



INDEX

Crop Conditions
Collar Rot of Apples
Brown Rot
More on Stone Fruit
Plum Pox Virus Found in Michigan
and New York
Tissue Analysis Grapes and Small Fruits
Strawberry Fruit Bud Development
Fall Herbicide Applications for
Strawberries
Perennial Weed Control
EEOC Offers Tips to Companies That
Employ Teens
New Farmers' Market in Crown Point
Consumption of Apples Improves Memory
Coming Meetings

FFF06-08

August 17, 2006

Crop Conditions: Gala harvest is underway in southern areas and should start in about 10 days in more northerly areas. Blueberry and blackberry harvest is winding down. Grape harvest is getting started in the southern part of the state.

Collar Rot of Apples: Now is a good time to scout trees for the above-ground symptoms of collar rot. Look for sparsely leafed trees with premature leaf reddening (this is especially true on Golden); Fruit tends to be heavily produced, but small and highly colored on red-fruited varieties. Key diagnostic symptoms require examining the crown or collar (this may be done after scraping away the soil to reveal dying and dead bark). Tissue beneath the bark will be red-orange-brown, becoming dark brown instead of a healthy white. A distinct margin may separate healthy from infected tissues. Fire blight symptoms may be similar when confined to the rootstock. Keep in mind that these above ground symptoms may be caused by a number of factors, e.g., Stem-girdling roots, animal injury, root damage, etc. However, trees that show the above-described symptoms and also have a canker at or just below ground level are likely infected

with collar rot. I really hate recommending rootstocks, since there are a number of *Phytophthora* species that cause root, crown, and collar rot. Without knowing what species of *Phytophthora* you have (this requires laboratory diagnosis) it is difficult to make any absolute statements about the relative susceptibility of different rootstocks to these diseases. Some specialists swear that they've never seen collar rot on B. 9. I think this is the same as taunting...

Several fungicides are registered for *Phytophthora* root diseases, but their success pales in comparison to good site preparation and the use of rootstocks adapted to the intended orchard site (this is code for finding out what *Phytophthora* you have!). Chemicals should be used as a preventative measure, and it's important to remember that it's practically impossible to eradicate the pathogen from the

roots after infection is established. If collar rot is suspected, you can still apply Aliette (2.5 to 5 lb/A.) or Agri-Fos (at 1.25 to 2.5 qt/A) to the point of run off. Do not apply Aliette within 14 days of harvest or with copper products. Do not apply either product within 2-3 weeks of leaf color change as the chemical will not be translocated from the leaves to the roots. Ridomil 2E can be applied in the fall **after** harvest but before the ground freezes. With all of these fungicides, be sure to treat surrounding “healthy”- appearing trees, not just trees already showing severe symptoms of collar rot. (Beckerman)

Brown Rot: Another warning for severe brown rot of stone fruits (apricot, cherry, nectarine, peach, plum). Warm, wet, humid weather at harvest is particularly favorable for this fungal disease. Also, as fruit softens during the ripening process, it becomes much more susceptible to brown rot. Carefully picking and handling fruit to avoid injuries prevents infection courts that brown rot is more than happy to exploit. If infection is severe, picking fruit a few days early and ripening off the tree may be required. Finally, when all is said and done, remove any remaining fruit from the tree after the final picking to prevent the possibility of overwintered mummies within the tree infecting susceptible blossoms next spring. This also gives you one less thing to do during your spring pruning and provides you with more latitude to selectively prune (in case of severe winter, hail, or animal damage) without increased risk of blossom infection. Pretty smart, eh? (Beckerman)

More on Stone Fruit: Now is a good time to scout for **Cytospora canker**. Key symptoms include dark, sunken areas with gum oozing through the bark on branches and limbs. Pruning thin, willow water sprouts in the center of the tree right now prevents canker establishment within the main stem of the tree. This is key, as nothing can be done when the

cankers get into the trunk. Do not use commercial wound paints on pruning cuts—I know, it makes you feel better, but it really messes up the tree—Just Don’t! When pruning side branches from larger limbs, the cut should be made just beyond the branch bark ridge, that ridge of thickened bark where the smaller branch joins the larger limb—But, as you cut carefully, do not cut flush to the main stem, and do not leave stubs! The branch bark ridge should not be removed because it is in this region where the most rapid wound healing occurs. Prune to open the center of trees to light penetration because shaded branches are weakened and more susceptible to winter injury and *Cytospora infection*. I know, that is a lot of “Do Not’s” but improper pruning can cause a lot problems in the future, so refresh your memory if you aren’t sure. Remove all dead and weakened wood and burn it immediately. Limb damage that occurs during the growing season should be repaired immediately; never wait for the dormant season. On plums, in addition to *Cytospora canker*, look for symptoms of black knot disease at the time of pruning. These are rough, black tumors or overgrowths that develop on shoots and limbs and should be pruned out completely and destroyed. (Beckerman)

Plum Pox Virus Found in Michigan and New York: The presence of plum pox virus (PPV) in Southwestern Michigan was confirmed last week by the USDA National Plant Germplasm and Biotechnology Laboratory. This follows on from the discovery of the disease in Niagara County, NY in July. PPV first turned up in North America in 1999 in two townships in Adams County, Pennsylvania. Efforts were made in Pennsylvania to contain and then eradicate the disease. However in 2000, PPV was detected in Ontario Canada, although the virus may have been present there as early as 1992.

What causes PPV? PPV is caused by a virus which has been known in Europe for over 60 years. Similar viruses in the United States infect potato and corn. Four major types of PPV occur and are designated the D, M, C, and EA strains of PPV. All of these strains can infect most stone fruits, but only PPV-C can infect cherries. Only PPV-D occurs in North America and infection of cherry has not been reported.

Is PPV present in Indiana? Not as far as we know. In 2001 and 2002, we sampled leaves from 10 of the larger peach growers in the state and all tested negative for the disease. With the Michigan discovery, we may start sampling orchards again next season.

Host range. PPV infects not only plums but also all economically important stone fruit (*Prunus*) species including peach, nectarine, apricot, almond, and cherry. PPV is also known to have the ability to infect some wild *Prunus* species, and a large number of weed species under laboratory conditions. In Europe, it is believed that spread within orchards occurs from infected to healthy fruit trees. The role of alternate weed hosts, if any, in disease spread is not known, but needs further study.

Symptoms on stone fruit. Symptoms of PPV may vary considerably with the plant species, the cultivar, tree age, nutrient status, and environmental conditions. Some infected plants show no clear symptoms at all. Diagnostic symptoms on leaves may consist of light green discoloration bordering the leaf veins (vein banding) or chlorotic light green or yellowed rings on the leaf blades. These symptoms may be obvious or barely visible to the eye, depending on factors described above. Symptoms frequently are restricted to only a few leaves per shoot. Infected trees are not stunted and are difficult to identify. Fruits of peach and apricot may develop lightly pigmented chlorotic rings or line patterns resulting from several

rings coalescing together. Fruits may become deformed or irregular in shape, developing necrotic areas. Plums are generally more severely affected and show more severe symptoms.

For some plum cultivars, infected fruits drop prematurely from the tree. Infected plum fruits often develop darker rings or spots on the skin, are severely deformed, and develop a reddish discoloration of the flesh. Affected fruit can be low in sugars and tasteless. PPV infection of fruit trees results not only in development of typical symptoms on leaves and fruits, but also eventually debilitates the tree, reducing its useful life. Unfortunately, many trees fail to show symptoms for the first few years following the initial infection of the tree. In a Pennsylvania survey, only 2 of the 18 infected peach blocks had trees showing obvious symptoms. Therefore, symptoms are not a good indicator of infection and cannot be relied upon to determine the incidence or range of the disease. When symptoms do occur, however, they are frequently very diagnostic and easily recognized.

How does plum pox spread? There are 2 vectors known to spread plum pox, aphids and humans. The D strain of the virus is not known to be seed-transmitted, and is not transmitted on fruit. There are several species of aphids that have been reported to carry the virus on their mouthparts after feeding on an infected plant. The virus is viable on the aphids' mouthparts for only an hour or so. Aphids are mainly responsible for the short-distance transmission of the virus from infected areas to uninfected areas.

Humans have been responsible for some of the greater-distance spread where the disease has crossed natural barriers like mountains and oceans. If budwood collected from an infected area is used for grafting and budding new trees, virus-infected budwood will result in a PPV-infected tree being transported to various locations. It is critical that any budwood collected or

shared for the purpose of grafting new trees is certified to be clean of the PPV!

(Hirst, with information from John Hartman, Kentucky Fruit Facts, Deborah Breth, Scaffolds Fruit Journal, USDA and Penn. State University)

Tissue Analysis Grapes and Small Fruits:

Plant nutritional status is important for all phases of plant growth and has a direct effect on vigor, fruitfulness, cold hardiness, and other factors. Tissue analysis is the most reliable means of determining plant nutritional status. Combined with soil testing, tissue analysis can help pinpoint the source of problems and determine what measures may be needed to ensure proper nutrition of the crop. Tissue analysis samples should be collected at the appropriate time to give the most meaningful results. For strawberry, sample the first fully expanded leaves after renovation, usually in mid to late July. For brambles, sample leaves on non-fruiting canes (primocanes) between August 1 and 20. For blueberries sample leaves during the first week of harvest. For grapes, samples should be taken about 70 days after full bloom, usually early to mid August. Samples should be adequate in size. Collect 30-60 leaves for strawberries, brambles, and blueberries, and 100 leaf petioles for grapes (for grapes submit only the leaf petiole, or stem, for analysis, discard the leaf blade). Collect samples to represent the entire field, not just from a few plants. Sample different varieties separately. If specific problems exist, collect separate samples from both normal and problematic areas of the planting. After collection, leaves should be washed gently to remove any pesticide residues and dust that might affect analysis, laid out to dry for a couple of days, then bagged in paper bags for submission to the lab. Some labs offer tissue analysis sample kits.

There are several private companies and a few universities that provide tissue analysis. A list of certified soil and plant analysis test-

ing labs serving Indiana growers is located at <http://www.agry.purdue.edu/ext/soiltest.html>

The Midwest Small Fruit Pest Management Handbook has a chapter on tissue analysis and fertilizer recommendations. It is available online at <http://www.ag.ohio-state.edu/~sfgnet/> (Bordelon)

Strawberry Fruit Bud Development: The time to fertilize strawberry fields is approaching. Applications of 20 to 50 pounds of nitrogen in mid August to September stimulate flower bud initiation during the fall months. Rates depend upon amount of nitrogen supplied at renovation and plant vigor. New fields with high vigor may not need additional nitrogen now, but most older fields should benefit. Irrigation during this time is also extremely important, if rainfall has not been sufficient. We suggest about 1 inch per week. (Bordelon)

Fall Herbicide Applications for Strawberries:

A number of herbicides can be used on strawberries during late summer and fall to prevent weed germination, kill emerged weeds, and provide residue control until the following spring. The key set of weeds you need to control during this period are fall germinating winter annuals such as chickweed, henbit, and shepherds purse. You may also need to control wheat, oats, or rye that come from seed in the straw mulch that you apply for winter protection.

Devrinol (napropamide) is a preemergence herbicide. It can inhibit rooting of daughter plants so it should be applied after early forming daughter plants have rooted. Late forming (after late August) daughter plants do not contribute to yield and Devrinol can be applied before these plants root. Devrinol must be applied before winter annuals and small grains emerge. Devrinol provides excellent control of small grains and some winter annuals such as chickweed. Devrinol must be moved into the soil by cultivation or water after application.

Dacthal (DCPA) is a preemergent herbicide that can be used in new plantings or immediately after renovation. It provides good control of many grasses and some broadleaves such as purslane and lambsquarter. Like Devrinol, it must be applied before weeds emerge.

Sinbar (terbacil) is primarily a preemergent herbicide but it has some postemergence activity against small susceptible weeds. Fall applications of Sinbar should only be applied after the strawberries are completely dominant. If Sinbar is applied to actively growing strawberries, injury can occur. Cultivars differ in tolerance to Sinbar. In general, less vigorous cultivars have greater injury. Applications are most effective when applied to the soil and activated by rainfall or irrigation. Sinbar provides excellent control of many winter annual weeds. Fall applications of both Devrinol and Sinbar will persist to the following spring.

Poast (sethoxydim) is a postemergent, grass specific herbicide. The grasses must be actively growing. Thus Poast should be applied in late summer or early fall before plants become dormant. Summer annual grasses, such as foxtails and crabgrass, will be killed by fall frosts, and do not require Poast applications for control. Poast is more effective against annual than perennial grasses. Poast can be used in the fall to suppress perennial grasses such as quackgrass; control early emerging small grains, and kill winter annual grasses such as wild oats and downy brome.

A systemic, postemergence broadleaf herbicide, 2,4-D amine can be applied when strawberries are dormant to control some winter annuals. 2,4-D provides good control of many mustards and shepherdspurse, but is not very effective against chickweed. The herbicide should be applied to actively growing weeds. Be careful of 2,4-D drift causing injury to non-target plants. Check the label as only a few formulations are labeled for strawberries.

Gramoxone Extra (paraquat) can be applied as a directed spray between strawberry rows, using shields to prevent contact with strawberry plants. Gramoxone is a nonselective herbicide, so it will kill or severely injure strawberries it contacts. Gramoxone is a restricted use pesticide and is extremely toxic to animals including humans. It provides excellent control of annual grass and broadleaf weeds. Gramoxone does not extensively translocate in plants so it does not control perennial weeds. Weeds should be actively growing when Gramoxone is applied.

The Midwest Small Fruit Pest Management Handbook has a chapter on weed management. It is available on line at <http://www.ag.ohio-state.edu/~sfgnet/> (Bordelon)

Perennial Weed Control: Late summer and fall is an excellent time to control troublesome perennial weeds by spot spraying with suitable herbicides. Perennial weeds tend to become established within the rows in fruit plantings because they are not fully controlled by the normal weed management program. Once established, these plants can be difficult to eliminate. Glyphosate (e.g. Roundup) is a particularly good herbicide for controlling perennial weeds in the fall. As perennial plants begin to slow growth and harden off for winter, carbohydrates are translocated to the roots for storage. Fall applied systemic herbicides will be similarly transported to the root system which leads to excellent control. Fall application works equally well on hard to control herbaceous perennial weeds such as thistle, dock, smartweed, and morning glory, as well as woody perennials such as poison ivy, Virginia creeper, multiflora rose, mulberry, blackberry and so on. The plants do not have to be actively growing for good results but should have sufficient active leaf area to take up the herbicide. Check the manufacturer's product label for specific recommendations. NOTE: Desirable crop plants are also translocating

carbohydrates to the roots and can be severely injured by fall applied systemic herbicides. Be EXTREMELY CAREFUL when spot treating to avoid any contact with desirable plants. (Bordelon)

EEOC Offers Tips to Companies That Employ Teens: The U.S. Equal Employment Opportunity Commission (EEOC) recently offered tips to companies that employ teenagers and called on the employer community to promote fair, inclusive and discrimination-free workplaces for millions of young people.

At the height of last summer (July 2005), more than seven million young people age 16-19 joined the U.S. workforce, according to the U.S. Department of Labor.

EEOC encourages industries to create an environment in which young workers can learn, develop and thrive. EEOC says the next generation of workers will carry the lessons you share throughout their careers.

EEOC offered employers the following tips to promote voluntary compliance and prevent harassment and discrimination cases involving young workers:

- Encourage open, positive and respectful interactions with young workers.
- Remember that awareness, through early education and communication, is the key to prevention.
- Establish a strong corporate policy for handling complaints.
- Provide alternate avenues to report complaints and identify appropriate staff to contact.
- Encourage young workers to come forward with concerns and protect employees who report problems or otherwise participate in EEO investigations from retaliation.
- Post company policies on discrimination and complaint processing in visible locations, such as near the time clock or break

area, or include the information with a young worker's first paycheck.

- Clearly communicate, update and reinforce discrimination policies and procedures in a language and manner young workers can understand.
- Provide early training to managers and employees, especially front-line supervisors.
- Consider hosting an information seminar for the parents or guardians of teens working for the organization.

For more information, visit:

<http://youth.eeoc.gov/>

(Mid America Ag and Hort Services)

New Farmers' Market in Crown Point: Vendors are needed for a late Fall - Pre-Christmas Farmers Market in Crown Point, Indiana. The location will be the Wheeler Barn Gathering Place at the Olthof Homes Community of Pentwater Southeast Crown Point, Indiana. The market plans to be open October 21 - December 16, 2006. This market is still in the planning stages and vendor suggestions are welcomed. For more information contact farmdirect@sbcglobal.net or phone 219-743-6274 (Hirst and Maynard)

Consumption of Apples Improves Memory:

Today, the University of Massachusetts-Lowell (UML) released exciting news about new apple health research. Dr. Thomas Shea and his research team discovered that apples and apple products may help boost brain function similar to medication. Dr. Shea found that apple juice, used in the study, may actually increase the production in the brain of the essential neurotransmitter acetylcholine, resulting in improved memory. According to UML researchers, the positive effect on the mice used in the study resulted from the equivalent of a human serving of two 8 oz. glasses of apple juice or 2-3 apples a day. Shea concludes, "The findings of the present study show that consumption of antioxidant-rich foods such as apples and apple

juice can help reduce problems associated with memory loss”. This study is published in the August issue of the *Journal of Alzheimer’s Disease*.

Upcoming Meetings:

Aug. 30-Sept.1. North American Fruit Explorers (NAFEX) annual meeting. Holiday Inn North, Lexington, KY. For more details contact John Strang, Univ. KY, jstrang@uky.edu

September. Fall Grape and Wine Workshop. Purdue West Lafayette campus. Watch for more details in the future. Contact Jill Blume 765-494-1749 or blume@purdue.edu. Date to be announced.

Dec. 5-7. Great Lakes Fruit and Vegetable expo, Grand Rapids, MI.

Jan. 29. Beginning Commercial Apple Production workshop. Indianapolis. For more info contact Peter Hirst

Jan. 29-31. Indiana Horticultural Congress and Trade Show, Indianapolis.

Department of Horticulture &
Landscape Architecture
Purdue University
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010

Bruce Bordelon
Dept. of Horticulture &
Landscape Architecture
Purdue University
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010
765/494-1301
e-mail: bordelon@purdue.edu

Janna Beckerman
Dept. of Botany & Plant Path.
Purdue University
915 West State Street
West Lafayette, IN 47907-1155
765/494-4614
e-mail: jbeckerm@purdue.edu

Peter Hirst
Dept. of Horticulture &
Landscape Architecture
Purdue University
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010
765/494-1323
e-mail: hirst@purdue.edu

Jennifer Dennis
Dept. of Horticulture &
Landscape Architecture
Purdue University
625 Agriculture Mall Drive
West Lafayette, IN 47907-2010
765/494-1352
e-mail: jhdennis@purdue.edu

Rick Foster
Dept. of Entomology
Purdue University
901 W. State St.
West Lafayette, IN 47907-1158
765/494-9572
e-mail: rfoster@purdue.edu

Disclaimer: Reference to products in this publication is not an endorsement to the exclusion of others that may be similar. Any person using products listed in this newsletter assumes full responsibility for their use in accordance with current label directions of the manufacturer.

It is the policy of the Purdue University School of Agriculture that all persons shall have equal opportunity and access to the programs and facilities without regard to race, color, sex, religion, national origin, age, marital status, parental status, sexual orientation, or disability. Purdue University is an Affirmative Action employer. This material may be available in alternative formats.