scaffolds

Update on Pest Management and Crop Development

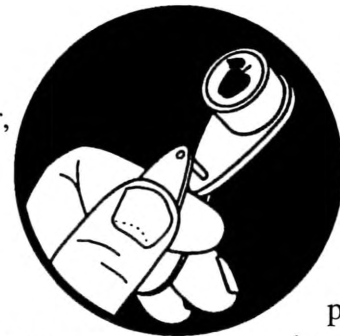
FRUIT JOURNAL

July 6, 1998 VOLUME 7, No. 16 Geneva, NY

SPOTS MARK THE X

X-DISEASE IN PEACHES

(Dave Rosenberger, Plant Pathology, Highland)



❖❖ X-disease of peach trees is causing significant tree losses in the Hudson Valley this year. Peach X-disease often follows a 10–15 year cycle. The disease will be very severe for 4–6 years, then will gradually disappear as a commercial problem until the next cycle begins. The reason for this cyclical pattern has never been determined. Based on field observations, however, it appears that we are heading back into the part of the long-term cycle where X-disease can rapidly devastate peach orchards in the Hudson Valley.

X-disease causes leaves on infected peach trees to turn yellow, curl upward, and develop red, water-soaked spots that are not limited by leaf veins. The leaf disorder results in early defoliation of the oldest leaves, leaving a "horse-tail" of young foliage at the end of affected terminal shoots. X-disease eventually causes death of the infected scaffold limbs or of the entire tree. Nitrogen deficiency and spray injury can also cause red spotting on leaves, but the symptoms on trees affected by nitrogen deficiency or spray injury usually occur uniformly throughout individual trees and sometimes throughout entire orchards. Symptoms of X-disease affect only random trees and/or branches of trees, although the incidence of X-disease may be higher in locations close to inoculum sources than in more distant parts of the orchard.

X-disease is caused by a phloem-limited mycoplasma — a minute pathogenic organism smaller than most bacteria. The X-disease mycoplasma is transmitted by at least eight species of leafhoppers found in New York. White apple leafhopper, rose leafhopper, and potato leafhoppers are not vectors. In fact, none of the X-disease vectors are abundant enough to cause direct feeding damage and they usually escape notice in the orchard. However, they are very efficient vectors of X-disease. The leafhoppers acquire the X-disease organism while feeding on diseased chokecherry bushes, on infected sweet cherry trees, or on wild seedlings of sweet cherry. They do not acquire the X-disease mycoplasma from diseased peaches because the population of the disease organism within diseased peach trees is so low that leafhoppers do not encounter the organisms while feeding.

After leafhopper vectors feed on an infected plant, the X-disease organism must grow within the insect for at least 20 days before the insect can transmit X-disease to another plant. Once that 25-day incubation period is completed, however, the leafhoppers with X-disease remain infective for the rest of their lives. In laboratory studies, leafhoppers have often lived for 30–40 days after they become infective. A single infective insect therefore has the potential to infect numerous plants.

Peach trees that become infected with X-disease are usually inoculated by leafhoppers during July and August, and symptoms then develop on the trees the following year. Leaf-

continued...

hoppers can continue to transmit X-disease to peach trees during September and early October, but many of the late-season transmissions fail to cause disease because the pathogen does not become established in the plant following late-season transmissions. The mild winter last year may have allowed more of the late-season transmissions to persist through winter, and the mild winter may therefore have contributed to the unusually large number of orchards that have suddenly developed X-disease this year.

The most effective protection against X-disease is to isolate peach plantings from all sweet cherry blocks and to regularly eradicate all chokecherries within 500 ft of peach orchards. The chokecherry species that harbors X-disease is *Prunus virginiana*, a plant that is more like a shrub than a tree. *P. virginiana* rarely reaches more than 15 ft in height in eastern New York. It should not be confused with the wild black cherry (*Prunus serotina*), which can develop into an 80-ft tall tree. *Prunus serotina* does not develop or harbor X-disease.

The two wild cherry species can be distinguished by the appearance of the bark, leaves, and fruit. Leaves of *P. virginiana* are more broadly oval with a hairy midrib on the underside of the leaf, whereas leaves of *P. serotina* are more narrow and have a smooth midrib on the underside of the leaf. Chokecherry plants infected with X-disease develop a red-yellow fall coloration during early July. With our early season this year, the distinctive color of infected chokecherries began appearing about two weeks ago along roadways in the Hudson Valley.

X-disease symptoms in sweet cherry trees are often indistinct, making it difficult to determine when a sweet cherry tree is infected. Infected trees usually produce small fruit that ripens later than healthy fruit, but this symptom is often indistinct in cherry orchards where fruit maturity is already variable because of uneven crop load. Unlike peach trees, cherry trees with X-disease can remain alive for many years after they become infected. Such infected trees become a long-term source of inoculum for other cherry trees and for peach trees. Whenever possible, peach plantings in the Hudson Valley should be kept at least 500 feet away from sweet cherry plantings.

There is no chemical means (sprays) for protecting trees from X-disease or for curing diseased trees. Injections of terramycin have been used to treat diseased trees in the past, but registrations for injectable terramycin have lapsed and the product is no longer available. Thus, infected peach trees are a total loss. They need not be removed since infected peach trees do not act as a source of inoculum. However, in young orchards infected trees can be removed and replanted after the source of inoculum (hedgerow chokecherries or seedling sweet cherries) has been identified and removed. X-disease does not remain active in the soil.

Leafhopper control in peach orchards may reduce the spread of disease. However, spraying for leafhoppers is not a substitute for identifying and eradicating the inoculum sources for X-disease because infective leafhoppers can enter the orchard from hedgerows and may infect trees before they are killed by insecticide residues in

continued...

scaffolds

is published weekly from March to September by Cornell University—NYS Agricultural Experiment Station (Geneva) and Ithaca—with the assistance of Cornell Cooperative Extension. New York field reports welcomed. Send submissions by 3 pm Monday to:

scaffolds FRUIT JOURNAL
Dept. of Entomology
NYSAES, Barton Laboratory
Geneva, NY 14456-0462
Phone: 315-787-2341 FAX: 315-787-2326
E-mail: ama4@nysaes.cornell.edu

Editors: A. Agnello, D. Kain

This newsletter available on CENET at: news://newsstand.cce.cornell.edu/cce.ag.tree-fruit and on the World Wide Web at: http://www.nysaes.cornell.edu/ent/scafolds/

the orchard. Nevertheless, an insecticide program that controls leafhoppers may be helpful in slowing spread of the disease. Early maturing varieties of peaches may benefit from a postharvest insecticide spray to minimize leafhopper populations in these trees during August.❖❖

INSECTS

DOWN IN THE VALLEY

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. Likewise, 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 mites and 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.❖❖

OUT WEST

COUNTERPARTS

❖❖ 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. It's been rough going for our weather monitoring capabilities this season, as the frequent severe storms have knocked out nearly all of the automated field stations in the Orleans Co. apple regions, and some in Wayne Co. as well. Following are the developmental totals that we've been able to calculate for various locations in the state as of this morning, 7/6:

SITE	FIRST CATCH	DD (43°F) TOTAL
Geneva	May 29	857
Williamson	June 1	812
Appleton	June 2 (estimated)	821

❖❖

PEST FOCUS

Geneva:
1st **obliquebanded leafroller** trap catch in Western N.Y. = 5/29. DD (base 43 °F) since 1st catch = 857. **Spotted tentiform leafminer** 2nd flight began 6/11. DD (base 43 °F) since then = 653. Leaf sampling should commence now.
Timing of control spray for 2nd brood **codling moth** = 1260DD (base 50°F) after biofix date (5/7). DD_{50} since then = 900 .

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	6/29	7/2	7/6
Spotted tentiform leafminer	516	665	385
Redbanded leafroller	0.8	0.5	2.0
Oriental fruit moth (apple)	2.4	2.2	1.5
Lesser appleworm	1.1	1.3	1.3
Codling moth	7.6	2.8	1.6
San Jose scale	3.5	0.5	1.0
American plum borer	0.3	1.2	2.6
Lesser peactree borer	2.3	0.8	1.6
Peachtree borer	2.0	1.0	2.3
Pandemis leafroller	0	0.3	0
Obliquebanded leafroller	1.0	0.7	0
Apple maggot	0.1	0	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- 7/6):	1758	1141
(Geneva 1997 1/1-7/6):	1360	851
(Geneva "Normal" 1/1-7/6):	1458	1015

Coming Events(Geneva):	**Ranges:**	
Apple maggot 1st oviposition punctures	1566-2200	1001-1575
American plum borer 2nd flight peaks	1648-2612	1037-1840
Codling moth 2nd flight begins	1355-2302	864-1549
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 peaks	1000-2908	577-2066
Redbanded leafroller 2nd flight peaks	1479-2443	952-1698
STLM 2nd gen. tissue feeders present	1504-2086	952-1201

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.

scaffolds
Dept. of Entomology
NYS Agricultural Exp. Sta.
Barton Laboratory
Geneva, NY 14456-0462

ARTHUR AGNELLO
ENTOMOLOGY
BARTON LAB
NYSAES