Photo 1: Decline of ALB-infested trees represents rather advanced stages of insect activity that may take years to be manifested. (Photo Credit: Dennis Haugen, USDA Forest Service, Bugwood.org)

Photo 2: The ALB was undoubtedly introduced into North America on wood material (pallets, dunnage) in ships from China. In this photo, a ship carrying consumer products from China passes by Alcatraz on its way into San Francisco Bay.

Photo 3: The adult ALB is rather large and striking in coloration. (Photo Credit: Melody Keena, USDA Forest Service, Bugwood.org)

Photo 4: The adult ALB is classified as a longhorned beetle, which may be confused with native longhorned beetles such as these Pine Sawyer beetles.

The Plant Doctor's LANDSCAPE TIPS

By David L. Roberts, Ph.D, *Senior Academic Specialist, College of Agriculture and Natural Resources, Michigan State University*

THE ASIAN LONGHORNED BEETLE: KEEPING A VIGILANCE

INTRODUCTION:

The Asian Longhorned Beetle (ALB=Anoplophora glabripennis Motschulsky, 1853) is native to Asia, especially China, Japan and Korea. Susceptible species of trees decline and eventually die from ALB infestations (Photo 1). The ALB was first detected in North America in Brooklyn, New York in 1996. Subsequently it was found in several locations in Chicago, Illinois in 1998; in Toronto, Ontario in 1998; in Jersey City, New Jersey in 2002; and in Worcester, Massachusetts in 2007. Recently, June 2011, the invasive insect was found in nearby Ohio near Cincinnati. As with the Emerald Ash Borer (EAB), the ALB was probably imported via shipping containers with wood pallets and dunnage (Photo 2).

Many invasive insects and diseases individually and alarmingly attack not just individual species of plants but rather a whole genus of plant (ex. EAB and Fraxinus; Dutch Elm Disease and Ulmus). The ALB, however, attacks several prominent genera of trees, including: Maple (Acer sp.), Elm (Ulmus), Willow (Salix), Sycamore and Planetree (Platanus), Poplars (Populus), Ashes (Fraxinus), Mountain Ash (Sorbus), Hackberry (Celtis), Birches (Betula), Goldenraintree (Koelreuteria), black locust (Robinia), and Mimosa (Albizia). The rather extensive host range of the ALB makes it a formidable, adaptive and definitely unwelcome guest to the United States.

DETECTION AND ID OF ALB:

Because ALB attacks so many genera of trees, our landscapes and forests may be forever changed if this insect becomes established here. Hence, it is vital that we maintain a constant vigilance so the insect can be caught early; early detection will enable more feasible eradication. For many pests and diseases, the first signs of tree infestations will generally include some tree decline symptoms such as canopy loss and branch dieback. With the ALB, however, branch dieback and canopy loss will disclose very advanced stages of infestations (Photo 1). Trees with ALB generally take many years to die. Unlike the EAB which feeds in the cambium of the tree, causing a rather rapid dieback, the ALB invades deeper into the sapwood and heartwood, leaving the vascular system comparatively intact, the reason trees take so long to die. Other signs and symptoms may augment diagnosis for early detection of ALB:

Insect: The ALB adult is a rather large insect measuring 1 to 1½ inches and is striking in color (Photo 3). It may be mistaken for other native longhorned beetles (Photo 4); this group of beetles is called "longhorned" because of their long antennae. A distinguishing feature of the ALB is alternating bluish-black and white bands on its antennae. The body of the beetle is also "dabbed" with white spots. Mature larvae are also quite large and appear segmented (Photo 5).

Woodpecker Activity: Like the EAB, woodpeckers are attracted to trees infested with ALB. Woodpecker activity on ALB-infested trees tends to appear rather aggressive (Photo 6) and perhaps more pronounced than damage with EAB-infested trees.

Limb Breakage: Due to extensive tunneling in the inner wood, the structural integrity of ALB-infested trees is compromised (Photo 7), leading to limb breakage. ALB has been detected at several locations from limb failure during storms.

Photo 5: The major stages of the ALB life cycle: adult, larvae, pupa. (Photo Credit: Kenneth R. Law, USDA APHIS PPQ, Bugwood.org)

Photo 6 (left): Like the Emerald Ash Borer, an early sign of ALB infestations is wood pecker activity on infested trees. Woodpecker activity with ALB is generally aggressive and deeper into the wood when compared to EAB.

Photo 7: Infestations of trees by ALB usually result in compromised structural integrity of limbs, which may become evident during storms. Limb failure is possibly an early symptom for detection of the insect. (Photo Credit: Larry R. Barber, USDA Forest Service, Bugwood.org)

Emergence Holes and Frass: The emergence holes of ALB-exiting adults are fairly large, measuring approximately ⅜–½ inches diameter (Photo 8), and extend deep into the wood. The holes are sufficiently large to hold a pencil or screwdriver. Wood shavings (frass) often protrude from emergence holes or can be found clinging to bark and branch crotches, and/or deposited on the ground.

Oviposition Pits: The ALB female gouges out "pits" in which she lays her eggs (Photo 8). These pits may be inconspicuous or confused with other injuries; however, the pits may augment diagnosis of the ALB when combined with other signs and symptoms.

Tree Symptoms: As related, decline and dieback of trees usually represent a fairly advanced infestation. Earlier symptoms include foliar feeding and twig feeding by adults; twig feeding will often result in wilted foliage (Photo 9).

Photo 8: Emergence holes of adult ALBs are large, measuring approximately ⅜ to ½ inches in diameter. Adult female ALBs gouge out pits in the bark where their eggs are deposited. Pits and emergence holes may be helpful in identifying ALB infestations.
(Photo Credit: Dennis Haugen, USDA Forest Service, Bugwood.org)

MANAGEMENT OF ALB:

Because the Asia Longhorned Beetle is considered an invasive pest that is still considered somewhat containable and eradicable, current strategies by federal and state authorities are aimed at destruction of the insect. The primary method employed is destruction of infested trees and suspected infested trees by chipping. Needless to say, may tree owners are not pleased when government officials require that seemingly healthy trees be destroyed to satisfy eradication efforts. Various pesticide applications have also been shown to be partially effected but quarantine laws aimed at eradicating the insect have largely precluded the application of insecticides to manage it at this time.

Early detection of ALB is vital if we are to contain and eradicate the insect at various locations around the U.S. Unfortunately, wherever ALB is found, other nearby outbreaks are invariably located as well. As with other wood-boring beetles, the ALB can be transported in wood products and firewood. In Michigan, everyone needs to be informed and educated about the signs and symptoms; we do not want the distinction of being the one state that detects the ALB too late to eradicate it from our state. Any suspected cases of potential ALB infestations should be reported to the proper experts/authorities.

For more information, please feel free to email David Roberts at robertsd@msu.edu or contact a professional plant health care provider. The author, MSU and MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.

Development of Landscape Tips was sponsored by MSU and MGIA.

MICHIGAN GREEN INDUSTRY ASSOCIATION

MICHIGAN STATE UNIVERSITY

Photo 9: Adults also feed on foliage and twigs; the wilting of foliage may signify an early stage of ALB infestation. (Photo Credit: Dean Morehead, Health Canada, Bugwood.org)