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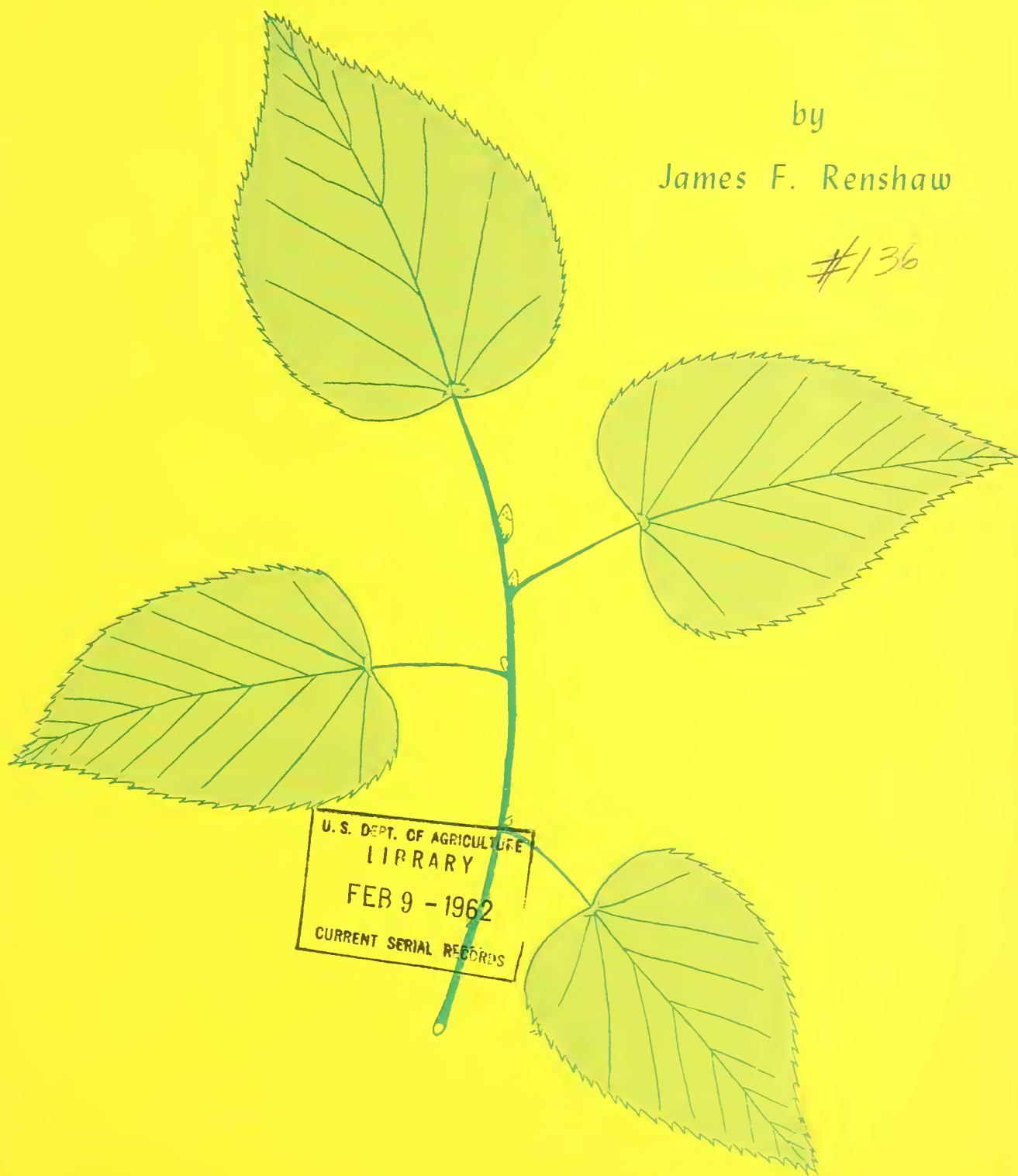
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Silvical Characteristics of White Basswood

by

James F. Renshaw

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³ X Silvical Characteristics of White Basswood

(Tilia heterophylla, Vent.)¹

by
James F. Renshaw²

White basswood, Tilia heterophylla, Vent., is also called beetreelinden, and sometimes wahoo (11). The species name indicates that its leaves take various forms, and as a result identification is difficult (6). In practice, white basswood is cut and mixed with other species of basswood, thus losing its identity in the lumber trade.

RANGE

White basswood is found from southern New York south along the Appalachian Mountains to Alabama, west to southern Indiana, and east of the mountains along the upper Piedmont Plateau in the Carolinas and Georgia to Jackson County, Florida (8) (fig. 1). It reaches its largest size in the Appalachian Mountain region where it is a characteristic tree in the overstory (3). It is much more common, however, in the mixed mesophytic forests of the Cumberlands, ranking next to sugar maple (Acer saccharum) in frequency of occurrence (3).

HABITAT CONDITIONS

CLIMATIC

White basswood occurs over a broad range of climatic conditions. Temperature extremes vary from almost frost-free winters in northwest Florida to the moderately severe winters of northern Pennsylvania and southern New York. Rainfall also varies widely, ranging from more than 80 inches for limited areas in the Southern Appalachians (14) to a low of about 30 inches. For its best development, however, the species requires abundant rainfall during the growing season. It will withstand short periods of zero weather in the winter and 100-degree weather in the summer.

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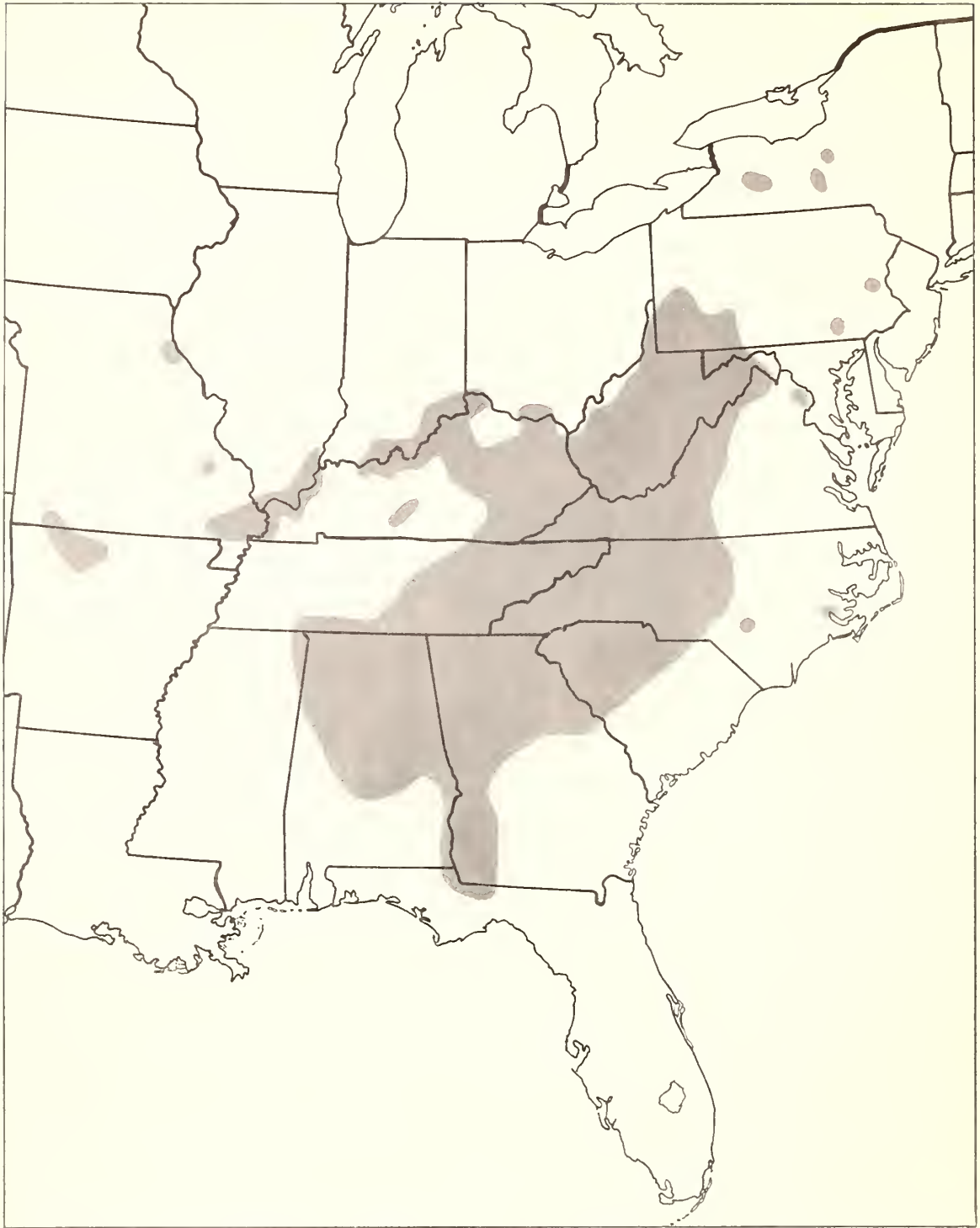


Figure 1. -- Botanical range of white basswood.

EDAPHIC

Quite particular in its soil and moisture requirements, white basswood cannot tolerate very wet or very dry conditions, and is almost always found on moist but well-drained soils. Ideal growing conditions are found along mountain streams or in mountain coves where the soils have either an alluvial or colluvial origin. These soils are deep and friable and contain considerable humus (3).

PHYSIOGRAPHIC

The species occurs within a wide range of altitudinal limits, and although rare at very low elevations (6), it is occasionally found in the coastal plain. It becomes more common in the upper Piedmont near the mountains, but is most common in the Appalachian Mountains at elevations between 3,000 and 5,000 feet, where it is usually found on north and east exposures. Ample moisture and adequate drainage are the principal controlling factors in its occurrence--as is the case with yellow-poplar.

BIOTIC

Although basswood is listed as a component of 16 of the 106 cover types listed for North America (13), white basswood is found in only half of them. It is a major species in only one of these types, northern red oak-basswood-white ash. In the northern part of its range it occurs with northern red oak (Quercus rubra), white ash (Fraxinus americana), black cherry (Prunus serotina), white oak (Quercus alba), sweet birch (Betula lenta), butternut (Juglans cinerea), American elm (Ulmus americana), and eastern hemlock (Tsuga canadensis); farther south in the Appalachians it is more commonly found with yellow buckeye (Aesculus octandra), yellow birch (Betula alleghaniensis), sweet birch, sugar maple (Acer saccharum), black cherry, and yellow-poplar (Liriodendron tulipifera).

Baker (1) classes all basswood as tolerant. No variations between species are noted. Braun (3) lists white basswood as a major species in the climax mesophytic forests.

LIFE HISTORY

SEEDING HABITS

White basswood flowers in early summer (12). Bees, attracted by its high degree of fragrance, make a very choice honey from its large quantities of nectar. The fruits are nut-like, $\frac{1}{4}$ - to $\frac{3}{8}$ - inch in diameter. Each cluster of a half dozen or so seeds is furnished with a special seed-leaf (10); this leaf serves as a parachute and retards descent so that the wind has an opportunity to carry the seeds some distance before they strike the ground. Little information exists about the flowering and fruiting of this species, but is con-

sidered similar to American basswood (Tilia americana), which flowers in June and July and ripens in September and October, with seedfall the following winter and spring (15).

As with most tree seeds, natural germination is best on mineral soil. No specific information is available for this species. In general, basswood seeds may remain dormant for several years (15).

VEGETATIVE REPRODUCTION

White basswood sprouts vigorously and is commonly found growing in clumps of from three to six or more stems. Although clump growth and development is quite good, the trees are frequently very defective and quite susceptible to sleet or wind damage. Sprout stands are therefore less desirable than those of seedling origin.

GROWTH AND MATURITY

Mature white basswood grows to a height of more than 90 feet, and to a diameter of more than 3 feet (4). The bole is typically free of branches and is relatively cylindrical in shape. According to Campbell (5), the basswoods are intermediate in their growth rate when compared with other Southern Appalachian species, growing faster than most of the oaks and maples, but considerably slower than yellow-poplar or northern red oak. He shows that it reaches economic maturity for sawtimber at 17 to 24 inches d.b.h., the size depending on the vigor class of the tree.

Principal enemies. --White basswood is relatively free of serious diseases, although it is attacked by cankers, rots, stains, leaf spots, and wilt. Discolorations of the wood are common following wounding of any type, but are not considered serious unless decay enters before the wound heals over. Decay fungi attacking white basswood include species of Daedalea, Fomes, Hydnum, and Pholiota (2). Basswoods of stump-sprout origin or seedlings that have been wounded are likely to become highly defective; often the main bole of such trees will be almost entirely hollow (9).

Cankers caused by Nectria galligena are common on basswood but are not considered serious. Leaf spots are common but do not cause excessive damage. The common leaf spots are caused by species of Cercospora, Phyllosticta, and Gloeosporium. Wilt caused by a species of Verticillium is known to occur on white basswood but so far has been of no consequence in forest stands (16).

White basswood is also comparatively free of serious insect enemies (7). It is host, however, to many defoliators, several borers, aphids, and gall midges. Common defoliators include the basswood leaf roller (Pantographa limata), the snow-white linden moth (elm spanworm) (Ennomos subsignarius), the linden looper (Erannis tiliaria), the white-marked tussock moth (Hemerocampa leucostigma), the variable oak leaf caterpillar (Hetero-

campa manteo), a leaf miner (Baliosus ruber), and the linden leaf beetle (Calligrapha scalaris).

Important borers include the linden borer (Saperda vestita), which attacks in the cambium area, and a flat headed borer (Chalcophora campestris), which enters the wood at wounds.

As in yellow-poplar, the tender, tasty twigs and smaller branches of basswood are eagerly browsed by livestock and white-tailed deer (Odocoileus virginianus).

Because of its thin bark, basswood is very susceptible to fire damage, especially at seedling and sapling size (fig. 2). Consequently, butt rot is very common and serious in burned stands. Basswood (Tilia spp.) had the highest cull percent in all diameters of any species studied by Hepting and Hedgcock (9).

SPECIAL FEATURES

Because of its soft texture, light weight, and dimensional stability basswood lumber (including Tilia heterophylla) is a choice wood. In addition to lumber uses, it is highly desired for veneer, slack cooperage, and excelsior.

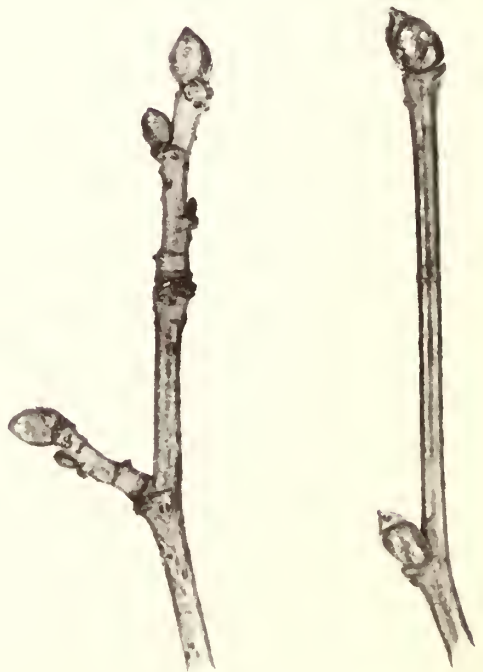
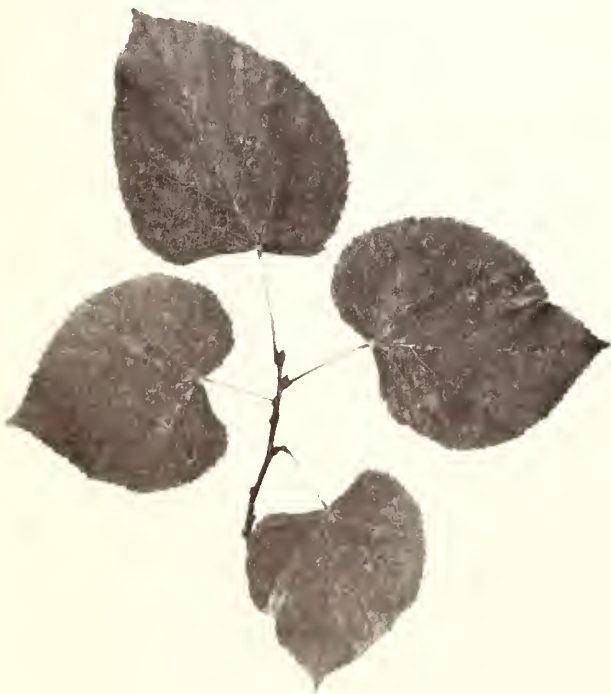
RACES AND HYBRIDS

Harrar and Harrar (8) list 16 species of basswood, all of tree size. Many of the species are small trees and some are very local in occurrence. One species, Michaux basswood (Tilia michauxii), is very similar to white basswood and some think it is a variety. Sargent (12) considers Michaux basswood to be more important than white basswood.

Little (11) tentatively accepts four species only, including white basswood, and distinguishes no varieties. He states that much field and experimental study is needed to correctly establish the species of Tilia.



Figure 2. -- Typical bark, leaves and twig, and buds of white basswood.



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