



# PLANT IMMIGRANTS.

No. 159.

JULY, 1919.

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Foreign Seed and Plant Introduction.

## E X P L A N A T O R Y N O T E .

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,  
*Agricultural Explorer in Charge*

*Office of Foreign Seed and Plant Introduction,  
Bureau of Plant Industry,  
U. S. Department of Agriculture.*

Issued July 28, 1919, Washington, D.C.

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of this circular should obtain permission by  
applying to this Office.**

*Achradelpha mammosa* (Sapotaceae), 47516. **Sapote.**  
From Laguna, P. I. Seeds presented by the Bureau of Agriculture, Manila. "One of the most important fruits of the Central American lowlands, well known to the Indians from time immemorial. It is wild in many regions, notably southern Mexico and Guatemala. It occurs most abundantly between sea level and 2,000 feet; at 3,000 feet it is still common, while at 4,000 it becomes scarce. It is generally believed that it will not succeed at 5,000 feet, but occasionally trees are seen at this elevation. In the highlands they are slow of growth and the fruit requires a long time to reach maturity. In the lowlands the sapote (Spanish orthography 'zapote') is a large forest tree, often 60 feet in height, with a thick trunk and stout branches. The Indians, when clearing land for coffee plantations, usually leave the sapote trees they encounter, for the sake of their valuable fruits. The foliage is abundant, and light green in color; the leaves are clustered toward the ends of the branchlets, and are obovate or oblanceolate in outline, broadest toward the apex, and four to ten inches long. The flowers are very small, produced in great numbers upon the stout branchlets. The fruit is elliptical in form, commonly three to six inches in length but sometimes larger. The skin is thick and woody, with a russet surface, and somewhat scurfy. The flesh is salmon-red, finely granular in texture, sweet, and of almost cloying flavor, in poor specimens strongly suggesting a squash or pumpkin. The single seed is large, shining brown except on the rough, whitish, ventral surface, and is easily removed from the fruit. The Indians commonly eat the sapote out of hand. It is occasionally made into a rich preserve, however, and can be used in a few other ways. It is slightly inferior in quality to its near relative the injerto or green sapote (*Achradelpha viridis*) of Guatemala. The seed of the sapote is an article of commerce in Central America. The large kernel is removed, roasted, and used to mix with cacao in the preparation of chocolate. According to some of the Indians, it imparts flavor to the chocolate; others say it is done to increase the bulk of the latter. In view of the high price of chocolate it seems more likely that sapote seeds are used as an adulterant, rather than for their flavor. In southern Mexico and Central America this fruit is known as 'zapote' (from the Aztec 'tzapotl'); in Guatemala the Indians knew it under the Maya names 'saltul,' 'saltulul,' and 'tulul;' in Cuba

it is called 'mamey colorado;' and in the Philippines 'chico mamey.'" (Popenoe.) - See Pl. 241.

*Botor tetragonoloba* (Fabaceae), 47510. **Goa bean.** From Zamboanga, P. I. Seeds presented by Mr. P. J. Wester, agricultural advisor. "**Seguidilla.** A climbing bean with four-winged pods, which when tender are used as string beans and are of excellent quality. They should be of great value in Porto Rico and Panama." (Wester.) "This species has fruited in Brooksville and its pods have been tested and found to be very palatable." (Fairchild.)

*Carica candamarcensis* (Papayaceae), 47524. From Ecuador. Seeds presented by Dr. J. N. Rose, Smithsonian Institution, Washington, D. C. "This *Carica* from Ambato (my No. 22354) is very different from the other *Carica* [S. P. I. No. 46623] collected by me in Ecuador. It has a stout thick trunk and a large round top. Unlike most of the other species, male and female flowers are borne abundantly on the same plant. The fruit is small, about three inches long, and has three, broad, low ribs. It is used chiefly in making dulces. It is grown in yards or gardens." (Rose.) - This tree is growing successfully at Berkeley, Cal. Mr. Ernest Robertson, of 4600 Brooklyn Ave., Los Angeles, Cal., writes as follows regarding the two plants of this same species sent him under 36969, in 1916: "I have just picked my first and only fruit, which is a hybrid, from one of the two plants of *Carica candamarcensis* which you sent me two years ago. Both proved to be female plants. I got some pollen from *C. papaya* and succeeded in setting two fruits, one of which is now ripe."

*Chlorophora excelsa* (Moraceae), 47497. From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. This is a valuable timber tree, native throughout most of tropical Africa. The wood is whitish, gradually changing to pale bay, and is durable and easily worked. The tree often reaches a height of 130 feet, with a diameter of 10 feet, - the trunk bare of branches for 60 feet. The thin, leathery, elliptical leaves are 6 to 7 inches long. The flowers, borne in dense spikes, are of two kinds: the pistillate are inconspicuous; the staminate have long, exserted, white stamens. The slightly fleshy fruits are greenish yellow. (Adapted from Thiselton-Dyer, Flora of Tropical Africa, vol. 6, part 2, p. 22.)

*Dioscorea alata* (Dioscoreaceae), 47446. **Yam.**  
 From Honolulu, Hawaii. Presented by Mr. J. E. Higgins, horticulturist, Hawaii Agricultural Experiment Station. "This yam, understood to be the best variety grown in Hawaii, has purple skin; when cooked, the flesh is a little dark and, like many other varieties, is somewhat moist. Besides being boiled and mashed — a favorite method of preparation — yams may be baked, or after being boiled, may be sautéed, or, like potatoes, may be made into a salad which is especially good." (Young.)

*Dracaena* sp. (Liliaceae), 47511. From Zamboanga, P. I. Seeds presented by Mr. P. J. Wester, agricultural advisor. "This *Dracaena* may prove a good pot plant for the conservatory and of course for culture out of doors in Porto Rico and south Florida." (Wester.)

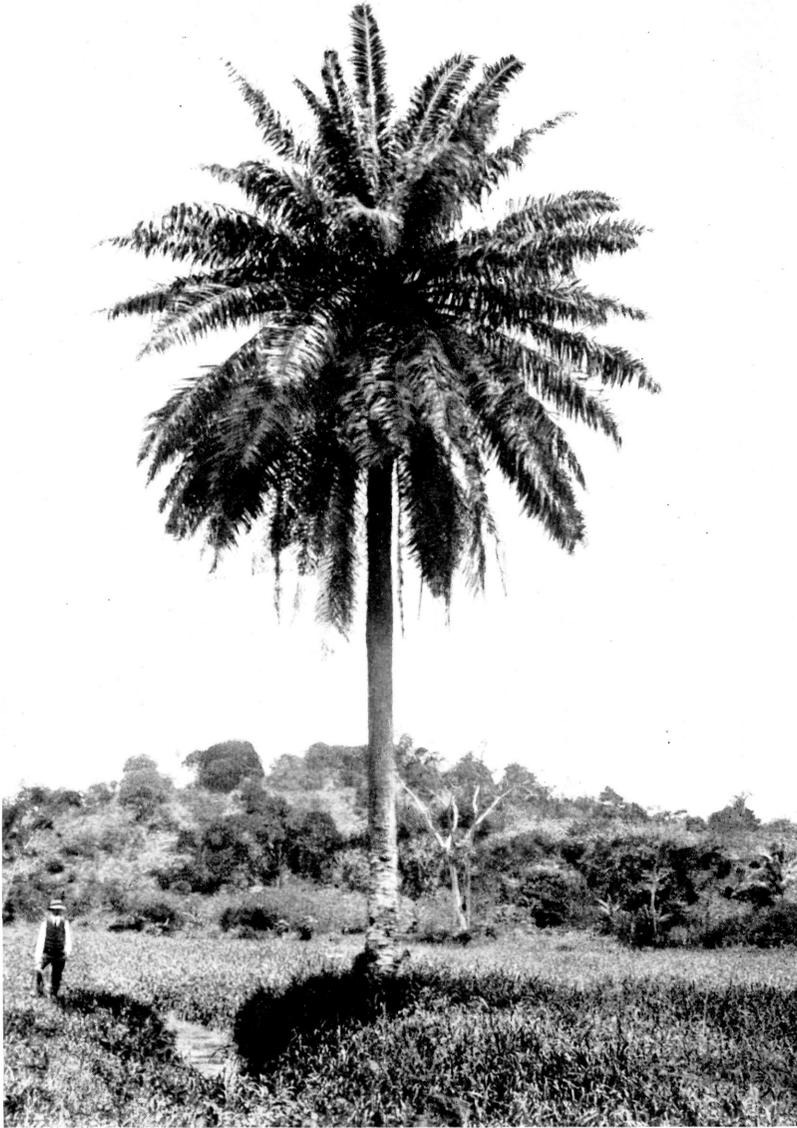
*Elaeis guineensis* (Phoenicaceae), 47504 to 47507. **Oil palm.** From Buitenzorg, Java. Seeds presented by the chief of the Division of Plant Breeding, Department of Agriculture. The oil palm is indigenous to the Guinea coast, where travelers found it used by the natives as early as the sixteenth century. From there it has gradually been disseminated throughout the tropics. The palm attains 15 to 20 meters in height; its trunk is erect and straight; the flowers are monoecious, and the pistillate ones develop into fruits (drupes) of the form and size of a prune, yellow or brownish when ripe, according to variety. These fruits, numbering 1,000 to 1,500 upon a raceme, have a hard, woody endocarp surrounded with a fibrous and at the same time fleshy pulp, varying in thickness according to variety, and containing much oil. The seed contains an oleaginous kernel which is exported to Europe under the name "palmiste." In his "Documents sur le palmier a huile," Chevalier mentions several varieties of this plant, differing in production and the quality of their oil. The development of improved varieties will be a matter of great importance. The racemes are harvested by natives who are very skillful in climbing the palms. The principal season of ripening is toward the end of the rains, but the harvest continues more or less throughout the year. The fruit yields two sorts of oils: one is extracted from the pulp "huile de palme," the other from the seed "huile de palmiste." "Huile de palme" is seen in Europe only in the solid state, since it does not become liquid at a lower

temperature than 40°C. It is orange-yellow in color. When fresh, it has a faint odor of violets and is employed by the natives very extensively in cooking. It becomes rancid very quickly. Commercially, it is used in soap-making. In its native home (Dahomey, for example), the oil is extracted by fermenting the fruits in jars for several days; they are then mashed, the nuts are taken out, and the pulp is boiled in large kettles of water. The oil rises to the surface of the water and is skimmed off. Its purification is later brought about by boiling it for some time. The nuts, clean of pulp, are then broken with stones or hammers. The kernel, "palmiste," is removed and dried, after which it is ready for use. These dried kernels are exported to Europe, and yield, under pressure, 40 to 42 per cent palmiste oil, which is white, and has a melting point of about 25°C. This oil is employed in the making of fine soap. (Adapted from Capus et Bois, *Les Produits Coloniaux*, 1912, p. 294.)

*Erythrina excelsa* (Fabaceae), 47498. From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. An ornamental tree, native to upper Guinea, growing to a height of 60 feet. It has glabrous branches which are armed with numerous sharp, straight, short prickles. The leaves are trifoliate, the broadly ovate central leaflet being 9 inches long. The bright scarlet flowers are borne in dense racemes about 6 inches long. (Adapted from Oliver, *Flora of Tropical Africa*. vol. 2, p. 183.)

*Ipomoea cairica* (Convolvulaceae), 47532. **Morning glory.** From Zamboanga, P. I. Seeds presented by Mr. P. J. Wester, agricultural advisor. "Seeds of a white-flowered variety of *Ipomoea cairica*, extremely attractive and floriferous. Unlike most plants of this family, *I. cairica* is ever-blooming. The mauve-colored variety is the most popular climber in the Philippines and very rarely seeds, being propagated by cuttings. The plant from which these seeds were obtained is the only one with white flowers I have seen." (Wester).

*Markhamia platycalyx* (Bignoniaceae), 47499. From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. A tree, 30 to 40 feet high, known in Uganda, where it is native, under the name **lusamabia**. It is said to yield the finest of local timbers. The compound leaves are made up of 5 to 9



A WEST AFRICAN OIL PALM, NEAR BAHIA, BRAZIL. (*ELAEIS GUINEENSIS*. SEE S. P. I. NO. 36973.)

The rapidly growing importance of the vegetable oils and the rank taken by this palm as an oil producer make it worth calling to the special attention of tropical plantation owners. In West Africa plantations of great size are being planted, and the British soap manufacturers have been recently given immense concessions of land in the Belgian Kongo for its culture. Like the coconut palm, this species deserves to be planted widely in the American Tropics, where it is as yet little known. (Photographed by P. H. Dorsett at Cabulla, Bahia, Brazil, December 13, 1913; P14509FS.)



**A PRODUCTIVE CHERIMOYA TREE AT HOME. (ANNONA CHERIMOLA.  
SEE S. P. I. NO. 45021.)**

This rather small tree was carrying over a hundred young fruits at the time it was photographed, and it was still flowering. The ripe fruits weighed about a pound each and were said to be of excellent quality. The productiveness of the tree and the high quality of the fruit commend it for trial in California and Florida. (Photographed by Wilson Popenoe at Antigua, Guatemala, October 26, 1916; P16915FS.)

obovate leaflets and the flowers, which are yellow striped with red, are borne in axillary and terminal panicles. (Adapted from Thiselton-Dyer, Flora of Tropical Africa, vol. 4, part 2, p. 525.)

*Monodora myristica* (Annonaceae), 47500. **Calabash nutmeg.** From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. A large, ornamental tree, native to Africa. The shining, pale green leaves are confined to the ends of the branches. The fragrant flowers, borne singly in the axils of the leaves, are about six inches across, with three spreading, wavy-margined, yellow petals, and three erect, creamy white petals, all six of which are dotted with red. The fruit, four to six inches in diameter, contains a number of cylindric seeds each about one inch long, which have a flavor closely resembling that of the nutmeg. (Adapted from Curtis's Botanical Magazine, pl. 3059.)

*Pahudia africana* (Caesalpinaceae), 47501. From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. This large, forest and timber tree is a native of the Niger and Congo valleys in western Africa. The small, white and red, fragrant flowers are borne in lax or dense racemes and are followed by smooth, thick, woody pods containing about ten seeds. (Adapted from Oliver, Flora of Tropical Africa, vol. 2, p. 302.)

"A useful tree for timber and shade. The wood is hard and durable---, and the bulk of the timber appears to be figured and of great value. It is frequently exported to Europe under the general trade name of 'African mahogany'". (Useful Plants of Nigeria, vol. 2, p. 272.)

*Phaseolus lunatus* (Fabaceae), 47447. **Lima bean.** From Guelph, Ontario, Canada. Presented by Mr. Jas. A. Neilson, Ontario Agricultural College. "Lima beans which were grown near Iroquois, Ontario, in the garden of Mr. Leigh Harkness. Mr. Harkness states that this strain of beans has been grown by members of his family since 1876. The seed was first secured from a seedsman in Philadelphia, Pa. During the first few years that the beans were tried at Iroquois, comparatively few ripened; but through selection of the earliest maturing and most productive plants for seed, a strain has been isolated which matures in a latitude

which is farther north than where lima beans can usually be grown. During the past summer I had the privilege of going through Mr. Harkness's garden and was very favorably impressed with the fine appearance of the beans. The plants were not very large, being about 16 to 18 inches in height and of about the same breadth, but they were very productive. I will venture to say that some of the plants produced as many as 75 pods of from 3 to 4 inches in length. Iroquois is in Dundas County and is approximately  $44^{\circ} 45'$  N. latitude. Considering the fact that lima beans are native to climates which are much warmer than that of the St. Lawrence River Valley, I think that Mr. Harkness has secured very good results." (Nielson.)

*Phytelephas macrocarpa* (Phoenicaceae), 47513. **Ivory-nut palm.** From Para, Brazil. Burs purchased from Mr. George H. Pickerell, American consul. An arborescent palm with a thick, rough, creeping trunk, from the under surface of which roots are given off; native to South and Central America. The leaves, which crown the trunk, closely resemble those of the coconut palm in size, shape, and disposition. The flowers emit a strong perfume, - especially the large, white, pistillate flowers which are, however, few in number. The fruits grow on the trunk just above the bases of the leaves in bunches of 6 or 7, and are called **cabeza de negro** by the natives of Colombia. The albumen of the seed is the so-called vegetable ivory, and this becomes whiter and more opaque on exposure to the air. (Adapted from The West Indian Bulletin, vol. 9, p. 279, 1908.)

*Saguerus pinnatus* (Phoenicaceae), 47527. **Sugar palm.** From Mayaguez, Porto Rico. Seeds presented by Mr. D. W. May, Porto Rico Agricultural Experiment Station. "The **gomuti** or **sugar palm** is one of the most useful of palms, and occurs in a wild state throughout the islands of the Indian Archipelago, but is more common in the interior, principally in the hilly districts, than on the sea coast; it is also very generally cultivated by the various people who inhabit that region. It is indigenous to Sunda and the Philippines, and is cultivated generally in tropical Asia. This palm attains a height of thirty to forty feet, and besides its saccharine sap furnishes a highly valuable, black, fibrous substance, ejoo fiber, superior in quality, cheapness, and durability to that obtained from the husk of the

coconut, and renowned for its power of resisting moisture. It is used by the natives of the Indian islands for every purpose of cordage and is known as 'tsongli'. Underneath this material is found a substance of a soft, gossamer-like texture, which is imported into China. It is applied as oakum in caulking the seams of ships, and more generally as tinder for kindling fire, - it is for the latter purpose that it is chiefly in demand among the Chinese. In Malacca, the *gomuti*, there termed 'kabong', is cultivated principally for the juice which it yields for the manufacture of sugar." (Simmonds, Tropical Agriculture, p. 252.) - Although the leaves of this *sugar-palm* were cut back by the fall frost, in Bay City, Fla., the trunk and body were not injured, and the tree is thriving.

*Spathodea nilotica* (Bignoniaceae), 47502. From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. This is a bushy, very beautiful, flowering tree, up to 20 feet in height, native to the Upper Nile Valley and the Belgian Congo. The opposite leaves are made up of 9 to 15 leathery leaflets covered with dense, short hairs beneath. The bright scarlet flowers are borne in short, dense, terminal racemes and resemble closely those of the well-known *S. campanulata*. (Adapted from Thiselton-Dyer, Flora of Tropical Africa, vol. 4, part 2, p. 529.)

"As *S. campanulata* has flowered in south Florida, even though tender, it is to be hoped that *S. nilotica* may prove hardier, and, if really as beautiful, it will be a valuable addition to the ornamentals of that region." (Fairchild.)

*Stevia rebaudiana* (Asteraceae), 47515. **Kaa-Hee.** From Asuncion, Paraguay. Seeds presented by Mr. H. H. Balch, American consul. "This Paraguayan herb is of peculiar interest because of the remarkable sweetness of the leaves. A fragment placed on the tongue seems as sweet as a lump of sugar of similar size. Several years ago the discovery that this plant, then called Eupatorium, contained a substance many times sweeter than sugar was heralded by the press and excited the keen interest of sugar planters all over the world. The substance turned out to be a glucoside and the anxiety of the sugar interests subsided. Further investigations, however, are now being made with this plant, by biological chemists and dieticians, because of the possibilities of utilizing sweet

substances to take the place of sugar in the food of persons suffering with certain diseases." (Fairchild.)

*Trichoscypha* sp. (Anacardiaceae), 47519. From Lcanda, Angola, Africa. Seeds presented by Mr. J. Gossweiler. "No.6882. A dioecious, palm-shaped tree, 25 meters in height, which produces on its trunk, about 2 meters above the ground, large bunches of peachlike, edible, succulent fruits. Quite a distinct, curious, and ornamental plant from the Portuguese Kongo. March, 1919." (Gossweiler.)

#### Notes on Behavior of Previous Introductions.

A letter received May 21, 1919, from Dr. H. Nehrling, Palm Cottage Gardens, Gotha, Fla., gives the following information:

"May 30, 1907, I received from you a tuber of *Dioscorea divaricata*, S. P. I. No. 10312, which has proved a great success. It is as good as the best potato, and is a most valuable root crop. The plant makes a tremendous growth - I have measured vines that were 60 feet long - and in rich, rather moist soil the tubers attain a weight of over a hundred pounds in two years. The foliage is very dense and the stems are provided with blunt spines. It flowers late in November and the three-cornered blossoms, almost pure white, exhale a delicious perfume.

"My *Alewites fordii* (S. P. I. No. 21013) is now a fine tree 25 feet high. Several seedlings, only a year old, and a foot high, flowered and set fruit."

The following analysis by Dr. Frederick B. Power, of the Bureau of Chemistry, will interest all those who have grown this attractive tree, *Pongam pinnata*, which flourishes luxuriantly in south Florida.

"The perfectly sound seeds amounted to 7,548 grams, and, on separating the kernels from the shells, the weight of the kernels was found to be 3,811 grams, or 50.5 per cent of the weight of the entire seed. A portion of the kernels was completely extracted with ether, when the yield of the fatty oil was 26.97 per cent. This would be equivalent to 13.4 per cent of the entire seed. The oil thus obtained was a pale yellow, limpid liquid having a very slight odor and a specific gravity of 0.9371 at 15.6° C. (60° F.)"

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