scaffolds Update on Pest Management and Crop Development

FRUIT JOURNAL

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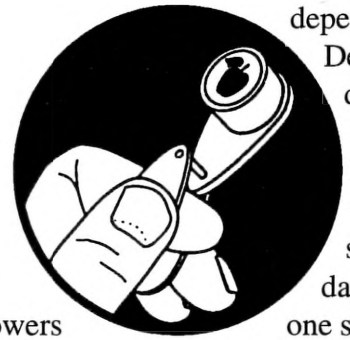
INSECTS

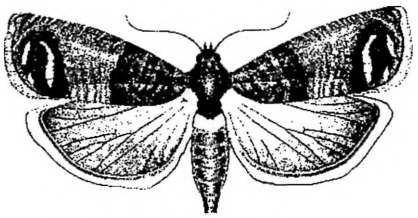
OUCH!

INSECT BITES
(Art Agnello, Entomology, Geneva)



Codling Moth

❖❖ Most New York apple growers have traditionally ignored the potential threat to their crop posed by this widely endemic orchard resident, as the regular OP sprays for plum curculio and apple maggot between petal fall and mid-August make fruit infestations by codling moth relatively rare. During the past few years, however, with the advent of trapping-based spray decisions for apple maggot, and a resulting decrease in cover sprays in some cases, we have begun to hear more about an unwelcome return of the worm in the apple, which is all the more unsettling because it is fairly easy to prevent. To that end, we will again publicize



suggested codling moth treatment windows this season, for those growers who don't necessarily spray certain blocks for maggot each year, and who have evidence (or suspicion) that codling moth is starting to pose a significant threat.

The Michigan model for predicting this insect's development gives acceptably accurate predictions of codling moth activity in N.Y. As many as two insecticide applications may be made for each of the two generations per year, depending on the severity of pressure. Degree days are accumulated from the date of first sustained moth catch, and the first spray is applied at 250 DD (base 50°F), which corresponds with predicted 3% egg hatch. A second spray may be applied 10–14 days later. If pressure is not too severe, one spray will suffice, applied instead at 360 DD_{50} after the biofix date (today, 5/28, in Geneva). In the Hudson Valley, they have reached 121 DD_{50}. To control the second generation, the timing is 1260 DD_{50} after this same biofix date. We will be providing regular updates to identify imminent spray dates.

Summer Oil

For situations where European red mite pressure or the crop's sensitivity to them don't necessarily justify the expense or paperwork of an Agri-Mek treatment, this is the time of year when a summer oil program might be considered as an alternative preventive approach. Until the 1970's, when a number of highly effective contact miticides became available, it was a common practice for growers to include a low rate (1 qt/100 gal water) of the standard superior-type oils in each of their summer cover sprays to provide constant, although incomplete, suppression of ERM populations by controlling the most susceptible stages—primarily eggs. Higher dosages were avoided to prevent potential foliar damage.

However, as mite populations began to develop resistance or tolerance to conventional miticides, and as more sophisticated oil refining

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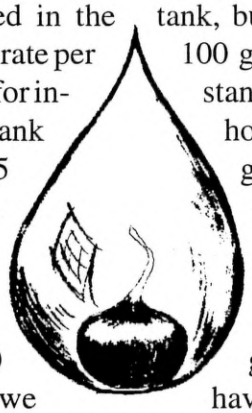
techniques removed even more impurities to produce a grade of oil that is less damaging to green tissue, a summer oil option has become more practical. The highly refined oil that is currently available has a narrower distillation range, so as to exclude some of the heavier plant-damaging components without affecting its effectiveness against mite pests. Some examples of these products are Sunspray Ultra Fine Spray Oil (Sun Refining & Marketing, Philadelphia), Stylet-Oil (JMS Flower Farms, Vero Beach, FL), and Damoil (Drexel Chemical, Memphis, TN). Field research trials conducted in commercial and experimental apple orchards in western N.Y. during the past few years have shown the effectiveness of using a highly refined oil in a seasonal program to control mites throughout the summer.

Our approach is to make three applications, on a preventive schedule, immediately after the bloom period, before mite populations have a chance to build. The first application can be any time from petal fall to 1–2 weeks later, followed by two additional sprays at 10–14 day intervals. The oil is not concentrated in the tank, but rather mixed on the basis of a rate per 100 gallons of finish spray solution; for instance, at the 1 gal rate, a spray tank holding 500 gallons receives 5 gallons of oil. The sprays are applied at a volume sufficient to obtain adequate coverage of the canopies; in most cases, we recommend 100 gal per acre. Dosages that we have tested are 6.5 oz, 1 qt, and 1, 2, and 3 gal/100 gal of finish spray solution. Results of our tests can be summarized as follows: the 2 and 3 gal rates effectively controlled mite populations for the entire season in all but the most extreme cases, such as certain problem blocks during a "jackpot" season (last year); the 1 gal rate maintained control of moderate populations but was not effective against severe mite pressure (a fourth spray was necessary later in July); and the lower rates provided only minimal control (light population pressure), permitting unacceptable mite numbers by mid-July in orchards with moderate or severe populations.



One undesirable consequence of the oil treatments can be the occurrence of small necrotic lesions on some of the leaves in blocks receiving the highest rates, particularly 2 and 3 gal. Foliar injury tends to occur mainly in those portions of the canopy where the spray has dried unevenly or else accumulated after the application, especially in locations adjacent to the sprayer and at the ends of leaf terminals. However, the oil caused no leaf drop in our tests, even in cases where the trees were under moisture stress. Fruit samples taken at harvest to check for any effects on fruit quality showed no differences in fruit color between oil-treated and untreated apples in a range of varieties. Also, there was no evidence of other anomalies such as a roughened surface, raised lenticels, or finish problems in the treated fruits. The only adverse result was an increase with oil rate of a varietal stippling characteristic in the skin of 'Red Romes', known as "scarf". Certain other varieties, such as 'Stayman', 'Jonathan', and some 'Red Delicious' strains, also exhibit this characteristic to some degree, but the oil tended to make it worse in our trials. Related tests we

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conducted using handgun oil sprays gave encouraging indications that summer oil sprays may be as effective against moving stages of mites as it is on the eggs. This would represent an additional argument for its use in the summer on an as-needed basis, to help control populations of mixed life stages as they appear.

Overall, the results of this work demonstrate that summer oil applications can be used to effectively control European red mite populations in many orchard situations. So far, mites have not demonstrated an ability to develop a resistance to oil, and oil is less toxic to at least some beneficial species than are traditional toxicants. Although it is possible to kill some predator mites by directly spraying them, overall mortality is not very high. In general, the most important predator mites respond to oil sprays with a temporary population decrease, but their long-term survival is not seriously hampered. Some potential drawbacks to this management strategy are:

- the relatively high cost of a complete summer program;
- phytotoxicity or fruit finish defects in some situations or on certain varieties, especially when applications take place at high temperatures or under conditions of moisture stress (not too much of a threat this year so far);
- the essential need for complete spray coverage to maximize effectiveness; and, most importantly,
- potential compatibility problems with some fungicides needed to control summer diseases, particularly captan.

Some principles to guide its use:

- oil appears to be capable of killing both eggs and motile mite forms, but is probably acting more against the motile forms in summer airblast applications;
- multiple sprays are necessary to control even moderate populations;
- summer oil sprays must be started when mite populations are low.

[Late Note: Harvey Reissig and I just had occasion to inspect some Red Delicious plots where we're testing a number of prebloom control programs for ERM. These trees are still in the midst of bloom, and we were amazed to find very high numbers of mites on fruit cluster leaves in plots that had received a pink application of Savey (last week). However, upon closer examination, most (if not all) of these mites appeared to be dead, although it's probably a little early to tell how many of these might have just been quiescent. Assuming that our application was adequate in terms of rate and coverage, etc. (obviously not always a given), it seems that this treatment may have been made so close to hatch that the mites emerged regardless, encountered the Savey residue and died, but haven't yet dried up or fallen. Naturally, we'll be making extensive further evaluations of these populations, but I bring it to your attention here to prevent anyone else who stumbles upon a similar situation from jumping to unnecessary conclusions (at least not until we can be certain whether some major blunder has occurred).]

De-worming

The spring flush of leaf-feeding caterpillars has arrived in many orchards, and these can be of particular concern in young, non-bearing apple plantings. Brief inspections can turn up not only OBLR, but also other leafrollers, green fruitworms (more than one species), loopers, and of course, gypsy moth larvae. The amount of defoliation that can be caused by this crowd is often not tolerable by small trees that have little foliage to spare. Check your young plantings and apply something appropriate (at least Imidan or Guthion) if you find more than a nominal amount of leaf feeding taking place.

European corn borer is one player that you won't see just now, but it may be a good idea to keep your eyes open for them over the next couple of weeks. Because of the late spring, this pest is a bit behind schedule; vegetable entomologist Chuck Eckenrode tells us that none are flying in the Geneva area so far,

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and larvae he collected a week ago and placed in rearing chambers haven't even pupated yet. This year's population should still be in the corn stubble left over from last fall. Infestations of ECB in orchards are not very common, but when they appear, they can be quite serious. Considerable feeding damage has been noted in late June in terminals of newly planted apple and cherry trees in Western NY. Also, early fruit feeding on apple has been seen in past years in the Hudson Valley. Infestations of this pest on apple are spotty and unpredictable; their occurrence in an orchard one year has no correlation with its likelihood to occur the next season. The ECB is found in NY as a single-brood (univoltine "Z race") and a double-brood (bivoltine "E + Z race") strain. Moths of the bivoltine strain traditionally peak in mid-June and in mid-August; the univoltine moth flight peaks in mid-July. In many areas of the state, the two strains occur as mixed populations.

Damage to newly-planted, non-bearing trees is caused by larval tunneling into the current season's growth. Browning of terminal leaves is a good indication of corn borer larval presence. The feeding will kill the terminal and disfigure the tree. Nonbearing, newly planted orchards normally do not receive the intensive cover spray program bearing orchards do; therefore, corn borer infestations can build up more easily in young orchards. Corn borer attack on young trees can occur from June through August. Damage to the fruit usually shows up in late summer, when the August flight of the bivoltine strain is active.

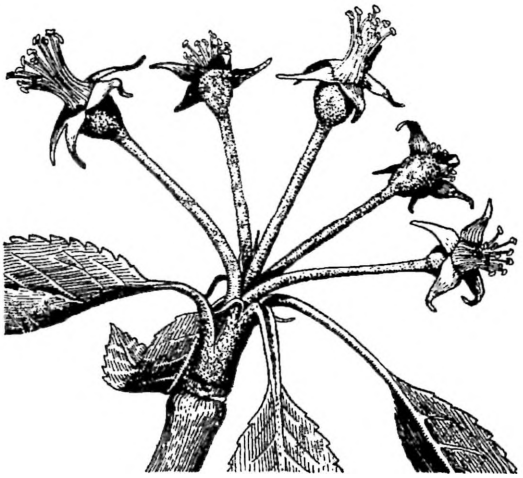
Bearing orchards are more likely to show some early corn borer damage on the fruit if growers relax their spray program in June or early July. However, most fruit feeding occurs between the last cover spray (mid-August) and harvest. Weedy sites provide plenty of alternative hosts for this insect, especially those containing broadleaf dock, ragweed, pigweed, smartweed, and barnyard grass. Penncap-M, Lannate, and Lorsban can give very good control of ECB larvae, provided application is made before the caterpillars become concealed in the plant tissue.

White Apple Leafhopper

WALH overwinters as an egg beneath the bark surface of wood that is 1–5 years old. Overwintered eggs hatch from late pink to petal fall. Nymphs feed on older cluster leaves from pink to petal fall. Both nymphs and adults remove chlorophyll from the leaves, causing a white mottling. Normally it is not necessary to sample for the first generation of WALH in western New York or the Champlain Valley because damage is not severe and populations are usually relatively low. If petal fall sampling is necessary in certain locations, such as the Hudson Valley, the suggested economic threshold is an average of 1 nymph per leaf on 10 fruit cluster leaves from each of 5 to 10 trees. Provado is a good choice for selective control of populations that are over threshold; otherwise, Sevin included in thinning sprays usually provides sufficient control of this generation.❖❖

PHENOLOGIES

Geneva:
Apple (McIntosh) - petal fall
Sweet cherry (Windsor) - fruit 10 mm
Tart cherry (Montmorency) - fruit set
Pear - frut set
Peach - petal fall
Plum (Darrow) - petal fall



INSECT TRAP CATCHES (Number/Trap/Day)

Geneva NY

	5/20	5/24	5/28
Green fruitworm	0	0	0
Redbanded leafroller	6.2	5.5	1.1
Spotted tentiform leafminer	641	627	88
Oriental fruit moth	3.6	3.4	1.0
Lesser appleworm	9.0	10.4	5.5
Codling moth	0	0	1.6*
San Jose scale	0	0	0
American plum borer	0.1*	0	0.3
Lesser peachtree borer (cherry)	0	0	0
Lesser peachtree borer (peach)	0	0	0

HVL, Highland NY

	5/13	5/20	5/28
Green fruitworm	0.1	0	0
Redbanded leafroller	0.9	1.0	0.6
Spotted tentiform leafminer	16.4	4.7	5.1
Oriental fruit moth	4.5	1.0	0.9
Lesser appleworm	0	0.1*	0.2
Codling moth	0	0.1*	2.8
Fruittree leafroller	0	0	0
Tufted apple budmoth	0	0	0.4

*=1st catch

(Dick Straub, Peter Jentsch)

PEST FOCUS

Geneva: **Mirid bug** nymphs present 5/22. **White apple leafhopper** nymphs present 5/22. 1st **codling moth** catch 5/28.
Highland: 1st adult **17-year cicada** emergence. 1st **European apple sawfly** damage.

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1- 5/28):	510	273
(Highland 1/1-5/28):	822	461

Coming Events:	**Ranges:**	
American plum borer 1st flight peak	360-962	134-601
Codling moth 1st flight peak	547-1326	307-824
Redbanded leafroller 1st flight subsiding	518-893	255-562
STLM sap-feeders present	295-628	130-325
STLM 1st flght subsides	489-978	270-636
Obliquebanded leafroller pupae present	612-860	330-509
European red mite summer eggs	448-559	235-320
San Jose scale 1st flight peak	581-761	308-449
Mirid bug hatch complete	610-720	330-390

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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