Ohio Fruit ICM News

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Comments from the Editor

Most of our ornamental crabapples at the South Centers are at ½"-green with several nearing tight cluster. Soil temperatures at 4" are over 45 degrees so we are removing straw mulch from matted row strawberries. Blueberry buds are swollen. Lime sulfur has been applied to brambles and our pruning is done. Row cover has been removed from plasticulture strawberries. Within a few weeks we should have our vines arriving for our new wine grape variety evaluation.

It will be a nice warm sunny weekend across most of Ohio, packages of bees are arriving from the south and the spring peepers have been heard so it must be time for my annual discussion of growing degree days, phenology and pest development.

Others have done a much better job on this topic than I can do so I will refer you to several excellent websites. To put it simply, growing degree days (GDD) are a measurement of the amount of time for insects or plants to complete certain stages of development (hatching, first flight, laying eggs, etc.) There are different ways to measure GDD, but to simplify matters, in Ohio, go to the OARDC website (http://www.oardc.ohio-state.edu/gdd/) where you can input your zip code and get a pretty close estimate of the growing degree days at your location. This website will also allow you to enter dates from a few years back so you can compare this year to others

Once you know how many growing degree days you have accumulated you can then look at the Pest Development Chart in this newsletter that is based on work from D. Kain and A. Agnello in New York (http://www.nysaes.cornell.edu/ent/scaffolds/) and see what pest events are expected in your fruit planting. This will enable you to accurately time your pesticide applications for maximum effectiveness and cost efficiency.

If you are getting older like I am it helps to have something memorable like a holiday or event to attach an activity to (ie. apply casaron to brambles between Thanksgiving and Valentines day, Labor Day strawberry herbicide application, stop fertilizing blueberries after Independence Day). Therefore, I have tried to incorporate certain phonological events into my Pest Development section. Phenology is the study of recurring biological phenomena and their relationship to weather. The Ohio State University has an excellent network of phenology gardens across Ohio where observers are tracking plant development (http://phenology.osu.edu/). By using the information on these sites and your own observations, I hope you feel more confident in your pest management.

Pest Development - (Based on Scaffolds Fruit Newsletter, Coming Events (D. Kain & A. Agnello), NYSAES, Geneva)

GDD accumulations in Ohio range from the low 40's in the northern Ohio to 130's in southern Ohio as of April 4.

Pear psylla adults active	0-49
Pear psylla 1st oviposition	1-72
Green fruitworm 1st catch	12-54
McIntosh at silver tip	15-41
McIntosh at green tip	36-62
Green apple aphids present	38-134
Spotted tentiform leafminer 1st catch	39-113
Red Maple First Bloom	44
Pear thrips in pear buds	50-98
Rosy apple aphid nymphs present	56-116
Spotted tentiform leafminer 1st oviposition	58-130
Pear psylla 1st egg hatch	60-166
Obliquebanded leafroller larvae active	64-160
McIntosh at half-inch green	65-91
Comstock mealybug 1st gen crawlers in pear buds	80-254
Oriental fruit moth 1st catch	81-205
McIntosh at tight cluster	84-122
Forsythia First Bloom	86
Rose leafhopper on multiflora rose - 1st nymph	96-198
European red mite egg hatch	100-168
Green fruitworm flight subsides	102-242
Redbanded leafroller 1st flight peak	104-192
Lesser appleworm 1st catch	108-292
Spotted tentiform leafminer 1st flight peak	113-209
Flowing Quince First Bloom	137
American plum borer 1st catch	140-280
Mirid bugs 1st hatch	163-239

Spotted tentiform leafminer sap-feeders present	165-317
McIntosh at bloom	170-220
San Jose scale 1st catch	186-324
Lesser appleworm 1st flight peak	189-387
Eastern Redbud First bloom	191

Preliminary Monthly Climatologic Data for Selected Ohio Locations - March 2008. This data is from the National Weather Service.

	Temperature (F)		Precipitation (inches)	
	Average	Departure from Normal	Monthly	Departure from Normal
Akron-Canton	33.1	-4.4	5.8	2.65
Cincinnati	41.1	-2.8	9.67	5.77
Cleveland	33.5	-4.0	5.51	2.57
Columbus	39.4	-2.6	7.58	4.69
Dayton	37.2	-3.0	6.98	3.69
Mansfield	33.6	-3.1	5.70	2.34
Toledo	33.8	-3.4	4.34	1.72
Youngstown	33.1	-3.6	6.38	3.33

Thinking Organically: Insect Pest Management by Peter Jentsch, Entomology, Highland (Source: Scaffolds, Vol. 17#2)

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.

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.

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 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.

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

Calendar - Newly added in ***Bold***

April 12, Kentucky Nut Growers Spring Meeting. Hardin County Extension Office, Elizabethtown, KY. For more information contact Carl Ray 270-281-4800.

April 26, 2008 Mid-Ohio Valley Agriculture Opportunities Conference. 9 a.m. until 4 p.m. at Washington State Community College in Marietta. Registration is $30 and includes lunch and all conference materials. For more information on the conference, contact Eric Barrett at (740) 376-7431 or e-mail barrett.90@osu.edu

May 24, Ohio Pawpaw Grower's Association Annual Spring Workshop and Meeting, 351 Hale Rd. Wilmington. Registration is $12 for OPGA members and $15 for nonmembers. Registration fee includes lunch and a potted "u"-graft pawpaw. For more information contact Richard Glaser at phone 937-382-5960 or glaser1971@earthlink.net

Jan. 5-6, 2009 Kentucky Fruit & Vegetable Conference & Trade Show, Embassy Suites Hotel, Lexington, KY. For more information contact John Strang at phone 859-257-5685 or email: jstrang@uky.edu

NOTE: Disclaimer - This publication may contain pesticide recommendations that are subject to change at any time. These recommendations are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. Due to constantly changing labels and product registrations, some of the recommendations given in this writing may no longer be legal by the time you read them. If any information in these recommendations disagrees with the label, the recommendation must be disregarded. No

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Ohio Poison Control Number

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