http://ipm.osu.edu/fruit/index.html

THE OHIO STATE UNIVERSITY Newsletter Extension

Fruit ICM News

Volume 5, No. 28
August 2, 2001

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Calendar

August 13: The USDA has announced that farmers can sign up for the Quality Loss Program (QLP) beginning Aug. 13. For more information, contact your local USDA Service Center or Farm Service Agency office. Source: http://www.fruitgrowersnews.com

August 20: Ohio Fruit & Vegetable Young Grower Tour, beginning at Hillsboro. For more information contact Ohio Fruit and Vegetable Growers at 1-614-249-2424 or growohio@ofbf.org. Complete information with registration form is available at http://www.ofbf.org by clicking on "Upcoming Events."

August 20: Horticulture Field Night, Southern State Community College, 200 Hobart Drive, US Rte. 62 north of Hillsboro. For information, contact Brad Bergefurd, 1-800-860-7232, or bergefurd.1@osu.edu

August 23: Ohio Grape & Wine Day & Grape Twilight Tour, OARDC Grape Branch at Kingsville and Markko Vineyard. OARDC staff have a great program planned from 1:30 to 4:45. Twilight tour begins at 5:00 with a fabulous Lake Erie walleye fish fry and fresh sweet corn. More details will follow in next week's newsletter or call 1-440-576-9008 for more information.

September 18-20: Farm Science Review - ***Pesticide credit can be earned at 2001 Farm Science Review!*** Applicators with a pesticide license can receive recertification credit at this year's Ohio Farm Science Review. For more information, contact the Pesticide Education Program, OSU Extension, at 1-614- 292-4070 or visit the website at http://www.ag.ohio-state.edu/~pested

Erratum

In the article, "Phytophthora Root and Crown Rot," printed in the July 26th ICM Fruit News, Ridomil Gold EC should replace Ridomil EC as the recommended fungicide for this disease. Ridomil Gold is the new formulation of Ridomil.

Congratulations

A "Tip-of-the-Hat" to Dick Funt and his team who recently received the American Society for Horticulture Sciences 2001 Award. The honor was for "**the best extension publication in the U.S."** and refers to Bulletin 782, *Brambles - Production, Management, and Marketing*. Other contributing members of the team were Mike Ellis, Roger Williams, Doug Doohan, Joe Scheerens, Celeste Welty, Joy A. Fischer, Brian Deep, John K. Victor, Dave Scardena, and Pamela Mayfield. The bulletin is online at http://www.ag.ohio-state.edu/~ohioline/b782/index.html

No Flies on Us

Source: Harvey Reissig, Entomology, Geneva, NY, Scaffolds, Volume 10, No. 20, July 30, 2001

We're in the traditional "peak activity" window for apple maggot right now, and although catches haven't been particularly stunning yet, this primer on maggot control strategies might bear repeating at this time:

The apple maggot (AM), *Rhagoletis pomonella* (Walsh), is a native insect that originally infested hawthorn trees throughout the northeastern United States and Canada. The AM has been a major pest of apples since they were introduced into North America. In unsprayed habitats, it is not uncommon for nearly 100% of apple and hawthorn fruit to be infested by AM, because natural enemies do not reduce population levels of this pest in natural settings. Therefore, some type of control program will continue to be necessary to keep this pest at acceptable levels in commercial apple plantings for the foreseeable future.

Biology

The AM overwinters as pupae in soil beneath apple trees. Adults emerge from the ground in late June or

early July (first 2000 catch in Geneva was 6/29, right on schedule) and begin to lay eggs in the fruit after a 7-10 day pre-oviposition period. Adults remain active during July and August, and a few adults remain active throughout September and even in October in seasons when the weather is mild. AM females lay eggs underneath the skin of apples. These eggs hatch in about a week, and larvae begin to tunnel throughout the fruit. Usually, particularly in cultivars with very hard fruit, larvae grow very slowly while the apple remains on the tree. Larvae usually complete their development after apples have dropped from the tree in the fall. Then they leave the fruit and tunnel into the soil to pupate, where they spend the winter.

General Management Principles

Organophosphate insecticides are very effective in controlling AM adults, and it is very rare to find detectable levels of AM injury in fruit sampled in commercial apple orchards in New York State. Therefore, management programs for AM are based on the assumption that there are no indigenous populations of this pest inside orchards and are designed to prevent flies from immigrating into orchards from outside habitats. Unfortunately, in NY there are usually numerous hosts (abandoned or uncultivated apple and hawthorn trees) that are chronically heavily infested with AM and relatively close to commercial orchards. Apple maggot flies are capable of moving at least several hundred yards to infest other hosts and at least a few flies will always move longer distances of up to one mile.

Extensive research has been done to compare the biology and host preferences of AM reared from apple fruit and various species of hawthorn fruit. Populations living in these two different hosts are considered to be somewhat distinct and are called "host races". There is considerable disagreement among various authorities about whether or not flies infesting hawthorns will immigrate into commercial apple orchards and oviposit in apples. For all practical purposes, heavily infested hawthorn trees near apple orchards should be considered just as much a potential threat as heavily infested wild apple trees.

Elimination of Wild Hosts and Cultivar Differences

Since wild hosts (apples and hawthorns) in close proximity to commercial orchards are considered to be the only sources of potential infestations of AM flies, it is a sensible strategy to eliminate as many of these pest sources as possible. Obviously, it is desirable to create as large a "host-free" area around orchards as possible, but most authorities recommend removing alternate hosts for a distance of at least 100 meters from the borders of commercial orchards. It is best to survey wooded areas surrounding apple orchards in the early spring when apples are in bloom because they are easier to detect at this time.

AM prefer to oviposit in certain cultivars of apples, and larvae survive better in some varieties of fruit than others. Early ripening, soft cultivars such as 'Wealthy', 'Cortland' and 'Early McIntosh' are generally more favored for AM oviposition and larval survival than harder, later-ripening cultivars such as 'Rome', 'Delicious', and 'Idared'. 'Northern Spy', which is a cultivar with hard, late-ripening fruit, appears to be one exception to this general rule because it is reported to be a favorite cultivar for AM infestation. Management strategies might be relaxed somewhat in less preferred, harder varieties.

Conventional Protective Control of Apple Maggot Flies

This program does not require monitoring of specific orchard blocks. Whenever it is determined that AM flies have first emerged in an unsprayed habitat (preferably in close proximity to the targeted orchard) the entire orchard should be sprayed initially with an organophosphate insecticide 7-10 days (their pre-oviposition period) later. Additional sprays should be applied at 10-14-day intervals until about the middle of August. Since flies emerge in late June-early July in New York State, this protective

program will usually require about 4 sprays annually. Usually this type of program is only necessary in blocks in which detectable levels of AM-infested fruit have been found, or in orchards located adjacent to extensive numbers of heavily infested wild hosts.

Reduced Protective Spray Schedule for AM Control

This program also does not require monitoring of specific orchard blocks and is very similar to the conventional program, except that the first spray is applied on a calendar basis on July 15. Then two more sprays will be applied, on August 1 and August 15. The delay of the first spray for AM control is based on the principle that extensive monitoring studies conducted in NY have shown that flies usually do not begin to immigrate into commercial apple orchards from wild habitats until about the middle of July. This type of program usually is quite effective unless environmental conditions result in a shortage of fruit on wild hosts outside of orchards. Then AM flies may alter their usual behavior of initially ovipositing in fruit on wild host trees close to their emergence site and may immediately begin to disperse to find suitable oviposition hosts in commercial apple orchards.

Conventional AM Monitoring Program

This program is described in detail in the Apple IPM Scouting Manual (IPM Pub. No. 207, *Apple IPM: A guide for sampling and managing major apple pests in New York State*; also at: http://www.nysipm.cornell.edu/publications/apple.man/mid.html) and is based on the idea that it is not necessary to spray an orchard unless a certain population level of flies (monitored by red sticky spheres) is detected immigrating into a monitored block. This technique has been used quite successfully by many growers in NY in "typical" orchards, and the average orchard monitored by this strategy will usually require 1-2 sprays annually for control of AM. Although many growers in NY use apple maggot traps hung along the edges of commercial orchards as a general indication of when to start spraying for AM, most do not adhere strictly to the formal recommendations described for the monitoring program. Some of the most common deviations from the protocol are: (1) Many growers use apple maggot traps only to determine when the first AM spray should be applied and then spray at 14-day intervals thereafter, regardless of subsequent trap catches. (2) Growers often monitor for apple maggots in one or two blocks and then spray the remainder of their orchards based on trap catches in the monitored blocks. (3) Many growers simply apply sprays whenever any flies are captured and ignore the recommended threshold level of 5 flies/trap.

Growers and consultants using an AM monitoring program often are concerned about late season catches of flies on traps during September and October in commercial apple orchards. Studies conducted in NY have not shown that there is any need to apply control sprays after the middle of August, even though flies can still be captured on traps after the estimated period of residual effectiveness of the last spray. Apparently, female AM active late in the season in apple orchards do not oviposit in fruit, even though most of them have completely developed eggs in their ovaries.

This monitoring program should not be used in "high risk" blocks that are adjacent to extensive sources of AM infestations from wild hosts. Using this program in such blocks will not only result in a potential risk of low levels of AM injury, but will also not result in any reduction of pesticide use, because experience has shown that in such blocks the traps will simply indicate that a spray is needed every 10-14 days throughout the season after the traps are deployed.

Although there have never been any formal recommendations presented on exactly how many AM traps should be deployed to completely monitor a grower's entire acreage of apples, it should be noted that AM traps, in contrast to pheromone traps for moths, have a very short range of attraction (10-25 yards).

Therefore, it is clearly unreasonable to expect that trap catches in any one particular block can be used to monitor fly immigration into another orchard 1-2 miles away! Also, there is some margin of safety built into the monitoring recommendations. The monitoring directions assume that the protective residue from an organophosphate spray will last 10-14 days before another spray is needed. Obviously, residues from organophosphate sprays gradually degrade and become less effective, so that the residual effectiveness in killing flies does not decline abruptly on the 14th day after a spray to become completely ineffective.

AM Monitoring, Border Spray Program

This strategy is similar to the standard recommended monitoring program, except that whenever trap catches indicate a need for an AM control spray, only the 3-4 border rows of the monitored block and the ends of rows are sprayed. This program is based on the principles that there are no indigenous populations of AM flies inside monitored orchards, and that AM flies immigrating into orchards from outside sources will be killed by residues on treated border rows trees before they can move into the interior of the orchard.

Although some growers and consultants have reported excellent success using border sprays for AM control, very little research has been done in NY to formally test the effectiveness of this type of program. Therefore, growers should be cautious in using this strategy. This program should probably be used only in "low risk" blocks that are not near sources of potential outside AM infestations and are planted to cultivars which are not favored for AM oviposition or larval survival.

New Insecticides and Tactics for AM Control

Organophosphate insecticides offer many advantages to growers for AM control. They are very effective, relatively inexpensive, generally not toxic to predaceous mites, provide good residual control, and there is no evidence to suggest that flies are becoming resistant to these compounds. However, changing pesticide regulations are resulting in either the loss of registration of some of these compounds or changes in the re-entry or pre-harvest intervals, which may adversely affect using these materials, particularly for late season control of AM.

Recent laboratory and field tests have shown that newer "reduced risk" compounds, such as SpinTor and Provado, have activity against the AM. When these materials were tested in NY, they provided comparable control to a standard treatment of Guthion, but weekly sprays were necessary for SpinTor because of its short residual effectiveness. These materials, particularly Provado, have very little contact activity and must be ingested by the flies to be effective. Laboratory trials have shown that the effectiveness of Provado against AM can be increased by adding sugar as a feeding stimulant, but these same effects have not been demonstrated in the field. Currently, cooperative work is being conducted with Dr. Dan Moreno, a USDA fruit fly specialist in Weslaco, TX, to develop an improved feeding stimulant bait that can be mixed with these types of new insecticides to increase their effectiveness. Additional trials of other new materials are being tested in the laboratory and field against AM, including: photoactive dyes, Calypso, Avaunt, and (outside of NY) poison baited spheres.

Kaolin clay (Surround) has also shown some potential for use against AM, although the NY data are not as strong as those reported by some researchers in other regions. In single-tree applications during the 2000 season at Geneva, 0% of the fruit were infested at harvest, although damage in the unsprayed checks was only 1%. In a commercial organic orchard that received airblast applications of Surround (on a less-than-optimal schedule), there was no difference in infestation from the 3% in untreated trees. It seems clear that application frequency and rate are key factors in the efficacy of Surround for this

purpose.

Proposed Apple Packaging Changes

Source: John Wargowsky, Ohio Fruit Growers

Several large food retailers are requiring fresh apple shippers to pack apples in new containers, which are different from the standard-size fresh apple carton. This development has led to the formation of a joint produce industry and food retail committee, which intends to facilitate industrywide transition to this new standard-sized produce container. Such a transition could cause changes in carton and pallet counts and create special issues regarding storage and packing line compatibility. USApple is seeking your input on the use of this new container in your state or region, and the future implications of transition to this new apple carton. For information, please contact USApple's Mark Nicholson by telephone at 1-800-781-4443, or via e-mail at: mnicholson@usapple.org

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

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

Traps used: STLM = Wing trap, SJS = Pherocon V, Codling Moth = mean of 3 MultiPher® traps, Others = MultiPher

Apple: 7/25 to 8/1

STLM: 42 (down from 77)
RBLR: 41 (up from 15)
CM (mean of 3 traps): 9.0 (up from 7.3)
SJS: 7 (down from 18)
OFM: 0 (down from 2)
DWB: 0 (unchanged)

TABM: 2 (up from 0)
VLR: 1 (unchanged)
OBLR: 0 (down from 5)
AM(sum of 3 traps): 1 (unchanged)

Peach: 7/25 to 8/1
OFM: 4 (up from 3)
LPTB: 2 (unchanged)
PTB: 4 (down from 8)

Site: East District; Erie & Lorain Counties
Source: Jim Mutchler, IPM Scout
Traps Used: STLM=wing traps, SJS=Pherocon-V, Others=MultiPher®

Apple: 7/25 to 7/31
STLM: 115 (up from 105)
CM: 4.0 (up from 1.9)
SJS: 16.3 (down from 56.3)
OBLR: 2.0 (up from 0.3)
RBLR: 1.0 (unchanged)
AM: 0.9 (up from 0.8)

Peach: 7/25 to 7/31
OFM: 0.7 (down from 3.0)
LPTB: 3.7 (down from 5.3)
PTB: 11.7 (up from 10.7)
RBLR: 2.3 (up from 1.7)

Other pests include white apple leafhopper, green apple aphid, Japanese beetle, wooly apple aphid

Beneficials include: lacewings everywhere (all stages), predatory mites, white maggots, orange maggots, lady beetles, *Stethorus punctum*.

Site: West District; Huron, Ottawa, & Sandusky
Source: Gene Horner, IPM Scout
Traps Used: STLM=wing traps, SJS=Pherocon-V, PC = circle traps, Others=MultiPher® traps

Apple: 7/25 to 7/31
CM: 1.4 (up from 0.5)
RBLR: 3.0 (up from 0.0)
SJS: 6.8 (down from 13.4)
STLM: 45 (down from 75)
PC: 0.0 (unchanged)
AM: 6.2 (up from 2.4)

Peach: 7/25 to 7/31
OFM: 6.3 (up from 4.8)
LPTB: 5.2 (up from 5.0)

PTB: 4.0 (down from 4.2)
RBLR: 3.0 (up from 0.2)
TPB: 0.0 (unchanged)

Other pests include green apple aphid, apple rust mite, Japanese beetle, potato leafhopper, oriental fruit moth strikes, green peach aphid, oak borer, codling moth damage, tarnished plant bug damage

Beneficials include: predatory mites, green lacewing eggs & adults, brown lacewing, banded thrips

Phenology

Coming Events	Range of Degree Day Accumulations	
	Base 43° F	Base 50° F
Apple maggot 1st oviposition punctures	1566-2200	1001-1575
Codling moth 2nd flight peak	1587-3103	1061-2212
Redbanded leafroller 2nd flight subsides	1927-3045	1291-2160
San Jose scale 2nd flight peak	1934-2591	1271-1874
Apple maggot flight peak	2033-2688	1387-1804
Obliquebanded leafroller 2nd flight begins	2134-3040	1412-2076
Oriental fruit moth 3rd flight begins	2172-2956	1553-2013
Spotted tentiform leafminer 3rd flight begins	2215-2783	1558-2123
Peachtree borer flight subsiding	2230-3255	1497-2309
Lesser peachtree borer flight subsiding	2782-3474	1796-2513

Thanks to *Scaffolds Fruit Journal* (Art Agnello)

Northern Ohio Sooty Blotch Activity from SkyBit®

	Dates	Level of Disease Activity
Observed	July 1-31	Possible **sooty blotch** infection & damage
Forecast	August 1-8	Possible **sooty blotch** infection & damage

The Bottom Line for Fly Speck and Sooty Blotch Control

Source: Dr. Mike Ellis, Integrated Pest Management (IPM) Disease Management Guidelines for Apples in Ohio

- Cultural practices such as pruning and fruit thinning that increases air circulation and reduce drying time of fruits are very important.
- Good spray coverage is essential.
- The benzimidazoles (Benlate or Topsin-M) are the best materials available. Captan is probably second best. Combination of a benzimidazole plus captan or alternatives of a benzimidazole and captan should provide the best level of control. Thiram and Ziram will work, but you have to keep the rates up (at least 1.5 lb/100 gal)and spray on a tighter schedule during wet growing seasons.
- **Note:** The SI fungicides are not effective in controlling these disease.
- **Rule of Thumb:** During wet growing seasons, do not exceed a spray interval of 3 weeks from the last spray to harvest.

Degree Day Accumulations for Selected Ohio Sites January 1, 2001 to Date Indicated

Location	Reported Degree Day Accumulations						Forecasted Degree Day Accumulations August 8	
	July 18		July 25		August 1			
	Base 45° F	Base 50° F	Base 45° F	Base 50° F	Base 45° F	Base 50° F	Base 45° F	Base 50° F
Akron - Canton	1804	1311	2035	1506	2225	1661	2441	1843
Cincinnati	2266	1709	2509	1916	2732	2104	2963	2301
Cleveland	1832	1348	2075	1557	2269	1715	2482	1893
Columbus	2250	1710	2493	1919	2704	2095	2933	2288
Dayton	2139	1616	2381	1823	2589	1996	2821	2193
Mansfield	1816	1326	2044	1520	2237	1678	2446	1851
Norwalk	1862	1378	2096	1576	2262	1713	2483	1898
Piketon	2239	1675	2468	1869	2678	2044	2900	2231
Toledo	1909	1420	2146	1623	2343	1785	2562	1969
Wooster	1859	1364	2094	1565	2290	1726	2502	1903
Youngstown	1716	1229	1946	1424	2124	1567	2230	1738

Ohio Drought Conditions

Conditions in Ohio as of July 28, 2001 according to Long Term Palmer Drought Severity Index

Source: http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif(1) or http://enso.unl.edu/monitor/monitor.html(2)

Region	(1) Category of Drought	(2) Category of Drought
Northeast Ohio	Severe	Abnormally Dry
Northeast Hills	Moderate	Abnormally Dry
Central Hills	Moderate	Abnormally Dry
North Central	Moderate	Abnormally Dry
Rest of State	Near Normal	Normal

Preliminary Monthly Climatological Data for Selected Ohio Locations July, 2001

Weather Station Location	Monthly Precip	Normal Monthly Precip	Year-to-Date Precip	Normal Year-to-Date Precip	Average High	Normal High	Average Low	Normal Low	Mean Temp.	Normal Mean
Akron-Canton	1.18	4.08	16.66	21.87	82.0	82.3	59.6	61.5	70.8	71.9
Cincinnati	8.70	4.24	24.33	25.63	83.9	85.5	64.5	64.8	74.2	75.1
Cleveland	0.68	3.52	16.44	20.99	81.7	82.4	62.1	61.4	71.9	71.9
Columbus	4.67	4.31	21.10	23.18	84.1	83.7	64.5	62.7	74.3	73.2
Dayton	5.48	3.54	20.41	22.42	82.8	84.9	63.7	63.4	73.2	74.1
Mansfield	1.05	4.04	16.74	23.28	81.8	82.1	60.0	62.0	70.9	72.0
Norwalk	2.61	4.16	15.07	21.10	80.9	82.7	62.6	60.7	71.7	71.7
Toledo	2.01	3.27	16.31	19.03	84.8	83.4	60.6	60.6	72.7	72.0
Wooster	1.07	4.05	12.70	21.43	83.7	83.6	58.7	59.7	71.2	71.6
Youngstown	2.02	4.07	14.13	21.86	81.8	81.3	57.4	59.3	69.6	70.3

Temperatures in degrees F, Precipitation in inches

Records set: Low - 2nd , Youngstown 40º; High - 23rd, Mansfield 91º

Record tied: Low - *2nd* , Toledo 46º

Table Created by Ted W. Gastier, OSU Extension from National Weather Service, OARDC and local data

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