scaffolds

Update on Pest Management and Crop Development

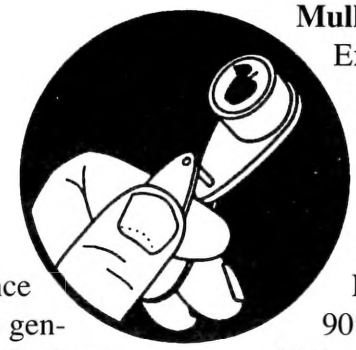
FRUIT JOURNAL

April 24, 2006 VOLUME 15, No. 6 Geneva, NY

INSECTS

BACK ON THE SCREEN

ORCHARD RADAR DIGEST



❖❖ Starting today, we're once again publishing pest predictions generated by the Univ. of Maine's Orchard Radar model estimation service, provided to us by Glen Koehler for Geneva. This pest management tool uses commercially available weather data as an input for apple pest occurrence and development models taken from many established university and practitioner sources. It's offered as another perspective on what's happening in the orchard to compare against our own record-generated advisories and, of course, personal observations from the field. We'll be printing only some of the short-term arthropod events; the full Orchard Radar product range covers disease and horticultural events as well. The public sites available for anyone to use are located at: http://pronewengland.org/Content/PROInfoDecisionModels.htm. Growers interested in exploring this service for their specific site may wish to contact Glen personally (gkoehler@umext.maine.edu).

Geneva Predictions:

Roundheaded Appletree Borer

RAB adult emergence begins: June 2; Peak emergence: June 16.

RAB egglaying begins: June 11. Peak egglaying period roughly: July 1 to July 15.

Lesser Appleworm

1st LAW flight, first trap catch expected: May 13; Peak trap catch: May 24.

Mullein Plant Bug

Expected 50% egg hatch date: May 22, which is 4 days before rough estimate of Red Delicious petal fall date.

The most accurate time for limb tapping counts, but possibly after MPB damage has occurred, is when 90% of eggs have hatched.

90% egg hatch date: May 26.

Obliquebanded Leafroller

1st generation OBLR flight, first trap catch expected: June 13.

Oriental Fruit Moth

1st generation OFM flight, first trap catch expected: May 4.

Optimum 1st generation first treatment date, if needed: May 5.

continued...

IN THIS ISSUE...

Redbanded Leafroller
Peak trap catch and approximate start of egg hatch: May 6.

San Jose Scale
First adult SJS caught on trap: May 20.

Spotted Tentiform Leafminer
1st STLM flight, peak trap catch: May 13.
1st generation sapfeeding mines start showing: May 25.
Optimum sample date is around May 26, when a larger portion of the mines have become detectable.

White Apple Leafhopper
1st generation WALH found on apple foliage: May 17.

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BEES' NESTS, AS USUAL

MUST BEE TIME: HONEY BEES AND POLLINATION
(Nick Calderone, Entomology, Ithaca)

PART I: GETTING THE MOST POLLINATION FOR YOUR DOLLAR

❖❖ Tree fruits, small fruits, and many vegetable crops, especially many of the vine crops, all require pollinating insects for a successful harvest. Remember! Not only is pollination important for a high yield, it is just as important for fruit size, shape and sweetness. A number of insects pollinate crops; but, for several reasons, the honey bee is the most versatile pollinator. Honey bees are available in large numbers throughout the growing season, they pollinate over 90 commercial crops, they are easily transported by truck, and they can be easily distributed throughout large plantings. In addition, they restrict their foraging activities to a single species on any given trip to the field. Compared with other pollinators, honey bees are very cost effective. A single strong, two-story colony provides 15–25 thousand foragers.

How many colonies

New York growers have traditionally used about one colony of bees per three acres for apple pollination. This number may have been adequate in small orchards visited by feral honey bees and by solitary bees and bumble bees from adjacent hedgerows and woods. However, wild honey bee populations have been greatly reduced by parasitic bee mites, and modern agricultural practices have eliminated many natural nesting sites for solitary bees and bumble bees. In addition, the flight range of solitary bees is not generally sufficient to ensure coverage of the interior portions of large plantings. Growers with large blocks of apples and other tree fruits may wish to increase the number of hives to one per acre. Modern cultivars with high blossom densities, such as trellised apples, also require more pollinators. If your fruit set has been lower than expected in the past, or your fruits are lopsided or misshapen, you probably need to use more bees.

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Remember, if your fruit set is too high, you can always thin, but if it is too low, you are just out of luck. Move bees into apples, regardless of variety, right before the king blossoms begin to open.

Special requirements

Most other crops are adequately served by a single strong colony per acre; however, some crops have special requirements. Red Delicious apples have a flower structure that is different from that of most other common varieties such as McIntosh. The anthers on Red Delicious flowers are widespread, and bees learn to insert their mouthparts between them to obtain nectar. Consequently, the bees do not contact the flower's sexual parts and pollination does not take place. Since it takes time for bees to learn to obtain nectar in this way, you can counteract this problem by using more colonies per acre to increase the number of inexperienced bees in the orchard. Up to two colonies per acre may be needed in large stands of Red Delicious apples.

Pollination of pears will probably always be a problem because pear nectar contains only about 15% sugar versus 40% for apples, dandelions, and yellow rocket. The answer is to move the bees into the center of the pear block when the pears are at 50% bloom. It will take some time for the bees to discover better sources farther away, and in that time, the pears may be adequately pollinated. An alternative is to use more colonies per acre, which will increase the number of bees foraging within the orchard. Sweet cherries should be pollinated soon after they open. Therefore, bees should be moved in the day before bloom. Since sweet cherries require a high fruit set for a commercially viable crop, and since they bloom early in the season when the weather is often unfavorable for foraging, two colonies per acre may be required. Research at the Geneva Experiment Station has shown that strawberries benefit substantially from having hives of bees in the field during bloom.

Hive Placement

To obtain maximum benefit for your pollination dollar, always select good locations for the bees you rent. A good location slopes slightly to the south, is protected from the prevailing winds, is dry, and has as much exposure to sunlight as possible. It is important that colonies of honey bees be kept in full sunlight in order to warm the hives rapidly in the morning and entice the workers out of the hives on chilly spring mornings. Entrances should face south to southeast whenever possible.

Keep colonies on pallets or cinder blocks to keep the bottom boards 4–8 inches above the ground. Hives with wet bottom boards will be cooler and have less foraging activity than dry colonies. A hive stand will also keep colonies above tall grass, which may shade or block the entrance. Place colonies in groups of 4–6 to take advantage of good locations. In large orchards and fields, groups of 10–20 hives can be used to take advantage of prime locations. It is best to locate hives near pollinizer rows where that consideration applies, such as with apples and sweet cherries.

Pesticides

Overall, pesticides are less of a problem to bees and beekeepers today than they were 10 and 20 years ago. Nevertheless, serious poisoning incidents still occur. It is important to read the pesticide label and to avoid using materials that are especially toxic to bees when there is a safer alternative available. Sevin (carbaryl) and Guthion (azinphosmethyl) are especially toxic to bees.

You can eliminate most pesticide damage to bees by following a few simple rules. Never apply pesticides to flowers in bloom, as this will contaminate the pollen and nectar collected by the bees. Unfortunately, pesticides often drift onto non-target crops and weeds, and honey bees are poisoned when they ingest the contaminated pollen and nectar. Therefore, do not apply pesticides when there is a danger of drift. Keep flowering ground-cover plants mowed if you are going to spray in an orchard during the summer. Clover and dandelions

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are a common problem for bees on orchard floors. If mowing is not possible, use an herbicide for control.

Bees can also be poisoned when they collect water from sources that have been contaminated by drifting pesticides. Standing water in wheel ruts or old tires near your fields are prime sources of contaminated water. Provide a source of clean water near the hives. A wash tub filled with fresh water and straw works well. The straw gives the bees a place to land and drink without drowning.

You can minimize the dangers from drift by restricting spraying to periods when the winds are less than 5 mph. If possible, begin to spray in the evening, about an hour before sunset, because there is generally little wind at that time. Always use the largest droplet size possible when spraying, and check out the use of spray stickers to help minimize drift. Always dispose of empty pesticide containers in an appropriate manner. Remember! If too many bees are killed, your crops will not be adequately pollinated, and it may be necessary to rent more bees.

General Recommendations

Bees should be moved at night, and once the hives have been placed on location, they should be left there until the job is done. Moving bees in the daytime and moving them short distances at any time (less than 3 miles as the crow flies) will result in a serious loss of foragers and seriously damage the colony. Always contact the beekeepers if the need arises to move the bees. If you live in an area with known bear problems, use an electric fence to protect the bees. Keep nearby flowering plants mowed to reduce competition for the bees' attention.

The Beekeeper

I recommend establishing good working relations with several beekeepers to ensure that you have a ready supply of bees for pollination. Any individual beekeeper's situation may change over time, but if you work with several beekeepers, you should always have access to an adequate supply of colonies.

Availability and Pollination fees

During the past 5–6 years, beekeepers have learned a lesson all too familiar to most farmers: eventually, pests become resistant to pesticides. Today, honey bee colonies are often infected with strains of parasitic mites that are resistant to one or more pesticides, making control unpredictable or impossible. This fact has contributed to the high losses reported over the last several years. Almond growers in California are desperately trying to attract beekeepers for pollination. In addition to the $150.00+ offerings per colony, some growers are also willing to pay trucking fees to bring in bees from around the country. Growers should expect to pay a premium for colonies this year. The best strategy is to lock in your spring pollination needs towards the end of the previous year. Prices and availability are volatile, so a contract will help to ensure that you get the hives you are expecting, when you are expecting them and at the price you are expecting.

It is wise to make payment schedules contingent on colony strength, with stronger colonies commanding higher rental fees than weaker ones. A good method is to specify a base price to be paid for a colony of a specified strength — measured in terms of combs of bees and combs of brood. Bonuses and penalties can be based on deviations from those specifications. Remember! The best deal may not always be the cheapest deal.

Expectations

Remember! Bees are an essential part of your crop production system, but they are only one part. In many ways, they are like the fertilizers and chemicals that you buy. Each is essential, but none of them, by themselves, can guarantee a crop. Many things influence the quantity and quality of your crop. One is the weather. Bees will visit flowers and pollinate only if they can fly. Cool, rainy, and windy weather will delay, slow, or stop flight, and the beekeeper cannot do anything about the

weather. Excessive heat during the summer can cause problems with fruit set in certain crops, like pumpkins. Again, this is beyond the beekeeper's control. Be clear up front about your expectations concerning the strength of the colonies you rent, and satisfy yourself that you have received what you expected. This will eliminate misunderstandings down the road.

TIP

Planning a new orchard? Be sure to determine if your main cultivars are self-sterile - like McIntosh and Red Delicious apples — or, worse yet, self-sterile and inter-incompatible, like many popular cultivars of sweet cherries. If so, be sure to plant an adequate number of pollinizer cultivars. Be sure you select compatible pollinizers that bloom at the same time as your main variety. If you do not have pollinizers in your self-sterile stands, you can purchase compatible pollen and hive inserts, and let the bees you rent for pollination distribute the pollen from the hive to the blossoms.❖❖

PART II: Honey bees, Rental Fees, and Pollination Contracts

❖❖ Making a decent living from farming demands close attention to costs, and it is only reasonable that a grower should seek out the best price for each of the inputs that go into his or her crop production system. When it comes to honey bees, however, most growers understand the need for quality hives, but they don't have the expertise to assess that quality. Most growers don't look inside the hives to see what they are renting, and even if they did, most wouldn't know a good hive from a bad hive. *The result is that* the emphasis is usually on unit cost or number of boxes, rather than the actual value of the hive. This is not the best strategy for ensuring adequate pollination.

The best way to ensure the quality of the hives you rent is to spell out specifications for colony strength, payment fees and schedules, bonuses and penalties in a contract with the beekeeper. When you get the bees, take the time to inspect them to make sure that they meet the agreed upon specifications. You may need to hire an independent beekeeper to do this. The other thing you can do to ensure a sustainable supply of high quality honey bees for pollination is to pay well. That's right! Don't shop the bargain basements. It pays to pay top dollar for the top hives. If you make it possible for a beekeeper to make a living without cutting corners, you both win in the end.

A contract is less a matter of trust and more a matter of memories, which often fade after a few months. A contract should be drawn up several months before the bees are needed and should, at a minimum, address the following items:

1. Contact information.
2. Arrival/departure dates.
3. Delivery locations (if the beekeeper is not familiar with your operation, specify that a grower representative will meet the beekeeper at the delivery site and see to it that the bees are placed at the right locations using reasonably well maintained roads).
4. The % of hives the grower will inspect (beekeeper is encouraged to participate).
5. Bonuses for hives placed in areas that are hard to reach.
6. Accommodations for helping with trucks that become stuck.
7. Accommodations for legitimate problems, like truck breakdowns, that arise from time to time (ask that the beekeeper stays in communication with the farm starting at least a month before anticipated delivery date).
8. Definition of a base unit and a fee for a base unit. A reasonable base unit is a colony with 6–7 deep frames of brood and 8 deep frames of bees.
9. Fee schedule:
   0–3 frames brood = $0.00
   4–5 frames brood and bees = 20% less than base
   4–5 frames brood with a full box of bees = base rate
   6–7 frames of brood and 8 combs of bees = base rate

continued...

8–10 frames of brood and full box of bees = 20% above base rate

10. In addition to the single story hive spelled out above, the colony should have an empty brood chamber and maybe a medium honey su per. This will give the bees room to grow, and that's what makes them collect pollen.
11. Bear fences if supplied by the grower: deduct set amount per fence.
12. Bear fence if supplied by the beekeeper: add set amount per fence.
13. Responsibility for setting up electric fences, if needed, to protect against bear damage.
14. Responsibility for the cost of bear damage.
15. Payment schedule: e.g., pay 1/3 upon delivery, 1/3 within 2 weeks of departure, and 1/3 within the next 30 days.
16. Penalty schedule for late payments: e.g., if grower fails to pay on time, add 1/2% interest per month to the balance.

Remember! You can hold the beekeeper to a high standard if you pay a reasonable fee, and, in return, the beekeeper will be more than happy to do whatever it takes to keep your account. That is all part of sustainability.❖❖

PEST FOCUS

Geneva:
1st **spotted tentiform leafminer** trap catch 4/20.

Highland:
1st **spotted tentiform leafminer** trap catch week of 4/17–4/21. Pear psylla 1st instar nymphs observed on pear foliage.

DON'T ASSAIL US, PLEASE

TARNISHED IMAGE
(Art Agnello, Entomology, Geneva)

❖❖ Not one, but two errors concerning tarnished plant bug recommendations to report:

• Last week's Scaffolds article on pink pests contained a possible error, depending on how it was read, regarding early season use of Assail. Poor wording might have given the impression that Assail is labeled on stone fruits (it isn't) and has tarnished plant bug on the label - it does not, but when applied in pome fruits during bloom, it will help in the incidental control of any TPB that might be there.

• In the 2006 Recommends (p. 127), Actara is included in the list of recommended materials for TPB in apples; however, this pest is not on the Actara label (although mullein plant bug is). So, if you have the former rather than the latter bug in your apples, Actara cannot be legally recommended for use.

We regret the error in both instances.❖❖

EASTERN NY

APPLE SCAB ASCOSPORE MATURITY COUNTS
(Kevin Iungerman)

❖❖ Leaf sample from Peru (Champlain Valley) collected on Wednesday April 19 when trees were at quarter-inch green showed the following:
82% immature spores, 18% mature spores, no empty asci, 143 spores in the tower discharge test.

These results indicated that significant spore discharges were likely to occur with the next rains (which occurred over the past week-end).
❖❖

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	4/17	4/20
Green fruitworm	0.4	0.5
Redbanded leafroller	2.9	3.7
Spotted tentiform leafminer	0.0	2.7*

* first catch

Highland, NY

	4/24
Green fruitworm	0.5
Redbanded leafroller	–
Spotted tentiform leafminer	9.5

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–4/24/06):	260	109
(Geneva 1/1–4/24/2005):	197	92
(Geneva "Normal"):	205	96
(Geneva 1/1–5/1 Predicted):	295	116
(Highland 3/1-4/24/06):	261	130

Coming Events:	Ranges(Normal±StDev):	
Green fruitworm flight subsiding	234–462	102–242
Pear psylla 1st egg hatch	174–328	60–166
STLM 1st oviposition	143–273	58–130
Obliquebanded leafroller larvae active	158–314	64–160
Comstock mealybug 1st gen. crawlers in pear buds	215–441	80–254
European red mite egg hatch	231–337	100–168
Oriental fruit moth 1st catch	204–384	81–205
Redbanded leafroller 1st flight peak	232–380	104–192
Rose leafhopper on multiflora rose-1st nymph	239–397	96–198
Lesser appleworm 1st catch	245–550	108–292
Spotted tentiform leafminer 1st flight peak	253–407	113–209
McIntosh at half-inch green	153–197	65–91
McIntosh at tight cluster	196–254	84–122

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PHENOLOGIES

Geneva:

	4/24	5/1 (Predicted)
Apple(McIntosh):	tight cluster	pink
Apple(Red Delicious):	tight cluster	pink
Apple(Empire):	tight cluster	pink
Pear:	early white bud	white bud – bloom
Sweet cherry:	early white bud	bloom
Tart cherry	bud burst	white bud
Plum:	early white bud	bloom
Peach:	pink	bloom

Highland:
Apple (Ginger Gold): early King bloom
Apple (McIntosh): late pink
Apple (Empire): late pink
Apple (Golden Delicious/Red Delicious/Honeycrisp): early pink
Pear (Bartlett): 30% bloom
Pear (Bosc): 5% bloom
Peach: full bloom
Plum (Stanley): full bloom
Plum (Italian): full bloom
Sweet cherry: white bud – full bloom
Apricot: fruit set, shucks on

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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