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Update on Pest Management and Crop Development

FRUIT JOURNAL

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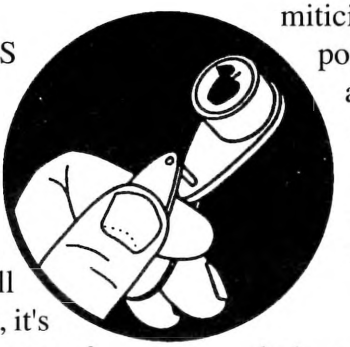
INSECTS

PEST PREVIEW

COMING DISTRACTIONS (Art Agnello, Entomology, Geneva)



❖❖ Even though we've still been getting some nights in the 30s, it's looking like this may actually be one of those springs without a last-ditch blast of winter weather to rattle us into the green season, so it shouldn't be too long before the buzzing in your ears really is coming from something with wings and not just your cell phone. [Last week in the Hudson Valley, I unexpectedly found myself in a cloud of irritating little flies, which Dave Rosenberger told me are known locally as "shad flies" — presumably because their activity coincides with the shad populations — and herald the official arrival of spring.] Not all of the following appearances will occur during the next week, of course, but just to keep you from being taken by surprise when all the excitement begins, here's a brief checklist of some prebloom arthropod activity to consider before the season cranks up.

Mites: Oil applications should go on before we reach pink in apples or white bud in pears, *and as there's not* much freezing weather in the extended forecast, any calm period of sufficient duration would be a suitable spray window. Start with 1.5–2.0% at first, and reduce to 1.0–1.5% as the trees reach tight/green cluster. Also, don't forget the usefulness of this tactic in stone fruit plantings (cherry, peach and plum) with a history of ERM. In apples, Savey and Apollo can be delayed until pink, and if everything else runs away with your time and a miticide application before bloom is impossible, consider Agri-Mek or Zeal at petal fall in problem blocks. Besides saving some time during the hectic prebloom period, this is also a sensible rotation program for purposes of resistance management.

Rosy Apple Aphid: In particularly susceptible varieties (Cortland, Ida Red, Golden Delicious, R.I. Greening), a material such as Lorsban or Supracide can provide effective prevention through tight cluster, and will pick up any San Jose scale at the same time. Actara is also a good prebloom fit for rosy apple aphid and other pests besides, including leafminers and early plum curculio. You'll also get some side rosy control if you're using Esteem for scale at this time.

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San Jose Scale: Besides the Lorsban and Supracide noted above, delayed dormant oil applications will do a good job of reducing scale populations. If you're not treating for rosies but are concerned that SJS might be increasing in some blocks, Esteem is an insect growth regulator with good activity on scale. The label calls for it to be mixed with oil, so if you're applying oil for mites anyway, this might be a tactic to try in severe cases.

Dogwood Borer/American Plum Borer: A coarse spray of Lorsban directed at trunk burr knots between half-inch green and petal fall is the most effective tactic against both species, which can be a problem in dwarf plantings.

Pear Midge: The first adults generally appear when Bartletts and Clapps are in the swollen bud to tight cluster bud stage, but no successful egg-laying occurs until the flower buds are a little more developed. It's nearly too late in many spots, but in pear blocks with a history of midge infestation, 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. Organophosphates like Guthion are the most effective materials; 2 sprays are recommended, one between swollen bud and first separation of the sepals, and another 7 days later (or at white bud, whichever comes first).

Pear Psylla: If you're just starting on your oil sprays, one application at 2% or two at 1% until white bud should provide adequate protection against egg deposition until an insecticide spray might be elected. Actara, Assail, and Esteem at white bud or after petal fall have all shown good activity in suppressing psylla numbers. Agri-Mek used shortly after petal fall has given good control if applied correctly (well-timed, adequate coverage, combined with an oil adjuvant), and split applications of Nexter or Provado, also starting soon after petal fall, will help keep nymph numbers down through the early summer.

Oriental Fruit Moth: The first adults could start flying during the next two weeks, depending on how much of a warming trend we get, but we don't necessarily recommend pheromone disruption against this brood in peaches or apples, as your plum curculio sprays will serve double duty against OFM as well. However, be prepared to start these at petal fall even in peaches, as shuck split will be too late to get the first egg-laying moths.

Black Cherry Aphid: In (sweet especially) cherry plantings with a history of infestation by this pest, which curls and stunts leaves, a prebloom inspection for these shiny black metallic insects can warrant an application of Thionex or a pyrethroid (Warrior or Asana).

Tarnished Plant Bug: Early season feeding by overwintered adults in peaches can damage flower buds and cause bleeding of sap from twigs and shoots. If you note several bleeding sites per tree, a pink application of a pyrethroid can offer some control. Also, a late bloom application of Assail (yes, it's labeled--just don't apply during the heat of the day when bees are foraging) has activity against this pest, and the timing may be just what's needed to ensure protection when it's needed most. In apricots, choose either Asana or Warrior.❖❖

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DISEASES

MORE SPORES, MORE CHORES

INOCULUM LEVELS IMPACT DISEASE CONTROL (THE CURSE OF THE INVISIBLE "I")
(Dave Rosenberger, Plant Pathology, Highland)

❖❖ Experienced fruit growers know that tree-fruit diseases are more difficult to control in high-inoculum orchards than in low-inoculum orchards. When facing high-inoculum conditions, we usually recommend higher fungicide rates, shorter spray intervals, starting fungicide coverage earlier in the season, continuing coverage later into the season, and/or using more potent fungicides. Taken together, the recommendations for controlling diseases in high-inoculum orchards usually translate into higher costs for disease control.

Plant pathologists lack effective methods for accurately quantifying inoculum levels for most tree-fruit diseases. We cannot use the entomology approach of counting pests in the field and then adjusting control strategies accordingly, because fungal spores are not easily counted, fungi can reproduce more rapidly than insects or mites, and slight errors in early season assessments can quickly turn into disease control disasters. For apple scab, the PAD assessments in autumn can be used to estimate ascospore inoculum levels, but few growers bother to make the fall assessment. In the absence of methods for evaluating inoculum levels, we continue to rely on non-quantifiable terminology such as "high-inoculum" and "low-inoculum."

Factors contributing to high inoculum are obvious for some diseases but more obscure for other diseases. An abundance of scabby leaves in the autumn translates to high apple scab inoculum for the next spring. Brown rot mummies left hanging in peach and cherry trees ensure high inoculum for brown rot blossom infections. Failure to remove black knots from plum or cherry trees during winter pruning guarantees a high-inoculum orchard. However, removal of black knots during winter pruning will not necessarily result in a low-inoculum orchard if black knots are abundant in wild Prunus in adjacent hedgerows.

Growers in the northeast who experienced problems with either cedar apple rust or flyspeck during 2005 may have been the unsuspecting victims of high-inoculum conditions last year. The wet autumn of 2004 may have allowed a greater abundance of flyspeck to build up in woodlots and hedgerows, thereby jump-starting the disease cycle in 2005. With cedar apple rust, wet autumn weather in one year results in higher inoculum 18 months later because the fungus moves from apple leaves to cedar trees in autumn and those infections do not produce mature galls until the second season after the cedar infections occurred. Thus, in the Hudson Valley, the wet harvest season of 2004 has produced a very heavy crop of cedar galls that will be releasing spores this spring.

It is relatively easy to understand why having more inoculum results in more disease where no fungicides are applied. But why should variations in inoculum level impact control in sprayed orchards? The following factors contribute to greater vulnerability for high-inoculum orchards:

1. Imperfect spray coverage: Airblast sprayers, even when properly calibrated, cannot provide uniform spray coverage over an entire tree. A small proportion of the surface area of leaves and fruit may receive no fungicide, or the fungicide dose may be so low that it disappears long before the next spray is applied. With low inoculum levels, there is relatively little chance a spore will be lucky enough to land on the small amount of tissue that was not covered by fungicide. As spore numbers rise, however, probabilities increase that some spores will find the unprotected tissue and initiate disease. Consider a Tax Day analogy: Al-

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though one tax auditor might fail to discover the unreported income omitted from your tax forms, that omission might be discovered if a group of 100 IRS examiners showed up to audit your tax returns. Inoculum levels often vary by factors of more than 100, and biological systems can be as unforgiving as the IRS.

2. More infections during short wetting periods: During any wetting period, some spores are released almost immediately and some are released later during the rain period. Some released spores find susceptible host tissue shortly after release, whereas some spores may be blown about for hours before landing. Because of these factors, we know that we can get more disease during longer wetting periods. However, high inoculum levels increase the amount of disease that can develop following short wetting periods. For example, if we hypothesize that one percent of apple scab ascospores are released and find susceptible host tissue immediately after the start of a rain, then a high-inoculum orchard that can release one million spores/A during a 24-hr wetting will have 10,000 spores/A capable of causing infections during the shortest possible Mills infection period, whereas a low-inoculum orchard that can generate only one thousand spores/A in a 24-hr wetting period will be able to generate only 10 infections/A.

3. Reduced fungicide efficacy: Both protectant and post-infection activities of fungicides might be slightly reduced in high-inoculum compared with low-inoculum orchards. Within most fungal populations, individual isolates vary in their susceptibility to fungicides. Usually a small segment of the natural population can survive a considerably higher fungicide dose than the dose that is required to kill 50% of the fungal population. With high inoculum levels, these "outliers" may be present in large enough numbers to create economic losses if there is even the slightest lapse in fungicide protection. Lapses in protection can result from either spray timing or poor coverage, such as occurs when spraying under windy conditions.

4. The three factors noted above can be additive since all three are usually operational at the same time in sprayed orchards.

Because we cannot accurately assess inoculum levels for most diseases, adjusting spray programs for varying inoculum levels remains an inexact science. Growers with keen observational abilities, lots of experience, and long memories frequently make shrewd adjustments to their spray programs when they anticipate high inoculum levels. As noted earlier, those adjustments include increasing fungicide rates, shortening spray intervals, and selecting more potent fungicides. Those with less experience may need to adopt more conservative spray programs as their standard practice in order to avoid disease control failures when inoculum levels are under-estimated. Alternatively, an experienced consultant can assist with making spray program adjustments allowed or necessitated by varying inoculum conditions.❖❖

EASTERN NY

APPLE SCAB ASCOSPORE MATURITY COUNTS (Kevin Iungerman)

April 12: Schuylerville (Albany-Saratoga region), with trees at 1/4 inch green:

87% immature, 13 % mature, 0% empty asci, 139 spores in the discharge tower.

April 12: Peru (Champlain Valley) with trees at silver tip:

98% immature, 2% mature, 0% empty asci, No spores discharged in tower shoot.

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FIELD NOTES

INSECT TRAP CATCHES (Number/Trap/Day) Geneva, NY

	4/3	4/10	4/17
Green fruitworm	0.1*	0.0	0.4
Redbanded leafroller	0.1	0.0	2.9
Spotted tentiform leafminer	–	–	0.0

* first catch

UPCOMING PEST EVENTS

	43°F	50°F
Current DD accumulations (Geneva 1/1–4/17/06):	203	81
(Geneva 1/1–4/17/2005):	115	43
(Geneva "Normal"):	148	66
(Geneva 1/1–4/24 Predicted):	270	115
(Highland 3/1-4/17/06):	196	96

Coming Events:	Ranges(Normal±StDev):	
Green apple aphids present	111–265	38–134
Rosy apple aphid nymphs present	134–244	56–116
Spotted tentiform leafminer 1st catch	112–236	39–113
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
McIntosh at half-inch green	153–197	65–91
McIntosh at tight cluster	196–254	84–122

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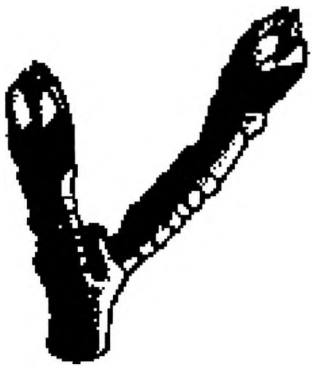

PHENOLOGIES

Geneva:

	4/17	4/24 (Predicted)
Apple(McIntosh):	quarter-inch green	tight cluster
Apple(Red Delicious):	quarter-inch green	tight cluster
Apple(Empire):	half-inch green	tight cluster
Pear:	bud burst	green cluster
Sweet cherry:	early bud burst	white bud – bloom
Tart cherry	late swollen bud	white bud
Plum:	early bud burst	white bud
Peach:	early bud burst	pink – bloom

Highland:
Apple (Ginger Gold): tight cluster – early pink
Apple (McIntosh): tight cluster
Apple (Empire): tight cluster
Apple (Golden Delicious/Red Delicious/Honeycrisp): tight cluster
Pear (Bartlett/Bosc): late bud burst
Peach: 50–80% bloom
Plum (Stanley): green cluster
Plum (Italian): green cluster
Sweet cherry: white bud – first bloom
Apricot: 40 – 60% petal fall

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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