

Dispersal of Emerald Ash Borer: A Case Study at Tipton, Michigan

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Summary:

We had a unique opportunity to assess dispersal of one generation of emerald ash borer adults in a rural area near Tipton, Lenawee County, Michigan. This area was well beyond the core infestation, when a Michigan Department of Agriculture (MDA) inspector discovered adult beetles ovipositing on small ash trees in 2002. Discussions with the property owner showed that the infestation originated from a load of infested ash firewood brought in from southeastern Michigan in 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 m out from 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, out to 400 m away from the firewood pile. We randomly selected 2 small, 2 medium and 2 large ash trees for sampling within each 50 m contour interval around the firewood pile. We returned with more than 20 volunteers and felled 84 trees. A section of bark, at least 600 m², was removed from the trunk, lower, mid and upper canopy of each tree (minimum of 4 samples per tree).

Galleries were found in a few trees that were 350-400 m 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 m away from the firewood pile, and trees growing in a woodlot that was roughly 400 m west of the drainage ditch. A cornfield lay between the woodlot and the ditch.

Results:

Preliminary results showed that more than 70% 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 m 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. 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 mid and upper canopy 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 m radius of the infested firewood pile were destroyed by the MDA later in the spring, before the new generation of beetles could emerge.