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Update on Pest Management and Crop Development

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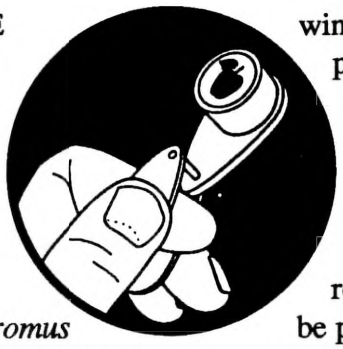
INSECTS

TALLY HO!

RELEASE THE HOUNDS
(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.

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.

The first method of moving *T. pyri* from one orchard block to another is to place wood pruned from a source orchard in winter or early spring into a recipient orchard. Because *T. pyri* overwinter as adult females, prunings harbor predators, although numbers in each section of pruning are highly variable. We suggest placing all the prunings from one tree into another tree. It is probably not effective to simply spread the prunings beneath recipient trees. Pruned wood need not be placed in the recipient trees immediately after pruning, but should be placed there before or just when trees begin to produce green tissue the following spring.

The second method consists of transferring flower clusters from a source orchard to a recipient site. *T. pyri* move into flower clusters at Tight

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Cluster and remain there through bloom, probably to feed on apple pollen. As many as 2 to 3 predators can be found in each flower cluster and surrounding leaves. To transfer predators in this manner, at least 20 flower clusters (and associated wood and leaves) should be placed in each recipient tree. The flower clusters are easily attached with paper clips, staples, or twist ties. Flower clusters may be stored for several days in a cooler before being affixed to receiver trees.

The third method of transferring *T. pyri* consists of collecting leaves during the summer from trees where *T. pyri* are abundant, and placing them into recipient trees. Leaves are easily affixed to the target sites using staples. The number of leaves to use depends on the density of *T. pyri* in the source orchard. As a guide, at least 50 predators should be released in each target tree.

The fourth method of transferring *T. pyri* is perhaps the easiest and does not carry the risks of also moving unwanted pests that the three prior methods have. Artificial overwintering sites for *T. pyri* can be created by glueing burlap to the inside of tree wrap. These composite bands, approximately 12 to 16 inches in length, are then placed on source trees in early to mid-September by stapling them around the tree bole and/or large scaffold branches. In early December, these bands should be collected, tightly rolled with a rubber band used to hold them so, and placed in a sealed plastic bag with a bit (i.e., a "puff") of wet cotton. The bag should be placed in an insulated storage container, which in turn should be placed in a cold, though protected, environment that will buffer large temperature fluctuations. Ideally, temperatures should be maintained right at the freezing point. The following spring, the burlap bands should be placed around recipient trees at around the Half-Inch Green bud growth stage. While the number of predators that overwinter in bands is variable, as many as 400 predators can be transferred in each band. We suggest placing a single band on each recipient tree if the bands were collected from trees that harbored moderate to high numbers of *T. pyri* (1–2 per leaf) the prior fall, and two bands in each tree otherwise.

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. The second season after seeding *T. pyri* and using nondisruptive pesticides in our IPM Demo blocks in western N.Y., predator numbers were at levels of more than 1/leaf by the end of August, and true biological control (that is, no oil or acaricides) of ERM was realized in all blocks by the third year.

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 recom-

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mended as a way to help manage European red mite numbers if predator numbers are insufficient for biological control. For a more detailed discussion of the ins and outs of establishing predator mites, refer to IPM Pub. #215, "Achieving biological control of European red mite in northeast apples: An implementation guide for growers", by D. Breth, J. Nyrop, and J. Kovach" (1998), from which much of this information was adapted.❖❖

VALUE INVESTING

HONEY BEES, RENTAL FEES, AND POLLINATION CONTRACTS

(Nick Calderone, Entomology, Ithaca)

❖❖ Making a decent living in farming demands close attention to costs, and it is only reasonable that a grower will try to find the best price for each of the inputs that go into his or her crop production system. When it comes to honey bees, however, growers usually don't look inside the hives to see what they are buying, and even if they did, most wouldn't know a good hive from a bad hive. Most growers understand the need for quality hives, but don't have the expertise to determine that quality. The result is that the emphasis is usually on unit cost rather than the cost/benefit ratio, and the goal is generally to pay as little as possible. Downward pressure on prices does not always produce the highest quality. Beekeepers, faced with low rental fees, may have little choice but to split colonies so that they have more units to rent. Nobody really comes out a winner.

A lot has changed in the past few years. Most notable is a new system put in place by Cherryfield Foods, Inc., the largest producer of lowbush blueberries in Maine. Cherryfield Foods is a progressive, successful and rapidly growing concern. As new management practices have increased plant and flower density, they have also increased the need for honey bees. One of the reasons for Cherryfield's success is that it has a farm manager who recognized the role honey bees play in determining yield and quality. Cherryfield has adopted a very reasonable policy to ensure a sustainable supply of high quality honey bees for pollination—they pay well! That's right, they aren't shopping the bargain basements, they pay top dollar for the top hives. They take care of the beekeeper, and they take care of the bees. It's all spelled out in a simple contract. The basic points in the contracts are:

- Specify arrival/departure dates and location several months in advance (with some flexibility built in to account for variation in weather conditions);
- A Cherryfield representative meets the beekeeper at delivery and sees to it that the bees are placed in the right location;
- Cherryfield provides electric fences to protect against bear damage;
- Cherryfield shares the cost of bear damage to hives;
- Cherryfield inspects about 3% of the hives in a random manner — beekeepers are encouraged to attend;
- A minimum of 6–7 deep frames of brood and 8 deep frames of bees is defined as a base unit.
- Payment is based as follows:
  - √ 0–3 frames brood = $0.00
  - √ 4–5 frames brood and bees = 20% less than base rate
  - √ 4–5 frames brood with a full box of bees = base rate
  - √ 6–7 frames of brood and bees = base rate
  - √ 8–10 frames brood and bees = 20% above base rate
- The base rate for 1998 is $50.00;
- Hives placed in areas that are hard to reach receive a $3.00 bonus
- Cherryfield helps with situations in which trucks become stuck;
- Cherryfield is understanding of legitimate problems that arise, like truck breakdowns; all they ask is that the beekeeper stay in communication with the farm.
- Payment is 1/3 upon delivery, 1/3 within 2 weeks of departure, and 1/3 within the next 30 days.
- If Cherryfield fails to pay on time, they will add 3/4% interest per month to the balance.

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That's pretty much all there is. Cherryfield is happy with the results they have gotten, and so are the beekeepers. The contract is based on the carrot and the stick. Beekeepers who provide top quality colonies make a good living; those who don't either get up to speed or are weeded out to make room for those who will. Cherryfield ensures a ready supply of the very best colonies because they make it economically possible for the beekeeper to provide them. You can hold the beekeeper to a high standard and, if you pay a reasonable rate, they will be more than happy to do whatever it takes to keep your account. Ask your local county extension educator for sample contracts.❖❖

DISEASES

TIME VALUE

PREBLOOM SPRAYS FOR SCAB AND MILDEW

(Dave Rosenberger, Plant Pathology, Highland)

❖❖ What a difference a year makes! One year ago primary scab lesions were visible in the Hudson Valley by April 21. This year, our first infection period did not occur until April 22–23. The delayed start of the scab season this year has benefits inversely analagous to waiting until age 55 to start saving for retirement. Waiting to age 55 to initiate a retirement plan is a bad idea because one loses the benefits of compounded interest over time. In the case of apple scab, a shorter season for "compound interest" (i.e., secondary spread of scab) means that the risk of a major scab epidemic is significantly reduced. With a delayed start to the scab season, the scab fungus has less opportunity to generate multiple secondary cycles during the period when leaves and fruit are most susceptible to infection.

The dry spring may have reduced the risk of a serious scab epidemic in 1999, but it is still too early to celebrate. Scab problems could still develop if we have an extended period of rainfall such as the 11 consecutive days that we had last year in mid-May. Good fungicide protection is required for the next several weeks. Primary infections that become established during pink and bloom could still provide inoculum for subsequent fruit infections during a cool wet summer. We are nearing the end of one of the driest Aprils on record, but I suspect that we will "catch up" on seasonal rainfall totals sometime during the next six weeks. Having a clean orchard when the rains come is the best protection against potential postbloom scab problems.

Years that are unfavorable for apple scab are often more favorable for powdery mildew. Powdery mildew is actually suppressed during very rainy seasons. The mildew fungus benefits from dry weather. Wetting periods are not required for mildew infection. Mildew infections on leaves can occur when temperatures are above 50°F and relative humidity is above 70%.

Mildew overwinters in infected buds. Conidia from these primary infections become available sometime between Tight Cluster and Pink. Mildew can be controlled with protectant fungicides (e.g., sulfur) if protection is initiated at Tight Cluster. The SI fungicides have post-infection activity against mildew, and the first SI spray for mildew can therefore be delayed until Pink. Highly susceptible cultivars such as Ginger Gold should definitely be protected with an SI fungicide beginning at Pink. An SI fungicide is also recommended at Pink for orchards that had mildew problems last year. Where mildew was well controlled last year, the first SI spray can be delayed until Bloom or Petal Fall provided that SI fungicides are applied at least three times during the period from Bloom to Second Cover.

Mildew infections on fruit can result in net-like russetting similar to that caused by phytotoxicity from prebloom copper sprays. Most fruit infections occur at Pink or early Bloom stages. Thus, pink sprays can be important for protecting fruit from mildew. Under New York conditions, however,

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fruit infections are relatively uncommon and seem to occur only in high-inoculum orchards of susceptible cultivars, and then only in years that are unusually favorable for mildew development during the prebloom period.

When choosing fungicides to control scab and mildew, remember that mildew is not controlled by dodine, captan, Vangard, Polyram, or the mancozeb fungicides. Benlate and Topsin M may still control mildew in some orchards, but resistant strains of mildew are present in many orchards. (Benlate and Topsin M are totally unreliable for apple scab because resistant strains of scab are present in most orchards.) Sulfur applied at 3 to 5 lb/A works reasonably well as a mildew suppressant, but SI fungicides are the only option for high-inoculum orchards and for highly susceptible cultivars. Bayleton controls mildew and rust diseases but does not control scab. Bayleton must be applied at a minimum rate of 3 oz/A for effective control of mildew. Lower rates worked well when the product was originally introduced, but rates below 3 oz/A have provided disappointing results in recent years. Rubigan, Nova, and Procure will provide good control of mildew when applied at rates recommended for scab control.❖❖

PHENOLOGIES

Geneva:
Apple (McIntosh): Late half-inch green
Apple(Red Delicious): Half-inch green
Pear (Bartlett): Early green cluster
Tart Cherry: Bud burst
Sweet cherry (Windsor): Early white bud
Peach: Early pink

Highland:
Apple (McIntosh): Early pink
Pear (Bartlett): Early white bud
Peach: Late bloom
Apricot: Petal fall

HUDSON VALLEY DISEASES

APPLE SCAB
(Dave Rosenberger and Fritz Meyer, Plant Pathology, Highland)

Apple scab ascospore counts as determined from squash mounts:

Date	imm.	mature	discharged	tower discharge
4/18[1]	90%	10%	0%	18
4/20[2]	84%	16%	0%	34
4/20[3]	82%	20%	0%	179

Saratoga[1], Peru[2], Highland[3]

❖❖ Last week Kevin Iungerman provided leaves from Saratoga and Peru for squash mount assessments. Trees in both locations were between Silver Tip and Green Tip when the samples were collected. In both of those regions, maturity levels were just approaching the point where economically significant discharges can be expected with the next wetting events. Spore maturity appeared slightly more advanced in the Champlain Valley (Peru) than in Saratoga. Ascospore development in the Saratoga area may have been retarded by exceptionally dry conditions that have prevailed in that region. Ascospore maturation can be arrested if the leaf litter that harbors the fungus becomes completely dried out.

In the lower Hudson Valley, scab spores are ready to go but rainfall has been limited. The wetting period that occurred April 15–17 provided the first infection period of the season with 35 hours of wetting at an average temperature of 47°F.❖❖

PEST FOCUS

Geneva:
1st catch of **oriental fruit moth** on 4/22. Cold weather over the weekend depressed trap catches.

Highland: **Apple rust mites** observed. First motile **European red mites** observed. First catch of **Oriental fruit moth**.

FIELD NOTES

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	4/19	4/22	4/26
Green fruitworm	0	0.2	0
Spotted tentiform leafminer	1.4*	135	1.8
Redbanded leafroller	0.1	8.8	1.3
Oriental fruit moth	-	0.5*	0.3
Lesser appleworm	-	-	0

Highland, NY

	4/19	4/26
Green fruitworm	0	0
Spotted tentiform leafminer	9.4	13.2
Redbanded leafroller	20.8	20.2
Oriental fruit moth	-	0.2*
Codling moth	-	0
European red mite(#/leaf)	-	0.2*

* first catch

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–4/26):	183	69
(Highland 1/1–4/26):	316	134
Coming Events:	**Ranges:**	
Green fruitworm flight subsides	170-544	75-280
Lesser appleworm 1st catch	135-651	49-377
Obliquebanded leafroller larvae active	149-388	54-201
Pear thrips in pear buds	137-221	54-101
Pear psylla 1st hatch	111-402	55-208
Rosy apple aphid nymphs present	91-291	45-148
Green apple aphid present	127–297	54–156
Spotted tentiform leafminer 1st oviposition	141-319	48-154
Spotted tentiform leafminer 1st flight peak	180-544	65-275
Tarnished plant bug adults active	71–536	34–299
European red mite egg hatch begins	157–358	74–208
Redbanded leafroller 1st flight peak	180–455	65–221
McIntosh at tight cluster	188-279	68-138
Peach at pink	152-269	68-119
Peach at bloom	229–446	95–199
Pear at green cluster	188-282	68-138
Pear at white bud	217–423	96–217
Plum at green cluster	170-282	75-138
Sweet cherry at white bud	152-267	75-116
Sweet cherry at bloom	187–326	83–150
Tart cherry at white bud	257-326	109-149

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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