

# scaffolds

Update on Pest Management  
and Crop Development

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

May 23, 1994

VOLUME 3

Geneva, NY

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## INSECT BITES

(Art Agnello)



### San Jose Scale

❖❖The San Jose scale (SJS) is a pest of tree fruit that attacks not only apple, but also pear, peach, plum, and sweet cherry. The minute SJS adult males emerge in the spring from beneath scale covers on the trees, usually during bloom, and mate. The first of this year's adults were recorded in our traps at Geneva on 5/5. The females produce live crawlers within 4–6 weeks of mating; these are bright yellow, very tiny insects resembling larval spider mites. About 24 hours after birth, the crawlers have walked or drifted to new sites and settled in by inserting their mouthparts into the tree and secreting a white waxy covering that eventually darkens to black.

SJS infestations on the bark contribute to an overall decline in tree vigor, growth, and productivity. Fruit feeding causes distinct red-purple spots that decrease the cosmetic appeal of the fruit. Control measures for SJS are recommended when the scale or their feeding blemishes have been found on fruit at harvest during the previous season. Insecticidal sprays are most effective when directed against the first generation crawlers, specifically timed for the first and peak crawler activity, which are usually 7–10 days apart.

The most reliable method of determining first appearance of the crawlers in your specific area is by putting sticky-tape traps on the tree limb near encrusted areas and checking them at

least twice a week, starting next week. Alternatively, a degree-day accumulation of 310 (50°F base) from the date of first adult catch has also been shown to be reliable if the degree-days are known with some accuracy.

Effective materials for SJS control include Lorsban 50WP, Guthion, Imidan and PennCap-M. These sprays may also help in the control of OBLR, apple maggot, and codling moth. Coverage and control are generally better if the pesticide is applied dilute and in every row. SJS is frequently a problem in larger, poorly pruned standard size trees that do not receive adequate spray coverage. Dormant or delayed-dormant sprays of oil, or 1/2-inch green applications of Lorsban 4EC or Supracide will help prevent populations from getting established. Early season pruning is important for removing infested branches and suckers, as well as for opening up the canopy to allow better coverage in the tree tops where SJS are often concentrated.

### Green Peach Aphids

Although apparently not as serious a problem as they can be some years, these greenish, smooth-looking aphids are occurring in some blocks around the state. They cause curled leaves that may turn yellow or red in severe cases. The young aphids begin to hatch about the time of peach bloom and remain on the trees for 2–3 generations, until early summer, when they seek other hosts (mainly vegetable crops). Green peach aphids suck the sap from the new fruits and twigs, and are also found on plum, apricot, cherry, and many ornamental shrubs. These insects are

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difficult to control; Lannate is recommended before excessive leaf curling occurs, in order to maximize the spray's effectiveness. Also, keep an eye out for black cherry aphid in your cherry trees. If colonies are building up on the foliage, recommended materials include Imidan (tart cherries only), malathion, Sevin, and Penncap-M.

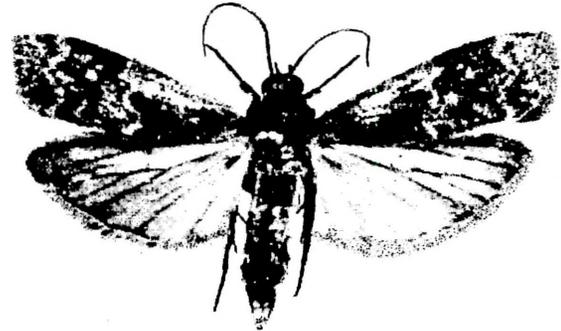
#### Lesser Peachtree Borer

Remember to get your trunk and scaffold sprays on peaches and cherries during the first week of June if borers are a problem in your blocks. This pest increases the severity of *Cytospora* canker infections in peaches and is often found within the canker; by feeding in the callous tissues, it interferes with the tree's natural defenses against the disease. Infestations can be determined by the presence of the insect's frass, which resembles sawdust, in the gum exuded from the wound. In peaches, you can use Lorsban, Thiodan, Asana, Ambush, Pounce, or Penncap-M for this application. In cherries, use Lorsban 4E, Thiodan 50WP, Asana, or Ambush 25WP as a trunk spray ONLY; do not spray the fruit.

#### American Plum Borer

We've recently been catching males of a moth called the American plum borer (APB) in traps at Geneva, as well as in Sodus, Albion, Highland, and Riverhead. APB is a pyralid, like European corn borer, rather than a clearwing moth that we usually think of when we think of borers. The APB adult is a tan-colored moth with darker (reddish brown to black) jagged markings running across the forewing about 2/3 of the distance from its base. Its wingspan is approximately 25 mm. Eggs are deposited in cracks under loose bark and hatch in a few days. Larval tunnels are shallow with frequent openings to the outer bark, where red frass accumulates. This insect is of interest because it has only recently come to be considered a major pest of cherry and plum in Michigan, and has rapidly gained in importance as a pest in that state. It has been found in about 85% of all cherry and plum plantings in western Michigan. It has even become more

important than lesser peachtree borer there. Its emergence as a major pest has been associated with wounding caused by mechanical harvesting of cherries. In fact, the larvae can't bore into the cambium unless a wound of some sort is present. In Michigan, directed trunk sprays are recommended in cherries upon emergence of these first generation adults. Lorsban 4E used for lesser peachtree borers at this time (early June or late May) will also provide control against APB that may be present. ❖❖



American plum borer

#### scaffolds

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##### scaffolds FRUIT JOURNAL

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## HUDSON VALLEY

### HUDSON VALLEY DISEASE UPDATE (Dave Rosenberger)

Apple scab ascospore maturity counts, Highland, NY, May 20

<u>Immature</u>	<u>Mature</u>	<u>Discharged</u>	<u>Tower shoot</u>
18%	30%	52%	not done

NOTE: Scab pressure has been relatively light so far this season, but we're a long way from finished. Remember, we traditionally run into the most scab problems in "light" years, when folks try to get away with just a little bit more than they should!

#### APPLE SCAB

❖❖ Cloudy cool weather last week seemed to put everything into a 'stand-by' mode. Early varieties were already at petal fall a week ago. However, with the exception of a few cultivars such as Jersey mac, fruitlets sized very little during the past week. We had numerous short wetting periods separated by breezy but cloudy drying periods. Although no one seemed too concerned about apple scab and rust, the intermittent wetting periods were probably more favorable for disease development than one would suspect based solely on wetting period information. Many scab and rust spores probably survived the relatively short drying periods between rains and contributed to infections in unsprayed trees. Fortunately, we did not have any torrential rainfall that was likely to remove all fungicide residue and leave commercial orchards at risk.

Our spore maturity counts show that we still have nearly half of the scab ascospores left to discharge. However, most of the remaining spores never make it into the air. Spore trapping records from around the country have shown that capture of apple scab spores after petal fall is usually quite low. Spores apparently get lost in decaying leaves or get trapped in the ground cover, which now shrouds most of the leaf litter.

We are not quite at the point of saying primary scab is done for this year in the lower Hudson Valley. However, the real risk now is from secondary scab rather than primary scab. Scab lesions are now easy to find in our unsprayed trees at the Hudson Valley Lab. The scab lesions that are now visible probably resulted from the May 7-8 infection period.

#### RUST DISEASES

Fruit susceptibility to rust diseases drops off rapidly after bloom. However, trees are now entering their growth flush, the period when terminal leaf area expands very rapidly. Inoculum for cedar apple rust is still abundant and will remain abundant for several more weeks. If susceptible cultivars such as Rome and Golden Delicious are not adequately protected with fungicides, severe rust infections terminal leaves can result. A few rust lesions on leaves probably cause no economic loss. However, where fungicide intervals are stretched too far or where fungicide rates are too low, two or three terminal leaves on each shoot may become severely infected during a single unprotected wetting period. These severely affected leaves will often drop from the tree in mid- to late July.

#### POWDERY MILDEW

Cold winters like the one we just had usually result in some reduction in mildew severity the following year. This occurs because apple buds infected with mildew are more susceptible to winter kill than are healthy buds. However, not all of the mildew-infected buds are killed. Primary mildew is now evident in our orchards at the Hudson Valley Lab. Because the amount of primary mildew may be reduced, the build-up of mildew in commercial orchards may be somewhat delayed compared with recent years. Nevertheless, growers using exclusively mancozeb and/or captan on susceptible cultivars like Rome and Cortland are likely to see mildew build up by the end of the season. The cheapest way to prevent mildew is to include a low rate of sulfur (2-3 lbs/A) in cover sprays. Other alternatives are the SI fungicides (Rubigan, Nova, Bayleton). Some growers continue to suppress mildew with Benlate

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or Topsin-M, but these fungicides have proven ineffective in other locations where mildew has developed resistance to the fungicides.

### RUBIGAN-NOVA COMPARISONS

According to the local rumor mill, there is still much confusion and misinformation concerning the relative merits of Rubigan and Nova as scab fungicides. I have conducted experiments over several years that clearly demonstrated that Rubigan and Nova provide similar levels of scab control so long as the rate of Rubigan (in fluid ounces) is twice the rate of Nova (in ounces). Thus, Rubigan at 8 fl. oz./A provides the identical level of control achieved with Nova at 4 oz./A. Rates higher than these are seldom required in commercial orchards. The only reasons for using higher rates might be for unusually large trees or where the fungicides are applied as a "bail-out" treatment against a running epidemic of apple scab. Note that labels for both products suggest higher rates under severe conditions.

In my opinion, both Rubigan and Nova should always be used in combination with a contact fungicide. The contact fungicide is needed to protect against black rot and to provide extended residual activity that is essential for preventing scab on fruit. Both Rubigan and Nova must be applied under conditions that allow good coverage of the entire tree canopy.

Because these products are so similar in their activity when compared at appropriate rates, the decision about which product to use must be based on factors such as cost per acre or preferences for or against an EC material as compared with a soluble packet. ❖❖

### PHENOLOGIES

Geneva:  
 Apple(McIntosh) - **Petal fall** ; Pear - **Petal fall**;  
 Tart cherry(Montmorency) - **Petal fall**; Sweet  
 cherry(Windsor) - **Fruit 10mm** Peach - **Fruit  
 10mm** ; Plum(Darrow) - **Petal fall**  
 Highland:  
 Apple (McIntosh) - **King fruit @ 10mm**

## GENEVA

APPLE SCAB  
(Wayne Wilcox)

### ASCOSPORE MATURITY (5/13)

DD 32*	Maturity category (%)**					Discharge test (Spores/LP field)
	1	2	3	4	5	
604	7	12	16	33	32	196

\*Accumulated degree days (base 32°F) between first date of green tip and date of assessment. Ability to discharge ascospores usually begins to increase rapidly at approx. 175–225 DD after green tip.

\*\*Categories: 1–3 = immature; 4 = morphologically (apparently) mature; 5 = discharged. Growth stage on 5/13: McIntosh = Full bloom

Note: The first sporulating scab lesions at Geneva were found on unsprayed McIntosh trees on May 16.

### FIRE BLIGHT ALERT

(Wayne Wilcox)

❖❖ Because of cool/cold weather in western and central N.Y., fire blight inoculum should have been at very low levels until the start of this weekend. Thus, growers who got nervous enough to apply streptomycin in response to the rains on Sunday the 15th almost certainly wasted their money, but should start getting nervous now instead. Warm weather this past weekend (5/21 and 22) provided 240 degree hours (base 65°F) by the morning of 5/23 here in Geneva, putting us above the 200 degree hour threshold suggested by the MARYBLYT model. Because the heat units are continuing to accumulate, growers with at-risk blocks in bloom should be prepared to apply streptomycin in response to the next rain. And remember, rains do not need to last for very long at all to constitute an "infection period": their function is merely to wash fire blight bacteria down from the stigmas (pollen receptors) into the openings at the base of the blossoms through which infection occurs.

As discussed in the 5/9 Scaffolds issue, strep sprays ideally should be applied immediately before

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an infection rain. However, local experience with applying strep within 24 hr after the start of a rain has been good, providing an attractive strategy for these days with the typical "possibility of a shower" forecast. Remember that streptomycin functions by interfering with bacterial multiplication, thus the warmer it is after a blight rain (and the faster the infecting bacteria are starting to multiply), the less time you have to get the strep on. Insofar as what this general concept means specifically (how many hours at what temps), there's an unfortunate dearth of data. ❖❖

### STRAWBERRY GRAY MOLD

(Wayne Wilcox)

❖❖ Now that strawberries are blooming, just the annual reminder that fungicides applied for control of gray mold go on during BLOOM. We have NEVER gotten any more control of gray mold by applying a full-season fungicide program than we have by just putting on two bloom sprays; conversely, sprays applied after bloom have relatively little effect, since infections occur through the flowers. Also remember that individual planting site and cultural practices have an extraordinary effect on gray mold development. Repeated observations in commercial plantings throughout New York show that factors restricting air circulation (wide and thick rows, poor weed control, lush growth from excessive

nitrogen, fields in hollows or up against woods) greatly increase the risk of this disease, whereas factors that promote good air circulation greatly reduce the risk.

For the past 3 years, Bob Seem, Marvin Pritts, and I have been trying to quantify the effects of various cultural practices on gray mold development in an experimental planting of unsprayed 'Honeoye' strawberries here at Geneva. The main factors we've looked at have been (a) flat vs. raised beds; (b) matted row (18" wide) vs. narrow row (10-12" wide); and (c) nitrogen applied only in the autumn (76 lb/A of actual N) vs. the same amount of fall N supplemented with additional N just before bloom in the spring. As shown by the data below from 1992 and '93, the effects of the first two factors have been moderate and/or inconsistent in this particular trial, but those of the spring N applications have been consistent and dramatic.

Clearly, gray mold pressure has been light in these two years, and even without fungicide sprays, the incidence of disease at the time of harvest has been acceptable. However, disease levels following the post-harvest incubation show that the percentage of "dormant" or latent infections has been much higher than what's actually shown up at harvest, particularly in plots receiving supplemental spring nitrogen.

TREATMENT	% BERRIES WITH GRAY MOLD*					
	1992			1993		
	HARV.	POST-HARV.	TOTAL	HARV.	POST-HARV.	TOTAL
Flat bed, matted	2	9	11	2	9	11
Flat bed, narrow	1	18	19	2	13	15
Raised bed, matted	2	13	15	1	11	12
Raised bed, narrow	1	5	6	1	8	9
Flat, matted, 30#N	3	42	45	3	22	25
Flat, matted, 60#N	3	32	35	4	30	34

\*% of diseased berries at the time of harvest; after a post-harvest incubation of symptomless berries for 4 days at 68°F and 95% relative humidity; and the sum of these two evaluations.

\*\*All treatments received 76 lb/A of actual N in the autumn before the fruiting year. The bottom two treatments received supplemental applications of 30 and 60 lb/A of N before bloom in the fruiting year.

There are at least three significant implications to these results: (1) There was a potential for much higher disease levels at the time of harvest if pre-harvest weather conditions had been more favorable for latent infections to become active. What actually causes latent infections, which are initiated during bloom, to become active before harvest is the \$64,000 question for gray mold biologists, but rainfall seems to have a lot to do with it. (2) In years and plantings similar to our experiment, a high incidence of unexpressed latent infections at the time of harvest is probably not economically important if customers are eating or processing their berries shortly after picking. However, berries that are wholesaled or otherwise given the opportunity to undergo their own post-harvest incubation period may end up causing unpleasant surprises. (3) Supplemental applications of spring nitrogen significantly increase the potential for gray mold development. This fact should be recognized and responded to, either by avoiding such fertilization practices or adjusting the intensity of gray mold control programs to account for this increased risk. ❖❖

## FRUIT THINNING

USE OF THE NEW  
CHEMICAL THINNER  
ACCEL IN 1994  
(Terence Robinson,  
Steve Hoying and  
Craig Telgheder)

❖❖ This season a new chemical thinner named ACCEL from Abbott Labs. is available for use by New York growers. Its primary active ingredient is the cytokinin hormone Benzyladenine (BA), which has been under test for about 10 years. The current formulation also contains a small amount of the gibberellin hormones 4+7 (GA 4+7), which we do not expect will have significant effect on the performance of the thinner. Since this new formulation has only been tested for one year in NY (1993), we are still somewhat cautious and suggest that growers use limited amounts of ACCEL in 1994.

Our 8 years of work on the product have shown it to be a consistent thinner and that it improves the

fruit size of 'Empire' more consistently than NAA year in and year out. Most of our work has been done with 'Empire' and 'McIntosh' but other growers in New York or other researchers outside of New York report positive results with 'Rome', 'Idared', 'Paulared', 'Gala', 'Jonamac', 'Jonagold' and 'Golden Delicious'. Most people have had very poor results with 'Red Delicious'; therefore, we do not recommend its use on 'Delicious' this year.

The degree of thinning achieved with ACCEL is a function of the dose applied to the tree, and its effect on return bloom is related to the degree of thinning achieved. We generally have seen a thinning and fruit size response from 25–150 ppm, with the best economic returns for 'Empire' from 50–100 ppm. With 'McIntosh' we suggest a rate from 25–75 ppm. We have experimented with timings from full bloom to 21 days after full bloom. In general, we have found it to be a less potent thinner at bloom and a more potent thinner between 2 and 3 weeks after bloom. However, its greatest effect on fruit size appears to be closer to bloom. For 1994, we suggest that this product be applied when fruit size is about 10mm in diameter; however, a note of caution should be made: We have seen over-thinning at rates above 100 ppm at the 10mm fruit size timing in some years.

The most exciting point about this thinner has been its effect on fruit size. It appears that BA stimulates an additional increase in fruit size independent of its thinning action. We have some evidence that BA increases cell division compared with NAA, and this may be the reason for its fruit size effect. In some of our tests, the economic difference between BA- and NAA-thinned 'Empire' trees has been hundreds of dollars per acre because of the improved size of BA-treated tree, regardless of similar fruit numbers.

Based on these results, ACCEL has been registered for use in 1994; however, the registration came with a restriction on the maximum rate

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allowed. The maximum labeled rate is 20 g/acre per application, and 2 applications are allowed per season. Therefore, a total of 40 g/acre can be legally applied per season. To make mixing easy, Abbott Labs has packaged 20 grams of active ingredient in each quart bottle, which has 35.6 fluid ounces. Thus, one bottle is allowed per acre per application, with 2 bottles allowed per season. The problem with the rate-per-acre system is that all of our previous work was done using concentrations in the tank and not amounts per acre. To help growers compare amounts per acre in a dilute spray with our test results using concentration in the tank, we have prepared a table. To use this table, first determine the dilute spray gallonage for your orchard and then read over to the column of the rate desired in parts per million; find in the box the fluid ounces of ACCEL to add to the dilute gallons per acre with the grams a.i./acre in parentheses. If the amount in the box is followed by an asterisk, it is above the 20 g/acre allowed in one application but still below the maximum allowed per season. If the box is empty, there is no legal rate to give that concentration. It quickly becomes obvious that the limit of 20 g/acre will limit concentrations that can be applied to large trees to the 25–50ppm range. This range will probably result in too little thinning and disappointing return bloom the following year. It is a frustration to have the maximum rate set so low, but there is hope that for the 1995 season the legal rate may be increased.

The low legal rate of ACCEL will lead many to wonder about combining ACCEL and other thinners. In the future this may prove to be the best strategy, but we cannot now recommend it because we have very little experience with combinations. Growers who choose to use combinations do so at their own risk. It has been reported that with 'Delicious', combinations of NAA and ACCEL increase the amount of pigmy fruit. This year we are testing combinations of ACCEL and Carbaryl and NAA, and we will have better guidelines next year.

Some suggestions for effective use of ACCEL are:

- 1) Don't use less than 25 ppm, and you may be disappointed with anything less than 50 ppm. If your tree size is so big that the maximum legal rate of ACCEL (from Table 1) will be below 50 ppm, consider using another thinner this year on that block.
- 2) Apply when fruit diameter is about 10mm for maximum thinning effect.
- 3) Apply when the temperature is above 65°F (it is most effective when temperature is 70–75°F).
- 4) Apply under slow-drying conditions to help increase uptake. (A majority of the chemical is not absorbed by the leaf.)
- 5) Apply with a surfactant to increase absorption. We suggest Regulaid @ 0.125% v/v.
- 6) Apply in a high volume of water (either full dilute or about 80% of full dilute). Consistent fruit size increases are seen when high volumes of water are used. ❖❖

Table 1. Relationship of fluid ounces or grams active ingredient of ACCEL added to a dilute spray volume and the concentration in the tank.

Dilute GPA	Concentration of ACCEL in the Tank					
	25 ppm Fluid Ounces of ACCEL (or grams a.i.) to add to dilute	50 ppm	75 ppm	100 ppm	125 ppm	150 ppm
35	6(3)	11(7)	18(10)	22(13)	29(16)	36(20)
40	7(4)	14(8)	20(11)	27(15)	36(20)	40(22)*
50	8(5)	17(9)	25(14)	36(20)	40(24)*	50(28)*
60	10(6)	20(11)	30(17)	40(22)*	50(29)*	60(34)*
70	12(7)	23(13)	36(20)	46(26)*	60(33)*	71(40)*
75	13(7)	25(14)	38(21)*	50(28)*	64(36)*	-
80	14(8)	27(15)	41(23)*	52(30)*	68(38)*	-
90	15(9)	30(17)	45(26)*	60(34)*	71(40)*	-
100	17(10)	36(20)	50(28)*	68(38)*	-	-
125	21(12)	43(24)*	64(36)*	-	-	-
150	25(14)	50(28)*	71(40)*	-	-	-
175	29(16)	59(33)*	-	-	-	-
200	36(20)	68(38)*	-	-	-	-
250	43(24)*	-	-	-	-	-
300	50(28)*	-	-	-	-	-
350	59(33)*	-	-	-	-	-
400	68(38)*	-	-	-	-	-

INSECT TRAP CATCHES (Number/Trap/Day)						
Geneva NY				HVL, Highland NY		
	5/16	5/19	5/23		5/20	5/23
Green fruitworm	0	0	0	Green fruitworm	0	0
Redbanded Leafroller	0**	0**	0**	Redbanded Leafroller	0.1	0.3
Spotted Tentiform Leafminer	688	24.2	573	Spotted Tentiform Leafminer	0.5	14
San Jose scale	0	0	0.3	Oriental Fruit Moth	0.1	0.3
Lesser appleworm	12.1	0	9	Fruitree Leafroller	0	0.5
Oriental fruit moth(apple)	10.6	0	10.3	Lesser appleworm	0	3.3
Oriental fruit moth(peach)	0.4*	0.3	0.5	Codling moth	0	3.5
Codling moth	0	0	3.8*	American plum borer	0	0
American plum borer(plum)	0	0	0.4*	Sparganothis fruitworm	0	0
American plum borer(cherry)	0	0	0.8*	Tufted apple bud moth	-	0.3*
				Variegated leafroller	-	0

\*\* We are not catching any RBLR in designated traps, but have seen them in other traps at the Station, and in Wayne County.

(Dick Straub, Peter Jentsch)

\* = 1st catch

UPCOMING PEST EVENTS			
	43°F	50°F	
Current DD accumulations			
(Geneva 1/1 - 5/23):	450	226	
(Highland 1/1 - 5/23):	573	286	
<b>Coming Events:</b>	<b>Ranges:</b>		
Lesser peachtree borer 1st catch	224-946	110-553	
Oriental fruit moth 1st flight peak	323-606	138-298	
Redbanded leafroller 1st flight subsiding	518-893	255-562	
STLM sap feeders present	295-628	146-325	
STLM 1st flight subsiding	489-969	270-566	
Tarnished plant bug adults active	71-536	34-299	
Lesser appleworm 1st flight peak	455-851	255-471	
Codling moth 1st flight peak	547-1326	307-824	
European red mite egg hatch complete	361-484	183-298	
Pear psylla hardshell present	463-651	259-377	
San Jose scale 1st flight peak	612-761	331-449	
McIntosh at fruit set	467-612	242-338	
Pear at fruit set	437-562	227-289	
Plum at shuck split	343-546	144-283	

PEST FOCUS
Geneva:
<b>Codling moth and San Jose scale</b> adults flying
<b>American plum borer</b> adults flying
1st <b>strawberry clipper</b> adults observed
Highland:
1st <b>white apple leafhopper</b> observed
1st <b>plum curculio</b> scarring observed

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**

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