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Weekly Update on Pest and Crop Development

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

May 11, 1992 VOLUME 1 Geneva, NY

INSECTS

BEES

INCREASING BEE POLLINATION EFFICIENCY

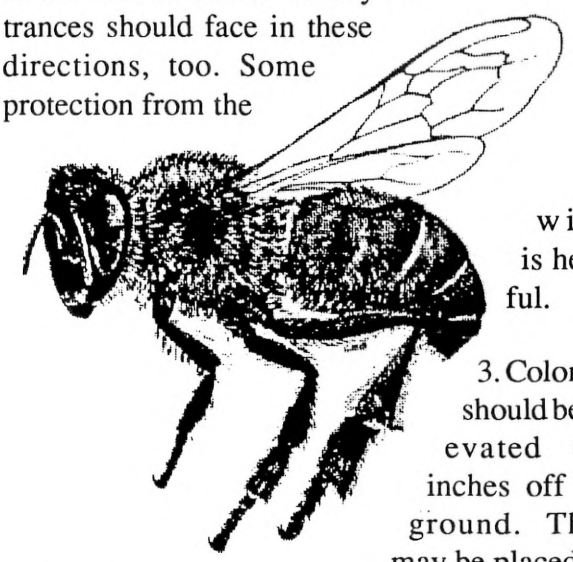
(Roger Morse)

❖❖ During the past 25 years, three new diseases of honey bees have been found in North America. Two of these were accidentally introduced from Europe, and one from Asia. We estimate that we have lost half of our colonies of honey bees in the U.S. since 1986 as a result of one of these diseases. The mites that cause this disease can be seen only with a microscope. They infest the breathing tubes of honey bees. Migratory beekeepers with southern operations have been able to make up these losses by growing new bees in February and March in the southern states. Many northern beekeepers have been splitting colonies and buying queen bees for the new units from the south. It is generally agreed that colonies that have been rented for pollination across the U.S. during the past few years have not been as strong as we would like. Equally important is the fact that the majority of feral colonies, those that live in hollow trees and buildings, have perished as a result of mite damage. Feral colonies have been very important to small orchards in past years, especially those in urban areas. In many places, feral colonies are numerous and provide large numbers of bees for pollination.

The new diseases that have been found recently mean that the routine management we give in placing and managing colonies for pollination in orchards becomes even more important. The guidelines are simple, but care and timing must be considered. The following points are especially critical:

1. Honey bees are able to detect differences in the quality of the food they collect. They will go to the plants with the highest sugar concentrations in the nectar and the greatest quantities of pollen. Dandelions and yellow rocket have nectar just as rich as that of apple. Orchardists should mow flowering weeds in orchards or kill them with a weed killer. Weeds in fields adjacent to orchards can pose problems too, as they may attract bees away from the trees to be pollinated.

2. Colonies of honey bees in orchards should be kept in full sunlight so as to warm the hives rapidly in the morning and to get the worker bees out of the hives. We suggest placing colonies in groups of 3-5, so as to take advantage of the best locations. Good locations for bees should slope to the east or south. Colony entrances should face in these directions, too. Some protection from the wind is helpful.



3. Colonies should be elevated 6-8 inches off the ground. They may be placed on pallets, cinder blocks, old tires, or any objects that will keep the bottomboards off the ground.

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Colonies with wet bottomboards will be cooler and this can slow flight. Some kind of hivestand will also keep colonies above the growing grass that may shade or block the entrance.

4. Bees often collect large quantities of water that they use to dilute honey they feed to their young. Water contaminated with pesticides can pose problems. It is not practical to carry sufficient water into an orchard to water bees. It is likewise not practical to fill all wheel ruts and holes with dirt or sand and to force the bees to forage outside of the orchard for water. Growers must understand that if bees are collecting contaminated water, there will be some that will be killed. One can determine if the situation is serious by counting the number of dead bees found in front of a hive in the morning; any number above 10 may be a problem. If the number is too high, it may be necessary to rent more bees. Beekeepers expect some losses of this nature and figure this into their rental fee.

5. Pesticides are less of a problem for bees and beekeepers today than they were 10 and 20 years ago. However, it is still important to read the label and to avoid using materials that are especially toxic to bees. Most honey bee pesticide losses occur when pollen is contaminated. Avoid spraying at a time when flowers, including weeds, are open and attractive to bees.

6. Red Delicious and a few other apple varieties have flower structures that are different. Their anthers are widespread, and bees learn to insert their mouthparts between the anthers to obtain nectar. In this way, the bees do not contact the flower's sexual parts and there is no pollination. It takes time for bees to learn to obtain nectar in this way. In the case of Red Delicious, the only answer appears to be to increase the number of colonies in the orchard so as to increase the number of naive bees that have not yet learned to visit flowers in this way.

7. In practice, New York growers are using about one colony of bees per 3 acres for apple pollination. This number may be adequate in small orchards, where there may be more nearby feral honey bee colonies, and solitary and subsocial bees, such as bumble bees, in adjacent hedgerows and woods. Where growers have larger blocks, they may care to increase the number of colonies to one per 2 acres, especially in light of the new disease problems.

8. Pear pollination will probably always be a problem, since pear nectar, on average, 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 in full flower. It will take several hours for the bees to find there are 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 naive bees.

9. Bees will visit flowers and pollinate only if they can fly. Cool, rainy, and windy weather will delay, slow or stop flight. In many years, it is warm during bloom and bees may over-pollinate and growers must thin. Unfortunately, we cannot predict the weather. For all the above reasons, we suggest it is best to contract for bees for pollination well in advance of the time the colonies will be needed.

Note to blueberry growers: The following varieties have flower bud structures that tend to cause a lower pollination efficiency. Use 2 hives/A in these cases: Stanley, Concord, Berkeley, Coville, Elliott, and Earliblue. ❖❖

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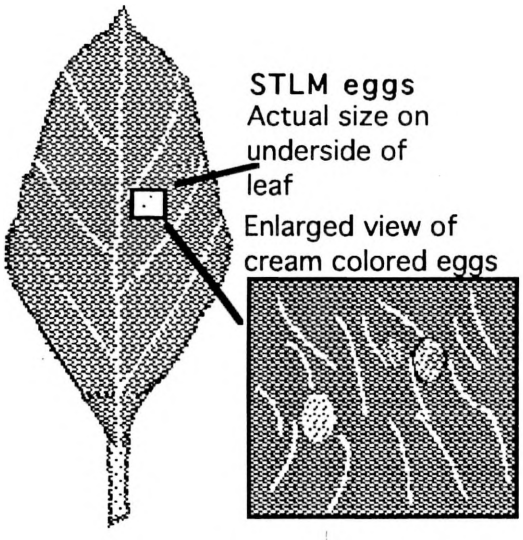
SCOUTING

SCOUT APPLES AT PINK AND BLOOM FOR STLM & OBLR

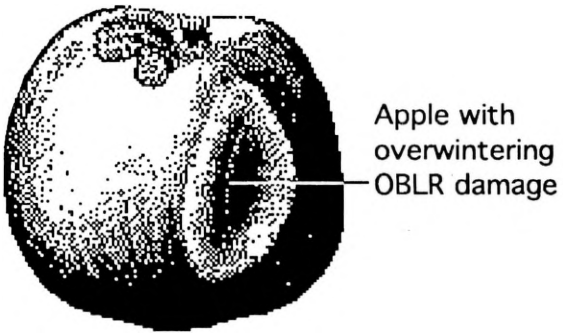
(Art Agnello)

❖❖The STLM moths that overwintered as pupae have been flying since the Green Tip to Half-Inch Green stage, and egg-laying begins as soon as the first leaves are folded back at Tight Cluster. Most of the eggs are deposited by the late Pink to early Bloom period. The objective of this scouting session is to assess the egg numbers in the block as late as possible during Pink, while still allowing enough time before Bloom for a spray, if necessary. If eggs are not sampled now, a decision on 1st generation control can still be made at Petal Fall by sampling sap-feeding mines.



Eggs are small (1/10 inch in diameter), oval, and creamy to transparent in color. They are laid on the undersides of the leaves, and are more difficult to see on cultivars with hairy foliage, such as R. I. Greening, than on smooth-leaved cultivars. Start near one corner of the block, and proceed across the block until you have sampled enough trees to reach a decision. Sample from trees that are representative of the entire block. Use the sampling procedure in the 1992 Recommends (see pp. 46, 57, or 182) to determine the need for a pink spray of a material such as Vydate or a pyrethroid.

The OBLR adults from last year's final OBLR flight laid eggs that hatched into larvae, which passed the winter in hibernation sites on the twigs or bark. These larvae begin feeding on developing fruit buds in the spring (in fact, larvae were reported feeding on Ida Red buds in the Half-Inch green stage near Albion on 4/28); many of the damaged fruits drop prematurely, but a small percentage remain on the tree, exhibiting deep corky scars and indentations at harvest. Bloom is the best time to determine whether infestation levels are high enough to include an OBLR material in your Petal Fall spray.



Examine up to 10 bud clusters (especially inside the flowers) or expanding terminals per tree for live OBLR larvae, starting with a random tree and continuing down the row, until you have sampled 10 trees. It is not necessary to pick the clusters or terminals. Do not count actual numbers of larvae in an infested cluster; do not count damaged clusters that have no OBLR in them, or clusters containing only dead OBLR. To maintain a fair sample, choose half of your clusters or terminals from inside the tree canopy, including some watersprouts, and the other half from near the outside of the canopy. Try not to "pick out" clusters that are damaged for your inspection; OBLR can be found in almost any tree, and your objective is to determine representative infestation levels. Use the sequential sampling procedure found in the 1992 Recommends (see pp. 48, 59, or 183), which uses a 3% infestation threshold for a decision on whether to include an OBLR material such as Lannate, Lorsban, a pyrethroid or a B.t. product in your petal fall spray. ❖❖

HORTICULTURE

WEEDS

LATE SPRING WEED CONTROL
(Ian Merwin)

❖❖ May is a time when most fruit growers are preoccupied with early season insect and disease control, and weeds are often at the low end of their worry list. However, fruit tree root growth and nutrient uptake precede visible leaf growth and bloom in the spring. In fact, the early months of the growing season may be the most important time to control weeds and orchard groundcovers. Orchard soil water reserves are usually fully charged in late spring, and gradually dry down during the summer because plant uptake exceeds rainfall inputs. Most fruit trees can tolerate soil water deficits without visible injuries; but renewal of the bearing surface, fruit set, fruit cell division, and flower initiation for next year's crop are all happening at the same time during early summer. These important processes are quite sensitive to drought stress even in mature trees. Newly planted or non-bearing fruit trees are especially vulnerable.

In non-irrigated orchards, you can help postpone the onset of drought stress by conserving the spring soil water reserves so they are available to fruit trees instead of the grass or weeds. For those of you using glyphosate (Roundup), early summer is the safest and most effective time to apply this herbicide, since it is less likely to translocate and injure other parts of the tree if it accidentally drifts onto the new foliage. Many of the most troublesome orchard weeds have already developed enough foliage for effective uptake and control with glyphosate in late May. Some of you may prefer to apply pre-emergence herbicides during the previous fall or in early spring. While this is a very effective way to minimize weed competition with trees during the critical early summer months, you may also have lost substantial amounts of your orchard topsoil during this spring's heavy rains. Applying post-emergence herbicides in the late spring also allows the weeds to help soak up access soil water in poorly drained sites, which can reduce the incidence of Phytophthora root rots.

During bloom, it is important to keep the orchard floor mowed so the honeybees will not be distracted from the fruit-tree flowers. Mowing the orchard floor will also reduce groundcover water consumption and nitrogen competition slightly, but it is not as effective as herbicides, mulching, or cultivation. The greatest benefit in regular mowing is probably that it suppresses tall perennial weeds such as goldenrod, milkweed and poison ivy, and encourages a more healthy sodgrass on the orchard floor.

We are fortunate to have a variety of labelled herbicides and other effective weed management strategies for tree fruits in New York. Now is the time to review your weed control options, and take appropriate measures before weed competition stunts your young trees and reduces the quantity and quality of this and future year's crops. ❖❖

DISEASES

CHERRIES

CHERRY LEAF SPOT
(Wayne Wilcox)

❖❖ This is the annual reminder that "opening day" for cherry leaf spot season is petal fall. Recall that, similar to the apple scab fungus, the leaf spot fungus overwinters in diseased leaves on the ground, and causes primary infections by releasing ascospores during rainy periods (in this case, from about the time of petal fall until midsummer). Secondary spores are then produced in the primary infection sites, and new infections can occur throughout the summer as the secondary spores are washed around during rainy periods. Epidemic development (the kind that causes early defoliation) is due to a "snowballing" effect, as more and more inoculum is produced from more and more infection sites when repeated infection periods occur throughout a wet summer. A sort of "Mills table", showing the approximate number of hours of continuous leaf wetness required to produce light, moderate, and heavy leaf spot infections, is included in this year's "Recommends" on pg. 82.

As with apple scab, the intensity of control programs in the early part of the season (primary infections) should be determined by a combination of weather and the amount of overwintering inoculum. Fortunately, last year's relatively dry weather—and better cherry prices—provided the right set of conditions for getting leaf spot back under control after the two previous epidemic years. Although this means that primary inoculum levels are relatively low in many orchards, growers and advisors should also remember how quickly a few primary infections can "explode" if wet summer weather favors secondary spread. In other words, good control last year provides a little cushion this year, but don't push it too hard. Finally, think back to the poor crops we've seen in "low maintenance" cherry orchards the last two years, and remember that epidemic leaf spot development REALLY DOES cause a significant reduction in return bloom and winter hardiness. No need in overspraying when disease pressure is low, but think about next year's crop if we get into a wet season and you get tempted to cut too many corners.

Recommended fungicides and rates are listed on pp. 76-77 of this year's "Recommends". Note that dodine (Syllit), Rubigan, and Nova all have kickback activity, which may be important in some circumstances. Captan's hard to beat as an all-purpose protectant for both leaf spot and brown rot (with the obvious exception of sensitive sweet cherry varieties), ferbam's also effective but messier and more expensive. If you end up needing a dicarboximide fungicide (Rovral, Ronilan) for brown rot control, remember that Rovral gives pretty good leaf spot control by itself, Ronilan doesn't. Sulfur's cheap and a lot better than nothing, but don't expect miracles; tighten up the intervals and keep the rate of the wettable formulations up to 6 lb/100 gal in pressure situations.❖❖

NOTE ON CAPTAN RATES FOR STONE FRUITS

In New York, captan has traditionally been tested and recommended on all stone fruit crops at a rate of 2 lb of 50WP formulation/100 gal dilute basis. However, the current label specifies a DIFFERENT PER-ACRE RATE for EACH of our major stone fruit crops, with no provision for differences in tree size: 4 lb/A for cherries, 6 lb/A for plums and prunes, and 8 lb/A (!) for peaches. All rates are for the 50 WP formulation, 80WP rates are reduced accordingly.

Since the label is the law, these are the only rates that can be legally applied. We will try to get approval for use of more realistic rates on peaches, but growers should be sure to take note of and observe the 4 lb/A limitation on cherries.

APPLES

APPLE SCAB
(Wayne Wilcox)

The last 3 weeks' ascospore maturity determinations:

			Maturity category (%)				
DATE	LOCATION	DD(32)	1	2	3	4	5
4/23	Geneva	69	51	11	11	27	<1
4/30	Geneva	166	39	9	9	38	5
5/6	Geneva	281	27	10	13	45	5

DATE	DISCHARGE TEST
4/23	30 spores/LP field
4/30	46 spores/LP field
5/6	108 spores/LP field

The degree-day model, maturity determination tests, and tree phenology all tell us that in terms of primary inoculum availability, we are now entering the "heart" of scab season. Oh yeah, I forgot to include previous experience and common sense.❖❖

FIELD NOTES

Hudson Valley Lab, Highland
(Dave Rosenberger, Dick Straub):
Phenologies, May 11:

Apples	McIntosh	20% Bloom
	Delicious	King Bloom
Pears	Bartlett/Bosc	Full Bloom
Plums	Stanley	70% Petal Fall

INSECT TRAP CATCHES - Pheromone Traps

	5/6	5/7	5/8	5/11
Spotted Tentiform Leafminer	2	7	34	72
Redbanded Leafroller	2	0	0	7
Oriental Fruit Moth	0	2	11	48

A DEAD HORSE??

I think it was my grandfather who first told me the old story about a parsimonious neighbor who was frequently dogged by just plain bad luck. This fellow often complained about the amount of money he spent feeding his workhorse. After years of complaining, he hit on a simple strategy to reduce costs: he would train the horse to eat less by gradually reducing the horse's rations. Several months later, he reported that his training strategy had worked perfectly. He had managed to reduce his feed costs several fold. But his usual bad luck was following him because just when the strategy started paying off, his horse died.

Some fruit growers have adopted similarly illogical strategies for reducing pesticide costs in their orchards. The old concept that one can always get away with cutting the recommended rates has now been COMBINED with the newer concepts of alternate-row spraying and using tree row volume (TRV). For example, a grower may use TRV to determine that the dilute-base equivalent for his trees on M.26 rootstock is 125 gal/A. From experience, the grower knows that 1.5 lb/100 gal is the appropriate dilute rate for mancozeb when it is used alone to control apple scab. He puts 1.5 lb mancozeb per 100 gal of water into his spray tank, but then decides that his sprayer calibration and travel speed work out best for applying 100 gal/A. He decides that cutting the rate a little bit by spraying just 25 gal/A less than the TRV-suggested 125 gal/A really won't make much difference. (He's always gotten by cutting rates before.) Finally, because he has a big sprayer and it is early in the season, he decides that he can spray alternate row middles. As a result, he actually applies only 50 gal of spray solution or 0.75 lb of mancozeb per acre on trees that require 1.88 lb/A for full protection (fungicide rate of 1.5 lb/100 times 1.25 which is 125 gal/A). His application rate is off by 60% from recommended rates, but he has saved money on spray materials (for the moment, at least).

Some of the myths involved in this approach to saving on pesticide bills include the following:

MYTH #1: "It never hurts to cut the rates a little below recommendations." This myth made sense in the stone-age before IPM and TRV because back then all recommendations were formulated to cover the worst-case scenarios. With new pesticides (like SI fungicides) and with older pesticides and rates adjusted for TRV, the rate-cutting has already been incorporated into the bottom line. You might still get by cutting rates on some pesticides, but don't call the vet (or your fruit extension agent) when the horse dies.

MYTH #2: "Alternate-row spraying means using a normal spray interval (7-10 days for primary scab on apples) and applying half of the TRV-calculated rate of material per acre in each spray." The fact is that alternate-row spraying as developed in Pennsylvania required more frequent applications (4-7 days for primary scab) to compensate for the lower rate of pesticide being applied in any given application. The advantage of alternate-row spraying was that it allowed growers to cover their orchards quickly and provided for more

regular renewal of fungicide and insecticide sprays. In New York, alternate row spraying has been bastardized to mean driving every-other row middle (and thus spraying half as much material per acre as compared to driving every row) while maintaining the spray interval suggested for a full every-row spray. The fact is that if pesticides are used at TRV rates, then the grower using alternate-row spraying has the following two options: He can either double the rate of material in the tank so that he applies the correct rate per acre, or he can shorten the spray interval so as to renew the pesticide residue on the trees more frequently. Doubling the rate of material in the tank makes sense on smaller trees where large air blast sprayers actually do cover two rows of trees. Shortening the interval between sprays is the best option for alternate row spraying on larger trees where coverage on the sides of trees facing into the unsprayed-row middles may be marginal.

MYTH #3: "I can see the spray plume going through the next row, so I know I'm getting coverage on two rows of trees when I spray alternate row." Evaluating spray coverage based on the visible spray plume is deceptive because the large droplets which carry most of the total pesticide load drop out of the air stream long before the finer droplets which reflect most of the light in the spray plume. Thus, even though your spray mist is getting the tree in the next row, those trees may be getting exactly what you are seeing—only a misting of pesticide.

The bottom line: Don't "starve your horse" by using an eclectic mix of old and new concepts to justify unrealistically low rates of pesticides. That isn't IPM and it won't save money in the long run. With integrated pest management, we have attempted to eliminate unnecessary pesticide applications and reduce excessive rates when they can be identified. Where pests are present and need to be controlled, there is nothing magical about IPM or TRV that will allow you to control the pests with sub-lethal doses of pesticides.

The very bottom line: The only way to KNOW that you are spraying correctly is to do the appropriate TRV calculations for you own orchards and then apply the correct amounts of pesticides using a properly calibrated sprayer.❖❖

PHENOLOGIES (Geneva)

Apple (McIntosh): early/mid pink
Pear, Plum: early white bud
Sweet Cherry, Peach: bloom
Plum: bud burst
Tart Cherry: white bud/bloom

PHEROMONE TRAP CATCHES
Number/Trap/Day, Geneva NY

	4/30	5/4	5/7	5/11
Green Fruitworm	0	0	0	0
Redbanded Leafroller	5.7	4.6	3.3	22.4
Spotted Tentiform Leafminer	476	632	713	881
Oriental Fruit Moth (apple)	0	0	0	39.6
Oriental Fruit Moth (peach)	0	0	0	0.1
Lesser Appleworm	0	0	0	1.0

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1-5/11):	258	113
Coming Events:	**Ranges:**	
Codling moth 1st adult catch	273-805	141-491
Green fruitworm flight subsides	244-448	119-251
Pear psylla nymphs present	297	154
Strawberry bud weevil (clipper) adults present	234-536	86-299
STLM sap-feeding mines present	295-628	146-325
White apple leafhopper 1st gen nymphs present	236-708	123-404
Apples (McIntosh) at bloom	310-425	152-225
Pears at bloom	242-402	117-225
Peaches at petal fall	257-734	131-353
Plums at petal fall	277-448	113-251
Sweet cherries at petal fall, Tarts at bloom	257-448	131-251

Note: For current information in your area of the state, check PEST STATUS under FRUIT on CENET.

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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