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Update on Pest Management and Crop Development

April 13, 2015

COMING EVENTS

| | 43°F | 50°F |
|-------------------------------|------|------|
| Current DD accumulations | | |
| (Geneva 1/1-4/13): | 41 | 17 |
| (Geneva 1/1-4/13/2014): | 61 | 21 |
| (Geneva "Normal"): | 136 | 44 |
| (Geneva 1/1-4/20, predicted): | 121 | 61 |
| (Highland 1/1-4/13/15): | 75 | 27 |

Upcoming Pest Events – Ranges (Normal +/- Std Dev):

| | | |
|--------------------------------|---------|-------|
| Green fruitworm 1st catch | 50-152 | 11-71 |
| Pear psylla adults active | 31-99 | 8-34 |
| Pear psylla 1st oviposition | 40-126 | 11-53 |
| Redbanded leafroller 1st catch | 112-178 | 40-82 |
| McIntosh silver tip | 61-109 | 20-42 |
| McIntosh green tip | 97-145 | 37-63 |

Phenologies

Geneva: All dormant

Highland: Apple

McIntosh:

silver tip

Ginger Gold: green tip
Red Delicious, Empire: dormant
Pear: dormant

Pest Focus

Geneva: 1st Green Fruitworm trap catch today, 4/13.

[Section: INSECTS]

PEAR PSYLLA HUNT FINDS FIRST EGGS IN THE HUDSON VALLEY

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[Box text: PSYLLA SEASON]

The first pear psylla eggs, in very low numbers of 5 per 205 buds, have been observed in the Hudson Valley Research Laboratory 1-acre pear block in Highland. Considerations for management should begin this week as weather permits. Cool temps and rain are expected throughout the week until the weekend when temps move back into the 60s.

The pear psylla, *Cacopsylla pyricola*, is a tenacious adversary, causing yearly economic loss to European pear varieties by way of fruit russet, pear decline and

"Psylla Shock", a toxic response to psylla feeding. At high densities, pear psylla causes tree stunting, premature leaf drop, reduced fruit size, and premature fruit drop, resulting in substantial losses in yield. Tree decline and often death of sensitive pear varieties such as Bosc can occur if left unmanaged. The deposit of "honeydew" or the shunting of excess sugars from the psylla nymph onto the leaf and fruit, acts as the substrate for sooty mold development, causing leaf scorch and russetting of fruit at harvest. Nymph and adult movement throughout the canopy can increase the spread of *Fabraea* spores, increasing infection that may increase early fruit and leaf drop.

In the overwintering stage, the adult lingers about the orchard and woodland edge from fall, through the winter and into spring. Adults are often seen in flight during the warm hours of the day, with increasing movement of woodland adults into the orchard over the next few weeks. After mating, females begin to produce the first of 3–4 generations, beginning with egg laying and nymph hatch from late March through June. When scouting for early egg laying, focus on the terminal end of the fruiting branches using magnification along the basal plates of buds.

Strategies to manage pear psylla include prebloom applications of ovipositional deterrents, ovicides and insecticides aimed at the adult and nymph populations. Early management should begin upon the first signs of the egg. To delay the insect from laying eggs, Surround WP or oil, both acting as a barrier film, can be used. Either of these products will reduce egg laying by adult pear psylla. Delaying oviposition of the adults buys time for a greater number of overwintering psylla to enter the orchard from the hedgerows and woodland, for a later adulticide application.

The results from a single collection from a 2014 trial are shown below (Table 1). We often think that a single application of oil and a pyrethroid will "do the job" during the prebloom period. The data suggests that, although egg numbers in the pyrethroid treatment are lower than the other treatments, possibly due to repellency of the pyrethroid, prior egg hatch and nymph development had not been suppressed. The use of oil in combination with either Centaur, Actara, or Surround, or oil alone, showed no significant difference in oviposition, although egg numbers were lower numerically, compared with M-Pede soap, resulting in little in the way of nymph reduction.

The economics in management is a driver in decision-making. Surround WP is most effective at the highest labeled rate of 50 lbs/A (at roughly \$1.00 per pound) costing about \$50/A. Two to three applications during the prebloom and petal fall period have been shown to be a viable approach to early psylla management. Head to head, a single application of 50 lb/A of Surround performed as well as a single 2% application of Damoil in reducing oviposition over time, yet was better in reducing nymph presence in foliage assessments. The stratification, or layerin, of the kaolin clay, the active ingredient of Surround, builds on the limbs to maintain the product on the tree. Using early season applications through petal fall has the additional benefit of controlling plum curculio, along with reducing egg laying from the 1st generation of psylla adults. Surround has not been shown to be toxic to the insect and, as such, is an important tool for use in resistance management strategies for this insect. The 2012 Scaffolds article addressing early Surround WP followed by 1% oil strategy in can be found at (<http://www.scaffolds.entomology.cornell.edu/2012/SCAFFOLDS 3-26-12.pdf>).

The advantages of using oil to control this insect are many. Oil is still a relatively inexpensive material for

which no mechanism has been shown for development of resistance by the insect. It provides a degree of egg laying deterrence on treated buds and wood lasting a week or two, depending on rate and weathering. Higher rates would be applied at the dormant stage this week, using one spray of 3% oil, or two of 2% until green cluster. This rate will also reduce overwintering populations of San Jose scale, European red mite, pearleaf blister mite, and Comstock mealybug. If you begin at swollen bud, one spray at 2% or two at 1% up to white bud would suffice. Contact of the adult by oil droplets will cause mortality, while applications over the top of the eggs will reduce adhesion, often causing them to dislodge from the tree. Oil applied prior to oviposition acts to delay and synchronize egg laying later into the season, resulting in the subsequent emergence of the nymphs as targets for a concentrated management approach using a single insecticide application. Negative impacts of oil applications have been observed in the form of enlarged lenticels on developing stems, which may have an impact on plant respiration.

Ovicides can also be employed to kill the eggs prior to hatch. Esteem and Centaur work as insect growth regulators (IGRs) to inhibit development of various life

stages. Esteem 35WP, used prebloom to kill the egg stage of psylla and reduce the viability of eggs laid by a treated adult, should be applied prior to sustained egg laying with 0.25% v/v horticultural spray oil. Esteem may be applied once prebloom at 16 fl oz/A, or once prebloom and once at petal fall at 13–16 fl oz/A, as a tactic for both psylla reduction and as a resistance management strategy. Remember, its mode of action is as an ovicide, so it will not reduce the adult or nymph population directly, and is most effectively used if the material is on the wood or foliage prior to egg deposition.

Using an ovipositional deterrent (e.g., oil, Surround WP) is a prerequisite to at least two follow-up strategies. One option, upon the completed migration of adults into pear orchards, is the use of an adulticide to kill the adults before significant eggs have been laid. Adulticides would be employed this season from mid- to late April to significantly reduce the adult population. The choices for managing adult psylla include the neonicotinoids, Actara 25WDG at 5.5 oz/A and Assail 30SG at 4–8 oz/A, and the pyrethroids, Ambush 25WP at 12.8–25.6 oz/A; Asana XL 0.66EC at 9.6–19.2 fl oz/A; Pounce 25WP at 12.8–25.6 oz/A; Danitol 2.4EC at 16–21.3 fl oz/A; Proaxis 0.5CS at 2.6–5.1 fl oz/A; or Warrior

1CS at 2.6–5.1 fl oz/A. The older insecticide Thionex is no longer labeled on pears. Multiple applications are often necessary in order to achieve optimum early season control.

Cool weather provides conditions for optimal use of pyrethroids. However, the use of these insecticides over the past 20 years has decreased pear psylla susceptibility to the pyrethroids such as Asana (esfenvalerate) and Warrior (lambda-cyhalothrin). Their use should therefore be limited and used only during periods of cool temperatures.

Table 1. Single application treatments against pear psylla egg laying and nymph survival on Bartlett pears, Hudson Valley Research Lab, 2014.

Egg Evaluation

| <u>Treatment</u> | <u>Mean</u> | <u>SEM</u> |
|-----------------------------|-------------|------------|
| Biocover Oil+Asana XL | 19.67a | 6.87 |
| Biocover Oil+Centaur 0.7WDG | 55.00ab | 29.80 |
| Biocover Oil+Actara | 69.67ab | 39.40 |
| Biocover Oil+Surround | 81.50ab | 31.85 |
| Biocover Oil | 84.17ab | 11.00 |
| Biocover Oil/M-Pede 49L | 147.33bc | 23.86 |
| Biocover Oil+Esteem 35WP | 241.00cd | 52.69 |

| | | |
|-----------|---------|-------|
| Untreated | 252.83d | 60.62 |
|-----------|---------|-------|

Nymph Evaluation

| <u>Treatment</u> | <u>Mean</u> | <u>SEM</u> |
|-----------------------------|-------------|------------|
| Biocover Oil+Surround | 7.67a | 2.67 |
| Biocover Oil+Centaur 0.7WDG | 7.83ab | 2.21 |
| Biocover Oil+Actara | 8.83ab | 1.54 |
| Biocover Oil | 9.33ab | 3.08 |
| Biocover Oil+Asana XL | 12.00ab | 4.08 |
| Biocover Oil+Esteem 35WP | 13.17ab | 2.90 |
| Biocover Oil/M-Pede 49L | 15.50b | 3.71 |
| Untreated | 11.17ab | 2.26 |

Applications made on 25 April, evaluation on May 15th, 2014. Treatments were applied dilute to runoff using a high-pressure handgun sprayer operated at 300 psi, delivering 1.3–1.9 gal/tree or 130–190 gal/A with the range in gallonage representing the increasing amounts of foliage as the season progressed. All insecticide dilutions (presented as amt./100 gal) are based on a standard of 300 gal/acre tree.

GOOD FOR WHAT OILS YOU

(Art Agnello, Entomology, Geneva; ama4@cornell.edu)

[Box text: OIL STRATEGIES]

It's safe to say that there's not much danger of the season sneaking up on us this year, which may cause a little anxiety for those of us who are ready to get things rolling; however, one positive aspect of our slow progress this year is that growers should have an adequate amount of time to consider the potential value of using horticultural mineral oil as an early season pest management tactic. This used to be a pretty much universal practice years ago, when mites and scales were more problematic and the options for dealing with them were less abundant. Those of us familiar with fruit insect and mite trends still believe that it's worthwhile to consider the use of oil applications for early season mite and insect control in both apple and pear plantings, because of its effectiveness, relative affordability, and safety from a biological and pesticide resistance perspective. Taking advantage of the most favorable spraying conditions to maximize tree and block coverage can be a challenge in our area, but few pest management efforts have such potentially high returns when all factors are taken into account, and this year may offer more opportunities than are normally available.

Mite and scale population trends are typically not the same each year, and weather conditions are certainly

among the most variable of factors in the pest scenario from one year to the next. Before you decide that it's too much trouble or cost to invest in a prebloom spray of oil, be sure you're aware of how much it could cost you (biologically as well as financially) if a rescue treatment for mites or scales ends up being necessary later in the season. Probably first, chronologically, early oil applications are useful against **pear psylla** all throughout the swollen bud stage; this potential use is examined in Peter Jentsch's article today.

The Original and Still Standard Line

The following advice developed from Paul Chapman's original research is essentially unchanged from what I print every spring, which shows the durability of not only the information, but also of a crop protectant that's still as good as it used to be:

A delayed-dormant spray of petroleum oil in apples from green tip through tight cluster can be a favored approach for early season mite control, both to conserve the efficacy of and to help slow the development of resistance to our contact miticides. Our standard advice has been to try for control of overwintered eggs using 2 gal/100 at the green tip through half-inch green stage, or 1 gal/100 at tight

cluster; this assumes ideal spraying conditions and thorough coverage. Naturally, this is not always achieved in real life, mainly because of weather and coverage challenges, coupled with the difficulty of getting to a number of blocks during a fairly brief window. It is possible for mites to start hatching when the trees are at solid tight cluster, so the suffocating mode of action tends to be compromised if the nymphs are able to pick their way through the droplets, or else avoid them entirely. Let practicality determine how best to use the following guidelines.

First, to be sure that mites are in the egg stage, start on your blocks as soon as the weather and ground conditions permit, even if this means using a higher rate. Depending on how wet the winter months have been, local conditions will be the prime determinant of how easily you can get through the rows early on. Also, tend toward the high end of the dosage range, especially if there's been no frost during the 48-hour period before your intended spray, and no danger of one for 24–48 hours afterwards. For example, use 1.5 gal/100 if the buds linger somewhere between half-inch green and full tight cluster during your chosen spray period. Naturally, when warm temperatures start as early in the year as they have this season, cold snaps

and overnight frosts are a wild card, so be aware of any imminent changes in weather patterns that could result in tissue damage in oil-treated trees.

Obviously, good coverage of the trees is critical if you're to take advantage of oil's potential efficacy; this in turn requires adequate spray volume delivered at an appropriate speed. Experience and research have shown that a 1X concentration (300 gal/A) in large trees is clearly preferable; however, if all other conditions are optimal (weather, speed, calibration), then 3X, or 100 gal/A, is the highest concentration that should be expected to give acceptable control at any given time. Growers like to concentrate more than this to save time and the hauling of extra water, but reducing coverage too much can compromise your efforts if you end up covering only a small fraction of the egg population with the residue.

Don't limit this mite control tactic just to apples and pears. Talks with stone fruit growers have reminded us that many cherry, peach and plum plantings can suffer equally serious European red mite infestations that weren't given the early season attention they might have needed. We don't have hard and fast threshold guidelines for these crops, but stone fruit plantings with

a history of past ERM problems should be examined for presence of the red overwintered eggs, and if they're numerous enough to see without a hand lens, then a prebloom application of 2% oil would be a prudent tactic to help ward off this damage, particularly if your fungicide program at this time doesn't present any compatibility problems.

Weighing the Scales

San Jose scale is one of the historically important pests that has taken advantage of our changing insecticide programs during the last few years. The disappearance of products like PennCap-M and Lorsban from our list of summer spray materials has been at least partly responsible for the fact that SJS persists or has returned to pest status in a number of orchards. It's therefore worth pointing out that a 2% oil treatment at half-inch green will control the immature forms overwintering under scale covers on the trees, and this is a preferred treatment if no other problem insects need to be controlled. Combining the oil with an insecticide generally has not been shown to be more effective than using the oil (or insecticide) alone, except possibly in the case of one alternative, Esteem, which has shown good efficacy when mixed with 2% oil at the pre-pink timing.

Finally, regarding the frequently voiced concern that oil may have a negative impact on the health of the trees, I would note that petroleum oil has been used for well over a century as a delayed-dormant treatment to control mites, scales, and even some aphids, with no ill effects on the health of the tree or the current season's crop. The primary cautions we advise when using oils at this time of year stem from their use a) in association with or too close in time to applications of sulfur-containing fungicides, or b) just before or too soon after sub-freezing temperatures; both of these practices risk the occurrence of phytotoxicity, as oil's penetrant activity is capable of damaging the bark, wood, or bud tissues in these situations. Application of oil under any circumstances that do not allow for normal drying to occur can also result in some tissue damage. Also, oil sprays during pink bud can cause burning of the sepals or petals, which may or may not affect normal pollination and fruit set.

ERRATUM

Correction to Chem Update:

Merivon – Group 7/11, a combination of fluxapyroxad and pyraclostrobin. Even though the PIMS website has the full Merivon label approved, it does not match the

label on the containers in distribution in NY. For 2015, the label is the same as 2014, Pome Fruit and Stone Fruit. There is also a SLN to prohibit the use in Nassau and Suffolk Counties. It is classified as "Restricted Use" in stone fruit, pome fruit by NYDEC. BASF will print the new package label for Merivon this fall so in 2016 we will have all the Federally approved crops on the NY label. Merivon is not labeled for use in strawberries for 2015. The current label says "Do Not Use Merivon with: Emulsifiable concentrate (EC) or solvent-based formulation products, or Crop oil concentrate (COC), or methylated seed oil (MSO) adjuvants." This will be changed to a "Caution" on the new label in 2016.

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