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Update on Pest Management and Crop Development

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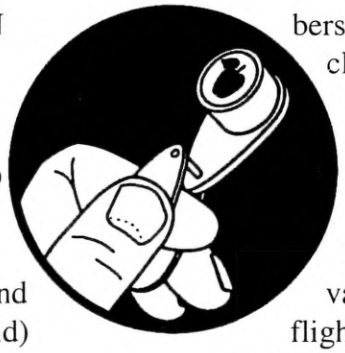
INSECTS

INCREASING BOREDOM

AMERICAN PLUM BORER AND DOGWOOD BORER IN APPLES



(Dave Kain, Entomology, Geneva and Dick Straub, Entomology, Highland)

❖❖ If you grow tart cherries, you've seen trees with gaping splits in the bark that you probably attributed to shaker damage or southwest injury. While it's true that bark damage originates from these injuries, the culprit behind the severe damage that eventually girdles the tree is the larva of a moth called the American plum borer. Shakers are the primary reason for infestation by this pest. The insect can't invade without some sort of opening through the bark. Longitudinal splits in cherry bark are sometimes caused by the pressure of the shaker clamp. These splits then exude gum that attracts egg-laying females and opens the way to the cambium where the larvae feed. Because they occur in large numbers and because, unlike clearwing borers, they feed in a horizontal manner, they eventually girdle the tree. Often the condition of the tree goes unnoticed because the bark remains intact even though the underlying inner bark is destroyed. Before being completely girdled, trees may lose major scaffolds. Or, they may be lost entirely because they fall over in windstorms or die during drought because they don't have enough inner bark left to withstand the moisture stress.

American plum borer overwinters as a larva inside a silken cocoon underneath the bark. If loose bark is peeled back, sometimes large numbers of these white cocoons can be found clinging to the inside of the bark. In the spring, larvae resume feeding along the edge of the inner bark until they mature and pupate. Plum borer larvae are dusky green or purple. Last instar American plum borer larvae are 0.75–1 inch long. The first flight of adults begins at about the time that Montmorency is at the white bud stage. The peak of the first flight is usually at about petal fall or shortly thereafter. The first larval generation is present from about mid-June to mid-July. The second flight begins in mid- to late July. The second larval generation, which is the overwintering brood, begins in August.

It was determined in the late 1980's that American plum borer was the most important wood-boring insect pest of tart cherry in Michigan, mainly due to the advent of mechanical harvesting. As part of that research effort a pheromone lure was developed that enabled us to easily determine the presence of adults here in New York. In 1993, we put out pheromone-baited traps in Geneva and caught a substantial number of moths. Because of this, and the fact

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that tart cherry culture is essentially the same here as it is in Michigan, we decided to conduct a survey of the pest in New York State stone fruit orchards.

In 1994, with the help of growers, Extension agents and others, we set traps out in tart cherry, peach and plum orchards in important stone fruit growing areas in western New York, the Hudson Valley and Long Island. Where moths were caught, we also dug around under the bark looking for larvae. In tart cherry and one western New York peach orchard infected with canker (which also opens the way to the inner bark), plum borer was the most abundant borer. While there usually were only 2–3 clearwing borer larvae per tree, there were anywhere from a couple, up to a high of about 40 plum borer larvae per tree. American plum borer was not abundant, although we did catch some adults, in the Hudson Valley and on Long Island. Presumably plum borer populations have built up in mechanically harvested tart cherries in western New York and have spread to some other susceptible trees such as peaches infected by cankers. Plum borers may contribute to the spread of these diseases, as well. Because we found a large number of them in the one peach orchard included in the 1994 survey, we decided to conduct another survey, in 1995, of peaches infected with cankers. We conducted that survey in Niagara County because of the concentration of peach orchards there, and their proximity to infested tart cherry orchards. While plum borer was present in all of the orchards surveyed, clearwing borer larvae were prevalent. But, in light of the fact that in addition to direct damage they can spread canker diseases, occasional control of American plum borer in these trees is probably a good idea.

Researchers in Michigan determined that Lorsban 4E was the best material for control of American plum borer, and would control the peachtree borers, as well. They recommend application at tart cherry petal fall. This timing is usually a little earlier than trunk sprays for the clearwing borers would go on. However, Lorsban 4E is persistent so it will control borers that are present later than the petal fall application, without missing the peak of the first plum borer flight. In fact, researchers in Michigan felt that just the petal fall application would be sufficient for the entire season, but trials we conducted indicated that if pressure is high (more than 3–4 plum borer larvae/tree) two applications are necessary to control both generations.

By now you're beginning to wonder why the title of this article suggests it's about borers in apple. Although tart cherries are becoming less important in New York, the American plum borer is still cause for concern. Recently, Debbie Breth (Lake Ontario Fruit Team) brought it to our attention that American plum borer was infesting young apple trees. Plum borer larvae were found in young (2–3-inch trunk diameter) dwarf apple trees in orchards near recently removed tart cherry orchards. In addition, borers (especially dogwood borer) seem to be an increasing problem in Hudson Valley apple orchards. In research conducted in the Hudson Valley in the 1980's on dogwood borer, American plum borer was also observed. Preliminary results of a survey we're conducting suggest that near infested tart cherry and peach orchards, and even old stumps of these trees or wild cherry trees, American plum borer is prevalent. In orchards more isolated from stone fruits, dogwood borer is more likely to be found.

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In apple, borers gain entry primarily through burr knots that form on the above-ground part of dwarfing rootstocks. They may feed on tissues within the burr knot, which is thought to be the least harmful type of feeding. But, they may move outward from there to feed on the inner bark. Both borers can eventually girdle the tree. They may also invade at the graft union. Where present, American plum borer is probably greater cause for concern because it is larger and more voracious, usually is more abundant within a particular wound and feeds in a more girdling fashion. Researchers in California have noted that American plum borer infestation of young pecan trees has led to death of the young trees or crotch splitting later in the life of the tree. Dwarf apple trees infested at the graft union may suffer similarly.

In trees with burr knots or other bark injury, look for reddish-brown frass being excreted to indicate whether borers are present. Carefully remove burrknot tissue or bark until the borer larva is revealed. Dogwood borer larvae are creamy white with a yellowish-brown head capsule and the last instar is about 15mm long. American plum borer larvae range from blackish-green to blackish-purple with a yellowish-brown to dark brown head capsule and are 18-25mm long in the final instar. American plum borers also have long hairs projecting from the body at right angles. Identification is important because the timing of control measures is different for the two species. The Cornell "Pest Management Guidelines for Commercial Tree-Fruit Production" calls for one trunk spray of Lorsban in mid-July to mid-August, or two applications of Thiodan — one in early July and one in early August for control of dogwood borer. We have not conducted control trials against American plum borer in apples, but because the peak of the first flight occurs at about the end of May, we recommend an application of Lorsban at that time in tart cherry. For apples, petal fall or shortly thereafter may be most appropriate. Lorsban is persistent, but if pest pressure is heavy, another application in mid- to late July (based on pheromone-baited trap catch) may be warranted for control of the second generation of plum borer, and will provide control of dogwood borer. We are conducting trials this season to determine the efficacy of various timings of Lorsban sprays against both borers.

The best control of these borers is to avoid the development of burr knots in the first place. Some agricutural chemicals, such as NAA, can increase the expression of burr knots. When establishing a new orchard, planting so that the graft union is about 2 inches from the soil surface will help any burr knots that do form to establish roots. Because what would have been burr knots and root initials becomes roots, this will decrease the number of burr knots. In established orchards with burr knots, soil can be mounded up to within a couple of inches of the graft to accomplish the same thing. Mounds must be wide enough to prevent freezing injury to the buried rootstock. In either case care must be taken to avoid planting too deeply and allowing the development of scion roots. Weed control around the trunk is important, too, because shade and increased humidity promotes the development of burr knots. It is becoming apparent, through surveys of a number of orchards early this season, that plastic spiral mousegaurds contribute substantially to problems with both borers.

Borers in tree fruits may be thought of as unimportant or secondary by many because the damage they cause is less visible and less immediately threatening. However, over the long run they can substantially decrease the lives of trees. It is estimated that the lives of tart cherry trees infested by American plum borers are shortened by about one-third. Young peach and apple trees may be killed outright, or weakened and deformed later in their lives. Although it is harder to quantify, borers may also reduce tree vigor and yield and open the way for increased disease problems. (We've begun working to determine the effects on dwarf apple tree yield and growth over the next 5–10 years.) And, we are receiving increasing complaints about borers. Maybe it's time to start paying them more attention. ❖❖

PEST FOCUS

Geneva:
Mullein plant bug nymphs present.

Highland: 1st **lesser peachtree borer** trap catch.
High numbers of **European red mite** observed.
Plum curculio damage to pear and apple observed.

UPCOMING PEST EVENTS

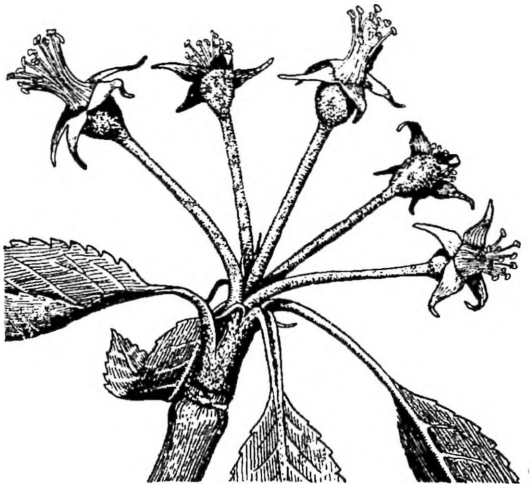
	43°F	50°F
Current DD accumulations (Geneva 1/1–5/15):	549	298
(Geneva 1999 1/1–5/15):	419	205
(Geneva "Normal" 1/1–5/15):	433	216
(Highland 1/1–5/15):	684	379

Coming Events:	**Ranges:**	
Codling moth 1st catch	273–805	141–491
San Jose scale 1st flight peak	457–761	229–449
American plum borer 1st flight peak	360–962	134–601
European red mite 1st summer eggs	448–559	235–320
Redbanded leafroller 1st flight subsides	518–1104	255–658
Lesser peachtree borer 1st catch	224–946	110–553
Pear psylla hardshell present	463–651	259–377
Mirid bugs hatch complete	532–720	252–390
McIntosh at fruit set	467–648	242–339

PHENOLOGIES

Geneva,
Apple (McIntosh): petal fall
Apple (Red Delicious): petal fall
Pear (Bartlett): fruit set
Tart cherry (Montmorency): fruit 10mm
Sweet cherry: fruit 10mm
Peach: fruit set, shucks off

Highland:
Apple (McIntosh): fruit 10mm
Peach: fruit set, shucks off



INSECT TRAP CATCHES (Number/Trap/Day)

Geneva, NY

	5/8	5/11	5/15
Redbanded leafroller	6.1	7.5	1.0
Spotted tentiform leafminer	392	247	92.6
Oriental fruit moth	73.8	33.7	35.9
Lesser appleworm	81.5	56.7	27.1
San Jose scale	0.3*	4.0	0.6
American plum borer	0.3*	0.5	0.4

Highland, NY

	5/8	5/15
Redbanded leafroller	6.5	1.3
Spotted tentiform leafminer	31.1	4.9
Oriental fruit moth	13.5	6.4
Codling moth	0.1*	0.9
San Jose scale	0	0
Pear psylla (eggs/50 leaves)	0	0
Pear psylla (nymphs/50leaves)	22	2.5
Lesser peachtree borer	0	0.3*

* first catch

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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