scaffolds Update on Pest Management and Crop Development

FRUIT JOURNAL

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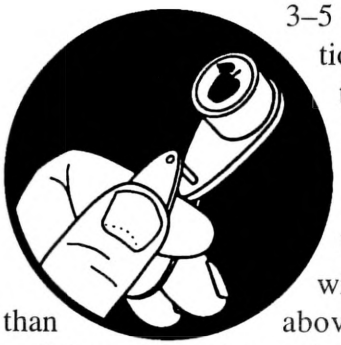
INSECTS

BEE THRIFTY

IMPORTANT POLLINATION POINTS (Roger Morse, Entomology, Ithaca)



❖❖ It's more important now than ever to exercise proper stewardship of those honey bees that are available to pollinate your fruit crops this year. Conditions have been unfavorable across the country for hives designated for this purpose, and for a variety of reasons: the severity of last winter, honey bee mite pests and diseases, and the rise in the wholesale price of honey, which has forced up the price of hives for pollination. By now you should be sure that your hive suppliers are aware of your needs and can fulfill them adequately.

The increasing incidence of diseases of honeybees (chalkbrood, American foulbrood, tracheal mites and Asian varroa mites), increases the importance of care and timing in placing and managing colonies for pollination in orchards. The following guidelines are especially critical. Honey bees will visit plants with the greatest quantities of pollen and the highest sugar concentrations in the nectar. The nectar of dandelions and yellow rocket is as rich as that of apple. Orchardists should mow flowering weeds in orchards or apply weed killer. Weeds in fields adjacent to orchards may also attract bees away from the trees to be pollinated.

Colonies of honey bees in orchards should be kept in full sunlight to warm the hives rapidly in the morning and entice the workers out of the hives. We suggest placing colonies in groups of 3–5 to take advantage of the best locations. Good locations should slope to the east or south with entrances facing in these directions and should be protected from the wind. Colonies should be placed on pallets, cinder blocks, old tires, or any objects that will keep the bottomboards 6–8 inches above the ground. Hives with wet bottomboards will be cooler, which slows bees' flight. A hivestand will also keep colonies above grass, which may shade or block the entrance.

Bees often collect large quantities of water to dilute the honey they feed their young. It is impractical to carry sufficient water into an orchard or to fill all wheel ruts and holes with dirt or sand and force the bees to forage outside of the orchard for water. But growers must understand that water contaminated with pesticides can kill bees that collect it. A problem exists if more than 10 dead bees are found in front of a hive in the morning. If too many bees die, it may be necessary to rent more bees. Beekeepers expect some losses and figure them into their rental fee.

Pesticides are less of a problem to bees and beekeepers today than they were 10 and 20 years ago. Nevertheless, it is still important to read the label and to avoid using materials that are especially toxic to bees. Honey bees are most often

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killed by pesticides when they ingest contaminated pollen. Avoid spraying when flowers, including weeds, are open and attractive to bees.

Red Delicious and a few other apple varieties have flower structures that are different from most other common varieties such as McIntosh. Their anthers are widespread, and bees learn to insert their mouthparts between the anthers to obtain nectar. In this way, the bees do not contact the flower's sexual parts and no pollination occurs. It takes time for bees to learn to obtain nectar in this way. To counteract this problem, the number of colonies in the orchard must be increased so there are more bees that have not learned this technique.

New York growers have traditionally used about one colony of bees per three acres for apple pollination. This number may have been adequate in small orchards, which were visited by feral honey bees and solitary and subsocial bees such as bumble bees from adjacent hedgerows and woods. However, most feral populations have been eliminated by various adverse conditions such as weather, disease and pesticide kills, so growers with larger blocks may wish to increase the number of colonies to one per two acres, especially considering the new diseases.

Pollination of pears will probably always be a problem because pear nectar contains only about 15% sugar versus 40% for apples, dandelions, and yellow rocket. The answer is to move the bees into the center of the pear block when the pears are in full flower. It will take several hours for the bees to discover the better sources farther away, and in that time the pears may be adequately pollinated. An alternative is to use more colonies per acre, which will increase the number of naive bees.

Bees will visit flowers and pollinate only if they can fly. Cool, rainy, and windy weather will delay, slow, or stop flight. In warm years bees may overpollinate during bloom, and growers must thin the flowers. Although we cannot predict the weather, it's certainly been looking like an unusually wet and cool spring this year. For the above reasons, it's always advisable to contract for bees for pollination well ahead of when the colonies will be needed.❖❖

SPREAD THE WEALTH

TRANSFERRING PREDATOR MITES FROM ONE ORCHARD TO ANOTHER

(Jan Nyrop and Dave Kain, Entomology, Geneva)

❖❖ The mite predator *Typhlodromus pyri* can give biological control of European red mite when the predator is conserved in apple orchards. Experiments have shown that once established in an orchard, this mite can completely eliminate the need for miticides. While *T. pyri* is endemic throughout much of western New York, it can take as many as three years in specific orchard blocks for predator numbers to increase to the point where biological control is realized. Moving *T. pyri* from blocks where they are abundant to sites where more predators are desired (seeding) can speed this process.

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

Editors: A. Agnello, D. Kain

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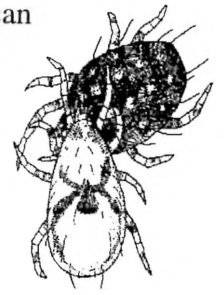
Instances will occur when it is necessary to use pesticides that are toxic to *T. pyri* to control other orchard pests. To combat the resulting disruptions of mite biological control caused by these pesticide applications, it has been suggested that orchardists establish sites to be used as mite "nurseries". These sites would not be treated with pesticides harmful to *T. pyri* and would be used as sources of predators that could be moved to orchards where predators are scarce; the practice of transferring them could therefore become an important ingredient of any integrated mite control program.

Transferring *T. pyri* entails removing wood (and foliage when present) from a source orchard to target trees. There are several timing possibilities, but in recent research trials, we found that bloom appears to be the preferable time to conduct this transfer. It has been noted that predators tend to concentrate in flower buds and the flowers themselves during bloom, most likely to feed on pollen. In our trials, predators were transferred from the source orchard to target trees by attaching five 20-inch-long branches collected from the source orchard to each of twelve recipient Red Delicious trees. Branches were chosen so that they each had approximately seven flower clusters. Transferring predators at bloom resulted in higher numbers of phytoseiids compared with transferring predators at tight cluster or at half-inch green.

Moving as few as 40 predators per tree resulted in substantial increases in predator abundance. Orchardists may not be willing to cut branches with flowers to transfer predators. In such cases, terminal branches cut later in the summer could be used; however, more branches will be required. Using winter prunings or branches cut early in the spring to transfer predators is not the most effective way of accomplishing this goal. While *T. pyri* overwinter throughout the tree, there are apparently many predators that overwinter on large branches or the trunk itself and that move into the canopy as foliage appears. Use of nurseries in which *T. pyri* are cultivated, and transfer of branches harboring *T. pyri* from these nurseries to target sites, should allow biological mite control to be more persistent on a farm-wide scale.

Unlike petroleum oils applied early in the growing season, oils applied during the summer can have an adverse effect on phytoseiid numbers. However, this effect is apparently only significant when high volumes of oil suspension are applied. Our opinion is that oil applied using conventional airblast sprayers will have only a minimal negative effect on phytoseiid numbers. As such, summer oil applications can be recommended as a way to help manage European red mite numbers if predator numbers are insufficient for biological control.❖❖



CHEM NEWS

GOOD NEWS

AGRI-MEK APPROVED IN N.Y. PEARS

(Art Agnello, Entomology, Geneva)

We've been informed that the NYS D.E.C. has approved the application of the New York Pears Growers Association to act as a third party registrant on a Special Local Need 24(c) label for the use of Agri-Mek on pears. The paperwork involved for anyone to use this product is a little cumbersome, but the NYSPGA has set things up to be as painless as possible. The process involves two separate documents: a NYSPGA Membership Agreement, and the User Disclaimer/Label Registration, both of which should be in the hands of the main fruit pesticide dealers and distributors by the end of this week (around May 10 if all goes as planned). A grower purchasing Agri-Mek obtains these documents, which must be filled out and notarized, and then sent in to the NYSPGA office with a $30 fee. They will be processed quickly and an approved copy will be sent back to the grower;

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the label must be in the applicator's possession when the material is applied. The use guidelines are the same as they have been for this material under previous Section 18 exemptions the past few years. A similar application for the use of Agri-Mek in apples (against European red mite) is currently under review at the DEC, with the New York State Horticultural Society acting as the registrant. We will pass along news on this package as it becomes available, but at the present time we have no indication that it should meet with any difficulties.❖❖

PEST FOCUS

Geneva: **Spotted tentiform leafminer** catch increasing. **Syrphid fly** adults active.
Highland: First **pear psylla** hardshell observed. 1st **pear thrips** on pear. 1st **white apple leafhopper** on Red Delicious.

FIELD NOTES

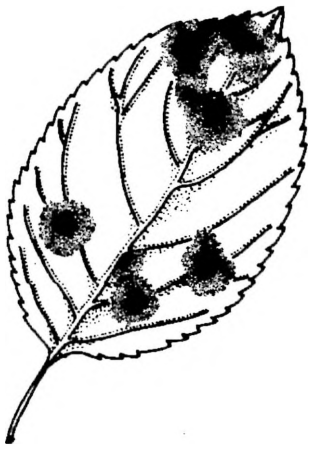
SCAB

APPLE SCAB UPDATE
(Dave Rosenberger, Plant Pathology, Highland)

Apple scab ascospore maturity counts from Highland, NY:

	Imm.	Mature	Empty	Tower shoot
5/6	35%	31%	34%	*

* The tower discharge was not done because leaves were collected in the rain. As expected, a significant portion of the ascospores were released during last week's rains.



APPLE SCAB UPDATE
(Dave Rosenberger, Plant Pathology, Highland)

Apr. 26: 13.5 hrs, 55°F, 0.28 inches rain; light Mills' infection period
Apr. 29-30: 43 hrs, 49°F, 1.89 inches rain; heavy Mills' infection period
May 3-5: 42 hrs, 52°F, 0.22 inches rain; heavy Mills' infection period
May 5-6: >16 hrs (on-going at this time)

❖❖ The threat from apple scab and rust diseases in the Hudson Valley is greater this year than in any year since 1989 because of the timing and duration of infection periods that we are experiencing. Slow tree development and repeated, lengthy wetting periods between tight cluster and full bloom favor development of scab and rust diseases and increase the likelihood that errors in spray timing or coverage will result in serious disease problems in orchards. The cool temperatures during the wetting periods to date may reduce the potential severity of rust infections, but risks of serious scab infections remain high. Growers who managed to save money over the past 2–3 years by shaving fungicide rates and extending spray intervals could see those savings evaporate if they fail to adjust for the disease-promoting weather conditions that are developing this year.

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One way to compare years is to look at the total number of hours of wetting that occur during various phenological intervals. Obviously, disease severity in any given year is dependent on more than just total hours of leaf wetting: Temperatures during wetting periods and between wetting periods, timing of the wetting periods, and inoculum levels all affect how much disease develops in any given year. Nevertheless, total hours of wetting provides one basis for comparison.

This year between green tip on April 15 and king bloom on May 6, we have had a total of 156 hours of wetting, with 5 Mills' infection periods. As shown below, the last "wet" spring was 1992, but that year many of the infection periods occurred too early in the spring to contribute to rust diseases, and there were also relatively few wetting periods after bloom to promote secondary spread of scab. The last year with comparable wetting periods to those we are having this year was 1989. Not surprisingly, 1989 was also the most recent year for major quince rust problems. That year, I visited one farm that had 15-20% fruit infection in Delicious and Cortland that were not protected during a single critical infection period. ❖❖

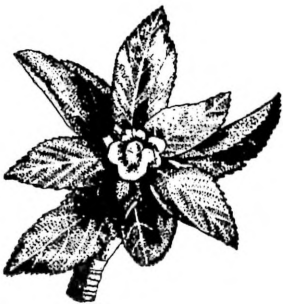
Summary of wetting periods and scab infection periods 1984-1996:

	Total hours of wetting from green tip through		No. of Mills' scab infections
Year	Pink	Full bloom	GT - Bloom
1996	156		5 (to king bloom)
1995	128	184	5
1994	85	170	5
1993	86	93	2
1992	213	256	6
1991	99	173	7
1990	191	256	6
1989	367	393	8
1988	221	330	8
1987	207	260	6
1986	172	195	3
1985	81	115	6
1984	101	134	6

ARRESTED DEVELOPMENT

PHENOLOGIES

Geneva:
Apple (McIntosh) - 1/2 inch green to tight cluster
Sweet cherry (Windsor) - early white bud
Tart cherry (Montmorency) - bud burst
Pear - bud burst
Peach - bud burst
Plum (Darrow) - swollen bud
Highland:
Apple (McIntosh)- king bloom
Pear(Bartlett) - full bloom



INSECT TRAP CATCHES (Number/Trap/Day)

Geneva NY

	4/29	5/2	5/6
Green fruitworm	0.3	0.3	0.3
Redbanded leafroller	0.3	0.2	0.3
Spotted tentiform leafminer	2.5	242	506
Oriental fruit moth	-	0	0
Lesser appleworm	-	0	0
San Jose scale	-	0	0

HVL, Highland NY

	4/22	4/29	5/6
Green fruitworm	0.2	0.2	0
Pear psylla (nymphs/leaf)	-	-	0.5
Redbanded leafroller	7.7	14.7	8.1
Spotted tentiform leafminer	4.3*	15.3	15.6
Oriental fruit moth	0.1*	0.3	4.4

(Dick Straub, Peter Jentsch)

*=1st catch

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1- 5/6):	206	86
(Highland 1/1- 5/6):	446	218

Coming Events:	**Ranges:**	
Green fruitworm peak flight	64-255	19-108
Pear psylla 1st egg hatch	111-402	55-208
Redbanded leafroller 1st flight peak	180-455	65-221
Spotted tentiform leafminer 1st flight peak	180-439	65-217
Spotted tentiform leafminer 1st eggs	141-319	48-154
Green apple aphid present	127-297	54-156
Rosy apple aphid nymphs present	91-291	45-148
Pear thrips in pear buds	137-221	54-101
Obliquebanded leafroller larvae active	149-388	54-201
Oriental fruit moth 1st catch	129-587	44-338
European red mite egg hatch	157-358	74-208
Syrphid predator eggs present	137-366	67-214
McIntosh at tight cluster	188-279	68-138

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