Flowering Dogwood

(*Cornus florida*)

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Flowering dogwood has two outstanding characteristics—the beauty of its conspicuous white flowers and the ability of its wood to stay smooth when subjected to long continued rubbing. It grows in the eastern part of the United States and is one of 17 species of dogwood native to this country.[1] Only 4 grow to tree size [2]—flowering dogwood (*Cornus florida*), Pacific dogwood (*Cornus nuttallii*), roughleaf dogwood (*Cornus drummondi*), and pagoda dogwood (*Cornus alternifolia*). Flowering dogwood is the most important commercially.

The tree is slow growing and of small size. It reaches a maximum height of about 40 feet and maximum diameter of about 18 inches. The trunk is often crooked and irregular in cross section. The wood is very heavy and very hard. Its outstanding use is for shuttles used in weaving,[3] for which this wood is especially suitable [4] because of its smooth-wearing qualities, hardness, and fine, uniform texture. The readily accessible supply of dogwood has been much reduced by cutting for commercial purposes and also by the destruction of the trees, both young and old, in felling and logging the other and larger species with which it grows.[5] A large amount of waste occurs in sawing out shuttle blocks from the short logs or bolts with which the block mills are supplied. There is also a considerable loss in seasoning the blocks and making them into shuttles.

Nomenclature.—The name flowering dogwood is generally shortened to dogwood. Other names, less frequently used, are boxwood and cornel.

Distribution and growth.—Dogwood is one of the most ornamental trees native to the United States. In the early spring it produces masses of white flowers 2 to 4 inches in diameter. In the early autumn, clusters of glossy red berries are much in evidence. Later the leaves turn red or purple.

Dogwood grows from southern Maine westward through central New York to southern Wisconsin and eastern Iowa and southward to central Florida and eastern Texas (fig. 1). It is commercially important chiefly in the southern Mississippi Valley, the southern Appalachian Mountain region, and in parts of the southern pine belt. The original supplies in Virginia, North Carolina, South Carolina, Tennessee, and Kentucky have been markedly reduced by heavy cutting.

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[1] There are about 50 known species of dogwood in the world.
[2] At least 8 feet high and 2 inches in diameter.
[3] Shuttles are indispensable to the cotton, woolen, and silk mills of the country, capitalized at several billion dollars.
[4] Persimmon is another wood with qualities suitable for shuttle manufacture, although not considered the equal of dogwood for this use.
[5] Dogwood trees near roadsides are often mutilated—sometimes destroyed—by people who tear off the branches in the spring, when the flowers are in bloom, and take them home for decorative purposes.

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Dogwood rarely, if ever, is found in pure stands. It grows slowly and generally occurs as an understory tree scattered among larger hardwoods, or as an understory to the southern pines. Dogwood reproduces both from seeds and sprouts. The seeds are widely scattered by birds which eat the berries. The tree develops a short trunk 6 inches or more in diameter, of which from 4 to 8 feet is generally merchantable. The trunks are seldom straight and not often round in cross section. Dogwood grows best in rich, well-drained soils along the banks of streams and in coves. Under favorable conditions it yields as much as 2 cords to the acre, but often 15 or 20 acres will produce no more than a single cord.

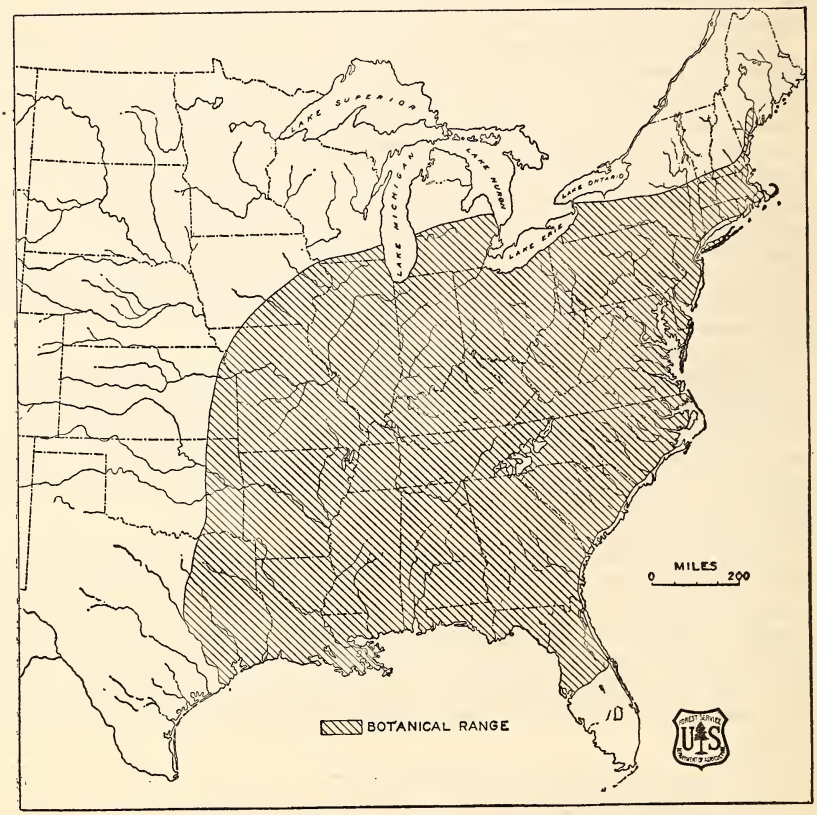

FIGURE 1.—Range of flowering dogwood (*Cornus florida*).

Supply.—The stand of commercially available dogwood at least 6 inches in diameter was estimated roughly in 1926 at 231,000 cords.[6] This stumpage was located in 13 States with an estimated maximum of 50,000 cords in Mississippi and a minimum of 1,000 cords in New Jersey. Five States (Mississippi, Alabama, Louisiana, Texas, and Georgia) were estimated to contain about 70 percent of the commercial

[6] CUNO, J. B. UTILIZATION OF DOGWOOD AND PERSIMMON. U. S. Dept. Agr. Bul. 1436, 43 pp., illus. 1926. The estimate included only commercially available material. It did not cover all standing trees but only accessible stumpage that was large enough and in sufficient quantity to be worth cutting and marketing.

stand. Heavy cutting had taken place for many years in Tennessee, North Carolina, Kansas, Virginia, and South Carolina. It is quite probable that an estimate of the total stand of dogwood, regardless of accessibility, quantity, or quality of the stumpage in various localities, would have been at least double that for commercially available material.

No recent estimate of the total stand of dogwood has been made. Such data on cut as are available indicate that the States which furnished the bulk of the dogwood up to 1926 have continued to do so, and that comparatively little cutting has taken place in the five States where the bulk of the stand was located in the 1926 estimate. Consideration of this and possible growth, together with reduced cutting for shuttle blocks from 1926 until the requirements of World War II took effect, are the basis of a very rough estimate of 500,000 cords as the total stand of dogwood in 1941. This is equivalent to approximately 150,000,000 board feet.

Production.—Data on the quantity of dogwood cut for lumber or for products made directly from cordwood bolts (without first cutting into lumber) are fragmentary and for the most part unreliable.[7]

A field study of the utilization of dogwood in 1923 [8] indicated a total consumption of 15,500 cords, of which about 90 percent, or 14,000 cords, was used for shuttle blocks. The production of dogwood lumber, reported [9] the same year, was 2,414,000 board feet, accounting for only about 8,000 cords, [10] or a little over half the consumption indicated by the field study, which included material cut into lumber.

The average cord [11] of dogwood bolts contains about 80 cubic feet and will yield about 350 shuttle blocks.[12] On this basis, 14,000 cords would produce 4,900,000 blocks. This was considerably above the average annual production in recent years until the requirements of World War II had to be met, including blocks for export as well as for domestic use. The estimated production of dogwood shuttle blocks in 1941 was 5,286,000, of which slightly less than one-half was exported. This production of shuttle blocks would require approximately 15,100 cords of bolts. If 10 percent is added to cover dogwood consumption for other uses, the total consumption for all purposes would be equivalent to approximately 5,000,000 board feet.

Properties.—The sapwood of dogwood varies in color from pinkish white to light pinkish brown. The heartwood is reddish brown to chocolate brown. Logs 6 to 8 inches in diameter and sometimes larger are frequently made up almost entirely of sapwood with the heartwood as small as a lead pencil. Occasionally in the larger trees the heartwood is 2 or 3 inches in diameter.

The wood has a comparatively fine, uniform texture. The annual rings of growth, commonly from 1/16 to 1/8 inch wide and made up of a band of springwood and a band of summerwood, can be distinguished

[7] This is due to the fact that the small and widely scattered plants where the short logs or bolts are cut into blocks for shuttle manufacture are often not included in the lists of lumber mills of the Bureau of the Census, and the records of those included are often incomplete. The manufacture of shuttle blocks and shuttles from these blocks are separate industries.

[8] The consumption of dogwood was greater in 1923 than for several years before and after.

[9] In the lumber production statistics of the Bureau of the Census.

[10] Allowing 300 board feet to the cord.

[11] Made up of unbarked wood, with pieces varying in diameter and straightness, but not less than 4 inches in diameter at the small end, containing 70 to 85 cubic feet of solid wood. The approximate weight of a cord of green dogwood bolts is 5,000 pounds.

[12] The number of blocks produced per cord varies from 300 to 500 or more, depending on the quality, size, and straightness of the bolts. Blocks are made in a number of sizes. Those for export are commonly smaller than for domestic use. The most common size is probably 15¾ inches×1⅝ inches×1¾ inches. The production of 350 blocks of this size from a cord of wood containing 80 cubic feet means a waste of approximately 90 percent.

but are not sharply differentiated. The wood is very heavy, [13] strong, not stiff, very hard, and has a very high resistance to shock. It is difficult to cut and shape and does not glue easily. Dogwood is not resistant to decay as it is practically all sapwood. [14] Under continuous wear it becomes extremely smooth. Dogwood has an exceedingly great shrinkage [15] and is difficult to season either in the air or in a kiln. [16]

The shuttle blocks into which the bolts and logs are commonly cut are generally air-dried in sheds with open sides. The ends of the blocks are first dipped into melted paraffin to retard end-drying and then carefully stacked, so as to allow ample circulation of air about each block. About 9 months are required for the blocks to become air-dry. Kiln-drying is practiced successfully by some manufacturers with a reduction of drying time to about 3 months. Blocks dried too fast are liable to split open during the process. This makes them worthless for further manufacture. When properly dried, dogwood ranks high in ability to hold its shape. The wood makes an excellent fuel, [17] a cord being rated as about equal to a ton of bituminous coal in heating value.

Principal uses.—A large proportion (probably 90 percent) of all the dogwood cut for commercial purposes is used in the manufacture of shuttles for textile weaving. The shuttle carries the weft thread between the warp threads. It is shot back and forth across the loom at high speed and rubs against the warp threads as it crosses. The need for a wood that will stay perfectly smooth under this rubbing is evident, as the least roughness in the shuttle means a broken thread and stoppage of the loom. [18]

Other uses of dogwood requiring a hard, close-textured, smooth wood, capable of withstanding rough usage, include spool and bobbin heads; small pulleys; skewers, quills, and flyer blocks used in weaving; mallet heads; turnpins for shaping the ends of lead pipes; jewelers' blocks; and, more recently, pipe blocks. [19] In the past, dogwood has been used for rake teeth, bearings for machinery, hubs of small wheels, engravers' blocks, and gunpowder charcoal.

The root bark of dogwood was one of the many barks used as a fever medicine before quinine became common. The roots were also used in earlier times in making a scarlet dye.

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[13] Average weight of green wood (between 60 and 70 percent moisture) is 64 pounds per cubic foot. Average weight of thoroughly air-dry wood (12 percent moisture) is 51 pounds per cubic foot.

[14] The sapwood of all species lacks resistance to decay.

[15] The total shrinkage in volume when dogwood is dried from a green to an oven-dry condition amounts to about 20 percent.

[16] Waste in seasoning dogwood shuttle blocks and in manufacturing the shuttles ordinarily amounts to about 13 percent. Adding this to the waste in making the blocks gives a total of approximately 92 percent of the cordwood. Some of this shuttle-block waste, however, is used as raw material for making pipe bowls and other small articles.

[17] About equal to hickory.

[18] Up to 1880, shuttles were made almost exclusively from Turkish boxwood. About that time roller skates with boxwood rollers came into vogue and absorbed most of the available supply of boxwood. Dogwood and persimmon shuttles were given a trial by a company at Lowell, Mass., and gradually became the standard shuttle woods.

[19] The recent utilization of dogwood for smoking pipes is due to the shortage of brier—the preferred pipe wood—formerly imported from southern Europe.

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