

BIOLOGY AND PHENOLOGY OF THE EMERALD ASH BORER, *AGRILUS PLANIPENNIS*

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The seasonality of events in the life history of the emerald ash borer was investigated under field and controlled-laboratory conditions. The emergence period of adults was determined, under field conditions, by rearing adults from log bolts in cages in an outdoor insectary. Adults were collected weekly from the cages and their sex was determined. Temperature conditions were monitored onsite using data-logging equipment. The first adults emerged during the week of 4-11 June, although a few adults were observed flying on 28 May. Mean emergence dates for males and females were 25 and 26 June, respectively. The last adults emerged during the period 24-30 July. The sex ratio approximated 1:1. To determine adult activity periods, Tangle Trap-coated plastic bands were placed on boles of host trees about 2 m above the ground. A total of 130 trees in three plots, with different levels of damage, were banded. Bands were examined for adults at weekly intervals throughout the summer. These bands captured about 10,000 beetles. Mean activity periods in the three plots were 3, 10 and 13 July. Adults were active into the second week of August. Larval and pupal development

was tracked by dissecting host logs throughout the growing season.

In the laboratory, adult longevity, oviposition, fecundity and egg development were investigated under controlled conditions. Mean longevity for unmated males and females was 29.8 and 26.5 days at 24° C. Although fecundity was extremely variable, one female deposited 275 eggs over her lifetime. The mean number of days to first-observed mating for females was 23.3 days (range 12-53 days; n = 16) and the mean time to first oviposition was 23.9 days (range 13-56 days; n = 22) at 24° C. There was a strong positive correlation between first oviposition and first observed mating. Mean longevity of mated females was 56.4 days at 24° C, which was much longer than the period for unmated females. Females were observed mating with multiple partners. Eggs took an average of 19.4 days to hatch at 24° C and 38.5 days to hatch at 18° C. A preliminary estimate for a developmental threshold for egg development was 12.3° C. The goal of these investigations is to develop models for predicting the phenology of this insect.