

# Hardwood Lumber and Veneer Series



## Ash

FNR-272-W

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**EXPERT**  
REVIEWED

Ash refers to a group of five species ranging throughout the eastern United States. White ash is the best known and preferred species. Technically, only wood from the black ash tree can be separated from the other species, and it is sometimes sold separately and referred to as brown ash by lumbermen.

White ash ranges from the Great Plains east and from southern Canada south, with the exception of the lower Mississippi River Delta and coastal plains area. The tree prefers deep, moist, fertile upland soils and is usually a scattered tree associated with many other species. The largest tree reported is over 8 feet in diameter at 4½ feet above the ground.

Black ash ranges from southeastern Canada through the northern half of the eastern United States. It prefers moist areas. The largest tree reported is over 4 feet in diameter at 4½ feet above the ground.

Green ash and pumpkin ash may be abundant on certain sites. Blue ash is normally a scattered tree. The lumber from these species is generally mixed with white ash and sold together. A lighter, soft-textured pumpkin ash, more common in the south, is sometimes sold separately.

### Wood Color and Texture

Both color and texture vary substantially in ash lumber. The earlywood pores are large and abruptly change to small diameter thick-walled cells. Thus, the wood is coarse grained and appears much like oak. However, it does not contain large wood rays, and so the quartered surface does not show “fleck” or the characteristic markings of oak.



Chip Morrison

Dan Cassens and white ash

Most ash in the Appalachian and southern region is fast growth. Fast growth material will have large quantities of dense latewood and will be very strong. Very slow growth material, like oak, can sometimes occur, and it will be relatively light weight and brash.

Black ash, with commercial quantities produced in the north, tends to be slower growth, contains

mostly light brown, somewhat dull heartwood, and has substantially reduced mechanical properties. These characteristics probably account for the lower price. Black ash is the only species that can be differentiated from the other ashes on an anatomical basis.

Color in ash can be one of the most important features. The sapwood on most healthy fast-grown ash in the Appalachian and southern region is wide and white. The heartwood is a characteristic light brown. In some cases it is mottled with darker lines with some whitish spots. Large, older, slow-growth and younger but dying trees will have a large portion of heartwood. The white sapwood is generally preferred. Buyers and sellers should discuss the amount of heartwood and sapwood in a particular shipment, particularly since it is not addressed by the hardwood lumber grading rules.

### **Workability**

White ash is very hard and firm and rated above average in planing, shaping, and boring, and about average in turning.

### **Strength**

At 12 percent moisture content, white ash wood is heavy and weighs about 42 pounds per cubic foot, and it is one of our strongest woods being comparable to white and red oak. Lumber from the black ash tree weighs 34 pounds per cubic foot or considerably less. The strength properties are also considerably reduced when compared to white ash lumber.

### **Steam Bending**

White ash is only rated as about average for bending. However, it is commonly used for bending in the industry and for handle stock. Its high strength is an attribute.

### **Drying**

The wood has a low initial green moisture content and can be easily dried with a moderate kiln schedule.

### **Shrinkage**

As a heavy wood, white ash has a substantial high volumetric shrinkage. Lumber from the black ash tree, although lighter, has an equally high shrinkage.

### **Decay Resistance**

The wood has no resistance to decay. It is frequently attacked by powder post beetles.



Deborah Miller, USDA Forest Service.

Adult emerald ash borers emerge from an infested ash tree

### **Commercial Use, Grading, and Value**

The wood grain appears very much like oak, but it does not have the large wood rays seen on the quartered surface of oak. As a result, it can be substituted for flat sawn oak if properly stained. It is used on exposed surfaces in furniture and cabinets and also for millwork and flooring. Because of its high strength in bending and high shock resistance, it is used in athletic equipment such as ball bats and rackets. It is also used for long tool handles that are loaded in bending such as shovels and oars.

Ash is graded “standard” by the National Hardwood Lumber grading rules. It is priced and sold based on the geographic region from which it is produced. Ash from the southern region (Texas and Oklahoma east and through the coastal plains) is generally the most valuable. Some of this material is somewhat (referred to as soft textured) softer and preferred by the kitchen cabinet industry. Lumber from the Appalachian region is generally intermediate in price, while lumber from the northern Appalachian region (northern Missouri, Illinois, Indiana, Ontario, New York, and east) is the lowest priced. Lumber from the black ash trees is common in the northern area (Michigan, Wisconsin, and Minnesota), and it is usually the least preferred species.

Ash, when compared to the other grainy hardwoods, is an inexpensive wood, and it should be given more consideration for appropriate uses.

### Other Considerations

The white sapwood of white ash is generally preferred. The NHLA rules do not specify the amount of white wood that must be present, thus buyers and sellers will need to carefully consider this factor where it is appropriate.

As a white sapwood species, the sapwood is subject to general discoloration as well as sticker shadow from enzymatic stain. Like white hard maple, the logs and lumber need to be processed promptly. Ash lumber is noted for its straight grain, but some lumber pieces can have a tight curl or tiger strip, and still others can have a broad rolling pattern that makes the growth rings appear scalloped.

The weight and mechanical properties of white ash can vary substantially. Because of its ring porous nature, fast growth wood will be dense and strong, whereas very slow growth wood will be light and almost brash. At one time, a cabinet grade and a tough texture ash were marketed with the cabinet grade containing the lighter weight softer material. If strength is critical, some sorting may be appropriate.

Glassworms and turkey tracks are two additional characteristics common to ash. Glassworms appear as a zigzag pattern across the growth rings and along the grain of the board. Very characteristic black spots can sometimes be associated with these marks. Turkey tracks appear more as light brown scratches in the wood. Both are caused by cambium minors that bore from the root to the top of the tree through the cambium. This disrupts the cambium and results in these very distinctive marks. Neither glassworms nor

turkey tracks are considered defects in ash lumber because they are so common. Some ash veneer is produced without glassworms or turkey tracks. The veneer comes from specifically selected trees or logs. White ash logs from the Shenandoah Valley in Virginia are reported to be free of glassworms.

A disease called “ash yellows” has developed in the central and New England states. The phloem is attacked, and the tree slowly dies back in the crown. Trees with 50 percent of the crown affected may take 5 to 10 years to finally die. Little is known about the disease; currently there is no treatment available.

Stored ash lumber seems vulnerable to powderpost beetle attack. Once infected, the lumber must be heated to over 132°F in a dry kiln or fumigated to kill this beetle.

The species is seriously threatened by the emerald ash borer. This exotic insect girdles and kills the tree. Numerous areas in Michigan, northwestern Ohio, northeastern and central Indiana, northeastern Illinois, Pennsylvania, Maryland, and Canada are quarantined. Attempts at destroying every ash tree in the quarantined areas in the hope of eradicating the insect have been abandoned. Although specific information is not available, these trees should probably be processed before or as soon as they are infected to obtain as much white sapwood as possible. As the tree dies, the white sapwood, which is preferred in ash, tends to discolor. Be certain to check any quarantine regulations before removing ash. For more information refer to <http://www.emeraldashborer.info/>.

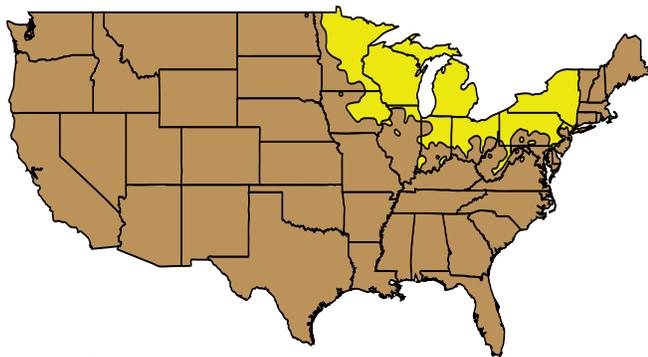


Glassworm in surfaced ash lumber

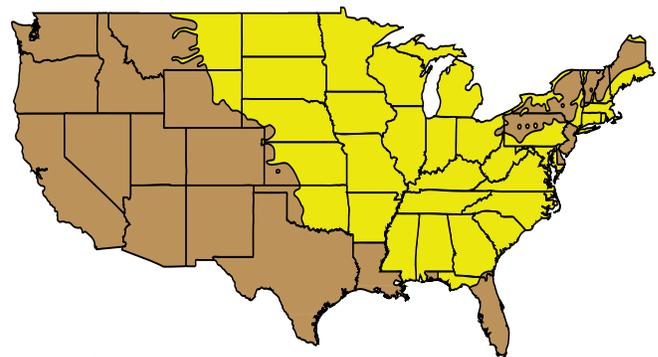
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**Table 1. Common and scientific names, range, preferred sites, and other information about different ash species**

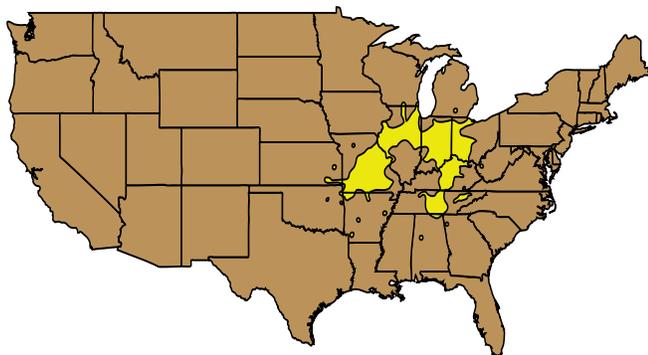
Common and Scientific Names	Range	Site	Comments
<b>White ash</b> <i>Fraxinus americana</i> L.	Nova Scotia to Wisconsin, south through Iowa, eastern Kansas to Texas and then back east except for the Mississippi delta and coastal plains.	Deep fertile upland soils and also on loamy ridges in the South	Most abundant and desirable commercial species
<b>Green ash</b> <i>Fraxinus pennsylvanica</i> Marsh.	Wide ranging species from Nova Scotia to Saskatchewan South through Montana to east Texas thence back east	Prefer most bottomlands and stream banks, but it can survive on dry sterile soils	Small to medium sized tree, usually poorly formed
<b>Black ash</b> <i>Fraxinus nigra</i> Marsh.	Southeastern Canada then northern half of the eastern United States	A more northern species that occurs along stream banks or borders of swamps	A relatively small, poorly formed tree. Lumber from this species is often segregated from the other ashes and sold at a reduced price.
<b>Blue ash</b> <i>Fraxinus quadrangulata</i> Michx.	Upper Mississippi and Ohio River Valleys	Scattered tree usually on dry limestone uplands	A medium sized tree but often slower growth and with a tendency to retain its branches thus producing lower quality lumber.



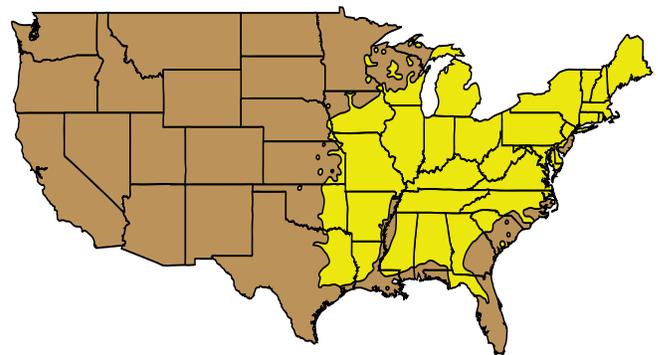
Range of the black ash



Range of the green ash



Range of the blue ash



Range of the white ash



Chip Morrison

Ash is a coarse grained wood very much like oak, but it does not have a large ray fleck on the quartered surface. Several species may be included in “ash” lumber, but once the tree is cut, specific species with the exception of brown or black ash cannot be differentiated. Some producers may sort the white sapwood from the brown heartwood and market the later as “brown”. While there is a black or brown ash common in the Lake States, brown or black ash is somewhat different than the other ash species, and it can be separated anatomically and sold separately.

Board 1 represents the best the species has to offer. The wood is all white sapwood and shows the coarse grain pattern of flat sawn stock. The white sapwood is preferred. A mineral streak is present at the bottom of this piece.

Board 2 is mostly heartwood. Like maples and basswood, the amount of heartwood in ash trees

varies tremendously. Less vigorous, old trees usually show more heartwood. The heartwood can be mottled or variegated as seen in Board 5.

Board 3 is all sapwood and shows “glassworm” damage near the top and at the bottom right. This damage results from a cambium miner that enters the tree root system and bores through the cambium to the top of the tree and then exits. In this example, the wood or xylem tissue has not actually been destroyed, but in some cases a dark pith fleck can result. Glassworm is not considered a lumber grading defect.

Boards 6 and 7 are black ash and show the characteristic darker, less lustrous color, numerous small knots, and pith.

The left side of Board 6 shows a rift to quarter pattern in ash.

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