scaffolds Update on Pest Management and Crop Development

FRUIT JOURNAL

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INSECTS

INSECT BITES

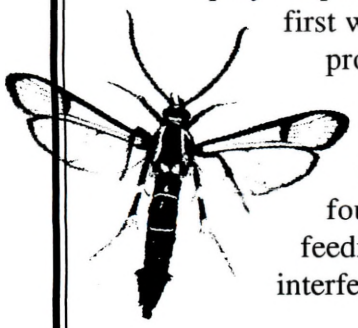
INSECT BITES (Art Agnello & Dave Kain, Entomology, Geneva)

Green Peach Aphids

❖❖ Although apparently not as serious a problem as they can be some years, these greenish, smooth-looking aphids are occurring in some blocks around the state. They cause curled leaves that may turn yellow or red in severe cases. The young aphids begin to hatch about the time of peach bloom and remain on the trees for 2–3 generations, until early summer, when they seek other hosts (mainly vegetable truck crops). Green peach aphids suck the sap from the new fruits and twigs, and are also found on plum, apricot, cherry, and many ornamental shrubs. These insects are difficult to control; Lannate is recommended before excessive leaf curling occurs, in order to maximize the spray's effectiveness. Also, keep an eye out for black cherry aphid in your cherry trees. If colonies are building up on the foliage, recommended materials include Imidan (tart cherries only), malathion, Sevin, and Penncap-M.

Lesser Peachtree Borers

Remember to get your trunk and scaffold sprays on peaches and cherries during the first week of June if borers are a problem in your blocks. This pest increases the severity of Cytospora canker infections in peaches and is often found within the canker; by feeding in the callous tissues, it interferes with the tree's natural defenses against the disease. Infestations can be determined by the presence of the insect's frass, which resembles sawdust, in the gum exuded from the wound. In peaches, you can use Lorsban, Thiodan, Asana, Ambush, Pounce, or Penncap-M for this application. In cherries, use Lorsban 4E, Thiodan 50WP, Asana, or Ambush 25WP as a trunk spray ONLY; do not spray the fruit.



Codling Moth

Most New York apple growers used to have the luxury of ignoring the potential threat to their crop posed by codling moth, the traditional worm of the wormy apple. Between the fairly regular OP sprays being applied against plum curculio and the apple maggot between petal fall and mid-August, fruit infestations by codling moth were effectively prevented and people tended to forget that it was even present in the state (let alone widely endemic). 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 about nasty surprises in the packinghouse as this old-timer has moved back in without warning. To prevent very much of this from occurring, we will again publicize suggested codling moth treatment windows for those growers who don't necessarily spray certain blocks for maggot each year, and who have evidence (or fear) that codling moth is starting to pose a significant threat.

The Michigan State field model for predicting this insect's development has been found to give fairly accurate predictions of codling moth activity in N.Y. As many as 2 insecticide applications may be made for each of the 2 generations

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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 after the biofix date (5/17 in Geneva). In Geneva today (5/22), we have accumulated 41 DD; in the Hudson Valley, they have reached 62 DD. To control the second generation, the timing is 1260 DD after this same biofix date. We will be providing regular updates via this newsletter to alert you to the imminent spray dates.❖❖

JUST ONE MORE BITE

AMERICAN PLUM BORER
(Dave Kain and Art Agnello, Entomology, Geneva)

❖❖ We've started to catch American plum borer (APB) (*Euzophera semifuneralis*) moths in traps at Geneva, as well as in Sodus and Olcott. APB is a pyralid moth, like European corn borer, rather than the clearwing moths that we usually think of when we think of borers in fruit trees. The APB adult is a tan-colored moth with darker (reddish brown to black) jagged markings running across the forewing about 2/3 of the distance from its base. Its wingspan is approximately 25 mm. It is seldom seen during the day, but can be trapped using a newly developed pheromone lure. Eggs are deposited in cracks under loose bark and hatch in a few days. Larval tunnels are shallow with frequent openings to the outer bark, where red frass accumulates. This insect is of interest because it has only recently come to be considered a major pest of cherry and plum in Michigan, and has rapidly gained in importance in that state. It has been found in about 85% of all cherry and plum plantings in western Michigan. It has even become more important than lesser peachtree borer there. Its emergence as a major pest has been associated with wounding caused by mechanical harvesting of cherries. In fact, the larvae can't bore into the cambium unless a wound of some sort is present. Since most of the tart cherries in New York are mechanically harvested, it seemed that orchards here were likely to be infested as well.

In 1994, a survey was conducted in New York State stone fruits (tart cherry, plum and peach) to determine the pest status of the American plum borer here. Results of the NYS survey indicate that APB may be the major borer pest in some orchards in the Lake Ontario fruit growing region, probably because of the concentration of mechanically harvested tart cherries here. These susceptible trees are not only damaged by APB, but likely serve as reservoirs from which other susceptible crops (such as peaches infected with canker diseases) may be infested. APB was found in all of the orchards surveyed in Wayne, Orleans and Niagara Counties. It was the prevalent pest in most of the tart cherry orchards surveyed. One peach orchard with quite a bit of bark damage from a canker disease supported a moderate to high number of borers, 75% of which were APB. There were only two plum

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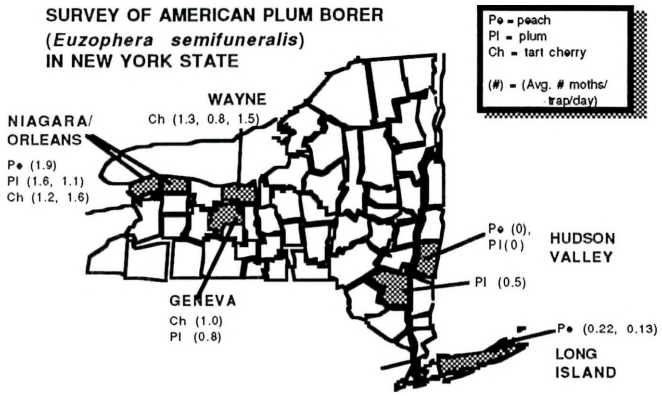
orchards included in the survey in WNY, and neither was heavily infested by APB. One of them, which was infected with black knot, did not support any infestation of the trunks by any borers. However, black knot cankers in this orchard were heavily infested with borers. Most of these were sesiids but



about 20% of the galls contained APB. The survey was also conducted in the Hudson Valley and on Long Island, but very few APB were found in those regions.

In Michigan, directed trunk sprays are recommended in cherries at petal fall, when first generation adults begin to emerge. Flight phenology in New York is similar. Adults begin to emerge around petal fall and the flight peaks about a week later. Lorsban 4E used for lesser peachtree borers in late May or early June will provide control against APB that may be present. This spray is reported to give season long control of APB and the sesiid borers in Michigan, but later applications are thought to be less effective in controlling damage. Research is under way in Western New York this season to determine whether the same is true here.❖❖

NO SOOT

PSYLLA SCRIMMAGE

(Art Agnello, Entomology, Geneva)

❖❖ The pear psylla, *Cacopsylla pyricola*, is the major insect pest of pears grown commercially in New York State. By sucking the sap from pear foliage and secreting large amounts of honeydew, this insect causes leaf scorch, tree stress, and serious smutting of fruit that can ruin its marketability. Failure to obtain adequate control of pear psylla with conventional cover spray insecticides has been widespread in N.Y. since the 1960's, and growers have had to make constant changes in their insecticide programs to effectively control this pest. Unfortunately, the pear psylla's ability to develop tolerance or resistance to new materials is well documented, and a given pesticide cannot be relied upon for any extended period.

Originally introduced accidentally from England into Connecticut about 1832, the psylla has three or four generations a year, depending on the length of the growing season for the area. The overwintering adults pass the winter in litter on the ground or in cracks in the tree bark. On warm spring days, prior to the trees' breaking dormancy, these adults can be found on the trunks, twigs, and branches. The first eggs in the spring are laid prior to bud burst, on the terminals and spurs. As the foliage appears and for succeeding generations, the eggs are laid on the new leaves. First egg hatch occurs about the time the foliage appears.

The pear psylla is a "flush feeder", meaning that the nymphs feed and develop primarily on the newer, more tender growth. By midway through the growing season, the majority of leaves are hardened off and psylla development then may be limited primarily to the water sprouts. Once the nymph begins to feed, a honeydew drop forms over the insect; the psylla develops within this drop for the first few instars. Honeydew injury occurs when excess honeydew drips onto and congregates on lower leaves and fruit. Under bright sunlight and dry conditions, the honeydew can kill the leaf tissue and produce a symptom called "psylla scorch". The honeydew is a good medium for sooty mold growth. When it occurs on the fruit, it russets the skin and makes the fruit unsaleable. Excessive feeding and the injection of toxic saliva by large populations of psylla can cause a tree to wilt and lose its leaves prematurely. This reduces tree vigor, which can take the tree several years to recover. Ladybird beetles, lacewings, syrphids, snakeflies (Raphidiidae), and predatory bugs have been recorded feeding on the psylla. There are also two chalcid parasites of pear psylla in

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the U.S. However, to obtain commercially acceptable fruit in New York, pear psylla must be controlled with insecticides.

Pears are currently grown on about 2,400 acres in N.Y. and have an estimated total value of 5.36 million dollars. Pear psylla is so well established in N.Y. orchards that virtually all growers must apply chemical treatments for control in order to avoid fruit or tree damage and yield loss. Registered insecticides for summer use on pears are increasingly unreliable in controlling pear psylla because of the development of resistance in psylla populations to materials that were once effective. In addition, N.Y. growing conditions necessitate management practices for fruit size attainment (vigorous fertilization and significant canopy pruning) that are favorable to the rapid buildup of psylla populations. Contributing to this situation of incomplete control is the widespread use of materials for other pests that are destructive to natural control agents, such as synthetic pyrethroids and carbamates. These factors virtually assure a yearly infestation of an insect that would otherwise be a relatively insignificant orchard resident, and at best, a grower can hope to keep psylla populations just barely under control. Large numbers of adults left in the orchard at the end of the summer overwinter and initiate the next spring population, while natural control agents don't have the chance to recover before the next encounter with destructive pesticides.

For psylla control, we have historically recommended an application of an effective insecticide when nymphs start to build to the level of 1–2 per leaf after petal fall. Repeated applications of a given material are often necessary. In the most recent past, the pyrethroids and Mitac have been the most widely used materials in our area. During the past 4 years, we have additionally been able to use Agri-Mek under Section 18 exemptions, and it is once again available this year. This chemical is absorbed into the leaf tissue and kills the psylla when it feeds; its mode of action is also different from the other contact toxicants. In field trials, it has provided 4–6 weeks or more of protection under normal growing conditions. However, current guidelines call for it to be applied within the first 1–2 weeks after petal fall, which may mean that the effectiveness of a single application may not carry through the entire season. This derives from our experience in 1991 when we believe unseasonably hot temperatures in May and June were responsible for hardening off the foliage prematurely and preventing adequate absorption of the material into the leaves. However, growers have asked whether it can be used at a later date if this unusual hot weather doesn't occur, presumably to get as much mileage as possible out of the single application.

In 1993, we set up trials to compare the effectiveness of single sprays of Agri-Mek applied (20 oz + 3 qt UltraFine Oil/A) at different intervals after petal fall: 15, 30, and 45 days. Mitac 50 WP (48 oz form/A) was applied as a standard summer material for comparison with the Agri-Mek treatments on 7 June and 13 July. Under high psylla pressure, the early-season (15 day post-petal fall) spray effectively maintained nymphal numbers at low levels in the fruit clusters; in foliar terminals, nymphs built up briefly by early July, but quickly subsided through mid-August. The 30-day Agri-Mek application was made just prior to a late June population increase, and psylla numbers did not immediately respond; however, by 2 weeks after this spray, egg and nymph populations were back down to negligible levels. Similarly, psylla numbers were already high in both fruit clusters and foliar terminals by the time applications were made in the late-season (45-day) Agri-Mek plots, and did not show a decrease until mid-July, ten days later. Populations were also effectively controlled in the plots receiving 2 sprays of Mitac, although egg numbers in these trees remained somewhat higher during the post-spray period than they were in the Agri-Mek plots. By mid-August, all treatments showed comparably low egg and nymph levels in fruit clusters and foliar terminals, respectively. Unfortunately, a statewide population resurgence occurred in late August, possibly as a result of unseasonably warm and dry weather after it was assumed that psylla populations had run their course, and honeydew buildup threatened substantial numbers of commercial orchards, including those in our trials. Pre-harvest rescue treatments of

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those in our trials. Pre-harvest rescue treatments of Mitac were elected in many locations.

In summary, all treatment timings of a single post-petal fall Agri-Mek spray were equally effective in initially maintaining psylla populations on fruit clusters and foliar terminals until mid-August. However, the longer the application was withheld, the greater was the early summer buildup on foliar terminals and the damage these populations caused. Although somewhat unsightly, this damage did not affect the fruit quality, and the populations were ultimately prevented from expanding onto the fruit surface. Also, the growing conditions at the end of August emphasized the potential for late-season population increases, after Agri-Mek's period of effective control (even in the latest-sprayed plots), and a final pesticide intervention was ultimately required to prevent sootiness of the fruit. As an object lesson, this experience points out that no one approach obviates the need for a watchful eye on the trees until the fruit is in the packinghouse.❖❖

DISEASES

DISEASE CONTROL OPTIONS

DAVE ROSENBERGER
(Plant Pathology, Hudson Valley Lab)

Apple Scab

❖❖ Scab infections are evident on the underside of early cluster leaves in some commercial orchards in the Hudson Valley. These infections developed from the April 21–22 infection period when buds were slightly beyond half-inch green. The affected orchards were left unsprayed until nearly tight cluster and were then covered using only mancozeb sprays. This strategy has worked in many orchards in the past, but apparently some orchards had more inoculum this year as a result of our wet July and August in 1994.

What should a grower do if scab is present in the orchard at this time of year? The answer depends on the degree of risk the grower is willing to consider. The safest strategy is to apply back-to-back applications of either Rubigan-captan or Nova-captan combinations, with the two applications no more than 10 days apart. The SI fungicides help to arrest spore production in existing lesions and, through presymptom activity, also arrest development of other scab and rust infections that may not yet be visible. Captan is the preferred contact fungicide to use with SI's when the objective is to arrest a running epidemic of apple scab. If the weather turns hot (>80°), then applications of captan alone may be almost as effective as the SI-captan combinations. Hot weather slows production of scab conidia in lesions, and it also seems to improve activity of captan. However, captan alone will prove less effective than the SI-captan combination if the weather remains cool and wet.

The presymptom activity afforded by SI fungicides accounts for their effectiveness in shutting down running epidemics of apple scab. When scab lesions are present prior to petal fall, one must always wonder whether the visible lesions represent the full extent of the problem or whether the visible lesions supplied inoculum for additional secondary infections that are not yet visible. SI fungicides attack developing infections that are not yet visible whereas contact fungicides do not. Nova is recommended at 5–6 oz/A and Rubigan at 10–12 fl oz/A in situations where antisporulant and presymptom activity is needed.

Benlate, Topsin-M, and dodine have also been used to arrest scab epidemics in the past, but none of these can be considered reliable anymore because apple scab is resistant to these fungicides in many orchards.

Black Rot

Black rot fruit decay caused by *Botryosphaeria obtusa* caused problems in some Hudson Valley orchards last summer and fall. The fruit decay sometimes appeared as early as July, but infections usually became visible as small, dark lenticel spots as the fruit ripened. Green fruit contain chemical

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compounds that inhibit development of some fruit-invading fungi, but these compounds disappear as the fruit ripen. Infections occurring during summer may remain quiescent in lenticels until the fruit begin ripening, then the decay gradually expands.

Two factors contributed to the black rot problem we noted last year. First, many growers have gradually scaled back their apple scab fungicide program to the point where they are successfully (usually!) controlling apple scab with very minimal rates (< 3 lb/A) of mancozeb fungicides applied alone. However, mancozeb at these low rates is relatively ineffective for controlling black rot. The second factor last year was the cool weather we had during fruit thinning. Because the trees were not stressed by warm sunny weather after chemical thinners were applied, the trees did not shed many of the fruitlets killed by the thinning sprays. The retained dying fruitlets were colonized by the black rot fungus, became black rot mummies, and then supplied spores for infecting the maturing fruit on the trees during July and August. Such retained mummies are always common on some varieties, such as Cortland and Northern Spy. Last year, however, retained mummies were found on Jonamac, Smoothee, and other cultivars which usually do not retain thinned fruit.

If our weather to date is any indication, we may be facing another cool post-bloom period similar to last year's. Thus, we could again face an increased risk from black rot if the thinned fruitlets fail to abscise and drop from the tree. What precautions can be taken to avoid black rot problems?

Growers have two opportunities to arrest the development of black rot. First, a good fungicide program during the period immediately after chemical thinners are applied should reduce the chances that retained fruits will become infected with the black rot fungus. If the retained fruitlets do become infected with black rot, the crop can still be protected by preventing spores from the mummies from getting into fruit during July and August. However, the latter strategy is more difficult and risky because inoculum levels will be higher and protection will be needed over a longer period of time than would be the case for preventing infection of the dying fruitlets. Thus, I believe the best strategy is to maintain adequate fungicide coverage during the period immediately after fruit thinning.

Captan, Benlate, and Topsin-M are the most effective fungicides for controlling black rot. Under New York conditions, the mancozeb fungicides also provide adequate control if they are applied at the rate of at least 1 lb/100 gal on a 7–10 day interval. However, many growers begin stretching their spray intervals during early June when thinned fruitlets are most likely to be colonized by the black rot fungus. Application of Benlate (and to a lesser extent Topsin-M) during the 45 days after petal fall increases the risk that fruit will develop scarf skin. Scarf skin is a milky fruit finish disorder that makes red apples appear dull instead of shiny after waxing. Scarf skin can be especially severe in years when trees are under drought stress for part of the season, then show rapid fruit sizing after soil moisture is replenished. To avoid potential fruit finish problems, the best approach for controlling black rot during June is probably to use either captan or a tighter schedule of mancozeb. Captan is the more effective of the two, but captan may not control rust infections. Rust infections on leaves can occur through mid-June in areas where cedar apple rust is present. If captan is used for black rot control, then rust can be suppressed by adding Bayleton to the spray mixture.❖❖

PEST FOCUS

Geneva: **Codling moth** 1st catch on 5/17.
Highland: 1st **lesser appleworm** catch. 1st **tufted apple bud moth catch**. 1st **plum curculio** oviposition scars observed in pears.

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva NY

	5/15	5/17	5/22
Green fruitworm	0.3	0	0
Redbanded leafroller	2.0	1.3	1.3
Spotted tentiform leafminer	492	812	202
Oriental fruit moth (apple)	57.0	71.0	10.9
Lesser appleworm	28.9	14.0	12.2
Codling moth	-	6.0*	2.3
San Jose scale	0.1*	0	0.1
American plum borer	0.1*	1.0	0.4

HVL, Highland NY

	5/8	5/15	5/22
Green fruitworm	0	0	0
Redbanded Leafroller	0.8	0.7	0.6
Spotted tentiform leafminer	6.0	8.2	2.6
Oriental fruit moth	0.8	1.0	0
Fruittree leafroller	0.1*	0.2	0
Rose leafhopper nymphs	1.2	20.3	-
White apple leafhopper nymphs	0.1	<0.1	-
Codling moth	-	<0.1*	1.9
Lesser appleworm	-	-	1.0*
Sparganothis fruitworm	-	-	0
Tufted apple bud moth	-	-	<0.1*

* = 1st catch

(Dick Straub, Peter Jentsch)

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1 – 5/22):	511	256
(Highland 3/1 – 5/21):	513	234

Coming Events:	**Ranges:**	
Redbanded leafroller 1st flight subsides	518–893	255–562
Spotted tentiform leafminer 1st flight subsides	489–978	270–575
STLM sap-feeders present	295–628	146–325
European red mite 1st summer eggs	448–559	235–320
White apple leafhopper nymphs present	236–708	123–404
San Jose scale 1st flight peak	581–761	308–449
Codling moth 1st flight peak	547–1326	307–824
American plum borer 1st flight peak	535–962	273–601
Lesser peachtree borer 1st catch	224–946	110–553
Plum curculio oviposition	448–670	232–348
Pear psylla hardshells present	463–651	259–377
McIntosh at fruit set	467–612	242–338
Pear at fruit set	437–581	227–308

PHENOLOGIES

Geneva:
McIntosh @ 90% petal fall
Sweet cherry (Windsor) @ fruit set
Tart cherry (Montmorency)@ 50% petal fall
Pear @ petal fall
Peach @ petal fall
Plum @ fruit set
Highland: McIntosh @ petal fall
Bartlett pear @ petal fall

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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