scaffolds Update on Pest Management and Crop Development

FRUIT JOURNAL

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INSECTS

## STYLETS & CORNICLES

ROSY-COLORED GLASSES

(Art Agnello & Harvey Reissig, Entomology, Geneva)

❖❖ Rosy apple aphid (RAA) is the most damaging of the aphids that attack apples and one of the most difficult insect pests to predict from year to year. Although it feeds mainly on apple foliage, causing leaf chlorosis and curling, its saliva is also translocated to nearby fruits, which become bunched, stunted, and malformed. RAA will attack all apple varieties, but varieties such as Cortland, Monroe, R.I. Greening, Ida Red, and Golden Delicious are particularly susceptible, and those in the McIntosh family are relatively tolerant. As with most aphids, this species has a complex life cycle, starting with black eggs that overwinter, together with those of green apple aphid and apple grain aphid, on twigs, in bud axils, and in bark crevices; eggs of the three species generally cannot be distinguished. The eggs develop into solitary, wingless "stem mothers", who then give birth to living young, most of whom are also wingless. RAA nymphs are visible beginning at about tight cluster but are most easily observed at the pink bud stage. The first adults appear around bloom.

Second-generation adults appear 2–3 weeks after petal fall. Some of these move to alternate hosts (such as narrowleaf plantain and dock) and the rest remain in the orchard. In those orchards with an early summer RAA problem, you can find colonies amidst their leaf damage and honeydew particularly in younger, succulent foliage, such as on watersprouts inside the canopy. In some cases it may be advisable to apply a treatment against these infestations if there is a danger of "spillover" (of either aphids or honeydew) to fruit clusters, but any systemic damage to fruit size and shape caused by RAA feeding will have already been initiated by the pre-bloom populations, and can't be reversed at this time. The third generation develops by mid-July and also moves to alternate hosts. Generally they will remain on these plants as wingless forms until early fall, when black winged adults are produced, which migrate back to the apple trees to eventually produce the eggs present during the winter.

WINGED ADULT

Our control recommendations for RAA cover the period from 1/2-inch green to the pink bud stage, using any of a number of materials: Thiodan, Lorsban, Lannate, Vydate, or Asana, listed roughly in order of increasing harm to beneficial mites. Recall also the newly instituted 2(ee) registration for Supracide 25WP (at 2 lb/A), which probably falls somewhere between Vydate and Asana in terms of its negative effects

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on predators. Past field trials generally indicate that pink applications of any of these products do a better job than an earlier spray. This is because, in those cases where aphid populations build up during early summer on vegetative growth inside the canopy, a pink spray is more effective than an earlier treatment at half-inch green. From the standpoint of management practicality, it is therefore easier and more natural to consider the need for aphid control at the time of the pink spray.

Because RAA populations are highly variable, it is important to assess their densities before making a treatment. In past surveys, approximately 50% of the orchards sampled have required treatment. If you are inspecting fruit clusters for STLM eggs at pink anyway, it is not much more trouble to note the presence of RAA nymphs or damage at the same time. We recommend, however, that a few more clusters be checked for RAA than are required for STLM sampling. Try to select 10 from the interior canopy area of each of 10 trees distributed throughout the block. Also, you should try to inspect clusters that already appear damaged. RAA nymphs are of course present at pink, and large enough to see without difficulty, but they do occur on the same tree and in the midst of colonies of green apple aphids, which are not usually a problem until the summer.

In order to distinguish among the species, you can use leaf damage as a cue, as well as the insects' color. RAA nymphs are usually pinkish, sometimes varying to a light brown, slate gray, or greenish black, and the body is covered with a whitish mealy coating. Most importantly, they have pronounced cornicles ("tailpipes"), and long antennae (more than half the body length). Green apple aphid nymphs are clearly green, and without the whitish cast. Their cornicles are little more than buttons, and the antennae are clearly less than half of the body length. Also, aphids found inside curled or distorted leaves at pink are almost always Rosy Apple Aphids. If you find ONE infested cluster (1%, or stop as soon as you find one), we would advise including a good RAA material in your pink spray; this threshold may be a little conservative for people who are skilled at finding the aphids.❖❖

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DISEASES

## ANTAGONISM FACTORS AFFECTING STREPTOMYCIN ACTIVITY AGAINST FIRE BLIGHT AND BLISTER SPOT

(Tom Burr, Plant Pathology, Geneva)

❖❖ Soon it will be time to start planning sprays for fire blight and blister spot control. Streptomycin has been the primary tool for disease management of these diseases for several years, and the recommendations for using streptomycin are well explained in the Cornell Commercial Tree Fruit Recommendations. These include recommendations on timings and rates that are based on susceptibility of trees and on the effects of environment on infection. However, even in cases where growers follow the recommendations carefully, the level of disease control is not always satisfactory.

One well known reason for control failures is cases where the pathogen develops resistance to streptomycin. In New York, the blister spot pathogen, *Pseudomonas syringae* pv. *papulans*, has developed streptomycin resistance and resistant strains are commonly found in orchards. This type of resistance was discussed this year at the NY Horticultural Society Meeting and at winter fruit schools. Resistance of the fire blight bacterium, *Erwinia amylovora*, has also been detected in N.Y., but only in one orchard, and a recurrence of that resistance has not been detected. Therefore, we will continue to monitor fireblight in orchards to test for the presence of streptomycin resistance.

Related research done in my laboratory has recently shown that additives to a streptomycin solution can have a major impact on the activity of the antibiotic. This was first discovered by a graduate, Michael Huang, who found that when streptomycin was dissolved in certain liquid media, the antibiotic had greatly reduced toxicity towards *P. syringae* pv. *papulans*. Reports in the medical literature indicate that certain compounds can act as antagonists of streptomycin activity. Two highly active antagonists are phosphate and calcium ions. Michael then determined that phosphate in the medium he was working with was inhibiting streptomycin activity. It has been reported that the antagonists compete for binding sites on the bacterial cell where streptomycin also attaches. Attachment of streptomycin to the bacterial cell is the first step in its activity against the bacteria. Because such streptomycin antagonists are known and since we found that they

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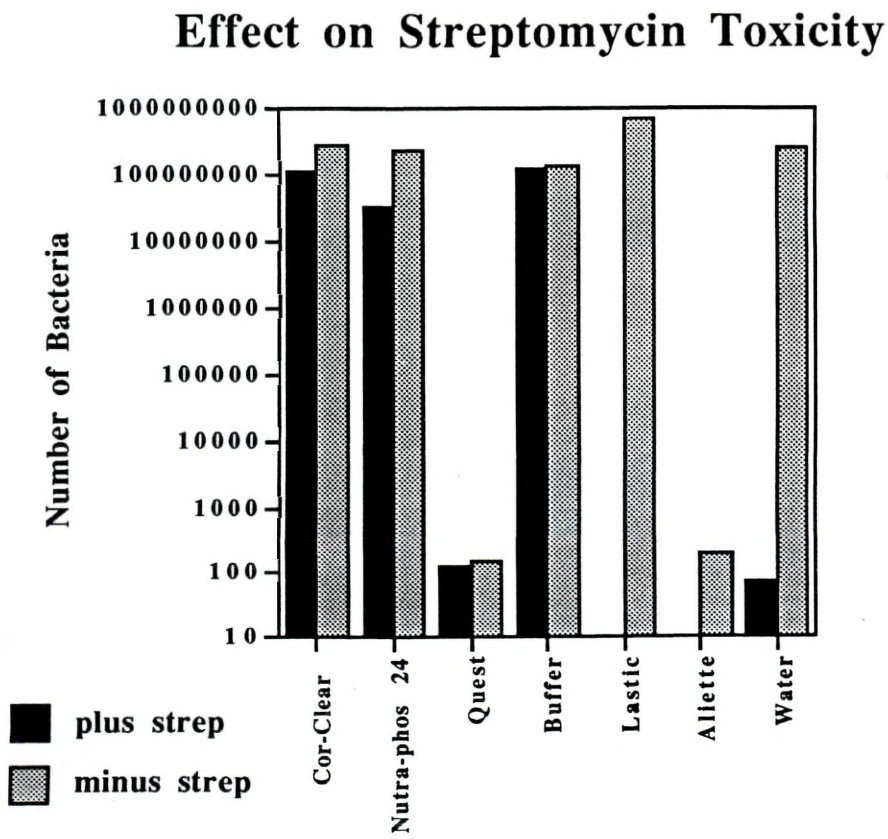

can inhibit activity against bacterial pathogens, we decided to test some additives that may be added to the spray tank with streptomycin.

The accompanying graph shows that certain compounds can inhibit the activity of streptomycin towards the blister spot pathogen. In this experiment, the additives were used at commercially-labelled concentrations together with streptomycin at 25 ppm. Bacteria were exposed in solutions of these mixtures for two hours and then checked for viability. First, note how effective streptomycin is in water for killing the bacteria. TB buffer is the medium containing phosphate that was first shown to inhibit streptomycin activity. Cor-Clear is a calcium chloride material that we have tested in the past for blister spot control, and Nutra-Phos 24 is a foliar nutrient. Both are strong antagonists of streptomycin. Aliette by itself is inhibitory to the bacterium and this may explain why Aliette has provided good control of blister spot in our field plots in recent years. It is not possible from this experiment to conclude that Aliette together with streptomycin is more effective than Aliette alone; however, no bacteria were detected in the mixture. Lastic is an antitransparent and appears to have no effect on streptomycin activity. Quest is a water conditioning agent that is primarily used to enhance the activity of herbicides. Interestingly, by itself it is inhibitory to the bacterium.

We have repeated these experiments with these and other additives several times. It is clear that materials with phosphate or calcium ions can greatly affect streptomycin activity. We have also determined that additives that negatively affected streptomycin against blister spot also negatively affected activity against *E. amylovora*. It is premature to say exactly how detrimental these additives will be to disease control in the field. However, when using streptomycin, all additional materials that are combined in the tank should be considered carefully. At this time it is recommended that all materials that release phosphate or calcium ions into the streptomycin solution should be avoided.❖❖

## UPDATE ON FRUIT FUNGICIDE REGISTRATIONS

(Wayne Wilcox, Plant Pathology, Geneva)

❖❖ There have been some new fruit fungicide products and/or usages that have received Federal and/or NY State registrations since the Recommends was printed. Among these are:

1. Nova 40W. The NYS restrictions against aerial application and use on Long Island have been lifted. Lifting the restriction against Long Island usage is good news for growers there. However, I hope that lifting the restriction against aerial applications won't affect many fruit growers, since thorough coverage is so important for this material to work properly.

2. Aliette WDG. Now labeled for use on bearing pome fruit trees. This may be important, since Tom Burr's work last year showed that Aliette provided pretty good control of blister spot on Crispin/Mutsu where strep resistance was a problem. The DEC has given their OK to use the material to control blister spot, even though it's a target pest that is not specified on the Federal label [allowed under Section 2(ee) of FIFRA]. More on the specifics of this usage as we get closer to petal fall.

3. Procure 50WS. This is an old SI that we quit testing here around 1986, but which has suddenly risen like the Phoenix. In the old days, it usually stacked up somewhere between Funginex and Rubigan, but of course performance of these SI's is always dependent on rate. Not yet labeled for use in NYS. When it is, approach with care (where are some independent, regional data over the last 10 years?) unless it's awfully cheap.

4. Indar 75 WSP. A newer SI with a Federal label for use on stone fruits to control brown rot, cherry leaf spot, and peach scab. In our trials, it has provided outstanding activity against brown rot in laboratory, greenhouse, and field trials. Not yet labeled in NYS.

We'll let you know as further developments unfold.❖❖

**EDITORS' ADDENDUM

Through an editing oversight, the EPA Registration Numbers of tree-fruit fungicides and bactericides failed to make it into the 1994 **OR** 1995 Cornell Recommendations. There aren't many changes from 1993's list, but just in case you don't have that handy, we are reprinting them here:

| Common Name | Product Name | Formulation | EPA Reg. No. |
|---|---|---|---|
| benomyl | Benlate | 50WP | 352-354 |
| | | 50DF | 352-447 |
| captan | Captan | 50WP | 10182-145 |
| chlorothalonil | Bravo | 4.17F | 50534-8 |
| | | 6F | 40534-188 |
| copper sulfate | oxychloride C-O-C-S | 50WP | 279-614 |
| copper hydroxide | Kocide | 77WP | 1812-288 |
| DCNA | Botran | 75WP | 45693-110 |
| dodine | Cyprex | 65WP | 241-51 |
| fenarimol | Rubigan | 1E | 1471-146 |
| ferbam | Carbamate | 76WP | 279-388 |
| iprodione | Rovral | 50WP | 264-453 |
| | | 4F | 264-482 |
| mancozeb | Dithane M-45 | 80WP | 707-78 |
| | Dithane DF | 75DF | 707-180 |
| | Dithane F-45 | 4F | 707-156 |
| | Manzate 200DF | 75DF | 352-449 |
| | Penncozeb | 80WP | 4581-358 |
| metalaxyl | Ridomil | 2E | 00-607 |
| metiram | Polyram | 80WP | 7969-70 |
| myclobutanil | Nova | 40WP | 707-221 |
| oxytetracycline | Mycoshield | 17WP | 1007-82 |
| propiconazole | Orbit | 42%EC | 100-702 |
| phosetyl-Al | Aliette | 80WP | 264-467 |
| thiophanate-methyl | Topsin-M | 70WP | 4581-322 |
| | | 4.5F | 4581-352 |
| triadimefon | Bayleton | 50WP | 3125-340 |
| thiram | Thiram | 65WP | 279-1872 |
| triforine | Funginex | 1.6EC | 21137-4 |
| vinclozolin | Ronilan | 50WP | 7969-53 |
| | | 4F | 7969-62 |

## SCAB

APPLE SCAB ASCOSPORE MATURITY
(Dave Rosenberger, Plant Pathology, Hudson Valley Lab)

| | Immature | Mature | Discharged | Tower shoot |
|---|---|---|---|---|
| Peru, NY, 4/10 | 99% | 1% | 0% | 0 spores |
| Highland, NY, 4/13 | 88% | 12% | 0.1% | 3 spores |
| Hudson, NY, 4/14 | 93% | 7% | 0% | 15 spores |

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## SCAB *UPDATE*
(Dave Rosenberger)

❖❖ In the Champlain Valley (Peru), the scab fungus in overwintering leaves was still a long way from having mature ascospores as of last week. In the lower Hudson Valley, we are approaching the threshold where, with a warm day or two, we could get a significant spore discharge. A few discharged spores were detected in the discharge tower, but the numbers detected (3 and 15 spores) are still quite small compared with counts that can exceed 600 during the peak of the season. Discharges of less than 60 spores in our discharge tower are usually too low to be of concern in commercial orchards.

With warmer weather and showers predicted for April 18–20, Hudson Valley growers using protectant fungicide programs should apply their first scab spray to early-blooming cultivars this week. Late cultivars such as Rome Beauty and Golden Delicious are at little risk until they have more green tissue. As indicated in various commentaries earlier this year, scab sprays should not be needed in clean commercial orchards until McIntosh are at half-inch green if protectant programs are used or until tight cluster if SI fungicides will be used.❖❖

## INSECT TRAP CATCHES (Number/Trap/Day)

**Geneva NY**

| | 4/10 | 4/13 | 4/17 |
|---|---|---|---|
| Green fruitworm | 0 | 0.3 | 0.3 |
| Redbanded leafroller | 0 | 0 | 0 |
| Spotted tentiform leafminer | 0 | 0 | 0 |

* = 1st catch

**HVL, Highland NY**

| | 4/11 | 4/17 |
|---|---|---|
| Green fruitworm | 1.0 | 0.3 |
| Pear psylla eggs/bud | 0.5 | 2.5 |
| Redbanded Leafroller | 0.5 | 2.6 |
| Spotted tentiform leafminer | 0 | <0.1* |
| Oriental fruit moth | 0 | <0.1* |

(Dick Straub, Peter Jentsch)

## UPCOMING PEST EVENTS

| | 43°F | 50°F |
|---|---|---|
| Current DD accumulations (Geneva 1/1 – 4/17 ): | 140 | 58 |
| (Highland 1/1 – 4/16): | 129 | 44 |

| Coming Events: | Ranges: | |
|---|---|---|
| Green fruitworm peak | 64–221 | 19–108 |
| Redbanded leafroller 1st catch | 32–480 | 5–251 |
| Spotted tentiform leafminer 1st catch | 73–433 | 17–251 |
| Rosy apple aphid nymphs present | 91–291 | 45–148 |
| McIntosh at half-inch green | 112–221 | 54–101 |

## PEST FOCUS

Orleans Co: **Apple grain aphid** nymphs present in apple buds, 4/17
Highland: **Spotted tentiform leafminer and oriental fruit moth** 1st catch, 4/17

**Geneva**: McIntosh @ green tip
**Highland**: McIntosh, Empire @ green tip to quarter-inch green; Golden Delicious, Rome @ silver tip to green tip

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.

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