

# *Morus rubra* L. Red Mulberry

Moraceae Mulberry family

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Red mulberry (*Morus rubra*), called moral in Spanish, is widespread in Eastern United States. It is a rapid-growing tree of valleys, flood plains, and low moist hillsides. This species attains its largest size in the Ohio River Valley and reaches its highest elevation (600 m or 2,000 ft) in the southern Appalachian foothills. The wood is of little commercial importance. The tree's value is derived from its abundant fruits, which are eaten by people, birds, and small mammals.

## Habitat

### Native Range

Red mulberry (fig. 1) extends from Massachusetts and southern Vermont west through the southern half of New York to extreme southern Ontario, southern Michigan, central Wisconsin and southeastern Minnesota; south to Iowa, southeastern Nebraska, central Kansas, western Oklahoma and central Texas; and east to southern Florida. It is also found in Bermuda.

### Climate

Red mulberry grows under a variety of conditions. The frost-free period ranges from 150 days in New England to 330 days in southern Florida. Total annual precipitation ranges from 1000 to 2000 mm (40 to 80 in). Best growth is in moist coves and flood plains in the southern half of its natural range. Mean annual snowfall ranges from zero in Florida to 150 cm (60 in) in New York.

### Soils and Topography

Red mulberry grows on a variety of moist soils at elevations below 600 m (2,000 ft). Soil orders on which red mulberry is found include Alfisols, Inceptisols, Spodosols, and Ultisols. Seeds are carried great distances by birds so trees may be found on any soil that is not too dry. Best development is on well-drained, moist soils of sheltered coves along streams (7).

### Associated Forest Cover

Associated species include sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), silver maple (*Acer saccharinum*), and sweetgum (*Liquidambar styraciflua*) in the southern parts of its range. Toward the north red mulberry is associated with American elm, red maple (*Acer rubrum*), boxelder (*Acer negundo*), and white ash (*Fraxinus americana*). It is a secondary species in succession and is seldom associated with primary invaders (2). Red mulberry is listed as a minor component in three bottom-land cover types (3): Cottonwood (Society of American Foresters Type 63), Sweetgum–Yellow-Poplar (Type 87), and Sugarberry–American Elm–Green Ash (Type 93). Associated understory species are roughleaf dogwood (*Cornus drummondii*), flowering dogwood (*C. florida*), swamp-privet (*Forestiera acuminata*), Nuttall oak (*Quercus nuttallii*), hawthorn (*Crataegus* spp.), and possumhaw (*Ilex decidua*). Herbaceous vegetation associated with red mulberry includes pokeweed (*Phytolacca americana*), stinging nettle (*Urtica dioica*), poison-ivy (*Toxicodendron radicans*), and greenbrier (*Smilax* spp.).

In the southern part of the range, red mulberry is often found in pastures and along borders of fields.

## Life History

### Reproduction and Early Growth

**Flowering and Fruiting**—Red mulberry is dioecious but can be monoecious, with male and female flowers on different branches of the same plants. Both male and female flowers are stalked axillary pendulous catkins and appear in April and May. The blackberry-like fruit reaches full development from June to August. Each fruit is composed of many small drupelets which develop from separate female flowers ripening together (8).

**Seed Production and Dissemination**—Minimum seed-bearing age is usually about 10 years, but 1-year-old trees planted in an abandoned field in east Texas produced fruits at age 4 (3). Optimum seed-bearing age is 30 to 85 years; the maximum is 125 years. Good seed crops occur every 2 to 3 years (2). The average number of red mulberry fruits per kilogram is about 8,600 (3,900/lb); the average number of cleaned seeds per kilogram is 795,000

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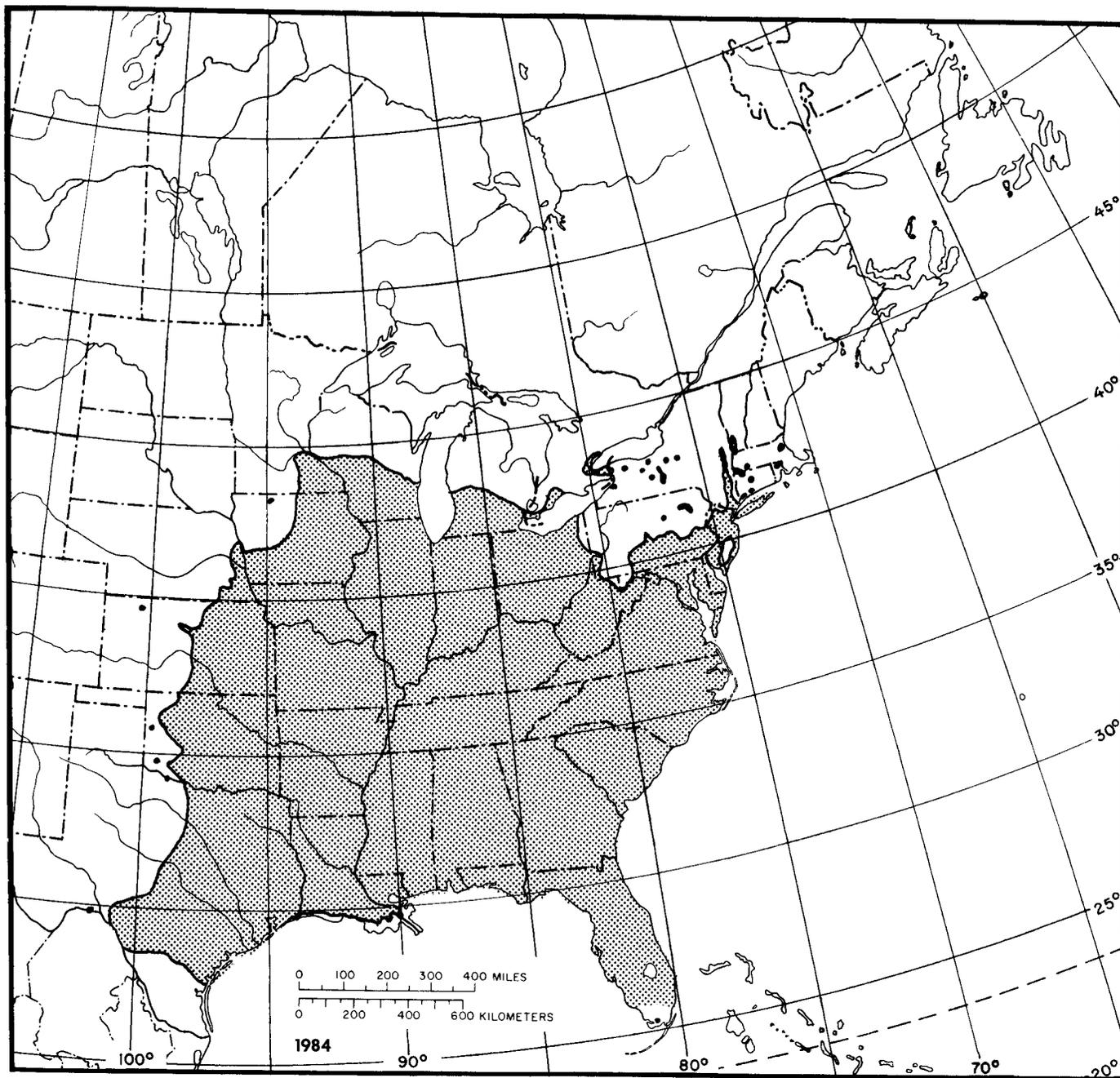


Figure 1—The native range of red mulberry.

(360,000/lb). One hundred kilograms (220 lb) of fresh fruit yield 2 to 3 kg (4 to 7 lb) of cleaned seeds (8).

Fruits that mature fall to the ground near the seed tree. However, because this relatively large, sweet fruit is a favorite food of most birds and some small

animals, most of the fruits are eaten and dispersed by wildlife before they fully mature (6).

**Seedling Development**—Seeds can be extracted from fresh fruits by mashing and soaking them in

water, and then passing them through a macerator, where pulp and empty seeds are skimmed or floated off. Storage temperatures of  $-23^{\circ}$  to  $-18^{\circ}$  C ( $-10^{\circ}$  to  $0^{\circ}$  F) are recommended for dry mulberry seeds (8).

Seeds can be sown in fall without stratification or in spring following 30 to 90 days of stratification at  $1^{\circ}$  to  $5^{\circ}$  C ( $33^{\circ}$  to  $41^{\circ}$  F) in moist sand. In nursery practice, seeds are sown in drills at the rate of 160 to 260/m (50 to 80/ft) in rows 20 to 30 cm (8 to 12 in) apart. Germination, which is epigeal, usually is from 12 to 50 percent. One-year bare-rooted seedlings may be outplanted (8).

**Vegetative Reproduction**—Red mulberry can be propagated from stem cuttings or by budding, but these methods are complex and require greenhouse facilities. The average rooting from stem cuttings taken in May, September, and January was only 7 percent, regardless of time of year (2). Red mulberry is a prolific root sprouter and can be reproduced by layering.

#### Sapling and Pole Stages to Maturity

**Growth and Yield**—Red mulberry (fig. 2) is usually found as scattered individuals near streams or in other moist places. Stands of any size are not mentioned in the literature. Very little is known about the growth and development of this species. At maturity, red mulberry trees are an average of 5 to 21 m (15 to 70 ft) tall and as large as 76 m (30 in) in d.b.h., depending upon habitat conditions. In wooded areas, red mulberry is often an understory tree with a rounded, spreading crown.

**Rooting Habit**—No information available.



Figure 2—Open-grown red mulberry that has been browsed by cattle.

**Reaction to Competition**—Red mulberry has been planted in the Midwest because its fruits are a valuable food for wildlife, but because it provides very little soil stability or cover for wildlife, it has not been planted widely (8). It grows best in open conditions (3) but is classed as tolerant of shade as it often grows as an understory tree.

**Damaging Agents**—Red mulberry seems to be vanishing from at least a portion of its central range, possibly due to a bacterial disease. The effects and extent of this disease have not been investigated thoroughly, but it is known that red mulberry trees are becoming increasingly scarce (2). The only noteworthy leaf pathogens of red mulberry reported in the United States are leaf spots caused by a species of *Cercospora*, *Mycosphaerella mori*, and *Pseudomonas mori* (4). Red mulberry also is susceptible to witches' broom, *Microstroma juglandis*, but the cause is unknown.

A variety of insects feed on red mulberry leaves, including the European fruit lecanium, *Parthenolecanium corni*; Comstock mealybug, *Pseudococcus comstocki*; and cottony maple scale, *Pulvinaria innumerabilis*. The American plum borer, *Euzophera semifuneralis*, and the mulberry borer, *Dorascema wildii*, attack twigs and stems of red mulberry (5).

Red mulberry has been rated as moderately tolerant of flooding as it usually withstands being inundated with up to a foot of water for a single growing season. It normally succumbs, however, after being flooded for two growing seasons (1).

#### Special Uses

The highest use of red mulberry is for its large, sweet fruits. These are a favored food of most birds and a number of small mammals including opossum, raccoon, fox squirrels, and gray squirrels. The fruits also are used in jellies, jams, pies, and drinks. In the past, the fruits were valued for fattening hogs and as poultry food.

Red mulberry is used locally for fenceposts because the heartwood is relatively durable. Other uses of the wood include farm implements, cooperage, furniture, interior finish, and caskets (7).

#### Genetics

Red mulberry hybridizes frequently with white mulberry (*Morus alba*), a native of China which has become naturalized throughout parts of the Eastern United States.

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