scaffolds Update on Pest Management and Crop Development

FRUIT JOURNAL

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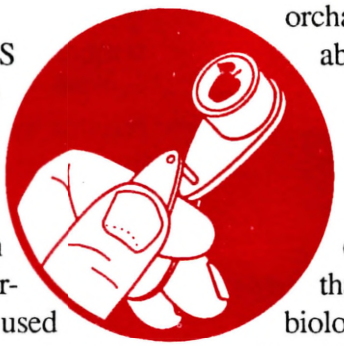
INSECTS

BENEFICIALS

MITE PREDATORS (Art Agnello & Jan Nyrop)



❖❖ We often overlook the fact that European red mite (ERM) is an induced pest in commercial apple orchards. This means that pesticides used against other arthropods usually destroy naturally occurring mite predators, allowing ERM numbers to increase to damaging numbers. The effects of pesticides on these species are listed in Tables 14 and 15 (pp. 64–68) of the 1993 Pest Management Recommendations for Commercial Tree-Fruit Production. There are five major predators of ERM that are found in commercial N.Y. orchards:

• *Typhlodromus pyri* Scheuten: This mite predator is very effective against ERM and when present in substantial numbers it will eliminate the need for chemical mite control. *T. pyri* spends its entire life in the tree, overwinters as an adult female, and is active by bloom. It prefers to feed on ERM but will sustain itself on other food sources. Once established in an orchard, if it is not disrupted by pesticides, *T. pyri* will keep ERM populations to densities of less than 1 mite per leaf year after year. It may take 2–3 years for *T. pyri* to become abundant in an orchard once a selective pesticide regimen is adopted.

• *Amblysieus fallacis* (Garman): *A. fallacis* is also an effective predator of ERM, but its continued presence in the tree from year to year is not reliable. If a site has a history of *A. fallacis*, pesticides should be managed to conserve it. Because *A. fallacis* remains in the tree year-round, even early-season applications of pyrethroids are damaging to it. Recent research shows no relationship between orchard ground cover management and abundance of *A. fallacis*.

• *Typhlodromus longipilus* Nesbitt: This predator apparently provides biological control of European red mite in commercial New York apple orchards, but is such a recent discovery that little is known about its specific biology.

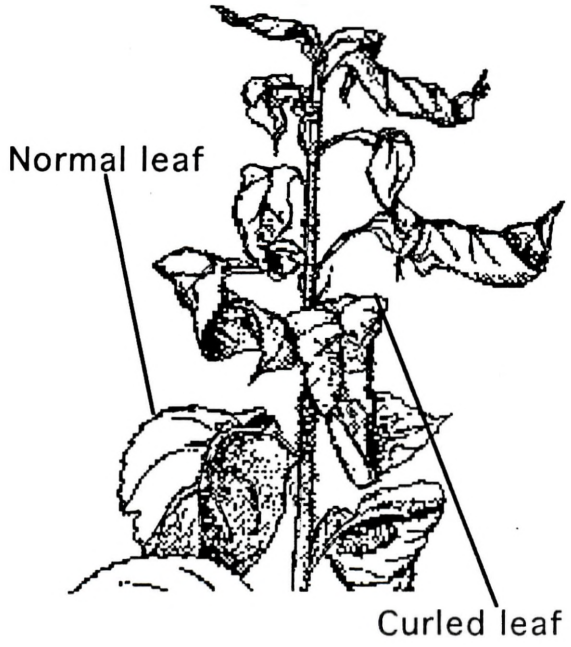
• *Zetzellia mali* (Ewing): This minute yellow mite is present in nearly all orchards, overwintering as a gravid female in concealed parts of the tree. Although it prefers older rust mites and eggs and immature stages of ERM and twospotted spider mites, it feeds on all stages of all these species. It undoubtedly helps to control ERM but is of little benefit if it is the sole predator species present.

• *Stethorus punctum* LeConte: This small, black ladybird beetle feeds on several small arthropods, including ERM. It is not common in orchards in western N.Y. and the Champlain Valley, although it has recently become more numerous in the Hudson Valley. Success in controlling ERM depends on keeping a relatively high population of ERM in the tree (3–5 mites per leaf).❖❖

APHID CONTROL

CONSIDERATIONS FOR THE CONTROL OF ROSY APPLE APHID (Art Agnello & Harvey Reissig)

❖❖ Rosy apple aphid (RAA), the season's first aphid species of concern to New York apple growers, is the most damaging of the aphids that attack apples and one of the most difficult insect pests to predict from year to year. Although it feeds mainly on apple foliage, causing leaf chlorosis and curling, its saliva is also translocated to nearby fruit, which



become bunched, stunted, and malformed. RAA will attack all apple varieties, but varieties such as Cortland, Monroe, R.I. Greening, Ida Red, and Golden Delicious are particularly susceptible, and those in the McIntosh family are relatively tolerant. As with most aphids, this species has a complex life cycle, starting with black eggs that overwinter, together with those of green apple aphid and English grain aphid, on twigs, in bud axils, and in bark crevices; eggs of the three species generally cannot be distinguished. The eggs develop into solitary, wingless "stem mothers", who then give birth to living young, most of whom are also wingless. RAA nymphs are visible beginning at about tight cluster but are most easily observed at the pink bud stage. The first adults appear around bloom. Second-generation adults appear 2–3 weeks after petal fall. Some of these move to alternate hosts (such as narrowleaf plantain and dock) and the rest remain in the orchard. The third generation develops by mid-July and also moves to alternate hosts. Generally they will remain on these plants as wingless forms until early fall, when black winged adults are produced, which migrate back to the apple trees to eventually produce the eggs present during the winter.

Our control recommendations for RAA span the period from 1/2-inch green to the pink bud stage, using any of a number of materials: Thiodan, Lorsban, Lannate, Vydate, or Asana, listed roughly in order of increasing harm to beneficial mites. Past field trials generally indicate that pink applications of any of these products do a better job than an earlier spray. This is because, in those cases where aphid populations build up during early summer on vegetative growth inside the canopy, a pink spray is more effective than an earlier treatment at half-inch green. From the point of view of management practicality, it is therefore easier and more natural to consider the need for aphid control at the time of the pink spray.

Because RAA populations are highly variable, it is important to assess their densities before making a treatment. In past surveys, approximately 50% of the orchards sampled required treatment. If you are inspecting fruit clusters for STLM eggs at pink anyway, it is not much more trouble to note the presence of RAA nymphs or damage at the same time. We recommend, however, that a few more clusters than required for STLM sampling be checked for RAA. Try to select 10 from the interior canopy area of each of 10 trees distributed throughout the block. Also, you should try to pick out damaged clusters to inspect. RAA nymphs are of course present at pink, and large enough to see without difficulty, but they do occur on the same tree and in the midst

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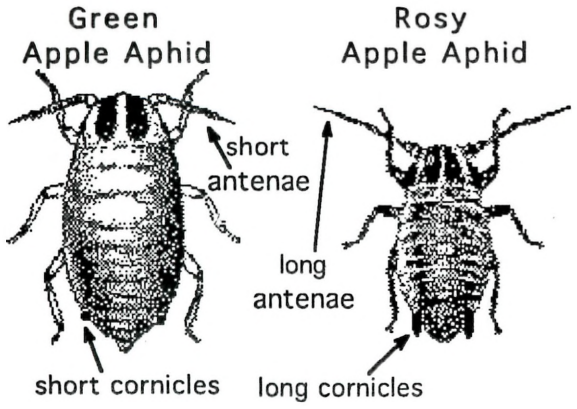
of colonies of green apple aphids, which are not usually a problem until the summer.

In order to distinguish among the species, you can use leaf damage as a cue, as well as the insects' color. RAA nymphs are usually pinkish, sometimes varying to a light brown, slate gray, or greenish black, and with the body covered with a whitish mealy coating. Most importantly, they have pronounced cornicles ("tailpipes"), and long antennae (more than half the body length). Green apple aphid nymphs are clearly green, and without the whitish cast. Their cornicles are little more than buttons, and the antennae are clearly less than half of the body length. Also, aphids found inside curled or distorted leaves at pink are almost



always Rosy Apple Aphids. If you find ONE infested cluster (1%, or stop as soon as you find one), we would advise including a good RAA material in your pink spray; this threshold may be a little conservative for people who are skilled at finding the aphids.❖❖

CORRECTION

❖❖ In the April 5 issue, the article on spray water pH included some examples of commercially available buffering agents for preventing alkaline hydrolysis. Of the materials listed, Mix Aid (Agway) is no longer available, and Agchem Service does not sell Unite at this time; the product available from both of these companies now is LI 700. Our thanks to Charlie Smith (Agchem Service) and Steve Hackett (Agway) for bringing us up to date.❖❖

DISEASES

BLACK KNOT

Wayne Wilcox

❖❖ Infections are caused by ascospores, which are ejected from fruiting structures embedded in the black knots on limbs. Ascospores are potentially available from green tip until early summer, although the peak period of spore discharge is presumed to be from about white bud until shortly after shuck split. As with the apple scab fungus, spore release occurs only during rainy periods. The spores are then moved by wind currents, and require a period of free moisture to cause infection. There is no Mills Table for black knot, but the little data available indicate that very long wetting periods are required at temperatures below 50–55°F. On the other hand, infections can occur with only 6 hr of wetting at a temperature of 70°F.

Infections occur almost entirely on the young green twigs, but usually remain undetected during the first year. Typical swollen knots start becoming obvious the following season, then turn ugly and begin producing new inoculum 2 yr after infection.

The single most important procedure for black knot control is sanitation; i.e., prune out and destroy all visible knotted tissue in the early spring. Ideally, this should be done before green tip, and no later than white bud. Again, the ideal recommendation is to burn these prunings, but a realistic alternative is to chop them with a flail mower that strips the bark. If using this method, do it as soon as possible, so that the bark has a chance to decompose before there's too much new shoot tissue out there. All infected branches and limbs should be cut 6–8" below any visible swelling, since the fungus spreads out beyond the knot itself. There's no need to sterilize shears between cut. An often overlooked source of inoculum is wild plum and cherry trees surrounding the orchard. Such trees should be eliminated altogether if possible, since they're also a great source of brown rot inoculum.

Fungicide sprays are effective in reducing the number of new black knot infections, but their effectiveness is strongly influenced by the inoculum load they've got to fight. A fungicide won't do the job by itself if you haven't helped out with the pruning shears. By the same reasoning, planting a new plum orchard next to an old one full of black knot is asking for a lifetime of trouble. Recent experience also suggests that establishing a cherry orchard in such a situation (or failing to remove that abandoned plum block near your cherries) also presents a risk to the cherries in severe black knot years.

In orchards with an established black knot problem, fungicide programs ideally should start after green tip once rainy periods with temperatures above 55°F are expected, and continue according to weather and crop economics until one week after shuck split. Where inoculum is reasonably under control and/or a minimum number of sprays is desired, concentrate on the peak danger period between white bud and shuck split, integrating these sprays with those for brown rot. Captan, Benlate, Topsin, and Bravo have all been shown to provide some protection against black knot and are all labeled on plums; no Bravo after shuck split.❖❖

APPLE SCAB UPDATE
(Dave Rosenberger)

❖❖ The progression in ascospore maturity for Highland shows that, as expected, spores developed rapidly during the past two weeks. The April 16 count was made before the beginning of a moderate Mills infection period (approximately 58°F, 15 hrs wetting) which began about 6:30 PM on April 16. Importance of this first infection period was diminished by the small amount of green tissue exposed and by the fact that the initial 2–3 hours of downpours probably washed many of the discharged ascospores out of the air before they could be blown up to buds in the trees. Some growers applied protectants prior to this infection period. Many growers with clean orchards last year have decided to delay their first application until later this week.

The disparity between ascospore maturity counts in Clermont and Highland is surprising. I suspect the difference between the two sampling sites is partially attributable to real differences in microclimate and partially attributable to variations that might be encountered between any two sampling sites.❖❖

FIELD NOTES

HUDSON VALLEY

APPLE SCAB ASCOSPORE MATURITY DATA
(Dave Rosenberger)

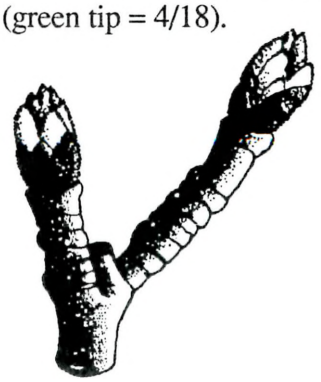
	Immature	Mature	Discharged	Tower shoot
Highland, NY:				
April 6	90%	10%	0%	0 spores
April 12	81%	18%	1%	5 spores
April 16	58%	39%	3%	234 spores
Clermont, NY (Columbia County):				
April 12	2%	0%	0%	0 spores

GENEVA

ASCOSPORE MATURITY DETERMINATIONS
(Wayne Wilcox)

	Maturity category (%)					Discharge test
Date	1	2	3	4	5	(Spores/LP field)
4/15	64	14	12	10	trace	0

Growth stage: McIntosh = late silver tip (green tip = 4/18).



INSECT TRAP CATCHES

Number/Trap/Day, Geneva NY

	4/8	4/12	4/15	4/19
Green fruitworm	0	0	0.4*	0.1
Pear psylla adults	0.1*	0	0.3	0.3
Redbanded Leafroller	0	0	0	0
Spotted Tentiform Leafminer	0	0	0	0

Number/Trap, HVL, Highland NY

	4/9	4/11	4/19
Green fruitworm	2*	0	1
Pear psylla	7	1	-
Redbanded Leafroller	0	0	0
Spotted Tentiform Leafminer	0	0	0
Sparganothis Fruitworm	0	0	0

* = 1st catch

(Dick Straub, Peter Jentsch)

PHENOLOGIES

Geneva:
- Apple(McIntosh) - **Green tip**
- Pear, cherry, peach - **Swollen bud**
- Plum, apricot - **Dormant**

Highland:
- Apple (McIntosh): **1/2-inch green**

PEST FOCUS

Pear psylla adults active, laying eggs

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1 - 4/19):	87	39
(Highland 1/1 - 4/19):	156	64

Coming Events:	Ranges:	
Redbanded leafroller 1st adult catch	32-480	17-251
Spotted tentiform leafminer 1st adult catch	73-433	17-251
Green fruitworm flight peak	64-221	19-108
Pear psylla 1st egg hatch	111-278	55-92
Rosy apple aphid nymphs present	91-291	45-148
McIntosh at green tip	24-161	4-74
Sweet cherry at swollen bud	67-137	17-67
Peach at swollen bud	67-184	17-82
Pear at swollen bud	67-184	17-86
Tart cherry at swollen bud	67-221	17-101

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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