

HONEY LOCUST

When we were kids, we probably liked to climb trees. We probably didn't even know the species of those trees. However, one species always stood out as a tree not to climb. That species was the Honey Locust (*Gleditsia triacanthos* L.).

The Honey Locust is a member of the Order *Fabales*, the Cassia or Senna Family (*Caesalpiniaceae*), the Subfamily *Caesalpinioideae*, and the Tribe *Caesalpinieae*. However, some references still list this species as being in the Bean, Pea, or Legume Family (*Fabaceae* or *Leguminosae*).

The generic name, *Gleditsia*, was named after Johann Gottlieb Gleditsch, an 18th Century director of the Berlin Botanical Gardens. The specific epithet, *triacanthos*, is Latin for "3 spines" or "3 thorns". *Tri* is "3" and *acantha* is "spine" or "thorn".

Many other scientific synonyms for this tree are *Acacia americana* Stokes, *A. inermis* Steudel, *A. laevis* Steudel, *A. triacanthos* Gronovius, *Caesalpiniodes triacanthum* (L.) Kuntze, *Gleditsia brachycarpa* (Michaux) Pursh, *G. bujotii* Neumann, *G. elegans* Salisbury, *F. ferox* Desfontaines, *G. flava* Steudel, *G. heterophylla* Rafinesques, *G. horrida* Salisbury, *G. inermis* L., *G. laevis* G. Don, *G. latifolia* Lavalee, *G. latisiliquae* Steudel, *G. meliloba* Walter, *G. microcantha* Steudel, *G. polysperma* Stokes, *G. sinensis* Lamarck, *G. spinosa* Marsh, *G. triacanthus* Miller, and *Melilobus heterophylla* Rafinesque. Other common names for this tree are Black Locust, Common Honey Locust, Confederate Pintree, Honeylocust, Honeyshucks, Squeaky Bean, Sweet Bean, Sweet Locust, Thorny Acacia, Three-thorned Acacia, and Thorny Locust.

DESCRIPTION OF THE HONEY LOCUST

Height: Its full height varies from 30-140 feet.

Diameter: Its trunk diameter varies from 1-6 feet.

Crown: Its crown is open, spreading, broad, rounded, and flat-topped. Its spread is about 25-80 feet.

Trunk: Its trunk is about 6-20 feet tall.

Branches: Its branches droop at their tips. During a windstorm, these branches will easily break.

Twigs: Its twigs are slender or stout, smooth, lustrous, mottled or streaked, and zigzag. The young twigs are green and the older twigs are brown, gray-brown, or red-brown. These twigs also have shield- or u-shaped leaf scars, with each leaf scar having 3 bundle scars.

Buds: This species has no terminal buds. The lateral buds are 1/8 inch, smooth, rounded, gray-green to orange-brown cones. Smaller buds are superposed above them and are hidden within the bark. When the tree is in leaf, these buds are hidden under the leaves' petioles.

Leaves: Its leaves are deciduous, alternate, pinnately or bipinnately compound, and about 4-15 inches long. The leaflets are opposite, sessile, and elliptical or oblong-lanceolate. They have asymmetrical bases, rounded tips with tiny points, and slightly toothed

margins. These leaves are shiny green above and are dull yellow-green below. Their rachis is slightly hairy. Their petioles are grooved and their bases are enlarged.

In the fall, these leaves turn bright yellow and fall off early in the season. After falling, these leaflets decompose rapidly.

The pinnately compound leaves have about 14-36 primary leaflets. Each leaflet is about 1-1½ inches long and about ½ inch wide. There is no terminal primary leaflet.

The bipinnately compound leaves have about 6-14 pinnae with secondary leaflets. Each of these secondary leaflets is about 3/8-¾ inches long and about 1/3 as wide. There is no terminal secondary leaflet.

The foliage of the Honey Locusts casts a light shade. This allows other plants to grow under this tree.

Bark: The young bark is smooth, thin, green to gray-brown, and has horizontal lenticels. The older bark is thick and is purple-gray, gray-brown, dark brown, or black. It is also fissured into vertical furrows and into long, scaly ridges.

Spines: its spines (or thorns) are usually arranged in clusters of 3's. These clusters are located upon the main trunk or at the bases of the branches. However, these spines are arranged singly on 1-year twigs. These spines arise from the wood, not the bark. As the tree ages, there are fewer spines present.

These spines are green when young but later become red to brown or even gray. These spines are stout, sharp-pointed, extend up to 16 inches, and are often branched with 1 main point and 2 side points.

The spines provide protection from both grazing and browsing mammals. These spines probably evolved as protection from the Ice Age Megafauna, during the Pleistocene Epoch of the Quaternary Period and of the Cenozoic Era.

Flowers: Honey Locust trees are either dioecious or monoecious. The flowers are about 3/8 inches wide, bell-shaped, white- or yellow-green, and slightly hairy.

These flowers are arranged in racemous clusters at their leaf bases. The male flowers are arranged in dense, multi-flowered, 2-2½ inch long clusters. The female flowers are arranged in slender, few-flowered, 2½-3½ inch long clusters.

Each flower has a corolla of 5 unequal petals and a tubular calyx of 5 lobes. Its 10 stamens have slender filaments and green anthers. Its only pistil has a single celled ovary, a short style, and terminal dense stigma.

These fragrant flowers are insect-pollinated and produce lots of nectar. Flowering season is usually May to June.

Fruit: Its fruit consists of compressed, flattened, and leathery or slightly hairy pods. They vary in color from green, red- or purple-brown, dark brown, to black. These pods are usually pendulant, curved, and twisted.

Each pod is thick-walled, about 6-18 inches long, about 1-1½ inch wide, and tapers at both ends. These pods are usually arranged in clusters of 2-3.

This tree usually produces a large fruit crop every 2-3 years. Southern trees usually produce more fruit than the northern trees. These pods may remain upon the tree from September to February.

When these pods drop in the fall, they are still unopened. Because these pods do not open by themselves to release their seeds, they must rely upon various species of livestock and wildlife to eat the pods and to spread their seeds. Some of these animals are Horses (*Equus caballus* L.), Cattle (*Bos taurus* L.), Sheep (*Ovis aries* L.), Goats (*Capra*

aegagrus hircus L.), Pigs (*Sus scrofa domestica* L.), White-tailed Deer (*Odocoileus virginianus* Zimmermann), Virginia Opossums (*Didelphis virginiana* Kerr), Eastern Cottontail Rabbits (*Silvilagus floridanus* J.A. Allen), Squirrels (*Sciuridae*), Foxes (*Canidae*), American Crows (*Corvus brachyrhynchos* Brehm), and Northern Bobwhite Quails (*Colinus virginianus* L.)

Seeds: These pods contain about 6-20 seeds and a yellow, brown, or light green, sugary sweet pulp. These seeds are about 1/3 inches long, hard, flat, ovoid, shiny, and dark brown.

Because these seeds have a hard, thick, impermeable seed coat, they must pass through an animal's digestive system before their seed coat can become permeable and the seed can germinate. However, not every animal species' system can digest these seeds.

Wood: Its wood is hard, dense, heavy, strong, stiff, durable, elastic, shock-resistant, and coarse-grained. It is also brittle and is easily polished. The sapwood is bright yellow and the heartwood is light red to bright red-brown.

Roots: Honey Locusts have a deep and a wide spreading fibrous root system, with deep taproots of up to 20 feet. These roots also have root hairs.

This tree can easily sprout from its roots. However, Eastern Cottontail Rabbits and White-tailed Deer will often eat these young sprouts. Unlike other members of this species' family, these roots have no *Rhizobium* nodules for fixing atmospheric nitrogen.

Habitat: Honey Locusts are found in fields, woods, and waste areas. In the early stages of forest succession, they are a pioneer species.

Range: Honey Locusts originated within the Mississippi River valley. However, with the arrival of the European settlers and their land clearings, this species has migrated eastward to the Appalachian Mountains and to southern Ontario.

Medicinal Uses of the Honey Locust

Honey Locust had some medicinal uses. The pods were used as an adjuvant, as an anthelmintic, and as an antiseptic. These pods and the bark were also used for treating indigestion, smallpox, and measles. Infusions from both the bark and the roots were used for treating coughs and colds. The inner bark was used for treating hoarseness and sore throats. The wood contains both fisetin and fuscine, which are both anti-cancer agents and which both inhibit highly carcinogenic aflatoxins. The leaves also have some anti-cancer properties. The leaves and the twigs contain the alkaloids gleditschic acid, which causes stupor and loss of reflex activity, and stenocarpine, which was once used as an anesthetic. Despite their medicinal properties, all parts of this tree may be toxic to humans.

Edible Uses of the Honey Locust

The young, unripe pods, with their sweet, sticky, and aromatic pulp, are edible and contain about 12-42% sugar. The older, ripen pods are bitter, tough, and inedible.

These pods can be consumed raw or cooked. If consumed raw, the pulp may irritate the throat. Before consuming them, these pods should be dried, toasted, ground, and sifted.

In the South, these pods are fermented and are made into beer. The fermented pods can also be made into ethanol, nitrogen-rich fertilizer, and high-protein animal food. Because livestock favor these pods, many farmers have used this tree as a forage crop.

Although livestock and wildlife eat the seeds, they are also edible to humans. The seeds contain about 30% sugar, about 10-24% protein, calcium, and phosphorus. These

seeds can be soaked overnight and subsequently cooked. They can also be ground into flour or roasted as a coffee substitute.

Other Uses of the Honey Locust

Honey Locusts have provided many uses for humans. Both the Native Americans and the European settlers had their own uses.

The sharp young spines were used as pins, nails, spear points, and animal traps. During the Civil War, when the South suffered many shortages, these spines were used to pin their clothing. These spines were also used in carding wool. However, the older spines are too brittle for any practical uses.

The Native Americans used this wood for making their bows, spears, and digging sticks. The European settlers used this wood for fence posts and rails, railroad ties, agricultural implements, general or rough construction, interior trim, cabinets, furniture, pallets, crates, turnery, veneer, and fuel. This tree can be easily coppiced for fuel.

The entire tree has landscape uses. These trees were planted for shade, hedgerows, mine reclamation, and wildlife habitats. During the 1930's, they were extensively used as shelterbelts. Spineless forms or varieties were bred for cultivation. The spineless trees are planted along freeways and streets in major cities, such as Chicago or New York.

Weaknesses of the Honey Locust

This tree is fast growing, short lived (about 125 years), and shade-intolerant. It is highly tolerant of flooding, drought, heat, pollution, compacted soil, and salt. It is not resistant to fire.

The Honey Locust does have a few insect pests. They are resistant to Gypsy Moths (*Lymantria dispar* L.) but not to Mimosa Webworms (*Homadaula anisocentra* Meyric), Spider Mites (*Tetranychus multigituli* Ewing), Honeylocust Podgall Midge (*Dasineura gleditschiae* Osten Sacken), Honeylocust Plantbug (*Diaphnocoris chlorionis* Say), Honeylocust Leadhoppers (*Macropsis fumipennis* Gillette & Baker) and (*Stragania apicalis* Osborn & Ball).

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