Phosphite
Jason Brock & Tim Brenneman

We have received a number of inquiries on a group of fungicides that contain phosphorous acid as the active ingredient. Examples of products include Agri-Fos, K-Phite, and Phostrol. Two obvious questions that will need to be answered are what these products are and should they be used.

What are they?

Do not confuse phosphorous acid with phosphoric acid. The two are very similar in name and structure, but differ in their properties.

Phosphoric acid (H₃PO₄) disassociates to release dihydrogen phosphate (H₂PO₄⁻) and hydrogen phosphate (HPO₄²⁻). These ions are taken up by the plant and utilized in plant nutrition as a source of phosphorus.

Phosphorous acid (H₃PO₃) disassociates to release dihydrogen phosphite (H₂PO₃⁻) and hydrogen phosphite (HPO₃²⁻), which are also readily taken up by plants, but are not utilized for nutrition. Phosphorous acids are used in a multitude of ways, including, as antioxidants, solvent in paint, flame retardant on fibers, and optical brighteners. Our interest is the possible use as fungicides.

Phosphorous acid fungicides have mainly been documented to suppress diseases caused by oomycetes, a group that includes Phytophthora, Pythium, and the downy mildews. The direct effect on the oomycetes is the inhibition of oxidative phosphorylation, part of the metabolic process. Indirectly, these compounds also seem to stimulate the plant’s natural defense response to a pathogen. This stimulation of the plant’s defense mechanisms can result in suppression of diseases such as Phomopsis leaf spot and black rot of grape and anthracnose in blueberries caused by non-oomycete pathogens.

Use Recommendations

A number of factors related to the use of Phosphorous acid and pecan disease management remain unknown. The stability
of phosphonate compounds is influenced by environmental conditions and crop. Plants also differ in uptake and translocation of phosphonate. Effectiveness against diseases also varies, with multiple examples showing either disease suppression or having no effect. Trials are being conducted to examine the potential use of these compounds for pecan disease management.

These products may end up being useful additions to our arsenal of pecan fungicides, but until more is known about their use on pecans, we suggest that growers do not replace fungicides with these materials. We have very little efficacy data on pecan diseases, or experience to validate crop safety. Until more data is available, only use these products as a supplement to an existing fungicide program. One option would be to have phosphite-treated versus untreated areas in the same orchard to see if there is any benefit from use of these fungicides.

One other important consideration is an area outside of efficacy. As with any new material, it would be prudent to check mixing compatibility prior to adding to the spray tank. A number of products are mixed in spray tanks, including fungicides, insecticides, miticides, and nutrients. There has been a report of some compatibility issues, and testing this on a small scale will help to avoid a larger problem.

**Zinc & Boron Sprays**

Lenny Wells

Zinc (Zn) and Boron (B) sprays should begin with your second fungicide spray and continue for a total of at least three applications. Zinc is critically important to leaf expansion and shoot elongation. As a result, zinc must be available to the tree at these specific times during the growing season. The most familiar characteristic of zinc deficiency is a curling of young leaves, resulting in a wavy leaf margin. Additional symptoms may be a rosette pattern, narrow leaves, and terminal die-back.

Even in the absence of visual symptoms, foliar Zn sprays can be beneficial. Zinc moves slowly in the soil, requiring two or more years for most surface applications to become effective. Foliar zinc applications are the most rapid means of providing Zn to the developing foliage.

In most situations, only two to three applications early in the season are required for maintenance of leaf zinc levels. Once leaves harden off, Zinc is not readily absorbed. Where a second flush of growth occurs later in the year, foliar sprays can be beneficial to that new flush of growth.

Boron plays an important role in the movement of carbohydrates across cell walls and in growth and stability of the pollen germ tube, which may rupture with inadequate B, leading to reduced fertilization.

Properly timed foliar B applications prior to, during, and after pollination can result in better nut retention and kernel quality. There is little evidence that foliar B applications following pollination are beneficial to pecan.

Both Zn and B applications should be made at approximately the same time and in most cases there is no problem tank mixing these two foliar fertilizers.
**Casebearer Sprays**  
*Will Hudson*

The first insect pest most growers see every season is pecan nut casebearer (unless you have phylloxera, which need to be treated at budbreak). The first generation moths emerge just as the trees are pollinating, and the females lay eggs on the small nutlets that will be food for the caterpillars. A single caterpillar can eat its way through several nuts in a cluster as it develops. Once inside the nut, insecticides cannot reach the larva so timing of sprays is critical to get the pests before the damage begins.

Pecan trees set many more nuts than they can carry to harvest and in "on" years the damage from low to moderate populations of casebearers is slight. Many growers elect to ignore them and not treat, especially if the weather is dry and treating would require a trip over the orchard just for the casebearer spray.

For those who choose to treat, the best way to get the timing right is through trapping the moths with pheromone traps. These traps are available from several vendors including Great Lakes IPM and Forestry Suppliers, and some local distributors also carry the traps and lures. Once some moths show up in the traps, you know about a week later the eggs will be laid and a few days after that caterpillars will be hatching, so you can peg the time to spray in your orchard. Lacking traps, some growers talk to their neighbors or call the pecan hotline and treat whenever others are treating. Others choose to add a caterpillar treatment to the fungicide spray closest to May 15th and hope for the best.

Whatever your strategy, there are several products that will give excellent control if timed well. These include Lorsban, Dimilin, Confirm, Belt and Intrepid. Jim Dutcher’s early scouting reports show large numbers of predators in the orchards. This is a good sign and should be taken into consideration when planning a casebearer spray. Of the products listed above, Lorsban would not be a good option if you want to preserve beneficial insects and minimize aphid problems down the road.

**‘Byrd’ Parentage**  
*Lenny Wells*

The parentage of the new cultivar ‘Byrd’ has recently been under examination. The cultivar was released as a ‘Desirable’ X ‘Pawnee’ cross and had generated a lot of excitement based on its early harvest date and exceptional kernel quality. DNA analysis by Dr. L.J. Grauke with USDA has confirmed that the parentage of ‘Byrd’ is actually ‘Wichita’ X ‘Pawnee’. Growers interested in planting ‘Byrd’ should be aware of this parentage.

**Cultivar Profile——‘Caddo’**  
*Lenny Wells*  
*Information from UGA Pecan Breeding Webpage*

‘Caddo’ was developed from a cross between the cultivars 'Brooks' and 'Alley' in 1922 or 1923 at the U.S. Pecan Field Station, Philema, Georgia. This cultivar was then tested and released in 1968 from the USDA breeding program at Brownwood, Texas.

‘Caddo’ is a precocious variety and production remains high in mature trees without going into an extreme alternate bearing cycle as most precocious cultivars do.
Nut quality in 'Caddo' is good at 54 % kernel with more than half the kernels rated as fancy. 'Caddo' has a slender kernel with an attractive gold color. Unlike many cultivars, nut quality remains high in mature trees even with the larger yields.

'Caddo’ s biggest challenge is that it averages only 67 nuts / lb. 'Caddo' is an early-ripening pecan, and is ready for harvest around October 11 in Tifton, which is about a week earlier than 'Stuart'. 'Caddo' is scab susceptible, but scab can be easily managed on this cultivar with a standard spray program. 'Caddo', much like 'Sumner' and 'Gloria Grande', appears to be favored by black aphids, and should be monitored for this pest.

'Caddo' is protandrous, meaning the anthers mature before the stigma, and would be pollinated by 'Elliot', 'Moneymaker', 'Schley', and 'Stuart'.

**Upcoming Meetings**
Georgia Pecan Growers Association
Annual Conference
May 6, 2010
Georgia National Fairgrounds
Perry, GA

**Pecan Hotline**
1-800-851-2847

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