

2006 Summer Update on Imidacloprid Basal Drenches For Emerald Ash Borer

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Imidacloprid basal drenches have given a very high level of control and restored ash trees to excellent health, even in heavily infested areas, when small ash trees (< 6" dbh) are drenched each spring. We also have several studies in progress where larger ash trees have received a basal drench each spring. In these studies we have had mixed results in the first 2 years after drenching, and the story is still unfolding.

One of our test sites is at Bay Pointe Golf Club in Orchard Lake, Michigan. Bay Pointe has 48 ash trees that vary in size from 10" to 30" dbh. In May of 2004 we treated 24 of the trees (randomly chosen among 3 size categories) with an imidacloprid basal soil drench. In October of 2004 branches were pruned to count galleries (Table 1). In the first year, the number of EAB galleries/m² was reduced by 38.5% on the trees receiving the soil drench. We continued the basal soil drench treatment in early May of each year, and by October of 2005, we could see differences in the appearance of treated trees compared with control trees (Figure 1). We recently visited Bay Pointe to collect tree health data this summer. As of August 1, 2006, it looks like we are going to save about 11 of the 26 trees receiving the basal soil drench, while only 1 of the 26 control trees has a chance of surviving (and that tree may be surviving due to being located very close to and between two drenched trees). This is very good news, because these trees were heavily infested with an average canopy thinning rating of 50% when we started the test. If we had started drenching these trees two years earlier, it is likely that the survival rate would be much higher.

We have a similar study underway with large ash trees at Barton Hills Country Club in Ann Arbor. At Barton Hills we began 4 treatments in 2004: imidacloprid basal drench, foliar spray with Tempo, imidacloprid drench + Tempo spray, and an untreated control. The drench was made each year in early May, and the Tempo was sprayed over the foliage and branches in early and late June. At the start of this test in 2004, all 60 trees had an average rating of 57% canopy thinning and dieback, with no differences among treatments. Most arborists would consider this much too late to begin insecticide treatments. On July 31, 2006, a little more than 2 years after we began insecticide treatments, ratings for untreated control trees averaged 88% dieback, while trees treated with an imidacloprid basal drench averaged 54% dieback (Table 4). Among the 13 trees receiving the imidacloprid basal drench, 7 of the trees are now looking very good with an average dieback rating of 24.3%, while the other 6 trees that were drenched are now dead or nearly so. These results are similar to what we saw at Bay Pointe; the basal drench appears to have saved about half of the trees, and like at Bay Pointe, it is very likely that we would have saved more of the drenched trees if we had started treating them a year or two earlier.

When considering all of our test sites, it looks like the imidacloprid basal drench is extremely reliable for small (< 5 " dbh) ash trees, and very promising for larger ash trees. However, if the trees are already heavily infested and showing obvious canopy thinning and dieback (50%), you can only expect to save about half of the trees. If the trees are showing more than 50% dieback, you will save even fewer of them. However, if you start drenching trees when they are still very healthy, you will very likely save more than half of them. It is also important to water trees during extended periods of dry weather, and to fertilize them properly, because a healthy tree is better able to withstand the initial stages of EAB attack. One other thing to consider is that 'Autumn purple' white ashes are going to be easier to protect with insecticides than 'Marshall seedless' green ash, and most of the other green ashes, because 'Autumn purple' has some natural tolerance to emerald ash borer that makes them last longer. But even the 'Autumn purple' ash trees will eventually die if they are not protected with insecticide treatments.

We also have other research sites where we started drenching trees when they were healthy. It is too early for results from those sites now, but each year we will have more complete information on how well imidacloprid basal drenches protect ash trees from emerald ash borer.

Table 1. Density of new emerald ash borer galleries in ash trees at Bay Pointe Country Club in November, 2004.

Treatment	n	New galleries/m² ± SD	ANOVA Statistics
Imidacloprid basal drench	24	26.9 ± 23.5	F = 4.8
Control	24	43.7 ± 29.4	P = 0.03



Figure 1. Ash trees at Bay Pointe County Club. Of the four large ash trees just across the fairway, the two outside trees have received an imidacloprid drench each spring since 2004, while the two inside trees have not been treated.

Table 2. Canopy thinning and dieback ratings for ash
Ash trees at Barton Hills County Club, July 31, 2006.

<u>Tree number</u>	<u>Treatment</u>	<u>% dieback Kevin 2006 7/31/06</u>	<u>% dieback Eric 2006 7/31/06</u>	<u>Average dieback rating 7/31/06</u>
407	Control	85	80	82.5
411	Control	90	90	90
417	Control	60	55	57.5
420	Control	.	.	100
421	Control	.	.	100
422	Control	100	100	100
425	Control	65	65	65
431	Control	85	85	85
435	Control	95	85	90
981	Control	.	.	100
984	Control	.	.	100
986	Control	.	.	100
992	Control	70	60	65
1000	Control	.	.	100
402	Drench Merit	.	.	100
404	Drench Merit	20	20	20
405	Drench Merit	55	60	57.5
408	Drench Merit	95	95	95
410	Drench Merit	.	.	100
424	Drench Merit	35	40	37.5
426	Drench Merit	30	25	27.5
427	Drench Merit	15	5	10
978	Drench Merit	25	20	22.5
988	Drench Merit	85	85	85
989	Drench Merit	.	.	100
990	Drench Merit	15	10	12.5
996	Drench Merit	50	30	40
403	Merit & Tempo	.	.	100
406	Merit & Tempo	80	70	75
415	Merit & Tempo	.	.	100
418	Merit & Tempo	55	50	52.5
423	Merit & Tempo	20	35	27.5
428	Merit & Tempo	55	50	52.5
429	Merit & Tempo	60	65	62.5
430	Tempo	.	.	100

436	Merit & Tempo	65	65	65
977	Merit & Tempo	5	0	2.5
983	Merit & Tempo	15	15	15
987	Merit & Tempo	65	65	65
994	Merit & Tempo	75	75	75
409	Tempo	100	100	100
412	Tempo	100	100	100
413	Tempo	15	10	12.5
416	Tempo	.	.	100
419	Tempo	.	.	100
432	Tempo	.	.	100
433	Tempo	15	10	12.5
434	Tempo	15	10	12.5
439	Tempo	70	60	65
982	Tempo	40	40	40
991	Tempo	30	20	25
995	Tempo	35	30	32.5
980	Tempo	40	50	45