

Copper, copper, copper...

The only effective product for canker control is also effective for many fungal diseases

By L.W. Timmer, J.H. Graham and H.L. Chamberlain

Citrus canker has now become widespread in South Florida and the east coast and has appeared on the Ridge as well. Next season, many growers will have to develop a canker control program for the first time. Unfortunately, we have only one product that is effective for citrus canker control — copper. Other products may have some limited effects, but none is equal to or superior to copper. So we'll have blue trees in many locations this year.

However, it is not necessary to just routinely spray all trees on a calendar basis from March to July to control canker. Excessive copper sprays will result in copper accumulation in soil and could disrupt insect and mite control. Every effort should be made to minimize the total amount of metallic copper applied wherever possible by reducing rates, using high quality products and eliminating unnecessary sprays.

CITRUS CANKER RECOMMENDATIONS

Leaves of most varieties are susceptible until they are fully expanded and fruit is susceptible from the time it is about ping-pong ball size (3/4 to 1-inch in diameter) until the end of July. Thus, depending on the variety and the destination of the fruit, copper sprays may be needed from first flush to late July. The basic programs recommended in the 2007 Florida Citrus Pest Management Guide are:

Processing fruit — Early and mid-season oranges require three sprays — one each in May, June and July,

whereas Valencias probably only need sprays in late May and June.

Grapefruit for processing will probably need sprays every three weeks from late April until mid-July.

Fresh market grapefruit — Copper sprays will be needed on the first flush at about 50 percent expansion and then every three weeks from late April to mid-July.

Fresh market oranges, tangerines, and tangelos — Most tangerines are more tolerant to canker than oranges and grapefruit and may require

fewer sprays. However, tangelos are as susceptible as most early oranges. For these varieties for the fresh market, copper sprays will probably be needed from late April to mid-July. This program will have to be integrated with the fungal disease program depending on the susceptibility of the variety to different fungal diseases as indicated below.

FUNGAL DISEASES

Since copper is effective for many fungal diseases as well, copper sprays for canker control must be integrated with the fungal disease program. Following are guidelines for the major fungal diseases of Florida citrus.

POSTBLOOM FRUIT DROP

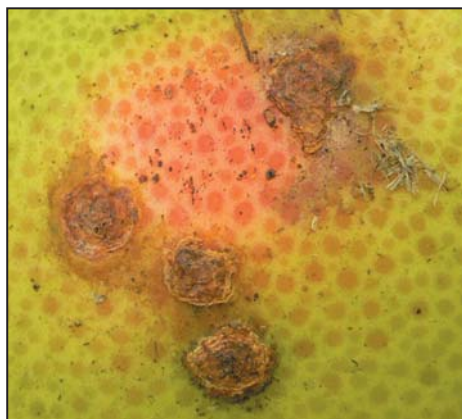
PFD has not been much of a problem in recent years, and even with the El Nino predicted this year, it is not likely we'll have

major problems. There is simply not enough inoculum around to cause a major outbreak. Topsin M, and to a lesser extent, the strobilurins (Abound, Gem, and Headline) are effective for PFD, but copper is not. In any case, no copper sprays are needed for canker control during the bloom. In fact, copper inhibits pollen germination and potentially could affect yield in some varieties. Thus, copper sprays should not be applied during the bloom period.



SCAB

Three sprays are recommended for scab control — at first flush, petal fall, and three weeks after petal fall. Previously, a strobilurin or ferbam spray was recommended



at first flush and now that Enable is registered for all citrus species and diseases besides greasy spot, we have another alternative. However, a copper spray is needed for canker control on highly susceptible varieties such as grapefruit. Copper does provide some control of scab, but is not highly effective, especially on rapidly expanding young flush.

Since the leaves are growing relatively fast, protection from either disease is needed for only a short period. For canker, no more than 0.5 lb of metallic copper is needed in the spray for the first flush. That will provide some control of scab as well, but where scab is severe, one of the fungicides mentioned above will need to be added.



MELANOSE

Copper sprays are as effective as any material for melanose control and are usually recommended from late April until early June. So, the recommended program for melanose control, using 1 1/2 to 2 lb/acre of metallic copper, will also control canker.

However, in the past, we recommend that strobilurins be applied during hot, dry periods to avoid copper damage to fresh fruit. Copper will probably have to be applied during those times now to assure control of citrus canker.

However, the copper rate should probably be reduced to 1/2 to 1 lb/acre of metallic copper to reduce the risk of spray burn. Also, these sprays should be applied without the addition of petroleum oils, spreader-stickers, or other adjuvants that might increase copper uptake and aggravate spray burn, and should be applied with a minimum of 125 gallon spray volume per acre.

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ALTERNARIA BROWN SPOT

Copper sprays as well as strobilurin fungicides are quite effective for control of this disease. Applications are recommended from first flush to mid-July, according to the Alter-Rater Model (http://www.crec.ifas.ufl.edu/crec_websites/pathology/diseasemodels1.htm). Normally, a strobilurin is recommended for the spray at first flush. However, in most



situations, a copper spray at 0.5 lb/acre will provide adequate control on that flush. Where Alternaria has been quite severe in the past, addition of a strobilurin with the copper spray may be necessary. Varieties susceptible to Alternaria are not highly sus-

ceptible to canker. Thus, the normal spray program for Alternaria should control canker as well. However, during hot dry periods, copper may speckle the fruit. During those times, the copper rate should be reduced to 0.5 lb/acre and a strobilurin can be added if Alternaria is severe.

GREASY SPOT

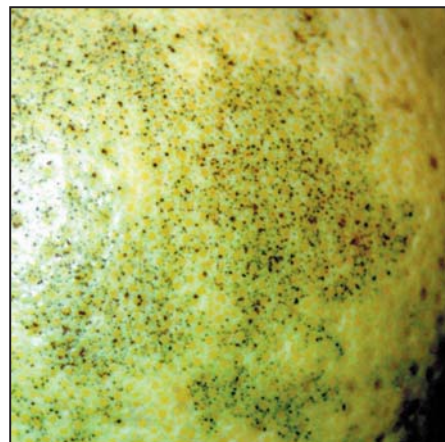
Copper sprays for canker are most needed in June and July during the rainy season. By the end of July, fruit becomes resistant to canker. Copper applied in June and July for canker control should provide a high level of con-

trol of greasy spot and addition of other products should not be necessary. However, for control of greasy spot rind blotch on fruit, an August spray is often needed. Enable or a strobilurin applied in early August should provide excellent control of this disease. Petroleum oil may be needed for insect and mite control, but is not really necessary for greasy spot control.

In order to maximize disease control, good coverage of the fruit is needed, which usually requires a spray volume of at least 125 gallon/acre for mature trees with correspondingly less for smaller trees. The rates of metallic copper suggested in this article are for the best quality copper products. If average quality copper products are used, rates of metallic copper may need to be increased by about 50 percent.

The increased use of copper for canker control will reduce, but not eliminate, the need for application of fungicides. Judicious use of copper sprays can provide good control of canker and other diseases without exacerbating spray burn or non-target effects.

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