

# *Fraxinus profunda* (Bush) Bush

# Pumpkin Ash

Oleaceae Olive family

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Pumpkin ash (*Fraxinus profunda*), also called red ash, is a large tree of swamps and bottom lands where it often develops a swollen or pumpkin-shaped butt. For management and utilization, it is treated the same as other ashes. The seeds are eaten by birds, and deer browse on the branches.

## Habitat

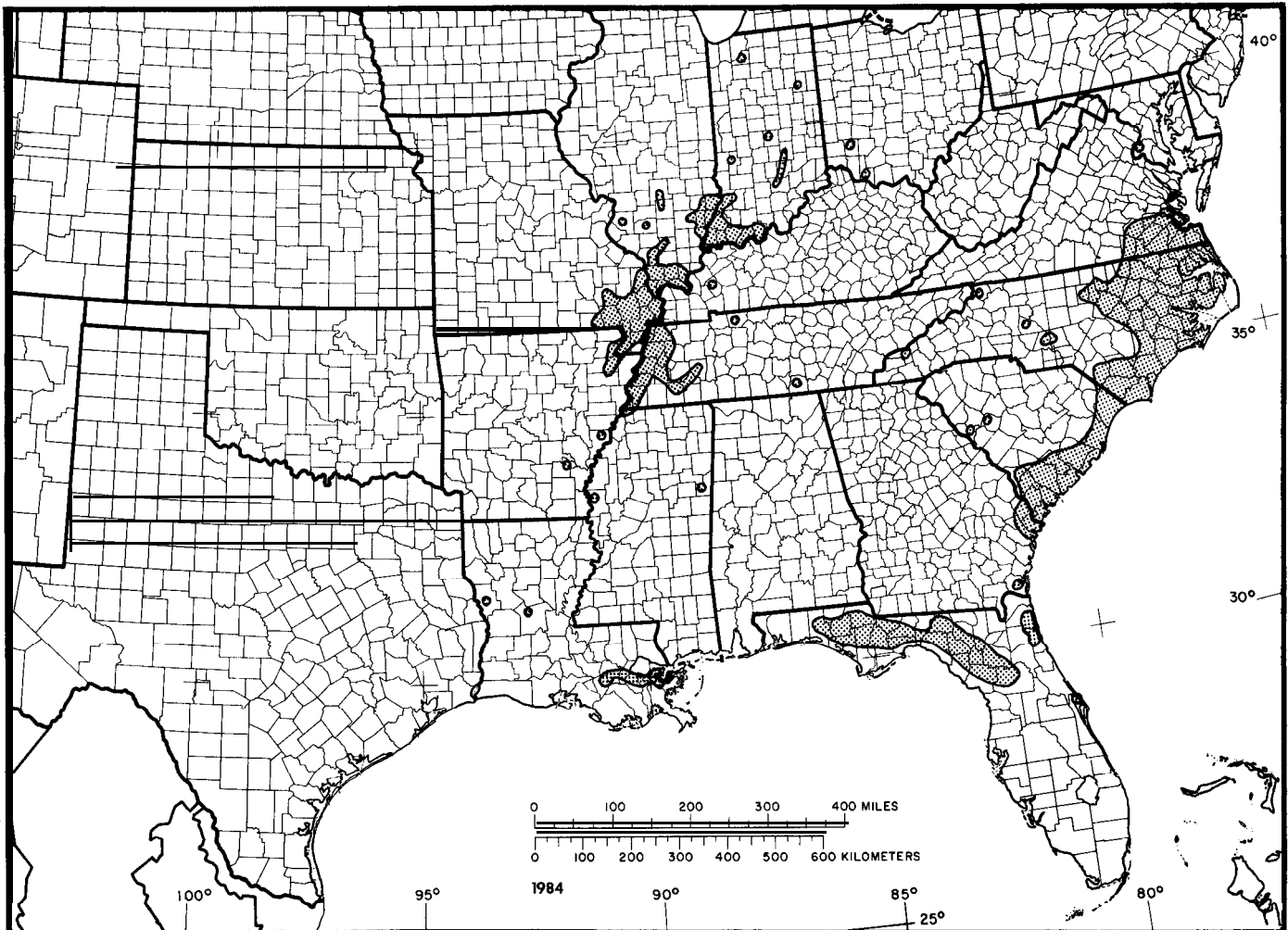
### Native Range

Pumpkin ash (figs. 1, 2) is found locally along swamp margins and river bottoms, chiefly in the Atlantic Coast-

tal Plain from southern Maryland and southeastern Virginia to northern Florida, and west to Louisiana. It also grows in the Mississippi and Ohio River Valleys from southern Illinois and Indiana, south through southeastern Missouri and northeastern Arkansas. Its range, however, is quite discontinuous.

## Climate

Annual precipitation varies from 1020 mm (40 in) in the central part of the range to 1220 mm (48 in) in the east and south. Average rainfall in the growing



Figure

The author is Principal Plant Physiologist, Southeastern Forest Experiment Station, Asheville, NC.



**Figure 2**—Pumpkin ash on the Francis Marion National Forest in South Carolina.

season, March through September, is 660 mm (26 in). The average summer temperature ranges from 27° C (80° F) in the north to 28° C (82° F) in the south, and the average winter temperature ranges from 2° C (35° F) in the north to 16° C (60° F) in the south. The number of frost-free days extends from 180 in the central region to 270 in the southern region.

### Soils and Topography

Pumpkin ash is found on wet to very wet sites where, in years of normal rainfall, surface water

stands well into the growing season. Sites include the margins of swamps and deep sloughs, very low, poorly drained flats of the major river floodplains, swamps of tidal estuaries, margins of coastal marshes, and the deeper, more extensive depressions of the Coastal Plain. The soils are mineral and usually range in texture from silt loam to clay loam. Swamps and depressions usually have a surface of muck or shallow peat. Soils in the central part of the range belong to the Alfisols and Entisols, while those in the east and south include the Spodosols and Ultisols (5).

### Associated Forest Cover

Pumpkin ash is listed as a minor component of three forest cover types: Baldcypress (Society of American Foresters Type 101), Baldcypress-Tupelo (Type 102), and Water Tupelo-Swamp Tupelo (Type 103) (1). Other species associated with pumpkin ash are red maple (*Acer rubrum*) and silver maple (*A. saccharinum*), blackwillow (*Salix nigra*), Carolina ash (*Fraxinus caroliniana*), swamp cottonwood (*Populus heterophylla*), water-elm (*Planera aquatica*), and water locust (*Gleditsia aquatica*). On the better drained sites, overcup oak (*Quercus lyrata*), swamp chestnut oak (*Q. michauxii*), willow oak (*Q. phellos*), water oak (*Q. nigra*), water hickory (*Carya aquatica*), American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), Nuttall oak (*Q. nuttallii*) in the Mississippi River bottoms; laurel oak (*Q. laurifolia*), sweetgum (*Liquidambar styraciflua*), persimmon (*Diospyros virginiana*), and sweetbay (*Magnolia virginiana*) are also present. Among the understory trees and shrubs commonly found in the deep swamps are buttonbush (*Cephalanthus occidentalis*), swamp-privet (*Forestiera acuminata*), Virginia-willow (*Itea virginica*), swamp dogwood (*Cornus stricta*), swamp cyrilla (*Cyrilla racemiflora*), possumhaw (*Ilex decidua*), swamp rose (*Rosa palustris*), and poison-sumac (*Toxicodendron vernix*); and such species as dahoon (*Ilex cassine*), yaupon (*I. vomitoria*), southern bayberry (*Myrica cerifera*), and lyonia fetter bush (*Lyonia lucida*) in the shallower upland swamps.

### Life History

#### Reproduction and Early Growth

**Flowering and Fruiting**--Pumpkin ash is dioecious, flowering in April and May before the leaves flush. The fruit is a winged, single-seeded samara and is borne in clusters. Pumpkin ash has the largest seed of the native ash species; seeds average 6.1 to

7.1 cm (2.4 to 2.8 in) in length and 9 mm (0.35 in) in width (4).

**Seed Production and Dissemination**-Seed production begins at an early age; the youngest seed-bearing age has been reported to be 10 years. The seeds mature in late summer, and fall between October and December. Most of the seeds are wind dispersed, though some dispersal by water occurs and may be important to regeneration under some conditions. Seeds remain viable in water for several months. There are no published data on abundance and periodicity of seed crops; however, pumpkin ash is apparently not a prolific seeder (6). Number of cleaned seed averages 7,050/kg (3,200/lb).

**Seedling Development**-Germination is epigeal. Pumpkin ash, in common with its associate green ash, reproduces best on bare, moist soil in openings. Seedlings are moderately shade tolerant and grow rapidly provided that the site is not totally preempted by ground cover or a dense overstory. They are tolerant of saturated soil conditions (2).

**Vegetative Reproduction**-Sapling and pole-size ash sprout readily. The sprouts grow rapidly and can rise above seedlings of most other species very quickly (3).

#### Sapling and Pole Stages to Maturity

**Growth and Yield**-Pumpkin ash is a large tree, reaching a height of 40 m (130 ft) and a diameter at breast height of 173 cm (68 in) on the best sites. On the wettest sites it commonly develops a swollen or pumpkin-shaped butt, hence its name. There are no published growth or yield data, and in practice it has not been practical to distinguish it from green ash either for management purposes or in its utilization (3).

The species can be readily planted. Unpublished records for a plantation in the Mississippi Delta show that trees planted on a cleared site at a square spacing of 3.7 m (12 ft) averaged 6.7 m (22 ft) in height and 8.9 cm (3.5 in) in d.b.h. at age 6.

**Rooting Habit**-There is no published information on rooting habits.

**Reaction to Competition**-Pumpkin ash is tolerant of shading when young and grows more rapidly than green ash. It becomes less tolerant as it

ages. Overall, it is most accurately classed as intermediate in shade tolerance. Pumpkin ash, along the margins of swamps and sloughs, grows very slowly. At somewhat higher elevations, where the soils are better drained, it grows more rapidly (6).

**Damaging Agents**-Pumpkin ash is very susceptible to fire. It is moderately susceptible to dieback during drought on the wettest sites. Upper stem heartrot (*Lentinus tigrinus*) may be severe in over-mature trees. There are no published data on specific insect or disease problems (3).

#### Special Uses

Pumpkin ash produces high-quality factory lumber and dimension material and is an important source of handle and implement stock. The fruits are eaten by wood ducks and many other birds. White-tailed deer browse the young twigs and leaves.

#### Genetics

Pumpkin ash is considered to be a true-breeding polyploid derivative of a cross between a diploid green ash and a tetraploid white ash. No races or hybrids have been reported (7).

#### Literature Cited

1. Eyre, F. H., ed. 1980. Forest cover types of the United States and Canada. Society of American Foresters, Washington, DC. 148 p.
2. Hosner, J. F., and S. G. Boyce. 1962. Tolerance to water saturated soil of various bottomland hardwoods. *Forest Science* 8:180-186.
3. Putnam, J. A., G. M. Furnival, and J. S. McKnight. 1960. Management and inventory of southern hardwoods. U.S. Department of Agriculture, Agriculture Handbook 181. Washington, DC. 102 p.
4. Schopmeyer, C. S., tech. coord. 1974. Seeds of woody plants in the United States. U.S. Department of Agriculture, Agriculture Handbook 450. Washington, DC. 883 p.
5. Southeastern Forest Experiment Station. 1969. A forest atlas of the South. USDA Forest Service, Southeastern Forest Experiment Station, Asheville, NC. 27 p.
6. Sterrett, W. D. 1915. The ashes: their characteristics and management. U.S. Department of Agriculture, Bulletin 299. Washington, DC. 88 p.
7. Wright, Jonathan W. 1965. Green ash (*Fraxinus pennsylvanica* Marsh.). In *Silvics of forest trees of the United States*. p. 185-190. H. A. Fowells, comp. U.S. Department of Agriculture, Agriculture Handbook 271. Washington, DC.