Post-Petal Fall Insect Pests on the Horizon

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As with many other biological events, insect development responds positively to warmer conditions. This was the case this year for sure, as we saw a marked uptick in pest activity following the stretch of hot weather we had around May 13-15 this season. Now that we are accumulating some heat units, management decisions for most major pests will tend to need addressing on a fairly predictable schedule. The following is a long-view update of some of the traditional crop protection scenarios during this period.

Plum Curculio

After moving into the orchard at bloom, egg laying for the next generation of plum curculio only continues for a limited amount of time. The warmer the post-petal fall period is, the quicker they finish which suggests that this year may potentially by a lesser year for plum curculio given our warm stretches. In order to determine how many cover sprays may be needed, utilize the long-term forecast to adequately protect your orchards until the ovipositing is finished. Coverage should remain in place until 308DD have accumulated since petal fall on your site. This can be easily determined using the Plum Curculio model on NEWA. Where additional applications against curcs are still warranted, some effective options included Imidan, Actara, Avaunt, Exirel, Verdepryn, Besiege, and Minecto Pro.

Plum curculio damage, photo credit Ontario Ministry of Agriculture Food and Rural Affairs.

For apples, if you additionally have **Rosy Apple Aphid** colonies active in your trees and want to guard against the buildup of foliar colonies later, consider an application of a material having good activity on this species (e.g., Actara, Admire Pro, Assail, Exirel, Leverage, Minecto Pro, or Sivanto Prime).

European Apple Sawfly

Traditionally confined to the eastern half of the state, the adults start laying eggs on or near newly set fruitlets at petal fall, so the plum curculio applications will have done double duty against this pest as well. Effective options include Imidan, Actara, Altacor, Avaunt, Exirel, or Voliam Flexi.

Obliquebanded Leafroller

Early heat this year has brought about the threat of OBLR sooner than usual. Depending on your location, larvae from the overwintering generation should also be able to be found in various stages of development. Pheromone traps should already be out in problem apple blocks, to fix the date of first emergence in your specific area. Recall that we recommend sampling at 600 DD (base 43°F) after the first adult catch, to determine the need and timing for treatment. For problem orchards with a reliable OBLR history where sampling is generally not needed, egg hatch (which equates to the first occurrence of susceptible larvae) occurs more or less 350 DD after the 1st adult catch. Once again, the Apple IPM Insect Models Website can help you zero in on these events in your specific area.

In orchards not too removed from petal fall and containing large larvae, an application of Intrepid, Proclaim, Rimon, Grandevo, or a B.t. product (e.g., Agree, Dipel, Deliver, Javelin) at this time will help diminish the population for better management during the summer. Although Altacor, Delegate, or Exirel are also very effective against OBLR, it would be advisable to save these big guns for the summer generation larvae, which are more of a direct threat to the developing fruits.

***Obliquebanded leafroller larvae. Photo credit** Todd M. Gilligan and Marc E. Epstein, CSU, Bugwood.org*

European Red Mite

Mite populations should be starting to build with warm temperatures, and adults may already be present in some warmer areas, which means that they'll be laying summer eggs that will hatch and create problematic populations. If you failed to take advantage of pre-bloom opportunities for early season oil or miticide applications, it's not too late to use one of the preventive materials such as Savey/Onager, Apollo, Agri-Mek, Nealta, Portal, or Zeal in problem blocks or where you may have noted ERM eggs.

In situations where European red mite pressure or the crop's sensitivity to them haven't necessarily justified an early season treatment with any of the above options, this is the time of year when a summer oil program also might be considered as an alternate preventive approach. Our field research trials have shown the effectiveness of using a highly refined oil in a seasonal program to control mites throughout the summer. Some examples of these products are PureSpray Spray Oil 10E, BioCover UL, or PureSpray Green (all from Petro Canada), Stylet-Oil (JMS Flower Farms), and Omni (an ExxonMobil product formulated using Orchex 796 and distributed by Helena); others are available, such as Damoil (Drexel), Saf-T-Side (Brandt Consolidated) and Mite-E-Oil (Helena), although we haven't tested all brands.

Our approach is to make three applications, on a preventive schedule, immediately after the petal fall 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 finished spray solution; in most cases, we recommend 100 gal per acre. A rate of 1–2 gal/100 should maintain control

of most moderate populations. Don't apply without leaving at least a 10–14-day interval before or after a captan spray, or an application of any thinning materials.

San Jose Scale

Minute SJS adult males emerge in the spring from beneath scale covers on the trees, usually following petal fall, and mate. The females produce live crawlers about 4–6 weeks after mating; these make their way to new sites and insert their mouthparts into the tree, secreting a white waxy covering that eventually darkens to black. SJS infestations on the bark contribute to an overall decline in tree vigor, growth, and productivity. Fruit feeding causes distinct red-purple spots that decrease the cosmetic appeal of the fruit. Insecticidal sprays are most effective when directed against the first generation crawlers, specifically timed for the first and peak crawler activity, which are usually 7–10 days apart.

In the Geneva area, first crawler emergence has tended to occur sometime around mid-June. If a treatment against this stage is needed, Esteem 35WP is one option. It should be applied at 4-5 oz/acre at first crawler emergence; a low rate (0.25% or 1 qt/100) of a highly refined summer oil (see above) has been shown to improve penetration and, therefore, control. Additional products showing control efficacy include Centaur (except Nassau and Suffolk Counties), Movento (which must be mixed with an organosilicone or nonionic spray adjuvant), Sivanto Prime, Venerate, and Assail. Other options include Imidan, Admire, or pre-mixes such as Endigo, Leverage, or Besiege. These applications should also be effective against White Prunicola Scale, which has gotten to be increasingly common of in our area, in apples as well as peaches.

San Jose scale female scale covering and winged male adult. Photo credit 2013 Encyclopedia Britannica Inc.

Codling Moth

Your best control will come from timing your sprays based on degree day accumulations following your biofix date. Again, these timings can be determined using your trap data and the Insect Pest Models page on NEWA. The first spray is recommended at 150 DD (base 50ºF) for ovicidal materials (Rimon,

Intrepid, Esteem), at 250-360 DD for larvicidal materials. Options include the diamides, Assail, Delegate, and possibly Imidan, depending on the status of resistance in your local populations. Options for mating disruption, always a recommended complement to your insecticide programs, include Isomate CM/ OFM TT or CM/OFM Mist, Suterra Puffer CMOFM, and Cidetrak CMDA Combo Meso-A. As for oriental fruit moth, don't overlook the potential contribution of granulosis virus products (Madex and Virosoft CP4) as a complement to your management program.

Codling moth larvae. Photo credit Utah State University Extension.

Woolly apple aphid

There have been an increasing amount of reports of blocks with problematic populations of woolies the past few years. Options include Diazinon (the best, but a problematic choice for some growers), Movento at PF–1C or whenever infestations are noted, Assail, and Sivanto. See the following article for thorough details on WAA.

Wooly apple aphid. Photo credit Greg Krawczyk.

Black stem borer

Management options are still considered provisional, since nothing we have will completely control this insect. However, trunk sprays are definitely the best option; Warrior II or Danitol are your two options now that we don't have Lorsban.

Dogwood Borer

From our observations, DWB is very widespread throughout many Eastern NY orchards with young plantings. While we do not have a complete picture of the effects of these borers on dwarf trees, we do know that they reduce vigor and can, in time, completely girdle and kill trees.

In New York, adult emergence generally begins about early June, with flight peaking in about mid-July.

A control option would be two coarse trunk applications of Assail; one by mid-June, and another by early August. Additionally we have a mating disruption option available, Isomate-DWB, which we have found to be very effective in interfering with these insects' pheromone communication process. Use of this product would be recommended as a tactic up to early June, before the first adult catch of the season, and in plantings with annual DWB pressure, should be considered as a valuable complement to a trunk spray program.

Spongy Moth

These are once again showing up in blocks across ENY this season. These are readily controlled by some of the broad-spectrum insecticides, including Imidan, Delegate, Danitol, and the B.t.s (Agree, Dipel, Deliver, Javelin, etc.).

Gypsy moth larvae. Photo credit Dan Prairie.

Brown Marmorated Stink Bug

It is too early to think about control just yet, but if any are found inside your orchard later in the summer, a treatment should be considered. Some later season treatment options include Endigo, Besiege, and Lannate.

Pear Psylla

These insects should also have been making steady progress, and the warming temperatures will eventually result in the production of summer nymphs. Since resistance issues are always a challenge, it makes sense to rotate among classes that you haven't used before. Particularly if you weren't able to get an oil spray on before bloom, populations of 1–2 per leaf would be an indication of the need for a prudent application of Agri-Mek at this time. Alternatively, Actara, Admire, Assail, Centaur, Danitol, Delegate, Esteem, Exirel, Movento, Nexter, Portal, Sivanto Prime, Warrior, Voliam Flexi and Agri-Flex also have varying degrees of effectiveness against this pest, usually negatively correlated with frequency of past use. Additionally, the recently expanded Magister label includes pear psylla, which we haven't tested, but may show promise owing to its being a novel a.i. (fenazaquin) against this species.

Spotted Wing Drosophila

Normally not considered to be a significant threat to tree fruits, SWD has caused problems in sweet and (particularly) tart cherry plantings over the past few years. Most programs require weekly applications, and the options comprise several pyrethroids (Mustang Maxx, Danitol, Lambda-Cy), as well as Delegate, Entrust, Exirel, and Grandevo. The SWD blog site (http://blogs.cornell.edu/swd1/) contains current trapping results and links to quick guides for product selection in various tree fruits and berry crops.

Spotted wing drosophila. Photo credit Oregon Dept. of Agriculture.

Stone Fruit Aphids

Although green peach aphid is not always a serious pest every year, colonies of these greenish, smooth-looking aphids are likely to occur in peach blocks during this period, along with their damage, which causes 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 can be found on plum, apricot, cherry, and many ornamental shrubs. These insects are difficult to control; the recommended options, where needed, include Actara, Admire, Assail, Beleaf, Grandevo and Movento. Lannate is an alternative, but possibly less effective choice. Applications are 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 after shuck fall. If colonies are building up on the foliage, recommended materials include Admire, Assail, Beleaf, Exirel, Grandevo, Movento, Sevin, and pyrethroids such as Asana, Baythroid, and Warrior. Pre-mixes labeled for this use include Endigo, Leverage, Minecto Pro, Voliam Flexi and Voliam Xpress/ Besiege.

Cherry Fruit Flies

It is too early for catches of adults on sticky board traps, but because of the zero tolerance in cherries for insect damage or presence, it is prudent to begin sprays in your cherries soon after shuck split (for this pest as well as for curculio). Imidan (tart cherries only), Sevin, Diazinon, Assail, Actara, Delegate or the pyrethroids are all effective treatments. Sevin will also control black cherry aphid.

Lesser Peachtree Borer

Currently the best Lorsban alternative is Isomate-PTB Dual for pheromone disruption. Now is a good time to think about hanging the ties (150-250/acre will disrupt both species — Peachtree Borer appears about mid-June in our region; use the higher rate where pressure is more severe). This pest increases the severity of Cytospora canker infections in peaches and is often found within the canker; by feeding in the callus 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 Baythroid, Pounce, or Warrior II for this application (or pre-mixes such as Endigo, Gladiator, Leverage, or Besiege). In cherries, use Baythroid, Pounce, Warrior II, Endigo, Gladiator, or Besiege, and observe the proper PHIs for these respective materials. Check the labels of all products for the recommended target area, where applicable (trunk vs. foliar).