scaffolds

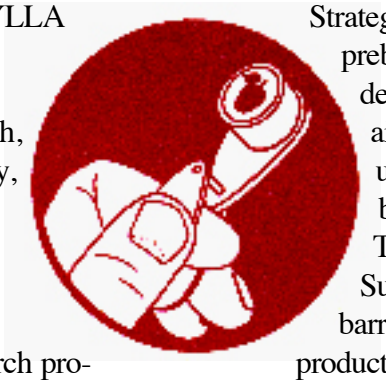
Update on Pest Management and Crop Development

F R U I T J O U R N A L

April 10, 2017 VOLUME 26, No. 3 Geneva, NY

INSECTS

CHILL A PSYLLA



EARLY PSYLLA MANAGEMENT

(Peter Jentsch, Entomology, Hudson Valley Research Laboratory; pjj5@cornell.edu)

❖❖ Recent snow in late March provided a welcome delay in bud maturity, which has recently progressed to 1/2-inch green as of this report. With temperatures now moving into the upper 70s, reaching 80°F by Tuesday, the pear psylla adult will be increasingly active throughout the Hudson Valley as we move through the pre-bloom period.

As psylla egg counts build from 0.0 per bud on 3 April to 0.6 or 29 eggs/50 buds as of 10 April, now at 1/2-inch green, management to inhibit intensive egg laying should begin. Considerations for management in southern blocks and orchards along the Hudson River provide a timely window as dry weather and orchard access permits. Cooler temps and rain are expected later in the week, when temps move back into the mid 60s over the weekend.

In the overwintering stage, the adult (Fig. 1) lingers about the orchard and woodland edge from fall, through the winter 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 three to four generations, beginning with egg laying and nymph hatch from late March through June.

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 targeting with a later adulticide application.

Fig. 1. Pear psylla adult on Bosc

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In 2016, we made two applications of oil at 1% and 2%, recording egg and nymph presence over the month of April. The results of the data from collections during this trial are shown in Fig. 2. Simply, we see a dramatic reduction in both nymphs and eggs from these two applications. The use of Surround, applied exclusively during the pre-bloom stage, has provided excellent reduction of the 1st generation nymphs through reduced egg laying management, with no observed clay residue on fruit at harvest.

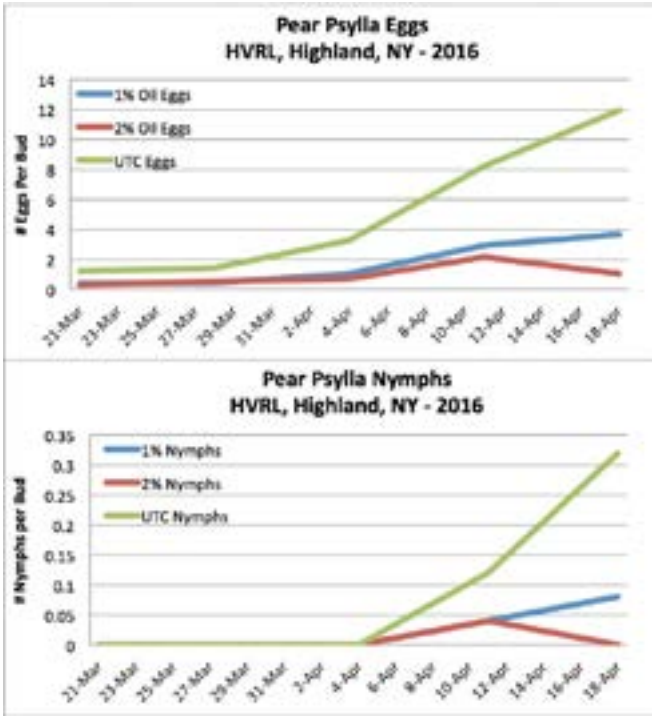

Fig. 2. Comparison of oil at 1% and 2% to untreated Bartlett.

We often think that a single application of oil and a pyrethroid will "do the job" during the prebloom period. This data suggests that the use of oil alone showed significant oviposition and nymph reduction during the 2016 season. Since two applications were made, using 2% over 1% appeared to also make a numerical difference in egg and nymph numbers. Now that the adults are in the orchard, it would be wise to consider the use of insecticides to control the adult population as we move toward bloom. However, pyrethroids are known to have reduced efficacy when used during warm temperatures above 70°F. We have seen pyrethroids completely fall down in psylla management over the past 5 years, likely due to the insects' ability to detoxify this class of insecticides. Consideration should be given to not employ pyrethroids near bloom due to bee repellency, and for bee attractiveness and pollinator conservation in general, as the honeybee is not particularly fond of pears relative to other tree fruits.

The advantages of using oil to control this insect are many. Oil is still a relatively inexpensive material for which there has been no mechanism found for resistance development by the insect. It provides a degree of egg laying deterrence on treated buds and wood lasting a week or two, depending on rates and weathering. Higher rates would be applied at the dormant stage this week, using one spray of 3% oil, or two of 2% to green cluster. This rate will also reduce overwintering populations of San Jose scale, European red mite, pear leaf 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

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over the top of the egg 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 subsequent emergence of the nymphs susceptible to a concentrated management approach using a single insecticide application. Negative observed impacts of oil applications have included 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. The use of 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 treated adults, should be applied prior to sustained egg laying with 0.25% v/v horticultural spray oil. Esteem may be applied once at delayed dormant to "pink stage" at 5 oz/A, or two applications at delayed dormant to "petal fall" stage at 4-5 oz/A, as a tactic for both psylla reductions 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; it's most effectively used if the material is on the wood or foliage prior to the eggs being deposited.

Using an ovipositional deterrent (oil, Surround WP) is a prerequisite to at least two follow-up strategies. One option, upon completed migration of the 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 and Pounce 25WP at 12.8–25.6 oz/A; Asana XL 0.66EC at 7.3-12.8 fl oz/100 gal or 9.6-19.2 fl oz/A (from dormant to white bud stage; postbloom rates are lower); Proaxis 0.5CS at 2.6–5.1 fl oz/A; Danitol at 16-21.3 fl oz/A; or Warrior II at 1.28-2.56 fl oz/A. The older insecticide Thionex is no longer labeled. Multiple applications often need to be applied 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 be limited and used only during periods of cool temperatures.

The economics of management are a driver in decision-making for pear production. Surround WP is most effective at the highest labeled rate of 50 lbs/A (roughly $1.00 per pound), costing about $50/A. Two to three applications during the prebloom and petal fall period have shown to be a viable approach to early psylla management. Although it does not kill the adult, it will inhibit egg laying as long as there is sufficient material on the foliage and stem to keep adults from the tree. In our studies, the use of a single prebloom application at 50 lb/A Surround was comparable to a single 2% application of Damoil in reducing oviposition when applied at the same time. Yet as the season progressed, the Surround treatment performed better in reducing the nymph presence on foliage during later assessments, compared with other prebloom choices.

The stratification or layering 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 to 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. For additional information on this topic, review the March 26, 2012 Scaffolds article on early Surround WP followed by 1% oil strategy.

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Ending the use of Surround WP by Petal Fall will reduce the overall cost of management using this product while reducing the potential for clay residues to be deposited on the fruit at harvest. However, pears will require continued management of pear psylla throughout the remainder of the season. We have found the use of 1% oil on a two-week interval provides sufficient control of the nymph population by reducing both egg laying and nymph survival. See the 2015 RESULTS OF INSECTICIDE AND ACARICIDE STUDIES IN EASTERN NEW YORK; Hudson Valley Laboratory, Highland, NY pgs 25-30. ❖❖

ON A DIFFERENT SCALE

MORE ON OILS FROM LAST WEEK'S ARTICLE

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

❖❖ Another scale we've been seeing in upstate NY orchards that might otherwise have been identified as white peach scale (*Pseudaulacaspis pentagona*) is almost certainly a closely related species (*P. prunicola*), which has the common name of white prunicola scale. According to scale authorities, this species is so closely related to *P. pentagona* that for years no one was aware that the white peach scale was not one but two species. Evidently, the prunicola scale is more common in temperate climatic zones, and scales found in upstate NY and New England will most likely be *P. prunicola*.

Infestations on apple and cherry as well as peach, are characterized by numerous white scales that cluster on the trunk and scaffolds, giving them a whitewashed appearance (**Fig. 3**). Feeding reduces tree vigor, and foliage of affected trees may become sparse and yellow; heavy infestations can cause death of twigs, branches and entire trees if left unattended. This species overwinters as an adult female and deposits eggs in the spring. Horticultural oil is recommended as a dormant spray

Fig. 3. Heavy infestation of *P. prunicola* on apple trunk
in April,

and insecticides can be used against crawlers in mid-June through early July (about 700–1150 DD base 50°F from March 1). Materials such as Movento or Centaur would be two good candidates at such a time. [Refs: Johnson & Lyon 1988, Insects that Feed on Trees and Shrubs; Davidson et al. 1983. Proc. Entomol. Soc. Wash. 85: 753-761].

ERRATUM - Oils and Copper

Last week, I cautioned that oil probably shouldn't be used when active captan or copper residues were present, to avoid phytotoxicity. This was too broad a statement, since it implied that oil is incompatible with copper products, which is not the case. I was referring to the more specialized cases of active copper residues present on the tree causing damage when oil is applied onto them during periods when freezing temperatures are likely to occur. I was reminded by a respected source that there never used to be any problems mixing oil with Bordeaux mixture, so incompatibility would not be an issue. Sorry to have overstated this issue. Dave Rosenberger provides some more useful insight on this topic, which I appreciate:

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'I'm not aware of any intrinsic problem from mixing oil and copper EXCEPT in situations where hard frosts are expected within several days after applications or if any of the new copper formulations specifically include a warning about oil compatibility. Following freezes, anything on the plant surface will get sucked into cells as frost crystals melt. Either oil or copper alone can exacerbate frost injury, but I think that the two together are especially damaging (although I can't say I have personal experience or observations to back up the concept that oil+copper are worse than either alone when applications are followed by frost).

Up until oil prices rose drastically in the late 1990s or thereabouts, many growers used 3% oil with their copper sprays so as to get both fire blight protection and insect control. When oil prices rose, this dropped from common usage because it was cheaper to use 2% or 1% oil at later bud stages, and we then suggested that growers use only 1 quart/100 gal of oil with copper to act as a spreader. Thus, I don't see a problem with combining the two unless, as noted above, there are specific label warnings to that effect or in situations when frost is expected within several days after application.

One final issue: In general, copper sprays should not be applied with anything that lowers the pH of the spray solution, since acidic solutions will make copper more phytotoxic. I have never checked the pH of spray oils, but I have no reason to believe that the newer oils are any more acidic than what was used 35 years ago. And to complicate the pH question even further, the relatively new low-rate Magnabon copper (CS2007, as I recall) is formulated in a very acidic solution (pH in the high 3 to low 4 range, as I recall). I would not recommend this product at GT anyway, but putting such an acidic solution of copper with spray oil may (or may not?) increase risks of phytotoxicity.' ❖❖

PEST FOCUS

Geneva:
Redbanded Leafroller 1st catch today, 4/10.

Highland:
Green Fruitworm 1st catch today, 4/10; and **Redbanded Leafroller** 1st catch 4/4

PHENOLOGIES

Geneva:	Current	4/17, Predicted
Apple (McIntosh):	50% green tip	half-inch green
Apple (Empire):	5% green tip	half-inch green
Apple (Red Delicious):	5% green tip	half-inch green
Apple (Idared):	early 1/4-in. green	half-inch green
Pear (Bartlett):	early bud burst	green cluster
Pear (Bosc):	swollen bud	bud burst
Highland:		
Apple (McIntosh, Empire, Ginger Gold, Red Del.):	silver tip	
Pear:	1/2-inch bud burst	

INSECT TRAP CATCHES (Number/Trap)

Geneva, NY	3/30	4/3	4/10	Highland, NY	3/27	4/3	4/10
Green fruitworm	0.0	0.5*	1.0	Green fruitworm	0.0	0.0	1.0*
Redbanded leafroller	–	0.0	0.5*	Redbanded leafroller	0.0	0.0	10.0*
Spotted tentiform leafminer	–	0.0	0.0	Spotted tentiform leafminer	0.0	0.0	0.0

* first catch

UPCOMING PEST EVENTS

		43°F	50°F
Current DD*	(Geneva 1/1–4/10/17):	138.4	54.6
accumulations	(Geneva 1/1–4/10/16):	149.4	59.0
	(Geneva "Normal"):	112.4	45.9
	(Geneva 1/1-4/17, predicted):	235.5	112.3
	(Highland 1/1–4/10/17):	189.3	72.9

Coming Events:	Ranges (Normal ±StDev):	
Apple grain aphid nymphs present	128-488	63-247
Comstock mealybug 1st gen crawlers in pear buds	215-441	80-254
European red mite egg hatch	231-337	100-168
Green apple aphids present	111-265	38-134
Green fruitworm peak catch	99-212	38-99
Obliquebanded leafroller larvae active	158-314	64-160
Oriental fruit moth 1st catch	223-324	96-163
Pear psylla 1st egg hatch	174-328	60-166
Pear thrips in pear buds	118-214	50-98
Redbanded leafroller 1st flight peak	228-378	104-198
Rosy apple aphid nymphs present	134-244	56-116
Spotted tentiform leafminer 1st catch	117-215	44-101
Spotted tentiform leafminer 1st oviposition	143-273	58-130
McIntosh green tip	98-144	37-63
McIntosh half-inch green	150-198	63-93
McIntosh tight cluster	206-258	91-125

*all DDs Baskerville-Emin, B.E.

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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