scaffolds FRUIT JOURNAL

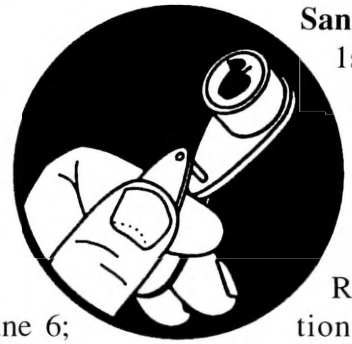
Update on Pest Management and Crop Development

June 16, 2003 VOLUME 12, No. 14 Geneva, NY

INSECTS

COMING SOON

ORCHARD RADAR DIGEST



Geneva Predictions:

Roundheaded Appletree Borer

RAB adult emergence begins: June 6; Peak emergence: June 21.

RAB egglaying begins: June 15. Peak egglaying period roughly: July 4 to July 18.

Codling Moth

Codling moth development as of June 16: 1st generation adult emergence at 54% and 1st generation egg hatch at 4%.

1st generation 3% CM egg hatch: June 17. This is first spray date where multiple sprays needed to control 1st generation CM.

Second spray date if using Imidan, Avaunt, or azinphosmethyl is around July 1. If using Bt insecticide, the optimum initial spray date is June 12. The rain-adjusted second Bt spray date is around June 22, with a third Bt spray around July 2 needed to maintain protection through majority of CM egg hatch period.

1st generation 20% CM egg hatch: June 24 (= single spray date where one spray needed to control 1st generation codling moth).

Obliquebanded Leafroller

1st generation OBLR flight, first trap catch expected: June 16.

Oriental Fruit Moth

2nd generation OFM flight begins around: July 7.

Redbanded Leafroller

2nd RBLR flight begins: July 9.

San Jose Scale

1st generation SJS crawlers appear: June 26.

Spotted Tentiform Leafminer

2nd STLM flight begins around: June 23.

Rough guess of when 2nd generation sap-feeding mines begin showing: July 12.

Highland Predictions:

Roundheaded Appletree Borer

RAB adult emergence begins: June 4; Peak emergence: June 19.

RAB egglaying begins: June 14. Peak egglaying period roughly: July 2 to July 15.

Codling Moth

Codling moth development as of June 16: 1st generation adult emergence at 63% and 1st generation egg hatch at 9%.

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IN THIS ISSUE...

1st generation 3% CM egg hatch: June 15. This is first spray date where multiple sprays needed to control 1st generation CM.
Second spray date if using Imidan, Avaunt, or azinphosmethyl is around June 29. If using Bt insecticide, the optimum initial spray date is June 10. The rain-adjusted second Bt spray date is around June 18, with a third Bt spray around June 28 needed to maintain protection through majority of CM egg hatch period.
1st generation 20% CM egg hatch: June 22 (= single spray date where one spray needed to control 1st generation codling moth).

Obliquebanded Leafroller
1st generation OBLR flight, first trap catch expected: June 15.

Oriental Fruit Moth
2nd generation OFM flight begins around: July 5.

Redbanded Leafroller
2nd RBLR flight begins: July 6.

San Jose Scale
1st generation SJS crawlers appear: June 24.

Spotted Tentiform Leafminer
2nd STLM flight begins around: June 21.
Rough guess of when 2nd generation sap-feeding mines begin showing: July 9.

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WELL TRAINED

MODEL BUILDING

Plum Curculio. Accumulated heat units need to reach 340 (base 50°F) from petal fall before the predicted end of the immigration of ovipositing females. Another week of seasonable temperatures should do it. Our numbers as of today:

Geneva (May 23 PF estimate) - 229
Highland (May 19 PF estimate) - 339
Lafayette (May 23 PF estimate) - 250
Lyndonville (May 28 PF estimate) - 236
North Appleton/Niagara Co. (May 28 PF estimate) - 168
Saratoga/Capital District (May 27 PF estimate) - 288
Sodus (May 27 PF estimate) - 216

Oriental Fruit Moth. The second application against the first brood in both peaches and apples should be applied at approximately 350-375 DD (base 45°F) from biofix, so every site has reached this milestone by now:

SITE	BIOFIX	CUM DD-45	APPROX. % HATCH
Highland	4/21	813	100%
Geneva	5/1	529	91%
Lyndonville	5/4	561	93%
Albion	5/5	491	88%
N. Appleton	5/6	429	76%
Williamson	5/8	472	85%

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is published weekly from March to September by Cornell University—NYS Agricultural Experiment Station (Geneva) and Ithaca—with the assistance of Cornell Cooperative Extension. New York field reports welcomed. Send submissions by 3 pm Monday to:

scaffolds FRUIT JOURNAL
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

This newsletter available on CENET at: news://newsstand.cce.cornell.edu/cce.ag.tree-fruit
and on the World Wide Web at:
http://www.nysaes.cornell.edu/ent/scaffolds/

Codling Moth. These accumulations are gradually reaching the intended spray threshold, but recall that this first brood will likely be taken care of by curculio sprays in most locations. With 250 DD (base 50°F) as a first spray date, we currently have:

Geneva (1st catch of May 22) - 234
Highland (1st catch of May 19) - 339
Lafayette (1st catch of May 23) - 250
Lyndonville (1st catch of May 20) - 236
North Appleton/Niagara Co. (1st catch of May 28) - 168
Saratoga/Capital District (1st catch of May 22) - 330

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FLY LINE

THE MAGGOT: RELOADED
(Harvey Reissig, Dave Combs & Art Agnello, Entomology, Geneva)

Monitoring

❖❖ Once again, it is nearly time to expect the first appearance of apple maggot (AM) flies in volunteer apple stands and abandoned orchards, particularly in eastern N.Y.; western N.Y. could be about a week later if this were a normal season, and the less said about that the better. Crop scouts and consultants have been using traps to monitor AM populations for a long time, but this tactic, useful as it is, nevertheless is not recommended in all cases. Some orchards have such high or such low AM populations that monitoring for them is a waste of time; that is, sprays are needed predictably every season in some blocks, and on a calendar basis; conversely, they are rarely needed at all in other blocks. However, most commercial N.Y. orchards have moderate or variable pressure from this pest, and monitoring to determine when damaging numbers of them are present can reduce the number of sprays used in the summer with no decrease in fruit quality.

Sticky yellow panels have been in use for over 30 years, and can be very helpful in determining when AM flies are present. These insects emerge from their hibernation sites in the soil from mid-June to early July in New York, and spend the first 7-10 days of their adult life feeding on substances such as aphid honeydew until they are sexually mature. Because honeydew is most likely to be found on foliage, and because the flies see the yellow panel as a "super leaf", they are naturally attracted to it during this early adult stage. A few of these panels hung in an orchard can serve as an early warning device for growers if there is a likely AM emergence site nearby.

Many flies pass this period outside of the orchard, however, and then begin searching for fruit only when they are ready to mate and lay eggs. That means that this advance warning doesn't always have a chance to take place — the catch of a single (sexually mature) fly then indicates a spray is necessary immediately to adequately protect the fruit. This can translate into an undesirable risk if the traps are not being checked daily, something that is not always possible during a busy summer.

To regain this time advantage, researchers developed newer traps that have the form of a "super apple" — large, round, deep red, and sometimes with the smell of a ripe apple — in an attempt to catch that first AM fly in the orchard. Because this kind of trap is so much more efficient at detecting AM flies when they are still at relatively low levels in the orchard, the traps can usually be checked twice a week to allow a one- or two-day response period (before spraying) after a catch is recorded, without incurring any risk to the fruit. In fact, research done in Geneva over a number of years indicates that some of these traps work so well, it is possible to use a higher threshold than the old "one fly and spray" guidelines recommended for the panel traps. Specifically, it has been found that sphere-type traps baited with a lure that emits apple volatiles attract AM flies so efficiently that an insecticide cover spray is not required until a threshold of 5 flies per trap is reached.

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The recommended practice is to hang three volatile-baited sphere traps in a 10- to 15-acre orchard, on the outside row facing the most probable direction of AM migration (south, or else towards woods or abandoned apple trees). Then, periodically check the traps to get a total number of flies caught; divide this by 3 to get the average catch per trap, and spray when the result is 5 or more. Be sure you know how to distinguish AM flies from others that will be collected by the inviting-looking sphere. There are good photos for identifying the adults on the Apple Maggot IPM Fact Sheet (No. 8); see p. 224 of the Recommends for details on obtaining one, or else check the web version at: http://www.nysipm.cornell.edu/factsheets/treefruit/pests/am/applemaggot.html. In home apple plantings, these traps can be used to "trap out" local populations of AM flies by attracting any adult female in the tree's vicinity to the sticky surface of the red sphere before it can lay eggs in the fruit. Research done in Massachusetts suggests that this strategy will protect the fruit if one trap is used for every 100-150 apples normally produced by the tree (i.e., a maximum of three to four traps per tree in most cases), a density that makes this strategy fairly impractical on the commercial level.

A variety of traps and lures are currently available from commercial suppliers; among them: permanent sphere traps made of wood or stiff plastic, disposable sphere traps made of flexible plastic, and sphere-plus-panel ("Ladd") traps. The disposable traps are cheaper than the others, of course, but only last one season. Ladd traps are very effective at catching flies, but are harder to keep clean, and performed no better than any other sphere trap in our field tests. Brush-on stickum is available to facilitate trap setup in the orchard. Apple volatile lures are available for use in combination with any of these traps. These tools are available from a number of orchard pest monitoring suppliers, among them:

- Gempler's Inc., 100 Countryside Dr., PO Box 328, Belleville, WI 53508; 608-424-1544, Fax, 608-424-1555
- Great Lakes IPM, 10220 Church Rd. NE, Vestaburg, MI 48891; 800-235-0285, Fax 989-268-5311
- Harmony Farm Supply, 3244 Gravenstein Hwy, No. B, Sebastopol, CA 95472; 707-823-9125, Fax 707-823-1734
- Ladd Research Industries Inc., 83 Holly Court, Williston, VT 05495; 800-451-3406, Fax 802-660-8859
- Olson Products Inc., PO Box 1043, Medina, OH 44258; 330-723-3210, Fax 330-723-9977
- Scenturion Inc., P.O. Box 585, Clinton, WA 98236; 360-341-3989, Fax 360-341-3242

By preparing now for the apple maggot season, you can simplify the decisions required to get your apples through the summer in good shape for harvest.

Comparison of Application Technology for AM Control - 2002

A western NY apple orchrd that has been in organic production for several years was selected for use in this trial because high levels of AM damage had been observed in fruit the previous season. Using an airblast sprayer delivering 200 gpa, two treatments were applied using Surround (kaolin clay) on a weekly basis; the two treatments varied in the nozzles used for each application. Tee Jet hollow cone nozzles (Model D4 disc with DC45 whirl plate) as well as Tee Jet air induction nozzles (Model AIll004VS, Spraying Systems Co., Wheaton, IL) were tested to determine the effectiveness of droplet size with this product. A volatile bait containing spinosad was applied with a Meterjet spray gun (Model 2362, Spraying Systems Co.) connected to a CO2 backpack sprayer at 40 psi, also on a weekly basis, at the rate of 1 gpa.

A new antagonistic method using chemical repellency was also incorporated into this trial by hanging 12 dispensers in the center of a 3 x 3 tree plot. This proprietary technology, developed by W. Roelofs (NYSAES, Geneva), is still in the preliminary testing phase, and this was its first assessment under field conditions. Treatments, including an untreated check, were replicated four times and

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arranged in a RCB design. All applications were started on 25 July and continued on 2, 8, 14, and 21 Aug. The dispenser vials for the repellent were hung on 20 July. Red volatile-baited sphere traps were hung in four trees surrounding the center tree in both the repellent trial and in the untreated check. Weekly counts were taken from these traps to determine whether the treated tree had any repellent activity. Fruit was harvested on 9 Sept by randomly selecting 200 fruits from the center tree in each replicate. A subsample was taken from the harvest sample from the check plot and the repellent block, and examined in the lab to determine numbers of AM punctures.

AM pressure in the test orchard was moderate to high, as indicated by the damage levels found in the untreated chack plots, and by high trap catches of flies throughout the season. The weekly applications of Surround provided good control of AM damage, regardless of the nozzle used (hollow cone, 2.4%; air induction, 3.3%). The spinosad bait also reduced damage found at harvest (12.8%); however, it was not significantly different from the check (24.6%). The repellent plots (20.3%) also did not separate from the untreated check plot. The pressure found in this orchard is many times greater than that found in the average commercial block. For this reason, the constant presence of flies in the orchard probably represented too high a pressure for the weaker programs to control. The subsamples examined for oviposition punctures provided little insight into the efficacy of the repellent treatment. The untreated check yielded a mean of 1.30 punctures per apple, and the repellent treatment resulted in 1.04 punctures per apple, which was not statistically different. Trap catches taken over the duration of the trial seemed to indicate some repellency to the dispensers. A mean of 7.6 flies per trap were caught in the untreated check plot, while a mean of 12.3 flies per trap were caught in traps surrounding the repellent dispensers; however, these numbers also were not statistically different.❖❖

NOW YOU SEE 'EM

PROTECTING FRUIT FROM APPLE SCAB IN ORCHARDS WITH VISIBLE SCAB LESIONS

(Dave Rosenberger, Plant Pathology, Highland)

DISEASES

❖❖ Keeping apple scab under control is proving very difficult this year in orchards where primary scab was not completely controlled during April and early May. Over the last 30 days at the Hudson Valley Lab, we have recorded 17 separate wetting events for a total of 228 hours of wetting and 5.8 inches of rain. Unfortunately, this period of extended wetting started shortly after petal fall just when fruit and leaves are at peak susceptibility for apple scab infection.

What is the best approach for keeping apple scab off of fruit in orchards with a moderate level of scab on terminal leaves? Unfortunately, there is no simple answer to this question. Below are four options to consider.

Option 1: Make at least two applications of captan alone at the maximum label rate per acre. Applications at this time of year can be 10–14 days apart unless rainfall (>1.5 inches) removes captan residues before 10 days have elapsed. Captan is very effective for protecting fruit, especially when combined with high temperatures of 80–85° F. However, if cool wet weather persists into July, then continued applications (more than two sprays) using high rates of captan may be essential. If weather becomes more normal (hotter and dryer), then the risk of fruit infection will subside until September when scab might become active again.

Option 2: Apply captan at maximum label rates as noted above, but tank-mix the high rate of captan with an SI fungicide (Nova, Rubigan,

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or Procure). The full rate of captan is needed because the SI's will shut down scab on leaves but will do little to protect the fruit. This option is considerably more expensive than Option 1. It will prove more effective than Option 1 IF orchards do not contain SI-resistant populations of scab and IF weather stays cool and wet for another month. Option 2 also provides extended control of mildew. However, if weather become hotter (days > 80-85° F) and dryer, then Option 1 will probably work just as well as the more expensive Option 2 for controlling scab.

Option 3: Apply captan at 50% of maximum label rates in a tank-mix with Flint or Sovran. Flint and Sovran will provide better protection of fruit than the SI fungicides so a half-rate of captan should be adequate. The fact that Sovran and Flint bind to cuticular waxes should make them more resistant to wash-off than is captan. However, Sovran and Flint will be less effective than the SI fungicides (in the absence of resistance) for arresting incubating but still invisible infections in leaves. Thus, the trade-off here is potentially better control of fruit scab with Sovran or Flint compared to greater reduction of total inoculum when SI's are applied to leaves with incubating lesions. It is very difficult to predict which option (2 or 3) will result in the least fruit scab. In two years of trials where I tested these products on trees with visible scab, I got better control with the SI's in one year and with the strobilurins (Sovran, Flint) in the other. The variation is largely due to the details of exactly when the products are applied within the scab incubation period. Be aware, however, that where Sovran and Flint have been used alone (without any contact fungicide) to stop previous scab epidemics in Michigan and Western NY, the results have generally been less than satisfactory. Thus, I personally would gamble on Options 1 or 2 rather than Option 3.

Option 4: Apply captan at 50% of the maximum label rate in combination with a full rate of dodine (Syllit). This is an extremely risky approach because we cannot accurately predict which orchards have dodine resistance. However, if you have not used ANY dodine, not even in the first spray of the season, for at least 10 years, then this approach might be very effective. Only one spray of dodine should be applied and the follow-up spray should be the full rate of captan because a single spray of dodine may be enough to re-select for dodine-resistant strains that survive at low levels in most orchards.

The specifics of the orchards involved should be considered when choosing among the options noted above. There is significantly more risk of getting scab on fruit of susceptible cultivars such as McIntosh and Ginger Gold and than on more scab-resistant cultivars such as Empire and Delicious. Therefore, captan alone might suffice for the more resistant cultivars whereas an SI-plus-captan might be warranted for McIntosh blocks. Similarly, vigorous young trees that are still actively growing have the potential for several more cycles of leaf scab whereas older orchards with a heavy crop will soon set terminal buds. The SI-captan combination is more likely to pay for itself in orchards with vigorous terminal growth because the SI's can quickly reduce the amount of inoculum available for infecting new leaves (unless, of course, the scab is SI-resistant).

Unfortunately, some orchards may already have so much scab that spending more money for fungicides will only increase costs for a crop that is already lost. In cases where a significant number of fruit already have visible scab, one must assume that additional fruit may soon develop symptoms from infections that occurred last week unless heroic measures have already been employed to save the crop. There is no point in spending big dollars for SI or strobilurin fungicides for a crop that will not pay for itself.❖❖

WHERE THERE'S SMOKE...???

NECTRIA TWIG BLIGHT

(Dave Rosenberger, Plant Pathology, Highland)

❖❖ Nectria twig blight is caused by the fungus *Nectria cinnabarina*. Symptoms of this disease appear in orchards during June and are easily confused with the shoot blight phase of fire blight. With both diseases, scattered terminal shoots wilt and produce a typical shepherd's crook at the end of the affected shoot. Fire blight infection is a serious problem whereas the Nectria twig blight rarely causes economic damage.

The best way to differentiate the two diseases is to check for characteristic symptoms of Nectria twig blight. *N. cinnabarina* usually infects twigs through apple fruit stems that were left in the tree during the previous year's harvest. Infections are more common following years when rapid temperature drops in late fall or early winter may have contributed to winter kill of the infected stems. The fungus moves from the infected fruit stem into the subtending node. Sometime during June of the following spring, the fungus succeeds in girdling the stem at the node and the shoot beyond that node wilts and dies. Unlike fire blight infections, the *Nectria* infection rarely extends more than one or two inches beyond the node. The margins of *Nectria* cankers are usually more distinct than are margins of fire blight cankers at this time of year. Within several weeks (by mid-July), nodes infected by *N. cinnabarina* will develop orange sporodochia, a kind of spore-producing structure. The presence of orange sporodochia on nodes below wilted twigs further differentiates these infections from fire blight.

Nectria twig canker is most common on terminal-bearing cultivars such as Rome Beauty, but it also occurs occasionally on other varieties such as Fuji and Empire. Fungicide sprays are not effective for controlling Nectria twig blight. Dead twigs can be removed during summer pruning or during dormant pruning the following winter. Leaving infected twigs in the tree during summer and fall does not have any significant effect on spread of this disease because the disease is more limited by fall/winter weather conditions than by presence of inoculum. *N. cinnabarina* colonizes many species of trees and shrubs, so inoculum is available from many sources other than apple trees.❖❖

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–6/16):	895	485
(Geneva 1/1-6/16/2002):	983	579
(Geneva "Normal"):	997	613
(Geneva 6/23 Predicted):	1051	577
(Highland 6/16):	1148	799
Coming Events:	**Ranges:**	
European red mite summer eggs hatch	773–938	442–582
Obliquebanded leafroller 1st catch	686–1104	392–681
Pandemis leafroller 1st catch	749–873	423–488
Oriental fruit moth 1st flight subsides	781–1574	442–1026
Peachtree borer 1st catch	565–1557	299–988
San Jose scale 1st flight subsiding	768–1096	434–656

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

PEST FOCUS

Highland:
White apple leafhopper and **rose leafhopper** increasing on apple. 1st **potato leafhopper** observed on apple. 1st **obliquebanded leafroller** caught 6/10.

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	6/5	6/9	6/16
Redbanded leafroller	0.0	0.0	0.0
Spotted tentiform leafminer	40.5	18.4	10.7
Oriental fruit moth	5.3	5.4	0.4
Lesser appleworm	0.5	0.5	0.4
San Jose scale	2.7	91.9	8.0
Codling moth	1.8	2.6	0.1
Obliquebanded leafroller	0.0	0.0	0.0
Pandemis leafroller	0.0	0.0	0.0
American plum borer	0.8	0.4	1.1
Lesser peachtree borer	0.0	0.3*	0.5
Peachtree borer	–	0.0	0.0

Highland, NY

	6/9	6/16
Redbanded leafroller	0.1	0.0
Spotted tentiform leafminer	2.6	9.8
Oriental fruit moth	0.6	0.1
Lesser appleworm	1.8	2.3
Codling moth	0.7	0.9
Obliquebanded leafroller	0.0	1.4*

* first catch

This material is based upon work supported by Smith Lever funds from the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.