scaffolds Update on Pest Management and Crop Development

FRUIT JOURNAL

May 8, 1995 VOLUME 4 Geneva, NY

INSECTS

BEE WISE

MANAGING HONEY BEE COLONIES FOR MAXIMUM FLIGHT

(Roger Morse, Entomology, Ithaca)

❖❖ The increasing incidence of the "new diseases" of honey bees, chalkbrood, tracheal mites and Asian varroa mites, increases the importance of care and timing in placing and managing colonies for pollination in orchards. The following guidelines are especially critical. Honey bees will visit plants with the greatest quantities of pollen and the highest sugar concentrations in the nectar. The nectar of dandelions and yellow rocket is as rich as that of apple. Orchardists should mow flowering weeds in orchards or apply weed killer. Weeds in fields adjacent to orchards may also attract bees away from the trees to be pollinated.

Colonies of honey bees in orchards should be kept in full sunlight to warm the hives rapidly in the morning and entice the workers out of the hives. We suggest placing colonies in groups of 3–5 to take advantage of the best locations. Good locations should slope to the east or south with entrances facing in these directions and should be protected from the wind. Colonies should be placed on pallets, cinder blocks, old tires, or any objects that will keep the bottomboards 6–8 inches above the ground. Hives with wet bottomboards will be cooler, which slows bees' flight. A hivestand will also keep colonies above grass, which may shade or block the entrance.

Bees often collect large quantities of water to dilute the honey they feed their young. It is impractical to carry sufficient water into an orchard or to fill all wheel ruts and holes with dirt or sand and force the bees to forage outside of the orchard for water. But growers must understand that water contaminated with pesticides can kill bees that collect it. A problem exists if more than 10 dead bees are found in front of a hive in the morning. If too many bees die, it may be necessary to rent more bees. Beekeepers expect some losses and figure them into their rental fee.

Pesticides are less of a problem to bees and beekeepers today than they were 10 and 20 years ago. Nevertheless, it is still important to read the label and to avoid using materials that are especially toxic to bees. Honey bees are most often killed by pesticides when they ingest contaminated pollen. Avoid spraying when flowers, including weeds, are open and attractive to bees.

Red Delicious and a few other apple varieties have flower structures that are different from most other common varieties such as McIntosh. 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 no pollination occurs. It takes time for bees to learn to obtain nectar in this way. To counteract this problem, the number of colonies in the orchard must be increased so there are more bees that have not learned this technique.

New York growers currently use about one colony of bees per three acres for apple pollina-

continued...

tion. This number may be adequate in small orchards, which may be visited by feral honey bees and solitary and subsocial bees such as bumble bees from adjacent hedgerows and woods. Growers with larger blocks may wish to increase the number of colonies to one per two acres, especially considering the new diseases.

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 in full flower. It will take several hours for the bees to discover the 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.

Bees will visit flowers and pollinate only if they can fly. Cool, rainy, and windy weather will delay, slow, or stop flight. In warm years bees may overpollinate during bloom, and growers must thin the flowers. Unfortunately, we cannot predict the weather. For the above reasons, you should contract for bees for pollination well ahead of when the colonies will be needed.❖❖

WHAT'S BUGGING YOU?

MIRIDS NEAR
(Art Agnello & Dave Kain, Entomology, Geneva)

❖❖ There have been increasing incidences in recent years of severe damage to certain apples, especially Red Delicious, caused by phytophagous mirid bugs that are related to the tarnished plant bug. This is a complex primarily composed of mullein bug, *Campylomma verbasci* (Meyer) and apple brown bug, *Atractotomus mali* (Meyer). Until recently, most reports of fruit damage came from research orchards at the Geneva Station, but increasing numbers of commercial orchards are starting to be attacked; these species are already perennial pests in Canadian apple orchards, particularly in southern Ontario.

The two species exhibit some differences in life history and feeding habits. Mullein bugs (MB) are beneficial most of the year, when they act as predators of mites, aphids and leafhoppers. However, mullein bugs may feed on fruit for a breif period after petal fall. Damage is

continued...

scaffolds
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:

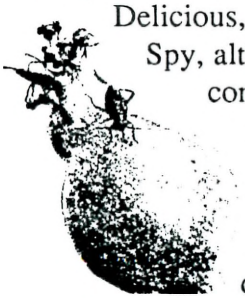
scaffolds FRUIT JOURNAL
Dept. of Entomology
NYSAES, Barton Laboratory
Geneva, NY 14456-0462
Phone: 315-787-2341 FAX: 315-787-2326
E-mail: art_agnello@cornell.edu

Editors: A. Agnello, D. Kain

This newsletter available on CENET, on the Tree Fruit News bulletin board under FRUIT and on the World Wide Web at: http://aruba.nysaes.cornell.edu:8000 under Station Publications.

often localized, but it may be quite severe. MB overwinters as an egg laid in the bark of the last season's growth. Eggs hatch during bloom and the nymphs may (or may not) feed on young fruit; most fruit injury occurs starting at this time. Apple brown bug (ABB) overwinters as an egg on the apple twig; the nymphs hatch during the bloom period and all hatching is completed by the petal fall stage. Adults first appear about 4 weeks after bloom, with peak numbers occurring about 2 weeks later, when males and females are equal in numbers. Oviposition occurs at this time, and the numbers of adults decline rapidly thereafter.

It is believed that the nymphs normally feed on phytophagous mites and other prey, and when these are absent the insect attacks young fruit. Initially, injury appears as a tiny pin prick on the fruit, surrounded by a water-soaked area that is not easily noticed. As the fruit enlarges, mirid injury forms a raised pimple on the surface of the fruit. This damage is most serious in early cultivars and Red Delicious, Golden Delicious and Northern Spy, although injury to McIntosh is becoming more common. Much of the injured fruit will drop with the June drop, but fruit remaining on the tree can be badly deformed. In some Station plots evaluated during the 1993 season, as much as 60% of all fruit harvested exhibited mirid damage, even in plots receiving normal pesticide sprays. ABB has one generation per year and MB two generations. Second generation MB do not damage the apple.



Canadian management guidelines call for monitoring to begin for MB nymphs during bloom and continuing at least once a week until 2–3 weeks after petal fall. Mullein bug nymphs, which are very small (smaller than an adult aphid) and fst-moving, can be detected by tapping limbs over a tray. Lining the tray with black cloth makes it much easier to see the tiny nymphs. There are no proven thresholds for MB control. However, a threshold of 3–5 nymphs per 25 tapped branches has been used in Ontario, although guidelines allow for the possibility of increasing this threshold if large numbers of alternative food sources (aphids or mites) are present. There is some debate over the choice of a pesticide for MB control. One opinion holds that mirids are tolerant to most conventional organophosphate materials and that a product such as Thiodan or Diazinon should be used; another school of thought maintains that OP's are perfectly effective, but timing of the spray with nymphal appearance is critical. Field trials we conducted last year using different materials at pink, petal fall, or both timings, gave inconclusive results because of unexpectedly low populations, so these trials will be repeated this year. However, as a best guess until further data is available, the most sensible approach in orchards with a history of this problem would be limb-tapping during bloom, and if warranted by a high nymphal count, a petal fall application that includes something besides the standard OP's, on the assumption that most local populations have already had considerable exposure to these materials.❖❖

SCAB

APPLE SCAB ASCOSPORE MATURITY

(Dave Rosenberger, Plant Pathology, Hudson Valley Lab)

	Imm	Mature	Discharged	Tower shoot
Peru:				
5/1	68%	32%	0.5%	820 spores
Highland:				
5/2	51%	37%	12%	>2000 spores

DISEASE UPDATE

APPLE DISEASE UPDATE

(Dave Rosenberger, Plant Pathology, Highland)

❖❖ Moderate daytime temperatures and cold nights have resulted in very slow bud development during the past week. By May 4, we had full king bloom on early-blooming cultivars such as McIntosh, good pollination weather, and

continued...

FIELD NOTES

good bee activity. Weather conditions from May 5–8 was too wet, cold, or windy to allow bees to work.

APPLE SCAB

In the Champlain Valley (Peru), ascospore maturity jumped dramatically since April 25 and economically important spore discharges can be expected with the next infection periods. In the lower Hudson Valley, we are now well into our peak risk period for apple scab. In the lower Hudson Valley, we had another light Mills' infection period Friday, May 5, with 16 hours of wetting at a mean temperature of 53 degrees. This morning (May 8), Gil Lasher at our local Agchem outlet reported that he had found a few scab lesions in a local orchard. These lesions most likely developed from infections that occurred April 21–22.

FIRE BLIGHT

Although we had a rain on Friday with Bartlett pears in full bloom, there was only a moderate risk of fire blight according to the MaryBlyte model. Temperatures during the rain were too cold to favor infection, and the degree-hour temperature accumulation prior to the rain was only 72% of what is needed to trigger a blossom blight infection period.

RUST DISEASES

The two most common rust diseases on apples are cedar apple rust and quince rust. Cedar apple rust causes yellow or orange lesions on both leaves and fruit of susceptible apple cultivars. Quince rust infects apple fruit, but not leaves.

Apple fruit are most susceptible to rust infections during the period from tight cluster through bloom. The tissue that will develop into the apple fruit is exposed just below the blossom and can become infected with rust as soon as the cluster leaves fold back from the flower clusters. However, in most years rust spores are not abundant until apples reach pink or full bloom. Wetting and temperature requirements for cedar apple rust infection are noted on page 42 of the 1995 Pest Management Recommendations for Commercial Tree-Fruit Production. When using the table, be sure to read the footnote. It indicates that the wetting durations listed in the table are the periods required for infection after (basidiospore) inoculum is available. However, in most cases, an initial 4 hrs of wetting is required for the galls on cedar trees to exude the gelatinous orange teliohorns and to produce basidiospores. After basidiospores are produced on the galls, the wetting period required for infection can range from 2 additional hours at 68–76°F to 24 additional hours at 36°F. Little cedar rust develops during wetting periods with mean temperatures below 46°F.

Wetting requirements for quince rust infection have not been clearly defined. However, I have only seen severe quince rust infections when extended wetting periods (at least 30 hours, usually >48 hrs) with moderate temperatures (50–75°F) have occurred between tight cluster and late bloom. Under these conditions, more than 50% of fruit on unprotected trees can develop quince rust. More commonly, 5–15% of fruit are affected. Delicious, Golden Delicious, Rome, and Cortland appear to be the most susceptible cultivars for quince rust in the Hudson Valley, but quince rust can occur on nearly all cultivars. Because of the limited period of susceptibility and the extended wetting period required for significant infection, conditions favoring severe quince rust infection occur only once every 5 to 7 years.

Unlike apple scab, none of the apple rust diseases have a secondary infection cycle. Primary lesions on apple fruit or leaves will never result in secondary spread to other apple leaves. All of the inoculum must come from cedar apple rust galls or quince rust cankers on cedar trees. After this primary inoculum is exhausted (usually about June 15 in the lower Hudson Valley), no further infections on apple can occur until the following season.

If ideal conditions develop for quince rust infections between the tight cluster and petal fall bud stages, growers using SI fungicides (Rubigan, Nova)

continued...

need to be especially cautious about spray timing. SI fungicides are less active against infections on fruitlets and flower parts than they are for infections on leaves. Quince rust may be especially difficult to control with SI fungicides if the SI's are used in an eradicant mode. I suspect that SI fungicides may eradicate quince rust infections if the fungicides are applied within 48 hours or perhaps even 72 hours after the beginning of the infection period. However, if applications are delayed until 96 hours, the quince rust fungus may have too much of a head start and infections may no longer be controlled by eradicant sprays.❖❖

PEST FOCUS

Geneva & Wayne Co.: Spotted tentiform leafminer eggs present. **European red mite** eggs beginning to hatch.
Highland: 1st **white apple leafhopper** nymphs observed. **European red mite** eggs hatching. 1st **spotted tentiform leafminer** sap-feeding mines observed.

CHEM NEWS

TERRAMYCIN USES IN N.Y.S.

(Craig Telgheder, Cornell Cooperative Extension, Hudson)

❖❖ The perennial question of the legal label uses of Terramycin (Mycoshield) in N.Y.S. has again come up. Here's a quick rundown of the legal uses of Terramycin in N.Y.S.

Pears — Fire blight. Data shows that Terramycin is not as effective as Streptomycin against fire blight on pears. It can, however, be useful as a resistance management strategy. During seasons that call for more than 3 strep sprays, it can be useful in rotation. That's if you can figure out you need more than three strep sprays by the time you need to make the fourth spray.

Peaches and Nectarines — The only antibiotic available for control of bacterial spot in N.Y.S. other than copper. Primarily a problem in Long Island and sporadically in the Lower Hudson Valley.❖❖

DISEASES

INSECT TRAP CATCHES (Number/Trap/Day)

Geneva NY

	4/24	5/1	5/8
Green fruitworm	0.3	2.7	0.8
Redbanded leafroller	1.0*	0.6	1.3
Spotted tentiform leafminer	157	371	349
Oriental fruit moth (apple)	0	0	8.9
Lesser appleworm	0	0.07*	7.5

HVL, Highland NY

	4/24	5/1	5/8
Green fruitworm	0.7	0	0
Redbanded Leafroller	10.4	8.7	0.8
Spotted tentiform leafminer	13.0	45.6	6.0
Oriental fruit moth	0	9.3	0.8
Fruittree leafroller	0	0	0.1*
Rose leafhopper nymphs	-	-	1.2
White apple leafhopper nymphs	-	-	0.1
European red mite motiles	-	-	0.1

* = 1st catch

(Dick Straub, Peter Jentsch)

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1 – 5/8):	290	124
(Highland 3/1 – 5/7):	324	130

Coming Events:	Ranges:	
Green fruitworm subsiding	170–448	75–251
Redbanded leafroller 1st flight peak	180–455	65–221
Spotted tentiform leafminer 1st flight peak	180–420	65–217
European red mite egg hatch complete	361–484	183–298
Obliquebanded leafroller overwintered larvae active	149–388	54–201
Tarnished plant bug adults active	71–536	34–299
White apple leafhopper nymphs present	236–708	123–404
San Jose scale 1st catch	189–704	69–385
McIntosh at bloom	310–425	152–225
Peach at bloom	229–446	95–199
Pear at bloom	242–402	117–225
Sweet cherry at petal fall	257–448	131–251
Tart cherry at bloom	257–448	131–251

PHENOLOGIES

Geneva:
McIntosh @ early pink
Sweet cherry (Windsor) @ bloom
Tart cherry (Montmorency)@ white bud
Pear @ green cluster
Peach @ early bloom
Plum @ green cluster
Highland: McIntosh, @ bloom
Empire @ 3/4 bloom
Red Delicious, Golden Delicious, Cortland @ King bloom
Bartlett pear @ bloom

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.

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