

SILVICS OF FOREST TREES OF THE UNITED STATES

Prepared by the Division of Timber Management Research
Forest Service

Compiled and revised by H. A. FOWELLS
Chief, Branch of Silviculture

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BLACK TUPELO (*Nyssa sylvatica* Marsh.)

Other common names: Blackgum, pepperidge, sour-gum, tupelo, tupelo-gum, and gum tree.

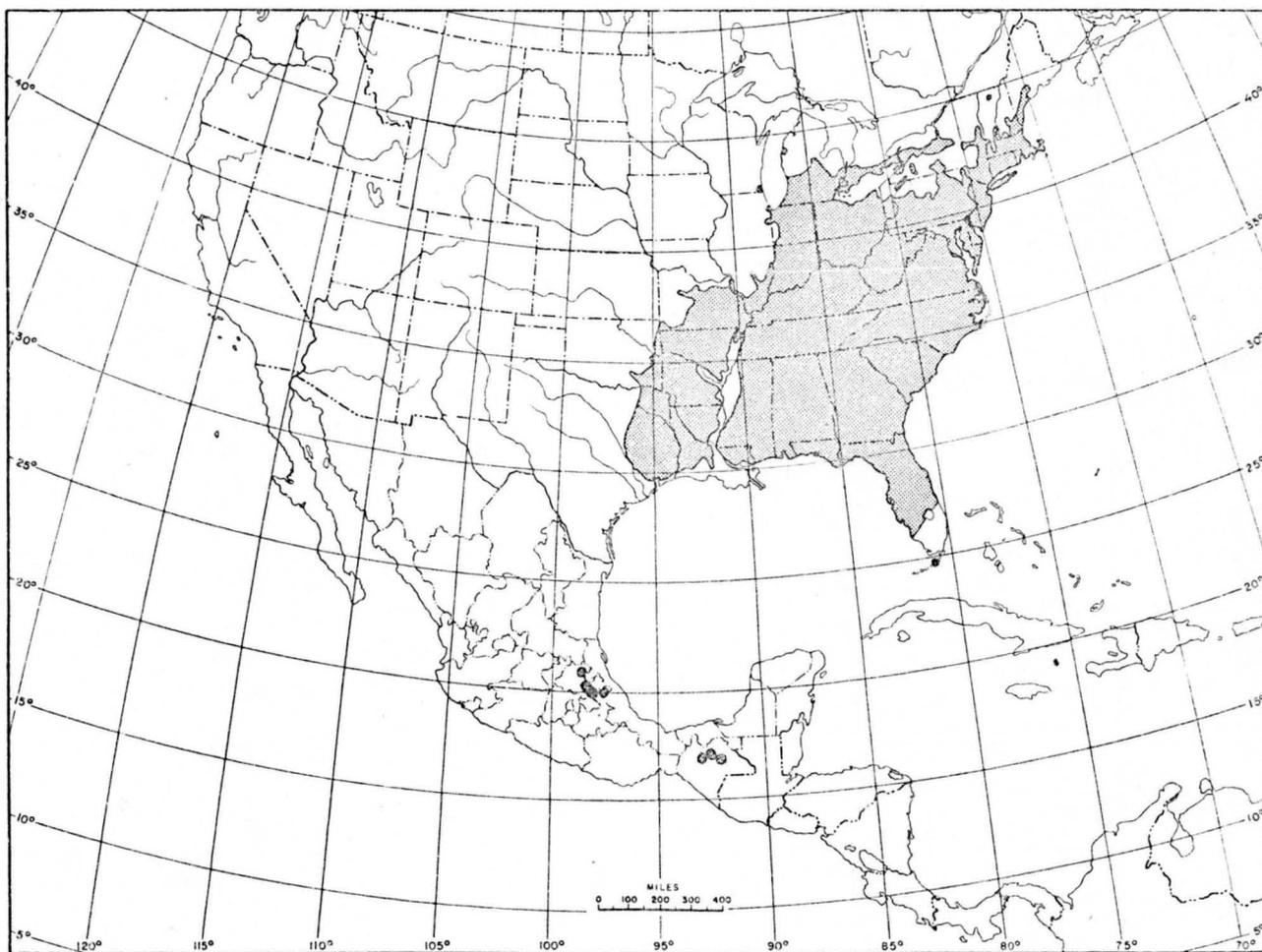
[Other common names for swamp tupelo: Blackgum, swamp black tupelo, swamp blackgum, and bastard blackgum.]

Black tupelo is divided into two distinct and commonly recognized varieties, typical black tupelo (*N. sylvatica* var. *sylvatica*) and swamp tupelo (*N. sylvatica* var. *biflora* (Walt.) Sarg.).

Black tupelo grows in the uplands and in alluvial stream bottoms from southwestern Maine west to New York, extreme southern Ontario, central Michigan, Illinois, and central Missouri, and south to eastern Oklahoma, eastern Texas, and southern Florida. It is local in central and south-

ern Mexico. Optimum development is made on lower slopes and terraces in the southeastern United States.

Swamp tupelo is limited to Coastal Plain swamps and estuaries from Maryland and southeastern Virginia south to southern Florida and north on the east side of the Mississippi River to western and southern Tennessee. It develops best in the coves and low swamps of the Southeast.



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The range of black tupelo.

HABITAT CONDITIONS

Climate

Since its range is greater, black tupelo is found in colder, drier climates than is swamp tupelo. The following tabulation compares the average climate for each variety's range:

	<i>Black Tupelo</i>	<i>Swamp Tupelo</i>
Precipitation per year.....	49 inches..	53 inches
Precipitation during growing season.	18 inches..	24 inches
Snowfall per year.....	25 inches..	3 inches
Annual temperature, average..	57° F.....	65° F.
July temperature, average.....	74° F.....	78° F.
January temperature, average..	38° F.....	47° F.
Growing season.....	216 days..	267 days

The two commercial ranges, although not identical, have quite similar climatic characteristics. The chief differences are the lower snowfall and the longer frost-season where swamp tupelo occurs. Both are in the humid zone with a normal annual rainfall of about 50 inches and an annual temperature of about 63° F.

Soils and Topography

Black tupelo grows well on well-drained light textured soils on the low ridges of second bottoms and on the high flats of silty alluvium. In the uplands it grows best on the loams and clay loams of lower slopes and coves.

Swamp tupelo grows on the wetter bottom land soils ranging from the highly organic muck soils to heavy clays in ponds and sloughs (2).¹

Black tupelo is adapted to a wide variety of sites—from the creek bottoms of the southern Coastal Plain to altitudes of 3,000 feet in North Carolina. It will tolerate brief spring flooding on alluvial sites and is common on the relatively dry upper and middle slopes in the Appalachian Mountains. It will survive, but with a slow growth rate, on the dry uplands of the Coastal Plain, Piedmont, and eastern Great Plains.

Swamp tupelo is found in and on the banks of the slackwater swamps, ponds, and estuaries of the Coastal Plain, and in low coves and seepages which remain wet the year round. Probably because of the better aeration in these coves and seepages, it achieves its highest growth rate and best form there. Swamp tupelo will tolerate wetter sites than black tupelo, but is not often found in the brakes, sloughs, deep swamps, or overflow river bottoms that are occupied by the water tupelo.

Associated Trees and Shrubs

Black tupelo does not dominate in any major

¹Italic number in parentheses refer to Literature Cited, p. 280.

forest type; however, it is a component of 29 types. In New England it is associated with the Black Ash—American Elm—Red Maple Type (Type 39). In the central forest region it is found in the following types:

<i>Type No.</i>	<i>Type</i>
40....	Post Oak—Black Oak
41....	Scarlet Oak
43....	Bear Oak
44....	Chestnut Oak
45....	Pitch Pine
48....	Eastern Redcedar—Hardwood
51....	White Pine—Chestnut Oak
52....	White Oak—Red Oak—Hickory
56....	Northern Red Oak—Mockernut Hickory—Sweetgum
53....	Yellow-Poplar—Hemlock
59....	Yellow-Poplar—White Oak—Northern Red Oak

In the southern forest region black tupelo occurs in the following types:

<i>Type No.</i>	<i>Type</i>
75....	Shortleaf Pine
76....	Shortleaf Pine—Oak
77....	Shortleaf Pine—Virginia Pine
78....	Virginia Pine—Southern Red Oak
79....	Virginia Pine
80....	Loblolly Pine—Shortleaf Pine
81....	Loblolly Pine
82....	Loblolly Pine—Hardwood
83....	Longleaf Pine—Slash Pine
85....	Slash Pine—Hardwood
90....	Beech—Southern Magnolia
91....	Swamp Chestnut Oak—Cherrybark Oak
93....	Sugarberry—American Elm—Green Ash
97....	Atlantic White-Cedar
99....	Slash Pine—Swamp Tupelo
100....	Pondcypress
104....	Sweetbay—Swamp Tupelo—Red Maple

In the southern bottom lands black tupelo is an important tree in the white oaks-red oaks-other hardwoods mixture and in the hackberry-elm-ash mixture (3, 4).

Swamp tupelo is of major importance in the Slash Pine—Swamp Tupelo (Type 99) and the Sweetbay—Swamp Tupelo—Red Maple (Type 104) Types of the lower Coastal Plain. The "bay-heads" and "titi" thickets of the Gulf Coast provide a favorable habitat for this species. Other southern forest types that contain swamp tupelo are Loblolly Pine—Hardwood (Type 82), Slash Pine (Type 84), Slash Pine—Hardwood (Type 85), Atlantic White-Cedar (Type 97), Pond Pine (Type 93), Pondcypress (Type 100), Baldcypress (Type 101), Baldcypress—Water Tupelo (Type 102), and Water Tupelo (Type 103).

Noncommercial trees and shrubs commonly associated with black and swamp tupelo are:

Eastern redbud (*Cercis canadensis* var. *canadensis*)

American hornbeam (*Carpinus caroliniana*)

Eastern hophornbeam (*Ostrya virginiana*)

Pawpaw (*Asimina triloba*)
 Bayberry (*Myrica* spp.)
 Mountain-laurel (*Kalmia latifolia*)
 Buckwheat-tree (*titi*) (*Cliftonia monophylla*)
 Yaupon (*Ilex vomitoria*)
 Dahoon (*Ilex cassine*)
 Swamp cyrilla (*Cyrilla racemiflora*)
 Dogwood (*Cornus* spp.)
 Sourwood (*Oxydendrum arboreum*)
 Hawthorn (*Crataegus* spp.)
 Swamp-privet (*Forestiera acuminata*)
 Common buttonbush (*Cephalanthus occidentalis*)
 Redbay (*Persea borbonia*)

LIFE HISTORY

Reproduction and Early Growth

Flowering and fruiting.—The flowers appear in the spring when the leaves are nearly grown. The fruit ripens and falls in autumn.

Seed dissemination.—The seeds of both varieties are distributed largely by small animals. In addition, the drupes and seeds of swamp tupelo float, and they may be transported for some distance by water. Receding water usually deposits the seed on a favorable bed.

Seedling development.—Under natural conditions, seed overwinters on cool, damp soil and germinates the following spring. Both varieties appear to require nearly full light for optimum early growth. Black tupelo, however, will tolerate more overhead competition and can exist on unfavorable sites. Swamp tupelo is much less adaptable.

Vegetative reproduction.—Layering has been used to produce black tupelo stock and may prove to be a valuable technique after further research. Root suckering may occur around dying black tupelo or near stumps. Swamp tupelo will sprout from young tree stumps.

Sapling Stage to Maturity

Growth and yield.—Both varieties grow to a mature height of 120 feet with diameters at breast height exceeding 4 feet on favorable sites. Diameter growth on medium sites would average 4 to 5 inches for 10 years.

Reaction to competition.—The intolerant (1) swamp tupelo often develops in even-aged stands, does not assert dominance, and will stagnate if heavily stocked. Black tupelo is usually found in

mixture with other species. Only rarely will it attain dominance within its age group, but is usually in the intermediate crown class on most sites. In the mountains it often has a dominant crown position. Both black and swamp tupelo respond slightly to release from a stagnated condition despite long periods of crowning.

Principal enemies.—Black tupelo, because it grows on drier sites, is more often affected by fire. However, swamp tupelo also suffers from fire when coves and swamps dry out. Hot fires cause severe mortality and cull. Heart rot appears to spread faster in black tupelo than in swamp tupelo.

The tupelo leaf miner (*Antispila nyssaeifoliella*) and the forest tent caterpillar (*Malacosoma disstria*) attack the tupelos. Bark damage and small stem cankers of unknown origin have been observed in lower Mississippi and Alabama. A trunk lesion of swamp tupelo, observed in south central Louisiana, is thought to be caused by *Fusarium solani*. The disease results in swellings and dead areas in the cambium, with subsequent degrade of the timber (5).

RACES AND HYBRIDS

There are no reported races or hybrids of black tupelo.

Revised from "Silvical Characteristics of Black Tupelo," by W. R. Beaufait and L. F. Smith. U.S. Forest Serv. South. Forest Expt. Sta. Unpublished paper. 1957.

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