IDENTIFICATION KEY *(DRAFT May 2007)*

Not all characteristics are listed, only those that are the most obvious and differentiate between American and Chinese chestnut trees. They, and their hybrids, are the most common. Today, the proverbial "spreading chestnut tree" is probably a Chinese chestnut.

APPEARANCE variable, even within species; small bush to large tree, single or multiple trunk(s).

Tall; single-trunk; medium-to-large ..... ***American or European***
Single trunk, often bent over, or clump of trunks; very dark, rough bark ..... ***American***
Multiple trunks; medium-to-large; branching low; spreading crown..... ***Chinese or Japanese***
Multiple large trunks or single, massive branching trunk; spreading crown ..... ***Chinese***
Small sometimes bush-like; single or multiple trunk(s) ..... ***chinkapin***

LEAVES alternate on twigs, simple, 4 to 8 inches long, 1 to 3 inches wide, oblong-lance-shaped, pinnately veined, coarsely serrate, each principal vein ending in a single tooth that tipped with a bristle or hair.

Leaves long, oblong-lance-shaped, tapered to stem, pointed at tip ..... ***American***
Leaves oval shaped, rounded at stem, shiny on top, lighter on bottom, leathery .... ***Chinese***
Teeth prominent and hooked (look like a good wave to surf) ..... ***American***
Teeth triangular or somewhat rounded, with bristle at their tips..... ***Chinese***
Underside of leaf is much lighter than topside; fuzz may be visible..... ***Chinese or chinkapin***

FLOWERS appear as cream-colored catkins, mainly near ends of branches, from late May to early July. These are male, pollen-producing flowers. Female flowers, which develop into the fruit (called a "bur"), are on some of the shorter catkins, near the stems.

FRUIT is a rounded, edible nut in a bur covered with long, needle-sharp spines. Burs open in late September or early October. Chestnut trees do not self-pollinate; therefore isolated trees may produce many shriveled, undeveloped nuts.

Only one pea-sized nut, in each bur; small burs open into halves ..... ***chinkapin***
3-5 nuts in each bur; nuts about one-half inch in diameter; pointed and hairy ..... ***American***
Nuts an inch or more in diameter..... ***Chinese, Japanese, or European***

TWIGS tend to be thinnest on American chestnut.

Color brown and/or red, lenticels barely raised ..... ***American***
Color light green and/or tan, lenticels raised (feel rough when rubbed), downy ..... ***Chinese***
Buds pointed ..... ***American***
Buds round and fat..... ***Chinese***
Stipules thin and wiry, present only at immature or newly mature leaves..... ***American***
Stipules wide, triangular, light green, persist into fall..... ***Chinese***

BARK on unblighted trees is shallowly furrowed, with broad flat ridges. On trees with diameters less than a few inches, it is smooth and greenish to chocolate brown in color.

Dark brown (almost black) with rough, fibrous burl-like lumpiness..... ***American***

HABITAT varies as Asian and European chestnuts have been planted for over 100 years. American chestnuts tend to prefer acid, well-drained soils.

Growing naturally in the woods..... ***American***
Planted in a yard or along a driveway..... ***Chinese or Japanese***

LEAF HAIRS on the underside of leaves can be seen with a 100x microscope. Once you know what they look like, you can spot them with a 10x or 20x magnifying glass. Glandular hairs tend to be yellow or tan, simple hairs are clear or milky. **American** leaves have mushroom-shaped, stalked four-celled glandular hairs on their surface and sparsely scattered long, thin simple hairs on their midribs. **Chinese** leaves are covered with star-shaped ("stellar") simple hairs (that look like a carpet of sea urchins) and have many long simple hairs on their veins. Japanese leaves can have dense mats of stellar hairs, but also have stalked glandular hairs. **European** leaves have both stalked glandular and stellar simple hairs, with long hairs on veins. **Chinkapins** have a dense carpet of branched simple hairs all over the underside.

SOME USEFUL WEB SITES AND PAGES FOR IDENTIFICATION RESOURCES

www.acf.org Click on "Find a Tree?" at left
www.acf.org/field_guide.htm Click on "Resources" on the main TACF page. This is one of the several resource links that are useful.
www.acffarms.org Click on "list of files" and other links. Check out files on leaf hairs.
www.ppws.vt.edu/griffin/accf.html Click on "The Genus Castanea" (and other links) at the bottom of the page.
www.nutgrowing.org Click on "Identifying Chestnut Trees."
chestnut.cas.psu.edu/Procedures/ID.htm Several useful links.

From *Our Trees; How to Know Them* by Emerson and Weed, published in 1908 by J. B. Lippincott Co., reprinted by Garden City Books in 1946.

AMERICAN CHESTNUT

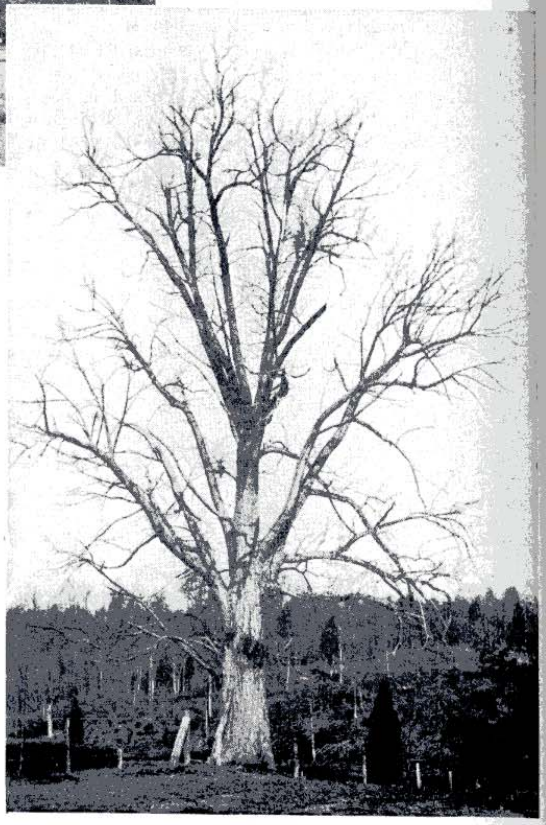
Castanea dentata, (Marshall) Borkhausen

THE American chestnut, which has given joy to so many people, is practically doomed by a disease, but continues sufficiently important to command attention among American trees. Before the chestnut blight gained its present headway, chestnut was found from southern Maine throughout the northern states to the foothills of the southern Appalachian Mountains and west as far as southern Michigan through Indiana to northern Mississippi. Suited to a variety of soils, chestnut attains its greatest size on well drained slopes in western North Carolina and eastern Tennessee. Here trees a hundred feet high with trunks five and six feet in diameter are found, and trees sixty to eighty feet high are not uncommon. The tapering trunk divides into several horizontal or ascending branches to form a broad, somewhat pyramidal head.

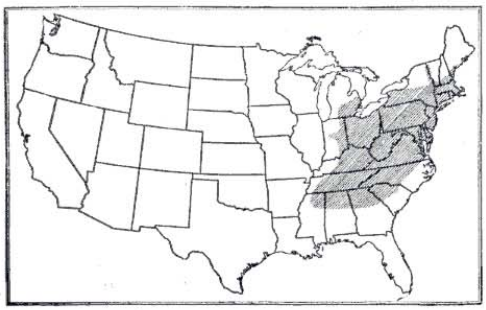
Commonly called American chestnut, and sometimes sweet chestnut because of the nut, the Indians of central New York called it "O-heh-yah-tah," or prickly bur. *Castanea dentata,* the scientific name, includes the Latin name for chestnut and refers to the conspicuous incurved teeth on the margins of the bright green leaves.

The long catkins of male flowers appear during late June and early July. Less conspicuous fruit-bearing flowers develop simultaneously on the new wood of the same trees, and in a few

Open-grown American Chestnut develops a broad, somewhat pyramidal crown, supported on a short thick trunk



The leaves fall in October and November to reveal the tapering trunk and sturdy horizontal or ascending branches



Natural range of American Chestnut in the United States

From *Knowing Your Trees* by Collingwood and Brush, published in 1937 by the American Forestry Association.

weeks prickly green burs appear. These become two to two and one-half inches in diameter by the end of August, and ripen during October and November, when the prickly covering splits open and reveals one to five dark brown sweet-meated nuts within a velvety case.

The dark grayish brown bark of mature trees is one to two inches thick, hard and deeply cleft to form broad flat ridges. That of young trees is smooth, often shining, and of a purplish brown color. It is an important source of tannin for the leather industry.

The buds are bluntly pointed, chestnut brown, alternate on the branches, and are borne singly at the ends of the twigs rather than clustered as with the oaks. The leaves are simple, five to ten inches long, narrow, toothed, and smooth on both sides. A cross-section of a twig reveals a star-shaped pith.

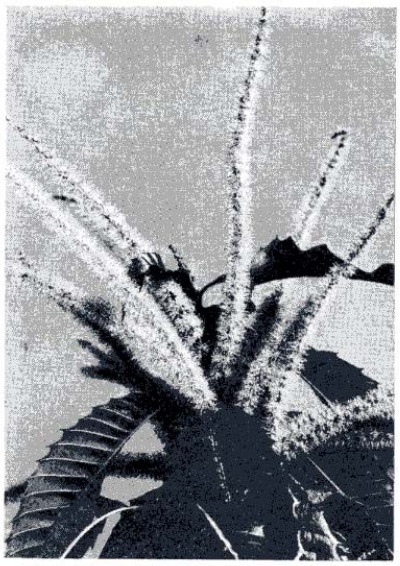
Chestnut reproduces from sprouts as well as from seeds. When cut or killed by fire or blight, chestnut trees sprout vigorously from the stump, which results in groups of two or more trees. In blight infested areas the roots and stump of dead or felled trees annually produce sprouts which live for a year or more before they in turn are struck down by the disease.

The wood is reddish brown with light colored sapwood. Although coarse, light, soft and relatively weak, it is useful for structural purposes, for interior trim, for fence posts, ties, pulpwood and fuel, as well as for furniture, packing cases, and crates. Superficially resembling oak but without prominent medullary rays, a cubic foot air dry weighs only about thirty pounds. Similarly it lacks the strength of oak. The ability of chestnut wood to resist attacks of wood-destroying fungi encourages its wide use for fence posts, fence rails and railway ties.

Had it not been for the chestnut blight this tree would still rank among the more important commercial and horticultural trees of the eastern states. But it has been decimated. In 1946, the total cut of chestnut lumber, most of which was blight-killed, was 63,000,000 board feet. The sweet chestnuts had long been used for food and were a source of income to many farmers, while tannic acid, used for tanning leather, was secured from the wood.

The chestnut blight, a fungus disease imported from Asia before this country had enacted plant quarantine laws, was first recognized in New York City in 1904. Since then it has spread rapidly over New England. New York and along the eastern slopes of the Allegheny Mountains and into the southern Appalachians.

There are other enemies of the chestnut but in comparison with the blight they are all of secondary importance. No adequate method of control has been developed, and in spite of constant search, no strain of blight resistant American chestnut has been discovered.



Massachusetts Horticultural Society

(Upper right) Long catkins of male flowers deck the trees in June and July, nearly two months after the leaves have appeared

(Center right) Before the leaves have fallen in October, the prickly burs have turned brown, and the sweet-meated chestnuts have burst from their velvet-lined case

(Lower right) The gray-brown bark of old trees is deeply fissured to form broad smooth plates

(Lower left) The winter buds are alternate on the twig, bluntly pointed and smooth