Southeastern Regional Peach Newsletter – Special Edition

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Editors Note

Due to potential shortages of Mycoshield in the marketplace, Dave Ritchie (North Carolina State) has taken the lead on an article which addresses alternatives to Mycoshield for control of post shuck-split bacterial spot control. Due to wet conditions, we are predicting an aggressive bacterial spot epidemic in 2003. Therefore, the limited supply of Mycoshield has to be addressed. Please read the following carefully.

Godspeed to all.

Phillip M. Brannen
Editor

Management of Bacterial Spot without Mycoshield

Dave Ritchie
NC State University

Phil Brannen
University of Georgia

As most of you are now aware, oxytetracycline (MYCOSHIELD) will be in short supply or possibly not available for the 2003-growing season, because of production issues.

The last several summers have been very dry, and bacterial spot incidences very low, thus carryover of the bacteria from last season was probably low. However, the bacteria can multiply very rapidly, and even limited bacterial carryover can result in severe disease pressure. With frequent periods of rainfall, extended periods of high humidity, and increasing temperatures, conditions have been favorable for bacterial spot infections on newly emerging leaves this spring. The figure to the left shows a peach leaf with angular, water-soaked bacterial spot lesions (visible at the time of shuck split on 6 April, 2000). There are enough bacteria in this one leaf to infect all the fruit on a

single tree, assuming the bacteria could be splashed to all fruit. One objective of applying copper sprays from bud-break through shuck-split is to prevent these early (primary) infections, which provide an enormous bacterial population for fruit infection (starting at shuck split or possibly while in the bloom if frequent rainfall occurs). The opposing picture (above right) is an example of injury (circular, red spots) from early-season sprays of copper. This picture was taken on 3 April, approximately one week after a copper application at petal fall.

There currently are no post shuck-split chemical alternatives which are as effective as Mycoshield for controlling bacterial spot on peaches – without phytotoxicity. Copper is very toxic to this bacterial pathogen, but it can be very damaging to peach leaves. Although leaf "shot-hole" can occur from use of copper, the greater damage is associated with excessive defoliation, which can reduce fruit quality (including smaller fruit size and delayed ripening). However, at recommended rates of copper, no direct injury to fruit finish has been observed. Mycoshield was registered for use on peaches in the early 1980s. No other products have shown efficacy which is comparable to Mycoshield; nor have any been registered for use on peaches since the registration of Mycoshield. Thus, to see what alternatives may be available, we need to look at chemicals which were evaluated prior to Mycoshield and which still remain available for use on peaches today.

Copper-containing materials – there are many different formulations. Most labels specify that copper-containing products are to be used post-bloom only in 1st and 2nd cover sprays; after that, the risk of leaf injury and defoliation can be very damaging. Use rates are not greater than 0.25 to 0.50 lb metallic copper per acre in these two cover sprays. This is approximately 1.0 lb of formulated material per acre. For post-bloom sprays with copper, probably the most used formulation has been TENN-COP 5E at ¼ pt (4 fl oz) per 100 gal of water. Use rate per acre is 4-6 fl oz. There is a maximum of six (6) applications per season. However, use of TENN-COP 5E can still cause injury. The picture shown above was from the use of 8.0 fl oz/acre of TENN-COP 5E applied at petal-fall. To a lesser extent, COPPER-COUNT-N, which contains 8% metallic copper and is used at the rate of 4-8 fl oz per acre, has also been used. There is little research data from which to draw any significant conclusions about the use of this product on peaches. However, it also can cause injury similar to the other copper-containing products.

The effectiveness of copper for disease control and the incidences and severity of phytotoxicity can be variable. This may relate to several fundamental characteristics of copper. First, it is the ionic form of copper that is toxic. Thus simply having copper present does not mean that it is toxic; it must exist as "free ions". The quantity of free ions is determined by the pH of the liquid in which the copper is present. The ionic form of copper is influenced by acidity. In acid (pH <7.0), the lower the pH (more acid), the more free ions of copper which will be present and the more toxic the solution for both the bacteria and the peach leaves. If the liquid is basic (pH >7.0), then few or no free ions are present; in this case, though copper is present, its toxicity to the bacteria and foliage is greatly reduced. Thus, it is important to have the proper pH balance, which is an important consideration for using a copper material that has been properly formulated. The pH of the spray water, and ultimately the pH on the leaf surface, can influence the quantity of copper ions and subsequent disease control and phytotoxicity.

Weather conditions at the time of application can also influence the occurrence and amount of copper injury to peach foliage. Cool (temperatures of roughly 50 to 63?F) and especially slow drying conditions can significantly increase phytotoxicity. Ideally, drying should occur within 3-5 minutes to reduce the risk of phytotoxicity. If it takes 20-30 minutes or more for the copper spray to dry, injury is likely to occur – even at very low rates. **To reduce the risk of accumulating copper on the tree to levels that could become phytotoxic, consecutive applications should**

NOT be applied during extended dry periods. Sprayers should always be properly calibrated, and the recommended rate should not be exceeded. If a copper material is used after shuck-split, it is recommended that the foliage be carefully examined 2 to 3 days later (or before the next copper application); following this examination, a decision must be made as to whether another copper application can be applied without excessive injury occurring.

The three pictures below show results from using a spray containing 1.0 oz (0.0625 lb) of metallic copper (0.25 lb of product per acre) on 25 May (foliage is normal), on 1 June (approximately 25% yellow foliage), and a close up of the foliage on 6 June. Approximately 10% defoliation occurred, and there was a 3-5 day delay in fruit ripening as compared to non-sprayed trees.

May 25 **June 1** **June 6**

The bottom line for use of copper when peach foliage is present – there is no rate of copper which has adequate activity against bacterial spot which will not cause some leaf injury.

Captan tank-mixed with dodine (SYLLIT 65W) – This is a combination that was evaluated in the 1960s and 70s, and the recommendation remains on the SYLLIT 65W label. It is recommended for use when bacterial spot pressure is light to moderate. This hopefully is the situation in orchards where the early-season copper spray program was followed. When using this chemical combination, data from the average of seven experiments (1961-1971) showed about 50% of the bacterial spot incidence of the non-sprayed check. In these experiments, the captan + dodine sprays were started at petal-fall or shuck-split, without any earlier sprays for bacterial spot. In years with frequent rainfall, newly emerged leaves can be infected earlier than petal-fall, thus providing an abundant source of bacteria for fruit infection starting at shuck-split. Therefore, this spray combination may be even more effective if earlier copper sprays have been applied. The rate listed on the SYLLIT 65W label is 0.5 lb + 1.0 lb captan 50% per 100 gal. The per acre rate is SYLLIT 65W at 2.0 lb + captan 50% at 4.0 lb per acre. Some leaf "shot-hole" has been observed with this combination, but this has not resulted in significant defoliation. This combination also provides peach scab control (if sprays are applied at proper time for scab control and at least 4.0 lb of captan 50% is used). **Dodine is dangerous, so this has to be taken into consideration.**

Zinc-containing materials – Different forms of the metal zinc have been evaluated – often as zinc sulfate. The disease control has been less than that with copper products and there remains the risk of phytotoxicity from zinc, which also responds to pH (similar to that described for copper). The fungicide, ziram contains the metal zinc. The safest method of application would be in the fungicide ziram, sold under the brand names ZIRAM 76DF and ZIRAM GRANUFLO 76%. Each of these products contains 16.25% metallic zinc. This is approximately 2.6 oz of zinc

per pound of material. The use rate is 4-8 lb per acre, and one should not exceed 72 lb per acre per year. Both of these formulations are labeled for use on peaches up to 14 days before harvest, BUT neither has bacterial spot listed on the label. Ziram has been occasionally evaluated during the last 20-30 years, with some indication of bacterial spot suppression. No foliar or fruit injury has been observed with the use of ziram. However, ziram should not be relied upon for adequate peach scab control.

GENERAL RECOMMENDATIONS:

1. If a grower plans to use Mycoshield this year and has a source, it should be purchased now.

2. If at all possible, insecticide and fungicide application should be conducted only when foliage is dry. Spraying when the foliage is wet can further distribute the bacteria.

3. The focus should be to prevent bacterial spot from starting. The optimal time to use Mycoshield, if the grower has it, is at late shuck-split to the start of shuck-off and then for the following 3-4 weeks on a 7-10 day schedule if weather conditions remain wet. Wet can be defined as at least one measurable rainfall per week or heavy dews that result in several hours of leaf wetness. Do not use less than 0.75 lb of material per acre in an attempt to "stretch" the Mycoshield by using low rates.

4. Once pit hardening occurs, at which time fruit apparently become less susceptible, evaluate the bacterial spot situation on fruit as well as the foliage. If few or no lesions are observed, but weather conditions remain favorable for disease, consider alternating a low rate of copper or a SYLLIT 65W + captan application with Mycoshield. Also, focus the use of Mycoshield on the most susceptible varieties.

5. If you do not have Mycoshield, continue to apply the reduced rates of copper sprays – carefully monitoring for injury before each application until a point is reached that injury is considered too gre at to continue the use of copper. Switch to SYLLIT 65W + captan sprays at this time.

6. On highly susceptible varieties, if no early-season copper sprays were used, the grower has no Mycoshield, and bacterial spot is observed, the grower may need to evaluate whether any of the alternatives for Mycoshield are economically worthwhile for this season.

These are the best suggestions we have at this time. A section 18 possibility is also being "explored" for another antibiotic, but this may not come to fruition. Even if possible, the section 18 would not be granted in time to alleviate the current need for bacterial spot control methods. Through use of the above suggestions, we are hopeful that bacterial spot control will be acceptable.

Some Common Symptoms of Bacterial Spot Observed in May and early June

Water-soaked lesions May 15

Lesions that have become visible in the last 24 hours

Typical lesions June 1

Bacterial spot symptoms on fruit and leaves June 6

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