Nyssa ogeche Bartr. ex Marsh. Ogeechee Tupelo

Cornaceae Dogwood family

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Ogeechee tupelo *(Nyssa ogeche),* also called Ogeechee-lime, sour tupelo-gum, white tupelo, and bee-tupelo *(3)*, is a scarce small tree or much branched shrub found along rivers and swamps of the Coastal Plain in constantly wet soils that are often flooded. The wood is of little value, but the mature fruits and their juice are used by people. It is also an important honey tree.

Much of the information given here was contributed by L. T. Nieland, formerly State Extension Forester, Gainesville, FL, who observed Ogeechee tupelo for many years in its natural habitat and experimented with its cultivation for farm use.

Habitat

Native Range

Ogeechee tupelo (figs. 1, 2) requires a very moist site and is distributed along the borders of rivers, swamps, and ponds that are frequently inundated *(2,4)*. It grows naturally from the borders of South Carolina near the coast through the Ogeechee Valley in Georgia to Clay County in northern Florida and Washington County in western Florida (4). It is found in abundance along the Ogeechee, Altamaha, and Suwannee Rivers *(2)*, and in certain wet flatwood regions between the Choctawhatchee and Wakulla Rivers of Florida (5). In its Florida range it is less than 1 percent of the woody plant population.

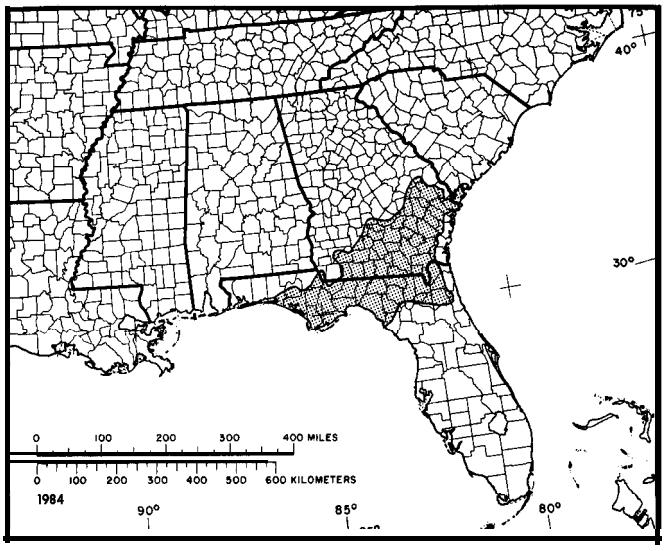

Figure *1-The native* range *of Ogeechee tupelo.*

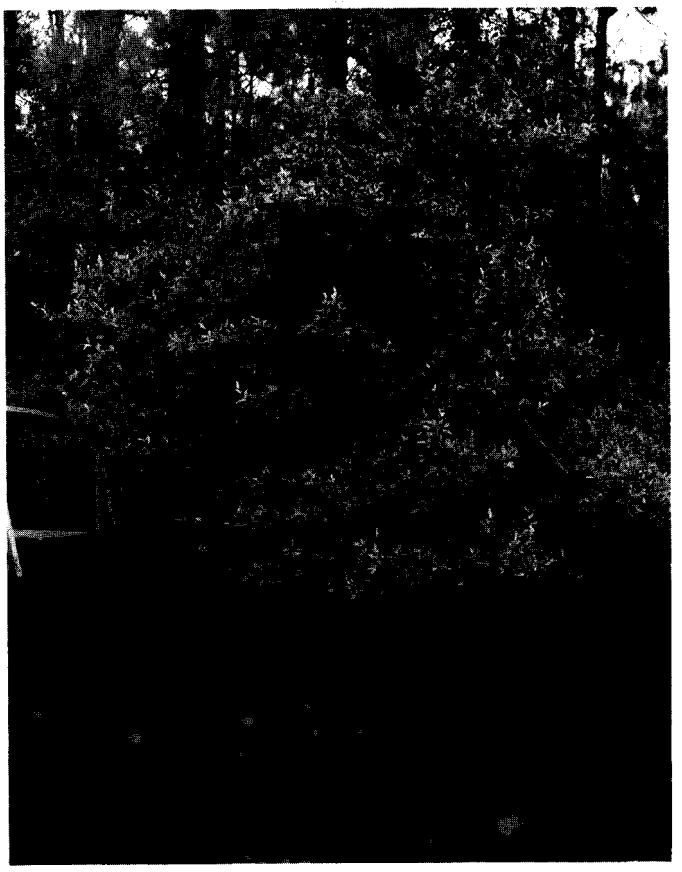

Figure 2—*Ogeechee tupelo.*

Climate

The climate over the entire range is humid to subhumid. About one-half of the 1295 mm (51 in) annual rainfall occurs between April and August. Average July and January temperatures are about 28" C (83" F) and 11" C (52" F), respectively Extreme temperatures average approximately -22" C (–8° F) in winter and 41" C (106" F) in summer. The growing season is about 270 days.

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Soils and Topography

Ogeechee tupelo is limited to alluvial soils along the rivers and in river swamps. A permanently wet site is apparently requisite for satisfactory regeneration and growth. It grows successfully on soils that are flooded for long periods; however, there must be at least a slight movement of the water. Ogeechee tupelo is most commonly found growing on soils of the order Inceptisols.

Where waters back up and stand for long periods after the main flood has subsided, as in second bottoms, Ogeechee tupelo is usually a tall, deliquescent shrub or a dwarfed tree. It seldom attains tree form very far from natural stream channels. Generally it grows best and is most abundant at an elevation of only a few centimeters above the average water level and is infrequently found more than 0.3 to 0.6 m (1 to 2 ft) above the average water level of the streams along which it grows.

Associated Forest Cover

Ogeechee tupelo occurs as a minor component in the forest cover types Baldcypress-Tupelo (Society of American Foresters Type 102) and Water Tupelo–Swamp Tupelo (Type 103) *(1)*.

Associated tree species include tupelo *(Nyssa* spp.), ash *(Fraxinus* spp.), oak *(Quercus* spp.), hickory *(Carya* spp.), elm *(Ulmus* spp.), baldcypress *(Taxodium* spp.), pine *(Pinus* spp.), red maple *(Acer rubrum)*, black willow *(Salix nigra)*, swamp cottonwood *(Populus heterophylla)*, water-elm *(Planera aquatica)*, waterlocust *(Gleditsia aquatica)*, leucothoe *(Leucothoe* spp.), sweetgum *(Liquidambar styraciflua)*, persimmon *(Diospyros virginiana)*, sweetbay *(Magnolia virginiana)*, redbay *(Persea borbonia)*, and Atlantic white-cedar *(Chamaecyparis thyoides)*. Other associates may include hawthorn *(Crataegus* spp.), buttonbush *(Cephalanthus* spp.), holly *(Rex* spp.), lyonia *(Lyonia* spp.), clethra *(Clethra* spp.), swamp-privet *(Forestiera acuminata)*, swamp dogwood *(Cornus stricta)*, swamp cyrilla *(Cyrilla racemiflora)*, poison-sumac *(Toxicodendron vernix)*, southern bayberry *(Myrica cerifera)*, and swamp rose *(Rosa palustris)*. Woody vines associated with the forest type include greenbrier *(Smilax* spp.), southeast decumaria *(Decumaria barbara)*, crossvine *(Bignonia capreolata)*, peppervine *(Ampelopsis arborea)*, supplejack *(Berchemia scandens)*, and poison-ivy *(Toxicodendron radicans)*.

Life History

Reproduction and Early Growth

Flowering and Fruiting-The species is polygamo-dioecious, bearing perfect and pistillate flowers on female trees and only staminate flowers on male trees. The flowers appear from late March to early May after the new leaves are fully grown *(5)*. The minute flowers, originating in the axils of bud scales, are greenish yellow and inconspicuous with rounded to oblong petals. Pistillate flowers are solitary on short, 1.6 mm (0.06 in) woody peduncles with a deep cup-shaped woolly calyx. The style is stout, exserted (extending beyond the petals), and reflexed from near the base; remnants of it persist on the mature fruit. The male flowers occur in clusters on slender hair peduncles 1.3 mm (0.5 in) long. The filaments are inserted under the margin of a thick disk and bear oval, roughened anthers *(4)*. The male flowers, in particular, produce an abundance of nectar. Bees are extremely active in the trees during the flowering period and probably are responsible for pollen dissemination.

The fruit is an edible, oblong-shaped red drupe, 3 to 4 cm (1.0 to 1.5 in) long, containing an acid flesh. Each drupe contains one, rarely two, 3 cm (1 in) long seed with a papery, pale seedcoat. Ogeechee tupelo has the largest fruit in the genus. It matures in July and August but persists until November and December after the leaves have fallen (4).

Seed Production and Dissemination-The species is a prolific and fairly consistent producer of blossoms and fruit, although a freeze after the flowers have opened may cause an occasional failure. Little is known about the age or size at which trees begin to bear seed. Seedlings planted on a lake shore in Florida grew to a height of almost 2.4 m (8 ft) in 3 years and matured a good crop of fruit at that time.

The fruit falls to the ground and into the water beneath the parent tree, and most seed dissemination is undoubtedly quite local. Birds and small animals may carry seed some distance, however. Some seed is waterborne, as drifts of the fruit may be found at previous high waterlines following floods. Fresh, undamaged fruit and the seeds from it usually sink in water *(5)*. Fruit and seeds that have dried a little will float. Cleaned seed range from 2,290 to 3,130/kg (1,040 to 1,420/lb), averaging 2,710/kg (1,230/lb).

Seedling Development-Germination is epigeal (6). Data on the establishment and early growth of Ogeechee tupelo are lacking. Where the surface soil

becomes very dry, the newly germinated seedlings generally do not survive. In a dense grass sod, the young trees may survive but grow very slowly

Under favorable conditions seedlings have attained a height of 0.6 cm (2 ft) or more during the first growing season. One group of about 200 seedlings left in nursery rows along a lake shore in north Florida averaged 1.2 to 1.8 m (4 to 6 ft) in height after 2 years.

Vegetative Reproduction-Much reproduction occurs as sprouts from stumps or root crowns. Stream edges may be quite densely covered with Ogeechee tupelo that has reproduced almost exclusively by this means. There is no recorded information about propagation by cuttings.

Sapling and Pole Stages to Maturity

Growth and Yield-While Ogeechee tupelo may mature as a shrub only a few feet tall or as a 19.8 m (65 ft) tree, it is most frequently a small, crooked, deliquescent tree 7.6 to 10.7 m (25 to 35 ft) tall *(3,5)* with a narrow, round-topped crown (4). Its height seldom exceeds 15.2 m (50 ft). Individual stems may have diameters of 30 to 61 cm (12 to 24 in) (3) but they are usually not more than 38 cm (15 in) (5). The bark is 3.2 mm (0.125 in) thick, irregularly fissured, with a dark-brown surface broken into persistent platelike scales (4).

The trees are probably short lived, although reliable information is lacking. When the original stems weaken or die, sprouts develop from their root crowns. These evidently produce a vigorous root system of their own, thus prolonging the life of the individual tree for a considerable time and resulting in the thicketlike growth frequently seen.

Reaction to Competition-Ogeechee tupelo is classed as intolerant of shade.

Rooting Habit and Damaging Agents-No published information is available on rooting habit or damaging agents of Ogeechee tupelo.

Special Uses

Thousands of hectares of Ogeechee tupelo have been planted in bee farms along the lower Apalachicola River and around swamps where it grows naturally *(2,4)*. **Bees** use nectar from the trees to make "tupelo honey." The mature fruit, known as Ogeechee lime, has a subacid flavor. It is made into preserves and is also used in making a beverage *(2)*.

The wood is light (specific gravity of 0.46), soft, tough but not strong. It is coarse grained, difficult to split, and of little value (4).

Genetics

There are no known races or hybrids of Ogeechee tupelo, and genetic studies of the species have not been pursued.

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