Southeastern Regional Peach Newsletter

Volume 2, No. 3 September 2002

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Editors Note

The singular statement that I have heard over and over this year is that "it could have been worse." That is consolation, but this was not the greatest overall year for peach production in the Southeast. Small fruit size was particularly problematic. On the flipside, generally dryer than average weather conditions made disease control much easier than last year. Of course, this benefit varied by location. Without regard, we can be thankful that we had a crop, and yes, "it could have been worse."

For this issue, we concentrate our pathology efforts on Armillaria, also known as oak root rot; this disease has become a primary concern for peach production in the Southeast. We also cover an ethephon update, and we give a gentle prod on nematode control – both of timely significance as we head into fall.

As always, there is still plenty of work to be done, but take a break as you have time. John Galbraith stated that "total physical and mental inertia are agreeable, much more so than we allow ourselves to imagine." I hope you have a chance to test this statement before the new year begins.

Phillip M. Brannen
Editor

Focal Points – New Information for the Peach Industry

❈ **Plum Pox Virus found in additional PA townships.** As additional infected trees have been found this summer, the PA Department of Ag has added new acreage to the PPV quarantine. The "quarantine will be amended to include Monaghan and Conewago townships, York county, effective July 23, 2002." "Treatment orders for removal and destruction of new 2002 detections are being delivered to the appropriate property owners covering 17 acres of infected trees and approximately 41 acres of commercial trees planted within 500m exposed buffer zones."

Horticulture Updates

IR-4 Moving Forward with Ethephon Registration on Peach

Wayne Mitchem
North Carolina State

Several years ago, close to a decade now, IR-4 conducted residue trials to support the registration of ethephon in peach orchards for bloom delay. A number of issues has limited the label development and registration. However this past June, IR-4 proposed to the EPA that fall ethephon applications in stone fruit be considered "non-food use". Due to the application time, the long preharvest interval, and the fact that ethephon promotes ethylene production, a naturally occurring plant hormone, the EPA felt such a classification was acceptable. Classifying a fall ethephon application as non-food use means there is no need to establish a residue tolerance.

The proposed use would be subject to the parameters below:

Application Timing
Post harvest treatment in the fall after approximately 50% of leaves have abscised (greater than 180 days till harvest).

Use Pattern
Make one foliar application in the fall after approximately 50% of the leaves have abscised. Apply a spray solution of ethephon concentration up to 100 parts per million (ppm) active ingredient (ai). Apply spray solution at a rate of 100-300 gal./Acre. A non-ionic surfactant may be used in the spray solution. Do not exceed a total rate of 0.55 lb ai/A. Do not harvest within 180 days of application.

These developments were learned a few days prior to posting the newsletter. It is still unclear whether registration will occur in time to allow applications this fall. However progress is being made and the long awaited registration of ethephon may finally happen.

Plant Pathology Updates

Oak Root Rot Diagnosis, Control Options and Future Research

Guido Schnabel and Desmond R. Layne
Clemson University

Prior to the widespread cultivation of cotton in many parts of the southeastern United States, the land was largely covered with hardwood forests. In this forested land, the oak root rot (ORR) fungus thrived and spread throughout the region. Today, the fungus can be found in the soil of most of the prominent peach growing areas -- if not everywhere --

should you just dig deep enough to find it. Deep down in the soil, where degradation of organic material progresses very slowly, the ORR fungus can survive in root pieces for up to a hundred years. Many growers have a misconception that growing trees on 'virgin' peach land (land where peaches have never been grown before) is a solution to the problem of soil-borne pathogens that kill peach trees. Depending on the depth where the ORR is present and the amount of inoculum that exists in the soil, trees on virgin land can die from ORR well before they live out their productive lifespan. There is currently no commercially available rootstock that is resistant to ORR. Although Guardian™ rootstock is very helpful on sites with Peach Tree Short Life (PTSL), it is also very susceptible to ORR. Once living peach tree roots reach the infected root pieces which remain in the soil, they become infected. The fungus then migrates up the root system to the crown of the tree, which it essentially girdles and kills. The tree subsequently dies. On existing peach sites where trees have previously died from ORR, it is highly likely that the inoculum level in the soil is greater and closer to the soil surface than in 'virgin' land. Thus, one would expect trees on replant sites to die even sooner (Figure 1). We have actually excavated young (second and third leaf) dying trees, and ORR was the cause of death on these replant sites!

Oak root rot or Peach Tree Short Life? The decline (and death) of several trees adjacent to each other indicates a strong possibility of oak root rot infection, because the fungus will travel across root grafts that form between adjacent trees. A very reliable diagnostic symptom is the white mycelium that can be found in bark tissue at the base of the dying peach tree. To check, free the lower trunk from surrounding soil, and cut a piece of bark away approximately 4 to 6 inches below the soil level. White fungal tissue should be visible in the bark tissue (Figure 2). Also, trees that are infected will demonstrate water stress symptoms (reduced shoot extension, leaf wilting, etc.), and they will look unthrifty. Occasionally, if the tree is in the early stages of decline, the fungal mycelium will not yet be present at the crown, and it will not be seen until the trees are pulled out and the large support roots are inspected. If no such symptoms can be found, PTSL may have killed the trees. Some rootstocks, like Lovell, are highly susceptible to PTSL. A characteristic sign of PTSL is the death of the top of the tree, followed by the development of suckers from the rootstock of the dead or dying scion (Figure 3). With PTSL, the top of the trees is dead, and the rootstock remains living. When symptoms are first noted with ORR, the top of the tree may still be living, while the root system will be dead or dying. ORR infected trees will usually die the first season symptoms are noted or certainly the next year. Trees that have been killed from ORR will not have living root suckers coming up from the crown.

Control options. There is basically nothing you can do to rescue infected trees. The only control option you have is to prevent the spread of the disease among adjacent trees. Even this method has its limitations and there is a cost in terms of lost production. The fungus, once established, will infect neighboring trees by root to root contact. The earlier you recognize the existence of this disease in your orchard, the less damaging and more successful will be your option of prevention -- provided there is not a tremendous amount of inoculum at the site and only a few isolated trees are infected. The extent of the tree pulling (roguing) which is necessary to stop the infection of the disease will depend on the type of orchard floor management system practiced in the orchard. Research has

demonstrated that when a herbicide strip is combined with a sod middle, feeder roots of the peach tree are confined to the herbicide strip area -- due to strong competition with the sod for water and nutrients. In this case, it should only be necessary to remove adjacent trees from within the tree row where dying or dead trees exist. For trees separated approximately 18-20 feet apart in a row (traditional spacing) one neighboring tree and for trees separated approximately 6 feet apart in a row (Y-shaped) three neighboring trees should be pulled out from each side of a dead tree (Figure 4). You should try to remove as many roots from the soil as possible, and take this material out of the orchard and burn it. On the other hand, if the orchard floor-management system is a chemically-mowed, bare-orchard floor, the tree root system from one tree row may actually grow across the row middle to the next tree row. In this situation, a more drastic tree roguing process is necessary, including trees in the rows on either side of that one which is infected (Figure 4).

Future Research. We have several projects which are currently underway to address the growing problem of ORR to peach production in the southeastern U.S. These include the use of biological control against ORR, the potential development of a resistant rootstocks through genetic engineering, and future work involving various cultural practices. We are looking for grower cooperators to participate in this research involving cultural practices. If you have a "hot" site with ORR, let us know (call Dr. Schnabel 864 656 6705 or Dr. Layne 864 656 4961) and we'd like to visit it and discuss the possibility of setting up a long-term trial on your farm. Cultural practices such as raised beds with microsprinkler irrigation may encourage root development above the soil zone where ORR is present, thus extending tree life substantially in a replant site, but we need to do field research to verify if this is possible.

Figure 1. Young trees dying on replant site.

Figure 2. Fungal mycelium in peach bark tissue, a diagnostic symptom for oak root rot.

Figure 3. Suckers develop from the base of trees that died of Peach Tree Short Life.

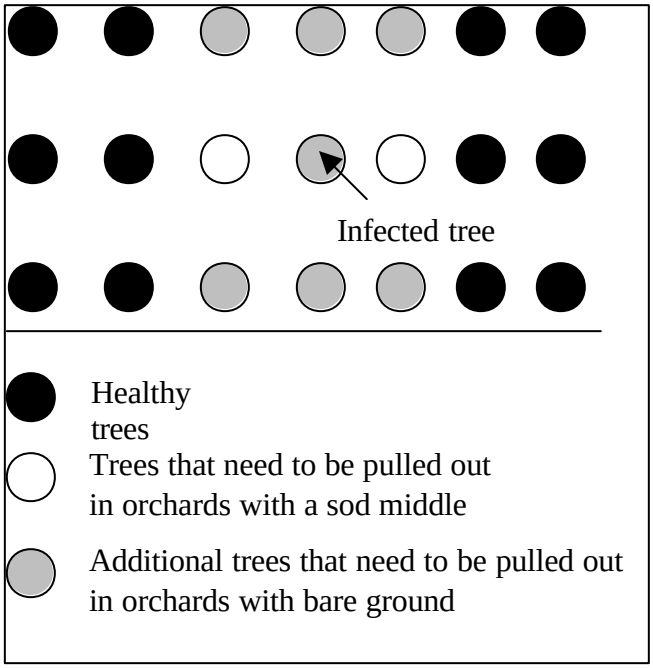

Figure 4. Orchard system dependent roguing of trees to prevent the spread of oak root rot.

Nematode Issues in the Southeast

Phillip M. Brannen,
University of Georgia

Over the last year, I have been concerned by the number of cases of severe nematode damage observed in many orchards, especially root-knot nematodes (Figure 5). With the nematode testing resources which are available, and with the chemical control and rootstock resources which are available, this should not be the case. I think there are three reasons for the high numbers of nematodes and subsequent damage observed.

1) **Failure to nematode test.** The information gained from a nematode test can be a "lifesaver." According to Georgia standards. Only one ring nematode or root-knot juvenile per 100 cc of soil would indicate the need to treat with fumigants. **A peach tree will simply not tolerate damaging nematode levels. Nematodes will result in death or reduced yields.**
2) **Failure to treat with nematicides.** Even in the absence of nematodes, as indicated by a soil test, we currently recommend that a 6-8 foot strip of soil be fumigated where the peach rows will run. This is because low levels of damaging nematodes may be difficult to detect, and we do not want to take chances. If one is planning to transplant trees in January or February, **do not** fumigate after Thanksgiving with Telone; residual Telone, especially on heavy soils, will often kill young trees if they are planted too close to the fumigation date.

3) **Failure to use Guardian rootstock.** Guardian is still the "best game in town" relative to peach tree rootstocks. It has good resistance to both ring and root-knot nematodes. It is susceptible to root-lesion nematodes, but you can't have everything. All-in-all, it is an excellent root stock. Even in the most opportune soils, nematodes have a difficult time in orchards where Guardian rootstock is combined with pre-plant fumigant treatments.

While I am at it, let me say a few words about spot replants – replanting trees in young orchards where some trees have died from various causes. In these cases, there is no practical means of spot-fumigating, and it is likely that nematode populations have developed – even if fumigation has been previously utilized. Therefore, this presents a dilemma. In these cases, I would definitely suggest the use of Guardian rootstock. The use of a good rootstock is your best shot at having the second-attempt trees survive and yield well.

With the implementation of the above recommendations, I hope we will observe less nematode damage in our southeastern orchards. As far as I am aware, there are no better-than-Guardian rootstocks on the horizon, and the chances of new nematicides is "slim and none." Therefore, these options will have to do for now, and they really are pretty effective – if utilized.

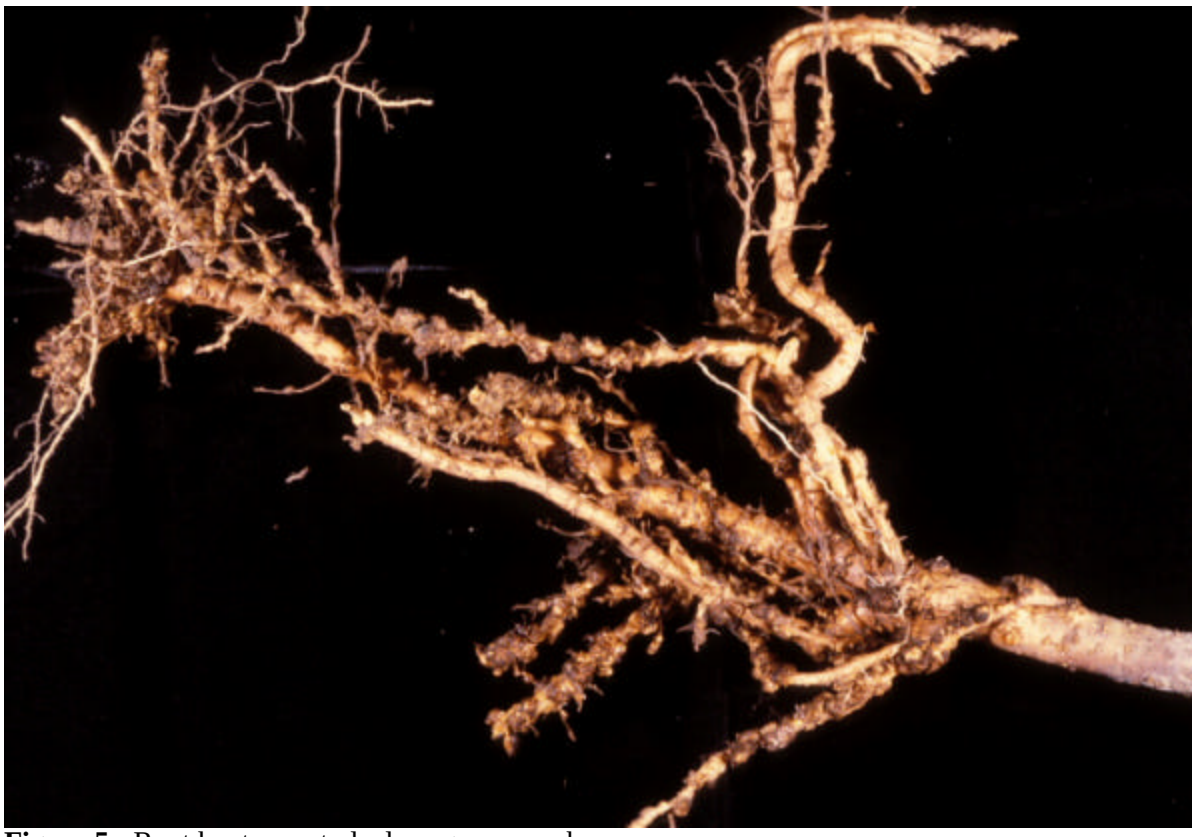

Figure 5. Root knot nematode damage on peach.

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