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The Ohio State University Newsletter Extension

Fruit ICM News

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Calendar

March 6: Labor Issues & Human Relations Workshop, Tom's Counry Place, 3442 Stoney Ridge Rd., Avon, OH. Attracting, recruiting, hiring, and maintaining permanent, seasonal, and non-traditional employees has become a concern in the horticulture industry. Our workshop leader, Dr. Bernie Erven, Extension Specialist, Human Resource Management, will take us through ideas to orient new program and build a package to maintain and retain good employees. Registration is required. Call Charles Behnke at 440-326-5851 by February 28.

March 6-7: Ohio Fruit and Vegetable Food Safety Workshop, ODA Bromfield Building at Reynoldsburg. Contact John Wargowsky, 614-246-8286 or labor@ofbf.org, or Mary Donnell, 419- 354-6916 or donnell.8@osu.edu or visit http://www.midamservices.org and click on 'projects.'

March 12: Ohio Fruit Growers Society Board Meeting, Johnny Appleseed Heritage Center, Mifflin, OH, 9:30 am. (For map to JAHC: http://www.jahci.org)

March 28-29: Berry School, video sites include OSU Learning Center, South, Piketon, OH; 244 Kottman Hall, OSU Columbus Campus; and OARDC Wooster, 1680 Madison Ave. Contact Sandy Kuhns at 1-800-297-2072 (Ohio only) or 740-289-4591 or e-mail kuhn.37@osu.edu

June 25: Ohio Fruit Growers Society Summer Tour, Glen Hill Orchard, 17156 Glen Road, Mt Vernon, OH. More details to follow later.

Soybean Oil May Help Grapes Ride Frosty Weather

Source: Dave Ferree, OARDC, *written by Candace Pollack, OSU Communications*

Spraying soybean oil on grapevines before the onset of spring may help grapes survive sudden onsets of frost early in the growing season. Ohio State University researchers have found that soybean oil delays bud bursts anywhere from three to 12 days depending on the grape variety, giving the crop the opportunity to weather frost conditions that would otherwise kill the buds and cause losses in fruit yield.

"Frost is a real problem in a lot of the grape-growing areas in Ohio because grapes are very sensitive to frost damage," said Dave Ferree, an Ohio State University fruit specialist with the Ohio Agricultural Research and Development Center. "Any sudden cold snap will kill just the primary bud, causing the secondary bud to grow, which produces a 20-50 percent smaller crop. The idea behind the project was to find a way to delay development to lessen the chances of frost damage."

Ferree and his colleagues applied soybean oil to six grape varieties: Concord, grown for grape juice; Seyval, a French-American white wine; Pinot Gris, a white wine gaining prominence in Ohio; Chardonnay, a white wine; Cabarnet Franc, a red wine; and Chambourcin, a red wine variety gaining popularity with Ohio growers.

The three-year study found that Concord was the most responsive to soybean oil with a 10- to 12- day bud burst delay. The other varieties had bud burst delays ranging from three to seven days. In addition, the soybean oil had no negative effects on yields, fruit maturation date, or the quality of the juice or wine.

"I think growers that have frost-prone sites would benefit from this kind of research," said Ferree. "Applying soybean oil is very effective in delaying bud burst and is inexpensive, costing approximately $50 per acre." For growers to take advantage of the benefits, the soybean oil should be applied to the vines when they are still dormant, usually during February or March, and the higher the application rate (up to 10 percent soybean oil), the more effective the control will be. The researchers applied a 5%, 7.5%, and a 10% oil concentration on the vines and found that the 10% rate was the most effective.

"The soybean oil should be applied as a spray, so it needs to be emulsified so it stays suspended in water. The emulsification process may be expensive, but it works well," said Ferree. "If a grower wants to apply a 10% soybean oil concentration, then 10 gallons of the oil should be mixed with every 100 gallons of water. The emulsifier to be added is then 10% of the amount of soybean oil used."

Effects of Multiple Pyrethroid Insecticide Applications on Secondary Mite Outbreaks

Source: R. W. Straub, A. Agnello, and H. R. Reissig, Cornell Entomologists, New York Fruit Quarterly, Winter 2000

Pyrethroid insecticides are known to cause or contribute to mite problems in certain situations. Our results showed that flaring of mite populations by Asana was greatly dependent upon the degree of early season mite control. Asana and Guthion applications suppressed *Typhlodromus pyri* in some trials, but this effect alone did not cause significant flaring, suggesting that other factors contribute to the phenomena. This work was supported in part by the New York Apple Research and Development Program and the USDA Northeast Pesticide Impact Assessment Program.

Organophosphate(OP) insecticides have long been essential to northeastern apple growers for the management of many insects, primarily for plum curculio and apple maggot. Because these two pests oviposit directly into the fruit, protection by insecticides is provided by toxicity to the adult prior to or during oviposition. The OP's have been well suited and popular for this purpose because they generally act quickly, yet have good persistence, and are effective against both Coleoptera and Diptera.

Implementation of the Food Quality Protection Act (FQPA) and the resulting restrictions on OP usage, has affected apple pest management programs in the Northeast. At the onset of the FQPA, we were concerned that all OP usage would be eliminated, and therefore thought it likely that this pest control void would be filled by pyrethroids. For the purposes of this research, we chose the worst-case hypothesis that all OP uses would be revoked.

It is commonly thought that because of detrimental effects on phytosied predators, applications of pyrethroid insecticides contribute to secondary outbreaks of European red mite (ERM), *Panonychus ulmi* (Koch) and two-spotted mite (TSM), *Tetranychus urticae (*Koch). It was undetermined, however, the extent to which such outbreaks might be mediated by the residues of three currently registered efficacious miticides, ie. Apollo, Savey, and AgriMek. Within the context of a larger project, one of our objectives was to assess the relationship of multiple pyrethroid applications to secondary mite outbreaks.

Within three commercial orchards (one each in Eastern NY [ENY] and two each in Western NY [WNY]) during 1998 and 1999, we established the following treatments in a split-plot design to assess the relationships among miticides, multiple Asana and Guthion sprays, and the seasonal buildup of phytophagous mites:

1. prebloom Apollo + multiple Guthion
2. prebloom Apollo + multiple Asana
3. petal fall AgriMek + multiple Guthion
4. petal fall AgriMek + multiple Asana
5. either no miticide or prebloom oil + multiple Asana
6. either no miticide or prebloom oil + multiple Guthion
7. various untreated situations

Treatments were replicated 4 times. Insecticide applications started at petal fall and continued as regular covers through the apple maggot oviposition period (approximately August 15). Prebloom and petal fall miticide treatments were prophylactic; summer miticide treatments, where necessary, were applied at the NY IPM threshold. Phytophagous and predacious

(*Typhlodromus pyri*) mite populations were assessed by standard methodology. Cumulative mite days per leaf (CMD's) were calculated by: [0.5(mpl1 + mpl2]*d1-2, where mpl1 is the number of mites per leaf at time 1, mpl2 is the number of mites per leaf at time 2, and d1-2 is the number of days elapsed between the two counts.

Simply described, the CMD model utilizes frequent assessment of mite numbers to measure the accumulative effects over time, rather than at a single point in time. For the purposes of these experiments, treatments allowing greater than 100 CMD's are considered to be poor from the perspective of mite management.

1998 Experiments Western NY:

Identical trials were performed in two commercial orchards. Moderate to high mite (ERM) populations were present at these sites. These trials included oil treatments applied at the same timing as Apollo (tight cluster). Pyramite alone was applied at IPM threshold and is considered as the untreated control. Results of these experiments, which are presented in Table 1, show the following:

- In the untreated plots at both sites, ERM populations developed early and Pyramite rescue treatments were necessary before the trial ended.

- In the tight cluster oil treatment at both sites, populations exceeded threshold by mid-June, regardless of the insecticide used.
- At both sites, the tight cluster Apollo treatments yielded very acceptable CMD's regardless of the insecticide used.
- Between sites, AgriMek applied at petal fall provided inconsistent results: Asana yielded high CMD's at site #1; while conversely, Guthion yielded high CMD's at site #2.

Eastern NY:

Low mite populations (ERM+ TSM) were present at this site. Leaf condition was compromised by severe apple scab infections. Results of this experiment, which are also presented in Table 1, show the following:

- Significant flaring of mites did not occur, regardless of the miticide used or the insecticide schedule.
- Based on CMD's, the Asana schedules tended to produce more mites, but in no instance did the effects approach seriousness.

1999 Experiments Western NY:

Identical trials were performed in two commercial orchards, representing two distinct mite (ERM) pressure situations. Results of these experiments, which are presented in Table 2, show the following:

- Infestation pressure at site #1was initially low and all miticides, regardless of seasonal insecticide program, allowed low CMD's throughout the season.
- By early July, however, populations at site #1 were significantly over threshold in both tight cluster oil treatments, regardless of insecticide used.
- Infestation pressure was considerably higher at site #2. Both tight cluster oil treatments needed rescue miticide applications after the trial was concluded.
- Within the tight cluster Apollo treatments, rescue treatments were required regardless of the seasonal insecticide schedule employed.
- AgriMek treatments maintained ERM well below threshold for the entire season, regardless of the seasonal insecticide schedule employed.
- Generally, Asana reduced *T. pyri* predator numbers to a greater extent than did Guthion. Relative to the untreated trees, however, all treatment combinations reduced *T. pyri* CMD's.

Eastern NY:

High mite (ERM+TSM) populations were present at this site. Results of this experiment, which are presented in Table 2, show the following:

- Treatments that utilized Asana or Guthion but no miticide, yielded very high CMD's, without an apparent relationship to the insecticide used.
- Similar to WNY-site #2, tight cluster Apollo
- applications allowed high CMD's, with no relationship to the insecticide used.
- AgriMek allowed very low CMD's, regardless of the seasonal insecticide schedule employed.

Table 1

Effects of seasonal insecticide applications on phytophagous mite pests of apple in Western and Eastern New York orchards, 1998.				
Treatment	**Miticide timing**	**Cumulative mite days per leaf**		
		WNY[1] site 1	**WNY[1] site 2**	**ENY[2]**
Oil + Guthion	TC	176.3[a]	247.4[b]	-
Oil + Asana	TC	164.9[a]	181.1[b]	-
Apollo + Guthion	TC	34.9	39.9	18.3
Apollo + Asana	TC	47.9[a]	23.3	49.8
AgriMek + Guthion	PF	38.1	132.0	58.7
AgriMek + Asana	PF	**125.4**	28.5	72.2
Pyramite check		291.9[a]	283.5[c]	-
No miticide + Guthion	**-**	**-**	**-**	93.3
No miticide + Asana	**-**	**-**	**-**	34.6

[1] ERM only; Guthion applied 5 times, starting at PF; Asana applied 6 times, starting at pink.
Numbers in bold represent a significant degree of flaring of mite populations by Asana.
[2] ERM + TSM; Guthion applied 4 times, starting at PF; Asana applied 5 times, starting at pink.
Note: severe apple scab infection affected leaf quality and subsequent mite infestations.
[a] Rescue treatments applied after data completed.
[b] Rescue treatments applied on 1 July before data completed.
[c] Rescue treatment applied 10 June before data completed.

Table 2

Effects seasonal insecticide applications on phytophagous mite pests of apple and a predator in Western and Eastern New York orchards, 1999.						
		Cumulative mite days per leaf				
	Miticide timing	**WNY[2] site 1**		**WNY[2] site 2**		**ENY[3]**
Treatment[1]		**pest**	**predators**	**pest**	**predators**	**pest**
Oil + Guthion[4]	TC	61 [6/28]	1.3	104 [6/28]	3.6	398 [7/22]
Oil + Asana[4]	TC	**131** [7/13]	0.7	**327** [8/6]	3.7	277 [7/22]
Apollo + Guthion	TC	25	4.3	171 [8/15]	4.7	342
Apollo + Asana	TC	51	1.4	**358** [8/15]	1.5	313
AgriMek + Guthion	PF	4	4.2	42	1.6	88

AgriMek + Asana	PF	6	1	3	2.3	54
Untreated	-	26	12.6	386	10.4	473

[1] At all locations, Guthion applied 5 times, starting at PF; Asana applied 6 times, starting at pink.
[2] ERM only; predator primarily *Typhlodromus pyri*. Numbers in bold represent a significant degree of flaring of mite populations by Asana. Dates in brackets are threshold or rescue treatments with Pyramite.

[3] ERM + TSM; dates in brackets are threshold or rescue treatments with Pyramite.
[4] Dormant oil applications in WNY only; ENY received insecticide only.

Our results show that either Asana or Guthion can cause flaring of mite populations. Within only four of twenty-one total paired comparisons (19 percent) between Asana and Guthion did the pyrethroid promote higher mite populations. Moreover, if effective and persistent miticides (AgriMek in particular) were employed against early-season mite populations, CMD's were not exacerbated by the use of either insecticide. It was apparent that flaring of mites was more likely to happen with either insecticide when early-season mite populations were high, or were not adequately controlled by an early miticide application. Our evidence suggests that Asana could be substituted for an OP without causing outbreaks of phytophagous mites, provided that current (and future miticides) remain efficacious and are applied early in the season. Analyses of predatory mite populations within Asana and Guthion treatment scenarios showed that both insecticides had suppressive effects on *T. pyri*, but this effect alone did not cause significant flaring of phytophagous mites.

Lessons We Should Have Learned from the 2002 Apple Marketing Season

Source: Alison DeMarree, Lake Ontario Fruit Program, Cornell Cooperative Extension, Newark, NY, New York Fruit Quarterly, Winter 2002

It took the shortest crop in almost 50 years to increase fresh apple prices to the point where growers could make money this year. Even then it was hard work! Only by working together through Premier Apple Cooperative and by growers holding the line on bulk apple prices could growers get and hold a decent price. (We also had a lot of help from Mother Nature in providing one of the best coloring years we have had in a long time.) What does this tell us?

- Supply is critical!
- We have to stay informed, work together, and hold the line in order to make money. The process apple lesson is a bitter one. There is such an oversupply of process apples in New York State that it took diverting apples to fresh and cider markets and increased demand from out of state (and country) processors before the price increased. And this was only on the latest maturing varieties. Even this price increase did NOT surpass 10 cents per pound!

What are the process apple lessons learned this year?

- Plan on losing money if you grow process Cortland, Wayne, Twenty Ounce, Greening, Monroe, McIntosh, or Empire for the applesauce market in the future. If these varieties were undesirable (as indicated by price) this year, the price will surely be less next year when New York and the nation have a more normal crop.

- The only way to make money growing the remaining process apple varieties will be to cut costs and increase production (probably over 900 bushel per acre). How many growers are in a position to cut costs and still increase production? Probably not many!
- If you didn't get any buyer respect or empathy this year, you are less likely to get it in the future.

I have little hope for strengthening peeler apple prices in the future. China has the capacity to double apple juice concentrate exports. Most of the countries exporting apple juice concentrate have living standards so low that they will continue to seek our dollar by sending the U.S. more apple juice concentrate.

If there has been serious damage to Washington State's trees from the late October freezes, we could probably expect even more low quality apples being dumped into process markets next fall (similar to what happened after the 1968 freeze).

The big lessons that all apple growers should have learned this year are:

- Preserve assets for the future. You will be much better off removing all unprofitable apple blocks this winter and sitting the game out rather than wasting your time, money and energy losing money in an oversupplied market next year.
- The future rests with growers keeping informed and controlling supply together (tree removal and adequate thinning! A huge crop next year could undermine any progress made with fresh buyers this year. No one can survive going back to the fresh apple prices of 2001.
- Supplying (not oversupplying) varieties demanded by consumers is the name of the game.
- We cannot work together if we don't share information; we need cooperation among growers and marketers and accurate tree surveys for strategic planning, both on the individual farm level and on an industry-wide level. We are all in this together; there is no honor in being the last man standing when the infrastructure that supports the industry has been gutted.

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