

EMERALD ASH BORER DISPERSAL—A RELEASE AND RECAPTURE STUDY

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ABSTRACT

This particular study was designed to investigate the emerald ash borer's dispersal behavior. We investigated distance dispersal from a central release point and landing height on trees.

At approximately 15, 30 and 60 meters out from the release location we chose respectively four, eight and 16 ash trees. From each tree a series of metal mesh panels (1 meter by 0.5 meters) covered in tangle foot strung together by 0.5 meter lengths of rope was hung along the length of the tree. The traps were strung vertically parallel to the tree's trunk by climbing a maximum of 10 meters and attaching a pulley to the tree. A rope was then strung through the pulley and the chain of traps was tied to the rope and pulled up along the length of the tree. A rope was tied to the tree holding the last two panels tightly to the tree, in order to keep the panels closely associated with the trunk of the tree.

Beetles used in this study were collected in the laboratory. Heavily infested ash wood was brought into the laboratory and placed in barrels. The adult emerald ash borer emerging from these barrels were collected and marked with day-glow powder. They were then placed in jars with ash leaves and water until their time of release. On the release date the leaves and water were taken out of the jars and the jars were left at the release point to allow the beetles to fly out at will.

Through the summer roughly 6,000 marked beetles were released in this study. Of the beetles released 210 were recaptured. Of the 28 trees, 20 recaptured at least one released beetle; the most a single tree recaptured in total was 29 marked beetles. The tree located farthest out from the release point, at 76 meters, recaptured two beetles. No trends in flight patterns were apparent from recapture rates, they dispersed at random. Furthermore, some trees located more closely to the release point recaptured no beetles, while others further from the release point, along the same direct flight path, did. The trees were either black or green ash and were in various states of decline. A Chi-square analysis of total number of beetles caught in black and green ash was significantly different from random, with more beetles caught on black ash trees. A Chi-square analysis of the total number of beetles caught on trees and the tree's percent relative dieback was also performed. The results were significantly different from random. Trees with 100 percent dieback (dead trees) caught the most beetles. We also analyzed the position of the panels along the length of the trunk and number of beetles detected on each panel using a Chi-square test. The results were significantly different from random. The panels located lowest along the tree trunk caught the fewest beetles and those located highest caught the most beetles. This was a consistent and prominent pattern.