Buckeye

Forest Service
U. S. DEPARTMENT OF AGRICULTURE

BUCKEYE

(*Aesculus species*)

By H. S. Betts, *senior engineer, Division of Forest Products*

The name buckeye as used in the lumber trade commonly includes two species—yellow buckeye (*Aesculus octandra*) and Ohio buckeye (*A. glabra*). Both are small to medium-sized trees that occur in comparatively small quantities and are of limited commercial importance. They grow naturally in the central portion of the eastern half of the United States.[1] Yellow buckeye is the larger of the two and furnishes most of the buckeye lumber. The wood of both species of buckeye is light in weight, white, soft, and weak. It is used principally for furniture, boxes and crating, and caskets and coffins.

The seeds of the various buckeyes consist of large reddish brown, thin-shelled nuts roughly spherical in shape and about 1 inch in diameter. They are produced in a thick husk which contains several nuts. The husks open in the fall and the nuts drop to the ground. They have no economic value and are said to be poisonous to cattle and hogs. The superstition persists both in this country and abroad that a buckeye nut carried in the pocket will ward off rheumatism.

Nomenclature.—Yellow buckeye is commonly known simply as buckeye. Other names sometimes used are sweet buckeye and large buckeye. Ohio buckeye is also commonly called buckeye. Other names are fetid buckeye, stinking buckeye, and American horsechestnut.

Distribution and growth.—Yellow buckeye is a medium-sized tree, generally 60–90 feet in height and 2–3 feet in diameter. Ohio buckeye is smaller, generally not over 30 feet in height; exceptional trees have been reported 70 feet in height and 2 feet in diameter. The natural range of yellow buckeye is from the Appalachian Mountains in Pennsylvania, Virginia, and North Carolina westward and southward into Kansas, Oklahoma, and Texas (fig. 1). Ohio buckeye has nearly the same natural growth range as yellow buckeye except that its range extends farther north in the Central States and not so far south in the Gulf States (fig. 2). Both species occur scattered sparsely through the forest. They grow best in rich moist soil along the banks of streams and in river bottoms and under such conditions have a fairly rapid growth. Buckeye generally matures in 60–80 years.

Supply.—It is estimated roughly that the stand of buckeye amounts to at least 75,000,000 board feet. The greater part of this stand is probably located in Kentucky, West Virginia, Tennessee, and North Carolina.

[1] Several other buckeyes are native to the United States including the eastern species—red buckeye (*A. pavia*), woolly buckeye (*A. discolor*), and scarlet buckeye (*A. discolor* var. *mollis*), and the western species—California buckeye (*A. californica*). All occur as comparatively small scattered trees and are of little, if any, commercial importance. The horsechestnut (*A. hippocastanum*), a close relative of our native buckeyes, was introduced into this country from Europe many years ago and has been widely planted for ornamental purposes. It is found in practically every State. Horsechestnut generally grows to a larger size than yellow buckeye or Ohio buckeye.

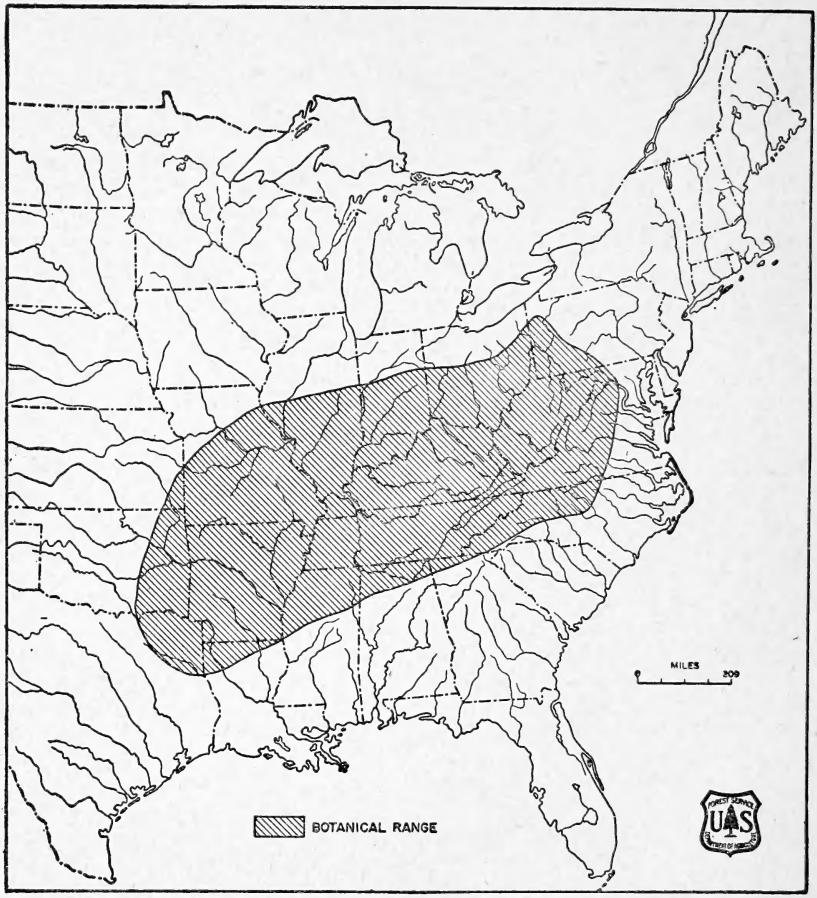

FIGURE 1.—Range of yellow buckeye (*Aesculus octandra*).

Production.—The earliest year for which the production of buckeye lumber was recorded separately from other species was 1907. In that year reported production was 2,480,000 board feet (fig. 3).[2] After 1907 production rose rapidly and reached its maximum of 11,737,000 in 1911. Since then the cut of buckeye lumber has been much less. In 1932, a year of depression in business, it dropped to an all-time low of 240,000 board feet. The average annual reported production of buckeye lumber for the 8-year period 1934–41 was 1,335,000 board feet. The 1941 lumber cut was 2,576,000 board feet. The principal producing States have been Tennessee and North Carolina. In addition to lumber, smaller amounts are used for fuel and for pulpwood. The average annual cut of buckeye for all purposes in recent years is estimated very roughly at the equivalent of 2,500,000 board feet.

[2] It is probable that production figures for buckeye are too low. This is because it is difficult to obtain complete returns for a species cut in small quantities and largely by small portable mills, and also because buckeye is commonly felled and sawed into lumber in mixture with species whose wood is quite similar in appearance, such as basswood and yellow-poplar, and sold as such.

FIGURE 2.—Range of Ohio buckeye (*Aesculus glabra*).

Properties.—The heartwood of yellow buckeye is creamy white or yellowish white in color. The sapwood is also white but generally without a yellow tinge. It merges gradually into the heartwood and is not clearly defined. Occasionally the wood near the center of the log is discolored to a grayish brown. The annual rings are marked by barely visible light-colored lines. The wood is uniform in texture and is generally straight-grained. Yellow buckeye and Ohio buckeye are much alike in appearance. Both resemble the sapwood of basswood and yellowpoplar.

Yellow buckeye is light in weight,[3] weak when used as a beam or column, soft, and low in shock resistance. The wood has a moderately large shrinkage. No definite information is available on its seasoning characteristics. It is said to lack durability when exposed to conditions favorable to decay. The wood is without characteristic odor or taste. Yellow buckeye and Ohio buckeye are reported to be very much alike in their properties.

[3] The average weight of yellow buckeye in an air-dry condition (12 percent moisture) is 25 pounds per cubic foot.

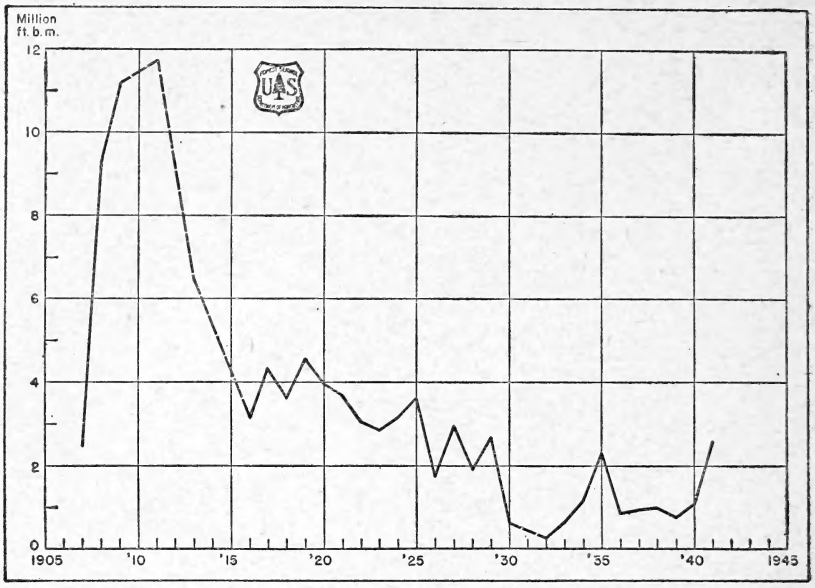

FIGURE 3.—Lumber production of buckeye (*Aesculus* species), 1907–41.

Buckeye [4] rates rather low in machining properties, i. e., in its behavior when subjected to the standard woodworking operations such as shaping, turning, boring, etc. Table 1 shows comparative values for some machining and related properties for buckeye and several other hardwoods. The wood is apparently best adapted to operations requiring turning and boring and not so well adapted to shaping, mortising, and steam bending. Clear, straight-grained pieces are reported as satisfactory for carving with hand tools.

TABLE 1.—*Percentage of pieces in good condition after being subjected to the indicated machining operations*

	Planing	Shaping	Turning	Boring	Mortising	Sanding	Steam bending
Buckeye	----------	6	58	75	18	----------	9
Basswood	64	9	68	75	51	17	2
Yellowpoplar	70	12	81	87	63	19	58
Sweetgum	51	21	86	92	58	23	67

Buckeye [5] has satisfactory paper-making properties and can be quite readily pulped by the soda, sulfate, and sulfite processes.[6] The result-

[4] Includes both yellow buckeye and Ohio buckeye.
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[6] Six processes are used commercially in making paper pulp from wood. One is the mechanical or ground-wood process, in which the wood is reduced to pulp on a grindstone. The yield approaches 100 percent of the weight of the wood. Four are chemical processes—the sulfite, sulfate, soda, and neutral sulfite. They depend upon the dissolving action of chemical reagents which remove essentially all of the binding material (lignin) surrounding the cellulose fibers and leave them in a fairly pure state. The removal of the lignin is accomplished by cooking the wood chips with the proper chemical under steam pressure. The yield of pulp is about one-half the weight of the wood. In a sixth process, the semichemical, part of the lignin is removed by chemical means and the resultant pulp, containing some lignin, is further refined by mechanical means. The yield of semichemical pulp is intermediate between the yields obtained with the mechanical process and the chemical processes.

ant pulps are suitable for the manufacture of book, magazine, and cheap printing papers.

Principal uses.—Buckeye is used principally for lumber and to a small extent for pulpwood. The lumber goes largely into furniture, boxes and crating, caskets and burial boxes, signs, and trunks and valises. Uses requiring less material, but material of higher quality, include scientific instruments and woodenware and novelties. Buckeye is used in furniture for the unexposed parts. Its lack of odor and taste, white color, and light weight account for its use for food containers. Formerly long, thin strips or shavings of the wood were used in making summer hats.

Table 2 shows the amounts of buckeye lumber used in the manufacture of wooden products in 1912, 1928, 1933, and 1940.

TABLE 2.—*Buckeye used in the manufacture of wooden products*

[Thousands of board feet]

Classes of products	1912	1928	1933	1940
Boxes and crating	3,174	1,462	1,151	394
Boxes, cigar and tobacco			107	
Car construction and repair		1		
Caskets and burial boxes	208	25		283
Electrical equipment		11		
Fixtures	10	77		
Furniture	415	525		1,207
Instruments, musical	6			
Instruments, professional and scientific				44
Laundry appliances	125			
Patterns and flasks				10
Sash, doors, general millwork	908	1	11	28
Signs, scenery, and displays	75		1	121
Sporting and athletic goods	3			
Toys		200	15	
Trunks and valises	415	50		196
Vehicles, nonmotor	63	5		36
Woodenware and novelties	84		71	20
Total	5,486	2,357	1,356	2,294

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