HOST RANGE OF THE EMERALD ASH BORER (*AGRILUS PLANIPENNIS*) (COLEOPTERA: BURPRESTIDAE): CHOICE AND NO-CHOICE TESTS

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ABSTRACT

Previous literature on the emerald ash borer (EAB) suggests that, in its native range in Asia, EAB will attack species other than ash (*Fraxinus*), including *Ulmus* sp. and *Juglans* sp. In North America, as ash trees die in the core zone of infestation, concern has been raised about the potential for species other than ash to act as a suitable host for this pest. If an alternate host species were to be discovered, the impact on forest resources would increase dramatically in North America.

Our objectives were to 1) determine if EAB can oviposit and develop on potential alternate host species; and 2) evaluate preference among four North American species of ash. We evaluated early instar development on logs of ash and potential alternate hosts that were placed in infested ash trees and in choice and no-choice tests using live nursery trees. We studied four ash species common in Michigan: green ash (*F. pennsylvanica*), white ash (*F. americana*), black ash (*F. nigra*), and blue ash (*F. quadrangulata*). Potential alternate host species included American elm (*U. americana*), black walnut (*J. nigra*), and Japanese tree lilac (*Syringa reticulate*).

In 2004, 40 nursery trees including 10 green ash, 10 white ash, 10 Japanese tree lilac, and 10 black walnut, were transplanted in Ann Arbor, MI. Male and female beetles were caged on the lower 1 m section of the stem of each tree throughout the summer. The uncaged portions of the trees were exposed to wild beetle populations for the duration of the natural flight season. All trees were harvested and dissected during the winter.

In 2004, there were approximately 35 galleries/m² on the caged green ash stems, 0.8 galleries/m² on the caged white ash stems, and no galleries on tree lilac or walnut. On the upper, uncaged sections of the trees, we recorded approx. 150 and 75 galleries/m² on green and white ash trees, respectively. No galleries were found on tree lilac or walnut. More than 65 percent of the galleries on green ash trees were on trees with rough bark.

In 2003, logs of green ash, walnut, and elm were attached to the main stem of infested green ash trees, 5 to 7 meters above the ground. In 2004, white ash and blue ash logs were added to the study and logs were attached to infested white ash trees. For both studies, less than four galleries were found on walnut and none were found on elm. Nearly 200 galleries per m² were found on green ash in 2003 and on white ash in 2004. This study was repeated in 2005 at two sites with predominately green ash trees and two sites with predominately white ash trees. One green and one white ash log were placed in each tree along with a third log that was either black or blue ash or black walnut. At three of the four sites, the green ash logs had higher gallery densities than the other ash species. At one site, gallery density on white ash logs was greater than the other ash species. Approximately 150 abnormal, unsuccessful, feeding attempts were made on seven of the twelve black walnut logs.

Overall, our results to date show that EAB females will land and oviposit on species other than ash. However, early instar feeding is limited and development is substantially impaired in non-ash species in both lab and field studies.