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PLANT IMMIGRANTS.

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Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

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.

April 25, 1919.

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Acacia giraffae (Mimosaceae), 46805. From Johannesburg, South Africa. Seed presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "**Kameel-doorn.** A valuable timber tree for arid regions in the warm temperate zone. One of the few native trees in British Bechuanaland. The ripe pods are greedily eaten by stock. It thrives in sandy soil, attains a large size, and furnishes valuable shade. The wood is dark red-brown in color, and is used by the Bechuanas for spoons, knife-handles, etc. At one time this tree furnished all the fuel for Kimberly, Vryburg and Mafeking." (Burtt-Davy.)

Actinidia chinensis (Dilleniaceae), 46864. **Yang tao.** Plants grown from cuttings of S. P. I. No. 21781 sent to the Plant Introduction Field Station, Chico, California, by Mr. Wm. Hertrich, San Gabriel, California, and grafted on seedlings of S. P. I. No. 21781. The plant sent Mr. Hertrich under the former number proved to be a perfect-flowered form and one that bore fruits of good size and quality. "The **yang tao,** a deciduous climber native to Szechwan province, has attracted considerable attention because of the high quality of its fruits and the ornamental value of the plant. The leaves have a plush-like texture and an unusual dark green color, while their large size and regular spacing add to the beauty of the vine. The flowers are buff-yellow to white, fragrant, often 1½ inches across,—and are produced in great abundance. The fruits are ovoid to globose and about 2 inches long. The outside is russet-brown and is clothed with villous hairs. The flesh is green, of most excellent flavor, resembling that of a gooseberry but tempered with a flavor peculiarly its own. The fruit is good when eaten fresh and also makes very fine jam and sauce. When we consider that there are several species which are hardy in Massachusetts, that one of them, *A. arguta,* bears when mature large numbers of very sweet fruits, it would seem as though this genus should be peculiarly attractive to the plant breeder." (Fairchild.)

Angophora subvelutina (Myrtaceae), 46873. From Australia. Presented by Mr. B. Harrison, Burringbar, New South Wales. "Called here 'apple-tree'. A large, spreading tree with strong and durable timber which is used for wheelwright work and floor boards. The foliage is used to feed stock in dry seasons." (Harrison.)

Annona diversifolia (Annonaceae), 46781. **Papauce.** From Mexico. Seeds collected by Mr. Wilson Popenoe and presented through Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "Among the lesser known fruits of Mexico the **papauce** impresses me as one of the most meritorious. It seems strange that it should still be included among the lesser known species, for it is considerably superior in quality to some of its congeners whose cultivation is widespread. For example, it is a vastly better fruit than the custard-apple (*A. reticulata*), and because of its larger size and more sprightly flavor, it is preferable to the sugar-apple (*A. squamosa*),—yet both these species are much more widely grown than the **papauce.** I consider a good **papauce** almost equal to a good cherimoya. Its larger seeds are slightly against it, but the color and texture of the flesh, and the rich, subacid flavor entitle it to a place among the very best of the anonas. I first saw the **papauce** on the border between Guatemala and Honduras, in April, 1918. I did not find ripe fruit at the time, however, and had never had an opportunity to test the quality of this interesting species until I reached Tapachula. Here the fruit is abundant, and though the season is not yet at its height, **papauces** are to be seen in the market practically every day. I believe they will be abundant from now (June 24) until the middle of August. The season, unfortunately is not long. In Guatemala the common name for this species is **anona blanca** (white anona); so far, here in Mexico I have heard it called nothing but **papauce.** Safford, I believe, says it is called **ilama** in this country, but I have only heard this name applied to *A. purpurea,* which is common in the state of Vera Cruz. The **papauce** tree grows to an ultimate height of about 25 feet in this region. It is slender in habit, the trunk not more than 10 inches thick, often branching from the ground to form 3 to 6 divisions, each 2 or 3 inches thick. Some trees form an erect, slender crown; others are broad and spreading in habit. The foliage somewhat resembles that of *A. squamosa,* but is larger, with the leaf-blades commonly oblanceolate in outline, obtuse to subacute at the apex. A distinguishing character of this species is the presence of orbicular, leaf-like bracts at the base of many of the smaller branchlets. There is a great amount of variation in the productiveness of the trees. About two-fifths of those I have examined here are not carrying any fruit. If they had produced any this year at least part of the crop would still be on

the tree, as it is yet very early in the season. While three-fifths of all the trees are bearing, many of them are carrying only 3 to 10 fruits each. The best production observed was that of a tree about 18 feet high and 10 feet in spread, which was carrying 85 fruits, nearly all of them fine large specimens. It may be noted that there is less variation in size and form among the fruits of one tree than is common in the cherimoya. In this respect the **papauce** resembles the sugar-apple. In form the fruits are conical, oval, or round. The largest specimens I have seen weighed a pound and a half. The average size is between eight ounces and a pound. The surface is rough, the carpellary areas being indicated by deeply incised lines, and each area giving rise, toward its lower end, to a short point or prominence. The roughness of the surface varies considerably among the fruits from different trees, as also the color. About half the fruits examined in Tapachula were pale green in color, and half more or less magenta-pink. All of them are heavily overspread with a whitish bloom which makes them very attractive in appearance, and which has doubtless given rise to the name **anona blanca** (white anona), used in Guatemala. In the pale green varieties the flesh is white, in the pink ones it is tinged with rose-pink. It is generally considered here that the white-fleshed fruits are best, as they are sweeter. This would conform with the Mexican taste. I have met one American who told me he greatly preferred the pink ones, because they were more acid. The skin or outer covering is nearly a quarter of an inch thick, soft and coarsely granular in texture. The flesh is custard-like in consistency, and in flavor about midway between a good cherimoya and a good sugar-apple. As nearly as I can recollect, it is almost identical with the flavor of some crosses between these two species, which I sampled at Miami, Florida, several years ago. I am speaking now of the white-fleshed varieties; some of the pink ones are considerably more acid in flavor than either the cherimoya or the sugar-apple. The seeds are about as numerous as those of the cherimoya, but larger. I have usually found about 25 or 30 in each fruit. The Tapachulans do not pick the fruits until they burst open on the tree. We observed the same custom in Brazil in connection with the cultivation of the sugar-apple. I doubt if the **papauce** is sufficiently hardy for cultivation in southern California, unless it be planted in the most protected situations. It seems to be a fruit of the tropical

lowlands. In fact, it might almost be termed the 'cherimoya of the lowlands.' As is well known, the cherimoya does not succeed in the tropics unless planted at considerable elevations, where the climate is cool. This species on the contrary, belongs in the lowlands, and the fruit is exceedingly similar in character to a good cherimoya." (Wilson Popenoe, in letter dated June 24, 1918, Tapachula, Mexico.)

Caesalpinia vernalis (Caesalpiniaceae), 46949. From Hongkong, China. Presented by Mr. W. J. Tutcher. An ornamental shrub, native of Hongkong, climbing by the reversed prickles on the under side of the leaves. The bipinnate leaves are made up of 9 to 12 pairs of pinnae, each bearing 4 to 8 pairs of ovate leaflets 1 inch long. The lemon-yellow flowers are borne in racemes about 6 inches long. (Adapted from Curtis, Botanical Magazine, vol. 133, pl. 8132.)

Canna edulis (Cannaceae), 46821. **Queensland arrowroot.** From Hawaii. Tubers presented by the Agricultural Experiment Station, Honolulu. "This plant, which is exclusively cultivated in Queensland, grows to a great height, often rising to 8 or 9 feet. It has very large, broad, ribbed leaves; and as many as 15 to 20 stalks rise from a single stool, each stalk representing a large bulb. In the flowering season the plant sends up a long, straight spike from the head of which bursts a beautiful branch of bright scarlet flowers having the appearance of those of the common canna known as 'Indian Shot' but far larger. The seeds do not often mature, however, as do those of the canna family generally. The bulbs from which the arrowroot of commerce is prepared form a compact mass on and near the surface of the soil, and so prolific is the plant that I have dug from a single stool as much as 60 lb. and even 80 lb. weight of bulbs." (A. J. Boyd, Queensland Agricultural Journal, vol. 10, p. 32.)

"The rootstocks are edible and palatable when properly cooked. More culinary experimentation with them, however, will be required before any definite decision regarding their probable popularity can be made. Mr. F. G. Krauss informs us that in Hawaii, where the Experiment Station officials have been growing an acre of *C. edulis*, it has been eaten after being boiled for 30 minutes and then mashed like boiled potatoes; he declares it is a good substitute for the potato, and that it outyields the potato two to one. The tops have been used as forage for cattle and swine." (Fairchild.)

Carica candamarcensis (Papayaceae), 46782. From Mexico. Seeds collected by Mr. Wilson Popenoe and presented through Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "Collected at La Zacualpa, Chiapas, October 10, 1918. A wild carica common in this region. It is very similar to the papaya. The plants grow to a height of about 10 feet, and resemble those of the papaya except in the distinctly darker color of the foliage and the less deeply lobed leaves. Staminate and pistillate flowers seem always to be produced on separate plants. The fruits are borne singly, not in clusters as is often the case in the wild papayas of Florida. They are obovoid-elliptic in shape, 2 to 4 inches in length, orange-yellow in color when ripe, with a more pronounced aroma than in the papaya. The natives call them **melocotones,** or 'peaches'. The flesh is about half an inch thick; each of the numerous seeds which fill the large cavity is enclosed in a translucent, whitish aril which is the part eaten. The seeds do not adhere to the wall of the seed cavity as in the papaya but, together with the arils surrounding them, entirely fill the cavity. The flavor of the arils is sweet and aromatic, very pleasant, and quite distinct from that of the flesh of the papaya." (Popenoe.)

Chamaedorea sp. (Phoenicaceae), 46783. **Palm.** From Mexico. Seeds collected by Mr. Wilson Popenoe and presented by Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "From Pochutla, Oaxaca, August 18, 1918. This closely resembles the dwarf palm which I sent in from Guatemala last year under the name **pacayito.** It is abundant on cool, shady mountain sides in the coffee district above Pochutla, at altitudes of about 3,000 feet. When mature, the plant has a slender trunk, perhaps half an inch thick and 2 feet high. The leaves are from a foot to 18 inches in length, rather finely pinnate, deep green, graceful, with the rachis stiff but arching slightly. As a house plant for the northern states, and for use in fern dishes, it seems to me that this plant possesses unusual possibilities, and I strongly recommend it for trial." (Popenoe.)

Colocasia esculenta (Aracaceae), 46788. **Dasheen.** From Port-of-Spain, Trinidad. Presented by Mr. Eugene André. "Tubers of what is being grown here as **Chinese eddoes.** This aroid gives better results in poor, dry soil than the dasheen, the latter requiring well-watered, low-lying land for remunerative crops." (André.)

"This variety, known in Trinidad as **Chinese eddo** is

very similar in appearance to what has been previously introduced into the United States as the Trinidad dasheen. The quality of the specimens received is excellent." (R. A. Young.)

Dioscorea sp. (Dioscoreaceae), 46801. **Yam.** Tubers grown at the Plant Introduction Field Station, Miami, Florida. "A very prolific, white-fleshed yam, obtained in the spring of 1918 by Dr. David Fairchild from Prof. C. T. Simpson, Lemon City, Florida. It is supposed to have come previously from the West Indies. The skin is without coloration, and the flesh remains almost snowy white when cooked. As compared with most other yams, it is very dry. It is well adapted for baking and for boiling and mashing; the mashing should be very thorough. Mashed yam becomes stiff upon cooling and therefore should be served hot. It is best to peel yams before boiling." (R. A. Young.)

Jatropha sp. (Euphorbiaceae), 46862. **Chaya de Mexico.** From Cuba. Cuttings presented by Mr. Mario Calvino, Director, Agricultural Experiment Station, Santiago de las Vegas. The leaves are edible. The following is the result of an analysis of them made at our Station during the rainy season:

Moisture	74.00 per cent
Protein	0.94 per cent
Ether extract	0.20 per cent
Carbohydrates	20.71 per cent
Crude fiber	2.25 per cent
Ash	1.90 per cent.

(Notes and analysis from letter of Dr. Calvino.)

Livistona altissima (Phoenicaceae), 46861. **Palm.** From Buitenzorg, Java. Presented by the Director, Botanic Gardens. A graceful palm with a trunk about 8 inches in diameter and often 80 feet tall, and bearing globose fruits the size of small cherries. The natives value the exceedingly hard wood very highly and use it especially for rafters which often last for three generations. (Adapted from Zollinger, Natuurkundig Tijdschrift voor Nederlandsch Indie, vol. 14, p. 150.)

Lobelia erinus microdon (Lobeliaceae), 46808. **Lobelia.** From Johannesburg, South Africa. Seed presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "An ornamental annual, entirely different in habit from

the ordinary garden form, being erect instead of diffuse. The fragrant flowers are beautiful shades of blue and white." (Burtt-Davy.)

Mussaenda pubescens (Rubiaceae), 46950. From Hongkong, China. Presented by Mr. W. J. Tutcher. A small, ornamental, climbing shrub, found on the island of Hongkong and in the province of Yunnan, China. The ovate-lanceolate leaves are minutely pubescent and the yellow flowers are borne in loose, few-flowered cymes. (Adapted from Sargent, Plantae Wilsonianae, vol. 3, p. 396.)

Pachylobus edulis mubafo (Balsameaceae), 46793. From Loanda, Angola, Africa. Presented by Mr. J. Gossweiler, Servicios de Agricultura. A tree found in the Cameroon valley in Upper Guinea, Africa. The odd-pinnate leaves have 15 to 17 coriaceous, ovate leaflets 4 to 6 inches long. The small flowers are borne in rusty-tomentose panicles collected near the ends of the branches. The oval, black fruits, about 3 inches long, have a pleasant taste. It is related to the Java-almond and to the pili nut. (Adapted from Oliver, Flora of Tropical Africa, vol. 1, p. 327, under *Canarium edule.*)

Passiflora sp. (Passifloraceae), 46785. **Granadita.** From Mexico. Seeds collected by Mr. Wilson Popenoe and presented through Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "From Puerto Mexico, Vera Cruz; collected September 9, 1918. A passion vine which grows upon the beach in the vicinity of Puerto Mexico. Its fruits are unusually handsome and are sold in the market. They are produced upon slender stems about 4 inches long, and are round, an inch in diameter or slightly larger, and brilliant crimson-scarlet in color. Of this genus, they are by far the showiest fruits that I have seen. The outer covering of the fruit is not hard; the seeds are surrounded by white, translucent pulp of slightly acid flavor. In quality this species is inferior to *P. ligularis* in that the flavor is not so aromatic and spicy. It would be worth cultivating, however, if only for the beauty of its fruits, and it should be an excellent species to cross with some of the larger-fruited passifloras." (Popenoe.)

Rosa gentiliana (Rosaceae), 46789. **Rose.** From Kew, England. Presented by Sir David Prain, Director, Royal

Botanic Gardens. "A plant raised from a cutting supplied by Sir William Thiselton-Dyer." (Prain.)

A rose which is abundant in the mountainous regions of western Hupeh and eastern Szechuan, where it forms tangled masses 6 meters or more in height. The numerous, large, white flowers are very fragrant and the anthers are golden yellow. The species is easily distinguished by its glabrous, pale gray shoots, and the three- to five-foliate leaves which are shining green above and very pallid beneath. (Adapted from Sargent, Plantae Wilsonianae, vol. 2, p. 312.)

Rhus viminalis (Anacardiaceae) 46810. **Karree-boom.** From Johannesburg, South Africa. Seed presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "A hardy, evergreen tree, withstanding the drought and frost of the Upper Karroo which has an altitude of 4,600 feet, and a rainfall of about 10 inches in summer only. It grows readily from seeds, cuttings, poles or stumps set in moist ground and kept moist until growth starts. Plants have been known to make a growth of 13 feet 6 inches, in three years. It prefers a thin, limestone soil, but thrives on other soils and attains a height of about 30 feet and a spread of the same distance. It is considered an excellent timber for gate and fence posts,- poles having been found in good condition twenty-five years after they had been set in the ground. The wood is flexible and is considered excellent for yokes, keys, tobacco pipes, and furniture. Sheep and goats browse on the foliage, and the sweetish fruits are eaten by poultry and sometimes by children. The **karree-boom** makes a beautiful street and shade tree, being hardier and more ornamental than *Schinus molle*, which it resembles in habit. It should be tried in Southern California, and in Arizona and New Mexico. Sow seeds in the spring; plant cuttings or poles in mid-summer." (Burtt-Davy.)

Sapranthus sp. (Annonaceae) 46786. From Mexico. Seeds collected by Mr. Wilson Popenoe and presented through Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "From the mountain near Pochutla, Oaxaca; altitude 3,000 feet. Collected August 18, 1918. A peculiar annonaceous fruit which is rather common in the mountains. The tree is tall and slender, and grows in the dense forest. The fruits are the size and shape of papaws (*Asimina triloba*), that is, oblong, about 3 to 4 inches in length, and

an inch and a half in thickness. The flesh is bright orange color; I do not believe it is edible,- at any rate, it is not eaten by the natives of this region." (Popenoe.)

Triticum aestivum (Poaceae), 46815. **Wheat.** From Johannesburg, South Africa. Seed presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "**Rietti.** Bearded; ear long and open, shedding rather too easily. It stools well and is a heavy yielder, especially in wet, late seasons; wonderfully rust-resistant. The grain is dark but the flour is very white and the variety is greatly valued as a milling wheat. This is the most extensively grown wheat in the Western Province (Uganda), though 'Glujas Early' threatens to oust it from this position. It has not given very good results in the region of summer rainfall." (Burtt-Davy.)

Triticum aestivum (Poaceae), 46817. **Wheat.** From Johannesburg, South Africa. Seed presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "**Glujas Early.** Beardless or semibearded; white; excellent quality; good yielder; does not shell out too easily. This is probably the most rust-resistant of all the white varieties of wheat yet introduced into the Western Province (Uganda), and stands second only to 'Rietti' in the acreage under cultivation in the principal wheat areas. It is annually gaining in popularity with every prospect of ousting 'Rietti' from the premier position. Now largely grown in the Transvaal also." (Burtt-Davy.)

Vitis sp. (Vitaceae), 46787. **Grape.** From Mexico. Seeds collected by Mr. Wilson Popenoe and presented through Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "**Totoloche.** Collected at Mogoñé, Oaxaca, October 1, 1918. A wild grape apparently belonging to the Muscadine group or closely related to it. The plant is said to be abundant in this region, but I have not seen it. The fruit is brought into town by the Indian women from San Juan Guichicovi. This impresses me as the best grape I have ever seen in the tropical lowlands, and I believe it has value. At least it should be of importance in connection with the development of a grape for cultivation in the tropics. It is vastly superior to *V. caribaea*, the berries being of much larger size and better flavor. The bunches are usually small and rather loose, but sometimes contain as many as fifty berries and

are quite compact. The individual berries are half an inch in diameter,– sometimes larger,– round, deep purple-maroon or purple in color when fully ripe. The skin is thick and tough, like that of the Scuppernong; it seems to me to be even thicker and tougher. The pulp is greenish, very juicy, containing 2 to 4 seeds, typically the latter number. While the **totoloche** appears to be most commonly eaten out of hand, it is also used in this region to make wine. When fully ripe this grape has a sweet flavor and a delicious aroma." (Popenoe.)

Vitis sp. (Vitaceae), 46833. **Grape.** From Southport, Conn. Cuttings presented by Mr. R. P. Wakeman. "During the past few years I have brought a few seedling grapes to fruitage, and out of the lot one seems good enough to be considered an acquisition. It is white in color and between 'Niagara' and 'Green Mountain' in size. The bunches are of good size but are not shouldered exactly like those of the 'Niagara'. The berries have tender pulp and are very sweet. They ripen in southwest Connecticut about September 6, and hang on well. It makes fine grape juice." (Wakeman.)

Voandzeia subterranea (Fabaceae), 46870. From Cangamba, Portuguese West Africa. Presented by Mr. A. W. Bailey. "Seeds of the ground bean which is used commonly for food both by natives and Portuguese. The local name is **vielu**. While these require a long season to mature, they may be used green as shell beans. The natives plant one in a hill. The plants do not require an excessively fertile soil." (Bailey.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

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