scaffolds

Update on Pest Management and Crop Development

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

March 31, 2008 VOLUME 17, No. 2 Geneva, NY

INSECTS

HEDGE YOUR BETS

OIL FUTURES VS. PEST FUTURES

(Art Agnello, Entomology, Geneva)

❖❖ Everyone is aware of the impact of rising oil prices on the cost of driving, and more than one grower has already commented to me about their impact on the cost of managing fruit pests. Not many people have questioned whether it's worth it to continue filling up their gas tanks, but some have started changing their driving habits to bring costs down; similarly, some fruit growers are weighing the merits of giving up or cutting down on oil applications to save money on their pest spray bills. I'm not in the same position as a grower, so oil prices don't affect me in quite the same way financially, but I can offer some perspectives on the merits of using oil in your early season pest management programs, even acknowledging their higher cost compared with past years.

In short, those of us familiar with fruit insect and mite trends still consider it worthwhile to use oil applications for early season mite and insect control in both apple and pear plantings, because of its effectiveness, (still) relative affordability, and safety from a biological and pesticide resistance perspective. Exploiting the most acceptable 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 considerations are taken into account. Reports from colleagues in more southern states relate that some of their growers plan to forgo oil this year because 'they didn't use it last year and they made out all right', which strikes me as a little like saying that I won't use my seatbelt today because I didn't use it yesterday and nothing bad happened. Mite and scale populations are not known for behaving exactly the same each year, and weather conditions certainly don't interact with other orchard factors in the same way from one year to the next, either. Before you decide to pass on a prebloom spray of oil (even at $5.50 a gallon), be sure you won't mind having to pay several times that much if a rescue treatment for mites or scale ends up being necessary later in the season.

Pear Psylla

A few sunny days with warmer temperatures have already occurred, and although I haven't yet heard that any pear psylla eggs have been laid, it won't take long for this to happen once we get a few more. Even though it's impossible to make sure your pear trees are all protected by the time the first psylla adults start flying and ovipositing, several nice warm days in a row at this time of year don't result in more than a

continued...

IN THIS ISSUE...

small number of psylla eggs, so you'll be more than adequately protected if you prepare now to get out there during the first real stretch of good weather.

Early oil applications are useful against pear psylla all throughout the swollen bud stage; although it's capable of killing adults and nymphs that are contacted directly, oil is recommended mainly because the residue has a repellent effect on adult females looking to deposit their eggs, and this lasts for an extended period after treatment. The objective of using oil is to delay the timing of any needed insecticide spray until as late as possible before (or after) bloom. Oil rates depend on when you start: If your buds are at the dormant stage, one spray of 3% oil, or two of 2% through green cluster are recommended; if you start at swollen bud, one spray at 2% or two at 1% up to white bud should be adequate for this purpose, especially if applied as soon as the psylla become active (50°F or above). This will also give some red mite control at the same time.

European Red Mite, According to Chapman

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

A delayed-dormant spray of petroleum oil 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, real life doesn't always measure up, mainly because of weather and coverage challenges, coupled with the difficulty of getting to a number of blocks during this transient 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 tiptoe through or avoid the droplets. 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 heavy snowfalls have been in certain locations, local conditions will be a 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.

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

continued...

scaffolds
is published weekly from March to September by Cornell University—NYS Agricultural Experiment Station (Geneva) and Ithaca—with the assistance of Cornell Cooperative Extension. New York field reports welcomed. Send submissions by 3 pm Monday to:

scaffolds FRUIT JOURNAL
Dept. of Entomology
NYSAES, Barton Laboratory
Geneva, NY 14456-1371
Phone: 315-787-2341 FAX: 315-787-2326
E-mail: ama4@cornell.edu

Editors: A. Agnello, D. Kain

This newsletter available on CENET at: news://newsstand.cce.cornell.edu/cce.ag.tree-fruit
and on the World Wide Web at:
http://www.nysaes.cornell.edu/ent/scaffolds/

gal/A) in larger 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 recently 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 measure to help ward off this damage, particularly if your fungicide program at this time doesn't present any compatibility problems.

San Jose Scale

It's been a concern that our recent insecticide withdrawals and restrictions may have been promoting a return to the pest profiles of the past, with direct fruit pests (internal leps, apple maggot, various bugs) taking precedence over the indirect foliar feeders. San Jose scale is one of those historic problems that has already responded to some of the regulatory actions of 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 nymphs, and this is a preferred treatment if no other problem insects need to be controlled. Combining the oil with an insecticide has not been shown to be more effective than using the oil (or insecticide) alone, except sometimes in the case of a more recent alternative, Esteem, which has shown good efficacy when mixed with 2% oil at the pre-pink timing.❖❖

WORKING THE BUGS OUT

THINKING ORGANICALLY: INSECT PEST MANAGEMENT
(Peter Jentsch, Entomology, Highland)

❖❖ In "unsubsidized" agricultural businesses, success equates to profitability. In organic apple production, success then hinges on maintaining high yields of marketable fruit and keeping the high price of management reined in, while creating a market niche of selling less-than-perfect fruit at premium prices.

Northeast organic apple production was not economically feasible prior to the commercial availability of kaolin clay (Surround WP) in 2000. Federally approved organic materials, such as pyrethrum (Pyganic), were available for control of fruit feeding insect pests. However, they were ineffective against plum curculio (PC), the principal fruit pest responsible for significant yearly crop loss in organic apples. Surround WP creates a barrier film of kaolin clay on the fruit and foliage, acting to inhibit egg laying of plum curculio and apple maggot, while reducing fruit feeding by a variety of insects. From recent insecticide research come organic materials such as azadirachtin (Aza-Direct, Neemix), a seed extract from the neem tree effective as an antifeedant, also disrupting insect growth, and spinosad (Entrust), an excellent lepidopteran material derived from the soil-dwelling bacterium, *Saccharopolyspora spinosa*. With the advent of these new materials emerges the possibility of organic apple production in the Northeast, cost notwithstanding.

continued...

The arrival of new organic insecticides, scab-resistant cultivars (SRCs), and larger-fruiting varieties, brings the prospect of economically viable production of organic apples in New York. In past studies conducted at the Hudson Valley Laboratory, we observed varying levels of disease, insect and mite populations in our NE-183 planting without the use of pesticides. These included new varieties of SRCs, some of them developed by the Purdue Rutgers-Illinois cooperative breeding program. Through the selection of both SRCs and varieties demonstrating inherently lower disease and insect susceptibility, as well as larger-fruiting varieties not as sensitive to organic thinning measures, the potential for dramatically reduced applications of organic fungicides and insecticides, increased fruit size and yield may be achieved. Details of these studies can be obtained in the Summer 2003 issue of the NYS Horticultural Society Fruit Quarterly Journal: http://www.nyshs.org/fq/summer03/NYFQ%20Summer03.pdf.

For several years, university researchers have conducted studies evaluating the impact of organically acceptable materials on the insect complex in both apple and pear. If one is considering organic apple production it is prudent to consider the past works of Agnello, Reissig, Nyrop, Merwin, Peck, Rosenberger and Straub, on the use of Surround WP, mating disruption for managing the lepidopteran complex, and disease management listed here: http://www.nysaes.cornell.edu/hort/fq/spring02/spring02.pdf, http://www.organic.cornell.edu/research/tsfsumms/2005/apples.pdf, http://www.nysaes.cornell.edu/hort/fq/spring03/NYFQ%20Spring03.pdf, http://www.nysaes.cornell.edu/ent/scaffolds/2008/080324.html.

In 2000, we conducted efficacy studies to determine the impact of the then newly registered insecticide Surround WP on the insect complex of four commercial apple varieties grown on M-26 rootstock. We applied Surround WP using a handgun at the high-labeled rate of 50 pounds per acre, on a 10–14-day interval in a season-long program beginning at early petal fall. In retrospect, Surround would have demonstrated far greater efficacy had it been applied in 2–3 applications prior to bloom in the high-pressure experimental orchards we have in the mid-Hudson Valley. This method gave us reasonable control of the primary insect pests compared with a conventional program of Calypso 2F at 1.0 oz/100 gal at pink, Guthion 50W at 8.0 oz/100 gal at PF applied until the end of season, and Provado 1.6F at 2.0 oz/100 gal at 3rd cover.

In harvest evaluations of damage to 'Ginger Gold', the Surround treatment had 45% clean fruit compared with the commercial standard of 89%. Plum curculio damaged 25.9% of the fruit compared with 1.9% and 42.3% in the commercial standard and untreated treatments, respectively. In regards to the complex of internal and external feeding Lepidoptera larvae, we observed higher levels of fruit damage in the Surround treatment (14.1%), compared with 5.2% and 72.9% in the commercial standard and untreated treatments, respectively. Surround did as well as the commerical standard for European apple sawfly and apple maggot control.

To better understand the combined effects of managing diseases and insects using organic control measures, we conducted a trial in 2006, making applications to five single-tree replicates for each of 28 different cultivars arranged in a randomized block design. Only 15 of the 28 cultivars were used for data collection. A commercial standard was compared with a program based on organic fungicides plus Surround WP applied using airblast applications on a 7–10-day interval in three treatment blocks. The Surround was included beginning with two pre-bloom applications at tight cluster, in order to layer kaolin on the trees prior to the establishment of European apple sawfly, tarnished plant bug, and plum curculio. In addition, spinosad was applied once during early summer and again in August to help with control of internal lepidopteran pests and apple maggot, with a Bt application for the obliquebanded leafroller in mid-June.

continued...

In evaluations of the organic plots, we observed smaller fruit size than in the standard and unsprayed plots when king fruits and lateral fruits were measured on 26 May. This size differential was attributable to the liquid lime sulfur thinning sprays applied in mid-May.

In pre-June drop fruit evaluations, we found that the organic program was equivalent to the standard program for controlling damage by European apple sawfly (EAS) and tarnished plant bug (TPB) on king fruit, and provided better control than the standard program on lateral fruit. Control of PC, EAS, and TPB in our standard program might have been better if an insecticide had been applied at pink. The proportion of fruit showing no insect damage was still quite high in the organic blocks on 26 May, but this dropped considerably due to later damage from PC. We attributed the high incidence of plum curculio damage at harvest to very heavy pressure (94% damage in the unsprayed control plots), a delayed peak in PC activity in the 2006 season, and the loss of insecticide residues from heavy rains on 2 June.

Evaluations of fruit at harvest showed that the organic program was more effective than the standard program for protecting fruit from EAS and TPB, less effective against external lep damage, and statistically comparable for controlling internal leps and apple maggot. The full report of this study can be found on-line at: http://www.nysipm.cornell.edu/grantspgm/projects/proj06/fruit/rosenberger2.pdf.

Use of Surround WP in a season-long program has been observed to fall short in controlling San Jose scale (Fig. 1) while adding to costs related to contending with clay residues on the fruit after harvest. San Jose scale management can be remedied with the use of a single well-applied 2–3% dormant oil application during the pre-bloom period. Clay residues can be removed using food grade fruit and vegetable cleaners such as acid or alkaline cleaners in dip tanks, flumes and sprayers over the washer brushes. An additional concern related to the use of Surround is that the clay barrier does not actually kill plum curculio, which continues to be present within the orchard throughout the season, and may remain at relatively high numbers to cause later damage as residues wane.

In summary, pesticides plus application costs totaled $650/A for the standard program as compared with $1,173/A for the organic program. Total yield per acre (including fruit damaged by pests) was 209, 409, and 861 bushels per acre for the unsprayed, organic, and standard treatments, respectively. Pest control costs per bushel were $2.98 for fruit from the organic block compared with $0.76 for the standard. Results from this trial show that pest-free apples can be produced organically in New York, but organic producers will likely need at least a 400% sales premium compared with standard growers, due to the high costs and reduced yields associated with organic pest control.

Further research may lead to cost reductions and improved productivity for organic systems, but farmers currently considering a switch to organic apple production should verify that their prospective buyers will be willing to pay a significant premium for organic fruit. ❖❖

Fig. 1. San Jose scale on McIntosh grown using a Surround program.

Reference

Travis, J.W., J. Schupp, G. Krawczyk and N. O. Halbrendt. 2007. Organic Apple Production – The Pennsylvania Experience. Fruit Research & Extension Center, Pennsylvania State University, Biglerville, PA 17307 http://www.newenglandvfc.org/pdf_proceedings/Apple_Penn.pdf

CHEM NEWS

TEN OF SEVIN

PRODUCT REGISTRATION UPDATE
(Art Agnello, Entomology, Geneva)

❖❖ Recently, there has been some confusion over the status of Sevin insecticide and its registration in New York, as well as availability of certain Sevin formulations. To clarify this matter, Dan DiGiacomandrea from Bayer CropScience offers the following information:

1. Bayer CropScience has discontinued the Sevin 80S formulation (EPA #264-316) and replaced it with Sevin 80S Solupak (EPA #264-316) due to worker exposure issues as part of the FQPA process. Please note the EPA numbers are the same, as this is really only a packaging change, not a formulation change.
2. The following formulations of Sevin Carbaryl Insecticide are registered in New York for Ag uses: (this list does not include formulation concentrates or Turf and Ornamental formulations. For a complete list go to <http://www.dec.state.ny.us/website/dshm/pesticid/webinst.htm>)

EPA #	Formulation
00264-00316	SEVIN 80 SOLUPAK
00432-01226	SEVIN 80 WSP CARBARYL INSECTICIDE {BAYER}
00264-00349	SEVIN BRAND 4F CARBARYL INSECTICIDE (AVENTIS)
00264-00349	SEVIN BRAND 4F CARBARYL INSECTICIDE {BAYER}
00264-00526	SEVIN BRAND 80 WSP CARBARYL INSECTICIDE* {BAYER} *NY Restricted Use
00264-00526	SEVIN BRAND 80 WSP CARBARYL INSECTICIDE* (AVENTIS) *NY Restricted Use
00264-00316	SEVIN BRAND 80S CARBARYL INSECTICIDE {BAYER}
00264-00316	SEVIN BRAND 80S CARBARYL INSECTICIDE (AVENTIS)
00264-00333	SEVIN BRAND XLR PLUS CARBARYL INSECTICIDE (AVENTIS)
00264-00333	SEVIN BRAND XLR PLUS CARBARYL INSECTICIDE {BAYER}

The Sevin Brand 80 WSP Carbaryl Insecticide (EPA #264-526) is considered a "New York Restricted Use Pesticide" (RUP) due to some old label language. Bayer no longer sells this labeled product in NY, but maintains this registration in NY in the event that any product is still in the channels of trade; however, my records show that the Sevin sold in NY is either Sevin 4F, Sevin 80S or Sevin XLR. None of these are RUPs in NY. ❖❖

ERRATUM

RATE RE-PEAR
(Art Agnello, Entomology, Geneva)

❖❖ Repeating the correction to the error in last week's issue (which I also repeated from last year): The yearly seasonal maximum amounts of formulated azinphosmethyl product allowed on pears should be:
2008: 3 lb
2009–10: 2 lb
2011–12: 1.5 lb

❖❖

PHENOLOGIES

Geneva, Highland: All dormant

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–3/31/08):	44	16
(Geneva 1/1–3/31/2007):	90	36
(Geneva "Normal"):	78	35
(Highland 3/1–3/31/08):	25	2
Coming Events:	Ranges (Normal ±StDev):	
Green fruitworm 1st catch	52–124	13–55
Pear psylla adults active	31–99	8–34
Pear psylla 1st oviposition	40–126	11–53
McIntosh at silver tip	55–111	17–43

This material is based upon work supported by Smith Lever funds from the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.