

## IS EMERALD ASH BORER AN OBLIGATE MIGRANT?

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### ABSTRACT

Computer-monitored flight mills with tethered emerald ash borer, *Agrilus planipennis* Fairmaire (Coleoptera: Buprestidae), adults to measure flight speed, duration, and periodicity showed tethered beetles flew up to 5.2 km in two days at flight speed of at least 1.5 m/sec (3.5 mph). Females fly twice as far as males ( $P < 0.002$ ), and mated females fly twice as far as unmated females ( $P < 0.0001$ ). The discovery that mated females fly longer, further, and faster than either males or unmated females suggests that females are programmed to make a post-teneral dispersal flight. This is supported by the absence of a correlation ( $R^2 = 0.007$ ) between distance flown and female size (Taylor et al. 2004).

Further study was done to better understand dispersal of mated females. After eclosion, female *A. planipennis* were allowed to maturation feed for 10 days and mate. One to three days later, 24 mated females were flown 8 h/day and allowed to rest, feed, and drink for 16 h for up to five days. The distance flown by these beetles ranged from 277 m to 9.84 km in two to five days. Their average flight speed over three days was 1.5 km/day, but 50% flew >4 km, and 10% flew >7 km. Of the latter group, the average flight speed was ~2.5 km/day. The distance flown declined from day to day, except for one mated female that flew >2 km per day for a total of 9.84 km in four days; she had been placed on the mill the day after mating. These results are consistent with our earlier conclusion that female *A. planipennis* engage in post-teneral migratory flight.

These studies were conducted in a more or less stimulus-free environment; thus, we have no knowledge of what external factors might influence flight thresholds and parameters. A better understanding of factors influencing flight behavior may facilitate development of effective management strategies for this highly mobile pest.

### REFERENCE

Taylor, R.A.J., L.S. Bauer, D.L. Miller, and R.A. Haack. 2005. Emerald ash borer flight potential, pp. 15-16. *In* Proceedings of the 2004 Emerald Ash Borer Research and Technology Development Meeting Romulus, Michigan. USDA Forest Service FHTET-2004-15. 92 p. <http://ncrs.fs.fed.us/4501/local-resources/downloads/2004EABProceedings.pdf>.