

Of the homeowners who reported having open-end type mortgages, only 6 percent had used them to finance the purchase of nursery stock and landscaping services. There appears to be an opportunity for improved landscaping through wider use of such financing methods. Nevertheless, two-thirds of the respondents were aware that home improvement loans which could be used for landscaping were available from banks and lending agencies.

Socioeconomic and Related Characteristics and Landscaping Expenditures

The level of average expenditures for landscape plants, lawn materials and related supplies in Florida was significantly associated with family income, occupation, education and degree of interest in landscaping. In general, average expenditures for landscape plants, lawn materials and related supplies increased with (1) rises in

family income, (2) shifts from unskilled to professional occupations, (3) rises in the amount of education and (4) degree of interest in landscape plants and lawns. The data in Table 8 show the level of such expenditures for homeowners with different levels of family income, levels of education and degrees of interest in landscaping. They serve to provide information on consumer expenditures which should be useful to the nursery and allied industries.

A multiple regression analysis was done in which the factors of family income, occupational class, education, degree of landscaping, age of house, size of lot and others were related to average expenditures for landscape plants, lawn materials and related supplies. The regression results were inconclusive since only 16 percent of the total variation was explained by the variables considered. A large coefficient of variability was associated with a wide range of variation in expenditures.

THE PALM: *BUTIA CAPITATA* X *ARECASTRUM ROMANZOFFIANUM*

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Abstract. *Butia capitata* (Martius) Beccari is a native palm of South America and is hardy as far north as South Carolina. *Arecastrum romanzoffianum* (Chamisso) Beccari, a native of Brazil, is also a pinnate-leaved palm which grows faster, higher, and broader than *B. capitata*, but is less formal in appearance and not as hardy. The cross between these two species displays the best qualities of each and is intermediate in every growth characteristic between the parents. Even though a few plants existed, the hybrid was virtually unknown in Florida prior to 1949.

This natural cross was observed in the seedling beds of the Florida Nursery and Landscape Company of Leesburg, in 1949, undoubtedly due to the tremendous quantity of seeds that had germinated and to the attentiveness of the late Ross Lafler, propagator for the nursery.

The availability of this hybrid will always be

limited since the cross is not readily accomplished; therefore, such hybrids would be relatively expensive. This paper presents the author's observations on this unusual and magnificent palm and offers procedures for its propagation to nurserymen.

The Jelly or Pindo palm *Butia capitata* (Martius) Beccari is a native of South America and is hardy as far north as South Carolina. It is distinguishable by its stiff upright leaflets and gray-green pinnate, mostly arching and recurving leaves. The petiole can be up to 6 feet long and is pined along the margin at its base and finely or coarsely dentate toward the apex. The trunk, up to 2 feet in diameter, is generally covered with persistent leaf bases. Leaf bases usually begin to slough off slowly at the bottom after the palm trunk reaches a height of over 6 feet. Mature specimens may attain a height of 20 feet. Older palms of 10 or more feet of trunk rarely show over 2 to 3 feet of clear wood at the base. The oblong-ovoid fruit is approximately 1 inch long, yellow to red with sweetish, pulpy, fibrous flesh.

The flavor is reminiscent of loquat. Seed germinate in 5 to 10 months, depending on the maturity. The palm is considered slow growing.

The Queen palm, *Arecastrum romanzoffianum* (Chamisso) Beccari, is a native of Brazil and has blue-green, pinnate leaves up to 15 feet long with soft drooping leaflets. The petiole is fibrous at the base margin and smoother at the apex. This palm is considered tender, although many grow in protected areas in Gainesville and Jacksonville. Thousands were killed in Tampa during the 1940 freeze and in Winter Haven and Tampa during the 1962 freeze. The trunk is generally less than 2 feet in diameter, smooth, but ringed up to 25 feet. The inflorescence, about 3 feet long, emerges from the axils of lower leaves. The fruit is approximately 1 inch long, ovoid, yellow, and fleshy with a fibrous exterior. Seeds germinate readily in 2 months or less. The palm grows rapidly when properly maintained.

The hybrid palm *Butia capitata* x *Arecastrum romanzoffianum* is intermediate between the parents in cold hardiness, size, rapidity of growth, and appearance. The trunk is heavy, up to 2 feet in diameter; leaves are more persistent than *Arecastrum*, but less than *Butia*. The margins of the petiole have stiff long fibers at the base and are smoothly dentated at the apex. Leaflets are not as stiff as *Butia*.

The first sprouted palm seeds that appeared to be of hybrid origin occurred in 1949, according to Gervin Pringle, owner of the Florida Nursery and Landscape Company in Leesburg. When the seedlings were a few inches high, it was apparent that about 5% were different. The original seed came from a street planting in Leesburg that was heavily planted in *Arecastrum* and *Butia* palms. Seed was also gathered from other adjacent counties where the two species grew in close proximity. Ross Lafler made hand pollinations by tying the *Arecastrum* inflorescence to that of *Butia*. He placed bee hives under the trees, as well as other methods of producing seed, but was never able to get over 5% hybrids. *Butia* was always used as the maternal plant; no seed taken from an *Arecastrum* developed into a hybrid.

During this period millions of liners and hundreds of pounds of *Butia* and *Arecastrum* seed were germinated yearly by the Florida Nursery and Landscape Company. Most of the hybrids observed by this writer came from this nursery.

The first literature report concerning this putative hybrid was by Barbosa Rodrigues (1903). Beccari (1916) partially described it. Liberty

Hyde Bailey (1936) described a palm growing at the Royal Palm Nurseries in Oneco, Florida, that . . . "probably was *Butia capitata* by *Arecastrum romanzoffianum*. It has never produced fertile seed. It is 15 to 18 years old." Bailey described the trunk as relatively slender. The balance of the description was similar to the hybrid. This palm was growing near the nursery office which was destroyed by fire a number of years ago. The palm also succumbed during the fire.

Professor S. F. Glassman, who previously made a taxonomic revision of the palm genus *Syagrus*, and who had placed both *Butia* and *Arecastrum* under *Syagrus*, described and named the three hybrid palms at Fairchild Tropical Garden *Syagrus* x *fairchildensis* Glassman 1971. These three hybrid palms were donated to Fairchild Garden by Florida Nursery and Landscape Company and planted in Plot 3 in 1959-60.

Following Glassman's publication Eric Golby, Horticulturist and Production Control Manager at Reasoner's Tropical Nurseries, wrote to Professor Glassman: "the late Egbert N. Reasoner who died in 1926 made the first hybrids between the various members of the coccid group in 1906 or 1907. These were palms generally classed as 8 to 10 species of "Cocos" and can be referred to in the 1887 to 1897 issue of the Reasoner Brothers Royal Palm Nurseries' catalogs that may be found in a few large and old horticultural libraries." Mr. Golby suggested the hybrid should be named 'Reasoneri'.

Paul S. Mears of Sarasota pointed out that four hybrid palms were located in the southwest corner of the property, just east of the Royal Palm Nursery. He estimated that they are at least 50 years old. They all appear to be about the same age and could be the oldest in Florida. One of the palms nearest the road has a trunk which measures 13 feet high with 7½ feet of clear wood. The trunk diameter is 12½ inches, measured 4½ feet from the base. The fiber on the basal margins of the petiole appear to be longer on these four palms than on many of the others observed.

Thirty-three fruits were collected from the base of another of the four hybrid palms. Most of the nearly round, orange fruit was small and measured 11/16 inch high x 13/16 inch across. Large fruit measured 14/16 inch high and 15/16 inch in diameter. Seed of large fruit measured from 8/16 to 10/16 inch wide and from 12/16 to 14/16 inch long. Seed of small fruit measured from 6/16 to 8/16 inch wide and from 10/16 to 13/16 inch long. This seed was planted 20 February 1973.

The USDA Plant Introduction Garden in Coco-

nut Grove has several cocoid hybrids. One is *Butia capitata* x *B. ericacantha*, a natural hybrid combining characteristics of both parents. The seed was received 21 June 1932. Other *Butia* hybrids are located near the fence on Old Cutler Road and all resemble *Butia capitata*. All seed from these hybrids was shipped from Leningrad and was produced in the Soviet Union at the Sukhum Subtropic Branch of the All Union Institute of Plant Industry, Sukhum Caucasus. These palms were grown for the fruit which tastes like loquat.

After Glassman published *A New Palm Hybrid from the Fairchild Tropical Garden*, Dr. Frederick C. Boutin of Huntington Botanical Gardens, San Marino, California, wrote "The accompanying photograph will at least attest to the existence of this hybrid. Pictured is plate V of two plates in Ruffo (1920) showing *Arecastrum romanzoffianum* x *Butia* growing in the garden of the Villa Lucia, Castellammare di Stabia, near Naples, Italy. Ruffo reported that this and another plant were planted in the open in 1908 and 1909 and produced viable seedlings (sic) after 1915 and 1916.

"Giorgio Roster, a photographer, reported in 1923 that *Arecastrum romanzoffianum* x *Butia* was being grown in six gardens in Italy and France located as follows: Chauvassaigne (Villa San Louis), Garavan, Mentone; Nabonnand Nursery, Golfe Juan; Garbari, Trento; Villa Ludica, Castellammare di Stabia; Giardino dell'Ottone, Island of Elba; and Roster's own Giardino dell'Ottone, also on the Island of Elba.

"Ruffo indicated that the hybrid plants at the Villa Lucia were acquired before 1908 from the Nabonnand Nursery. These hybrids sold as *Cocos nabonnandii* were most likely produced by Paul Nabonnand, who was known for his breeding of tea roses and *Rosa gigantea* hybrids. Nicolas (1937) reported that "Nabonnand was commissioned by the French government to hybridize and improve coconut, date and ornamental palm trees for the French Colonies . . ."

Some of the finest specimens of hybrid palms are known to exist in a number of locations. O. J. Custead, Regulatory Plant Inspector for the Division of Plant Industry in Plant City, planted one bushel of *Arecastrum* and *Butia* seeds about 1 February 1941. These seeds were collected in a neighbor's yard. One hybrid germinated from the *Arecastrum* seeds, whereas all other seedlings were true to species. This 22-year-old hybrid palm measured 26 feet overall height in May 1973. It had a spread of 25½ feet, with a clear trunk of 11 feet 1 inch, and a clear wood trunk diameter of

15 inches measured at 4½ feet from the ground. Seed from this palm was planted for approximately 12 successive years but with no germination.

The Leesburg Rainbow Garden Nursery on West Main Street purchased hybrid palms from Florida Nursery and Landscape Company about 1957. Seed from these palms was planted yearly for several years also without any germination.

Noel R. Lake, Landscaping and Groundskeeping Superintendent of the University of Florida, reported that six hybrid palms were bought in 1958-59. These palms were planted on the campus: one at the Law Building, two by Little Hall, one behind Tigert, one at Jennings Dorm, and one at McCarty Hall.

In 1968, I purchased three hybrid palms in the Zellwood muck fields of the Florida Nursery and Landscape Company. They were planted as part of the landscaping of the Doyle Conner Building, Division of Plant Industry, Florida Department of Agriculture and Consumer Services.

During the week of January 6-11, 1970, low temperatures of 20-21°F severely damaged leaves of all three palms. One was slow in recuperating. These were young succulent palms, grown in muck with copious amounts of fertilizer. They were planted in Gainesville about 3 or 4 years from germination and were just beginning to develop a trunk.

In 1972, each of these palms bore a minimum of three spadices. One inflorescence was all female, another was all male flowers, and another had male flowers on the first 4 inches at the distal end of each branch of the spadix, and the balance of the branch to the stem were alternately male and female. The spadices and all flowers were light golden in color, similar to *Arecastrum* and *Butia*. A spadix of all female flowers is quickly pollinated, but generally all abort when about 3/8 inch in diameter following fertilization. A spadix of all male flowers aborts quickly. Older trees seldom mature more than 5-15% of their fruits.

Dr. Merrill Wilcox, Agronomist at the University of Florida, has checked the pollen on three inflorescences at the Division of Plant Industry and found that all were sterile. He has distinguished himself, however, by crossing *Butia* with *Arecastrum* resulting in the successful establishment of two seedlings.

Henry Martin, Head Groundskeeper for Florida State University in Tallahassee, bought 15 hybrid palms from Florida Nursery and Landscape Company in 1954. These ranged from 3½ feet to 6 feet high and were planted around the circle

driveway in front of Florida State University on West Call Street. Some suffered cold damage, and one in particular was seriously injured during the 1962-63 freeze when the temperature dropped to about 8°F. One palm was planted on each side of the entrance to the main library. The palm on the right side has about 12½ feet of trunk with a total average height of about 25 feet, the palm on the left side is insignificant in comparison.

Raulerson and Waas (1970) published an enlightening article on Jacksonville palms. Raulerson wrote that Mr. Tipple of Mathonia Avenue in Jacksonville reported to have sprouted one seed from his palm. Two hybrid palms are located on the median strip between the sidewalk and the street on the corner of Avondale Avenue and Oak Street in Jacksonville. It is not known if the landscape contractor who planted a palm in a Holiday Inn landscaping just off the I-75 Ocala exit knew it to be a valuable hybrid.

Paul S. Mears, one of the owners of the well-

known Indian Rocks Nursery of Pinellas County is experienced in growing hybrid palms. At the corner of his home in Sarasota is a hybrid palm that has more characteristics of the *Arecastrum* than *Butia*. It was germinated in 1955. *Arecastrum* could have been the mother plant. The inflorescence was rosy-red in color. Mears had three *Butia* palms and one *Arecastrum* planted in close proximity in 1954. His records show that he germinated about 400 hybrids in the first planting and about 200 in the second planting. He sold these palms as 'Pindo Queen' palms, using the common name of each parent. They all grew fairly fast until they reached 10 to 12 feet. He has several hybrids at his nursery. The most striking are seven hybrids planted as a clump from seed germinated between 1956-68. All have rosy-red flowers. Generally, hybrid palm inflorescences are yellow and similar to *Butia* and *Arecastrum*. I have observed rosy-red inflorescences on an occasional *Butia*, but never on an *Arecastrum*.

Roy Amerson of Terra Ceia has grown a number of hybrid palms from liners purchased from another nursery. A field of *Butia* contained several hybrid palms. The hybrids are more vigorous and easily identified from the *Butia*. Amerson stated that he has had hybrid palms develop from *Arecastrum* seed plantings.

It is the general consensus of those familiar with this hybrid that Florida nurserymen should make every attempt to propagate it. The 5% of anticipated hybrid seed would relegate it to the luxury class of palms. Mature palms with 6 to 7 feet of trunk have been sold in landscape designs for up to \$750 each.

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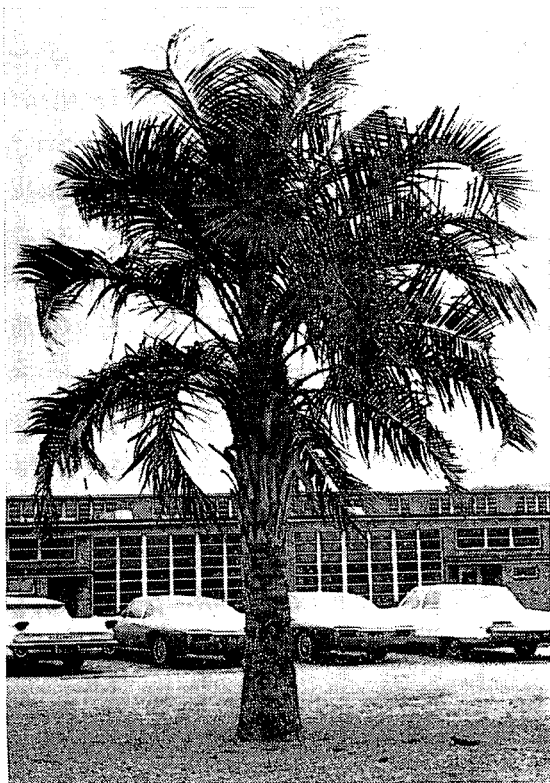


Fig. 1. Hybrid Palm on Call Street, FSU Campus, Tallahassee, Florida.