

ANALYSIS OF THE ASIAN LONGHORNED BEETLE INFESTATION IN JERSEY CITY, NJ

A.J. Sawyer¹, V. Mastro¹, B.C. Emens² and T. Denholm³

¹USDA APHIS PPQ, Otis Pest Survey, Detection & Exclusion Laboratory, Bldg. 1398, Otis ANGB, MA 02542

²USDA APHIS PPQ, PO Box 330, Trenton, NJ 08625

³New Jersey Department of Agriculture, Room 303, Health & Agriculture Bldg., John Fitch Plaza, Trenton, NJ 08625

Abstract

In October 2002 an adult Asian longhorned beetle (ALB), *Anoplophora glabripennis* (Coleoptera: Cerambycidae) was discovered on a tree in Jersey City, NJ. A survey of the area by APHIS and NJDA personnel revealed an infestation involving over 100 trees, mostly Norway maples, concentrated in a 3 hectare urban area. Because the infestation was well isolated from previous finds (Manhattan, > 3.2 km away), this site provided a unique opportunity to study the history and dynamics of colonization by the ALB. Detailed information on the numbers and spatial distribution (between-tree and within-tree) of ALB egg sites, tunnels and exit holes was collected from the infested trees before and during removal. Infested material from selected trees was taken to the quarantine facility at Otis where it was dissected to collect ALB life table data and to estimate the ages of exit holes from growth rings. A total of 5,698 oviposition sites and 446 exit holes were found on 113 infested trees. Most trees had no exit holes or very few. Ten trees had 10 or more exit holes, including four having 40, 45, 56 and 104. Only the latter two trees were found to have exit holes pre-dating 2002 (1998-2001). Some exit holes were completely closed by new growth in a single growing season. Based on excavation of >1200 oviposition pits and tunnel systems in Norway maples, approximately 95% actually had eggs laid in them. Survival rates through the egg, neonate, phloem-feeding larval and pupal stages were about 85% each, while survival of xylem-feeding larvae was only 60%. Overall, 30% of observed oviposition pits produced adults. Intraspecific competition or cannibalism appeared to be the principal cause of the relatively high mortality rate seen among large larvae in the heavily infested trees from which most of these sites were collected. A simple population model (with conservative assumptions: sex ratio = 0.5, mating success = 0.8, oviposition pits chewed per female = 28 and adults emerging per initial pit = 0.25) indicates that the number of egg sites and exit holes observed in January 2003 could easily have resulted from a colonizing event of one gravid female arriving on site in the summer of 1997. The distance from the likely epicenter of this infestation to the most distant tree bearing an egg site in January 2003 was only 250 m.