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Update on Pest Management
and Crop Development

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

July 28, 2003

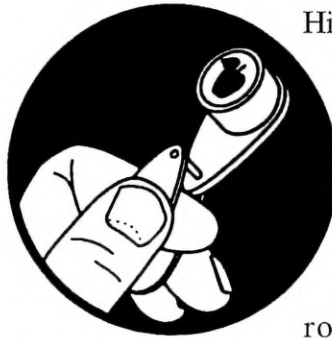
VOLUME 12, No. 20

Geneva, NY

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WHO'S
ON
1ST?

ORCHARD
RADAR
DIGEST



Highland Predictions:

Roundheaded Appletree Borer

First RAB eggs hatch roughly: June 29. Peak hatch roughly: July 16 to August 3.

Dogwood Borer

First Dogwood borer egg hatch roughly: July 4. Peak hatch roughly: August 5.

Geneva Predictions:

Roundheaded Appletree Borer

First RAB eggs hatch roughly: June 30. Peak hatch roughly: July 18 to August 5.

Dogwood Borer

First Dogwood borer egg hatch roughly: July 5. Peak hatch roughly: August 8.

Codling Moth

2nd generation 7% CM egg hatch: August 7 (rain-adjusted first spray date where multiple sprays needed to control 2nd generation CM).
2nd generation 30% CM egg hatch: August 18 (= single spray date where one spray needed to control 2nd generation codling moth).

Oriental Fruit Moth

Optimum 2nd generation - second treatment date, if needed: July 24.

Spotted Tentiform Leafminer

Second optimized sample date for 2nd generation STLM sapfeeding mines, if needed: July 24.
Third optimized sample date for 2nd generation STLM sapfeeding mines, if needed: August 4.

Codling Moth

2nd generation 7% CM egg hatch: August 3 (rain-adjusted first spray date where multiple sprays needed to control 2nd generation CM).
2nd generation 30% CM egg hatch: August 12 (= single spray date where one spray needed to control 2nd generation codling moth).

Spotted Tentiform Leafminer

Second optimized sample date for 2nd generation STLM sapfeeding mines, if needed: July 21.
Third optimized sample date for 2nd generation STLM sapfeeding mines, if needed: August 1.

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- ❖ Apple maggot
- ❖ Insect bites

UPCOMING PEST EVENTS

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INSECT TRAP CATCHES

WHAT'S ON 2ND?

MODEL BUILDING

❖❖ **Oriental Fruit Moth.** Catches of 2nd brood adults are still extremely variable, and often very light at many sites where we are trapping. Most problem orchards should have received a first spray against this brood already, although we must admit to being puzzled by the lower than expected catch numbers. The provisional PA model predicts that the accumulated DD's (base 45°F) at this time should correspond with approximately the 70–90% egg hatch period of this generation. Our numbers from the season's first biofix as of 7/27 are:

SITE	BIOFIX	CUM DD-45
Highland	4/21	1947
Geneva	5/1	1608
Lyndonville	5/4	1597
N. Appleton	5/6	1499
Williamson	5/8	1492
Albion	5/5	1560

Codling Moth. The first application against the 2nd brood of this species is not advised until 1260 DD (base 50°F) after the season's first biofix; Geneva is at 1074 as of July 27, and Highland is at 1262, so the Orchard Radar predictions (in this issue) should be fairly accurate for the recommended spray timings.

Obliquebanded Leafroller. Sites on a Spintor program should receive their 2nd application against the first summer brood this week, if it has not already been applied.

❖❖

HEY, MAGGOT!

BANDED-WING BANDITS

(Harvey Reissig,
Entomology, Geneva)

We're in the traditional 'peak activity' window for apple maggot right now, and there have been some impressive numbers of adults caught in some lure research sites we have around the state, so this primer on maggot control strategies bears 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.

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Dept. of Entomology

NYSAES, Barton Laboratory

P.O. Box 462

Geneva, NY 14456-0462

Phone: 315-787-2341 FAX: 315-787-2326

E-mail: ama4@cornell.edu

Editors: A. Agnello, D. Kain

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Biology

The AM overwinters as a pupa in soil beneath apple trees. Adults emerge from the ground in late June or early July (first 2002 catch in selected locations: Highland, 6/30; Geneva, 7/14; Lafayette, 7/17; Sodus 7/23) 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 NY. 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 prac-

tical 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 m 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. Although no commercially produced cultivars are immune to AM infestation, management strategies can 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 to early July in NY, this protective program will usually require about 4 sprays annu-

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ally. 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.

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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, Actara, 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. Ongoing work is being conducted on 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, and (outside of NY) poison baited spheres.

Kaolin clay (Surround) has also shown good potential for use against AM, although application frequency and rate are key factors in its efficacy for this purpose.❖❖

OTHER PLAYERS

SURFACE ATTACKS

(Art Agnello, Entomology, Geneva)

❖❖ The first **Comstock mealybug** adult males of the season will have emerged somewhere around the start of the July 4th weekend, which means that the invasive crawlers are due to start showing up soon, probably by next week. For those with a history of infestations of this pest in their pears (or peaches), the crawlers are the most susceptible stage for chemical control, and generally make their appearance about this time in western N. Y. every year. If you don't have out sticky-tape traps on the scaffold branches, check green shoots and cut a few pears to see whether any are showing up in the calyx. An application of Provado or Lannate is recommended for this pest, and it is also on the Diazinon pear label. Refer to the Comstock Mealybug IPM Fact Sheet, No. 22, for photos and more information on its biology.

Larvae of both species of **peachtree borers** are still able to hatch and get into your stone fruit trees, and this week is timely for any orchard on a seasonal control program of trunk sprays: cherries — Asana, Lorsban, Ambush, or Pounce; peaches — add Thiodan to the above list (do not spray fruit).❖❖

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Dept. of Entomology
 NYS Agricultural Exp. Sta.
 Barton Laboratory
 Geneva, NY 14456-0462

PEST FOCUS

Geneva:

Apple maggot trap catch increasing. Spotted tentiform leafminer
 2nd flight began 6/23. The first sample of sap-feeding mines should have been taken at 690 degree days (base 43°F) following this event. If necessary, resample at 840 and 1150 DD43°F.
 DD43°F to date = 962.

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1-7/28):	1972	1265
(Geneva 1/1-7/28/2002):	2173	1470
(Geneva "Normal"):	2115	1458
(Geneva 8/4 Predicted):	2167	1411
(Highland 7/28):	2366	1600

Coming Events:**Ranges:**

Apple maggot 1st oviposition punctures	1566-2200	1001-1575
Codling moth 2nd flight begins	1355-2735	864-1905
Oriental fruit moth 2nd flight peak	1000-2908	577-2066
Redbanded leafroller 2nd flight peak	1479-2443	952-1698
STLM 2nd generation tissue feeders present	1504-2086	952-1201
Comstock mealybug 1st flight subsides	1668-2245	1101-1450
American plum borer 2nd flight peak	1648-2688	1037-1840

INSECT TRAP CATCHES
 (Number/Trap/Day)

Geneva, NY

Highland, NY

	7/21	7/24	7/28		7/21	7/28
Redbanded leafroller	2.4	1.2	0.4	Redbanded leafroller	2.1	0.6
Spotted tentiform leafminer	199	65	52.8	Spotted tentiform leafminer	90	46.2
Oriental fruit moth	2.5	0.7	1.1	Oriental fruit moth	1.8	1.1
Lesser appleworm	0.0	0.0	0.3*	Lesser appleworm	1.9	0.2
San Jose scale	0.0	0.0	1.8*	Codling moth	0.3	0.4
Codling moth	0.1	0.2	0.0	Obliquebanded leafroller	0.9	0.4
Obliquebanded leafroller	0.6	0.2	0.0	Fruittree leafroller	0.0	0.0
American plum borer	0.6	1.3	0.4	Sarganthis fruitworm	1.4	0.2
Lesser peachtree borer	0.5	0.5	0.8	Tufted apple budmoth	0.3	0.1
Peachtree borer	0.1	0.0	0.1	Variiegated leafroller	0.0	0.3
Dogwood borer (N. Huron)	-	0.5	-	Dogwood borer	0.1	0.0
Apple maggot	0.1	0.3	1.0	Apple maggot	0.5	1.0

* first catch

NOTE: Every effort has been made to provide correct, complete and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are possible. These recommendations are not a substitute for pesticide labelling. Please read the label before applying any pesticide.

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