

EASTERN COTTONWOOD

Whenever a habitat is disturbed, either by nature or by man, there are some tree species, often called pioneer tree species, which arrive early to colonize this newly disturbed habitat. One of those pioneer tree species is the Eastern Cottonwood (*Populus deltoids* Bartram ex Marshall).

The Eastern Cottonwood is a member of the Willow Family (*Salicaceae*). Its generic name, *Populus*, is from the Latin word, *papelin*, which is “to babble”, referring the sound of the rustling leaves. Its specific epithet, *deltoides*, is Latin for “triangle”, which is from the Greek word, *deltoeides*, which is “delta form”.

Some of the previous scientific names of this tree were *Populus angulata* Aiton, *Populus palmeri* Sargent, and *Populus virginiana* Fougereux de Bondaroy. Other common names for this tree are Aspen Cottonwood, Big Cottonwood, Carolina Poplar, Common Cottonwood, Cottontree, Cottonwood, Eastern Poplar, Necklace Poplar, River Poplar, Southern Cottonwood, Water Poplar, Whitewood, and Yellow Cottonwood.

The Eastern Cottonwood is both a fast growing and a short-lived tree. Its growth may exceed 10 feet in height its first year, about 5 feet in height in each succeeding year, and about 1 inch in diameter per year. Some improved clones in some tree plantations have yielded trees that grew up to 10 feet per year. At 70-80 years of age, the Eastern Cottonwood is considered an old tree and begins to deteriorate. This tree rarely exceeds 125 years of age.

This tree is highly shade intolerant and is susceptible to fire. However, it can tolerate flooding, silting, air pollution, and salt spray.

DESCRIPTION OF THE EASTERN COTTONWOOD

Height: 40-200 feet.

Diameter: 1-8 feet.

Crown: The crown is open, broad, wide spreading, and irregular or symmetrical. Its width is about 40-75 feet.

Its branches are usually stout or thick. These branches are either pointed upright or are slightly drooping downward.

Trunk: Its trunk is long, straight, smooth, and massive. It may sometimes fork into 2 –6 smaller trunks. These trunks hollow easily and provide ideal shelter and nesting habitats for many animal species, such as Virginia Opossums (*Didelphis virginiana* Kerr), Raccoons (*Procyon lotor* L.), and Wood Ducks (*Aix sponsa* L.).

Twigs: Its twigs are stout, smooth, brown, red, gray, or yellow. They have horizontal lenticels, narrow vertical ridges extending downward below the buds, and a 4-angled cross-section. Its pith is white, continuous, and has a star-shaped cross-section. Its leaf scars are large, triangular or 3-lobed, and have 3 bundle scars. The White-tailed Deer (*Odocoileus virginianus* Boddaert) frequently browse upon these twigs.

Buds: Its buds are yellow-brown, hairless, shiny, and gummy or resinous. Its terminal bud is about ½-1 inch long, 3-sided, slender, conical or pointed, and has about 6-7 bud

scales. Its lateral buds are much smaller and diverge from the twig. All of these buds are aromatic when crushed. Bees sometimes collect the buds' resin.

Leaves: Its leaves are simple, alternate, and deciduous. Each leaf is broadly or ovately triangular, smooth, thick, and is about 2-8 inches long and about 2½-5 inches wide. Its top is a smooth shiny green and its bottom is a downy pale green. This leaf also has coarse pinnate veins and a conspicuous yellow midrib.

Its apex is long and pointed and its base is truncated or cordate. Its margin is translucent and has 40-50 coarsely incurved, gland-tipped teeth. Their petioles are about 1½-4 inches long, slender, flattened, reddish tinged, and have 2-5 tiny warty glands at their upper end. This leaf is also aromatic when crushed. In the fall, these leaves turn yellow. The White-tailed Deer frequently eat these leaves.

Flowers: These flowers are dioecious and are wind-pollinated. Its pollen may cause hay fever for some people. Because these flowers are wind-pollinated, they have no calyx or corolla to attract insects. Flowering season is usually February to May, usually before the leaves arrive. This tree can produce flowers when it is as young as 10 years of age.

Male Flowers: The male flowers are fuzzy and are densely arranged on 3-5 inch long, drooping, cylindrical, short-stalked, red or yellow catkins. Each flower has about 30-60 stamens with red anthers.

Female Flowers: The female flowers are red and are loosely arranged on 1-3½ inch long, drooping, cylindrical, short-stalked yellow-green catkins. Each flower has 3-4 fan-shaped stigmas.

Fruit: Its fruit is a capsule. These short-stalked capsules are clustered on 5-10 inch long slender drooping catkins. Each capsule is green or light brown, thin-walled, elliptical or ovate, pointed, and is about ¼-3/8 inch long. A single capsule may contain about 30-60 seeds. In May or June these capsules' 2-4 valves split open to release its numerous tiny seeds.

Seeds: These seeds are white to light brown and have cottony tufts at their bases, which resemble snow. In a single year, a single tree may produce nearly 50 million seeds. There are about 350,000 seeds to the pound.

These seeds will travel by wind or by water to a suitable location for colonization. This suitable location must have bare soil and must have sufficient moisture and sunlight to allow these seeds to germinate. Up to 500,000 seeds may cover a single acre. Although about 90% of these seeds germinate rapidly, only a few of those seedlings will survive.

A few bird species, such as the Eastern Evening Grosbeak (*Hesperiphona vespertina vespertina* Cooper) and the Rose-breasted Grosbeak (*Pheucticus ludovicianus* L.), will eat those seeds.

Bark: The young bark is smooth and yellow-green. The mature bark is thick, rough, light gray or brown, and deeply furrowed with corky, irregular, interlocking, flat-topped ridges.

Wood: This wood has white sapwood and dark brown heartwood, and is of poor quality. It is soft, weak, brittle, close- and even-grained, and non-durable. When cured or seasoned, this wood checks, shrinks, or warps very easily. This wood also has low shock resistance and, when wet, emits a bad odor.

Roots: The roots are shallow, fast growing, and widespread. Unlike other members of this genus, these roots do not send up suckers or sprouts.

If periodic flooding covers the ground with large amounts of fresh silt deposits, sometimes as much as 3 feet, dormant buds located within Eastern Cottonwood's inner bark can grow new adventitious roots into this new silt. The only damage that this tree may receive is some height loss and some chlorosis of the leaves.

Habitat: In the eastern region, this tree is usually found in wet areas, such as bottomlands, floodplains, stream banks, and disturbed wet areas. This tree is capable of pioneering new sandbars, point bars, bare floodplains, and restored wetlands. In the western region, this tree may be found in more upland areas.

Range: The Eastern Cottonwood's range extends throughout most of the Mississippi River watershed and into several adjacent watersheds.

Uses of the Eastern Cottonwood

Despite its poor grade of wood, this tree does have some uses. Because this wood is light, the Native American used it in constructing their lodges and the early European settlers used it in constructing their protective stockades. More recent uses for this wood have been for barrel staves, baskets, boxes, crates, excelsior, fuel, furniture interiors, matches, plywood, poles, posts, pulpwood, shelving, veneer, and woodenware. This wood is able to hold printer's ink but cannot hold nails. Its pulp is especially useful in making highly glossed paper for magazines.

Both the Native Americans and the European settlers had medicinal uses for the Eastern Cottonwood. A tea from its inner bark was used for treating childbirth pains, common colds, heartburn, pertussis, scurvy, and tuberculosis. A decoction from the bark was used for treating intestinal worms. Its bark also contains salicin glucoside, a substance similar to aspirin. The leaves were used as poultice for treating aches, boils, bruises, and sores. The steam from a decoction of the bark, leaves, and stem was used for treating wounds and snakebites. The cottony tufts were used as an absorbent in treating open sores and wounds.

The Eastern Cottonwood also had a few edible uses. Its inner bark, buds, and capsules are all edible. Its buds and cottony tufts were used as chewing gum. Its sap, which contains some sugar, is drinkable. However, unlike the Maple (*Acer* sp.), there isn't enough sugar in the sap to feasibly tap this tree's sap for its syrup or its sugar. Early settlers fed bark, buds, and leaves to their livestock. The leaves from a few *Populus* hybrids that include the Eastern Cottonwood contain as much protein as meat.

The leaf buds were used as dyes by several Native American tribes. Some of their dye colors were red, yellow, purple, and white.

The Eastern Cottonwood has been planted for wind and water erosion control. The tree is used as a windbreak in shelterbelts. The roots are used for controlling soil erosion in waterways.

This tree is also planted as an ornamental, but is not recommended as an urban ornamental. Its roots can clog sewers and drainpipes and are capable of uplifting pavement and sidewalks. Its brittle branches litter lawns. Its numerous cottony seeds amass along fences, curbs, and gutters. Planting the Eastern Cottonwoods as an ornamental is illegal in some municipalities.

Diseases and Insect Pests

There are a few diseases and insects that attack this tree. Some of its diseases include *Cytospora chrysosperma*, a canker disease that causes sunken oval lesions that may enlarge and girdle the trunk or branches; *Dithichiza populea*, another canker disease that elongates to cracked areas on trunks and branches and exposes its brown and diseased wood; and *Melampsora*, a rust that produces spores on the underside of the leaves which eventually defoliates the tree. Some of the insect pests include the Cottonwood Leaf Beetle (*Chrysomela scripta*), which defoliates the tree; the Cottonwood Borer (*Plectrodera scalator*), which bores 6-inch tunnels into the root crowns and the stem bases to weaken the tree's structure; and the Poplar Borer (*Saperda calcarata*), which eats the young bark and leaves black swollen scars on the bark. Other insect pests may include aphids and carpenter ants.

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