Regulation of the St. Louis Airport for Japanese Beetle

Larry E. Trevathan, USDA-APHIS-PPQ

The Japanese beetle (*Popillia japonica*) has been a reported pest in Missouri since being found in the southern part of St. Louis in 1934. At the time, New England and Mid-Atlantic states were generally infested and within the regulated area of federal quarantine. The USDA Japanese Program Manual currently lists 44 preferred hosts of Japanese beetles, a majority of which occur in Missouri. Because of the abundance of preferred hosts, and the fact that Missouri is included in the list of regulated states, Japanese beetle has continued to be the subject of regulatory scrutiny in the greater St. Louis metropolitan area.

With the growth of the nursery industry in Missouri (currently over 100 commercial nurseries are operating in the greater metropolitan St. Louis area) and the westward expansion of Japanese beetles, trapping efforts have continued to monitor population levels. Beginning in the 1960s, infestations were reported in other urban areas of the state. Initial reports of infestation were usually associated with golf courses and plant nurseries.

A particular site of vulnerability to infestation is the Lambert-St. Louis International airport. This airport was regulated because adult beetle populations constituted a threat of spread to other protected states with direct flights originating from the airport to those protected states on six major air carriers. In addition, urban and commercial development has completely encompassed the facility. The terminal area is surrounded by managed turf and landscape plantings, which include preferred food hosts such as *Hibiscus* spp., Linden, crabapple, and maple trees and runways are bordered by pasture grasses. This environment is particularly conducive to Japanese beetle activity. For these reasons, a concerted outreach effort was initiated by PPQ Missouri in 2009.

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This included program presentations to managers of the major carriers and the Operations & Maintenance Department of the airport. This department has been particularly responsive and proactive in attempts to reduce beetle populations in the vicinity of the airport. To lower beetle populations to non-threatening levels, landscape personnel have adopted an IPM approach. Fast-acting insecticides are applied to host plants, biological agents are applied to managed turf for larvae control, and preferred hosts are replaced with non-preferred and/or non-hosts when horticultural circumstances permit.

Trapping results for the past 4 years are presented in the figure below. In general, the beetles have an initial emergence followed by a drop in the population before a peak emergence occurs. Traps were placed in direct sunlight just outside the one-half mile perimeter of aircraft operating areas. Due to high numbers of beetles trapped at the beginning of the peak emergence period in 2011 (June 30), visual surveys were conducted at least three times a week for 15 minutes each in aircraft operating areas. These surveys were initiated just prior to departure of the first flight of the day destined to a protected state and continued through mid-afternoon to coincide with peak beetle activity.

The high number of beetles trapped during initial emergence in 2011 (June 23) was followed by visual observation of two or more beetles in areas where aircraft were being loaded or unloaded. An Emergency Action Notification (PPQ Form 523) was issued and trapping ceased. Efforts were then directed to aircraft inspections due to the possibility of beetle infestation and consideration of aircraft as regulated articles. At that point, there was a threat that beetles could enter aircraft and be transported to states free of Japanese beetle.

Because 2011 is the only year that the airport in St. Louis has been regulated, the high beetle population at initial emergence could be a determining factor. Unlike previous years when initial emergence numbers declined prior to increasing at peak activity, the slope of the population curve in 2011 continued to increase. It is not known what happened continued on next page

Graph provided by the author shows trapping densities at the St. Louis airport in 2009, 2010, 2011, and 2012.
Collaborative and Enhanced First Detector Training Workshops to be held in Florida and California

Stephanie Stocks, Department of Entomology and Nematology, University of Florida

A multi-agency collaborative effort between Cooperative Agricultural Pest Survey Program (CAPS), the Florida Department of Agriculture and Consumer Services - Division of Plant Industry, California Department of Food and Agriculture, USDA-APHIS-PPQ, local Cooperative Extension, the University of Florida-IFAS Extension, the University of California at Davis, the National Plant Diagnostic Network (NPDN), Protect U.S. and the Sentinel Plant Network (SPN) is underway to offer First Detectors in the high risk states of Florida and California specialized invasive species training workshops.

Invasive species featured in the workshops will be both CAPS pests of concern as well as species of concern to the particular target audiences: master gardeners, small farm producers, public gardens, and nursery growers. The workshops (and species list) will be tailored to fit each individual target audience.

Other topics that will be presented in the workshops include: how to submit a sample (plant disease and arthropod), an overview of the agencies involved and their mandate for invasive species monitoring, management recommendations, regulation information, and hands-on identification.

The presentations developed for each of the workshops will be available for download online to First Detector Educators at the conclusion of all the workshops. In addition, these presentations will be converted to e-learning modules that will be made available to all First Detectors.

About NPDN:

The NPDN is a network of state and federal officials, land grant universities, and First Detectors whose mission is to detect, diagnose, and disseminate information regarding high consequence plant disease or pests. The NPDN was established in 2002 in response to a need for greater agricultural security.

Over the years, the NPDN has grown into an internationally respected consortium of plant diagnostic laboratories.

The five regions that make up the NPDN are the: NEPDN, SPDN, NCPDN, GPDN, and WPDN.

Please feel free to browse the links to the various regions to get a better idea of what is going on in your part of the country.
Asian Longhorned Beetle (*Anoplophora glabripennis*) in Ohio

Joe Boggs, OSU Extension, Hamilton County and OSU Department of Entomology, & Amy Stone, OSU Extension, Lucas County

On Friday, June 17, 2011, the United States Department of Agriculture, Animal and Plant Health Inspection Service (USDA-APHIS) and the Ohio Department of Agriculture (ODA) jointly announced that an Asian longhorned beetle (ALB) infestation had been found near the Village of Bethel, a small Ohio town in Tate Township, Clermont County, located about 25 miles east of Cincinnati. The current quarantined area encompasses 61 square miles. The state joined four others where ALB has been found in the U.S.: New York (Brooklyn, 1996); Illinois (Chicago, 1998); New Jersey (Jersey City, 2002); and Massachusetts (Worcester, 2007). ALB was also discovered in 1998 in Toronto, Ontario.

ALB is native to China and the Koreas. North American ALB populations were spawned by the arrival of only a few beetles, most likely in infested wood packing material including crates and pallets. This “founder’s effect” creates a genetic bottleneck that has proven helpful in disclosing the origin of ALB infestations. Genetic analysis has shown that thus far, all North American ALB infestations stem from beetles arriving directly from Asia; none have been caused by beetles moving or being transported from state-to-state.

ALB in Ohio is somewhat unique in that the infestation is occurring in an area where emerald ash borer (*Agrilus planipennis*) (EAB), another non-native invasive, is also at work killing ash trees. Consequently, the public’s confusion relative to understanding the differences between these two tree-killing beetles has presented some challenges with raising awareness of ALB.

The two major differences between EAB and ALB are host range and management strategies. EAB only kills trees in one genus, *Fraxinus*, while ALB kills trees belonging to 13 plant genera. These include: *Acer* (all maple species); *Aesculus* (horsechestnuts and buckeyes); *Ulmus* (elms); *Salix* (willows); *Betula* (birches); *Platanus* (Sycamore / Planetrees); *Populus* (Poplars); *Albizia* (Mimosa); *Cercidiphyllum* (Katsura); *Fraxinus* (ashes); *Koelreuteria* (goldenraintree); *Sorbus* (mountainash); and *Celtis* (Hackberry). While the first six in this list of genera are generally considered the trees most commonly attacked, all of the trees in this list can be attacked and killed by ALB. Trees in the first group are like “steak” to ALB, while trees in the second group are like “hamburger.”

EAB is too widespread and established in North America to be eradicated; however, ALB is restricted enough in its distribution (as of now) to be eradicated. The USDA-APHIS has been waging war against ALB since 1996 continued on next page
with this pest having been declared eradicated in Chicago and in several locations in New York and New Jersey.

The following are a few key ALB detection features being taught in outreach educational programs:

• **The Beetle:** ALB is a large, striking looking beetle with adults measuring 1 to 1.5” in length. The beetle belongs to the family Cerambycidae which are commonly called “longhorned beetles” because of their extremely long antennae.

• **Big Emergence Holes - the “Pencil Test”:** Adult emergence holes are 3/8-1/2” in diameter and the holes extend deep into the xylem. The holes are large enough to easily insert a #2 pencil and this “pencil test” is effective in separating other phloem feeding borers from ALB (the emergence holes of ALB are much deeper). Of course, ALB holes can be found in living, healthy branches and trunks; whereas a number of native longhorned beetles infest dead or dying stems instead.

• **Oviposition Pits:** Every ALB infestation starts with female beetles chewing circular to oblong-shaped pits, around 1/2” in diameter, through the bark and down to the white wood of host trees. They are often more obvious in the spring and fall when sap oozes out of the wounds and runs down the bark. Pits remain evident for about a year until wound tissue seals them. The beetles will only lay eggs on LIVING stems so new pits do not appear on firewood. Beetles will lay eggs throughout the tree. The pits are as likely to be seen at eye-level as they are to be found high in the tree. Trees of all sizes are selected as long as stem size can support complete larval development.

• **Coarse Frass:** ALB frass consists of very obvious wood shavings that look like “wood wool,” or Excelsior packing material. The distinctive ALB frass collects on the bark, falls into branch forks, and drops onto the ground around the base of an infested tree trunk.

• **Branch Breakage:** Late instar ALB larval feeding activity in the white wood (xylem) causes substantial structural weakening of infested branches leading to branch breakage. Always look at the ends of broken branches to see why the branch broke! Also, look for heavy tunneling across the rings of the white wood. In fact, one of the Worcester infestations was discovered by USDA-APHIS personnel examining the ends of branches broken after an ice storm.
• **Heavy Woodpecker Damage:** ALB larvae bore into the white wood (xylem) and woodpeckers must excavate deeply to extract these larval meat morsels.

• **Tree Dieback and Death:** ALB infestations eventually kill trees; however, death comes very slowly. While infested trees will show canopy thinning, this symptom on maple sometimes does not occur until the main stem is riddled with emergence holes. Canopy decline is also not a reliable indicator of an ALB infestation.

Suspected ALB infestations can be reported online [here](#).

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**Key to *Diabrotica* from North and Central America just released**

CPHST and collaborators at the University of Maryland have recently released “*Diabrotica* ID: Identification of North and Central American *Diabrotica* Beetles”. This genus contains many economically important species that feed on the flowers, leaves, and roots of both ornamental and agricultural crops. They can also be vectors of lethal plant diseases such as bacterial wilt (*Erwinia tracheiphila*) and cucumber mosaic virus.

This matrix-based key to all 112 valid species and subspecies has been designed for use by non-specialists and specialists alike. Click [here](#) to access it.

The developers would appreciate any comments or suggestions regarding this tool. Please feel free to direct those comments to Alex Konstantinov or Amanda Redford.


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**NAPPO Phytosanitary Alert System**

The North American Plant Protection Organization’s (NAPPO) Phytosanitary Alert System is featured in this newsletter every month. Remember that this a great resource to keep up to date on the latest pest detections and quarantine information. The website features both official reports and unofficial alerts of pests for Canada, Mexico, and the United States.

They also have free subscriptions that are available for periodic email notifications of new postings on their website. Be sure to check it out regularly!
Upcoming Meetings:

- February 27, 2013 - Collaborative and Enhanced First Detector Training Workshop will be held in Tavares, FL for Master Gardeners - contact Dr. Jennifer Hamel for more information.
- March 21, 2013 - Collaborative and Enhanced First Detector Training Workshop will be held in Miami, FL for nursery growers - contact Dr. Jennifer Hamel for more information.
- March 22-23, 2013 - Georgia State Master Gardeners Meeting will be held in Watkinsville, GA - click here for more information.
- March 26-28, 2013 - Malacology Workshop will be held at University of California, Davis - contact Richard Hoenisch for more information.
- March 29, 2013 - Collaborative and Enhanced First Detector Training Workshop will be held in Tampa, FL for public gardens - contact Dr. Jennifer Hamel for more information.
- April 12, 2013 - Collaborative and Enhanced First Detector Training Workshop will be held in Chipley, FL for small farm producers - contact Dr. Jennifer Hamel for more information.
- April 15, 2013 - Collaborative and Enhanced First Detector Training Workshop will be held in Miami, FL for public gardens - contact Dr. Jennifer Hamel for more information.
- April 15-17, 2013 - Alabama State Master Gardeners Meeting will be held in Florence, AL - click here for more information.
- May 14-16, 2013 - Mississippi State Master Gardeners Meeting will be held in Brookhaven, MS - click here for more information.
- May 15-18, 2013 - Arkansas State Master Gardeners Meeting will be held in Rogers, AR - click here for more information.
- If you would like your meeting listed in the newsletter, let us know.

Do you tweet?

- Click here for updates.

First Detector Training Opportunities:

- If you are hosting a First Detector Training Session, please post these on the NPDN First Detector Training website so that they can be listed here.

Employment Opportunities:

- Please click here for more information.

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Editors: Carrie L. Harmon, Stephanie D. Stocks, and Amanda Hodges
To submit news items in future editions of the newsletter, contact: clharmon@ufl.edu or sstocks@ufl.edu or achodges@ufl.edu

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