scaffolds Update on Pest Management and Crop Development

FRUIT JOURNAL

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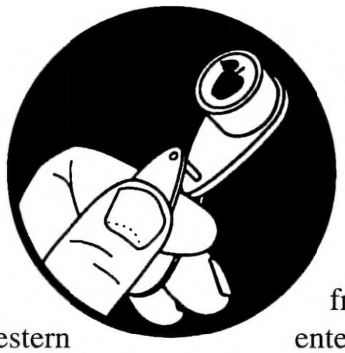
INSECTS

NO REST FOR THE WICKED

SUMMER AFFAIRS (Art Agnello, Entomology, Geneva)



Spotted Tentiform Leafminer

❖❖ A number of orchards in western N.Y. have turned up with surprisingly high levels of 1st generation STLM mines this season, which is actually not so surprising considering the ideal weather conditions they had this spring for mating and laying eggs. With the high temperatures of the last (and those forecast for the next) several days, the second generation moths should be nearing peak levels this week. The injury caused by the second and third generations is identical to that caused by the first, but second-generation injury is most damaging to the tree. Third-generation STLM is usually not a problem if the second brood was controlled properly. Proper timing is essential for both the assessment of STLM densities and control, if required. Sampling for sap-feeding mines should be done at approximately 690 degree-days (base 43°F) after the start of the flight of the second generation. This flight began on June 15 in the Hudson Valley (current DD tally from 6/15 is 432), and on June 11 in Geneva (which puts the DD tally at 483). Sampling guidelines can be found on pp. 85, 93–94, and 102 in the Recommends. A decision regarding the third generation is generally not required unless the density of the second brood exceeded two mines per leaf. In recent years, an average of 8% of sampled orchards have required a treatment for second-generation STLM.

Several insecticides are effective against this pest, including Provado, Vydate, Lannate, and Asana. All of these products except for Provado are detrimental to predatory mites. Depending on the product chosen, application can be made anytime from initial egg deposition until larvae enter the tissue-feeding stages. Sampling is, of course, recommended before any spray is applied. If Provado is chosen, the manufacturer recommends aiming for the period 10–14 days after the flight starts. Unfortunately, if mines haven't yet begun to show up, this approach requires that you predict the need for a treatment based on either moth numbers or past field history, neither of which has been shown to be a very reliable indicator of actual pressure. According to our experience with this material, waiting until the appearance of early sap-feeding mines will give a better picture of problem blocks, and is still timely enough to effectively manage economic populations.

Potato Leafhopper

This insect is generally a more serious problem in the Hudson Valley than in western N.Y. or the Champlain Valley; however, as in past years, Deb Breth reports seeing some true problem populations (mostly nymphs) and damage in Niagara Co. last week, so this is one more reason to tour observantly through a few orchards now. PLH does not overwinter in the northeast but instead migrates on thermals (warm air masses) from the south. Because PLH migrate constantly during the season, there are no distinct

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broods or generations and the pest may be present continuously in orchards from June through harvest.

PLH feeds on tender young terminal leaves. Initially, injured leaves turn yellow around the edges, then become chlorotic and deformed (cupping upward) and later turn brown or scorched. Damage is caused by a toxin injected by PLH while feeding. PLH also occasionally causes symptoms similar to the effects of growth regulators, such as excessive branching preceding or beyond the point of extensive feeding. PLH damage is often mistaken for injury caused by herbicides, nutrient deficiency, or overfertilization. PLH injury may not be serious on mature trees but can severely stunt the growth of young trees.

Nymphs and adults should be counted on 50–100 randomly selected terminal leaves in an orchard. Older trees should be sampled approximately every three weeks during the summer. Young trees should be sampled weekly through July. PLH nymphs are often described as moving sideways like crabs, whereas WALH generally move forward and back. No formal studies have been conducted in N.Y. to determine the economic injury level for PLH on apples, so we suggest a tentative threshold of an average of one nymph or adult PLH per leaf. Little is known about the natural enemies of PLH, but it is assumed that they cannot control this pest in commercial New York orchards.

Populations of all leafhopper species in New York are best controlled with materials such as Provado, Sevin, Thiodan, Carzol, Lannate, or Vydate. However, many of these pesticides, primarily the latter three, are toxic to beneficial mites, so make your treatment decision with these factors in mind.

Comstock Mealybug

Adult females of this insect can be found now in the foliage of pear, apple, and even some peaches, so it follows that their invasive crawler offspring should be showing up before too long, perhaps as soon as the middle of July, especially in the Hudson Valley. This is a localized problem, but calyx infestations of mealybug crawlers can be an unpleasant and costly surprise when fruits are inspected for processing or even fresh use. The crawlers are the most susceptible stage for chemical control, which we expect sometime during the next couple of weeks.

The following information is taken from the Comstock Mealybug IPM Fact Sheet, No. 22. As is the case with other insect pests this season, you can advance all the timings by about 2 weeks because of the warm weather:

There are two generations of Comstock mealybug in New York, each taking 60 to 90 days to complete, depending on seasonal temperatures. Adult females and males emerge at the same time, from late June to mid-July for the first (overwintering) generation, and late August to mid-September for the second (summer) generation. Adult females are present for a total of 4–6 weeks, and oviposit for about one week after mating. Males survive for only a few days after emerging.

The elongate, orange-yellow eggs are laid in

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jumbled masses along with waxy filamentous secretions in protected places such as under bark crevices, near pruning cuts, and occasionally in the calyx of fruit. The summer-generation eggs are laid from mid-June through late July, and the overwintering eggs from mid-August into October. The early larval instars of the CMB are similar to adult females (wingless and elongate-oval in shape, with a many-segmented body) except that they are smaller, more oval-shaped, lack the long body filaments, and are orange-yellowish because they have less wax covering. Later instars are similar in appearance, but become progressively browner and redder.

Nymphs that hatch from the overwintered eggs are active from roughly early May to early July. As the nymphs approach the adult stage, they tend to congregate on older branches at a pruning scar, a node, or at a branch base, as well as inside the calyx of pears. Second- (summer) generation nymphs are present from about mid-July to mid-September, with the Hudson Valley populations normally 1–2 weeks ahead of western N.Y.

To date, the Comstock mealybug has primarily been a problem to growers of processing pears because of contamination and for aesthetic reasons. However, certain peach blocks in western N.Y. have recently shown infestations high enough to be noticed by fresh-market consumers. An infestation generally requires one or more insecticide sprays during the growing season, directed against the migrating crawlers. Examine the terminal growth for crawler activity periodically throughout the summer. Crawler and adult female activity can also be monitored by wrapping double-sided white carpet tape around low scaffold branches and inspecting the surface for crawlers that have been caught by the tape. They can be recognized with a hand lens or, with some experience, by the unaided eye (the Fact Sheet has a photo).

When crawlers are detected on traps in problem blocks, perhaps by mid-July this year, we advise an application of a material such as Penncap-M, Provado (apples and pears only), Diazinon, Lannate, or (on apples only) Lorsban to control this insect.

Japanese Beetle

This perennial pest overwinters as a partially grown grub in the soil below the frost line. In the spring the grub resumes feeding, primarily on the roots of grasses, and then pupates near the soil surface. Adults began to emerge during the middle of June in upstate N.Y. lawns this year, which Mike Villani indicates could be a record early date. The adults fly to any of 300 species of trees and shrubs to feed; upon emergence, they usually feed on the foliage and flowers of low-growing plants such as roses, grapes, and shrubs, and later on tree foliage. On tree leaves, beetles devour the tissue between the veins, leaving a lacelike skeleton. Severely injured leaves turn brown and often drop. Adults are most active during the warmest parts of the day and prefer to feed on plants that are fully exposed to the sun.

Although damage to peaches is most commonly noted in our area, the fruits of apple, cherry, peach and plum trees may also be attacked. Fruits that mature before the beetles are abundant, such as cherries, may escape injury. Ripening or diseased fruit is particularly attractive to the beetles. Pheromone traps are available and can be hung in the orchard in early July to detect the beetles' presence; these products are generally not effective at trapping out the beetles. Fruit and foliage may be protected from damage by spraying an insecticide such as Sevin or Penncap-M when the first beetles appear.

(Information adapted from: Johnson, W.T. & H.H. Lyon. 1988. Insects that feed on trees and shrubs. Cornell Univ. Press.; and Howitt, A.H. 1993. Common tree fruit pests. Mich. State. Univ. Ext. NCR 63.)❖❖

FLAG DAZE

DON'T GET CORNFUSED

❖❖ Deb Breth alerts us to having seen European corn borer larval damage in terminals of some young plantings recently. It's easy to mistake the symptoms of infestation for fire blight damage, so be careful. In weedy sites especially, check any suspicious-looking shoots for these caterpillars; as stated earlier, Penncap-M, Lannate, Lorsban and Asana can give very good control of ECB larvae, provided application is made before they become concealed in the plant tissue.❖❖

DDAY

UP FOR THE COUNT

❖❖ Obliquebanded leafroller larvae are well into hatch in all parts of the state now. The 50% hatch point is predicted by the developmental model by 630 DD (base 43°F) after the first moth catch, and by 720 DD the earliest emerging larvae should be about half grown (third to fourth instar). Following are the developmental totals we've calculated for various locations in the state as of this morning, 6/29:

SITE	FIRST CATCH	DD (43°F) TOTAL
Highland	May 26	836
Geneva	May 29	688
Williamson	June 1	649
Albion	June 2	519(6/25)

❖❖

SOME ARE FUNGI

SUMMER DISEASES IN APPLES
(Dave Rosenberger, Plant Pathology, Highland)

DISEASES

❖❖ Sooty blotch and flyspeck are the two most important summer diseases on apples. In northeastern United States, most of the inoculum for these diseases comes from outside of the orchard. The fungi causing sooty blotch and flyspeck have numerous wild hosts, so any unsprayed woodlot or hedgerow can provide inoculum.

Flyspeck is the more difficult of the two diseases to control because it is somewhat less sensitive to fungicides than is sooty blotch. In the northeast, flyspeck almost always appears in sprayed orchards before sooty blotch appears, although the two diseases appear at about the same time in unsprayed trees. Spray programs that are adequate to control flyspeck will almost always provide good control of sooty blotch as well.

Researchers in North Carolina and Massachusetts have shown that the flyspeck fungus overwinters on wild hosts around the perimeter of orchards and produces ascospores that mature starting during or shortly after bloom. They have also shown that visible symptoms appear on fruit only after fruit have had approximately 270 hours of accumulated wetting counting from the time that infections on fruit are initiated.

Our current hypothesis concerning development of flyspeck in apple orchards in the northeast is as follows:

1. Release of flyspeck ascospores peaks about 10 days after petal fall. However, only a small number of ascospores land on apple fruit and most of these are killed by fungicides used to control apple scab.

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2. Flyspeck ascospores are important, however, because they cause additional primary infections in the border areas.

3. If flyspeck develops at the same rate on wild hosts as on apples, then primary flyspeck lesions will appear on wild hosts after approximately 270 hours of wetting have accumulated counting from 10 days after petal fall.

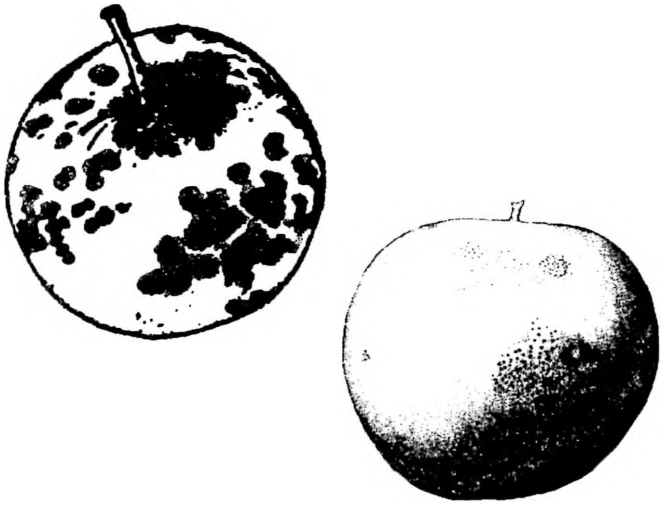
4. The lesions that appear in wild hosts after 270 hours of accumulated wetting produce an abundance of conidia that are blown into apple orchards and cause the fruit infections that can appear later in the summer (after another 270 hours of accumulated wetting).

If the above hypothesis is correct, then fungicide protection for controlling flyspeck becomes especially critical beginning at the point when 270 hours of wetting have accumulated counting from 10 days after petal fall. In the Hudson Valley, accumulated wetting in orchards we are monitoring currently ranges from 205 to 312 hours. Thus, we can now expect flyspeck conidia to be blowing into orchards and fungicide protection will be needed from now until the end of the season to protect fruit from this constant influx of inoculum.

Research conducted in the Hudson Valley over the past five years has shown that the benzimidazole fungicides (Benlate and Topsin M) have some eradicant activity against flyspeck, whereas captan and ziram do not. Our current "best guess" from field trials is that Benlate provides about 100 wetting hours of eradicant activity. Thus, even where fruit infections may have occurred after accumulated wetting reached 270 hours, development of flyspeck on fruit can probably be arrested if Benlate is applied sometime between 270 and 370 hours of accumulated wetting counting from 10 days after petal fall.

Captan and ziram can provide good control of flyspeck if they are applied on a 14-day interval, although shorter intervals may be needed to compensate for wash-off by rains. However, Benlate or Topsin M provide both eradicant activity and better rain-fast protection.

Spray coverage is probably the most critical factor for getting good control of flyspeck. In a wet year like 1998, even the best fungicide program will not provide good control of flyspeck on poorly pruned trees or in orchards where sprayer nozzling and travel speed prevent complete coverage when fungicides are applied.❖❖



PEST FOCUS

Geneva:
1st **obliquebanded leafroller** trap catch in Western N.Y. = 5/29. DD (base 43 °F) since 1st catch = 688. **Spotted tentiform leafminer** 2nd flight began 6/11. DD (base 43 °F) since then = 483.
Timing of control spray for 2nd brood **codling moth** = 1260DD (base 50°F) after biofix date (5/7). DD_{50} since then = 779 .

Highland:
1st **obliquebanded leafroller** trap catch in Highland N.Y. = 5/26. DD (base 43 °F) since 1st catch =836. **Spotted tentiform leafminer** 2nd flight began 6/15. DD (base 43 °F) since then = 432.

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	6/22	6/25	6/29
Spotted tentiform leafminer	477	646	516
Redbanded leafroller	0	0.5	0.8
Oriental fruit moth (apple)	0.1	0.3	2.4
Lesser appleworm	0.1	0.3	1.1
Codling moth	1.0	12.5	7.6
San Jose scale	0.1	1.2	3.5
American plum borer	0	0.3	0.3
Lesser peactree borer	2.6	2.7	2.3
Peachtree borer	0.5	3.0	2.0
Pandemis leafroller	0	0	0
Obliquebanded leafroller	0.1	0.5	1.0
Apple maggot	0.1*	0.1	0.1

HVL, Highland, NY

	6/15	6/22	6/29
Spotted tentiform leafminer	22.9*	23.5	40.1
Redbanded leafroller	0	0.3	2.4
Oriental fruit moth	0.1	0.1	0.4
Lesser appleworm	0	0	0
Codling moth	1.6	1.4	1.6
Obliquebanded leafroller	0.4	0	0
Variegated leafroller	1.5	0.2	1.1
Tufted apple budmoth	5.4	0.9	1.8
Fruittree leafroller	0.1*	0.1	0.1
Sparganothis fruitworm	0	0.9*	0.7
Apple maggot	0	0.1*	0.1

* 1st catch

(Dick Straub, Peter Jentsch)

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1- 6/29):	1588	1020
(Geneva 1997 1/1-6/29):	1175	714
(Geneva "Normal" 1/1-6/29):	1283	888
(Highland 1/1-6/29):	1833	1189

Coming Events(Geneva):	**Ranges:**	
Apple maggot 1st oviposition punctures	1566-2200	1001-1575
American plum borer 2nd flight begins	906-1876	973-1337
Comstock mealybug adult 1st catch	1270-1673	756-1105
Lesser appleworm 2nd flight begins	1152-2302	778-1531
Lesser peachtree borer flight peak	733-2330	392-1526
Peachtree borer flight peak	864-2241	506-1494
OBLR 1st flight subsides	1420-2452	899-1790
Oriental fruit moth 2nd flight begins	1152-1819	772-1215
Redbanded leafroller 2nd flight begins	1096-2029	656-1381
San Jose scale 2nd fllight begins	1449-1975	893-1407
STLM 2nd gen. tissue feeders present	1504-2086	952-1201

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