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Update on Pest Management and Crop Development

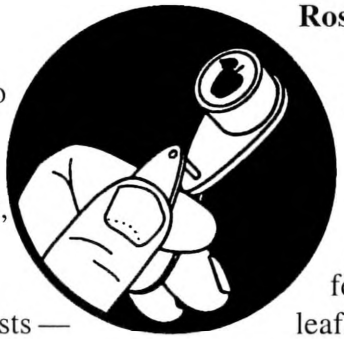
FRUIT JOURNAL

April 17, 2000 | VOLUME 9, No. 5 | Geneva, NY

INSECTS

IT'S A LITTLE NIPPY OUTSIDE

BITE OF SPRING (Art Agnello & Harvey Reissig, Entomology, Geneva)



❖❖ Early season arthropod pests — that is, those present before bloom — generally fall into two groups: the mites, and everything else. Generally speaking, most growers have to do something about mite populations in their blocks, but not everyone has to do something about the rest of the potential pests, or at least usually not all of them. These include rosy apple aphid, tarnished plant bug, and spotted tentiform leafminer. We've already looked at mite management during the early season, so as soon as we start to get more than one warm day in a row, the insects will begin to make their presence known without fail (and probably all at once).

Fortunately, most insect management issues converge at about the time of pink, along with a million other things, but you've probably been impatient for spring to start anyway. The whole key behind a pink strategy boils down to setting priorities, or maybe it can be thought of as a series of risk tolerances, which most growers seem to be prediposed to working with. Everyone has their own version of this process, and all of them result from being familiar with your own orchards — does a given block have a history of or susceptibility to a specific pest? Start with your knowledge of the block, use a sampling procedure where appropriate, and make a management decision.

Rosy Apple Aphid

In our opinion, the most crucial pest decision to be made at pink has to do with rosy apple aphid (RAA), because this is the last distinct period for a truly successful rosy management option. Although RAA feeds mainly on apple foliage, causing leaf chlorosis and curling, its saliva is also translocated to nearby fruits, which become bunched, stunted, and malformed. RAA will attack all apple varieties, but those such as Cortland, Monroe, R.I. Greening, Idared, and Golden Delicious are particularly susceptible, and those in the McIntosh family are relatively tolerant. As with most aphids, this species has a complex life cycle, starting with black eggs that overwinter on twigs, in bud axils, and in bark crevices. The eggs develop into solitary, wingless "stem mothers", which then give birth to living young, most of which are also wingless.

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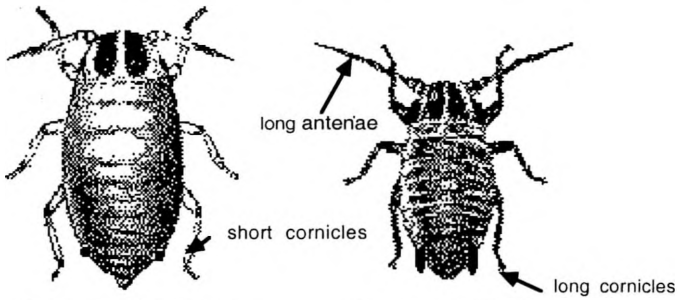
RAA nymphs are visible beginning at about tight cluster but are most easily observed at the pink bud stage.

Our control recommendations for RAA cover the period from half-inch green to the pink bud stage, using any of a number of materials: Thiodan, Lorsban, Lannate, Vydate, Supracide or Asana, listed roughly in order of increasing disruption of beneficial mites. Pink applications of any of these products do a better job than an earlier spray. This is an observation resulting from the fact that, in those cases where aphid populations have built up during early summer on vegetative growth inside the canopy, a pink spray will have done a more effective job of reducing populations than an earlier treatment at half-inch green. From the standpoint of management practicality, it is therefore easier and more natural to consider the need for aphid control at the time of the pink spray.

Because RAA populations are highly variable, it is important to assess their densities before making a treatment. In past surveys, approximately 50% of the orchards sampled have ended up requiring treatment. If you are inspecting fruit clusters for STLM eggs at pink anyway, it is not much more trouble to note the presence of RAA nymphs or damage at the same time. We recommend, however, that a few more clusters be checked for RAA than are required for STLM sampling. Try to select 10 from the interior canopy area of each of 10 trees distributed throughout the block. RAA nymphs are of course present at Pink, and large enough to see without difficulty, but they do occur on the same tree and in the midst of colonies of green apple aphids, which are not usually a problem until the summer.

To distinguish among the species, you can use leaf damage as a cue, as well as the insects' color. RAA nymphs are usually pinkish, sometimes varying to a light brown, slate gray, or greenish black, and the body is covered with a whitish mealy coating. Most importantly, they have pronounced cornicles ("tailpipes"), and long antennae (more than half the body length). Green apple aphid nymphs are clearly green, and without the whitish cast. Their cornicles are little more than buttons, and the antennae are clearly less than half of the body length. Also, aphids found inside curled or distorted leaves at pink are almost always rosy apple aphids. If you find



Green Apple Aphid **Rosy Apple Aphid**

ONE infested cluster (1%, or stop as soon as you find one), we would advise including an RAA material in your pink spray; this threshold may be a little conservative for people who are skilled at finding the aphids.

Spotted Tentiform Leafminer

What else is happening at pink? STLM is laying eggs, but most orchards don't suffer too greatly from 1st brood leafminer, and even if so,

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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:

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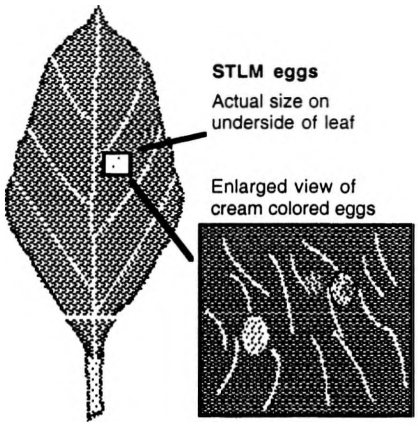
This newsletter available on CENET at: news://newsstand.cce.cornell.edu/cce.ag.tree-fruit
and on the World Wide Web at:
http://www.nysaes.cornell.edu/ent/scafolds/

a sequential sampling plan can be used to classify STLM egg density at pink or of sap-feeding mines immediately after petal fall (see the Recommends when it finally comes out). Treatment is recommended if eggs average 2 or more per leaf on the young fruit cluster leaves at pink, or if sap-feeding mines average 1 or more per leaf on these leaves at petal fall. Sampling can be completed in approximately 10 minutes. In recent years, only 1 out of 6 sampled orchards have required insecticide treatments to control first-generation STLM populations. Vydate at pink or Provado or Lannate at petal fall are our standard recommendations for this pest; Provado will also add to the leafhopper control if you don't use enough Sevin at thinning to do an adequate job.



Miscellaneous

Leafrollers are also out there, but only part of the population is active at this time, so it's better to wait for bloom or petal fall to address this one. Tarnished plant bug is the only real player left, and you're going to have to decide for yourself whether this bug is a major concern to you. We have seen few orchards in western N.Y. where TPB control is warranted (slightly more so in the Hudson Valley), simply because the most effective treatment to use is still a pyrethroid, which a) wipes out predator mites, and b) still rarely lowers TPB damage enough to be economically justified. If you elect an Ambush/Asana/Pounce spray at pink for plant bug, you'll take care of rosy apple aphid (and STLM) at the same time; if rosies are your primary concern, scout for them first, and use Lorsban or Thiodan if you find any.❖❖

AMBUSH BUGS?

HIDING IN THE WEEDS
(Dave Kain & Art Agnello, Entomology, Geneva)

❖❖ Severe damage to apples caused by phytophagous mirid bugs has increased in recent years. What we refer to here as mirids is a complex composed of mullein plant bug (MPB), *Campylomma verbasci* and apple brown bug (ABB), *Atractotomus mali*. Until recently, most reports of fruit damage in our area came from research orchards at the Geneva station, but increasing numbers of commercial orchards are starting to suffer damage; these bugs are already perennial pests in Canadian apple orchards, particularly in southern Ontario. It's very possible that some mirid bug damage has occurred regularly in N.Y. orchards over time, but has been mistaken for plum curculio scarring, which is capable of being quite variable in appearance. In western N.Y., MPB is more prevalent than ABB. These bugs are actually considered beneficial part of the season, being predators of pest mites and aphids. However, from bloom (when overwintered eggs hatch) until shortly after petal fall they may severely damage fruit.

Eggs of both species overwinter in the previous season's spur wood, barely evident with only their tips protruding from the bark; hatch occurs at bloom time. MPB nymphs are small and lime-green in color, and can be confused with rosy apple aphid or white apple leafhopper nymphs, except that they move much more rapidly. They may have a reddish cast after feeding on European red mites. ABB nymphs are mahogany brown in color and slightly larger than MPB (refer to Insect Fact Sheet I25 for photos). Both species pass through five nymphal instars over the course of about 4 weeks. Adult MPB are small and green or brown with black spines and spots on their legs. They do not damage the fruit, but are predaceous.

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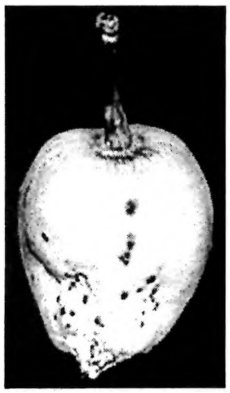
They may be found in fruit trees beginning about late June. Some may remain in the trees through the rest of the season. Most, however, migrate to mullein plants to lay eggs. In late summer or early fall, after another generation or two has been completed on mullein, the resultant adults will migrate back to fruit trees to lay overwintering eggs.

Damage to developing flowers or young fruitlets is caused by 1st generation nymphs of both species. Nymphs puncture the epidermis, which results in raised, corky, brown or black wart-like blemishes on



the fruit. Some fruits will drop. On dark-skinned varieties like Red Delicious, minor blemishes may become less noticeable, and even disappear, as the fruit ripens. However, severe blemishes and malformation of the fruit, and minor blemishes on lighter-skinned varieties, will make the fruit unmarketable as fresh fruit. Some varieties appear to be more susceptible than others, although any variety can be attacked. Red Delicious, Golden Delicious, Northern Spy and Spartan are reported to be among the more sensitive, while McIntosh seldom suffers damage. We have seen severe damage in Empire, Rome and Crispin as well.

It is difficult to predict where and when mirid bugs may become a problem. Monitoring should begin in areas where damage was noted previously. Look also in areas that are in proximity to weedy areas inhabited by mullein or evening primrose. Mirid bug presence can be determined by tapping limbs with a length of hose or a stick over a tray covered with black cloth. Monitoring should take place every 2–3 days beginning at bloom and continuing through a week or so after petal fall. New growth, with a higher proportion of flower than leaf clusters, should be sampled by sharply tapping 2 or 3 times. It is suggested that 4 limbs on each of 10 trees (40 limbs total) be tapped in each separate orchard or block. Greater than 12 nymphs per 40 limbs may be considered high. High populations can also be predicted from pheromone trap catches the preceding fall (more than 6/trap/day any time after Sept. 1).

Timing of insecticide application is critical but difficult to ascertain. The fact that the peak hatch period is during full bloom, when no insecticides may be applied, makes prevention of all damage unlikely. A chemical with relatively long residual activity, such as Asana, applied at pink, may provide control through the bloom period. Pink applications should be made as late in that growth stage as is safe for honey bees. At a certain (lower) density, petal fall applications of other materials may be just as good at preventing damage and are less harmful to predatory mites. These will kill most of the nymphs present, but some of the damage has already been done. Petal fall sprays in these cases should be applied as soon as possible after blossoms are off. Materials used at petal fall for plum curculio, obliquebanded leafroller or STLM will control most of the mirid nymphs present.❖❖

PEST FOCUS

Geneva:
1st catch of **redbanded leafroller** and **spotted tentiform leafminer**.

Highland:
1st **pear psylla** nymphs and **pear thrips** observed. **Tarnished plant bug** observed on Bartlett and Bosc pears. **Rose leafhopper** observed on multiflora rose.

PHENOLOGIES

Geneva,
Apple (McIntosh): half-inch green
Apple (Red Delicious): half-inch green
Pear (Bartlett): late bud burst–green cluster
Tart cherry (Montmorency): bud burst
Sweet cherry: bud burst
Peach: half-inch green
Plum: bud burst

Highland:
Apple (McIntosh): early pink
Pear (Bartlett): early white bud
Peach: full bloom
Plum (Stanley): early white bud

INSECT TRAP CATCHES
(Number/Trap/Day)

Geneva, NY

	4/6	4/10	4/17
Green fruitworm	0	0	0.1
Redbanded leafroller	0	0	2.9*
Spotted tentiform leafminer	0	0	150*

Highland, NY

	4/10	4/17
Green fruitworm	0	0
Redbanded leafroller	4.7	8.1
Spotted tentiform leafminer	2.4	22.9
Pear psylla (eggs/50 clusters)	–	12
Pear psylla nymphs/50clusters	1*	1

* first catch

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–4/17):	211	86
(Geneva 1999 1/1–4/17):	154	61
(Geneva "Normal" 1/1–4/17):	141	61
(Highland 1/1–4/17):	306	137
Coming Events:	**Ranges:**	
Green fruitworm flight peak	64–255	19–108
STLM 1st oviposition	141–319	48–154
Pear psylla 1st egg hatch	111–402	55–208
Rosy apple aphid nymphs present	91–291	45–148
Green apple aphid present	127–297	54–156
Tarnished plant bug adults active	71–536	34–299
Obliquebanded leafroller larvae active	149–388	54–201
Oriental fruit moth 1st catch	129–587	44–338
McIntosh at tight cluster	188–279	68–138
Peach at pink	152–269	68–121
Pear at green cluster	188–282	68–138
Plum at green cluster	170–282	75–138
Sweet cherry at white bud	152–267	75–116
Tart cherry at white bud	248–326	104–149

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