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Update on Pest Management and Crop Development

F R U I T   J O U R N A L

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INSECTS

ON GUARD

FALL BORER CONTROL POINTS

(Dave Kain and Art Agnello, Entomology, Geneva)

[Ed. note: We're printing this article as an update from last year's version on borer management because of its timeliness and applicability to the situation in many commercial orchards recently.]

❖❖ There is increasing concern throughout the Northeast about damage done to apple trees by borers. The species of primary concern is dogwood borer, but American plum borer can be prevalent in western New York apple orchards that are close to tart cherry and peach orchards. While we do not yet fully understand the effects these borers have on dwarf trees, we do know that they reduce vigor and can, in time, completely girdle and kill trees.

Over the last four growing seasons, we have tested a number of insecticides against these borers. Lorsban is very effective for this use and we would strongly urge growers to take advantage of it where needed. In 2001–2003 we compared some other materials, including white latex paint, endosulfan, Avaunt, Surround, Intrepid, Danitol, Imidan, spinosad and Esteem with Lorsban, with varying results. To make a long story short, only Avaunt, Danitol and, possibly Esteem, applied two or three times in midsummer, provided control comparable to one application of Lorsban.

Our tests so far have shown that borers can be controlled season-long by applying Lorsban at various times in the spring and summer. While postbloom trunk applications of Lorsban are still allowed, enabling growers to spray at the peak of the dogwood borer flight, applying this material prebloom as early as half-inch green works well, too, and may be more convenient. Fall also may be a good time to control dogwood borer. Results from 2002 indicated that Lorsban applied postharvest the previous year (sprays went on in October 2001) controlled both generations of dogwood borer. An October 2002 application of Lorsban similarly provided season-long control of dogwood borer in 2003. Lorsban works when applied in the spring and fall because it infiltrates burrknot tissue and kills larvae concealed within. It is also very persistent in wood so it continues to work for a considerably long time after it is applied (apparently 9–12 months in our trials). Fall application may offer growers a more convenient alternative for applying borer control sprays.

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In a survey we conducted recently, we observed some relationships between borer infestation and various orchard parameters such as the proportion of trees with burrknots, proximity to stone fruit orchards and presence of mouseguards. Conventional wisdom has held that borer problems are worse where mouseguards are in place. Mouseguards can contribute to increased expression of the burrknots borers invade and may shield borers from predators and insecticide sprays. This has led some growers to contemplate removing mouseguards under the premise that mice are easier to control than the borers. However, results of our survey indicate that dogwood borer larvae may be found as readily in trees without mouseguards as in those with them. (American plum borer may be a different story in orchards near tart cherry or peach trees.) The orchard in which we have conducted borer control trials has never had mouseguards and there is no shortage of dogwood borers. If mouseguards are deteriorated and no longer protect the tree, there may be some small advantage, in terms of borers, to removing them. But, in orchards where mouseguards still provide protection against rodents, removing them for the sake of borer control is probably not worth the risk. Instead, we would recommend the use of trunk sprays to control borers. Even with mouseguards on, insecticides will give adequate control if they are applied carefully (i.e., a coarse, low-pressure, soaking spray with a handgun). Bottom line: as we go into fall, consider using Lorsban after harvest to control borers, and reconsider removing mouseguards on trees where they still afford protection.❖❖

DISEASES

DUNKIN' DON'TS

OPTIONS FOR POSTHARVEST FUNGICIDE TREATMENTS ON APPLES

(Dave Rosenberger, Plant Pathology, Highland)

❖❖ Sanitation measures can reduce the incidence and severity of postharvest decays caused by *Penicillium expansum*, but fungicide treatments may still be needed to achieve acceptable control of postharvest decays. Sanitation reduces or eliminates inoculum that recycles from year to year on bins and in storages. However, sanitation alone will not eliminate inoculum that originates in the field.

Spores of postharvest decay fungi are often present on fruit before harvest because *P. expansum* and *Botrytis cinerea* are present in orchard soils and in organic debris on the orchard floor. These spores can be blown onto fruit prior to harvest, or they can be carried to fruit via soil on bin runners when bins are stacked on trucks or in storage. Spore concentrations on

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fruit at harvest vary from year to year, but we currently have no way of predicting "bad decay years." As a result, we cannot predict when postharvest treatments might be beneficial and when they will not be needed.

Because postharvest treatments (fungicides, diphenylamine, calcium chloride) are applied using recycling drenches, the treatment can worsen decay problems in the absence of effective fungicides because the treatment solution ensures uniform inoculation of all fruit wounds and stems. The combination of thiabendazole (Mertect 340F) plus diphenylamine (DPA) is still effective for controlling *B. cinerea*, but it no longer controls *P. expansum*. As a result, fruit that is moved into storage without any postharvest treatment may develop decays caused by *B. cinerea*, but decays caused by *P. expansum* cause minimal losses on non-drenched fruit. The reverse is true for fruit given a postharvest treatment of thiabendazole plus DPA: *B. cinerea* will be controlled but *P. expansum* will be more prevalent than in non-drenched fruit. In most cases, losses to *P. expansum* are potentially greater than losses to *B. cinerea*. Therefore, postharvest treatments are usually omitted on apples that do not require DPA treatment.

Captan is registered for postharvest treatments and can be used either alone or in combinations with thiabendazole. Some packinghouse operators report that captan treatment helps to suppress postharvest decay, but captan has been inconsistent and only moderately effective in controlled research trials. If captan is used in postharvest treatments, it should be used at the full label rate because lower rates are unlikely to provide any control of *P. expansum*.

A new fungicide, pyrimethanil (trade name: PenBoTec) received a federal registration for postharvest use on apples on 13 August 2004. It is unlikely that this fungicide will receive a New York State registration in time for the 2004 harvest season, but New York State might approve PenBoTec by late winter at which time it could still be used as a line spray to prevent decay in packed fruit.

PenBoTec is very effective for controlling both *P. expansum* and *B. cinerea*, and it is fully compatible with other postharvest products such as DPA and calcium chloride. However, several factors may limit its usefulness, at least initially. One limitation is that many other countries (including Canada and most European countries) have not yet approved residue tolerances for this product, so treated fruit may not be acceptable for export. A second limitation for using the product in postharvest drenchers is that PenBoTec treatment will likely cost about three times more than Mertect 340F on a per-box basis. Each packinghouse operator will need to determine whether the risks of postharvest decay warrant that level of expenditure for postharvest treatment. The answer will vary depending on how well the packinghouse has been able to manage decays over the past few years without PenBoTec, how long the fruit will be stored, and the anticipated value of the fruit being stored. For example, after PenBoTec is approved in New York State, treatment may be warranted for Honeycrisp (a high-value cultivar prone to both stem punctures and decay) whereas treatment may not be warranted for Empire that will be stored for less than 6-8 months.

<u>Guidelines for using fungicides in postharvest drenches</u>: Storage operators opting to use postharvest fungicide treatments on apples should consider the following:

1. <u>Keep drench solutions agitated</u>: Without agitation, Mertect 340F and captan will settle to the bottom of the treatment reservoir when the system is shut down at night, and the settled product will be difficult to resuspend. Postharvest drenchers should be outfitted with an agitation system capable of resuspending any sediment that settles to the bottom of the tank during periods when the system is shut down. In the absence of a good agitation system, the fungicide concentration will quickly drop below effective levels.
2. <u>Keep drench solutions clean</u>: Soil introduced into the postharvest treatment tanks carries decay inoculum and makes it more difficult to keep postharvest

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chemicals in suspension. A pre-wash with a high-volume stream of non-recycling water may be needed to remove soil from bins or equipment before they enter the postharvest drencher. Empty and clean tanks at least as frequently as is required on the DPA labels.
3. Keep drench solutions properly recharged: The drench solutions should be regularly recharged according to instructions included on the postharvest labels of the products being used. ❖❖

TARNISHED GOLD

NECROTIC LEAF BLOTCH OF GOLDEN DELICIOUS APPLES
(Dave Rosenberger, Plant Pathology, Highland)

❖❖ Within the last week, Golden Delicious apple trees in the Hudson Valley suddenly began developing necrotic spots on leaves, leaves turned yellow, and many of the yellowed leaves are dropping from the trees. Affected leaves frequently have irregular, brown, necrotic areas between veins and/or necrotic sections that extend to the leaf margins. As leaves turned yellow during the week, small areas of the leaves remained bright green against the predominant deep yellow color.

This disorder is called necrotic leaf blotch (NLB). Affected trees do not drop all of their leaves, and fruit do not drop or become blemished. In some seasons, however, more than 50% of terminal leaves can become affected and drop from the tree by early September. Unfortunately, no one has been able to determine the cause of NLB. Fungicides and/or foliar nutrients containing zinc can decrease severity of the disorder if sprays are applied every two weeks during later summer. However, I doubt that control sprays are warranted when the disease appears as suddenly as it has this year. In my plots at the Hudson Valley Lab, Golden Delicious trees looked fine during a "windshield survey" on Tuesday afternoon (17 Aug), but a large proportion of the foliage was severely yellowed by Friday evening.

The last time that this disorder caused widespread leaf drop in the Hudson Valley was 1996. With that kind of sporadic appearance, expenditures for annual control measures, especially when they are only moderately effective, are not warranted.

Necrotic leaf blotch was extensively studied in the early 1970's by Dr. Turner Sutton in North Carolina. He found that the disorder is not caused by a fungus, bacterium, or air pollution and that it is not related to foliar nutrient levels. Symptoms and subsequent leaf drop frequently occur in distinct "waves" in mid to late summer, but Sutton noted that there was considerable variability in severity between and within orchards. The rootstock on which Golden Delicious were propagated did not appear to influence susceptibility or severity. All strains of Golden Delicious were susceptible, but Sutton did not find the disorder on other apple cultivars unrelated to Golden Delicious.

In controlled environment tests, Sutton showed that the disorder failed to develop on leaves of trees held at 86/79°F. day/night temperatures, whereas 33% of leaves on trees held at 79/72°F or 72/64°F day/night temperatures developed leaf blotch. He also showed that potted trees watered every day had roughly three times more leaves affected than did similar trees watered only every second or third day. One might conclude that necrotic leaf blotch is favored by relatively cool, wet weather in late summer — conditions that accurately describe our weather pattern this year.

Although necrotic leaf blotch does not cause fruit drop or fruit blemishes, it may have adverse affects on fruit size and perhaps on the strength of flower buds for the following year. No studies have reported on the effects of this disorder on fruit size because no one has figured out how to maintain affected and unaffected trees in the same field for side-by-side comparisons.

NLB is likely to remain as one of those sporadically-occurring "mystery" disorders that cannot be controlled. Fortunately, it rarely causes significant crop loss.❖❖

INSECT TRAP CATCHES
(Number/Trap/Day)

Geneva, NY

	8/9	8/16	8/23
Redbanded leafroller	0.4	0.0	0.1
Spotted tentiform leafminer	7.5	16.7	10.8
Oriental fruit moth	0.4	0.1	0.4
Lesser appleworm	0.0	0.2	0.3
Codling moth	0.0	0.0	0.1
San Jose scale	0.0	0.0	0.0
Obliquebanded leafroller	0.4	0.3	0.5
American plum borer	1.8	1.1	0.9
Lesser peachtree borer	0.1	0.1	0.6
Peachtree borer	1.3	1.7	0.9
Apple maggot	0.3	0.5	0.6

Highland, NY

	8/16	8/23
Redbanded leafroller	0.6	1.0
Spotted tentiform leafminer	15.9	8.5
Oriental fruit moth	0.4	1.8
Codling moth	0.1	0.1
Lesser appleworm	1.9	3.1
Obliquebanded leafroller	0.0	0.0
Sparganothis fruitworm	0.4	0.4
Tufted apple bud moth	0.0	0.0
Variegated leafroller	0.1	0.0
Apple maggot	0.7	0.5

* first catch

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–8/23):	2720	1783
(Geneva 1/1–8/23/2003):	2723	1834
(Geneva "Normal"):	2803	1964
(Geneva 8/30 Predicted):	2926	1940
(Highland 1/1–8/23):	3289	2313

Coming Events:	**Ranges:**	
Oriental fruit moth 3rd flight begins	2342–2756	1613–1901
Oriental fruit moth 3rd flight peak	2641–3249	1821–2257
Spotted tentiform leafminer 3rd flight peak	2599–3055	1776–2134
Codling moth 2nd flight peak	2005–2835	1337–1977
Lesser appleworm 2nd flight peak	2315–3295	1554–2292
Obliquebanded leafroller 2nd flight peak	2615–3023	1779–2117
Redbanded leafroller 3rd flight begins	2634–2960	1812–2092
Redbanded leafroller 3rd flight peak	2742–3222	1876–2342
Peachtree borer flight subsides	2523–3191	1708–2232
San Jose scale 2nd flight subsides	2639–3349	1785–2371

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