



Southeastern Regional Peach Newsletter

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Editors Note

It is hard to believe it, but a year has passed since this newsletter first started. Once again, it is time for the holidays, and it is time to close another calendar year as well.

We have covered a multitude of issues in this newsletter over the past year. Many of the topics have addressed specific issues which were recently observed in the field. As a producer, county agent, or researcher, I would solicit your ideas for topics or specific issues of concern to the peach industry. If you have suggestions or questions which you would like addressed in future issues, please e-mail (pbrannen@arches.uga.edu) or call (706-542-1250).

This quarter's newsletter addresses several weed science, entomology and pathology issues, and it includes an update on the Fort Valley State University efforts for peach production.

I look forward to visiting with many of you in the new year. Have a Merry Christmas, and a Happy and Prosperous New Year!

Phillip M. Brannen
Editor

Focal Points – New Information for the Peach Industry

* **Flint™ registered for scab and powdery mildew control.** Flint now has a registration for scab and powdery mildew control in peach. Flint contains a strobilurin compound (trifloxystrobin), so it has a similar mode of action as Abound. It has a good fit in early-season (petal fall through 7-10 days post shuck off) scab control efforts, since it is highly efficacious.

* **Peach label for Esteem™ 35 WP insecticide.** Dan Horton (Univ. of Georgia) and Sam Hudson (Clemson Univ.) have indicated that Esteem 35 WP (pyriproxyfen; recently labeled for peach) is an excellent scale-control material. Esteem is a growth regulator, which means that the time of application is important; it is slow acting, but it is very effective. "Esteem's optimal use window will be application with oil at delayed-dormant. It is also effective in-season when applied just in advance of crawlers. In orchards with severe scale infestations, in-season Esteem applications should be tank-mixed with Imidan or Guthion/Sniper to reduce the incidence of scale on the harvested fruit. Esteem has a 12-hour REI and a 14-day PHI." See the label for additional information.

* **Scholar™ now registered.** Scholar is now registered through a regular Section 3 registration, which is good news. Scholar is registered for control of *Monilinia* spp.

(brown rot), *Botrytis cinerea* (gray mold), *Rhizopus stolonifer* (Rhizopus rot), and *Gilbertella persicaria* (Gilbertella rot). Restrictions: Do not make more than one post-harvest application to the fruit. For high volume (dilute) application, mix 8-16 oz. Scholar in 25-100 gal. of an appropriate water, wax/oil emulsion, or aqueous dilution of a wax/oil emulsion for the crop being treated. Apply to 200,000 lbs of fruit. Use a T-jet or similar application system. For low volume (concentrate) application, mix 8-16 oz. of Scholar in 7-25 gal. of water, wax/emulsion, or aqueous dilution of wax/oil emulsion for the crop being treated. Apply to 200,000 lbs of fruit. Use a control droplet-type application or similar system. For maximum efficacy, use low volume concentrate application systems for treatment of plums. For a dip application for peach, mix 8-16 oz. of Scholar in 100 gal. of water, wax/emulsion, or aqueous dilution of wax/oil emulsion. Dip for

approximately 30 seconds and allow fruit to drain. Treat fruit only once. The dip solution should be replaced with fresh dip solution after 200,000 pounds of fruit has been treated. See the label for additional information.

✳ **Syngenta Post-Harvest Control Meeting (La Jolla, CA).** Harald Scherm (Univ. of Georgia) recently attended a post-harvest control meeting in CA. He reports that “there are several postharvest fungicides in the pipeline. Apart from Scholar (fludioxonil), which now has a label, there will be the mix Elevate + Allisan (label anticipated 2005; a little weaker on brown rot), Pristine (BAS-516; label anticipated 2006; similar in activity to Scholar), and PH-066 (pyrimethalin; weaker on Rhizopus).”

Weed Science Updates

Spring Forward with Herbicide Sprayer Maintenance

Wayne Mitchem
North Carolina State

Winter is here, and you may want to think about sprayer maintenance on your herbicide applicator. This is an excellent time to make changes in spray volume or nozzle type, replace worn spray tips, and verify sprayer output with a calibration procedure.

Attached is simple procedure for checking the output of boom sprayers. The method is an easy, fast, and accurate method to calibrate. In the event you have questions after reviewing the procedure, contact your county agent with the Cooperative Extension Service.

Fruit growers throughout the Southeast apply herbicides in a variety of volumes (gallons per treated acre). Some growers apply herbicides in volumes of more than 40 gallons per treated acre. A volume of 20 to 30 gallons per treated acre is fine for applying glyphosate, paraquat, Rely, and most preemergence herbicides. In fact a volume of 20 gallons per treated acre is preferred when applying systemic herbicides like glyphosate, Poast, or Fusilade. The time saved from filling the sprayer is an added incentive.

Traditionally fruit growers have applied herbicides with flood type spray tips because of concerns associated with drift potential from “fan type” spray nozzles. However spray tip technology has led to the development of “fan type” spray tips that provide uniform coverage, using large spray droplets to minimize drift. These kind of tips include TeeJet XR, Turbo TeeJet, and the Delevan Extended Range Tip.

1/128th Acre Calibration Method

1. Use nozzle spacing to determine driving distance. (Refer to chart below)
2. Fill sprayer ½ full with water, select RPM and gear settings. Determine how many seconds it takes equipment to travel the determined distance. Record the times of three separate passes and average.
3. Park tractor, maintain engine RPM, and catch spray in container marked in ounces for time noted in #2. Catch spray from one nozzle.
4. Ounces collected from an individual nozzle is equivalent to gallons of spray solution applied per acre.
5. Collect output from each nozzle to assure uniform distribution. Replace any nozzle that varies >10% from the average output.

Travel Distance to Allow Each Nozzle to Spray 1/128th of an Acre

Nozzle Spacing (in.)	Distance (ft.)
14	292
16	255
18	227
20	204
22	186
24	170
26	157
28	146
30	136

If you have questions or need assistance contact the Agriculture Agent with the Cooperative Extension Service in your county.

Source: Calibration card developed by Wayne Buhler, Pesticide Education Specialist, Dept. of Horticultural Science.

Winter Annual Broadleaf Weed Control

Wayne Mitchem
North Carolina State

Winter annual broadleaf weeds are harboring a major pest that will attack your orchards this spring. It is well documented that cat-facing insects love to spend winter among chickweed, vetch, cutleaf eveningprimrose, and a number of other winter annual broadleaf weeds. A significant amount of research, most recently from NJ, has demonstrated that ground cover management can have a significant impact on cat-facing insect populations. Controlling winter annual broadleaf weeds on the orchard floor is part of an integrated approach to cat-facing insect control.

Assuming a preemergence herbicide was used in the tree row this fall, there is still a need to control winter annual broadleaf weeds in the drive alley between the trees. In the event you have a perennial sod established between the tree rows, like fescue, or you have established a small grain cover crop in that area use 2,4-D amine for winter annual broadleaf weed control without injuring the desired ground cover. In areas where there is no established ground cover between the rows growers may use glyphosate or glyphosate in combination with 2,4-D amine. Adding 2,4-D amine to glyphosate will improve control of cutleaf eveningprimrose which is not controlled with glyphosate alone.

In the event no preemergence herbicide was applied in the fall a postemergence herbicide would need to be applied to the entire orchard floor (tree trunk to tree trunk).

Postemergence herbicides should be applied 4 to 6 weeks prior to peach tree bloom. Remember to follow all label precautions when using herbicides, even when trees are dormant.

Plant Pathology Updates

2003 Plum Pox Virus Update

Phillip M. Brannen,
University of Georgia

Plum pox virus (PPV) is a devastating disease of peaches. Although fruit from PPV infected trees is unattractive, it is not harmful to humans. However, fruit is often rendered inedible due to modified sugar production in the fruit. Where PPV is found, trees must be destroyed to limit spread of the disease. In the fall of 1999, PPV was identified in Pennsylvania - the first account of the virus in North America. In 2000, the virus was identified in Canada. When detected in U.S. orchards, the orchards are being destroyed as part of a massive eradication program. As of November 2001, 1346 acres of peach had been removed from Pennsylvania. More recently, the destruction of trees has been less dramatic. However, in 2002, treatment orders for removal and destruction of infected trees were delivered for 17 acres of infected trees and approximately 41 acres of surrounding commercial trees (planted within the 500 meter buffer zones). Also, the quarantine zone was expanded to include two new Pennsylvania townships; though the quarantine and eradication efforts are obviously having an impact, PPV has not been eradicated from

Pennsylvania. Canada's containment/eradication efforts are not as stringent as those of the U.S.; as a result, it is likely that we will have PPV present in the Northeast for years to come – if not permanently.

That is the bad news – now for the good news. PPV has not been found in the Southeast or other regions. Georgia has had an extensive screening program for the last three years, and PPV has not been identified anywhere in the state to date. The vast majority of Georgia peach acreage has been surveyed. A total of 55,084 samples have been collected at a cost of \$367,572. All samples analyzed were negative. Other peach-producing states have had similar activities and results.

Back to the bad news. Though aphids can spread the virus locally, it is not likely that the virus will come to the Southeast or other regions through aphids. However, the virus can be spread long distances through movement of propagative material – grafted seedlings and budwood. A single infected bud stick can give rise to numerous infected trees which can be spread throughout the southern region – even the nation. Therefore, we continue to have a precarious situation relative to PPV.

Now for more good news – enter the budwood testing program. The vast majority of southeastern peach seedlings are produced through three Tennessee nurseries with budwood from Georgia and South Carolina. A collaborative effort between the University of Georgia, Clemson University, South Carolina and Georgia producers, and nurseries has resulted in the development of a regional virus-testing program. Through a memorandum of agreement, the peach and nursery industries are now annually supporting this program. These efforts insure that the vast majority of Georgia and South Carolina budwood material is tested for the presence of PPV and two other critical viruses of peach, prior to its use by the nursery industry.

Efforts in the field include identification of bud wood sources, tagging of trees (blue numbered aluminum tags) and spraying of tree trunks (blue paint) for future reference, and sampling of leaves from each budwood tree for virus testing (see film).

BUDWOOD TESTING PROGRAM VIDEO ([Stream Clip](#)) ([Download Clip](#)) ([Get RealOne Player](#))

As an offshoot of the program, it was determined that Prunus necrotic ringspot virus (PNRSV) has been spread throughout the Southeast through propagation of infected budwood. Through use of this newly established budwood-testing program, new trees will be free of PNRSV – resulting in improved tree quality (longer life, less sunburn, resistance to other stresses – both biotic and abiotic) and fruit production (8.2-47.3% yield reductions have been reported by Pusey and Yadava; Plant Disease 75:847-851; 1991).

As one might guess, it is an imperative that the whole peach-production industry remains diligent relative to PPV. The following suggestions are given for producers and nurseries:

1. Nurseries should **never, never, never utilize budwood from sources which have not been tested for PPV.** Request testing results prior to utilizing budwood.
2. Producers should **never, never, never send budwood to a nursery which has not been tested for PPV.** If not directly linked as part of the budwood program (i.e. South Carolina and Georgia), ask your county agent and/or extension specialist for help in obtaining testing of your budwood material. In addition, producers should never propagate trees themselves without having the budwood tested for PPV.

3. Producers should always request trees which have gone through the southeastern budwood testing program or similar testing. **If a nursery does not supply PPV-tested trees, obtain trees from a nursery which does.**

This is serious business. Eventually, state regulations will likely require a certificate of testing for peach trees and other Prunus species. However, as of now, it is up to each of us to self-regulate and maintain a PPV-free industry. **Unfortunately, “one bad apple,” or peach as the case may be, “will spoil the whole bunch,” and we are dependent on each other to make sure this virus is not propagated and spread throughout the Southeast and remainder of the nation.** Even if we do everything that we can, we may still have PPV at some point. The degree to which we take this threat seriously may dictate where U.S. peach production survives as an industry.

NE1006 Plum Pox Virus Meeting Notes (15-17 Dec; Shepherdstown, WV)

*Phillip M. Brannen,
University of Georgia*

I recently attended the NE1006 meeting. This meeting serves as the major information exchange for Plum pox virus (PPV) work in the United States and Canada. The following notes should be of interest to peach, plum, and nectarine producers throughout the Southeast.

Canada has now been surveying for three years. There continue to be numerous “hits” of PPV. Canada is still not taking the stringent measures required to eradicate PPV. As a result, it is likely that PPV will continue to spread in Canada. Of 331,309 total samples taken in Canada, 1,183 positive samples have been observed. In 2002, 82 new orchard blocks were identified which contained PPV. The majority of trees show no symptoms, even if they have the virus.

Infected plum trees have been found in an Ontario homeowners yard. This find may represent yet another new isolate of PPV (different from all observed to date throughout the world). **The trees came from Russia; the woman who brought these in 25 years ago is now dead, but this little problem may live for many years to come. This once again shows the importance of import issues and the potential for homeowners to cause harm to commercial production.** Thus far, of homeowner samples from Canada, five dwarf flowering almonds have tested positive, and two European plums have tested positive.

Fruit can definitely contain the PPV virus, especially in the skin. With the D strain observed in Canada, PPV fruit ripens faster than healthy fruit. This has implications for shipment and aphid spread. Virus concentration goes down in rotting fruit over a period of roughly 4-7 days; this means the virus would not likely be very active in cull piles, but the virus could still be infective for some period of time.

Fruit quality work on PPV-D infected fruit was conducted with a human sensory panel. Taste-testing indicated no significant difference between PPV fruit, or people preferred PPV-infected fruit. This is likely related to the fact that the PPV-infected fruit matured more quickly, and the healthy fruit were not at the same level of sugar production. However, some scientists indicated that the sugar reduction issues may not hold true for PPV in peach – a matter of some debate.

Weed species in PA have not shown PPV to date, and this is good news. Seven positive trees were identified in PA this year, so eradication appears to be working (slowly but hopefully surely) in the United States.

With the exception of TX, the PPV survey has ended in the South. Nationally, approximately \$40.5 million has been put into the project so far.

Peach Biotechnology Research at Fort Valley State University

Anand K. Yadav,
Fort Valley State University

Compared to nearly 16 million peach [*Prunus persica* (L.) Batsch] trees found in Georgia during the 1930s, we currently have less than 2.5 Million trees. One of the reasons has been the peach tree short life (PTSL) syndrome, which commonly kills peach trees under six to eight years of age. Trees stressed by PTSL die before orchards reach full productivity, leaving these peach orchards unprofitable, and requiring frequent replanting. Therefore, fruit growers have been forced to abandon peach orchards and seek other profitable crop commodities.

Severe stresses of peach trees imparted by cold or winter injury, bacterial canker instigated by *Pseudomonas syringae* van Hall, and certain nematode species contribute to the development of PTSL. Significant increase in cold tolerance, and reduction in the bacterial and/or nematode damage would in turn enhance peach tree longevity. A research project entitled “**Developing Biotechnological Approaches towards Improving Peach Tree Longevity**” funded in 1999 (\$300,000 for three years) by the USDA-CSREES-HEP has been targeted to accomplish the above with the following objectives: (1) develop *in vitro* peach regeneration methods through shoot tips, cotyledons, and other tissues in order to maximize shoot multiplication, (2) exploit somatic embryogenesis from nucellar tissue and embryonic axis from peach zygotic embryos, and (3) investigate *Agrobacterium*-mediated peach transformation using shoot apical meristems and embryogenic tissues or somatic embryos.

Genetic resources for cold hardiness and disease resistance are known to exist for peach, a severe impediment to the genetic improvement of peach is that several generations of hybridization and selection are required to produce commercially acceptable fruit with adaptive characteristics obtained from non-commercial genotypes. Additionally, a narrow germplasm base of peach has severely constrained traditional breeding methods. Over the past 15 years, some groundwork has been laid for using plant molecular approaches to improve perennial temperate fruit crops; however, the success with peach transformation has been limited. For peach, successful use of genetic transformation will heavily rely on regeneration of plants from mature tissues. Thus, two ways to regenerate peach plants from mature tissue were proposed: utilization of shoot tips and cotyledon culture (Figure 1), and exploit nucellus and other tissues to induce embryogenic cultures (Figure 2). The initial peach biotechnology research at Fort Valley has been concentrating on *in vitro* micropropagation.

Our research accomplishments thus far have been very encouraging. Once easy, rapid and accurate protocols for peach regeneration are standardized, genetic transformation research will be initiated. For transformation, *Agrobacterium tumefaciens* with various binary vectors will be used to infect shoot apical meristem, which will then be regenerated *in vitro*. Once the protocol for somatic embryogenesis has been developed and refined, *Agrobacterium*-mediated gene

transfer of somatic embryos will be initiated. When additional genes that enhance cold hardiness, and resistance to *Pseudomonas syringae* and possibly to nematodes, become available, they will be utilized for further genetic transformation attempts. **The ultimate research goal at the Fort Valley State University is to develop cold hardy peach lines that may also have beneficial traits to resist PTSL stresses and improve tree survival and orchard longevity.**

Nodal Explant Culture

Shoot Tip Culture

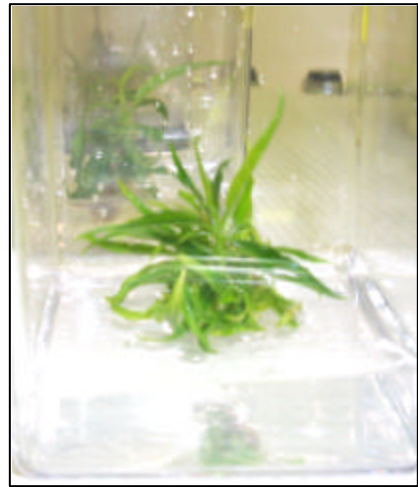


Figure 1. Peach *in vitro* micropopagation. Multiple shoot induction is accomplished using shoot tip and nodal explants.

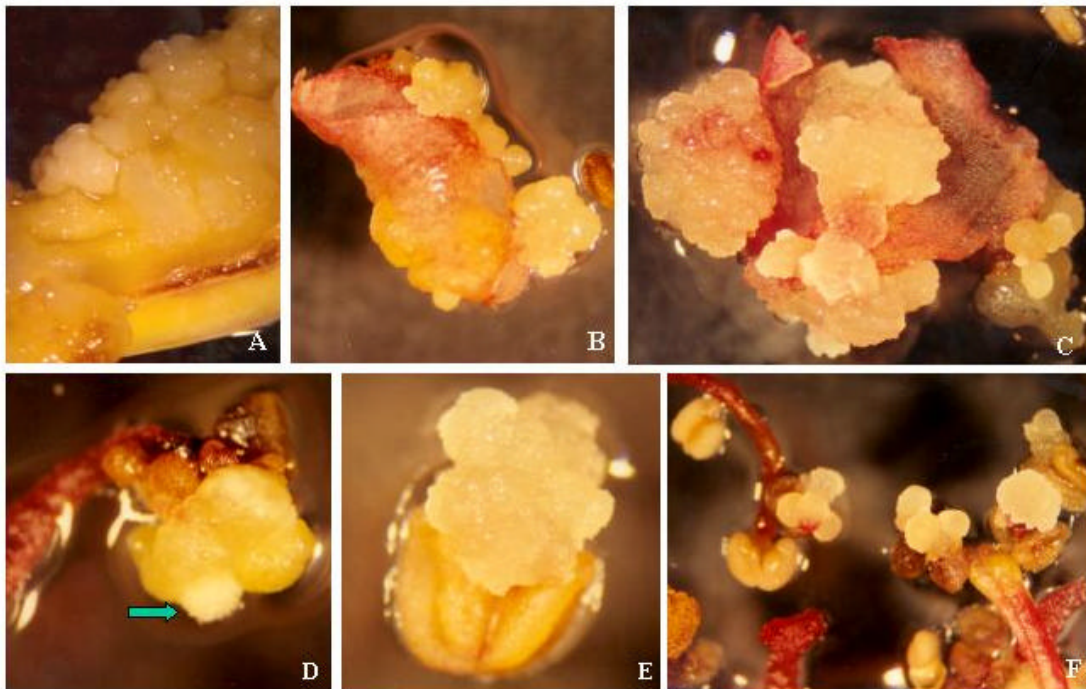


Figure 2. Peach tissue culture explant screening from: (A) cotyledon, (B) and (C) petal, and (D-F) anthers.

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