

Hornbeam - *Carpinus sp.*

General Information: A handsome tree in many locations, the tree slowly reaches a height and spread of 20 to 30 feet. It will grow with an attractive open habit in total shade, but be dense in full sun. The muscle-like bark is smooth, gray and fluted. Ironwood has a slow growth rate and is reportedly difficult to transplant from a field nursery (although 10-inch-diameter trees were moved with a 90-inch tree spade during the winter in USDA hardiness zone 8b with no problem) but is easy from containers. The fall color is faintly orange to yellow and stands out in the landscape or woods in the fall. Brown leaves occasionally hang on the tree into the winter.

Family: *Betulaceae*

Lighting: Partial shade in summer, otherwise full sun.

Temperature: Fairly cold hardy - zones 3 through 9A.

Watering: Moderate, increasing in summer. Never let the soil dry completely.

Feeding: Feeding instructions vary greatly. Simon and Schuster's Guide recommends feeding Every 20-30 days, stopping for a month-long break in midsummer. The advice to stop feeding in July-August is echoed by the Samsons. Tomlinson is far more aggressive, recommending a weekly feeding for the first month after bud-burst, switching to every two weeks until late summer. Ordinary plant food at half strength is fine, as is bonsai fertilizer. Of course, the whole controversy can be avoided with time-released pellets. Do not feed for two months after repotting. *C. laxiflora* may experience branch die-back if underfed.

Pruning and wiring: Elliptical, heavily veined leaves with pointed tip. Can be wired from spring to autumn - some bark protection may be needed, but the hornbeam is fairly sturdy for a deciduous tree. Accepts repeated pruning, quickly healing scars. Prune back to the first pair of leaves on new shoots. The best times for minor pruning are early spring and after flowering. Major developmental pruning should be done in late winter, before bud burst. Strong apical growth of upper part of tree, so it may be necessary to cut back radically at the apex, but to prune the lower portions of the tree conservatively, especially with the Japanese species, to check its rapid apical growth. Defoliation to reduce leaf size is possible, but will inhibit flowering and fruiting. As it ages branches die, complicating management as a bonsai. As the tree ages, branches may die back for no discernable reason.

Propagation: From seed. Fresh seed in fall is best - sow immediately. Otherwise, seed must be cold treated and planted in late winter. Seed which has been dried may need up to a year to germinate. Murata warns that it is difficult to get viable seed from *C. japonica*, as there is little overlap in flowering time between the male and female flowers. May also be propagated by cuttings and air layering in spring.

Repotting: Every 2-3 years in early spring. Use basic bonsai soil. Prefers a deep pot.

Pests and diseases: Pests: Relatively few insects attack hornbeam. Maple phenacoccus forms white cottony masses on the undersides of the leaves. **Diseases:** None are normally very serious. Several fungi cause leaf spots on Carpinus. Leaf spots are not serious so control measures are usually not needed. Canker, caused by several fungi, causes infected branches to dieback and entire trees die if the trunk is infected and girdled. Severely infected trees can not be saved and infected branches are pruned out. This could limit usefulness in parts of the Deep South.

Some species suitable for bonsai:

- Carpinus betulus: hornbeam, European hornbeam, European ironwood. Can grow to 50 ft., but is usually shorter. It has 4 inch leaves and catkins, and drooping clusters of fruit. Its autumn color is yellow-green, and it has grey bark. Hardy in zones 5-7.
- Carpinus caroliniana (C. americana): American hornbeam, blue beech, water beech - Native to eastern North America. A small - under 20 ft. - tree with a rounded habit and generally prone to multiple trunks. Tolerates both wet soil and shade, but does not like to be transplanted. Nice orange and yellow autumn show. Hardy in zones 3-8.
- Carpinus coreana: Korean hornbeam - Has very twiggy branching and a spectacular fall display with leaves that turn yellow, orange and red, sometimes in bands on the same leaf!
- Carpinus japonica: Japanese hornbeam, Japanese carpinus - nice flowers in spring. Smooth pink-grey bark.
- Carpinus laxiflora: Japanese hornbeam, Japanese loose-flowered hornbeam, Loose-flowered hornbeam - smooth, grey-beige trunk, small, glossy leaves.
- Carpinus tschonoskii: Yedoensis hornbeam, Yeddo hornbeam
Carpinus turkzaninowii: Korean hornbeam, Turkish hornbeam - yet another hornbeam reputed to have a wonderful fall display. Has very small leaves.

Bibliography:

"The Hearst Garden Guide to Trees" by William Thomas (ed.)
 "American Nature Guides: Trees" by Alan Mitchell
 "Bonsai" by Susan M. B. Resnick
 Simon and Schuster Guide
 "The Creative Art of Bonsai," by Isabelle and Remy Samson
 Gordon Owen's "Bonsai Identifier"
 Harry Tomlinson's "Complete Book of Bonsai"
 "Four Seasons of Bonsai," by Kyuzo Murata
 Florida Bonsai XIV:2: pg. 38-50.
 USDA Fact Sheet ST-120

Compiled by Sabrina Caine
 Edited by Thomas L. Zane