

FACTORS THAT INFLUENCE EMERALD ASH BORER (*AGRILUS PLANIPENNIS*) ADULT LONGEVITY AND OVIPOSITION UNDER LABORATORY CONDITIONS

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ABSTRACT

The emerald ash borer (EAB), *Agrilus planipennis*, is a nonnative insect from Asia that threatens ash trees in the urban and natural forests of North America. Research on this invasive insect and rearing parasitoids for release rely heavily on the ability to artificially rear EAB. Methods to maintain EAB adults and obtain eggs exist, but result in inconsistent adult fecundity and longevity. Here, we evaluate the effects of host plant, temperature, humidity, and oviposition substrates on adult survival and fecundity. Each treatment used 21-40 pairs of adults that emerged from infested wood collected in Michigan. The pairs were held at 25 °C, 65 percent RH and 16:8 light:dark cycle except in the temperature and humidity studies.

EAB adults did not survive or reproduce well when fed *Fraxinus griffithii*, an evergreen ash of Asian origin, but did well when fed mature foliage of *F. uhdei*, an evergreen ash of North American origin. When adults were fed newly expanded foliage, fecundity, longevity, and the percentage of females that oviposited were all lower than when mature foliage of the same species was used.

The best oviposition substrate, of those tested, was a 2 x 20 cm bolt wrapped first with butcher paper and then with a 1.3 cm wide strip of purple curling ribbon (not overlapping). Using this substrate, 50 percent of the eggs were laid on the butcher paper which is a fairly clean substrate on which eggs hatch well. The eggs on butcher paper can also be placed on artificial diet and the larvae that hatch will burrow into the diet.

EAB adult longevity decreased as temperature increased from 20 to 30 °C. Only one female oviposited at 20 °C. Percentage females ovipositing and fecundity were higher at 25 °C than at either 20 °C or 30 °C. Percentage egg hatch was also highest at 25 °C. Female fecundity and survival were lower at 55 percent and 75 percent RH than at 65 percent RH. There was little effect of percent RH on male survival. Egg hatch was lower at 55 percent RH than in the higher percent RH treatments.

These results provide good methods for maintaining adults and obtaining eggs that hatch well. Further improvement may be possible by using different containers or group rearing.