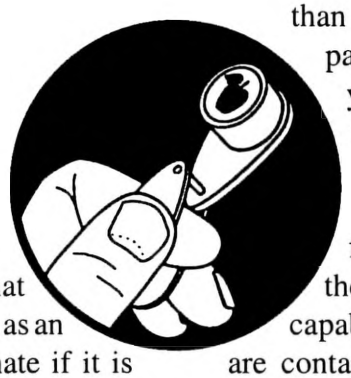
scaffolds : FRUIT JOURNAL

Update on Pest Management and Crop Development

March 24, 2003 VOLUME 12, No. 2 Geneva, NY

THE OILY BOID...

OVER A BARREL (Art Agnello, Entomology, Geneva)



❖❖ After the passing of what many growers have been describing as an old-time winter, we will be fortunate if it is followed by an old-time spring that develops slowly, warms gradually, and contains a sufficient number of stretches of non-stormy weather to allow appropriate early season sprays by those who may need them for prebloom arthropod control. This would be an optimal situation to consider using petroleum oil, a traditional option that continues to be a wise tactic, despite the fact that a number of newer and capable contact miticides are available for early season use. For as many of the blocks as you can find the time and application window to devote to a thorough treatment, oil retains a justifiably preferred position because of its effectiveness, affordability, and relative safety from a biological and resistance perspective. Exploiting the most acceptable spraying conditions to maximize tree and block coverage can be a challenge in our area, but few pest management efforts have such potentially high returns when everything *falls* properly into place.

Pear Psylla

It's nearly impossible to be sure your pear trees are all protected by the time the very first psylla adults start flying and (presumably) laying eggs during the first warm temperatures of the spring. However, even a few nice warm days in a row don't waken more than a small percentage of the total population, so you'll be more than adequately psylla-ready if you prepare a little ahead of time, provided your orchard floors aren't too soggy from spring snows.

Early oil applications can be useful against pear psylla all throughout the swollen bud stage; although it's capable of killing adults and nymphs that are contacted directly, oil is recommended mainly because the residue has a repellent effect on female psyllas looking to deposit their eggs, and this lasts for an extended period after treatment. The strategy behind the use of oil is to delay the timing of any needed insecticide spray until as late as possible before (or after) bloom. Oil rates depend on when you start: If your buds are at the dormant stage, one spray of 3% oil, or two of 2% through green cluster are recommended; if you start at swollen bud, one spray at 2% or two at 1% up to white bud should be adequate for this purpose, especially if applied as soon as the psylla become active (50°F or above). This will also give some red mite control at the same time.

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European Red Mite

A delayed-dormant spray of petroleum oil from green tip through tight cluster can be a favored approach for early season mite control, both to conserve the efficacy of and to help slow the development of resistance to our contact miticides. Our standard advice has been to try for control of overwintered eggs using 2 gal/100 at the green tip through half-inch green stage, or 1 gal/100 at tight cluster; this assumes ideal spraying conditions and thorough coverage. Naturally, real life doesn't always measure up, mainly because of weather and coverage challenges, coupled with the difficulty of getting to a number of blocks during this transient window. It is possible for mites to start hatching when the trees are at solid tight cluster, so the suffocating mode of action tends to be compromised if the nymphs are able to wade through or avoid the droplets. Let practicality determine how best to use the following guidelines.

First, to be sure that mites are in the egg stage, start on your blocks as soon as the weather and ground conditions permit, even if this means using a higher rate. Snowfalls have been generally heavy in many locations, so local conditions will be a prime determinant of how easily you can get through the rows early on. Also, tend toward the high end of the dosage range, especially if there's been no frost during the 48-hour period before your intended spray, and no danger of one for 24-48 hours afterwards. For example, use 1.5 gal/100 if the buds linger somewhere between half-inch green and full tight cluster during your chosen spray period.

Naturally, good coverage of the trees is critical if you're to take advantage of oil's potential efficiency; this in turn requires adequate spray volume delivered at an appropriate speed. Experience and research have shown that a 1X concentration (300 gal/A) in larger trees is clearly preferable; however, if all other conditions are optimal (weather, speed, calibration), then 3X, or 100 gal/A, is the highest concentration that should be expected to give acceptable control at any given time. Growers like to concentrate more than this to save time and the hauling of extra water, but reducing coverage too much can wipe out your efforts if you end up getting only a small fraction of the egg population under the residue.

Don't limit this mite-control tactic just to apples and pears. Talks with stone fruit growers over the winter have reminded us that many cherry, peach and plum plantings can suffer equally seriously from European red mite infestations that weren't given the early season attention they might have needed. We don't have hard and fast threshold guidelines for these crops, but stone fruit plantings with a history of past ERM problems should be examined for presence of the red overwintered eggs, and if they're numerous enough to see without a hand lens, then a prebloom application of 2% oil would be a prudent measure to help stave off this damage.

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is published weekly from March to September by Cornell University—NYS Agricultural Experiment Station (Geneva) and Ithaca—with the assistance of Cornell Cooperative Extension. New York field reports welcomed. Send submissions by 3 pm Monday to:

scaffolds FRUIT JOURNAL
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This newsletter available on CENET at: news://newsstand.cce.cornell.edu/cce.ag.tree-fruit
and on the World Wide Web at:
http://www.nysaes.cornell.edu/ent/scaffolds/

Scaling Up?

We've been discussing how some of the recent .nsecticide withdrawals and restrictions may induce a return to the pest profiles of the past, with direct fruit pests taking precedence over the indirect foliar feeders. San Jose scale is one of those old standbys that already has been responding to some of the regulatory actions of the last few years. The disappearance (or restriction) of products like Penncap-M and Lorsban from our list of spray materials has been at least partly responsible for the fact that SJS still presents a challenge in a number of orchards. It's therefore worth pointing out that a 2% oil treatment at half-inch green will control the nymphs, and this is a preferred treatment if no other problem insects need to be controlled. Combining the oil with an insecticide has not been shown to be more effective than using the oil (or insecticide) alone, except in the case of one new alternative, Esteem, which has shown good efficacy when mixed with 2% oil at the pre-pink timing.

If you choose not to use oil against the scale nymphs, or if you have Rosy Apple Aphid or other early season insects to be controlled, an insecticide would be more appropriate. For both of these pests, Lorsban 4EC or Supracide have proven very effective during the green tip to tight cluster stage. The neonicotinoid Actara has a good fit in apple prebloom programs, owing to its activity against Rosy Apple Aphid in addition to leafminers. Check the opening buds for infestations of Rosy Apple Aphid; treatment would be advisable upon finding one colony per 100 clusters.❖❖

ION THE BUDS

SPRING COPPER SPRAYS FOR FRUIT DISEASES

Dave Rosenberger (Plant Pathology, Highland)

DISEASES

❖❖ Copper sprays can be applied in early spring to control several important diseases on tree fruits. On apples, pears, and quinces, copper applied at green tip can help to suppress fire blight in orchards where blight was present in either of the two previous years. A copper spray between bud swell and bud burst can be used to control peach leaf curl on peaches and nectarines. On sweet cherry, tart cherry, and apricot, a copper spray at bud burst can help to suppress bacterial canker.

Which copper product should I use?

A recent search of the New York State pesticide registration database showed that 19 different copper products are currently registered on tree fruit crops in New York State. The crops, diseases, and application timings listed vary greatly from one product to another. When using copper sprays, users must read the individual product label to ensure compliance with label restrictions.

Of the 19 copper products registered for use on tree fruits, 11 products are formulations of copper hydroxide and four are formulations of copper sulfate. Cuprofix MZ Disperss and Mankocide are copper products formulated with mancozeb. Clean Crop C-O-C-S is a mix of copper oxychloride and copper sulfate, and Tenn-Cop 5E is a mix of copper salts of fatty and rosin acids.

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For tree fruit applications, "fixed" coppers usually work better than copper sulfate applied alone. The term "fixed" copper refers to copper products that are formulated or tank-mixed in such a way as to create relatively insoluble or "fixed" deposits of copper on plants. Copper ions are gradually released from these deposits when plants are wet, and it is the copper ions that control diseases. Copper ions can also cause phytotoxicity to the treated crop if the concentration of copper ions is too high. Because copper ions are released slowly from the spray deposits created by fixed copper sprays, the fixed coppers are less phytotoxic to plants and provide better residual activity against diseases than can be achieved with a non-fixed form of copper.

Copper hydroxide and copper oxychloride are both fixed coppers whereas copper sulfate is not. If copper sulfate is mixed with spray lime to make a Bordeaux mixture, then the copper sulfate and calcium in the lime react together to form a fixed copper. Product labels for products containing copper sulfate can be confusing: The label for the new copper fungicide Cuprofix Disperss indicates that the formulation is 36.9% basic copper sulfate, so one might assume that this is not a fixed copper and that it will therefore lack the residual activity found in fixed coppers. However, Cuprofix Disperss is formulated with gypsum, a carrier that contributes the calcium ions needed to convert the copper sulfate into a fixed form of copper, and it therefore should work as well as any of the other fixed copper products.

What is the best product for any given application? Research in other cropping systems has shown that the biggest factor affecting efficacy of fixed coppers is the amount of elemental copper that is applied. This means that so far as efficacy is concerned, products can be selected based on the cost per pound of elemental copper. However, some of the liquid formulations or finely ground dry formulations may go into solution more easily in the sprayer tank than older and coarser formulations. Convenience of measuring and mixing should also be a consideration when deciding which product to purchase.

Copper sprays for pome fruits

A copper spray applied at the green-tip bud stage has been recommended for more than 40 years as part of a fire blight control strategy for apples and pears. Copper residues on the twigs and branches kill bacteria as they are released from over-wintering cankers. Cankers usually begin releasing bacteria when trees are at the pink or bloom stages. However, copper must be applied at green tip to avoid the phytotoxicity that can occur with later applications. In years when more than three inches of rain occurs between the copper application and full bloom, the efficacy of the copper spray may be reduced because much of the copper residue will have been depleted before over-wintering cankers release bacteria. In years when little or no rain occurs between the green-tip copper application and bloom, fruit may develop copper-induced russetting (Fig. 1) because too much copper residue will still be present at bloom. To avoid the potential for phytotoxicity on apples, the copper rate should be reduced for any applications made after green-tip, and no copper sprays should be applied to apples after half-inch green unless the block is intended for processing and fruit russetting is not a concern.

Fig. 1: Russetting on McIntosh fruit caused by phytotoxicity from a copper spray applied after half-inch green.

Copper sprays applied to control fire blight may also help to suppress superficial bark cankers caused by *Botryosphaeria* species. In orchards where only EBDC fungicides (mancozeb, Polyram) and SI fungicides (Rubigan, Nova, Procure) are used for prebloom scab control, trees may gradually develop

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a severe "rough bark" symptom (Figs. 2–3) that we believe is caused by *Botryosphaeria dothidea* or other *Botryosphaeria* species. These pathogens affect only the outer bark and only rarely cause necrosis that extends into the cambium. However, the superficial cankers can quickly extend into the cambium when apple trees are under extended drought stress. The effects of this rough-bark condition on productivity are not known, and the optimum spray timing for controlling this disease has not been determined. However, we know that EBDC

Fig. 2: Early symptoms of rough bark caused by Botryosphaeria species.

and SI fungicides do not control *Botryosphaeria* species and that the rough-bark disease has appeared primarily in orchards where these fungicides were used in prebloom sprays. Copper, captan, Sovran, Flint, and Topsin M are all effective against *Botryosphaeria* species. An application of copper at green tip may be the most economical approach for suppressing the rough-bark disorder.

Fig. 3: Advanced symptoms of rough bark on a Cortland tree from an orchard where prebloom scab was controlled exclusively with EBDC and SI fungicides

Copper sprays for stone fruits:

Copper sprays applied either at leaf fall in autumn and/or as a dormant spray in spring have been very effective for controlling bacterial canker (*Pseudomonas* species) on sweet cherries and leaf curl (*Taphrina deformans*) on peaches and nectarines. An application of copper at bud burst on apricots may also help to prevent the severe bud blast that can occur if apricots are colonized by *Pseudomonas* during a cool wet spring when a light frost occurs during bloom. In some years and locations, the combination of *Pseudomonas* and light frost has caused nearly 100% kill of apricot flowers and foliage. Although no research has been conducted on the efficacy of copper sprays for preventing such damage, copper residues from a spray at bud burst should help to suppress bacterial populations that contribute to spur death following frost events.

In the Hudson Valley, at least one grower has stopped using the spring application of copper on sweet cherries because of concerns that copper residues might reduce fruit set on the treated cherry trees. Copper is toxic to pollen, and the earlier flowering date for cherries as compared with apples increases the likelihood that copper residues from spring applications could interfere with pollination. Effects of copper sprays on fruit set are not a concern on apricots, peaches, and nectarines where extensive fruit thinning is usually required after bloom. ❖❖

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UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–3/24):	37.8	15.9
(Geneva 1/1-3/24/2002):	73.4	23.3
(Geneva "Normal"):	43	17
Highland 1/1–3/24):	71.1	27.3
Coming Events:	**Ranges:**	
Green fruitworm 1st catch	36–173	9–101
Pear psylla adults active	2–121	0–49
Pear psylla 1st oviposition	25–147	1–72
Redbanded leafroller 1st catch	32–480	5–251
McIntosh at silver tip	54–137	17–58
Red Delicious at silver tip	54–117	20–59

PHENOLOGIES

Geneva:
All dormant

Highland:
All dormant

PEST FOCUS

Geneva:
Pear psylla adults observed 3/24.

Highland:
Pear psylla adults and eggs observed 3/24. **Green fruitworm** moths beginning to fly.

NOTE: Every effort has been made to provide correct, complete and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are possible. These recommendations are not a substitute for pesticide labelling. Please read the label before applying any pesticide.

This material is based upon work supported by Smith Lever funds from the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.