeks before 'Contender'. 'Galactica' blooms about 1 week before 'Contender'; the chilling requirement to satisfy flower bud dormancy is about 800 hours below 45°F. Although 'Galactica' flowers earlier than many commercial peach cultivars, it has cropped well 5 of the 6 years of evaluation. A grower trial in the mountains of North Carolina has confirmed its consistent cropping ability.

Fruit of 'Galactica' are very large, with many fruit commonly attaining three inches in diameter when properly thinned. Because of its moderate to high flower bud number, heavy thinning is required in years of little natural fruit thinning from freeze events. Fruit demonstrate the flat (peento) shape (Figures 5 and 6).

'Galactica' fruit are white fleshed and have moderate flesh acidity, lower than typical commercial peach cultivars. Flesh color and quality (texture, flavor, and aroma) are excellent. Fruit are firmer than most white fleshed peach cultivars, similar to 'China Pearl'. About 80% of the fruit exterior is covered with a bright red overcolor. Foliage of 'Galactica' is relatively susceptible to bacterial spot disease incited by *Xanthomonas campestris* pv. *pruni*. Control measures may be necessary under conditions favorable for disease development. Trees of 'Galactica' show a growth rate and form typical of most commercial cultivars. Flowers are pink and showy. Pollen is abundant, and trees are self-fertile. Leaf glands are reniform.

In summary, 'Galactica' will provide growers with a consistent cropping, early to mid-season ripening cultivar with a novel flat fruit shape and excellent flesh quality. Its novel fruit shape, white flesh, and moderate fruit acidity should provide growers with opportunities for marketing 'Galactica' fruit as a specialty crop, particularly to Asian and Hispanic consumers. Currently, almost all "saucer" peaches are commercially grown in California. They command a premium price in supermarkets and specialty produce stores. Few "saucer" peaches are grown in the southeast due to lack of an adapted cultivar. The apparent cold hardiness and high flower bud density of 'Galactica' should make it an appropriate choice for peach growers in North Carolina. 'Galactica' will also be valuable for commercial production in other peach growing regions of the U.S. that receive sufficiently cool winter temperatures to satisfy bud dormancy. The name 'Galactica' is suggested for this selection because of its novel fruit shape.

Figures 5 and 6. Fruit of ‘Galactica’.

Weed Science Update

The Wait is Over! Chateau is Here!

Wayne Mitchem,
North Carolina State University

For several years I have mentioned the future registration of Chateau. In October, a label allowing Chateau use in non-bearing stone fruit orchards was approved. It is a product that will improve weed control in newly planted orchards, and hopefully, it will eventually receive clearance for bearing fruit orchards too.

Advantages of Chateau

The greatest advantage Chateau has is the range of species controlled. It is a stand-alone preemergence herbicide that needs to be tank mixed with only a non-selective postemergence herbicide (paraquat) to control emerged weeds. It effectively provides residual control of the following broadleaf and grass species:

Chickweed	Dandelion	Cutleaf evengprimrose	Florida pusley
Groundsel	Henbit	Jimson weed	Lambsquarter
Morniglory sp.	Mustard	Nightshade sp.	Pigweed
Prickly sida	Ragweed	Smallflower morningglory	Smartweed
Spurge	Spurred anoda	Tropic croton	V. mallow
Barnyardgrass	An. Bluegrass	Crabgrass (Lg. and smooth)	Foxtails
Goosegrass	Signalgrass	Panicums	

Having a broad-spectrum, preemergence herbicide for use after transplanting young trees will make weed control in newly planted orchards less difficult. The spectrum of control with Chateau is more typical of the control obtained with herbicide programs that are not available until orchards are established 2 or more years. Herbicides like oryzalin (Surflan and others) and Prowl provide effective control of annual grasses and small-seeded broadleaf weeds in newly planted orchards, but they do not adequately control species like palmer amaranth, morningglory, smallflower morniglory, and cocklebur. Chateau will be an excellent option for growers trying to establish fruit orchards infested with more difficult to control broadleaf weeds.

Chateau contains an active ingredient unique to other preemergence herbicides used in fruit crops. This uniqueness aids weed resistance management – an issue for some herbicides (dinitroaniline and triazine chemistries) used in fruit crops.

Use Pattern and Restrictions

Results from university trials indicate that Chateau is most effective when applied as a sequential application. In my opinion, the preferred program for use in a newly planted orchard would consist of a late winter or early spring application of Chateau at 6 to 10 oz/A. If weeds have emerged, tank mix Chateau with Gramoxone and a non-ionic surfactant.

A second application of Chateau at 6 to 10 oz/A with Gramoxone and surfactant should be applied when control from the initial application deteriorates. If the initial application is applied in mid to late March, the second application will most likely need to be applied in late May to mid June. In our trials, the initial application lasts at least 60 days. In orchards where morningglory, smallflower

morningglory, or cocklebur are problematic the 8 to 10 oz/A rate is recommended. The maximum rate for Chateau is 12 oz/A per application. Results in trials conducted in NC and SC indicate that in most situations 6 to 10 oz/A per application is adequate. Unless perennial grasses or nutsedge (yellow or purple) are present or there is inadequate rainfall for herbicide activation, a sequential application program with Chateau can provide summer long control in newly planted orchards.

Chateau is currently registered for use in **non-bearing orchards only.** However, Valent is pursuing uses for bearing stone fruit orchards. Use in bearing stone fruit orchards is not expected until the 2006 growing season.

There are several restrictions noted on the label which growers need to carefully read and follow. Those restrictions are listed below.

1. A maximum rate of 6 oz/A should be used on soils having a sand plus gravel content over 80% if trees have been established less than 3 years.

2. Do not apply to trees established less than 1 year unless protected from spray contact by non-porous wraps, grow tubes or waxed containers.

3. Do not make a sequential application within 30 days of the first application.

4. Do not harvest fruit from treated trees within one year of application.

5. Follow the most restrictive label limitation and precaution of the tank mix products being used.

If you would like to view a full Chateau label it can be found by conducting a search for "Chateau" at the following web address: www.cdms.net

When the Chateau products are listed, click on the label icon for the "Chateau WDG" formulation.

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PUTTING KNOWLEDGE TO WORK

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