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Update on Pest Management and Crop Development

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INSECTS

OUT TO SEE

ORCHARD RADAR DIGEST

Geneva Predictions:

Roundheaded Appletree Borer

RAB peak emergence: June 12.

Peak egglaying period roughly: June 27 to July 12.

Codling Moth

Codling moth development as of June 14: 1st generation adult emergence at 70% and 1st generation egg hatch at 16%.

1st generation 20% CM egg hatch: June 15 (= single spray date where one spray needed to control 1st generation codling moth).

Obliquebanded Leafroller

1st generation OBLR flight, first trap catch: June 7.

If using BT insecticide, optimum date to begin 2 to 4 weekly low-rate applications for small OBLR larvae is roughly: June 26.

Oriental Fruit Moth

2nd generation OFM flight begins around: July 1.

Optimum 2nd generation - first treatment date, if *needed: July 7.*

Redbanded Leafroller

2nd RBLR flight begins around: July 3.

San Jose Scale

1st generation SJS crawlers appear: June 18.

Spotted Tentiform Leafminer

2nd STLM flight begins around: June 16.

Rough guess when 2nd generation sap-feeding mines begin showing: July 6.

Highland Predictions:

Roundheaded Appletree Borer

RAB peak egglaying period roughly: June 17 to July 3.

Codling Moth

Codling moth development as of June 14: 1st generation adult emergence at 91% and 1st generation egg hatch at 54%.

Lesser Appleworm

2nd LAW flight begins around: July 1.

Obliquebanded Leafroller

If using BT insecticide, optimum date to begin 2 to 4 weekly low-rate applications for small OBLR larvae is roughly: June 17.

Optimum first sample date for summer generation OBLR larvae: June 26.

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Oriental Fruit Moth
2nd generation OFM flight begins around: June 23.
Optimum 2nd generation - first treatment date, if needed: June 26.

Redbanded Leafroller
2nd RBLR flight begins around: June 24.

San Jose Scale
1st generation SJS crawlers appear: June 10.

Spotted Tentiform Leafminer
2nd STLM flight begins around: June 8.
Rough guess when 2nd generation sap-feeding mines begin showing: June 26.
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MODEL BUILDING

NUMBERS RACKET

Plum Curculio. Most sites should reach the 340 DD (base 50°F) spray cutoff for this pest this week, so if your trees are protected for the next 4–5 days, that should be sufficient. Our sample numbers:

Albion (May 17 PF estimate) - 279
Appleton/Niagara Co. (May 20 PF estimate) - 231
Clifton Park/Capital District (May 15 PF estimate) - 462
Geneva (May 17 PF estimate) - 313
Highland (May 10 PF estimate) - 453
Lyndonville (May 17 PF estimate) - 274
Sodus (May 17 PF estimate) - 290
Williamson (May 17 PF estimate) - 271

Oriental Fruit Moth. This pest's development is tracked using a 45°F DD model from biofix, defined as the first sustained moth catch. Peach growers should have applied their second (14 days after PF) application of a pyrethroid by now for this insect (plus plum curculio).

SITE	BIOFIX	CUM DD-45	APPROX. % HATCH
Appleton	4/30	584	95%
Albion	5/4	590	95%
Geneva	5/7	631	98%
Lyndonville	4/30	619	97%
Williamson	5/3	601	96%

Codling Moth. With 250 DD (base 50°F) as a first spray date, we currently have:

Geneva (1st catch May 17) - 313
Albion (1st catch May 17) - 279
Williamson (1st catch May 18) – 255
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DISEASES

FRIENDLY FIRE?

APPLE TREE DEATHS ATTRIBUTABLE TO HERBICIDES?

(Dave Rosenberger, Plant Pathology, Highland and Mike Fargione, Cornell Cooperative Extension, Hudson Valley Regional Fruit Program)

❖❖ Over the past five years, we have noted with increasing frequency a kind of trunk injury on apples trees that does not fit the description of any known disease. The injury usually occurs at or near ground level and extends 2–8 inches up the trunk from the graft union. Frequently the injury is confined to one side of the trunk (Fig. 1), but in some orchards large numbers of trees are killed after trees become girdled. Bark on roots below the soil line and on the trunk above the cankered area remains healthy. The canker margin is usually rather distinct. In some orchards, cankers are most prevalent on the southwest side of trees, suggesting that winter injury may be involved. However, in other orchards the injury may be more prevalent on the northern side of the trees. In eastern New York, tree losses from this trunk canker are becoming more common than tree losses from fire blight.

Most affected orchards have the following characteristics:

- The orchards are well-managed with a very clean herbicide strip.
- Trees affected are generally more than five years old with trunks at least three inches in diameter.
- Severity of damage is often variety-dependent, with especially severe injury noted on Cortland and Macoun trees.
- Affected orchards have received glyphosate (Roundup or generic equivalents) at least once per year.

At this point, we are just initiating research to determine the causes of this potentially lethal trunk

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Fig. 1. Example of trunk injury that may be associated with herbicide injury that occurs when herbicide sprays contact the lower part of the tree trunks (A) and the same canker with bark removed to show necrosis (B).

canker. However, we are sharing our hypotheses at this time in hopes of minimizing further damage. We also encourage observers to contact us with other ideas, observations, and information.

Hypotheses for explaining herbicide-induced trunk cankers:

- The trunk cankers result from hitting the lower part of the tree trunks with glyphosate sprays.
- Stress within the glyphosate-sprayed bark may enable the white rot fungus, *Botryosphaeria dothidea*, to invade and kill the bark.
- The glyphosate/*B. dothidea* interaction may be more lethal in trees that are under water stress when the glyphosate is applied as compared with non-stressed trees.
- Cankers may not become apparent until several years after the injury that allowed canker initiation. Therefore, eastern NY growers noting cankers for the first time this summer may be seeing results of herbicide injury that occurred during the July-August drought of 2002.

Observational support for these hypotheses: The patterns of injury on the trunks is often consistent with the exposure pattern that would be expected from an herbicide sprayer where the boom is adjusted to provide overlapping coverage in the line directly between trees within the row. The injury has been observed in orchards where only glyphosate and gramoxone are applied, so we can rule out residual herbicides as a potential cause. Gramoxone has a longer history of usage than glyphosate, and the trunk canker problem emerged relatively recently during the same time frame during which we suspect that orchard use of glyphosate was increasing. The extremely clean herbicide strips in many of the affected orchards suggest late-summer applications of glyphosate are common in the affected blocks.

B. dothidea is endemic in most older apple orchards where it commonly occurs in superficial cankers that cause little damage to the tree (Fig. 2A). However, *B. dothidea* can become aggressively pathogenic in drought stressed trees. When that happens, necrosis can extend into the inner bark (Fig. 2B). Thus, *B. dothidea* is commonly present in older apple trees but can cause serious damage only when trees encounter stress conditions. Perhaps glyphosate alone can cause the injury that we are seeing, but we suspect that in many cases glyphosate and *B. dothidea* are acting together.

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Fig. 2: Superficial cankers caused by *Botryosphaeria dothidea* on trunk (A) and on limb (B), with the latter cut to show necrosis that extends into inner bark.

Management implications: Drastic changes in ground cover management are not warranted at this time because we still have no experimental evidence that glyphosate injury is at the root of the problem. However, if our hypotheses are correct, then the following precautions are worth considering:

- Glyphosate applications made after July 1st may be more likely to cause injury than those made during May and June because trees are more likely to be under stress conditions during summer and fall. Gramoxone may be a safer alternative for summer and fall sprays.
- If glyphosate is applied during late summer or fall, the lowest effective rate of glyphosate should be used, contact with the tree trunks should be minimized, and sprays should not be applied during periods when trees are likely to be water stressed (i.e., during drought periods or on very hot days).
- Read glyphosate labels carefully! Many different formulations are currently available, so anyone using 10-yr-old notes when adding glyphosate to their spray tank may be drastically overdosing their trees. Whether using glyphosate or gramoxone, always include a drift inhibitor in the spray tank to minimize the potential for unwanted drift of small spray droplets.
- Glyphosate should never be applied in orchards using controlled droplet applicators (CDA sprayers) because these applicators by definition generate small droplets that are prone to drift.

In summary, caution is advised when applying contact herbicides during summer or fall. Everything possible should be done to avoid contacting trunks with the herbicide sprays. Finally, we emphasize that the relationships between trunk cankers and herbicide injury or infection by B. dothidea remain to be proven. We will appreciate input from anyone who can contribute further information on occurrences and causes of the trunk canker problem in apples.❖❖

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–6/14):	1043	633
(Geneva 1/1–6/14/2003):	853	469
(Geneva "Normal"):	950	569
(Geneva 6/21 Predicted):	1231	773
(Highland 1/1–6/14):	1300	813

Coming Events:	**Ranges:**	
Oriental fruit moth 1st flight subsides	843–1297	493–823
Oriental fruit moth 2nd flight begins	1267–1565	784–1022
Pandemis leafroller flight peak	868–1050	505–601
Peachtree borer 1st catch	780–1338	445–829
Pear psylla 2nd brood hatches	967–1185	584–750
Rose leafhopper adults on apple	809–1053	440–622
San Jose scale 1st generation crawlers present	1033–1215	619–757
Spotted tentiform leafminer 2nd flight begins	944–1180	555–739
Apple maggot 1st catch	1187–1595	749–1033
American plum borer 1st flight subsides	1155–1555	694–1038
Obliquebanded leafroller summer larvae hatch	1038–1460	625–957

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PEST FOCUS

Geneva:
Obliquebanded leafroller trap catch increasing. Degree days (base 43°F) accumulated since 1st obliquebanded leafroller adult catch = 156. (300–340 DD_{43} = 1st hatch)

Highland:
Rose leafhopper nymphs observed. **Potato leafhopper** damage observed. First catch of **sparganothis fruitworm**, **tufted apple bud moth** and **variegated leafroller**.
Degree days (base 43°F) accumulated since 1st obliquebanded leafroller adult catch = 299. (300–340 DD_{43} = 1st hatch)

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	6/7	6/11	6/14
Redbanded leafroller	0.0	0.0	0.0
Spotted tentiform leafminer	2.4	4.1	9.0
Oriental fruit moth	0.0	0.0	0.0
Lesser appleworm	0.0	0.0	0.0
Codling moth	0.3	0.1	0.3
San Jose scale	0.3	0.0	0.7
Obliquebanded leafroller	0.9*	1.5	7.3
Pandemis leafroller	1.0*	3.5	2.2
American plum borer	0.8	1.3	0.5
Lesser peachtree borer	0.5	3.3	1.8
Peachtree borer	0.0	0.0	0.0

Highland, NY

	6/7	6/14
Redbanded leafroller	0.0	0.0
Spotted tentiform leafminer	46.8	80.3
Oriental fruit moth	0.0	0.0
Codling moth	0.0	2.1
Lesser appleworm	1.0	2.0
Obliquebanded leafroller	1.8	0.9
Sparganothis fruitworm	–	1.6*
Tufted apple bud moth	–	0.4*
Variegated leafroller	–	0.4*

* 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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