

## DISPERSAL OF EMERALD ASH BORER: A CASE STUDY AT TIPTON, MICHIGAN

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### ABSTRACT

We had a unique opportunity to assess the dispersal of one generation of emerald ash borer adults for spread pattern in a rural area near Tipton, Lenawee County, Michigan. A Michigan Department of Agriculture inspector discovered adult beetles ovipositing on small ash trees in 2002 in this area, well beyond the core infestation area. Discussions with the property owner revealed that the infestation originated from a load of infested ash firewood brought in from southeastern Michigan in the spring of 2002. The infested firewood, which effectively served as the point source of the infestation, had been piled along the side of a drainage ditch. A mixture of green ash, soft maple, black walnut, and other hardwoods grew along the sides of the drainage ditch, generally from 20 to 125 meters outward of the ditch. We were confident that any emerald ash borer galleries on trees in this area were the result of adults that had emerged from the firewood pile in 2002.

In February, 2003, we marked and recorded location and diameter of the roughly 235 ash trees growing along both sides of the ditch, up to 400 meters away from the firewood pile. We randomly selected two small, two medium and two large ash trees for sampling within each 50-meter contour interval around the firewood pile. We returned with more than 20 volunteers and felled 84 trees. A section of bark, at least 600 cm<sup>2</sup>, was removed from the trunk, lower, middle, and upper canopy of each tree (a minimum of four samples per tree).

Galleries were found in a few trees that were 350–400 meters north of the firewood pile. Therefore, we returned in early March and sampled more than 100 additional ash trees. This sample included trees that were growing along the ditch from 400 to roughly 850 meters away from the firewood pile and trees growing in a woodlot that was roughly 400 meters west of the drainage ditch. A cornfield lay between the woodlot and the ditch.

Preliminary results showed that more than 70 percent of the emerald ash borer galleries occurred on trees growing within 100 m of the firewood pile. Gallery density decreased substantially with increasing distance, but a gallery was discovered in one tree that was 750 meters from the firewood pile. Beetles appeared to exhibit directional dispersal, and followed the corridor provided by the drainage ditch. No galleries were found on trees growing in the woodlot across the cornfield. There were no significant effects of tree size on infestation. Galleries were most often found on medium-sized trees (15–20 cm DBH), but trees ranging from 10 to 25+ cm DBH had one or more galleries. Galleries were more likely to be found in the middle and upper canopies of trees

than on the trunk or lower canopy as distance from the firewood pile increased. Analysis of data is continuing. All ash trees within an 800-meter radius of the infested firewood pile were destroyed by the Michigan Department of Agriculture later in the spring before the new generation of beetles could emerge.