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Update on Pest Management and Crop Development

May 24, 2004 VOLUME 13, No. 10 Geneva, NY

INSECTS

TIME WILL TELL

ORCHARD RADAR DIGEST

Geneva Predictions:

Roundheaded Appletree Borer

RAB adult emergence begins: May 25; Peak emergence: June 11.

RAB egglaying begins: June 6. Peak egglaying period roughly: June 27 to July 11.

Codling Moth

1st generation, first sustained trap catch biofix date: May 17.

Codling moth development as of May 24: 1st generation adult emergence at 15% and 1st generation egg hatch at 0%. 1st generation 3% CM egg hatch: June 7 (= target date for first spray where multiple sprays needed to control 1st generation CM).

1st generation 20% CM egg hatch: June 15 (= single spray date where one spray needed to control 1st generation codling moth).

Lesser Appleworm

Peak trap catch: May 21.

Obliquebanded Leafroller

1st generation OBLR flight, first trap catch expected: June 9.

If using BT insecticide, optimum date to begin 2 to 4 weekly low-rate applications for small OBLR larvae is roughly: June 25.

Oriental Fruit Moth

Optimum 1st generation first treatment date, if needed: May 17.

Optimum 1st generation - second treatment date, if needed: May 28.

Plum Curculio

Increased risk of PC damage as McIntosh and culivars with similar development reach fruit set: May 21.

San Jose Scale

1st generation SJS crawlers appear: June 18.

Spotted Tentiform Leafminer

Optimum sample date is around May 21, when a larger portion of the mines have become detectable.

Highland Predictions:

Roundheaded Appletree Borer

RAB adult emergence begins: May 18; Peak emergence: May 31.

RAB egglaying begins: May 25. Peak egglaying period roughly: June 17 to July 2.

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Codling Moth
Codling moth development as of May 24: 1st generation adult emergence at 45% and 1st generation egg hatch at 1%. 1st generation 3% CM egg hatch: May 26 (= target date for first spray where multiple sprays needed to control 1st generation CM).
1st generation 20% CM egg hatch: June 4 (= single spray date where one spray needed to control 1st generation codling moth).

Obliquebanded Leafroller
1st generation OBLR flight, first trap catch expected: May 30.
If using BT insecticide, optimum date to begin 2 to 4 weekly low-rate applications for small OBLR larvae is roughly: June 15.

Oriental Fruit Moth
Optimum 1st generation - second treatment date, if needed: May 21.

San Jose Scale
1st generation SJS crawlers appear: June 9.

Spotted Tentiform Leafminer
2nd STLM flight begins around: June 6.

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DISEASES

GERM WARFARE

BLISTER SPOT
(Bill Turechek,
Plant Pathology, Geneva)

❖❖ Blister spot is an important and difficult to control bacterial disease of apple fruit on 'Mutsu' (or 'Crispin'), 'Fuji' and a few less popular varieties. The disease can also affect apple foliage, leaf petioles, and shoot tips on a number of varieties, but these infections are considered important only in nursery production. The disease is generally most severe when temperatures are warm, and rain and high relative humidity are prevalent during bloom — such as the conditions we've been experiencing this season — and throughout the period of peak susceptibility (see below). After this period, the level of susceptibility sharply declines.

Fruit are most susceptible to infection beginning two weeks after petal fall and become increasingly susceptible for another two to four weeks

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afterwards. The fruit are infected through the stomata and it is assumed that the leaves are infected in a similar manner. Most infections occur on the lower half of the apple. The first infections are observed as small, darkened water-soaked areas, generally around stomata (eventually turning into lenticels). From there, small raised blisters are formed. The blisters at first start with a light color but eventually become purplish-black as they expand towards the end of the growing season. The epidermal layer covering the blister dies and will often flake off the surface. This stage is the most obvious of blister spot and can be mistaken for tiny lesions caused by apple scab. The lesions, generally circular although they are sometimes lobed, rarely become larger than 4–5 mm in diameter. The infections are shallow, not extending more than 1–4 mm into the fruit flesh.

Disease Management

Applications of streptomycin (e.g., Agri-mycin 17 @ 8 oz/100gal), starting 2–2.5 weeks after petal fall and continuing for another 2 to 4 weeks, is the standard program for control of blister spot. This program worked fairly well in New York until 1986, when resistant strains of the bacteria became prominent. Fortunately, resistance is not a stable trait in the blister spot bacteria, as it is in the fire blight pathogen. In other words, resistance to streptomycin will decline quickly in the absence of streptomycin. Therefore, growers can opt not to use streptomycin for a season when faced with loss of efficacy and then return to its use the following season and expect appreciable control. Fosetyl-Al (Aliette 80WDG @ 0.5-1 lb/100gal) is another option for managing blister spot. Like streptomycin, fosetyl-Al should be applied 10 to 14 days after petal fall followed by two additional sprays at weekly intervals.

Currently, streptomycin and fosetyl-Al are the two best materials we have for managing blister spot. Both products will give about the same level of control when applied alone ***and*** at the appropriate timings. Slightly better control can be achieved if the two products are tank-mixed; this mixture may also be useful for resistance management. Unfortunately, the level of control can be quite variable. In years when disease pressure is high, you should expect less than 50% control with the most effective treatment. Alternative control options are somewhat limited. Two newer products with potential for blister spot control are NutriPhyte Magnum and Oxidate. Both of these products performed very well in trials conducted in Geneva last year. In fact, they worked just as well as streptomycin and fosetyl-Al. However, blister spot pressure was relatively low in these trials last year and I am not certain how well these products will hold up under higher disease pressure. These products are included once again in our trials and we hope to see similar results. If you plan to use Oxidate, be aware that it may cause fruit to russet, although I did not see this in my trials last year.❖❖

FIREWALL

MANAGING FIRE BLIGHT AFTER BLOOM (Dave Rosenberger & Bill Turechek, Plant Pathology, Highland and Geneva)

❖❖ Fire blight remains one of the most destructive and difficult-to-control diseases of apples and pears. Young high-density apple plantings are especially at risk because they often contain vigorously growing, blight-susceptible cultivars growing on highly susceptible rootstocks. Under high risk conditions, the recommended applications of copper at green tip and streptomycin during bloom may not provide complete protection against fire blight. When blight becomes established in young orchards, large numbers of trees can be killed within a single season. The objective of post-bloom fire blight management is to minimize shoot blight and the development of cankers that serve as next year's inoculum source.

The first step for minimizing shoot blight damage involves pruning out infected limbs ***as soon as symptoms are detected*** and before extensive necro

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sis develops. Failure to do so increases the likelihood that blight will continue to spread both to adjacent trees and into the rootstocks of affected trees (rootstock blight). Pruning out infections in mature trees may not be practical, but mature trees with a full crop will set terminal shoot buds earlier than young trees. When trees set terminal buds, blight stops spreading, both between trees and within the affected trees. In order to remove strikes before cankers extend too far into the tree, trees must be examined at least two or three times weekly until the epidemic begins to slow. In sections where trees are severely affected, it may be more cost-effective to immediately remove entire trees, especially if trees are a susceptible cultivar like Gala. Pulling out badly affected trees will allow blight removal crews to focus their efforts on trees that can be salvaged.

Occasionally we see orchards where no streptomycin was applied and blossom blight infections are so abundant as to make selective removal of infected limbs impractical. When this occurs with mature apple trees, it is often best to just walk away from the orchard and allow the disease to take its course, then remove cankers and dead wood during winter pruning. An exception would be cases where blighted older orchards are adjacent to younger blocks of highly susceptible cultivars: In that case, the older trees should be pruned or removed to minimize spread into the young orchard. With pears and young apple trees, infections should always be pruned out, even if that means removing nearly all of the tree canopy.

When pruning out fire blight strikes, cuts should be made at least 12 inches below symptoms. The effectiveness of sterilizing pruning shears between cuts is debatable, and is often not done due to the impracticality. The late Dr. Paul Steiner has shown that disinfecting pruning tools is a waste of time because minute cankers often form on the ends of cuts even when pruning shears are disinfected. Instead of wasting time disinfecting pruning tools, Paul recommended making all cuts into at least 2-year-old wood where bacteria will be less able to multiply. Also, leave "ugly stubs" by cutting branches between nodes and at least several inches away from the central leader. Small cankers that form on these stubs can then be removed during winter pruning, whereas a canker that forms at a flush cut on the central leader will be missed during winter pruning. In the ideal world, blight removal would only be done in dry weather. If rain is predicted during the period of pruning, one must weigh the risks of spreading blight by pruning in wet weather versus the risks of giving the epidemic a full week, or even a two- or three-day head start. With highly susceptible cultivars like Gala, it is probably best to remove blight as quickly as possible, even if that means that some removal would be done in less than ideal weather.

In orchards with fire blight, growers should implement management practices that promote early cessation of tree growth. In a year with only light to moderate rainfall, withholding irrigation and delaying orchard mowing (so that the ground cover competes with trees for water) can help to shut down tree growth. No additional nitrogen fertilizers should be applied in orchards with active fire blight. Allowing trees to carry a heavier-than-normal crop can also help to slow vegetative growth and reduce further spread of fire blight.

Streptomycin sprays should NOT be applied during summer because summer applications will result in rapid development of streptomycin-resistant strains of the blight pathogen. The only exception is that streptomycin should be applied immediately after any hailstorm if there is active blight in the orchard (i.e., orchards where blight was present this year and terminal shoots are still growing). Apogee, a plant growth regulator, can help to decrease the severity of shoot blight if the first Apogee application is made during bloom, but Apogee applications are ineffective for blight control if the first spray is applied only after the first blight symptoms appear. Copper applications during summer have not proven effective and may cause unacceptable fruit russetting.

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Hand thinning or bud pinching while blight is active in the orchard should be avoided until after terminal bud set. Delaying hand thinning may result in some loss of fruit size, but risks of spreading blight outweigh the benefits of early hand-thinning. At least one grower has demonstrated that pinching buds as part of tree training for the vertical axe system is a great way to spread blight. Even though we no longer recommend disinfecting pruning tools between cuts, one can still spread blight on one's fingers while pinching buds (and presumably while hand-thinning). Pinching is done to succulent shoot tips that are highly susceptible to blight, whereas cuts made to remove blight are made in wood that is at least two years old.

Trauma events (hail, high winds) can put any orchard block at risk because varieties that are considered relatively resistant to blossom blight and shoot blight can develop severe blight if inoculum is blown in from adjacent susceptible varieties. If a trauma event occurs when trees are actively growing, streptomycin should be applied as soon as possible (within 4 hours is best) after the trauma so as to limit the incidence of trauma blight. After midsummer, when trees have hardened off for the season, streptomycin protection following trauma events may be unnecessary because trees are fairly resistant to fire blight after tree growth stops for the season. Applications of streptomycin may not be possible after midsummer anyway because of the days-to-harvest limitations on the label.

Apogee (Prohexadione Calcium) has demonstrated potential for managing shoot blight infection in experimental trials conducted in New York, Michigan, and Virginia when Apogee applications were initiated at bloom or petal fall. Apogee works by "shutting down" the growth of a tree and, therefore, is used primarily to control overly vigorous trees and reduce the need for seasonal pruning. Apogee has value in fire blight management because when trees stop growing, they become relatively resistant to new blight infections and further expansion of established infections is arrested. Thus, Apogee can significantly reduce secondary spread of fire blight (i.e., shoot blight infections) in orchards where streptomycin sprays failed to provide 100% control of blossom blight.

The problem with using Apogee to control shoot blight is that the first application of Apogee must be made before the effectiveness of streptomycin blossom sprays can be evaluated. Research trials in both the Hudson Valley and Geneva have shown that if the first Apogee application is delayed until blossom blight symptoms appear, then Apogee will have almost no benefit for controlling fire blight. Apogee has no effect on shoot growth or fire blight for at least 10 days after application, so it acts too slowly to be of value as a rescue treatment for orchards with blight symptoms.

In mature orchards where trees have already filled their spaces, the decision whether or not to use Apogee can be based on a combination of its potential value as a vegetative growth inhibitor and as a supplement to fire blight control. In young orchards where trees have not yet filled their spaces, the decision is much more complex. Using Apogee for fire blight control in young orchards will increase the number of years required for trees to fill their spaces and for the orchard to reach the break-even point. Because of this, the benefit of Apogee applications for fire blight control in young orchards may often be negated by the loss of productivity. ❖❖

GENERAL INFO

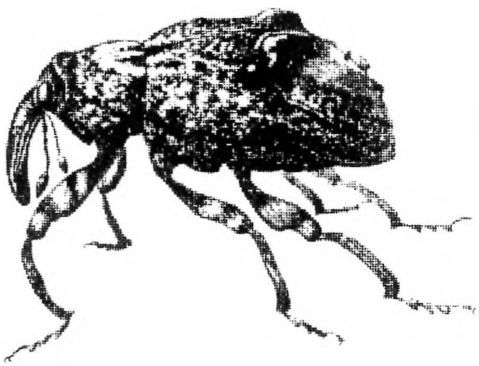
IN MEMORIAM

SEMPER FLY: REMEMBERING RON

❖❖ Leaving aside for a moment all of the other 'musts' of this season, we would recommend a pause here to commemorate the life of Ron Prokopy, a colleague, teacher, and friend of the fruit industry, who died unexpectedly on May 14 at his home in Conway, MA. Always a source of startling inquisitiveness and ingenuous encouragement, Ron enlightened even as he challenged us to constantly think and re-think our assumptions about fruit insects and the part they played in the natural world that consumed his professional life. An optimist who motivated, inspired, amused, and at times exasperated those he came in contact with, he was an individualist whose memory will provide numerous stories and a high standard of professionalism as a continuing influence on his peers. We're sure that, although he will be missed for many reasons, Ron would regret having to depart this world with so much yet left to do.❖❖

Photo courtesy of Charles Vincent

Donations in lieu of flowers can be made to:
Mass Fruit Growers Assoc.
Horticultural Research Fund
P.O. Box 9632
N. Amherst MA 01059



INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	5/17	5/20	5/24
Green fruitworm	0.0	0.0	0.0
Redbanded leafroller	5.8	2.3	1.5
Spotted tentiform leafminer	25.0	11.7	9.0
Oriental fruit moth	2.1	0.8	1.3
Lesser appleworm	0.0	0.0	0.3*
Codling moth	0.3*	0.8	1.5
San Jose scale	1.8*	2.7	4.3
American plum borer	1.7*	1.5	2.4
Lesser peachtree borer	0.0	2.3*	3.3
Peachtree borer	0.0	0.0	0.3*

* first catch

Highland, NY

	5/17	5/24
Green fruitworm	0.1	0.0
Redbanded leafroller	1.6	0.5
Spotted tentiform leafminer	18.6	6.1
Oriental fruit moth	1.5	0.1
Codling moth	0.0	0.6
Lesser appleworm	6.7	6.7

PEST FOCUS

Geneva:
Lesser peachtree borer first catch 5/20. **Lesser appleworm** and **peachtree borer** 1st catch 5/24.

Highland:
1st **potato leafhopper** observed 5/21. **European apple sawfly** and **plum curculio** damage high on McIntosh. Second generation pear psylla oviposition observed.
Insect model development:
199 DD base 50F of PC model (40% ovip. / 340 DD Spray cutoff)
278 DD base 50F of CM model (first appl. 250DD = 3% hatch)

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–5/24):	659	385
(Geneva 1/1–5/24/2003):	510	264
(Geneva "Normal"):	564	295
(Geneva 5/31 Predicted):	785	463
(Highland 1/1–5/24):	903	559

Coming Events:	**Ranges:**	
American plum borer 1st flight peak	360–962	134–601
Redbanded leafroller 1st flight subsides	417–1104	255–716
Lesser appleworm 1st flight peak	372–851	181–483
Obliquebanded leafroller pupae present	612–860	330–509
Plum curculio oviposition scars present	448–670	232–348
San Jose scale 1st flight peak	457–761	229–449
Rose leafhopper adults on multiflora rose	668–916	336–519

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