

TECHNICAL NOTE NUMBER D-11

FOREST PRODUCTS LABORATORY - U. S. FOREST SERVICE - MADISON, WISCONSIN

HOW TO DISTINGUISH BLACK ASH FROM COMMERCIAL WHITE ASH LUMBER

Black ash in general is considerably lighter, softer, and weaker than any of the commercial white ashes -- namely, the white, green, blue, and Biltmore species. For this reason it is desirable in many cases to have a means of distinguishing black ash from white ash lumber. The following key has been prepared by the Forest Products Laboratory, Madison, Wis., for this purpose.

Some of the differences between the two woods are to be noted by ordinary inspection. Finer structural differences may be seen with the aid of a hand lens magnifying about 15 diameters.

General Structure of Ash Wood

The ashes all belong to the group of "ring porous" hardwoods, that is, woods having one or more rows of large pores at the beginning of each year's growth or annual ring. The pores are much larger than the other cells or fibers which make up the annual ring, and their arrangement causes the appearance of conspicuous concentric rings on the end grain of the log. The portion of each annual ring which contains the large pores is the springwood, and the denser, and darker-colored portion the summerwood.

Table 1 presents a summary of the differences between black and white ash.

Width of Sapwood

The sapwood (the light-colored wood next to the bark) of black ash is narrow, usually less than 1 inch wide. The sapwood of the commercial white ashes is several inches wide.

Color of Heartwood

The color of the heartwood (the wood in the center of the tree) of black ash on a fresh cut across the grain is difficult to describe otherwise than as plain brown, sometimes faintly tinged with olive. The heartwood of the white ashes is usually lighter brown, and often has a reddish tinge.

Table 1.--Characteristics which may be used to distinguish black ash from the commercial white ashes

	Black ash	Commercial white ashes
Width of sapwood.	: Usually less than 1 : inch.	: Several inches wide. :
Color of heartwood.	: Plain brown, tinged : with olive	: Grayish to reddish brown, : often pale.
Shape of pores or vessels on cross section.	: Usually oval. :	: Usually round. :
Tyloses in inner sapwood and heartwood.	: Usually absent, scat- : tering if present, : very rarely numerous. : Pores usually may be : blown through without: : difficulty.	: Always present, usually : abundant. Usually dif- : ficult or impossible : to blow through pores. :
Fine white lines (parenchyma) in the summerwood.	: Very rare, fine and : usually short if : present. :	: Variable but generally : present; frequently : long and very prominent, : especially in wide : annual rings.
Approximate weight: in lbs. per cu. ft. of normal wood at 12 per- cent moisture	: 34. : : : :	: 41. : : : :

Shape of Springwood Pores

A careful examination of the large springwood pores of the ashes, as seen on a smoothly cut surface of the end grain, brings out the fact that the majority of the pores in black ash are oval rather than round in outline. In the white ashes, on the other hand, the pores tend to be more nearly round.

Tyloses

A further aid to the identification of black ash is the fact that most of the large pores are open. This gives the wood the "porous" look which is characteristic of red oak. As in the case of red oak, it is possible to blow bubbles through the large springwood pores of black ash. This open character of the pores is due to the fact that they, for the most part, are not closed by tyloses. Tyloses appear as glistening, often rainbow-tinted, fragments here and there in the cavities of the large pores. When they are present in black ash, tyloses are usually few and widely

scattered. In the white ashes, on the other hand, tyloses are very numerous. They may even occur in narrow rings where other distinguishing characters are not well developed. It is usually impossible to blow bubbles through the heartwood or inner sapwood of white ashes, because most of the large vessels are closed by tyloses. The pores in the outer sapwood are always open in all species of wood.

Care must be taken to distinguish broken fragments of the cell wall which may resemble tyloses, but are produced by the use of a rough or dull knife in cutting. If a fresh, very smooth cut is made across a doubtful surface and the pores still appear closed, it is safe to conclude that tyloses are present.

White Lines in the Summerwood

An examination of the cross section of the outer, or last-formed, summerwood of the white ashes reveals very fine broken whitish lines which run almost parallel with the annual rings. These fine lines are parenchyma tissue, which is made up of groups of thin-walled cells. The lines are very variable in appearance being especially conspicuous and long in wide annual rings of the white ashes and sometimes absent in narrow rings. The parenchyma projections are almost never present in black ash, so that the summerwood presents a plain, unfigured appearance.

Weight

Although each species of ash varies considerably in weight, black ash wood averages distinctly less in weight and hardness than that of the species known commercially as white ash. However, some of the swelled butt portions of these other species, growing in swamps, are often very light in weight, and soft.