

Propagation and Production of *Ilex* species in the Southeastern United States

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Cultivars of *Ilex crenata*, *I. cornuta*, *I. vomitoria*, and *Ilex* hybrids comprise a very significant product group at Flowerwood Nursery Inc. of Mobile, Alabama, U.S.A. Flowerwood Nursery production facilities are located in Florida, Georgia, and Alabama. Consisting of 600 acres of field production and 600 acres of container production, Flowerwood Nursery serves independent garden centers, landscape contractors, and rewholesalers in the Southwest, Deep South, Southeast, and Mid-Atlantic areas of the United States. It is the largest wholesale nursery in the south. Evergreen rhododendrons and evergreen *Ilex* are the two predominant plant groups of that area. Our company produces 40 cultivars of hollies. The major three cultivars are *I. cornuta* 'Dwarf Burford', *I. crenata* 'Compacta' and *I. vomitoria* 'Nana', dwarf Yaupon holly. We will easily produce and sell 300,000 units of each primarily in 7-inch and 11-inch containers. Each cultivar is sold in smaller and larger sizes but in smaller quantities.

ILEX SPECIES

***Ilex vomitoria*.** Commonly called Yaupon holly, *I. vomitoria* is native to our southern United States. Native Americans would drink the tea made from some portion of the plant, probably the leaves or seed and would vomit. I do not know the reason but that habit was common enough to have influenced the naming of the species.

The female has persistent bright red berries that are most ornamental and a few yellow-berried selections also are cultivated. The species is a small multi-trunked tree reaching 15 ft tall and 12 ft wide. However, the most popular forms of Yaupon holly are the dwarf Yaupon hollies, which can grow to be 6 ft tall, and have a mounding, very dense form, with gray-green small foliage, and no berries. Dwarf Yaupon is, as the species, widely adapted to soil pH, and is drought tolerant. In the landscape the shrub is mostly used for foundation plantings and maintained at approximately 3 ft tall. At least two cultivars, 'Schilling's Dwarf' and 'Stokes', are recognized as being widely cultivated, and there is considerable confusion as to which is which. Our cultivar is generally called 'Schilling's Dwarf'.

In 1994 'Bordeaux' dwarf Yaupon holly was introduced by our company. 'Bordeaux' is identical to dwarf Yaupon except the mature foliage is greener and the new foliage is burgundy, as is the winter color. We think we have dramatically improved a very good landscape plant with 'Bordeaux'. It is patented in the United States.

All other cultivars of *I. vomitoria* are typical of the species in form, with various horticultural features. Weeping Yaupon is the most unusual form. There may be more than one pendulous selection but the most recognized cultivar name is 'Folsom's Weeping' Yaupon. The leaves are small and the limbs dramatically sweep downward—a central leader is common. This selection is female. People either like it very much or find the form very unattractive.

'Pride of Houston' is the most widely known upright form. 'Pride of Houston' has a prolific, bright-red berry set and the leaves are bright shiny green and medium sized. 'Kathy Ann' has larger dark green leaves and a heavy berry set. The berries are dark red and large. 'Kathy Ann' is a new selection and our customers are anxious for any inventory that becomes available. 'Kathy Ann' has been well received. It is a selection of Mr. Dan Batson of Perkinston, Mississippi. 'Hightower' is a small grayish leaf cultivar with a strong upright branching habit. 'Hightower' is being grown as a small single-trunked tree. 'Shadow's Female' is a selection from Don Shadow of Winchester, Tennessee. The leaves are large, rounded, dark green, and flat. Cold hardiness is reportedly superior. The shrub appears to be very broad. 'Ocracoke' is a brand new selection from the North Carolina outer bank islands. Selected by Tim Gwaltney of Flowerwood Nursery, 'Ocracoke' appears to be fairly cold hardy and should be salt tolerant, being native to a coastal island. Winter foliage becomes shiny, almost metallic. The summer foliage is a pleasant green.

We have the best propagation success with Yaupon hollies after they have experienced some cold weather in October and November. Cuttings should be newly mature summer and fall growth about 2 to 3 inches long. It is important not to stick the cuttings more than 3/8 inches deep. Yaupon cuttings should be rooted in a very humid and enclosed environment. A high density of cuttings helps create this environment. If the cutting wood is soft, alcohol-based hormones can be harmful.

Ilex cornuta. Known as the Chinese holly, *I. cornuta* and its cultivars generally have lustrous dark green, spiny foliage. The leaves are leathery and can be 3 inches long and 2 inches wide. Some forms are shrubby while others are small trees. Most selections were made from a seed lot imported into the U.S.A. to Avery Island, Louisiana, from China in the early part of this century. Many of the original plants are alive on the plantation today. From less than 1000 seedlings many cultivars arose.

'Dwarf Burford' is the most significant. 'Dwarf Burford' is a dense shrub with a maximum height and width of 15 ft. Commonly, landscape plantings are sheared to 3 to 4 ft. Tolerant to a wide range of soil pH and conditions, 'Dwarf Burford' is a highly sought after shrub, valued for its foliage and form, not its fruit production. We strive to produce a dense bushy plant.

"Dwarf Chinese" or 'Rotunda' holly is another cultivar with a mounding habit. The leaves are bright green and very spiny. Once the most widely sold cultivar of this group, "Dwarf Chinese" in the last 15 years has been replaced by the sport 'Carissa'.

'Carissa' introduced by Wight Nursery of Cairo, Georgia, in the early 1970s is the second most popular Chinese holly. 'Carissa' has dark green foliage with a single spine at the end of a longer-than-wide leaf. The shrub is dense and wider than tall. A 10-year-old plant may be 4 ft tall and 6 ft wide.

'Burfordii' holly has large, 2¾ inches long and 2 inches wide, somewhat, spiny leaves. Mostly used as a multi-trunked, specimen tree, Burford holly has a heavy, profuse, red fruit set. The tree head is round. Other cultivars of note are 'Needle-point', 'McIlhenny', and 'O'Spring', a beautifully variegated cultivar.

Ilex cornuta hollies should be propagated with newly matured or semi-mature wood. Overly matured and immature soft stems root poorly. Wood condition and

nutritional level of stock plants are more critical than timing. Chinese hollies are heavy feeders and respond to high nitrogen levels. Scale insects can be a significant problem to old nursery plants or established plants that are stressed.

***Ilex crenata*.** *Ilex crenata* known as a group as the Japanese hollies, is cold hardier than *I. vomitoria* and *I. cornuta*. Japanese hollies require acidic soil and will not tolerate extended periods of drought. Spider mites love Japanese hollies and can be an economic pest in production or be destructive to landscape plantings. Despite these limitations, the Japanese hollies are staples of gardens in many Southeastern states. The leaves are small, approximately 1/2 inch long and 3/8 inch wide. The shrubs are dense and dark green. Some cultivars can be trimmed to small specimens. The vast majority are mass planted as medium 4 to 5 ft hedges or 2 ft high foundation plants.

Ilex crenata 'Compacta' is the most popular cultivar. There seems to be two forms of cultivar in the trade, one of which has a larger flat leaf and slightly larger overall shrub size compared to the other which is smaller in general, with a slight cup to the leaf.

'Helleri' is the second most popular cultivar. The foliage is small, dark green, and leathery and the shrub will mature to 2 ft tall and is wider than it is tall. 'Helleri' is not tolerant of dry soil or very wet soils. Many nurserymen find 'Helleri' difficult to produce because of heat, therefore supplies are quite often short.

Other cultivars with different horticultural features are:

- 'Greenluster'—similar to 'Helleri' with more cold hardiness
- 'Soft Touch'—mounding, low growing and with soft foliage.
- 'Glory'—cold hardy and similar to 'Compacta'.
- 'Beehive'—very cold hardy, gray-green foliage, and somewhat upright.
- '151'—bright green and upright.
- 'Rocky Creek'—contorted branches.
- 'Hetzii'—cupped leaf and cold hardy.
- 'Chesapeake'—pyramidal, bright green, large with cupped leaves.
- 'Girard's Border Gem'—compact, dark green and very cold hardy.

***Ilex latifolia*.** Luster leaf holly is maybe the largest-leaved evergreen holly. The trees are tall to 30 ft and pyramidal. Female selections are prolific fruit producers with many large clusters of fruit.

***Ilex decidua*.** The possum holly, grows native in alkaline soils in the Southwest, Midwest, and southern United States. A large shrub, up to 20 ft, it grows wild in fence rows and along pasture edges. The fruit is prolifically produced and generally red but will occur as pinks and oranges. A fruited shrub adds beauty on a stark, drab winter day. The fruit is persistent until late winter and will disappear overnight when the birds determine that the fruits are ripe and delicious. Several selections have been made—but not enough. 'Warren's Red', 'Sundance', 'Pocahontas', 'Sentry', and 'Red Cascade' (syn. 'Cascades') are a few cultivars. *Ilex verticillata*, the winterberry holly, is the common eastern U.S.A. deciduous holly. Occurring in acidic soil, this holly reaches heights of 12 ft. The horticultural characteristics are similar to *I. decidua*. This species has been hybridized and many selections for fruit size, color, and persistence and compact form are named. 'Bonfire' and 'Cardinal Red' are two cultivars.

***Ilex cassine*.** The Dahoon holly with orange-red fruit is native to Florida and the Gulf of Mexico coastal area. It is a small tree to 15 ft tall. *Ilex cassine* var. *myrtifolia* is a smaller leaf form and somewhat hardier. Red-, orange-, and yellow-fruited forms are available. This native shrub can be sheared tightly and is attractive in a patio topiary form.

***Ilex opaca*.** The American holly, is widely native to the U.S.A., with many selections. It is evergreen, and the female forms are the most desirable.

***Ilex xaquiperi* 'Brilliant'.** This is a pyramidal and dense shrub. 'Brilliant' is very popular because it has very good cold hardiness, large red prolific fruits, and dark green foliage.

***Ilex glabra* 'Shamrock'.** 'Shamrock' is an inkberry holly cultivar. The species is native to the coastal plains from Texas to Maine. The species has a leggy, open form and is salt tolerant. 'Shamrock' is brighter green and compact. The fruit is black and the juice was once used for ink by early settlers. Other cultivars are 'Nordic' and 'Densifolia'.

***Ilex integra*.** *Ilex integra* is a bushy, tall, upright shrub. It has large glossy leaves and thrives in coastal sandy soil, as well as, dry, alkaline tight soils.

ILEX HYBRIDS

Many evergreen holly hybrids are very beautiful and commercially produced. *Ilex* 'Nellie R. Stevens' is a hybrid of *I. aquifolium* × *I. cornuta*. This very widely used, large evergreen shrub can reach 15 to 25 ft in height. The large, dark green leaves are lustrous with 2 or 3 spines on each side. 'Nellie R. Stevens' is one of the best hollies for our area and has a vigorous growth habit.

Ilex xattenuata is an interspecific hybrid between *I. cassine* and *I. opaca*. Many selections were made by E.E. Foster of Bessemer, Alabama. Only one, 'Foster's Number 2' is commercial. 'Fosterii' can be used as a foundation plant, hedge, or specimen. 'Fosterii' holly has dark green, glossy leaves, and pyramidal growth habit and fruits readily. 'Savannah' is another of that hybrid group. As a small tree, 'Savannah' is semi-deciduous and has bright red fruit. It can obtain heights of 30 ft. 'East Platka' is another discovered near East Platka, Florida. This cultivar is a female form with broad, flat, dark green leaves and few spines. It is popular when grown as a single trunk specimen or as a shrub.

Ilex 'Mary Nell' is a selection of Tom Dodd, Semmes, Alabama. 'Mary Nell' is a cross of *I. latifolia* × (*I. cornuta* × *I. pernyi*). This tall, narrowly pyramidal, evergreen shrub is a female form with dark green, ribbed, spiny leaves. 'Mary Nell' was introduced only 15 years ago and is becoming very popular. Recently, Mr. Dodd released *I.* 'Lib's Favorite'. This cultivar has soft green, shiny foliage and is very vigorous. The fruit set is extremely heavy and the red berries are large.

Ilex xmeserveae, Meserve holly, is an interspecific cross of *I. rugosa* × *I. aquifolium*. It is extremely cold hardy and does not like the southern heat. Several cultivars possess shiny, crinkled, dark glossy green foliage. The early releases, 'Blue Boy' and 'Blue Girl', are all but discarded. However, the later releases, 'Blue Prince', Blue Princess®, and Blue Angel®, are very successful in commerce. More recently, China Boy®, China Girl®, and 'Blue Maid' were introduced; 'China Girl' has proven to be more humidity and heat tolerant than other cultivars.

NEW ILEX HYBRID CULTIVARS

Many new hybrids are near release in the United States. Several open pollinated seedlings of 'Mary Nell' have been evaluated and named by Mitchell McGee of Poplarville, Mississippi. Three of these cultivars exhibit bright red foliage when the plants are actively growing. 'Little Red' is a shrubby selection which will be good for low hedges. 'Cardinal' and 'Robin' are larger in leaf size and growth habit. 'Oakleaf', with medium, dark green foliage shaped like an oak leaf, is an upright shrub. 'Festive' is a very compact small pyramidal shrub. The leaves are very spiny, dark green, and shiny.

Table 1. Liquid hormone rooting solutions for *Ilex* taxa.

IBA 1250 <i>I. crenata</i> 'Beehive' <i>I. crenata</i> 'Compacta' <i>I. crenata</i> 'Border Gem' <i>I. crenata</i> 'Glory' <i>I. crenata</i> 'Greenluster' <i>I. crenata</i> 'Soft Touch'	KIBA 8000 <i>I. xmeserveae</i> Blue Angel® <i>I. xmeserveae</i> 'Blue Prince' <i>I. xmeserveae</i> Blue Princess®	IBA 1875 <i>I. vomitoria</i> 'Weeping Yaupon' <i>I. cassine</i> 'Myrtifolia' <i>I. opaca</i> 'Carolina #2' <i>I. 'Hoogendorn'</i> <i>I. xattenuata</i> 'East Palatka' <i>I. 'Green Leaf'</i> <i>I. crenata</i> '151' <i>I. glabra</i> 'Shamrock' <i>I. crenata</i> 'Rocky Creek' <i>I. xattenuata</i> 'Savannah' <i>I. vomitoria</i> 'Dwarf Yaupon' <i>I. vomitoria</i> 'Bordeaux' <i>I. 'De Worth'</i> <i>I. 'High Tower'</i> <i>I. vomitoria</i> 'Kathy Ann' <i>I. vomitoria</i> 'Pride of Houston'
IBA 6250 + NAA 750 <i>I. cornuta</i> 'Burfordii' <i>I. cornuta</i> 'Dwarf Burford' <i>I. 'Fineline'</i> <i>I. integra</i> <i>I. cornuta</i> 'Rotunda' <i>I. cornuta</i> 'O'Spring' <i>I. 'Wetumpka'</i>	IBA 8750 + NAA 1500 <i>I. opaca</i> 'Croonenburg'	
KIBA 3000 + NAA 750 <i>I. decidua</i> 'Warren's Red' <i>I. latifolia</i>	KIBA 10,000 <i>I. xattenuata</i> 'Fosterii'	
KIBA 3000 <i>I. crenata</i> 'Helleri'	IBA 10,000 + NAA 1500 <i>I. xaquiperi</i> 'Brilliant' <i>I. latifolia</i> <i>I. 'Martha Berry'</i>	
	IBA 8125 + NAA 750 <i>I. cornuta</i> 'Carissa' <i>I. 'Mary Nell'</i> <i>I. cornuta</i> 'Needlepoint'	IBA 8750 + NAA 1500 <i>I. 'Nellie R. Stevens'</i>

PROPAGATION

Ilex species and hybrids are generally easily propagated by cuttings of semi-mature wood. Cuttings are 2 to 3 inches long, and should be treated with a rooting hormone. Table 1 gives specified hormonal concentrations.