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CHESTNUT OAK.

Quercus prinus Linn.

Chestnut oak belongs to the white oak group of the oak family, but the wood is somewhat coarser grained and harder to work than that of white oak. It grows commonly in drier situations than white oak and is characteristically a smaller, knottier tree and more subject to defects, which makes the wood still less valuable. The bark is rich in tannic acid, and up to a few years ago this was the only part of the tree utilized. As the more valuable woods have become scarcer, however, chestnut oak has been cut more and more for ties, bridge timbers, mining props, and rough construction and fencing materials, and to a limited extent, where it is well developed and comparatively free from defects, for lumber.

RANGE AND OCCURRENCE.

Chestnut oak ranges from southern Maine westward to Lake Erie, and from central New York southward through western Pennsylvania, Maryland, and West Virginia, to Kentucky and Tennessee, and in the Appalachians to northern Alabama and Georgia. Throughout its range it is a tree of hill slopes and ridges, particularly in the southern Appalachians, where it is usually found in the greatest numbers on upper slopes and ridges, although the best development is made in the coves, when it is not crowded out by faster-growing species.

In the North, chestnut oak is found at low altitudes, not exceeding 2,500 feet, while in the southern Appalachians its altitudinal range is from 2,000 to 4,500 feet.

CLIMATE.

The seasonal range of temperature it endures is from -20° to 95° F., and the precipitation is rather large throughout—from 35 to 70 inches.

ASSOCIATED SPECIES.

On the ridges and upper slopes chestnut oak associates with red oak, black oak, chestnut, black hickory, black gum, pitch pine, and locust; while in the coves and lower slopes it associates commonly with white,

red, scarlet, and black oaks, shagbark and black hickory, yellow poplar, red maple, white pine, hemlock, beech, sourwood, sassafras, dogwood, ironwood, service-berry, magnolia, mountain laurel, rhododendron, umbrella tree, and other species. Some large areas of chestnut oak are found in pure stands on the steep, high ridges.

HABIT.

Chestnut oak is a medium-sized tree. Measurements of a large number of individuals in the southern Appalachians gave the following averages: Ridge type, height 55 feet, diameter 23 inches; slope type, height 75 feet, diameter 27 inches; cove type, height 95 feet, diameter 32 inches. All measurements were of mature trees under moderately favorable conditions. In the exposed upper slope and ridge sites the bole is short, with a gradual taper, and often gnarly and crooked, the crown large and wide spreading, frequently stagheaded, and the bark very thick and deeply ridged. In the lower slope and cove situations, a long, clear bole, more compact crown, and thinner bark are usual. The root system is very adaptable; the tap root is deep in deep soils, while in rocky or shallow soils the lateral roots are better developed. Growth is rather slow, except in the case of coppice shoots for a few years. The thick bark is very resistant to fire, and even when young the tree is quite hardy and very windfirm.

SOIL AND MOISTURE.

Chestnut oak does better on the deep, fertile, moist soil of the coves, but when crowded from them by more vigorous, tolerant, or faster-growing species it adapts itself remarkably well to the thinner, drier, poorer soils and more exposed situations on the ridges. It never does well in very damp, swampy soil. Good drainage is an essential, while fertility, depth, and moisture are advantageous but not necessary to its development.

TOLERANCE.

Chestnut oak is a light-requiring species, but will do well in early life under partial shade, and in general tolerance is perhaps somewhat inferior to the other oaks with which it associates, and to chestnut. In very early life it is, perhaps, slightly more tolerant than these species, but is less tolerant when it becomes older. Coppice shoots are more tolerant than seedlings; they are a little less tolerant than the sprouts of white oak and chestnut, and considerably less so than those of black and red oaks.

REPRODUCTION.

Seeds ripen in one year and germinate during the autumn in which they mature. The production of acorns is rather poor, and good seed years are at irregular and infrequent intervals. The acorns are very liable to destruction by worms and squirrels, and the germinating per-

centage is low. A deep layer of humus and litter, damp and rich, is the best germinating bed, but on the ridges and high slopes it is not found so often as in the coves. The sprouting capacity is good, about equal to that of white oak, but inferior to that of red and black oaks. It is better in early life than later, when it becomes poor, and probably ceases at about 120 years. The sprouts are generally from the root collar, a few from the stump, and occasionally from the roots themselves. Ground fires promote sprouting temporarily, but if repeated they reduce it, and in any case fire-started sprouts do not have the same vitality as coppice from cutting. Fires also pack and dry the soil and thus lower its quality as a seedbed.

MANAGEMENT.

Chestnut oak is a less valuable tree than white oak, both on account of its slower growth and the poorer quality of its wood. It should, therefore, be favored only in the drier situations, which are less suited to white oak and other valuable timber trees. In such situations its slow growth should make the production of saw timber less profitable than that of smaller-sized material, and chestnut oak should therefore be managed chiefly for tanbark, ties, and mine timber. The trees may be cut to a diameter limit of 10 inches, and reproduction may be secured from the sprouts and from the seedling growth which is generally present as an understory.

The fact that cutting for tanbark must be done in the spring when the bark will peel is unfortunate. Spring and summer cutting usually weakens the sprouting capacity of the stumps and renders sprout reproduction less sure. It is important, therefore, that cutting for tanbark should be done as far as possible in the early spring, so that the sprouts which start will have time to mature and will not be killed back by early frosts.

In cutting for ties and bark under a sprout system, it will often pay not to cut the better seedling trees which may be found here and there, but to leave them to produce saw timber. Protection from fire is absolutely essential to successful management.

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