

3. *Pieris japonica* 'Daisen'. Selection by K. Wada from Mount Daisen in Japan; flowers deep pink in bud, fading upon opening, leaves are wider and smoother than most; deserves more use.
4. *Pieris japonica* 'Valley Rose'. Introduced by Dr. Robert Ticknor of North Willamette Valley Experiment Station in Oregon; very compact habit, deep pink buds fade when open; delivers what *Pieris japonica* 'Dorothy Wyckoff' promises.
5. *Pieris japonica* 'Variegata'. Slow growing; leaves green edged with cream; new growth green, pink, and cream; very attractive.
6. *Pieris japonica* 'Pygmaea'. A novelty; in growth and form similar to *Rosmarinus officinalis*.
7. *Pieris japonica* 'Christmas Cheer' and *Pieris japonica* 'Valley Valentine', two of the more colorful flowering cultivars.
8. *Pieris japonica* 'Mountain Fire'. Introduced by Dr. Robert Ticknor; superb brilliant red new growth emerges several times a year; excellent.

## PROPAGATION OF SOME RARE TROPICAL PLANTS

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The purpose, objectives and goals of this article are to provide an overview of the propagation, multiplication, and production techniques of some rare and tropical plants grown and utilized in Florida rural and urban landscaping. From several thousand rare, exotic and tropical plants, only a few of the most that are highly utilized for residential as well as for commercial landscaping were selected for discussion.

The opinion, comments, remarks, suggestions or criticisms offered or most encountered problems within this article should be useful to plant propagators and nurserymen throughout southeastern United States. It may bring or provide to the average nurserymen information and practical propagation knowledge of plants used in landscaping in our subtropical parts and provide a guideline in the choice of plants that do well in the warmer regions of the state of Florida.

(1). *Acacia auriculiformis*, Leguminosae. Earleaf acacia is native to Australia. Best adapted to cool, sub-tropical, or warm temperate climates, this medium-sized tree is semi-deciduous

and fast-growing. It does best in slightly dry soil. It is available in many nurseries.

Propagation: This acacia is propagated by seed, germinated in a lathhouse or 30 to 40% shade. A sterile, moderately heavy, sand and peat, or peat-containing medium is preferred. The seed coat should be softened by soaking in warm (75°F) water for 1 to 2 days. Sometimes to hasten germination the seed is scarified or a cut is made through the thick, hard coat. Keep the seed bed moist.

(2). *Arecastrum romanzoffianum* (*Cocos plumosa*) Palmaeae. Queen palm is native to Brazil; it has a tall single trunk, reaching to 50 ft. in height; tree width is from 12 to 15 feet. This specimen tree creates a tropical effect and is used in landscapes or street plantings in central and south Florida. It thrives best in full sun. Three-foot long yellowish spathes appear in summer. The fruits are no more than 1 in. long.

Propagation: The queen palm is propagated by seeds. The seeds should be kept cool until planted. The fresh seeds grow easily in sun or partial shade in well-drained sandy soil. The growth rate is moderate to fast. Recommended germination procedures are similar to those for pigmy date palm. Seeds should be soaked in slightly warm water for 2 or 3 days. A satisfactory medium consists of Florida peat, 40% pinebark or cypress sawdust, and 20% sand. Avoid addition of any kind of fertilizer during germination.

(3). *Bucida buceras*, Combretaceae. Black olive. This semi-deciduous tree reaches 30 ft. or more in height. It is useful planted in groups or parkways or sometimes as a single specimen as it is salt tolerant and wind-resistant, good for south Florida areas. It is usually grown in full sun to give dense evergreen foliage. It is commonly available in south Florida landscape nurseries.

Propagation: Black olive is generally propagated by seeds. It produces small, greenish yellow flowers in the spring, which are borne in spikes. Fruits are curved, oval, about 1/3 in. long. Growth rate is very slow, even in fertile sandy-loam soil. Sometimes propagated by marcottage practices. Terminal softwood cuttings taken during spring when a fresh flush of growth is evident can be propagated under mist using 50% perlite and 50% peat; 30 to 40% shade conditions, where air temperature does not exceed 90°F, are important. In fact, rooting is better at 65 to 75°F. Excess water consistently results in failure to root. The use of Hormodin #3 is helpful.

(4). *Calphyllum inophyllum*, Guttiferae. Beauty leaf, kamani, or alexandrian laurel is native to the shores of the

Indian and western Pacific oceans. It has very fragrant white flowers and is tropical in nature.

Propagation: The green fruits are in pendulous clusters. They have thin leathery skin covers and hard-shelled coats. The seed coat may be softened by soaking in 75°F water, about 3 to 4 times their volume, for 10 to 12 hours. Before planting the seeds in seed bed or flats, a 10-min. soak in fungicide such as Banrot 40% WP ( $\frac{3}{4}$  lb/100 gal. of water) has proven helpful. A moderately heavy but well-drained, moist, well-aerated propagation medium gives good germination. A 30 to 40% shade level, 75 to 85°F air temperature, high humidity, are required. Cover the seed but not too deeply.

(5). *Chrysobalanus icaco*, Chrysobalanaceae. Coco plum in south Florida natural conditions is a small, native, evergreen tree reaching 10 to 15 ft. The dark green, glossy-leaved coco plum grows moderately in a wide variety of soils. It has high salt tolerance and withstands flood conditions. It does not tolerate drought. Coco plum fruit and nuts are edible. It is recommended for south Florida landscape. However, it is not readily available.

Propagation: It is propagated by seeds and softwood cuttings. Long cuttings are made from current season's growth, treated with Hormodin #1 and placed in a propagating frame, using 50% perlite and 50% peat medium; 30 to 40% shade is preferred. Semi-hardwood cuttings may be taken during fall and winter and rooted under mist house conditions. They root in 6 to 8 weeks with high humidity, 60 to 70°F air temperature, and a moist but well-aerated medium. Seeds should be planted in spring in sterile well-drained medium. Scales and some caterpillars may be troublesome. Green tip and red tip coco plums are widely grown in several nurseries.

(6). *Clusia rosea*, Guttiferae. Autograph tree, pitch apple, or pat pork tree, this south Florida native apple-like evergreen tree reaches 25 to 30 ft. in height. It has a moderate growth rate and bears large pink and white flowers. It is preferred mostly because it requires little maintenance and has high salt tolerance. The growth is medium, and it has a value as a flowering tree. Scale can be a problem.

Propagation: It produces 1½ in. apple-like fruits; seed should be planted as soon as ripe. Remove fleshy coat, or soak in water for 1 to 2 days before planting. Use sterilized propagation medium in flats or beds. Peat:sand:soil, 1:1:1 by volume is acceptable and proven satisfactory. Keep soil moist, provide 30% shade, and keep daytime air temperature between 85° and 95°F. The seed should germinate within 30 days. Seedlings

may be transplanted as soon as leaves are well-developed to keep a straight stem habit.

(7). *Coccoloba diversifolia*, Polygonaceae. Pigeon plum is a native Florida tree and is semi-deciduous, slow-growing, reaching heights of 40 ft. It has high salt tolerance and is commonly found on seaside locations.

Propagation: The small purple fruits contain seeds smaller than those of seagrape. They are easy to grow either on a ground bed or in deep flats containing slightly heavy, but well drained, sandy soil.

(8). *Coccoloba uvifera*, Polygonaceae. Seagrape is native to Florida and is a semi-deciduous, slow grower reaching 25 ft. with a spreading growth habit. It has high salt tolerance, and is commonly found on beaches. Most south Florida nurseries grow this plant.

Propagation: The small, grape-like  $\frac{1}{2}$  to  $\frac{3}{4}$  in. fruits should be collected from August to November. Seedlings are grown either in a seed bed or in deep flats containing moderately heavy, but well-drained soil. Some growers have success propagating by cuttings and by air-layering. The seed coat of mature seeds is easy to peel off; no other special treatment is required. Seeds should be planted before drying out. Seeds must be covered to a depth equal to the size of the seeds. Ants can be a problem during germination. Apparently seeds contain a sugar source. Other problems include scales, rust, and caterpillars. Sometimes twig pith borers and leaf spot problems also appear.

(9.) *Cocculus laurifolius*, Menispermaceae. Snail seed is native to the Himalayan region and is found and grown in Florida. It forms a small tree or shrub with evergreen foliage and a weeping habit of growth. It does not tolerate salt or too much wind.

Propagation: The standard method of leaf-bud cuttings under intermittent mist in the spring is preferred. Cuttings from young shoots can be rooted in the greenhouse or other propagating structure in 40% perlite, 40% peat, and 20% sand medium. The cuttings should be taken in the spring from mature shoots and should consist of a leaf blade plus a short piece of the stem with the axillary bud. Scales can be troublesome.

(10). *Conocarpus erectus*, Combretaceae. Button mangrove. Buttonwood is commonly known as green buttonwood and *C. erectus* var. *sericeus* is silver buttonwood. It is native to tropical America and West Africa. These button mangroves are attractive, prostrate shrubs or small trees. The silver buttonwood has oval-shaped, glossy leather leaves with a silvery

cast. Both thrive best in a humid tropical climate. They are widely used for ocean-front landscaping in south Florida as they are tolerant of lime soils. Sooty mold is a common problem.

Propagation: The plants have greenish flowers and purplish fruit. Fruits are observed in clusters up to ½ in. in diameter. Propagation is by softwood or semi-hardwood cuttings. Keep the moisture level low. Leaf drop is a common reaction to an improper propagation medium or high temperature.

(11). *Dalbergia sissoo*, Leguminosae. Indian rosewood is a deciduous tree from India and grows to 70 to 80 ft. It thrives best in central and south Florida. This shade tree has semi-deciduous leaves, fragrant, yellowish-white flowers, and 2 to 3 inch papery pods containing 1 to 3 seeds. It has low salt tolerance. Sometimes caterpillars are troublesome.

Propagation: Seeds germinate easily in a light-weight medium, with only minimum watering during germination. Seedlings grow rapidly and do best in full sun after germination. Indian rosewood may also be air-layered. It can be transplanted bare-rooted.

(12). *Manilkara zapota*, (*Achras zapota*). Sapotaceae. Sapidilla is native to south Mexico and central America. The fruiting season is from spring to summer, February to November. The fruits are edible fresh or frozen. Its medicinal and economic values are as a source of latex, a source of chicle, and as an ornamental. Sometimes fruits are used for sherbets and in ice creams and for making sapodilla halwa, a kind of Indian sweet. It is a medium-sized, excellent slow-growing ornamental evergreen tree. It is wind and drought tolerant but moderately salt and cold tolerant and poorly flood tolerant. It is only occasionally found in nurseries. Recommended for planting in south Florida. Grows very well in Florida.

Propagation: The large, brown, sweet-pulped fruits have several flat black seeds. Seed propagation is a common method; grafting is rarely used. The hard-coated seeds must be soaked overnight in warm water (70-75°F).

(13). *Phoenix roebelenii*, Palmae. Pigmy date palm or Roebelin palm is native to China; dwarf palm has a trunk 3 to 4 in. in diameter. Leaves are pinnate, 4 to 6-ft. long. It is used as a potted specimen, in a patio planter box, or for a tropical effect, as its crown is like an umbrella. It grows slowly, needing a slightly acid well-drained fertile soil. It thrives best in full sun or partial shade in Florida. It tolerates light frost but not salt. The pigmy date palms are dioecious, having 10- to 12-inch greenish-yellow flowers in May and June. The ½ inch

fruits are oblong, purplish black. Florida red scale and fungus are common problems.

Propagation: It is mainly propagated by seed. Pigmy date palm seed, like *Aerca* palm seed, germinates easily in about 1 to 3 months in sterilized media of peat:sand 1:1 v:v or peat:vermiculite:sand 1:1:1 v:v:v. Seed treatment with ferbam or ziram is suggested. It is said that fresh-ripened, mature seeds are more likely to germinate. The recently-harvested seeds could be stored for 2 to 3 weeks, but the fleshy coat must be removed, and the seeds should be dried out in a shady area before storage. The scarification process or cutting through the thick or hard seed coat helps to hasten germination. Always keep the flats or seed bed moist and maintain high temperature until germination. For some palms the higher the soil temperature, the higher the rate of germination. The pigmy date palm seeds of common kinds germinate readily if sown in flats of soil and placed in a bottom heat of 80°F.

(14). *Roystonea elata*, Palmae. Florida royal palm is a tropical tree from South Florida thriving best in nearly frostless locations in full sun or partial shade with rich fertile moist sandy loam soil. It is salt tolerant and is sensitive to cold, but has a nice clean, upright habit of growth. It reaches 30 to 50 ft. in overall height. It is readily available. Scales are a common problem.

Propagation: Propagation is by seed. Fruits are black or bluish, berry-like drupes, ½ in. long. Procedures described for propagation of pigmy date palm should be followed to germinate royal palm seeds.

(15). *Scaevola frutescens*, Goodeniaceae. Beach naupaka, scaevola. Native areas known for this plant are the coasts of the Indian and Pacific Oceans. It is grown widely in the warmer parts of Florida. This quick-growing plant bears white, fleshy berries from September to November. It is mainly used for hedges and soil erosion control for coastal areas and for landscaping sandy locations. It is a fast growing evergreen and needs frequent trimming. However, it has good wind resistance capacities. Problems include poor salt tolerance, moderate cold tolerance, and sensitivity to drought. Mites can be troublesome. The plant is a preferred landscape item but is usually not available in the nurseries.

Propagation: *Scaevola* is propagated by seeds or from cuttings. The seed coat may be softened by soaking overnight in tap water. Softwood cuttings in summer may be rooted under lathhouse or 30 to 50% shade conditions. Hormodin 1 is helpful. A light weight propagation medium is important as it is

very subject to root rot. Softwood cuttings usually root in 6 to 8 weeks.

(16). *Swietenia mahagoni*, Meliaceae. Mahogany is known to be native to Florida and the Keys and is cultured in warmer areas of South Florida. It is tall, semi-deciduous, best adapted as a framing shade tree. It is slow-growing but has a high salt tolerance. The Cuban maybeetle, caterpillars, web worm, and scales can be problems. Mahogany is readily available in Florida nurseries.

Propagation: Seeds are borne in brown-gray pods, 4 to 6 in. long, hanging from cords. The seeds mature in winter and germinate easily without soaking. A light weight propagation medium and partial shade are best and should be covered lightly. The major problems are caterpillars and damping-off after the emergence of the seeds.

(17). *Tabebuia argentea*, Bignoniaceae. Gold tree or silver trumpet tree is native to Paraguay. It grows moderately, reaching 20 to 25 ft. in height and 15 to 20 ft. in width in Florida climate. The light-colored bark is cork-like; golden yellow flowers in April are spectacular.

Propagation: Seeds germinate easily and cuttings or air layering can be used. It grows rapidly in a light-weight 50% perlite, 50% peat medium. Thoroughly soak the medium and seeds with captan, Ferbam, or other recommended fungicide for damping-off control.

(18). *Tamarindus indica*, Leguminosae. Tamarind is a large tree native to India. The brown-pulped, date-like pods develop from April to June. They are used for drink, preserves, and chutney. This evergreen tree has a moderate growth rate, but has good wind, salt, and drought tolerance. Cold and flood tolerance are poor. It is recommended for planting in south Florida.

Propagation: Tamarind is mainly propagated by seeds. Air-layering and grafting are also practiced.

(19). *Zamia floridana*, (Coontie) Cycadaceae. This dwarf, herbaceous, palm-like plant, native to central and south Florida, is evergreen and preferred as either a foundation planting or a potted specimen. It is hardy in Florida and is salt tolerant. Coontie has no fragrance but tolerates sandy soils and grows either in sunny or shady locations. However, it is difficult to transplant. It is related to Queen Sago.

Propagation: Cones, containing orange seeds, mature during fall and winter. The seeds are used for propagation; however, germination is very slow, and chances for losing seeds are high. Well-drained porous soil is important. For better

germination remove the seed coats by mechanical means, or soak seeds in concentrated H<sub>2</sub>SO<sub>4</sub> for one hour then wash thoroughly with tap water. This treatment can give 95 to 98% germination. It is also reported that soaking in 1000 ppm GA hastens germination. Occasionally plants are gathered from the woods, the tap roots cut back and replanted. The root pieces are then used for propagation. The roots should be dipped in Daconil to avoid decay. Florida red scales are major pests. It is hard to transplant coontie plants.

### ACKNOWLEDGEMENTS

Special mention needs to be made of certain individuals, namely: Mr. Larry Lavagna, Vice-President, Everglades Sod and Landscaping, Inc. for his approval and assistance; Mrs. Rosemary Berenguer, Executive Secretary; and Miss Ricci Rankine, Secretary, for their typing help, proof reading, and cooperating.

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## PROPAGATION AT GREENBRIAR NURSERIES

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Greenbriar Nurseries was started in 1974 and produces hardy, woody ornamentals on 21 acres in north central Florida. We produce all of our own liners and the procedures used in propagation as well as our costs and method of productivity are described as follows.

We get most of our cuttings from our landscape scheme as well as from our inventory of container material.

The trays we use are approximately 12 in. × 18 in. and we use a 40-cell insert made by Growing Systems. We get approximately 5-yr. use from the tray and 3-yr use from the insert.

Our soil is mixed for us locally and consists of 4 parts native peat, 3 parts composted pine bark, 3 parts Soilite (ex-