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Update on Pest Management and Crop Development

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

July 6, 1999 VOLUME 8, No.16 Geneva, NY

INSECTS

KINGSTON DUO

HUDSON VALLEY LEAFROLLERS (Harvey Reissig, Entomology, Geneva)

❖❖ Two species of leafrollers, Variegated *Leafroller (Platynota flavedana)* and Sparganothis Fruitworm (*Sparganothis sulfureana*), have occasionally damaged fruit in the Hudson Valley, and have apparently become serious problems in some orchards during the last several years because they have developed resistance to organophosphate insecticides. The variegated leafroller is found from Kingston (in Ulster County) south to the Rockland County line, in a narrow band bordered by the Hudson River on the east and the Marlboro mountain range on the west. The Sparganothis fruitworm is found predominantly in Columbia County on the east side of the Hudson River and north to Albany. It is also prevalent in western New York, but is currently not a pest in commercial apple orchards there.

Both species overwinter as third-instar larvae in the orchard ground cover and begin feeding in early spring on weeds and plants under trees. Larvae pupate in the ground cover, and adult moths emerge shortly after petal fall. Adults lay eggs on apple leaves during June; eggs hatch and larvae are found from late June to July. A second flight begins in late July. These larvae may feed on fruit in late summer until they reach the third instar, at which time they spin down into the ground cover to overwinter.

Larvae of the summer generation may use dead leaves to build a feeding shelter beneath the apple. Most of the larvae from the overwintering generation probably feed primarily on leaves in the late summer, but they may occasionally damage fruit. This late-season damage is less extensive than that from the summer generation of larvae but usually consists of tiny pinholes on the fruit surface.

Males of both species can be monitored in pheromone traps, but numbers caught in the traps cannot be related to potential fruit damage in the orchard. Because these species are a serious problem only in certain orchards, the most reliable way to determine if a specific block requires treatment would be to monitor larval populations during June and July. No formal techniques have been developed to sample these larvae. Like-

continued...

IN THIS ISSUE...

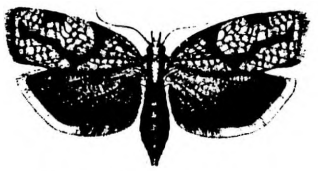
INSECTS
- ❖ Hudson Valley leafrollers
- ❖ Spotted tentiform leafminer update

DISEASES
- ❖ Captan phytotoxicity on Empire

PEST FOCUS

INSECT TRAP CATCHES

UPCOMING PEST EVENTS



Sparganothis Fruitworm

Variegated Leafroller

wise, no formal studies have been done to estimate an economic threshold level for initiating summer treatments. It would not usually be considered economically feasible to apply special treatments to control these leafrollers unless at least 3–5% fruit damage was anticipated. This threshold represents a larger value than the cost of the spray, but leafroller sprays are often not able to completely eliminate damage. Depending on the material used, special leafroller sprays may also harm predatory mites and other beneficials and could increase the cost of mite management.

Several parasites attack leafroller larvae, keeping them to relatively low levels in unsprayed orchards. Because these parasites are susceptible to insecticides, they are not effective in controlling leafrollers in sprayed commercial orchards. Leafrollers in the Hudson Valley are resistant to the commonly used organophosphate insecticides. Other chemicals available for use are the same as those commonly used to control OBLR (Lorsban, Lannate, B.t., Asana, Penncap-M). Larger larvae are more difficult to kill with these materials, so sprays should be targeted against small larvae whenever possible.

BY DEGREES

Obliquebanded leafroller in the earliest western N.Y. sites should be reaching the 90% hatch point by now, as predicted by the developmental model (810 DD, base 43°F, after the first moth catch). By 950 DD, these populations should be essentially 100% hatched. The current (7/6) DD accumulations in Geneva, according to our most scientifically precise measurements, is 893.❖❖

COVER YOUR ASSETS

HOW TO AVOID BEING SPOTTED

❖❖ A number of orchards in western N.Y. have turned up with surprisingly high levels of 1st generation spotted tentiform leafminer 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

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degree-days (base 43°F) after the start of the flight of the second generation. This flight began on June 28 in Geneva (which puts the DD tally at **687**). 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.❖❖

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	6/28	7/1	7/6
Spotted tentiform leafminer	819	675	1112
Redbanded leafroller	0.8*	0.3	0.3
Oriental fruit moth	5.1*	4.0	1.9
Lesser appleworm	3.4	1.5	2.3
Codling moth	6.5	1.0	2.7
American plum borer	0.1	0.8	0.1
Lesser peachtree borer	1.1	0.7	1.0
Pandemis leafroller	0	0	0
Obliquebanded leafroller	0.6	0.5	0
Peachtree borer	0.6	1.5	0.8
Dogwood borer	0.5	0.8	0.9
Apple maggot	0.06*	0	0.05

Highland, NY

	6/14	6/21	6/28
Spotted tentiform leafminer	38.5	10.3	34.9
Redbanded leafroller	0.1	0.9	2.6*
Oriental fruit moth	0.4	0.4	0.6
Codling moth	1.0	0.5	1.3
Lesser appleworm	0.4	0.6	0.8
European red mite(#/leaf)	5.2	17.8	10.2
Two-spotted spider mite(#/leaf)	3.0	5.8	7.8
San Jose scale	0.4	0	0
Fruitree leafroller	0	0	0.1
Obliquebanded leafroller	5.1	4.8	3.4
Tufted apple budmoth	4.0*	3.7	6.7
Variegated leafroller	2.3*	0.7	1.1
Sparganothhis fruitworm	2.1*	1.9	1.1
Apple maggot	–	0	0

Hudson, NY

	6/21	6/28	7/6
Spotted tentiform leafminer	7.6	12.8	7.6
Oriental fruit moth	1.3	0.8	0.6
American plum borer(cherry)	1.3	1.4	0.7
Lesser peachtree borer(peach)	6.3	3.0	1.8
Peachtree borer	3.2	3.3	3.3
Tarnished plant bug	0.2*	1.0	0.3

* first catch

DISEASES

TOO HOT

DON'T BURN THE FRUIT!

(Dave Rosenberger, Plant Pathology, Highland)

❖❖ For fruit growers in the northeast, pesticides are indispensable tools for controlling diseases, mites, insects, and weeds. Unfortunately, misapplied pesticides sometimes cause more damage (phytotoxicity) to the crop than would have been caused by the pests that were the target of the pesticide applications. Sometimes the causes of phytotoxicity are obvious, but in other cases the causes of the injury can be difficult to determine. An example of the latter occurred on Empire fruit in 1998.

During August and September of 1998, fruit spotting developed on Empire fruit in numerous orchards throughout the northeast. Affected fruit developed tan lesions on the sides and calyx ends of fruit. In some cases, blackened lenticels were also present, especially on the exterior of the tree canopy where fruit were most directly exposed to sprays. The injury was most severe in orchards where pesticides were applied as fairly dilute sprays (full dilute to 2X concentration). The tan lesions were especially evident where spray residue had accumulated and dripped from the lowest surface of the fruit following pesticide applications, but it was not limited to drip points. The injury occurred almost exclusively on Empire. Other varieties in adjacent rows were either unaffected or showed only minor spotting that would have escaped detection on the packing line. By contrast, some blocks of Empire were so severely affected that more than 20% of fruit were out of grade.

After extensive investigating during early September of 1998, we determined that in almost all cases, the injury seemed to be associated with captan sprays. Severity of the injury was not related to the formulation of captan (50W, 80W, or 4L). However, injury was most severe where captan was applied with foliar nutrients (especially calcium sprays) or with adjuvants that caused increased absorption of captan. Applications made at night or

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under slow drying conditions seemed to further increase the severity of the injury. Growers who applied captan without calcium generally had no fruit spotting.

The unusual cloudy and wet weather conditions that prevailed during the first half of the 1998 growing season may have contributed to the captan-related phytotoxicity that developed on Empire fruit. Fruit growing under stress-free conditions early in the season may have had a thinner cuticle and may have therefore been more susceptible to spray injury. We know, however, that the injury problem on Empire is more than a single-season phenomenon because similar injury had been noted for several years in western New York orchards where captan and calcium sprays were routinely applied to Empire.

Based on our experiences with phytotoxicity to Empire fruit, we recommend that growers use special care when applying summer sprays to Empire orchards. Current captan labels warn against applying captan with products that will result in increased absorption of the captan into plant tissue. That is a nebulous warning that is difficult to interpret. When multiple pesticides, nutrients, and spray additives are mixed in a spray tank, who knows if the final solution will have properties that "result in increased absorption" of captan? Obviously, it is not feasible to make separate trips through the orchard with each product that must be applied, but fruit burn caused by pesticide/nutrient sprays can also be very costly.

All we can say at this point is that combining captan and calcium in the same tank may cause phytotoxic spotting on Empire fruit. The risks are increased if the spray solution collects in drops on the bottom of fruit or if sprays are made under slow-drying conditions. We do not know if risks are dependent on the formulation of calcium that is used in foliar sprays. The role of other spray adjuvants is also unclear, but adjuvants that may contribute to increased absorption of captan sprays should be avoided.❖❖

PEST FOCUS

Geneva:
Spotted tentiform leafminer 2nd flight began 6/10. DD(base 43°F) accumulated since then = 687. 1st catch of **obliquebanded leafroller** = 6/2. DD(base 43°F) accumulated since then = 893. Degree days (base 50°F) accumulated since 1st **codling moth** trap catch = 906. Control of the 2nd generation is timed at 1260 DD_{50} from 1st catch.

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–7/6):	1668	1101
(Geneva 1998 1/1–7/6):	1758	1141
(Geneva "Normal" 1/1–7/6):	1464	1021
Hudson (3/17–7/6):	1747	1147

Coming Events:	**Ranges:**	
Comstock mealybug 1st flight peak	1528–1782	824–1185
Spotted tentiform leafminer 2nd flight peak	1295–2005	824–1355
STLM 2nd gen. tissue feeders present	1504–2086	952–1201
American plum borer 2nd flight begins	906–1876	973–1337
Codling moth 2nd flight begins	1355–2302	864–1549
Oriental fruit moth 2nd flight peak	1000–2908	577–2066
San Jose scale 2nd flight begins	1449–1975	893–1407
Redbanded leafroller 2nd flight peak	1479–2443	952–1698
Apple maggot 1st oviposition punctures	1566–2200	1001–1575

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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