

Ulmus serotina Sarg. September Elm

Ulmaceae Elm family

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September elm (*Ulmus serotina*), also called red elm, is one of two fall-flowering native elms. This medium-sized, rapid-growing tree is found most frequently on moist clay or sandy loam soils, but it also grows on dry, rocky soils of limestone origin. It is never abundant and in early development it is an inconspicuous understory component of hardwood stands. This species may appear more frequently within its range than is currently documented because it may be confused with other elm species. The lumber is cut and sold with four other elm species

and marketed as rock elm. Wildlife browse young trees and eat the seeds and buds. September elm is planted in landscapes but succumbs to Dutch elm disease.

Habitat

Native Range

September elm (fig. 1) grows sporadically from southern Illinois across Kentucky and Tennessee to

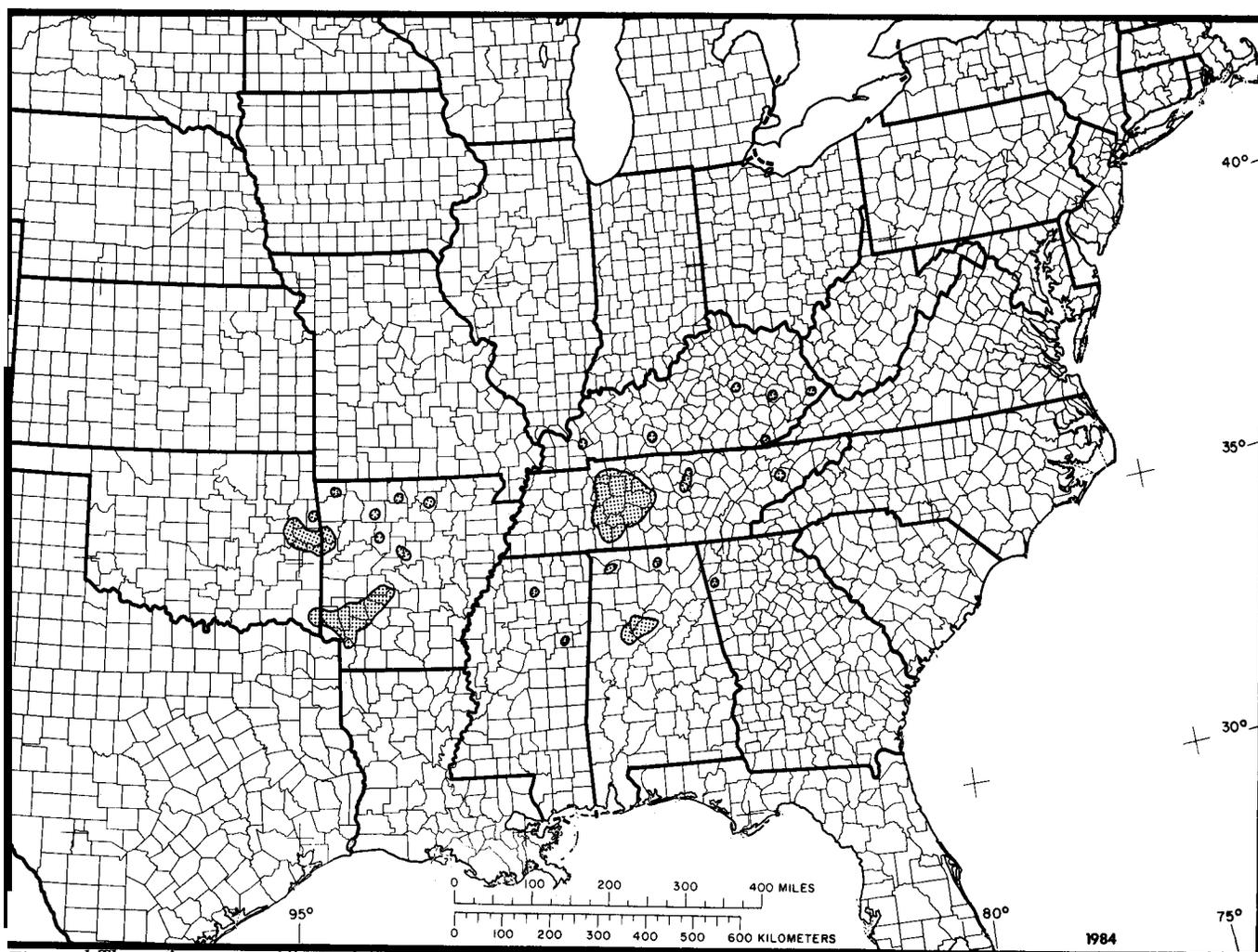


Figure 1—The native range of September elm.

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northern Georgia, northern Alabama, northern Mississippi, Arkansas, and eastern Oklahoma (5). It is most abundant in Arkansas and Tennessee.

Climate

The distribution of September elm is in the humid to temperate zones of the East-Central United States. Average annual precipitation ranges from about 1020 mm (40 in) to about 1320 mm (52 in), of which about 50 to 65 percent occurs from April through September. Average annual snowfall over the region ranges from about 5 cm (2 in) to 50 cm (20 in). Average annual temperatures range between 13° C (55° F) and 17° C (62° F), but the lowest and highest temperatures observed are -23° C (-10° F) and 46° C (115° F), respectively. The growing season averages between 180 and 220 days over the species range (15).

Soils and Topography

September elm grows most frequently on moderately to well-drained, moist soils varying in texture from clay loams to sandy loams. It is also common on dry, rocky soils derived from limestone or other calcareous material. It is less frequent on alluvial soils along streams in rich bottoms and on the margins of swamps (4,12). The clay loams and sandy loams are principally in the order Ultisols and sub-order Udults. The Udults are usually moist, with relatively low amounts of organic matter in the subsurface horizons. They are formed in humid climates that have relatively short or no dry periods during the year. September elm is reported in some localities where Alfisols and Inceptisols are present. Alfisols are medium to high in bases and have gray to brown surface horizons and clay accumulations in subsurface horizons. They are usually moist but may be dry during summer. Inceptisols have weakly differentiated horizons, with materials that have been altered or removed, but have not accumulated. These soils are also moist but may be dry during the warm season (17).

September elm grows at elevations ranging from about 100 m (325 ft) in the more southerly part of its range to about 460 m (1,500 ft) in northerly areas. Sites vary from very flat topography to moderate slopes in some of the upland coves and ravines. It has been reported to grow in upland coves and ravines in Arkansas (14) but is notably absent from the poorly drained lowlands of the Mississippi alluvial plain (12).

Associated Forest Cover

September elm is generally very scattered, and there are few records of stands with this species as a primary component. It is not a common associate in any of the forest cover types currently listed by the Society of American Foresters.

September elm often grows on floodplains in mid- to late-successional communities where common associates are American elm (*Ulmus americana*), river birch (*Betula nigra*), sweetgum (*Liquidambar styraciflua*), and sometimes silver maple (*Acer saccharinum*). In coves and on mesic slopes it may grow with American hornbeam (*Carpinus caroliniana*), Florida maple (*Acer barbatum*), white ash (*Fraxinus americana*), blue ash (*F. quadrangulata*), sweetgum, northern red oak (*Quercus rubra*), white oak (*Q. alba*), and American elm. Its common appearance on streamsides, roadsides, and other openings may indicate low shade tolerance (13).

Life History

Reproduction and Early Growth

Flowering and Fruiting-September elm and cedar elm (*Ulmus crassifolia*) are the two species of native elms that flower and bear fruit in the fall. The hermaphroditic, protogynous flowers of September elm usually appear in September and are in small racemes in the leaf axils of the current season (2). The fruit are light-greenish samaras that turn brown as they ripen in late October or early November. The winged fruits are 10 to 13 mm (0.4 to 0.5 in) long, oblong-elliptical in shape, deeply divided at the apex and fringed along the margins with white hairs (11).

Seed Production and Dissemination-Most species of elm produce good seed crops every 2 or 3 years, but seed production data for September elm are not available. The seeds are dispersed by gravity and wind. Cleaned seeds are very small, averaging about 328,500 per kilogram (149,000/lb) (1).

Seedling Development-Naturally dispersed seeds over-winter in the litter or at the soil surface and germinate the following spring. Germination is epigeal (1). If seeds are to be sown in a nursery, they should be stratified at 5° C (41° F) for 60 to 90 days (1). Nursery-grown seedlings are usually outplanted as 1-O stock.

Vegetative Reproduction-September elm, like many other elms, sprouts readily when the stem is severed or badly injured. Damaged young trees

sprout more readily than older trees, and sprouts grow rapidly.

Sapling and Pole Stages to Maturity

Growth and Yield-September elm grows rapidly on good sites with low competition. Trees attain a diameter of 60 cm (24 in) to 90 cm (36 in) (4) and may reach a height of 25 m (82 ft). The tree attains the general form of American elm, but branches are smaller and somewhat more pendulous. Lower portions of large trees may provide logs of veneer quality.

Rooting Habit-No information available.

Reaction to Competition-September elm is classed as tolerant of shade and probably exists most commonly as an inconspicuous understory plant during early developmental stages. Upon release, growth response is rapid, especially on better sites. If competition is minimal, however, the species will grow rapidly during all stages of development.

Damaging Agents-The susceptibility of September elm to Dutch elm disease (*Cerutocystis ulmi*) is probably the greatest deterrent to its growth and development. All three mature specimens of September elm at the National Arboretum have been killed by this fungus since 1965; seedlings of the species are also very susceptible to Dutch elm disease (9).

September elm has also been reported as a host of American mistletoe, *Phorudendron flavescens* (6).

Special Uses

The seeds of September and other elms are eaten by a variety of birds and small mammals, including squirrels. Twigs and buds are sometimes browsed by deer, and a few game birds eat the buds (3).

The species has been planted as an ornamental tree in Georgia and Alabama, where it grows abundantly in hilly areas (11). This elm is also reported to thrive in Massachusetts (10).

The reddish-brown wood of September elm is hard, close grained, and very strong and can be polished to a high luster. It is one of four species included as "rock elm" in commercial lumbering (16). This group has a specific gravity of 0.57 to 0.63 and moisture contents of 44 and 57 percent for the heartwood and sapwood, respectively. Elm wood also has excellent bending qualities.

Genetics

Little information is available on genetic characteristics of September elm. Santamour (7) reported that the chromosome number of September elm was diploid ($2n=28$) and he later (8) used this characteristic to advantage in making crosses of Chinese elm (*Ulmus parvifolia*) and September elm with nine spring flowering species. Fourteen hybrids were developed from these interspecific crossings, four of which were from *U. serotina*. Later crosses of September elm with Siberian elm (*U. pumila*) showed that the hybrids were very susceptible to Dutch elm disease (9).

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