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THE OHIO STATE UNIVERSITY Newsletter Extension

Fruit ICM News

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Calendar

June 30: Ohio Fruit Growers Society Summer Tour, OARDC Horticulture Unit 2, Wooster. Registration begins at 7:00 a.m., program runs 8 a.m. to 3 p.m.. Registration fee.

This year's Ohio Fruit Growers Society (OFGS) Summer Fruit Tour is ripe with the latest information and technology that will help you grow quality crops and maximize your harvest. The tour, expected to draw 300-350 participants from all over Ohio, will take place on June 30 at the Horticulture Research Farm Unit 2 (Oil City Road) on the Ohio Agricultural Research and Development Center's (OARDC) Wooster campus.

"This is a great opportunity for fruit growers to get together and see what other growers and researchers are doing to better the industry," said OFGS Executive Director Tom Sachs. "Growers really like to see what other orchards are doing and learn about new cultivars and cultural practices."

Two orchard tours, one focusing on horticultural aspects of fruit production and the second on diseases and insects, will be offered concurrently beginning at 8 a.m. "Both tours will showcase current research projects underway in support of the Ohio fruit industry," said Diane Miller, a researcher with OARDC's Department of Horticulture and Crop Science. "Each tour will run approximately one hour, and registrants are encouraged to attend both of them."

The horticulture tour will consist of six informational stops:

- NC-140 cooperative fruit rootstock evaluations in Ohio by Stephen Myers, chairman of the Department of Horticulture and Crop Science

- NE-183 apple variety evaluations in Ohio by Miller
- Weed control in young fruit plantings by Doug Doohan, OARDC weed specialist
- Use of windbreaks for orchard screening and reducing spray drift by Steve Davis, Ohio Department of Natural Resources
- Grape research at OARDC by viticulturist Imed Dami
- Primocane-fruiting blackberries by Joe Scheerens, OARDC small-fruit specialist.

The disease and insect tour, certified for one hour of Pesticide Applicator Training (PAT) update credit, will also feature six informational stops:

- New developments in fungicides for fruit disease control by OARDC plant pathologist Mike Ellis
- Organic strawberry production involving composts, pest density, consumer taste panels and economics by Joe Kovach, OARDC integrated pest management specialist
- Impact of Asian lady beetle on grape and wine production in Ohio by Roger Williams, OARDC entomologist
- Reducing spray drift and improving pest management by Richard C. Derksen, U.S. Department of Agriculture expert based on the Wooster campus
- Insecticide and pheromone options for managing oriental fruit moth in peaches and codling moth in apples by OARDC entomologist Celeste Welty
- Encouraging honey bee populations impacted by diseases, nest site destruction and pesticides by Jim Tew, OARDC beekeeping specialist

"This is a great opportunity for researchers to demonstrate the work that they are doing right there in the orchard," Sachs pointed out.

The orchard tours will be followed by lunch, which participants can purchase at the site between 11 a.m. and 1 p.m., and the OFGS business meeting, beginning at 1 p.m. under the tent. Other specialists will be available in the tent area to assist you on a one-on-one basis, providing:

- A plant pest diagnostic clinic, where you can bring samples and have Nancy Taylor, OSU Extension plant pathologist, diagnose your plant problems
- Fruit on the Web, a demonstration on how to access fruit informational web sites by Ted Gastier, OSU Extension
- An orchard weather monitoring equipment demonstration by Ron Becker, OSU Extension
- A cider regulation update providing the latest information for the 2004 autumn cider season by Chuck Kirchner, Ohio Department of Agriculture
- Information from Ohio State's Fruit Team members, who will answer questions and have a variety of extension publications on fruit-crop production and management available for purchase

The summer tour will also gather more than 30 suppliers supporting the fruit industry. They will set up exhibits, allowing participants to discuss products and learn about technologies available to grow and market better fruit.

Following the tour, attendees are invited for a wagon tour of Secrest Arboretum on the OARDC campus. The arboretum tour will be from 2-3:30 p.m., and wagons will load at the Fisher Auditorium parking lot. Secrest has beautiful collections of crabapples, arborvitae, azaleas, and rhododendrons, along with the Garden of Roses of Legend and Romance. To learn more, visit http://www.secrest.osu.edu.

Registration begins at 7 a.m. the day of the tour. The cost is $15 for OFGS members, $20 for members' families, $20 for non-OFGS members, and $25 for non-OFGS members' families. For more information

about the OFGS tour, contact Sachs at 614-246-8290, TSachs@ofbf.org, or Miller at 330-263-3824, miller.87@osu.edu.

Codling Moth Control Using *Granulosis* Virus

Source: Larry Gut, MSU Entomology, Fruit Crop CAT Vol. 19, No. 3, June , 2004

Among the new options available for control of codling moth (CM) is a naturally occurring virus that goes by the scientific name of Cydia pomonella granulovirus (CpGV). It is commonly referred to as the codling moth granulosis virus. CpGV is highly specific to the codling moth. It may infect the larvae of a few very closely related species, but it is noninfectious toward beneficial insects, fish, wildlife, livestock, or humans.

Each CpGV particle is contained within a protein occlusion body (OB). Preparing a concentrated suspension of OB's using mass-reared CM larvae infected with CpGV produces commercial formulations of the virus. Viral OB's are very small. Indeed, over a trillion OB's are present in an ounce of formulated product. These tiny particles must be ingested by the CM larva to be effective, but it only takes a few to cause death.

Upon ingestion, OB's are dissolved by the insect's alkaline gut lining, releasing the viral particles. The virus replicates itself within the gut cells and rapidly spreads to other organs. Within a few days the larva stops feeding, becomes discolored and swollen, and melts into a mass of billions of viral OB's.

Products

Two CpGV-based biological insecticides are available for use by apple growers, Cyd-X® (Certis USA, L.L.C.) and VirosoftCP4 (BioTEPP Inc.). The label recommended application rate for Cyd-X is 1 to 6 fluid ounces per acre. The labeled application rate for Virosoft is 3.2 fluid ounces per acre. Both are organically approved products. They can be applied up until harvest and have a re-entry interval of only four hours. Stored material should be kept refrigerated to ensure stability and potency.

Rate and timing of application

There are many options for incorporating virus into your CM management program. Deciding how much, when, and how often to apply product can be quite confusing. Keep in mind the following factors when trying to sort things out:

- CpGV must be ingested by the CM larva and may not kill it immediately.
- The virus breaks down in the environment, thus a spray may only be effective for a week or so.
- The virus is highly lethal, a few OB's are all that are required to cause death.

Optimal use of the virus is against young larvae before they penetrate the fruit. The best way to target young larvae is to have the virus present on the surface of the eggs when they begin to hatch. Hatching CM larvae will ingest the virus as they consume their eggshells. If the virus is intended as a primary CM control, the first application should be made at about 250 GDD50 after biofix. At least four applications will be required to cover the egg hatch period. Weekly applications at a low rate are a better approach than high dose sprays applied at wider intervals. In orchards with high CM pressure, this sequence of sprays will need to be repeated beginning at about 1250 GDD post-biofix or 250 GDD after the start of the second-generation flight.

Growers can opt to use the virus as part of a multi-tactic CM control program. Rotating it with chemical insecticides is a good means of combating resistance. We suggest the following approaches to incorporating CM virus into a management program. If you want to restrict your use to a single generation, target the first generation. Some virus-infected larvae will not die immediately, allowing them to cause fruit damage and even complete larval development. Fortunately, stings or deeper entries in small fruits attacked by first generation larvae often fall off the tree or are removed by thinning.

Additionally, research conducted in 2003 revealed that less than 4 percent of the individuals that managed to complete larval development survived to pupate and emerge as summer generation adults. Thus, applications against the first generation can greatly reduce the size of the summer generation that will need to be controlled.

Regardless of the generation targeted, it is best to make at least two applications. If you want to rotate a CpGV product with other controls, I favor applying a chemical insecticide as the first spray at the start of egg hatch (250 GDD) and the virus as the second spray. This is because more eggs will be present and covered by the virus spray at the later timing. The insecticide and virus could then be rotated again, or the virus could be applied weekly at a low rate for the remainder of the egg hatch period.

Tank mixing

Codling moth granulosis virus products are compatible with most fungicides and insecticides sprayed in apple orchards. However, they should not be mixed with lime sulfur, Bt products, or copper fungicides. Use of a buffer to neutralize the spray mix is recommended if the pH is above 9 or below 5. Also, I am concerned about tank mixing them with the neonicotinoids, Assail and Calypso. This is because bioassays conducted at the MSU Trevor Nichols Research Complex have indicated that the compounds have anti-feeding properties.

Use of spray adjuvants

A number of adjuvants have been recommended and tried as a means of increasing the longevity or improving the effectiveness of CpGV products. The virus is sensitive to the UV rays in sunlight, thus powdered milk and other adjuvants have been added to limit this effect. Since the virus must be ingested to be effective, feeding stimulants such as molasses are often used in an attempt to increase larval feeding on the spray droplets. Although these options may prove useful, my experience is that applying more virus, rather than adding a spray adjuvant, is the best means of increasing efficacy.

Modified Wooden Clothespins for Encouraging Good Limb Development

Source: Bill Shane, Michigan State Extension District Agent for Fruit and Marketing, Fruit Crop CAT Vol. 19, No. 3, June , 2004

Good crotch angle development is important for developing sound tree structure. An article in the June 18, 2002 Fruit CAT Alert by Dr. Ron Perry, Department of Horticulture, provided a nice summary for using clothespins for spreading limbs in the planting year and is reprinted here as an excerpt. Conventional wooden clothespins open a maximum of a half-inch, not wide enough for large caliper sweet cherry or plum trees.

An alternative mentioned by Dr. Perry in his article are large format plastic clothespins, available from

some venders. A third option is a simple modification of the wooden clothespin by inserting pieces of clothespin wood next to the spring. This adaptation allows the jaws to open to 1 inch, enough to accommodate most first year trees. The modified clothespins can be assembled quickly, being careful to put the groove side of the wood piece next to the round center spring so that it stays in place. Wood from oneclothespin will provide enough pieces for three modified versions. (See a picture of this modification at http://www.ipm.msu.edu/CAT04_frt/F06-01-04clothespin.htm).

Once buds start to develop on newly planted trees, the next operation involves the spreading of branches to form 90-degree crotch angles. Thus far, there is only one way and with only one instrument that this can safely and effectively be accomplished. A plastic clothespin is placed on the leader (perpendicular and clasped to the leader) and obstructs the development of young branches when they are about three to four inches in length (the length of a clothespin). If this is not done and the grower waits until the branches are 10 to 12 inches long (which is okay in apples), the crotch angle is lignified and formed. Then when you attempt to spread the succulent branch, many of the branches break immediately or by the next day and you are left with broken cherry branches.

Secondly, spreading the branches to 90 degrees from the start avoids "bark inclusion" on the upper side of branch attachment to the leader. When this happens, a mechanical pinching of the meristematic tissue occurs, which inhibits vascular function and causes weakness. Eventually, canker and cold injury occurs at these points and the branch is ultimately destroyed, so it is critical that a clothespin is used from the beginning.

We have found that not just any clothespin works for sweet cherry. Wooden pins used in apples have too narrow a jaw opening and slip out of position on sweet cherry branches. Other plastic pins don't last or don't have a wide enough jaw. In North America, the only product that I have found that works is one distributed by Seymour Housewares Corp., Seymour, Indiana. They handle several products and specifically the one that works is called the "Super Grip" Clothespin (model #12-123-33). It is sold off the shelf through Meijer's stores in Michigan. Not only does this pin have the largest jaw and best design to fit a branch snugly, it also has a wide surface area and is most effective in obstructing branch development.

Degree Day Accumulations for Ohio Sites June 2, 2004

Ohio Location	**Degree Day Accumulations Base 50**	
	Actual	**Normal***
Akron-Canton	599	476
Cincinnati	844	738
Cleveland	584	454
Columbus	798	606
Dayton	763	693
Fremont	558	461
Kingsville	527	365
Mansfield	598	466
Norwalk	621	433
Piketon	857	639

Toledo	582	450
Wooster	656	439
Youngstown	563	428

Pest Phenology

Coming Events	**Degree Day Accum. Base 50F**
San Jose scale 1st generation crawlers present	569 - 784
Apple maggot 1st catch	629 - 1297
Redbanded leafroller 2nd flight begins	656 - 1381
Codling moth 1st flight subsides	673 - 1412
Spotted tentiform leafminer 2nd flight peak	701 - 1355
Oriental fruit moth 2nd flight begins	772 - 1215
Lesser appleworm 2nd flight begins	778 - 1531
Codling moth 2nd flight begins	864 - 1549
San Jose scale 2nd flight begins	893 - 1407
Obliquebanded leafroller 1st flight subsides	899 - 1790
Codling moth 2nd flight peak	931 - 2212

Thanks to *Scaffolds Fruit Journal* (Art Agnello)

Fire Blight Report for Erie County

Source: Ted Gastier, OSU Extension Educator, Huron County from old-style leaf-wetness monitor and Spectrum Technologies software

May 19-23, 27, 28, and 31: High infection risk whether or not fire blight was present in the area in the last 2 years (unless a spray application had been made).

WeatherTracker® Apple Scab Report

Source: Ted Gastier, OSU Extension Educator, Huron County, cooperating growers & other Extension personnel

The WeatherTracker uses internal software based on the modified Mills Table, which can only be used for primary scab. Primary scab develops for ascospores, while secondary scab develops from conidia produced on lesions of primary scab. The development of these conidia is dependent on slightly different environmental conditions. Therefore, the WeatherTracker predictions are no longer applicable.

Fruit Observations & Trap Reports

Insect Key
AM: apple maggot
CM: codling moth
ESBM: eye-spotted budmoth
LAW: lesser apple worm
LPTB: lesser peachtree borer
OBLR: obliquebanded leafroller
OFM: oriental fruit moth
PTB: peachtree borer
RBLR: redbanded leafroller
SJS: San Jose scale
STLM: spotted tentiform leafminer
TABM: tufted apple budmoth
VLR: variegated leafroller

Site: Waterman Lab, Columbus
Dr. Celeste Welty, OSU Extension Entomologist

Apple: 5/26 to 6/2/04	
Redbanded leafroller	13 up from 0
Spotted tentiform leafminer	743 up from 742
San Jose scale	0 same as last wk
Codling moth	16.3 down from 29.3
Lesser appleworm	17 down from 76
Tufted apple budmoth	1 same as last week
Variegated leafroller	10 up from 3
Obliquebanded leafroller	4 down from 5

Site: Medina, Wayne, and Holmes Counties
Ron Becker, IPM Program Assistant

No report available due to Memorial Day Holiday. Report will be included in next week's issue.

Site: West District; Huron, Ottawa, Richland, and Sandusky Counties
Lowell Kreager, IPM Scout/Technician

Apple 5/25 to 6/1/04	
Codling moth	1.8 down from 3.8

Lesser appleworm	7.3 down from 16.5
Oriental fruit moth	0.8 up from 0.6
Redbanded leafroller	0.1 down from 0.6
Spotted tentiform leafminer	160 down from 472
Peach 5/25 to 6/1/04	
Lesser peachtree borer	0.7 down from 5.8
Oriental fruit moth	0.7 up from 0.6
Peachtree borer	0.3 down from 1.8
Redbanded leafroller	0.2 up from 0.0

Beneficials include lacewings and native lady beetles

Site: East District; Erie and Lorain Counties
Jim Mutchler, IPM Scout/Technician

Apple 5/25 to 6/1/04	
Codling moth	3.3 down from 5.2
Oriental fruit moth	2.9 down from 3.4
Redbanded leafroller	0.0 down from 0.1
Spotted tentiform leafminer	135 up from 68
Peach 5/25 to 6/1/04	
Lesser peachtree borer	1.6 down from 13.5
Oriental fruit moth	1.1 up from 1.0
Peachtree borer	0.2 up from 0.0
Redbanded leafroller	0.0 same as last week

Beneficials include native lady beetles & lacewings

Other observations include apple scab and fire blight.

Preliminary Monthly Climatological Data for Selected Ohio Locations, May, 2004

Weather Station Location	Monthly Precip	Normal Monthly Precip	Year-to-Date Precip	Normal Year-to-Date Precip	Avg High	Normal High	Avg Low	Normal Low	Mean Temp.	Normal Mean
Akron-Canton	6.52	3.96	17.88	15.27	74.3	69.8	51.3	47.8	62.8	58.8
Cincinnati	6.85	4.59	20.12	18.12	76.5	74.4	57.5	52.9	67.0	63.6
Cleveland	5.90	3.50	17.91	14.58	73.1	68.5	51.2	48.3	62.1	58.4

Columbus	5.93	3.88	20.26	14.75	77.1	73.3	56.5	51.8	66.8	62.5
Dayton	8.62	4.17	20.42	16.38	74.9	71.2	56.3	51.1	65.6	61.1
Fremont	5.42	3.63	11.80	12.80	73.8	70.4	49.5	48.2	61.7	59.3
Kingsville	9.19	3.32	21.26	12.70	71.7	67.0	49.2	47.1	60.5	57.1
Mansfield	6.97	4.42	18.97	16.75	73.9	69.3	51.3	46.7	62.6	58.0
Norwalk	6.81	3.55	16.93	13.08	75.2	69.3	50.4	47.9	62.8	58.6
Piketon	2.63	4.20	13.97	18.60	78.8	73.8	56.1	49.5	67.5	61.7
Toledo	4.67	3.14	9.73	12.81	73.5	70.6	50.5	48.5	62.0	59.6
Wooster	7.91	4.01	20.88	13.91	76.4	70.6	50.9	46.5	63.7	58.5
Youngstown	7.03	3.45	18.68	14.20	74.0	69.0	49.2	46.2	61.6	57.6

Temperatures in degrees F, Precipitation in inches
Record low set: Toledo - May 4, 28 degrees F
Record low tied: Dayton - May 3, 33 degrees F; Mansfield - May 4, 30 degrees F
Record high tied: Mansfield - May 10, 85 degrees F.
Table Created by Ted W. Gastier, OSU Extension from National Weather Service, OARDC & Local Data

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