

## Pejibaye (Peach Palm) Growing in the Florida Home Landscape<sup>1</sup>

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**Scientific Name:** *Bactris gasipaes*

**Common Names:** pejibaye and peach palm (English), pejivalle, piva, cachipay, bobí, cachipaes, chontaduro (Spanish), popunha (Brazilian)

**Family:** Palmae or Arecaceae

**Related Species:** maraja palm (*Bactris maraja*), tobago cane (*B. guineenses*), and Colombian palm (*B. major*).

**Origin:** Pejibaye in the Amazonian regions of Colombia, Ecuador, Peru, and Brazil but has become naturalized throughout Central America.

**Distribution:** Pejibaye is found throughout the tropical world.

**History:** Pejibaye was introduced into the U.S. in 1920, the Philippines in 1924, and India during the 1970s.

**Importance:** Costa Rica, Venezuela, Ecuador, Colombia, and Brazil grow pejibaye commercially. Cost Rica is the leading exporter of heart of palm.

### Description

#### Tree

Pejibaye is an erect clumping palm, 65 to 100 ft tall, (20- 31 m), with multiple stems (trunks) 4 to 12 inches (10-31 cm) in diameter. Pejibaye suckers freely, thus as one stem dies or is cut off, others replace it. The trunk is generally armed with stiff, black spines in circular rows (there are spineless forms). The crown is spreading.

#### Leaves

The leaves are pinnate, 8 to 12 ft long (2.4-3.7 m) long, with many linear, pointed 2- ft- long (0.6 m), 1 1/4 -inch- wide (3.1-cm) leaflets. Leaf veins are covered with short spines. Leaves are green to dark green.

#### Inflorescence (Flowers)

The inflorescence emerges from leaf axils, is enclosed in a spathe, and is composed of racemes 8 to 12 inches long (20-31 cm). The racemes possess yellowish male and female flowers; terminal flowers

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are all male. Flowers are mostly insect pollinated, and cross pollination among plants improves fruit set.

### **Fruit**

The edible fruit hangs in clusters of 50 to 300 fruit and may weight 25 lbs (11.4 kg). There may be up to 5 clusters of fruit on a plant at a time. The time from flowering to fruit harvest is about 8 to 9 months.

The fruit is a drupe and is yellow to orange to scarlet or brownish, turning purplish when fully ripe. The fruit may be oval or round, 1 to 2 inches in diameter, with a 3-pointed calyx at the stem end. The peel is thin. The pulp may be yellow to light-orange, sweet, dry and mealy, fruit usually contain only 1 black seed enclosed in a thin endocarp. Some fruit are seedless.

### **Heart of Palm**

The central white, soft core of young pejibaye stems is edible. Young suckers 3 to 4 ft high (0.9-1.2 m) high are cut at their bases and the leaves and outer leaf stems are removed until the central core is exposed. The core is then cut loose and harvested for eating.

### **Forms**

There is a wide variation in the degree of spyness along the trunk and leaves. Seedlings range from spineless to very spiny. Other plant characters also vary greatly including bunch size, fruit size, fruit color and starch content.

### **Climate**

Pejibaye grows best in hot, humid, tropical climates with well distributed rainfall but will grow in warm subtropical areas. The ideal average temperatures for growth range from 75 to 84°F (23-29°C). Pejibaye palm has limited cold tolerance with palm shoots killed back to the base after exposure to 25 to 27°F (-3 to -4°C). However, the mat (roots plus regenerative tissue) may survive these temperatures and grow new shoots.

## **Propagation**

Pejibaye may be propagated by seed or suckers. Fruit quality of pejibaye propagated by seed varies widely. Superior plants must be propagated by suckers.

Pejibaye seeds take 60 to 90 days to germinate. Prior to planting thoroughly wash the seed and dip it into a fungicide to seed -rotting fungi. Slightly bury the seed in a well- drained media, cover the container with a plastic bag to increase the relative humidity, and place the container in a warm but shaded location. Well-grown seedlings will be ready for planting out-of-doors after 6 months. Seedlings grow rapidly, and after 21 to 27 months or more the trunk begins to form. Under favorable climatic and cultural conditions the palm has 15 to 25 leaves. Seedling trees may begin to bear fruit after 3 to 4 years.

## **Production**

In cool areas pejibaye may begin fruit production in 10 to 12 years. A clump with 3 to 4 stems (trunks) may produce about 100 lbs (45.4 kg) or more of fruit per trunk per year. Thinning to reduce the amount of fruit may improve development of the remaining fruit in cool subtropical climates. Season of production varies with location.

The amount of heart of palm produced per year depends upon plant vigor and the number of young stems of harvestable size. Usually this will not be more than 1 to 3 a year.

## **Spacing and Pruning**

Pejibaye may be planted as part of the landscape but its clumping growth habit and dangerous spines must be taken into account; therefore this palm should be grown away from areas where people frequently walk or play. The spines from the first 5 to 8 ft (1.5-2.4 m) of trunk may be removed for safety. One pejibaye clump may be utilized for both heart of palm (cutting young palms out) and for fruit from mature suckers.

## Soils

Pejibaye is well-adapted to most well-drained soils but grows best in moderately fertile soils.

## Planting a Pejibaye Palm

Proper planting is one of the most important steps in successfully establishing and growing a strong, productive tree. The first step is to choose a healthy nursery tree. Inspect the tree for insect pests and diseases and inspect the trunk of the tree for wounds and constrictions. Select a healthy tree and water it regularly in preparation for planting in the ground.

### Site Selection

In general, pejibaye palm should be planted in full sun for best growth and fruit production. Select a part of the landscape away from other trees, buildings and structures, and power lines. Pejibaye palm grown for the fruit can become very tall. Pejibaye grown for heart of palm is usually only allowed to grow 6 to 7 feet tall (1.8-2.1 m) (to the top of the youngest leaf). Select the warmest area of the landscape that does not flood (or remain wet) after typical summer rainfall.

### Planting in Sandy Soil

Many areas in Florida have sandy soil. Remove a 3- to 10 -ft diameter (0.9-to 3.1-m) ring of grass sod. Dig a hole 3 to 4 times the diameter and 3 times as deep as the container the pejibaye palm came in. Making a large hole loosens the soil next to the new palm, making it easy for the roots to expand into the adjacent soil. It is not necessary to apply fertilizer, topsoil, or compost to the hole. In fact, placing topsoil or compost in the hole first and then planting on top of it is not desirable. If you wish to add topsoil or compost to the native soil, mix it with the soil excavated from making the hole in no more than a 50-50 ratio.

Backfill the hole with some of the excavated soil. Remove the palm from the container and place it in the hole so that the top of the soil media from the container is level with or slightly above the surrounding soil level. Fill soil in around the tree roots and tamp slightly to remove air pockets.

Immediately water the soil around the palm and palm roots. Staking the palm with a wooden or bamboo stake is optional. However, do not use wire or nylon rope to tie the tree to the stake because they may eventually damage the tree trunk as it grows. Use a cotton or natural fiber string that will degrade slowly.

### Planting in Rockland Soil

Many areas in Miami-Dade County have a very shallow soil, and several inches below the soil surface is a hard, calcareous bedrock. Remove a 3- to 10- ft diameter (0.9- to 3.1- m) ring of grass sod. Make a hole 3 to 4 times the diameter and 3 times as deep as the container the palm tree came in. To dig a hole, use a pick and digging bar to break up the rock or contract with a company that has augering equipment or a backhoe. Plant the tree as described for sandy soils.

### Planting on a Mound

Many areas in Florida are within 7 ft (2.1 m) or so of the water table and experience occasional flooding after heavy rains . To improve plant survival, consider planting the palm tree on a 2- to 3-ft- high by 4- to 10- ft -diameter(0.6-to 0.9-m by 1.2-to3.1- m) diameter mound of native soil. After the mound is made, dig a hole 3 to 4 times the diameter and 3 times as deep as the container the palm tree came in. In areas where the bedrock nearly comes to the surface (rockland soil), follow the recommendations for the previous section. In areas with sandy soil, follow the recommendations from the section on planting in sandy soil.

## Care of Pejibaye Palm Trees in the Home Landscape

A calendar outlining the month-to-month cultural practices for pejibaye is shown in Table 1.

### Fertilizer

Young palm trees should receive 1/4 to 1/2 pound (113 to 226 g) of a mixed fertilizer containing nitrogen (N), phosphate ( $P_2O_5$ ), potash ( $K_2O$ ), and magnesium (Mg) 2 to 3 times during the growing season. As trees mature, the fertilizer rate should

increase to 1 to 2 lbs (0.45 to 0.9 kg) with an application frequency of 2 to 4 times per year. Fertilizer mixtures containing 6-8% nitrogen, 2-4% available phosphoric acid, 6-12% potash and 3-4% magnesium are satisfactory. Fertilizer mixtures with slow-release potash and magnesium are most beneficial.

In acid to neutral-pH soils, micronutrients such as manganese, zinc, and iron may be applied in dry applications to the soil or in a liquid form sprayed onto the leaves. Two to 3 applications should be made per year. Trees growing in high-pH or calcareous soils should receive 2 to 3 foliar applications per year of a micronutrient mix which includes zinc and manganese. Iron deficiency may be corrected by 1 to 2 yearly soil applications of iron sulfate for trees growing in neutral or low-pH soils and 2 to 3 soil drench applications of chelated iron (specifically formulated for calcareous soils) to high-pH soils (pH above 7).

### **Irrigation (Watering)**

Pejibaye palm trees need about 4 to 6 inches (10.2-15.2 cm) of water per month for normal growth and production. Thus about 1 to 1.5 inches (2.5-4 cm) of water should be applied per week from April through October (the warm to hot period during the year) if it does not rain enough, and during warm, dry periods in the late fall and early winter months.

### **Pejibaye Palm Trees and Lawn Care**

Palm trees in the home landscape are susceptible to trunk injury caused by lawn mowers and weed eaters. Maintain a grass-free area 2 to 5 or more feet (0.6-1.5 m) away from the trunk of the palm tree. Never hit the palm tree trunk with lawn mowing equipment and never use a weed eater near the palm tree trunk. Mechanical damage to the trunk of the tree will weaken the tree and, if severe enough, can cause dieback or kill the tree.

Roots of mature palm trees spread beyond the drip-line of the tree canopy and heavy fertilization of the lawn adjacent to the palm trees is not recommended, because it may reduce fruiting and or fruit quality. The use of lawn sprinkler systems on a timer may result in over watering and cause palm

trees to decline. This is because too much water too often applied causes root rot.

### **Mulch**

Mulching pejibaye palm trees in the home landscape helps retain soil moisture, reduces weed problems next to the tree trunk, and improves the soil near the surface. Mulch with a 2- to 6- inch (5-to15-cm) layer of bark, wood chips, or similar mulch material. Keep mulch 8 to 12 inches (20-30 cm) from the trunk.

### **Insect Pests and Diseases**

The trunk of pejibaye is susceptible to attack by *Phytophthora* algae. Leaves may be attacked by *Pestalotiopsis* sp., *Mycosphaerella* sp. and *Colletotrichum* sp. Fruit diseases are caused by *Monilia* sp. and *Ceratocystis* species. Insect pests include the sugar cane weevil (*Metamasius hemipterus*) and mites. Please contact your local County Cooperative Extension Agent for current control recommendations.

### **Pruning**

Pejibaye is a clumping palm. Young palm shoots are harvested for heart of palm (called palmito). None of the shoots of pejibaye palm used for palm heart is allowed to grow past 2 to 3 inches in diameter (measure at the base of the palm). As shoots reach a size suitable for palm heart extraction, they are removed. Usually only 3 to 4 shoots are maintained in a pejibaye clump. Working around pejibaye palm is dangerous, and goggles to protect the eyes, and long and thick leather gloves should be worn.

Pejibaye used for palm fruits is allowed to grow to maturity. Usually only 1 or 2 shoots are allowed to grow to maturity and any new shoots are eliminated.

### **Harvest, Ripening, and Storage**

**Fruit.** Due to the spines, the fruit are usually harvested with long poles equipped with cutters. If possible, a soft landing for the falling fruit should be put in place prior to cutting; this may be composed of loose leaf matter.

**Heart of Palm.** The time from planting to the first harvest for palm heart is usually 18 to 24 months. The procedure to remove a shoot for palmito includes:

1. Select a shoot that is 4 to 5 ft (1.2-1.5 m) tall and 1.2 to 2 inches in diameter (3-5 cm).
2. Use a lopper to carefully remove the leaves back to the main stem (trunk).
3. Use a machete or similar tool to detach the young shoot at the base of the stem (trunk) from the clump.
4. Remove the outer leaf shafts (rachis) to reveal the white, somewhat soft inner palm heart (tissue). Cut into sections for cleaning and storage.

### **Uses and Nutritional Value**

**Fruit.** Pejibaye fruit contain carotene, calcium, phosphorus, and ascorbic acid among other nutrients (Table 2). Fruit should be boiled within 2 to 4 days of harvest. Before consumption, the fruit is boiled in water with added salt for about 1 to 3 hours to eliminate oxalate crystals and a trypsin inhibitor. Then, the peel is removed and the pulp eaten. The flavor varies with the carotenoid content and may be bland to a nutty or strong flavor. The pulp may be dipped in mayonnaise or cheese-dip. Pejibaye pulp may also be mixed with cornmeal, eggs, and milk and fried. Raw fruits may be kept for several weeks in a cool, dry place and cooked fruits may be held in the refrigerator for 5 or 6 days.

**Heart of palm.** The palm heart may be eaten raw or cooked. Chunks of palm heart may be added to green salads or cooked with spices and peppers and served hot.

Table 1. Suggested cultural practices for mature pejibaye palm trees in the Florida home landscape.

| Operation                            | Jan  | Feb | Mar | April                 | May | June                  | July | Aug                   | Sept | Oct                      | Nov | Dec |
|--------------------------------------|--|-----|-----|-----------------------|-----|-----------------------|------|-----------------------|------|--------------------------|-----|-----|
| <b>General<sup>1</sup></b>           |  |     |     | Apply N-P-K-Mg        |     | Apply N-P-K-Mg        |      | Apply N-P-K-Mg        |      | Apply N-P-K-Mg           |     |     |
| <b>Micro-nutrients<sup>2</sup></b>   |  |     |     | Apply micro-nutrients |     | Apply micro-nutrients |      | Apply micro-nutrients |      |                          |     |     |
| <b>Iron applications<sup>3</sup></b> |  |     |     | Apply iron            |     | Apply iron            |      | Apply iron            |      |                          |     |     |
| <b>Watering</b>                      | Water during prolonged dry periods                     |     |     |                       |     |                       |      |                       |      | Water during dry periods |     |     |
| <b>Insect control</b>                | Monitor for insect infestations and treat if necessary |     |     |                       |     |                       |      |                       |      |                          |     |     |
| <b>Disease control</b>               | Monitor for disease symptoms and treat if necessary    |     |     |                       |     |                       |      |                       |      |                          |     |     |

<sup>1</sup> Dry fertilizer mixes which include nitrogen, phosphate, potash, and magnesium. Fertilizers formulated especially for palms growing in south Florida are best (e.g., fertilizers termed palm special with a 8-4-12 ratio).

<sup>2</sup> Micronutrients may be applied to palms growing in neutral or low-pH soils but should be applied to the foliage of palms growing in high-pH, calcareous soils.

<sup>3</sup> Iron sulfate applications may be made to palms growing in neutral or low-pH soils, but for palms growing in high-pH, calcareous soils, iron chelates should be mixed with several gallons of water and applied as a soil drench around the base of the palm tree.

**Table 2.** Nutritional value of pejibaye palm fruit (100 g; 3.5 oz).<sup>z</sup>

| <b>Constituent</b>  | <b>Value</b>    |
|---|-----------------|
| Water   | 25-82%          |
| Protein   | 0.3-0.6 g       |
| Carbohydrate  | 14-85% (dry wt) |
| Fat   | 3-8 g           |
| Fiber   | 0.8-1.4 g       |
| Calcium   | 9-40 mg         |
| Phosphorus  | 34-55 mg        |
| Iron  | 0.9-2.3 mg      |
| Carotene  | 0.3-70.0 mg     |
| Ascorbic acid   | 15-41 mg        |
| <p><sup>z</sup> Morton, J.F. 1987. Fruits of warm climates. J.F. Morton Publ., Miami, Fla. P.12-14 and; Mogeia, J.P. and E.W. M. Verheij. 1991. <i>Bactris gasipaes</i> Kunth. In: Plant Resources of South-East Asia, No. 2: Edible fruits and nuts. E.W.M Verheij and R.E. Coronel, editors. 1991. Pudoc-DLO, Wageningen, the Netherlands. p.100-104.</p> |                 |