scaffolds Weekly Update on Pest and Crop Development

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INSECTS

PEAR MIDGE

❖❖The pear midge is an old pest not commonly seen in blocks under a "standard" spray schedule. This insect is usually controlled by chemical applications for other pests, and in most cases of fruit infestation (whether commercial or homeowner), the problem comes down to the proper timing of an insecticide spray.

The pear midge overwinters as a pupa in the soil, and the adults emerge in the lake plains area of NY in early May. The first flies will generally appear when Bartlett and Clapps are in the tight cluster bud stage, but no successful egg-laying occurs until the flower buds are a little more developed. The critical period for chemical control begins when the sepals have spread apart enough to show the first appearance of pink (the folded petals underneath), and continues until just before most of the blossoms are open. The flies disappear by the time of Bartlett full bloom. Larvae may be present inside the fruitlets on the tree, and do not affect fruitlet color. Full-grown larvae may leave the fruit or remain inside until it drops to the ground. In June and July, the maggots exit from the fruit (on the tree or the ground) and burrow into the soil as much as 3 inches to pupate later.

We know of no practice, either chemical or cultural (for instance, rototilling), that is effective enough to recommend for controlling the insects in the ground. These insects emerge in very large numbers, especially in a block continuously infested from year to year, and it is much easier to protect the fruit than to eliminate the pests at their source. If you wish to limit the area requiring chemical sprays, concentrate on those portions of the orchard most protected from the wind by trees, high ground, or buildings, as the midges tend to be most numerous in these spots. The most effective materials to use for midge sprays are organophosphates like azinphos-methyl; at least 2 sprays are recommended, one at first separation of the sepals, and one 7 days later (or at white bud, whichever comes first).❖❖

MITE PREDATORS

❖❖We often forget that European red mite (ERM) is an induced pest in commercial apple orchards. This means that, in the absence of pesticides that destroy ERM predators, European red mite would be difficult to find. There are four major predators of ERM that are found in commercial N.Y. orchards. The effects of pesticides on these species are listed in Table 4 (p.12) of the 1992 Tree-Fruit Recommendations.

a) *Typhlodromus pyri* Scheuten: Adults of *Typhlodromus pyri*, a major predacious mite species, are present in the tree at about the time of ERM hatch. These predators are effective in controlling low to moderate numbers of ERM, but are not effective in regulating high populations of ERM. If *T. pyri* populations in commercial orchards are not destroyed by pesticides, they will control ERM, and can eliminate the need for miticide treatments. *T. pyri* spends its entire life in the tree. It overwinters as an adult female and is active by bloom. It feeds preferentially on ERM, but will sustain itself on a variety of other food sources. Once established in an orchard, if it is not disrupted by pesticides, *T. pyri* will keep ERM populations at very low densities (less than 1 per leaf) year after year. It may take 2-3 years for *T. pyri* to become abundant in an orchard, once a selective pesticide regimen is adopted.

b) *Amblysieus fallacis* (Garman): *Amblyseius fallacis*, the major predacious mite species in the Hudson Valley, overwinters both in apple trees and in the ground cover beneath apple trees; however, ground cover beneath the trees appears to have little influence on *A. fallacis* number and movement in the tree. We previously thought that *A. fallacis* was a poor biological control agent because it did not move into the trees until late in the growing season, after ERM had reached problem levels. More likely, *A. fallacis* numbers are often low until late in the season because pesticides toxic

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to them are often used early in the season. *A. fallacis* cannot be counted on to be present in the tree from year to year. If a site has a history of *A. fallacis* presence, pesticides should be managed to conserve it. Because *A. fallacis* is in the tree year-round, even early season applications of pyrethroids are damaging to this natural enemy.

c) *Typhlodromus longipilus* Nesbitt: A third phytoseiid species that apparently is capable of providing biological control of European red mite has been identified in western New York apple orchards. This predator is *Typhlodromus longipilus*, and is such a recent discovery that little is known about its specific biology.

d) *Stethorus punctum* LeConte: *S. punctum* is a small, black ladybird beetle that feeds on a number of small arthropods, including ERM. This predator is very intermittent, although it has recently become more common in the Hudson Valley. Success using this predator for controlling ERM is dependent upon keeping a relatively high population of ERM in the tree (3-5 mites per leaf), so complete reliance on *S. punctum* will often result in some bronzing.❖❖

DISEASES

BROWN ROT

BROWN ROT CONTROL STRATEGIES

Wayne F. Wilcox

❖❖Brown rot is the most consistently destructive disease of stone fruits in New York. With stone fruit bloom just around the corner (he says trying to convince himself), it's time to refresh the collective memory about a few basic principles affecting control of this disease. Whether you want to call it intelligent farming or IPM, the point is that you can use these concepts to minimize fungicide use and maximize the efficiency of sprays that are applied.

The guiding principle of every introductory plant pathology course is that for any disease to develop, three things must occur simultaneously: (1) the host plant must be in a susceptible state; (2) inoculum of the disease-causing organism must be present in sufficient numbers; and (3) environmental conditions must be favorable. Simple as this is, it's sometimes forgotten that the disease "pressure" at any given time (and the appropriate control response) is determined by an interaction of all three factors. It's also important to remember that each of these factors can be highly variable for brown rot.

Periods of host susceptibility. Control recommendations have traditionally emphasized the need to prevent infections during the susceptible bloom period and the last 2-3 weeks before harvest. Less appreciated is the fact that most stone fruits (with the exception of sour cherries) are also very susceptible from shuck split until pit hardening. Some infections that occur during this early period cause the small green fruit to rot, but others can remain dormant until just before harvest, when they suddenly "explode". The bottom line here is to remember that the period between shuck split and pit hardening is also an important period for controlling brown rot (except on sour cherries) if inoculum is available and weather is conducive to infection. Also, remember that any injury that breaks the skin (insect feeding, rain cracking, etc.) greatly increases fruit susceptibility to infection.

Inoculum availability. The three main sources of brown rot inoculum for blossom infections are (1) last year's mummified fruit within the orchard (most important), either hanging in the trees or on the orchard floor; (2) cankers that developed when the brown rot fungus grew from rotten fruit into spurs or twigs (most commonly a problem on peaches); and (3) abandoned orchards or wild stone fruit trees within 1/4 mile of the orchard. Obviously, the degree to which these

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sources are or are not present has a tremendous influence on the risk of blossom infection in any particular orchard or year. Another less obvious influence is whether or not these sources of the brown rot fungus are actually producing infective spores at the time of bloom. Wet weather during the prebloom period encourages the production of brown rot spores from mummies and cankers, whereas dry weather significantly suppresses it. This is an important consideration which is often overlooked.

The primary inoculum for fruit infections can come from mummies and cankers or the spores produced on infected blossoms. Once the first fruit rot occurs, millions of additional spores are produced on the infected fruit, providing the potential for epidemic disease development. Another overlooked but potentially important source of brown rot spores in peach orchards is thinned fruitlets lying on the orchard floor. A detailed study in South Carolina showed that fruitlets thinned before pit hardening decompose quickly and produce relatively few spores; in contrast, those thinned later do not decompose before harvest and serve as a major source of inoculum to cause rot of ripening fruit.

Environmental requirements. The brown rot fungus requires rain or heavy dew for its spores to germinate and cause infection, and it thrives under relatively warm conditions (77° F is optimum). If inoculum is plentiful and fruit are in a highly susceptible state, infection can occur after only a few hours of wetness at optimum temperatures. However, as temperatures get lower and/or inoculum gets scarcer, progressively longer periods of wetness are required. This same principle also holds true for infections of blossoms and young fruitlets. The current "best guess" (based upon controlled-environment experiments) is that about 12-24 hr of wetness are required to produce infections of sour cherry blossom at 60° F under typical field conditions, and this figure should be adjusted down or up for warmer or cooler temperatures and above- or below-average inoculum availability.

Fungicide considerations. Each of the preceeding factors influences if, when, and how intensively fungicides should be applied to control brown rot, but the actual material used will also have an effect. For instance, captan and sulfur are protectant materials that act on the surface of blossoms and fruit. Therefore, they must be present before an infection period (wetness) occurs and need to be reapplied fairly regularly if they are washed off by rain or degraded by the elements. Rovral and Ronilan are closely related fungicides that offer both protectant activity and some limited systemic activity. These materials can stop blossom infections if applied within 24-48 hr after the start of an infection period and also have some limited after-infection activity against fruit rot. Significantly, they also interfere with the production of brown rot spores from infected blossoms and fruit, so they are useful in slowing down the spread of an epidemic. However, resistance to Rovral and Ronilan can develop, so they should not be used excessively throughout a season: we recommend using them only during the preharvest period unless an emergency or very high pressure situation occurs during bloom. Funginex has post-infection and antisporulant activities that are similar to but slightly weaker than those of Rovral and Ronilan. However, Funginex is not related to these materials and will not contribute to the buildup of resistance (it's also cheaper).

Bottom line. Sanitation is important—with plenty of mummies in the trees or lying on the ground will need more fungicides than those which have been cleaned up. Thin peach fruitlets before pit hardening. Determine the need for bloom sprays according to the availability of inoculum and weather—they can sometimes (often?) be omitted, but not always. If you need a blossom spray, you probably need something more effective than sulfur; captan's decent under moderate pressure, Funginex provides some kickback and antisporulant activity, Ronilan and Rovral as a last resort.

After bloom, provide protection through pit hardening if weather is wet. Sulfur, captan, and Bravo (not after shuck split) are the only choices during this period; although Benlate and Topsin are also labeled, don't count on 'em. Bravo is expensive but has relatively long residual activity, so a good shot at shuck split might carry you through to pit hardening, depending on subsequent rain intensity. Minimize injuries and treat as necessary during the last few weeks before harvest, using disease pressure and fungicide characteristics to guide specific decisions. ❖❖

PHENOLOGIES (Geneva)

Apple, Pear, Cherry, Peach, Plum: **all dormant**

PHEROMONE TRAP CATCHES
Number/Trap/Day, Geneva NY

	3/30	4/2	4/6
Green Fruitworm	0	0	0
Redbanded Leafroller	-	-	0

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1-4/6):	31	7

Coming Events:	**Ranges:**	
Green Fruitworm 1st adult catch	41-143	9-69
Pear Psylla adults active	2-121	0-42
Pear Psylla 1st oviposition	27-147	10-72
Redbanded Leafroller 1st adult catch	32-480	17-251
Apples at Green Tip	39-147	19-61

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

PEST FOCUS

Pear psylla adults were active in Geneva research plantings, 4/6.

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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