

Quercus shumardii Buckl. Shumard Oak

Fagaceae Beech family

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Shumard oak (*Quercus shumardii*) is one of the largest southern red oaks. Other common names are spotted oak, Schneck oak, Shumard red oak, southern red oak, and swamp red oak. It is a lowland tree and grows scattered with other hardwoods on moist, well-drained soils associated with large and small streams. It grows moderately fast and produces acorns every 2 to 4 years that are used by wildlife for food. The wood is superior to most red oaks, but it is mixed indiscriminately with other red

oak lumber and used for the same products. This tree makes a handsome shade tree.

Habitat

Native Range

Shumard oak (figs. 1, 2) is found in the Atlantic Coastal Plain primarily from North Carolina to northern Florida and west to central Texas; it is also

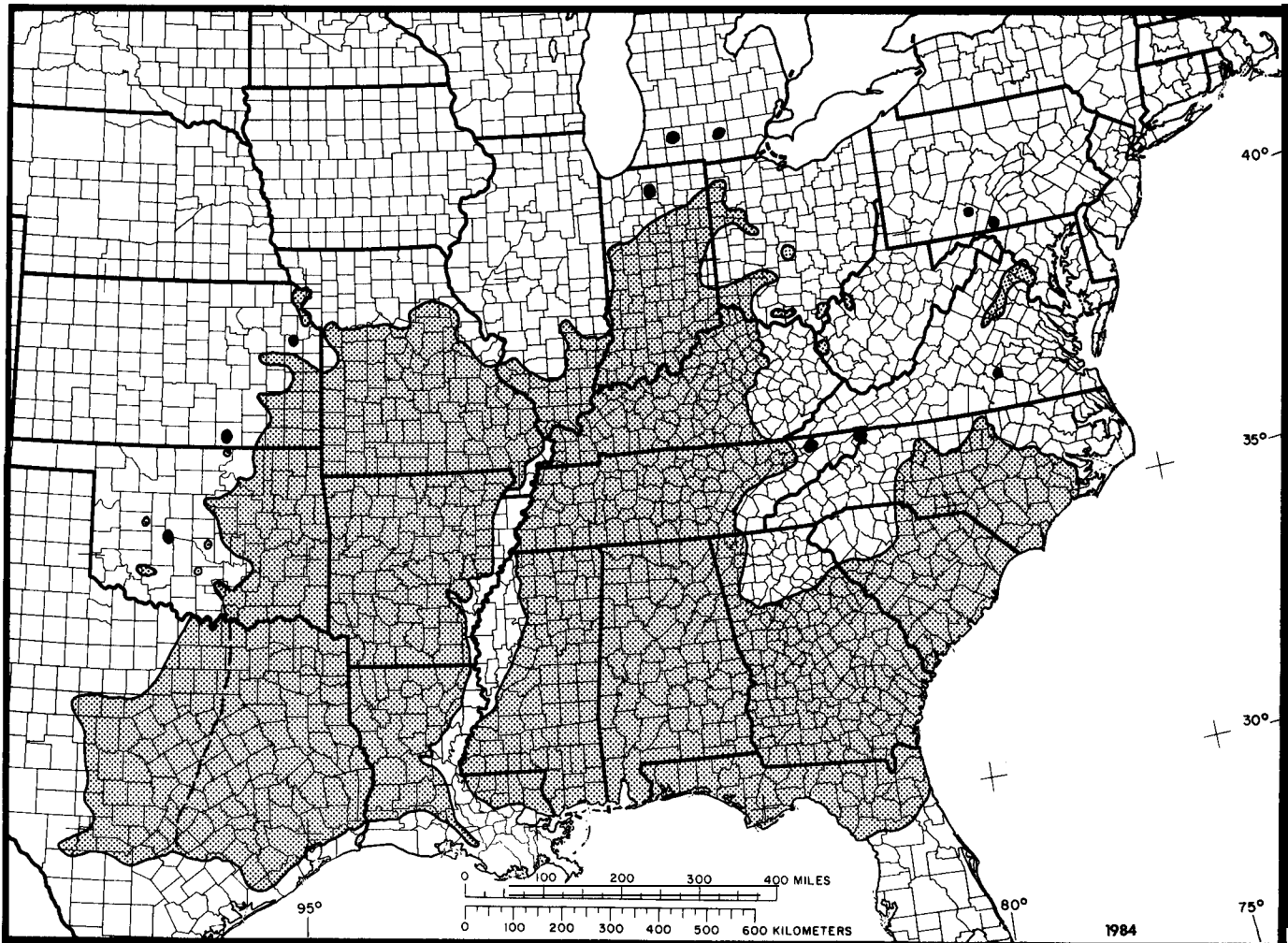


Figure 1—The native range of Shumard oak, *Quercus shumardii*. The broken line separates eastward the typical variety and westward the variety Texas oak, *Q. shumardii* var. *texana*.

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Figure 2—*Shumard oak*.

found north in the Mississippi River Valley to central Oklahoma, eastern Kansas, Missouri, southern Illinois, Indiana, western and southern Ohio, Kentucky, and Tennessee. It is found locally north to southern Michigan, southern Pennsylvania, and Maryland (4).

Climate

Usually Shumard oak grows in a humid, temperate climate, characterized by hot summers and mild, short winters. The growing season usually extends from 210 to 250 days through the major portion of the species commercial range. The average annual temperature is 16° to 21° C (60° to 70° F) with an average annual precipitation of 1140 to 1400 mm (45 to 55 in). The annual maximum temperature for this area is 38° C (100° F) and the annual minimum temperature is about -9° C (15° F). The majority of

the rainfall occurs from April through September. Shumard oak tolerates drought well, as shown by its presence in parts of Texas and Oklahoma where the average annual rainfall is only about 640 mm (25 in) (7).

Soils and Topography

Shumard oak grows best in rich sites of the southern forests that have moist, well-drained loamy soils found on terraces, colluvial sites, and adjacent bluffs associated with large and small streams. It is found in hammocks of the Coastal Plain, but rarely on first-bottom sites. It appears to be tolerant of sites with high pH and associated nutrient deficiencies. In trial plantings, Shumard oak has grown well on alluvium with a pH near 7.5. Shumard oak is most commonly found on soils in the orders Alfisols, Inceptisols, and Vertisols.

Associated Forest Cover

Shumard oak is included in the forest cover type Swamp Chestnut Oak-Cherrybark Oak (Society of American Foresters Type 91), a bottom-land type of the Southern Forest Region (1). Shumard oak is a prominent hardwood associate of this type, along with green and white ash (*Fraxinus pennsylvanica* and *F. americana*), the hickories, shagbark (*Carya ovata*), shellbark (*C. laciniosa*), mockernut (*C. tomentosa*), and bitternut (*C. cordiformis*), as well as white oak (*Quercus alba*), Delta post oak (*Q. stellata* var. *paludosa*) and blackgum (*Nyssa sylvatica*). Main associates in the type are willow oak (*Quercus phellos*), water oak (*Q. falcata*), southern red oak (*Q. falcata* var. *falcata*), post oak (*Q. stellata*), American elm (*Ulmus americana*), winged elm (*U. alata*), water hickory (*Carya aquatica*), southern magnolia (*Magnolia grandiflora*), yellow-poplar (*Liriodendron tulipifera*), beech (*Fagus grandifolia*), and occasionally loblolly (*Pinus taeda*) and spruce (*P. glabra*) pines.

Shumard oak is often included in cover types Ash-Juniper-Redberry (Pinchot) Juniper (Type 66) and Mohrs (Shin) Oak (Type 67). Some of the other associates of Shumard oak include red buckeye (*Aesculus pavia*), devils-walkingstick (*Aralia spinosa*), American hornbeam (*Carpinus caroliniana*), flowering dogwood (*Cornus florida*), witch-hazel (*Hamamelis virginiana*), American holly (*Ilex opaca*), red mulberry (*Morus rubra*), southern bayberry (*Myrica cerifera*), and American basswood (*Tilia caroliniana*).

Life History

Reproduction and Early Growth

Flowering and Fruiting-Shumard oak is monoecious. Its flowers usually appear in March or April; they are unisexual, with stamens in glabrous 15 to 18 cm (6 to 7 in) long aments and the pistils are single or paired on pubescent stalks. The fruit is an egg-shaped acorn 2.5 cm (1 in) long, enclosed at the base in a thick, flat, saucer-shaped cup with pubescent scales. The acorn ripens and falls during September or October of its second year.

Seed Production and Dissemination-The minimum seed-bearing age for Shumard oak is 25 years and optimum production is about 50 years. The interval between seed crops is 2 to 3 years. There are about 23 kg (50 lb) of seeds per 35 liters (bushel) of fruit. The range of cleaned seeds per kilogram is 172 to 282 (78 to 128/lb) with an average of 220 (100) (8). Acorns of Shumard oak are an excellent wildlife food and are consumed by birds, white-tailed deer, and squirrels. Animals that hoard the acorns also disseminate them. This species frequently produces multiseeded acorns.'

Seedling Development-As with other oaks, germination is hypogeal (8). It appears that the microclimate, edaphic conditions, and several stand variables all have a definite influence on the quantity of small established oak regeneration, but their effect is probably overshadowed by the seed supply. Where oak regeneration is to be favored in uneven-age management, large openings appear most desirable. In even-age management, when a seed-tree cut is contemplated, extremely large- or small-diameter trees should be left as seed producers only as a last resort (2).

The species needs full light to achieve good reproduction. In the Coastal Plain, Shumard oak is found mostly on sites with rich, well-drained soils and an abundance of moisture, but it may also inhabit dry, upland sites.

The stems of the young seedlings are smooth, brownish green or light gray, changing to gray or grayish brown by midseason of the first year. Buds are ovoid with acute apex, 6 mm (0.25 in) long, smooth, with closely overlapping gray-brown or dull straw-colored scales (5).

Vegetative Reproduction-Shumard oak does not propagate readily on moist sites or by cuttings.

Sapling and Pole Stages to Maturity

Growth and Yield-Shumard oak grows quite large, especially on favorable bottom-land sites where it reaches a height of 30.5 m (100 ft) or more with a trunk diameter of 0.9 to 1.2 m (3 to 4 ft). Its shape is characterized by a clear trunk and spreading crown. In a report describing the concentration of hardwood species on pine sites, cubic volume is reported for all sites (pine and hardwood) as 7.3 million m³ (259 million ft³) in 11 Southern States. The total volume on pine sites is 3.4 million m³ (120 million ft³) (6). Heavy pole stands contain over 430 stems/ha (175 stems/acre) 13 to 28 cm (5 to 11 in) d.b.h. In old-growth, mixed stands with Shumard oak, there are total volumes of as much as 420 m³/ha (30,000 fbm/acre).

Rooting Habit-No information is currently available.

Reaction to Competition-Shumard oak is classed as intolerant of shade and needs open areas as well as adequate moisture to become established; such openings are easily invaded by competing annuals that inhibit oak establishment. It is reported, however, that at maturity Shumard oak retards the growth of competing understory vegetation apparently by an allelopathic effect (3).

Shumard oak reproduction shows some tolerance to complete inundation, a requisite for survival on bottom-land sites. Conditions other than species-site relationships are important in determining the regeneration potential and succession of the species in bottom-land hardwood situations. Water is apparently most likely to become the limiting factor on sites that are consistently flooded for fairly long periods of time during the growing season, such as true swamps, deep sloughs, and backwater areas.

Shumard oak is one of the prominent oaks in oak-hickory regions but does not act as a dominant in the extensive range of the oak-hickory association. Therefore, the place of Shumard oak in the ecological succession is not clearly defined. It is probably not a true climax tree in most oak-hickory communities where it is found.

Damaging Agents-This species is susceptible to wilts and leaf diseases. Oak leaf blister (*Taphrina caerulescens*) is common in certain years. Oak wilt (*Ceratocystis fagacearum*) has killed Shumard oak in Missouri. The most common wood-rotting fungi attacking this oak are *Fomes* spp., *Polyporus* spp., and *Stereum* spp.

No insects are specifically associated with Shumard oak, but many insects attack southern oaks, probably including Shumard. Insect defoliators are June beetles (*Phyllophaga* spp.), orangestriped oakworm (*Anisota senatoria*), cankerworms (*Alsophila pometaria* and *Paleacrita vernata*), forest tent caterpillar (*Malacosoma disstria*), yellownecked caterpillar (*Datana ministra*), variable oakleaf caterpillar (*Heterocampa manteo*), and the redhumped oakworm (*Symmerista canicosta*) (7).

The borers that attack healthy trees are red oak borer (*Enaphalodes rufulus*), in cambium and other sapwood; carpenterworms (*Prionoxystus* spp.), in heart and sapwood; and the Columbian timber beetle (*Corthylus columbianus*), in sapwood. Those attacking weakened trees include twolined chestnut borer (*Agrilus bilineatus*), in cambium; and the tilehorned prionus (*Prionus imbricornis*), in roots.

Dying trees are attacked by the oak timberworm (*Arrhenodes minutus*). The golden oak scale (*Asterolecanium variolosum*) kills reproduction and tops in older trees. The gouty oak gall (*Callirhytis quercuspunctata*) and horned oak gall (*C. cornigera*) injure small limbs, while the basswood leafminer (*Baliosus nervosus*) attacks the leaves (7).

As in many oaks, the nut is attacked by acorn weevils in the genus *Curculio*. A reliable method of sorting weeviled acorns from sound ones is by color of the cup scar on the nut; a bright, light tan indicates a good acorn, a dull brown, a bad one.

Special Uses

The acorns of Shumard oak serve as mast for numerous species of birds and mammals. In the Mohrs oak and Ashe juniper-redberry juniper types, Shumard oak acorns are probably an important source of food for the deer herd.

Commercially, Shumard oak is marketed with other red oak lumber for flooring, furniture, interior trim, and cabinetry.

Genetics

Shumard oak has two varieties—*Quercus shumardii* Buckl. var. *shumardii* (typical), and *Q. shumardii* var. *texana* (Buckl.) Ashe, Texas oak, found in central Texas, including the Edwards Plateau, and in southern Oklahoma in the Arbuckle Mountains.

Shumard oak hybridizes with *Quercus hypoleucoides*; *Q. imbricaria* (*Q. x egglestonii* Trel.); *Q. marilandica* (*Q. x hastingsii* Sarg.); *Q. nigra* (*Q. x neopalmeri* Sudw.); *Q. nuttallii*; *Q. palustris* (*Q. x mutabilis* Palmer & Steyerl.); *Q. phellos* (*Q. x moultonensis* Ashe); *Q. rubra* (*Q. x riparia* Laughlin); and *Q. velutina* (*Q. x discreta* Laughlin) (4).

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