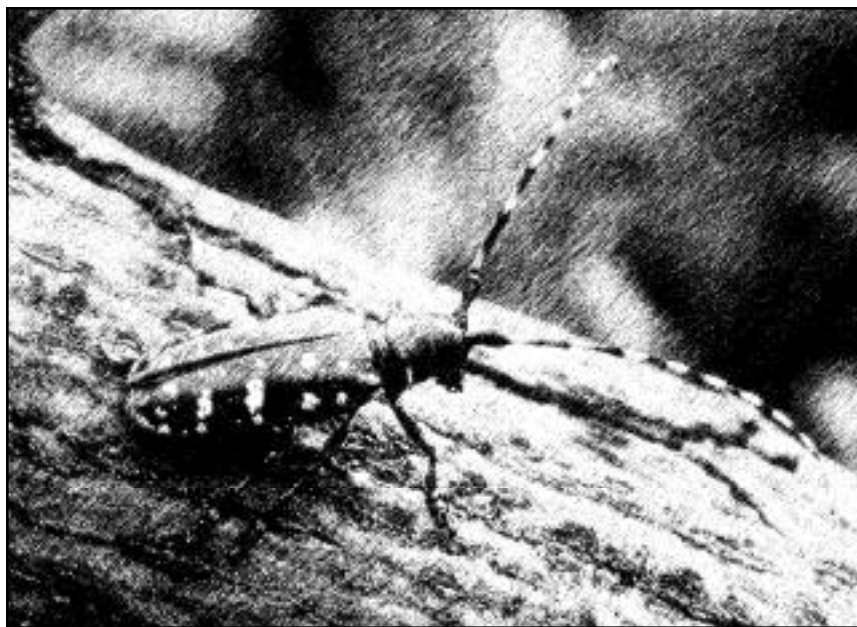


TRAINING RESOURCE MODULES -

MANAGING THE ASIAN LONGHORNED BEETLE IN THE NORTHEAST

Ver. 1.0



*Training Curriculum Materials for the
Identification of the Asian Longhorned Beetle*

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United States
Department of Agriculture

Forest Service

Northeastern
Area



*ASIAN LONGHORNED BEETLE
TRAINING RESOURCE MODULES*

MODULE A

IDENTIFICATION OF ALB HOST TREE SPECIES



Module A: Identification of ALB Host Tree Species

Materials

1. Overhead projector
2. Spare projector bulb
3. Extension cord
4. Tree ID plates
5. Tree ID overheads
6. ID Info Sheet Key

Goal

To educate participants about the host species of the Asian Longhorned Beetle

Objectives

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

1. Name the host tree species of the ALB;
2. Identify the host species via leaves and bark;
3. Discount 'similar' species characteristics of non-host trees.

Activities

PRESENTATION: Host species, leaves and bark characteristics using ID sheets and Information sheets; non-host species discussion.

WORKSHEET: Mini-quiz on characteristics and species identification.

FIELD EXERCISE: Review characteristics of trees using nearby samples (or ID plates with overhead)

Module Length: 1.5 hours

Module A: ALB Life Cycle and Identification

ACTIVITY 1: Presentation and Background on ALB

Introduction - In 1996 the Asian Longhorned beetle was discovered attacking trees in New York City. The control method of choice involves locating infested trees, removing the tree, and chipping and burning the wood. Infested trees are located by looking for the 1/4 inch, dark colored, exit holes of the adult beetles, and the more shallow, rust colored oviposition holes where an egg is laid. There are millions of trees in New York metropolitan area, so the job of searching for the beetle is a big one. One beetle characteristic that helps in the search, is the fact that they prefer certain species to others. There are less than a dozen species that are highly preferred by the beetle (most in the maple family). Another dozen or so are attacked less often. Most tree species are not attacked at all. See the included list of host trees.

Why is Species I.D. Important? By learning to identify the preferred host species of the ALB, beetle busters can greatly reduce the number of trees to inspect when searching for beetle damage. Another benefit of improving tree I.D. skills is that tree planters can select species that are not known hosts of the beetle.

What's in a Name? Most of us know trees by their common name, such as river birch. The problem with this is that a species can have different common names from area to area. River birch is also known to some as red birch.

To solve this problem species are also given a scientific name using Latin. Each species will have a series of names to identify the family, genus, species and variety (if needed). For example, the scientific identification for Heritage river birch is:

Betulacea (family name - starts in upper case letter)

Betula (genus name - starts in upper case letter)

nigra (species name - starts in lower case letter)

Heritage' (variety name - not in Latin, in single quotation marks)

In normal local usage the common name is fine, as long as everyone knows what tree you are referring to. When the Latin name is used the family is not included, and often there is not a specific variety identified. *Betula nigra* would be the common expression of the Latin name for river birch.

Is it a Tree or a Shrub?

Trees - A tree is a woody plant at least 15 feet tall and with an upright, single trunk at least 3 inches in diameter at maturity.

Shrub - A shrub is a small woody plant with multiple stems, branching from the base. ALB can infest trees or shrubs, but generally will be found on branches or stems at least 1 1/4 inches in diameter. Because of this minimum size, trees are the most common host.

Is it a Gymnosperm or Angiosperm?

Trees in our area fall into one of these two categories. Gymnosperms (sometimes called softwoods or conifers) are most often 'evergreen', have cones or berries and have needle or scale like foliage. They do not have flowers in the common sense. There are no

Gymnosperms on the list of ALB host species. Angiosperms are generally considered to have true flowers and broad, flat leaves, which they shed in the fall (some can however keep their leaves year round).

Using Tree Characteristics to Identify Species

Tree species identification at first seems like a difficult task. There are hundreds of species, and many have similar characteristics. In the dormant season when the leaves drop, the task seems nearly impossible! A comforting analogy to think of, is comparing tree I.D. to people I.D. Walking down a crowded city street you may see hundreds of people, all with similar characteristics. However, you can pick out a familiar friend from a block away. Tree species are much the same, once you become familiar with the individual characteristics! We will look at tree characteristics such as leaf, shape, bark etc. to help with I.D.

Shape of Crown

Tree species generally develop a typical shape when crown in the open. Seen from a distance tree shape can help to identify tree species. Keep in mind that the tree shape may vary due to shading, pruning or storm damage. Looking at the tree silhouette from a distance can help to identify the species.

Leaf Arrangement

How the leaves are arranged on the stem can help to classify species:

Alternate - leaves are attached singly at different levels on the stem

Opposite - leaves are at the same level on the stem in pairs

Whorled - three or more leaves attached at one level in a ring

Alternate leaves are by far the most common, so trees with opposite leaves are easy to spot. For example the maple species, the most common hosts of ALB, have opposite branching. The only other species that have this characteristic are the ashes and the dogwoods. Dogwood is not on the list of host species, and green and white ashes are rarely attacked.

Leaf Types

Simple - A leaf is made up of a broad flat blade and a leaf stalk, which is attached to the twig. Most leaves have one blade and are called simple leaves.

Compound - A compound leaf has the blade divided into two or more leaflets.

Pinnately compound - Leaves are arranged in two rows along the axis.

Bipinnately compound - Leaves are on side branches off the axis.

Palmately compound - Leaves radiate out like a fan.

Leaf Shape

There are a dozen or more leaf shapes. The leaf shapes of some species, like white oak, are distinct and easily recognizable. Others species have leaf shapes that look similar. In this case you need to look at specific leaf characteristic:

Margins - The margins are edges may be smooth, toothed, wavy, or lobed.

Tips - Leaf tips may be pointed or rounded.

Bases - The base of the leaf, where it attached to the leaf stem may have different shapes and the attachment: may vary.

Veins - The veins in the leaf may be arranged in different patterns.

Keep in mind that leaf shapes on a certain species may vary depending on the site the tree is growing on, the age of the tree, the tree health, etc.

Bark

Tree bark may be helpful as an identifying characteristic in some trees where there is a very distinct bark. Some good examples are the smooth gray bark of American beech, or the loose shaggy appearance of shagbark hickory. The bark appearance may vary widely between old and young trees of the same species. Look at the pattern, the texture and the color of tree's bark.

Twigs

Twigs may be distinctive in color, odor, thickness, and presence of thorns. The most helpful twig characteristic is the color, size, shape and position of the buds and leaf scars. For example, red maple buds are very large, and red in the springtime. The leaf scar (point where last years leaf was attached) on ash has a unique shape to it. Buds are especially useful for identification in the winter.

Flowers

The flower is the plants reproductive organ. The size, color, abundance and timing of the flowers are characteristic of each species.

Fruit

The fruit bears the seed of the tree. Seeds of Gymnosperms (evergreens) are bare. Fruits of Angiosperms (deciduous) trees can be fleshy, simple or in groups, and different colors, shapes and sizes.

Size

The height and diameter of the tree at maturity is an identifying trait. The box elder, which is an ALB host in the maple family, is a moderate size tree growing to a height of 30 feet. The sugar maple may exceed 70 feet in height at maturity.

Individual Tree Species I.D.

Use overheads of the Tree Identification sheets that are included in Module A to discuss each host species and its identifying characteristic. If available, slide photographs can also be used for this portion

Easily Confused Non-Host Species

There are some non-host species that can be confused with the host species, because, they have similar traits. The following lists a few of these. We have included a species fact sheet for these non-host imitators to help you differentiate the species.

Non-Host Species Recommended for Planting

The presence of the ACB ten or more years from now is difficult to predict. Control efforts may be successful and the insect will be eradicated. Or perhaps we will continue to be successful at slowing the spread, but ALB could still have a presence. Whatever the outcome, it does not make sense to plant tree species that are known hosts for ALB. Trees planted in urban areas deal with many factors that cause stress on the tree and reduce its life span. Select trees that are tolerant of urban conditions. The criteria for choosing a species fall into two basic categories - site conditions or constraints, and desired species characteristics. There are many good references for selecting appropriate tree species for tree planting.

ACTIVITY 2: Use of Tree Key

It can be difficult to memorize and remember all of the characteristics needed to identify trees. We can also use tree keys to help determine tree species. A key is a system, which asks a series of questions about a particular tree's characteristics to gradually place it in a family, genus, and species. Using the National Arbor Day Foundation Tree I.D. Key, explain the basic of how a key is used.

ACTIVITY 3: Field Exercise - Species I.D. using trees in area

Slides and drawings are not a substitute for seeing trees "in person". This activity will take you outside to look at trees in the local area. Ideally a training location should be chosen that include some host trees.

ACTIVITY 5: Mini-Quiz on ALB Host Tree Identification

A mini-quiz is provided at the end of Module A to test your skill at identification of host trees of the ALB.

Take 10 minutes to complete the quiz.

Module A: Mini-Quiz
Identification of ALB Host Tree Species

7. Gymnosperms are sometimes called hardwoods, true or false?
- 2) ALB can infest trees, but not shrubs, true or false?
- 3) Alternate leaf arrangement occurs only in coniferous trees, true or false?
- 4) Which type of leaf arrangement is the most common?
- 5) Which genus of tree is the most common host of ALB?
- 6) Is Dogwood (*Cornus* sp.) a regular host of ALB?
- 7) Does ALB attack any gymnosperm tree species?
- 8) What are the 3 types of compound leaves?
- 9) What are the 4 types of leaf margins?
- 10) Give 2 examples of trees that have distinctive bark.
- 11) What is the function of a tree's flower?
- 12) Name 3 leaf shape characteristics that help in identifying trees.
- 13) Can overall tree size be used to identify a tree?
- 14) Trees are generally at least ___ feet tall with an upright, single trunk at least ___ inches in diameter.
- 15) Why are common names of trees not used when identifying a species?