

## **Borer problems and their control in dwarf apple trees**

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In the winter of 1998 it came to our attention (via Deb Breth, LOFT) that American plum borer larvae, which we had recently identified as the prevalent borer pest of tart cherries in western New York, were invading burrknots on dwarf apple trees. About the same time, Dick Straub, entomologist in the Hudson Valley, was receiving reports from around the Northeast that dogwood borer damage seemed to be becoming more common in dwarf apple plantings, as well.

Based on Deb's alert, we decided to conduct a survey in western New York to determine how widespread American plum borer was in dwarf apples and how abundant it is compared to dogwood borer. A similar survey had been conducted in the 1970's by Rick Wieres, et al showing that dogwood borer was common in burrknots. Knowing that American plum borer has built up to rather high levels in tart cherries over the last 20 years (it's also present in peaches), and that it will invade apple burrknots, we suspected it may be more common in dwarf apple orchards than anyone had realized up until now.

Survey Preliminary Results Most of the survey work will take place this fall, because larvae of both insects can be found easily then. But, some orchards were surveyed this spring and preliminary results indicate a few things: 1) Most dwarf apple orchards have burrknots and most burrknots are infested with borers. 2) American plum borer larvae are generally more abundant in orchards near tart cherries. Dogwood borer larvae are generally more abundant where there are no tart cherry orchards nearby. 3) Both borers are more abundant in trees with mousegaurds. 4) Damage can be severe enough to destroy trees.

Two orchards that were surveyed had been sprayed for borers last year and very few larvae were found in them.

Both insects overwinter inside bark as larvae. Dogwood borer begins flying in late-June. Cornell Pest Management Guidelines for Commercial Tree-Fruit Production for 2000 suggests one application of Lorsban 50WS sometime between July 15 and August 15, or two applications of Thiodan, one in early-July and one in early-August, for dogwood borer control. American plum borer has two generations per year. Eggs of the first are being laid from mid-May to mid-June. The second generation begins in mid-July. The current dogwood borer control recommendation will lead to the first generation of American plum borer going uncontrolled if it is present. Lorsban is very effective against both pests if applied at the right time. In tart cherry, when plum borer numbers are not too high, one application of Lorsban at petal fall will provide effective control season-long. To determine the best borer control strategy for both pests in apple, we put out trials to evaluate the efficacy of different timings of Lorsban sprays. Lorsban 50W sprays were applied at petal fall or in mid-July (current recommendation), or at petal fall + mid-July.

Spray Timing Results Lorsban 50W timing trials were conducted in two orchards in Wayne County. Both were heavily infested by borers. Lorsban was applied as a coarse spray (150 psi), directly to the trunk using a handgun sprayer, at a rate of 1.5 lb/100 gal. The following tables show preliminary results:

### Wafler

Treatment (Lorsban 50W timing)	% trees infested	
	late June	October
Petal fall	1.3 a	5.3 a
Petal fall + mid-July	4.0 a	2.7 a
Mid-July	24.7 b	1.3 a
Untreated	40.0 c	66.7 b

Means followed by the same letter are not significantly different ( $P < 0.001$ ). n = 50

### Fowler

Treatment (Lorsban 50W timing)	% trees infested	
	6/28	10/5
Petal fall	5.0 a	0 a
Petal fall + mid-July	7.5 a	0 a
Mid-July	32.5 b	5.0 a
Untreated	30.0 b	35.0 b

Means followed by the same letter are not significantly different ( $P < 0.001$ ). n = 10

A tree was considered infested when fresh frass was apparent. The 28-June evaluation was conducted prior to the mid-July spray. (Therefore, the difference shown between the mid-July treatment and the untreated check in the Wafler block is not due to treatment.) Lorsban applied at petal fall was effective in preventing infestation by the first summer larval generation of American plum borer. We would have expected this based on control trials we have done in tart cherries. However, we still expected to see frass produced in treated trees by overwintering dogwood borer larvae that had not yet emerged, and that we thought would be sheltered from the spray because they were inside the bark. Because we did not see any frass in those treatments, we conclude that Lorsban applied at petal fall controlled most dogwood borers that were inside the bark. All Lorsban treatments effectively controlled both borers season-long. Obviously, the mid-July only treatment would not have impacted the first APB generation or overwintered DWB, and would have allowed damage to occur during that time.

After this season, Lorsban use will not be allowed postbloom. We think that a prebloom trunk spray with Lorsban may be just as effective as a petal fall spray. But, if a second application is needed, we will have to evaluate some other insecticide strategies.

Both of these borers can contribute to a decline in the health of trees. They feed initially on burrknot tissue, but when that is consumed they will move out into normal bark tissue and may eventually girdle the tree. They may also open the way for diseases to invade. They likely cause reductions in yield each season, as well, but we do not know to what extent. We have established a couple of plantings where we will try to determine both long-term and seasonal effects on tree vigor and yield.