
*ASIAN LONGHORNED BEETLE
TRAINING RESOURCE MODULES*

*MODULE B
ALB LIFE CYCLE AND IDENTIFICATION*



Module B: ALB Life Cycle and Identification

Materials

8. Insect specimens
9. Stereoscopes
10. Hand lens
11. Good lights
12. Separation keys
13. All ALB life stages
14. Wood samples showing ALB activity
15. Diagram of seasonal life cycle and activity
16. ALB ID card

Goal

To have participants recognize ALB from other common insects and to understand what it looks like, where it lives, and its life cycle.

Objectives

At the end of this module participants will be able to:

- 1.) Differentiate ALB adults from other common insects;
- 2.) Identify the 4 life stages of ALB and where they live;
- 3.) Understand when and how long each life stage lives.

Activities

PRESENTATION: Present ALB and other insects and how to differentiate them from 'similar' insect species; Outline the ALB life stages and where they are found in the tree; and present how long ALB life stages persist and when they occur during the year.

WORKSHEET: Mini-quiz on characteristics and species identification.

FIELD EXERCISE: Review characteristics of the ALB using sample insects, ID cards and wood samples.

Module Length: 1.0 hours

Module B: ALB Life Cycle and Identification

ACTIVITY 1: Presentation

The ability to identify the Asian Longhorned beetle is critical to the success of an eradication program. The more people that know how to recognize the insect will mean that there will be a larger cadre of skilled surveyors out in our communities looking for signs of the beetle. This module aims at providing an overview of the various stages of the insect's life cycle and provides information on how to eliminate 'similar' species of beetles that are not as devastating as the ALB.

Life Cycle

The life cycle of the ALB is divided into four recognizable stages - 1.) Egg, 2.) Larval stage, 3.) Pupal stage and 4.) Adult. The most recognizable stage, to the non-professional, is the adult stage. It is during this stage that the beetle is found outside of the wood and branches of a tree, and can be found almost anywhere on, or nearby, a host tree.

Review the ALB Life Cycle informational handout to see a description of the following stages of the ALB's life cycle:

Egg: Bark of recently cut logs, drying trees, stressed and even healthy trees can serve as egg laying sites. The eggs are rice-like and are found right below the bark. The oviposition niche (egg laying site) can be of variable shape.

Larval Stage: Worm-like larvae will feed (tunnel) just beneath the bark for a short time. Then the larvae tunnel to the heartwood, in the central portion of the tree, and feed. It is here that they can cause extensive damage.

Pupal Stage: Toward the end of the larval stage, the insect will expand its feeding tunnel (so it has more room) and go into a non-feeding stage. It is then called a pupa. It is during this stage (inside the wood) that it transforms into the adult that most are familiar with.

Adult: Adult beetles emerge from the tree out of exit, or emergence holes, which are about 7/8" in diameter. The adult beetles are heavy-bodied insects. Although they are capable of flight, they probably will not fly great distances to feed on tree twigs, especially if suitable tree hosts are present. Adults can probably be expected to be present from late May through October. The adult beetles will feed on the twig bark of healthy trees. The adult feeding wounds are possible sites for the introduction of branch pathogens that can eventually kill a tree's branches. The female beetle chews a small funnel shaped depression in the tree bark and inserts an egg under the bark.

Signs of ALB Infestation

The ALB can be found in different locations of a tree during the various stages of its life cycles. It is important to look for signs of the beetle in all areas of the tree, including the trunk, branches, and twigs and on the leaves. The easiest stage to find and identify the ALB is during the adult stage, although signs of the other stages may be apparent in the tree.

The **Eggs** are laid just beneath the bark of the tree, usually on branches and the trunk. The adult female lays the eggs at one time for about 9-15 days of its adult stage. The female can lay up to 50 eggs at one time.

Eggs hatch into white, wormlike **Larvae** that bore into the tree trunk and branches. The larvae bore past the cambial layer of the tree into the heartwood. As the larvae feed, the colonies, or tunnels, that it creates become larger and cause structural damage to the wood of the tree. This weakens the branches and trunk of the tree. It is also during this stage that frass (insect waste and sawdust) can be found at the base of infested trees and in branch crotches.

The **Pupal Stage** of the beetle's life cycle is where the insect is in a non-feeding mode and is found in the heartwood of the tree. During this stage, inside the wood of the tree, the beetle transforms itself into a mature adult.

Adult beetles emerge out of the heartwood through emergence (exit) holes and then move along the branches and trunk of the tree. The emergence holes are about the size of a dime (1/2 inch diameter), or slightly larger. The adult beetle is shiny and coal-black with white spots and about 1 inch long. ALB has very long horn-shaped antennae (feelers) that are black with white rings.

Adult Asian Longhorned beetles are active only during the summer and fall months. They reside deep inside infested trees during the rest of the year. It is important to remember that any stage of the insect can be found in the tree, at any time of the year. Because the adult female lives from 20 to 60 days, eggs are continually laid throughout the warmer summer and fall months, leading to a steady stream of new insects at various life stages throughout the year. Pay careful attention to wood that is found in trees that are cut down or trimmed.

It is most likely that you will find the adult beetle the easiest to identify, but keep a careful eye out for oviposition sites and exit holes on the trunks and branches of host species. Additionally look for piles of frass (insect waste and sawdust) at the base of infested trees and in branch crotches, and for sap leaking from wounds in trees.

ALB or Whitespotted Sawyer?

Using the USDA Forest Service handout, compare the ALB to the Whitespotted Sawyer, a similar looking insect that is common throughout the northeastern United States. This insect is much less destructive than the ALB and poses no serious threat to our forests. Note the differences in the two beetles, making careful note of the color, antennae banding, and spotting on the insects Elytra (wings).

Note that the ALB attacks apparently healthy hardwood trees, while the Whitespotted Sawyer are drawn to dying, stressed or recently felled conifers.

ACTIVITY 2: Mini-Quiz on Use ALB Life Cycle and Identification

A mini-quiz is provided to test your skill at identification of the ALB and its life cycle.

Module B Mini-Quiz
ALB Life Cycle and Identification

17. Name the four stages of the ALB life cycle.
18. To the non-professional, the most recognizable stage of the ALB life cycle is the _____ stage.
19. The non-feeding stage of the ALB life cycle is the _____ stage.
20. Adult beetles emerge from the heartwood through oviposition sites. True or False?
21. It is during the _____ stage of the ALB life cycle that frass can be found at the base of infested trees and in branch crotches.
22. The adult female can lay up to 10 eggs at one time. True or False?
23. Adult females normally live from ____ to ____ days.
24. Adult ALB are normally active during the summer and fall months. True or false?
25. ALB attack apparently healthy trees while the Whitespotted Sawyer are drawn to dying, stressed or recently felled conifers. True or False?
26. The _____ niche is where the female lays her eggs.