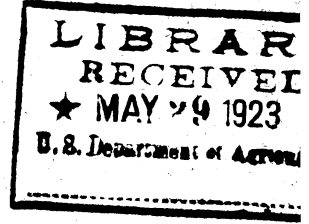


78
Issued. May 14, 1923.

U. S. DEPARTMENT OF AGRICULTURE.
BUREAU OF PLANT INDUSTRY.



INVENTORY

OF

SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
DURING THE PERIOD FROM JUNE 1
TO SEPTEMBER 30, 1920.

(No. 64: Nos. 50648 to 51357.)



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1923.

Issued. May 14, 1923.

U. S. DEPARTMENT OF AGRICULTURE.
BUREAU OF PLANT INDUSTRY.

INVENTORY
OF
SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
DURING THE PERIOD FROM JUNE 1
TO SEPTEMBER 30, 1920.

(No. 64: Nos. 50648 to 51357.)



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1923.

CONTENTS.

	Page.
Introductory statement	1
Inventory	7
Index of common and scientific names.....	91

ILLUSTRATIONS.

	Page.
PLATE I. A new and brilliant Hawaiian hibiscus. (<i>Hibiscus brackenridgeri</i> A. Gray, S. P. I. No. 50693).....	14
II. A Hawaiian hibiscus that should be widely cultivated. (<i>Hibiscus brackenridgeri</i> A. Gray, S. P. I. No. 50693).....	14
III. Preparing cassava roots in Tanganyika Territory. (<i>Manihot esculenta</i> Crantz, S. P. I. No. 50837).....	30
IV. Types of eggplants from the Belgian Kongo. (<i>Solanum melongena</i> L., S. P. I. Nos. 50915 to 50918).....	30
V. A wild avocado tree in Costa Rica. (<i>Persea</i> sp., probably <i>P. americana</i> Mill., S. P. I. No. 51031).....	44
VI. The aguacate de anís, or wild avocado of Costa Rica. (<i>Persea</i> sp., probably <i>P. americana</i> Mill., S. P. I. No. 51031).....	44
VII. The Bennett soursop, a choice variety from Costa Rica. (<i>Annona muricata</i> L., S. P. I. No. 51050).....	48
VIII. A seedless form of the pejobaye, or peach palm, of Costa Rica. (<i>Guillielma utilis</i> Oerst., S. P. I. No. 51092).....	48

INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRO- DUCTION DURING THE PERIOD FROM JUNE 1 TO SEPTEMBER 30, 1920 (NO. 64; NOS. 50648 TO 51357).

INTRODUCTORY STATEMENT.

During the period covered by this inventory three agricultural explorers were in the field for the Bureau of Plant Industry. Wilson Popenoe finished his plant hunting in Guatemala and Costa Rica, and after a brief stay in the Canal Zone, commenced work in the Colombian highlands. Dr. H. L. Shantz was making his way through British East Africa, preparatory to coming down the Nile. Joseph F. Rock, who has joined the force of this office and has become an agricultural explorer for it, was on his way to Siam and Burma to search for seeds of the tree which yields the chaulmoogra oil that has proved so successful in the treatment of leprosy.

Mr. Rock sent in from the island of Oahu (Territory of Hawaii) a showy tree hibiscus (*Hibiscus brackenridgei*, No. 50693), bearing yellow flowers 6 inches across.

From Guatemala Mr. Popenoe sent in the zacate blanco (*Ixophorus unisetus*, No. 50650), one of the best native forage grasses for moist places such as the Everglades. From the region around El Barranquillo, Guatemala, which is exceedingly dry for a large part of the year, he sent a collection of flowering trees and shrubs which should find a home in southern Florida and California.

Mr. Popenoe also obtained seeds of a rare species of *Persea* (*P. caerulea*, No. 51032), related to the avocado, which bears racemes of black fruits the size of large peas. Whether or not this has value as a stock for the avocado remains to be seen. Certainly the avocado industry is becoming of such importance as to warrant the assembling of all the species of the genus *Persea*, to which the avocado belongs, preparatory to a systematic study of their possibilities for breeding purposes.

The pejibaye palm (*Guilielma utilis*), a very ancient food plant of Costa Rica, Mr. Popenoe thinks is remarkably promising. It

is a slender palm which bears as much as 125 pounds of dry mealy fruits that, when boiled in salted water, resemble chestnuts in texture and flavor. It bears in 6 to 8 years, lives to be 50 years old, is the favorite vegetable fruit of the Costa Ricans, and a most important commercial product. Every attempt should be made, Mr. Popenoe thinks, to cultivate this in western Florida, where it may succeed. His discovery of seedless forms (Nos. 51091 and 51092) in Costa Rica is worthy of special mention; and we wish to record here our appreciation of the gifts of offshoots of these palms by Doña Amparo de Zeledón and by Alfredo Brade, as also the assistance rendered Mr. Popenoe, during his stay in Costa Rica, by Otón Jiménez, an active young botanist of San Jose.

From Zanzibar in June, 1920, Doctor Shantz shipped a most remarkable collection of 241 introductions (Nos. 50726 to 50966) obtained by him in the region of Nyanza, Lake Tanganyika, Dar es Salaam, Urundi, and Ujiji. These represent, in the main, varieties of the grain and vegetable crops of the native agricultural tribes of this interesting region, and out of the collection can hardly fail to come strains of sorghum, beans, corn, or other plants which, through breeding, will add to our own American varieties of these crops such characters as resistance to drought or disease.

The dahlia has become of such importance to our horticulture and there are so many breeders of it that a collection of tree dahlias (*Dahlia* spp., Nos. 51086 to 51090) from Costa Rica can scarcely fail to be of interest as material for breeding purposes.

Mr. Popenoe's wild raspberry (*Rubus eriocarpus*, No. 51094) from 10,000 feet altitude on the slopes of the Volcano Irazu may prove of value to breeders.

Ideal street trees are an asset to any country, and Mr. Popenoe, in getting seeds of the muñeco (*Cordia nitida*, No. 51118) of Costa Rica, may have introduced a valuable one for southern Florida.

The tacaco (*Polakowskia tacaco*, No. 51122), like the chayote of Guatemala, is a favorite vegetable among Costa Ricans and according to Mr. Popenoe deserves to be improved by selection.

From the well-known collector, Carlos Wercklé, Mr. Popenoe procured a new fruit tree of the genus *Coccolobis* (No. 50683) and an as yet undetermined fruit tree (No. 50692) which he thinks may be a new genus; both have tart edible fruits of some promise.

The new and handsome shrub (*Wercklea insignis*, Nos. 51124 and 51125), named for Mr. Wercklé and having bright-lilac flowers resembling in size and form the well-known *Hibiscus rosa-sinensis*, may grow in California and Florida and become popular.

From Bogota, Colombia, Mr. Popenoe sends a wild blackberry (*Rubus urticaefolius*, No. 51354), from an altitude of 5,000 feet, and *Erythrina edulis* (No. 51357), the seeds of which furnish an impor-

tant article of food on the western slopes of the Cordillera Oriental. These seeds are sometimes 2 inches long and when cooked are more agreeable in flavor and more delicate than the ordinary bean.

So little has been done in the way of selecting superior seedlings of the tropical fruits that Mr. Popenoe's discovery of a variety of the soursop (*Annona muricata*, No. 51050), which is more productive than the ordinary seedling and has unusually handsome fruits, will interest tropical horticulturists generally.

J. A. Hamilton, of Cairns, northern Queensland, Australia, believes his new Improved Dwarf Lima bean (*Phaseolus lunatus*, No. 50999) is better adapted to subtropical regions than Burpee's Bush Lima.

Dr. Proschowsky, of Nice, France, sends in *Alectryon subcinereum* (No. 51000), a relative of the lychee; he suggests that it may prove a good stock for that valuable Chinese fruit tree.

Mr. Macmillan sends in seeds of the giant bamboo (*Dendrocalamus giganteus*, No. 51026) of the Malay Peninsula, which grows more than 100 feet tall and 30 inches in circumference. As it seeds very infrequently, this variety should now be given a thorough trial in southern Florida.

Mr. Poynton, of Auckland, New Zealand, presents seeds of the pohutukawa tree (*Metrosideros tomentosa*, No. 51048) which grows on the shores of the North Island. Its thick evergreen leaves withstand salt spray remarkably well, and in the New Zealand summer the plant is covered with a profusion of scarlet blossoms. It should be useful on the shores of California.

There is something peculiarly romantic in Mr. Poynton's story of how the beautiful puka tree (*Meryta sinclairii*, No. 51049) of New Zealand was saved, after it had become so nearly extinct that there remained only 27 plants of it on some small islands in the Hauraki Gulf; all the trees now planted in the parks and gardens of that country came from cuttings of these specimens. It has the largest leaves of any plant in New Zealand.

Ornamental-berried house plants which will keep their freshness and their show of fruits for a long time are not common, and Mr. Johnson may have found a new one in his as yet undetermined species of *Ardisia* (No. 51052) from Alta Vera Paz, Guatemala. Mr. Johnson's introduction of two new species of the true pepper (Nos. 51059 and 51060), which have a slightly different flavor from that of the commercial species, *P. nigrum*, may have some economic importance for tropical horticulture.

The passifloras, or passion fruits, form a fascinating field for the plant breeder, and it is hard to understand why no one has studied them, especially since there are forms like *Passiflora macrocarpa*

(No. 51099) which bear delicious-flavored fruits the size of a man's head.

A new lawn grass (*Aeluropus brevifolius*, No. 51110) for alkaline soils will interest a wide circle of those who live in the Southwest, some of whom doubtless know its sender, Dr. R. H. Forbes, who lived in Arizona for many years before he went to Egypt.

A wild species of tulip (*Tulipa stellata*, No. 51113) from Punjab, India, with pure-white petals and bulbs which are frequently eaten by the East Indians, may interest the bulb growers and hybridizers.

Crotalarias appear to be excellent nitrogen gatherers in the sandy soils of Florida, and a new one (*Crotalaria verrucosa*, No. 51119) from Puntarenas, Costa Rica, is worthy of a fair trial.

The pandan has become so thoroughly at home in Florida that many horticulturists will be glad to try the four species (*Pandanus* spp., Nos. 51135 to 51138) sent in from Buitenzorg by the Java Department of Agriculture.

The accoub of Syria (*Gundelia tournefortii*, No. 51142) appears to be a promising new vegetable. It is a perennial spiny composite, similar to the globe artichoke but said to be superior to it.

The accounts of the mowra tree of India (*Madhuca indica*, No. 51155) are so remarkable that efforts ought to be made to establish this species on the dry waste lands of Florida, where its unusually sweet, edible blossoms could be utilized for alcohol manufacture. Single trees have been known to yield 300 pounds of flowers which yield from 40 to 70 per cent of invert and cane sugar mixed.

A collection of Wright's new peaches and apples (Nos. 51162 to 51179) from Auckland, New Zealand, including the Alpha apple, which he considers the earliest of all apples, will interest breeders of these fruits.

Wester sends in a new green-leafed vegetable for the South in his Talinum (No. 51193) a relative of purslane, which he reports makes an excellent dish for the table.

Bischofia trifoliata (No. 51194), the Javanese timber and shade tree, is proving such a beautiful thing in southern Florida that a distribution of it as a street tree is contemplated.

Eugenia curranii (No. 51201) from the Philippine Islands, according to Wester, bears immense quantities of fruits suitable for preserves.

The leaves and stems of a form of *Chenopodium album* (No. 51214), which is closely related to our own lamb's-quarters, according to Mr. Carter, of Calcutta, are used as greens in India, and the seeds are eaten as a cereal. The hill tribes of the western Himalayas cultivate this species as one of their principal crops.

Doctor Shantz finds the ati grass (*Heteropogon contortus*, No. 51226) of the region about Nairobi to be an excellent forage grass,

and recommends it for Arizona, New Mexico, and the pinelands of Florida. His hedge plant (*Coleus barbatus*, No. 51239), producing masses of sky-blue flowers, will be a desirable novelty if it proves hardy.

O. F. Cook has pointed out that we have in the driest desert region of California a leguminous tree (*Olneya tesota*, No. 51254), the beans of which when roasted resemble peanuts. These *Olneya* trees, as they are called, are among the most attractive trees of our Southwest. They deserve trial in other desert regions of the world.

The iburu (*Digitaria iburua*, No. 51257), a cereal grown by the natives of Northern Nigeria and producing a small, pure-white grain, is already under observation by Mr. Piper, who considers it worth while from the standpoint of a forage crop.

Perhaps the macui (*Solanum* sp., No. 51265) which Mr. Johnson finds in use among the Kekchi Indians of Alta Vera Paz, Guatemala, may be what we are looking for as a summer green vegetable for the South. He says the tender young tips are widely used and have an excellent flavor.

The fufu grass (*Pennisetum purpureum*, No. 51286), of Rhodesia, is found by Mr. Holland, of Port Elizabeth, South Africa, to be softer, sweeter, and more succulent than Napier grass, and this forage crop may prove superior to the latter in our Southern States.

The botanical determinations of seeds introduced have been made and the botanical nomenclature revised by H. C. Skeels, and the descriptive and botanical notes have been arranged by G. P. Van Eseltine, who has had general supervision of this inventory. The manuscript of this inventory has been prepared by Miss Esther A. Celandier and Miss Patty T. Newbold.

DAVID FAIRCHILD,
Agricultural Explorer in Charge.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION,
Washington, D. C., January 13, 1922.

INVENTORY.¹

50648. SCHIZOSTACHYUM sp. Poaceæ. Bamboo.

From Buitenzorg, Java. Plants presented by Dr. J. C. Koningsberger, director, Java Botanic Garden, through K. Heyne, Department of Agriculture. Received June 8, 1920.

Late in 1915 L. C. Westenek, a resident of Benkulen, Sumatra, while on a trip through the highlands of Kroe, found this solid-stemmed bamboo. Material was sent to the garden of the Museum of Economic Botany, in Buitenzorg, where it grew abundantly, flowered, and fruited. This bamboo forms a thick stand about 7 meters (24 feet) high; the green stems are 3 centimeters (more than an inch) thick, with joints about 25 centimeters (10 inches) long. (Adapted from *Teysmannia*, vol. 30, p. 846.)

50649 to 50651.

From the city of Guatemala, Guatemala. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 8, 1920. Quoted notes by Mr. Popenoe.

50649. ANANAS SATIVUS Schult. f. Bromeliaceæ. Pineapple.

"(No. 373.) Suckers of the *Montufar* pineapple, a variety grown in the lower Motagua Valley, notably at the station of Montufar, whence the name. The plants forwarded under this number were obtained from the grounds of the United Fruit Co. hospital at Quirigua.

"The plant is large and has slender, finely serrate leaves, not noticeably recurved. The fruits may be termed medium to large in size, being commonly 6 to 8 inches in length and oblong in form. The lines marking the carpellary divisions are not deeply incised, and the eyes, therefore, are not prominent. The surface is dull yellow in color, more commonly greenish yellow, because the fruits are not left on the plant until fully ripe. The flesh is light yellow, very juicy, with abundant aroma and rich flavor. It is not so delicately flavored nor so sweet as the *Smooth Cayenne*, but impresses me as considerably better than the *Red Spanish*. The variety is one which I have not seen elsewhere. It is forwarded for trial in connection with the Hawaiian experiments."

For previous introduction, see S. P. I. 49370.

¹ It should be understood that the varietal names of fruits, vegetables, cereals, and other plants used in these inventories are those which the material bore when received by the Office of Foreign Seed and Plant Introduction; and further, that the printing of such names here does not constitute their official publication and adoption in this country. As the different varieties are studied, their identity fully established, their entrance into the American trade forecast, and the use of varietal names for them in American literature becomes necessary, the foreign varietal designations appearing in these inventories, in many cases, will undoubtedly be changed by the specialists interested in the various groups of plants and the forms of the names brought into harmony with recognized American codes of nomenclature.

50649 to 50651—Continued.

50650. IXOPHORUS UNISETUS (Presl) Schlecht. Poaceæ. **Grass.**

"(No. 372a.) *Zacate blanco*. Seeds of a native grass from Quirigua in the lower Motagua Valley. Altitude, 250 feet.

"This is considered one of the best native forage grasses of its region. Its leaves, which are succulent and about half an inch wide, reach a height of about 2 feet. The plant seems to thrive in moist places and is worth testing in the Everglades region of southern Florida."

50651. PINUS OCCARPA Scheide. Pinaceæ. **Pine.**

"(No. 371a. Herb. No. 975.) From the Finca Moca, San Francisco Miramar, Patulul. Altitude about 3,200 feet. Seeds of a white pine, abundant on the lower slopes of the Volcano Atitlan. It yields good lumber and is cut for this purpose."

50652 to 50678.

From the city of Guatemala, Guatemala. Seeds collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 8, 1920. Quoted notes by Mr. Popenoe.

"(Nos. 345a to 370a. April 23, 1920.) The following have been collected at El Barranquillo. Many of these species I have seen in bloom and consider promising. Some of the others I have taken upon the recommendation of Fernando Carrera, who has collected the seeds.

"The region from which they come is exceedingly dry for a large part of the year, but is never cold; it does not seem certain, therefore, that these plants will stand the cold winters of California and Arizona, though they should be adapted to resist the dry atmosphere. It seems likely that most of them will succeed in southern Florida."

50652. ALVARADOA AMORPHOIDES Liebm. Simaroubaceæ.

"(No. 355a. Herb. No. 956.) *Plumajillo*. Described as a tree about 25 feet high, which produces an abundance of white flowers in January."

50653. CAESALPINIA EXOSTEMMA Moc. and Sesse. Cæsalpiniaceæ.

"(No. 350a. Herb. No. 974.) *Carcomo*. A leguminous shrub, reaching about 10 feet in height and producing terminal racemes of flowers somewhat resembling those of *Caesalpinia pulcherrima*, particularly in color, which is a combination of yellow and light orange-scarlet."

50654. CASSIA BICAPSULARIS L. Cæsalpiniaceæ.

"(No. 361a. Herb. No. 969.) *Cola de pato*. Described as a small tree which produces yellow flowers in March."

For previous introduction, see S. P. I. 44123.

50655. CASSIA EMARGINATA L. Cæsalpiniaceæ.

"(No. 362a. Herb. No. 959.) *Vainillo*. Described as a medium-sized tree which produces yellow flowers in March."

50656. CYDISTA PUBESCENS Blake. Bignoniaceæ.

"(No. 368a. Herb. No. 980.) *Campana*. Described as a vigorous climber which produces handsome pink flowers."

50657. EUPHORBIA LEUCOCEPHALA Lotsky. Euphorbiaceæ.

"(No. 359a.) *Flor de pascua*. Described as a small tree bearing white flowers at Christmas time (hence the name *flor de pascua*, or Christmas flower). Said to be particularly handsome."

50652 to 50678—Continued.

50658. *MACROSCEPIS OBOVATA* H. B. K. Asclepiadaceæ.

"(No. 336a. Herb. No. 970.) *Chununo*. Described as a climbing plant which produces reddish purple flowers in January."

50659. *GUAIACUM GUATEMALENSE* Planch. Zygophyllaceæ.

"(No. 364a. Herb. No. 952.) *Guayacan*. The Guatemalan lignum-vitæ, a small tree which is covered in February or March with lavender-blue flowers."

For previous introduction, see S. P. I. No. 47900.

50660. *HAEMATOXYLUM BRASILETTO* Karst. Cæsalpiniaceæ.

"(No. 348a. Herb. No. 936.) *Brazil*. A handsome flowering tree. It grows to about 15 feet in height, is spreading in habit, and during the early spring is covered with small yellow flowers."

For previous introduction, see S. P. I. No. 44456.

50661. *IPOMOEA* sp. Convolvulaceæ.

Morning-glory.

"(No. 360a.) *Bejuco blanco*. A climber, said to produce large white flowers in December."

50662. *JACQUINIA GRACILIS* Mez. Theophrastaceæ.

"(No. 356a. Herb. No. 957.) *Duruche*. Described as a small tree, producing in January many fragrant yellow flowers."

50663. *JACQUINIA GRACILIS* Mez. Theophrastaceæ.

"(No. 356a.) *Duruche*. Described as a small tree, producing in January many fragrant yellow flowers."

50664. *MAXIMILIANEA VITIFOLIA* (Willd.) Krug and Urb. Cochlospermaceæ.
(*Cochlospermum hibiscoides* Kunth.)

"(No. 346a.) *Tecomasuche*. A handsome plant, first introduced from Guatemala in 1917; but it has seemed worth while to obtain additional seed. In habit it is a small tree, with long, stiff unbranched growths from the main trunk, terminating in clusters of leaves which fall during the dry season and are replaced by clusters of flowers of the form and color of large California poppies (*Eschscholtzia californica*)."

For previous introduction, see S. P. I. 44821.

50665. *PETREA ARBorea* H. B. K. Verbenaceæ.

"(No. 365a. Herb. No. 954.) *Cuero de zapo*. This is one of the finest flowering climbers of the Tropics. It is occasionally seen in southern Florida gardens, but is deserving of much wider cultivation in that region than it enjoys at present. It is a vigorous climber, with oblong leaves about 4 inches in length and harsh to the touch, and trusses of star-shaped flowers of sky-blue color. It blooms more or less throughout the year, but is fairly covered with flowers in the early spring."

For previous introduction, see S. P. I. No. 49031.

50666. *PHYLLOCARPUS SEPTENTRIONALIS* Donn. Smith. Cæsalpiniaceæ.

"(No. 345a.) *Flor de mico* (monkey flower). From El Barranquillo, Department of El Progreso, altitude about 1,800 feet. This unusually handsome flowering tree was introduced in 1917, but at that time only

50652 to 50678—Continued.

a small quantity of seed could be obtained. I have, therefore, obtained an additional supply, so that the species can be given a wide trial in the Tropics and Subtropics."

For previous introduction, see S. P. I. No. 44775.

50667. PLOCOSPERMA BUXIFOLIUM Benth. Loganiaceæ.

"(No. 357a. Herb. No. 972.) *Barreto*. Described as a small tree, reaching about 20 feet in height and producing in April small purple flowers."

50668. PLUMERIA ACUTIFOLIA Poir. Apocynaceæ.

"(No. 354a.) *Palo de la Cruz*. Known in English as frangipani, the source of the perfume of the same name. A stiff, erect, small tree, reaching about 25 feet in height, the branches naked except for clusters of leaves at the summit of each, where also appear in early spring clusters of single white, star-shaped flowers of delicious fragrance. This species is probably already known in Florida, as several plumerias are grown there to a limited extent; but it deserves much wider dissemination than has yet been given it in that State."

50669. PODOPTERUS GUATEMALENSIS Blake. Polygonaceæ.

"(No. 349a. Herb. No. 973.) *Cruzito*. A small tree or large shrub, which produces in February and March a profusion of small white flowers of peculiar form. A curious and beautiful plant."

50670. SAPINDUS SAPONARIA L. Sapindaceæ.

"(No. 352a.) *Jaboncillo*. One of the soapberries. See S. P. I. No. 49781 [324a]."

50671. SECURIDACA SYLVESTRIS Schlecht. Polygalaceæ.

"(No. 347a. Herb. No. 964.) *Choreque*. A vigorous climber, producing trusses of reddish purple flowers. A handsome thing."

50672. STIGMAPHYLLON sp. Malpighiaceæ.

"(No. 351a.) *Coralillo*. Said to be a red-flowered climbing plant. I am not familiar with it."

50673. TABEBUIA sp. Bignoniaceæ.

"(No. 366a.) *Cacho de chibo*. Described as a medium-sized tree producing small white flowers in January."

50674. VERNONIA PATENS H. B. K. Asteraceæ.

"(No. 358a. Herb. No. 960.) *Suquinay*. Described as an arborescent shrub, about 10 feet high, bearing many small white flowers about the first of March."

50675. (Undetermined.)

"(No. 369a.) *Granadillo*. Described as a medium-sized tree which produces in December an abundance of small white flowers."

50676. SIMAROUBA GLAUCA DC. Simaroubaceæ.

"(No. 353a. Herb. No. 982.) *Jocote mico*. Described as a small tree which produces attractive flowers followed by terminal racemes of plum-like fruits said to be edible."

50677. KARWINSKIA sp. Rhamnaceæ.

"(No. 370a.) *Manzanito*. Described as a medium-sized tree which produces small white flowers in January."

50652 to 50678—Continued.**50678.** ASCLEPIAS CURASSAVICA L. Asclepiadaceæ.

“(No. 367a.) *Viborana*. Described as a small tree which produces small red flowers in March.”

50679 to 50681.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 26, 1920. Quoted notes by Mr. Popenoe.

50679. GUILIELMA UTILIS Oerst. Phœnicaceæ.

Palm.

(*Bactris utilis* Benth. and Hook.)

“(No. 391a. June 7, 1920.) *Pejibaye palm*. Seed of a remarkable food plant, of ancient cultivation in Costa Rica, and certainly deserving of wide dissemination in the Tropics. Pittier says: ‘The Indians [of Costa Rica] have cultivated it since a remote period, and it is not now known in the wild state.’ And Gagini quotes Alcedo to the effect that the fruit is almost the only food of the Guaimies and the Indians of southern Talamanca, in this country. It is to-day grown commercially in the vicinity of Tucurrique, on the Atlantic side, and is also known on the Pacific side, though not so abundant there. In the markets of San Jose the fruit is always in great demand and fetches a high price. The name is sometimes written *pejivalle*, *pjivay*, and *piabay*; it is pronounced pe-he-vy-e, with the e’s short.

“The palm is a beautiful pinnate-leaved species, with a slender trunk reaching to 50 feet, though commonly not more than 35 feet. The leaves resemble those of *Cocos plumosa* and other palms of that type, while the trunk is armed from top to bottom with thin, sharp spines about 2 inches long. Flowers are produced in spring, from March to June (occasionally at other times of the year), and are followed by stout racemes of fruit which matures principally in the autumn. The racemes sometimes weigh 25 pounds, and as many as five or six are produced by the palm in a single crop. The individual fruits are top shaped, up to 2 inches long, yellow to deep orange, with a thin skin, and a hard seed in the center surrounded by abundant flesh of orange or yellow color, firm texture, and dry, farinaceous character. Seedless varieties are known, and since these can be propagated, like date palms, by means of offshoots, of which the plant produces several in the course of its life, the establishment of superior forms should be simple.

“The pejibaye, which is one of the most popular of all Costa Rican fruits (though it should not, perhaps, be called a fruit, except in the botanical sense), is prepared for eating by boiling it for three hours in salted water, after which the skin is pared off with a knife, and the flesh, which strikingly resembles boiled chestnuts in appearance and flavor, is eaten without seasoning of any sort. Doubtless the fruit would lend itself to many uses, such as stuffing for fowl, but it is so good in its simple form that Costa Ricans have not sought to improve it by bringing it under the influence of the culinary art.

“The palm is said to come into bearing at 6 to 8 years from seed, and to live at least 50 years. It is found in Costa Rica from sea level up to 5,000 feet elevation, but in extremely wet regions above 4,000 feet some of the palms do not bear. The ideal region for it seems

50679 to 50681—Continued.

to be, in this country, between 2,000 and 3,000 or 3,500 feet and where the rainfall is not great. It does not appear to be particular as regards soil.

"The fruit contains about 40 per cent of carbohydrates, and according to an analysis made in San Jose, one pound of the flesh represents 1,096 calories of energy, which entitles the pejobaye to serious consideration as a food plant. All in all, it seems to me that it should be widely planted in tropical regions. In the United States, it may perhaps succeed in southern Florida, but the climate of California is probably too cool for it."

For previous introduction, see S. P. I. No. 44268.

50680. *PERSEA AMERICANA* Mill. Lauraceæ. Avocado.
(*P. gratissima* Gaertn. f.)

"(Nos. 382 and 395. May 27, 1920, and June 9, 1920. Cuttings of Avocado No. 42, from the residence of Margarita Muñoz, 4a Avenida Este and 5a Calle Sur, San Jose.) This avocado was called to my attention by Don Anastasio Alfaro, Director of the National Museum. He recommends it as one of the finest known to him, and a variety of unusually late ripening season. The parent tree, which stands in a small back yard, about 10 feet from a house, is 30 feet high, slender in form, with a straight trunk 15 inches thick at the base, branched 8 feet above the ground. At this time (June, 1920) the fruits are not half grown, but judging by their present appearance and a plaster of Paris model made last year by Sr. Alfaro, it is possible to say that the form is oval to broad pyriform and that it is up to one pound in weight. The color is said to be green, the seed not unreasonably large, and the flesh of excellent quality. The season of ripening is September to November, sometimes to December. Most of the avocados in this region ripen in August and September. The tree is a heavy bearer, the fruits sometimes being produced in clusters of two or three."

50681. *RUBUS* sp. Rosaceæ. Blackberry.

"(No. 390a. June 7, 1920.) A wild blackberry which occurs in the vicinity of San Jose. The seeds sent under this number are from fruits purchased in the market. This species produces fruits about an inch long, in form and general character resembling the cultivated blackberries of the North. The quality is fairly good, though the flavor is a trifle too acid. Of interest principally to those engaged in breeding new forms of blackberries."

50682 to 50685.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 15, 1920. Quoted notes by Mr. Popenoe.

50682. *CHAYOTA EDULIS* Jacq. Cucurbitaceæ. Chayote.
(*Sechium edule* Swartz.)

"(No. 380a. May 27, 1920.) A good variety of chayote from the San Jose market. The fruits are broadly obovoid in form, nearly round, about 3 inches long, and waxy white. There are a few short spines on the surface."

50682 to 50685—Continued.**50683. COCCOLOBIS** sp. Polygonaceæ.

“(No. 376. May 27, 1920.) Plants presented by Carlos Wercklé, El Coyolar, Costa Rica. Mr. Wercklé described this as a small tree, ever-green, much branched, and handsome in appearance. It produces blue-black fruits the size of small plums, with juicy flesh of acid, somewhat astringent flavor, good for making jellies and preserves and also for eating out of hand when of a good variety. The single stone is rather large. This plant may succeed in southern Florida. It is from the lowlands of Costa Rica and hence tropical in its requirements.”

50684. MARANTA sp. Marantaceæ.

“(No. 377. May 27, 1920.) *Lairen*. Roots presented by Carlos Wercklé, El Coyolar, Costa Rica. A plant allied to arrowroot and greatly resembling it in appearance. It yields large numbers of plump tubers, 2 to 4 inches long. These contain much starch, and can be eaten when boiled, though they never become soft or mealy. Mr. Wercklé thinks the species may be of value as a source of starch because of the large quantity of tubers which each plant produces.”

50685. NECTANDRA GLABRESCENS Benth. Lauraceæ.

“(No. 379a. Seed from Rancho Redondo, near San Jose, elevation about 1,500 meters. May 27, 1920.) A round-topped tree growing to about 40 feet, and producing fruits which look like small avocados of the Mexican race. They are obovoid in form, nearly 2 inches long, with a thin black skin and yellow flesh of oily texture and strong aniselike taste which makes them inedible. Of interest as a possible stock plant for the avocado.”

50686 and 50687.

From Kisantu, Belgian Kongo. Seeds presented by Father H. Vanderyst. Received June 29, 1920.

50686. ANDROPOGON sp. Poaceæ.

Grass.

Numbered for convenience in testing by the Office of Forage-Crop Investigations.

50687. BRACHIARIA BRIZANTHA (Hochst.) Stapf. Poaceæ.

Grass.

(*Panicum brizanthum* Hochst.)

“A tall grass, especially on the higher land. It is very abundant on the uplands and forms a large part of the great grass cover of this grassland country.” (*Shantz*.)

For previous introduction, see S. P. I. No. 49687.

50688. PERSEA AMERICANA Mill. Lauraceæ.

Avocado.

(*P. gratissima* Gaertn f.)

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 15, 1920.

“(No. 485.)” (*Popenoe*.)

50689 and 50690.

From Kisantu, Belgian Kongo. Seeds presented by Father H. Vanderyst.
Received July 29, 1920.

50689. *CHAETOCLOA* sp. Poaceæ. Grass.

Numbered for convenience in testing by the Office of Forage-Crop Investigations.

50690. *CHAETOCLOA LUTESCENS* (Weigel) Stuntz. Poaceæ. Grass.

Numbered for convenience in testing by the Office of Forage-Crop Investigations.

50691 and 50692.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received June 15, 1920. Quoted notes by Mr. Popenoe.

50691. *RUBUS GLAUCUS* Benth. Rosaceæ. Andes berry.

"(No. 378a. Seed from Rancho Redondo, near San Jose. May 27, 1920. Herb. No. 988.) *Mora de Castilla*. This is either the same species sent from northern Guatemala under the name of *tokan-uuk*, or one of very similar character. The plant resembles the *tokan-uuk* very closely, and the fruit is of the same size and form but lighter in color, being of a light-red shade. It has a delicious aroma, suggesting strawberries. The fruit is oblong or somewhat ovate, up to an inch in length, very plump, soft and juicy when ripe. Several species of *Rubus* are given the common name *mora de Castilla*: this is used to indicate, in fact, any *Rubus* that produces good fruits of blackberry or raspberry character."

For previous introduction, see S. P. I. No. 49387.

50692. (Undetermined.)

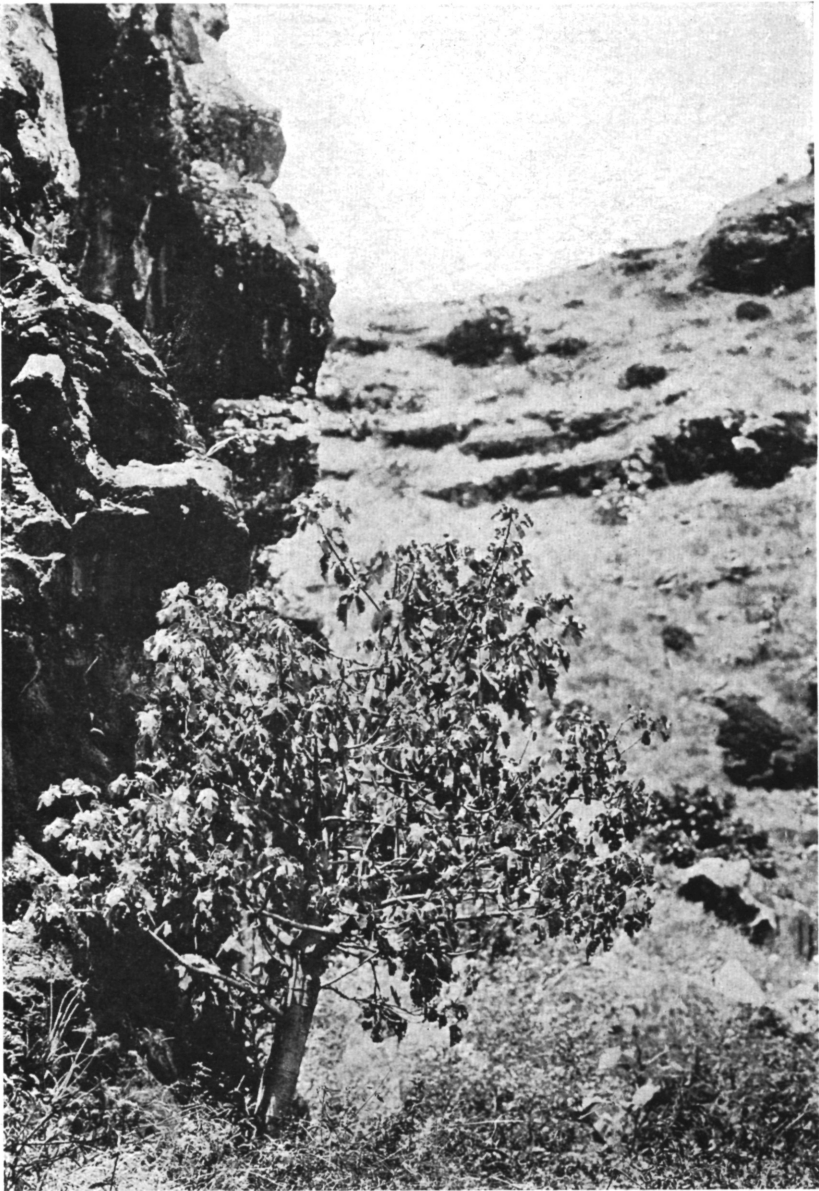
"(No. 375a. May 27, 1920.) *Fruta de pava*. Plants presented by Carlos Wercklé, of El Coyolar, Costa Rica. A large tree native to this region. Mr. Wercklé believes it is a new species, perhaps representing a genus not yet described botanically. The fruit is about an inch long, shining black, with dark-purple flesh inclosing a single elongated stone. The flavor is agreeable, not sour but sometimes astringent. The young fruits are yellow, later turning red, then black. It is from the lowlands and likely to succeed in the United States only in southern Florida."

50693. *HIBISCUS BRACKENRIDGEI* A. Gray. Malvaceæ.

From Honolulu, Hawaii. Seed presented by J. F. Rock. Received June 30, 1920.

"A striking and well-marked rather rare species with a shrubby erect stem, 4 to 5 feet high, stiff spreading branches, and rather stout, very leafy flowering stalks. It is worthy of cultivation on account of its showy yellow flowers. The smooth, bright-green leaves on long petioles are rounded in outline, $3\frac{1}{2}$ to 4 inches in diameter and 5 to 7-lobed, somewhat resembling those of the common grapevine. The spreading yellow corolla is about 6 inches across. Found in the scrub vegetation of the leeward side of Oahu, East and West Maui, and Lanai." (Rock.)

A wild shrub of this species and a single flower are shown in Plates I and II.



A NEW AND BRILLIANT HAWAIIAN HIBISCUS. (HIBISCUS BRACKENRIDGEI A. GRAY, S. P. I. NO. 50693.)

This extremely rare species of Hibiscus, which Mr. Rock found growing among the stones at the base of a cliff on the windward side of the island of Oahu, is a thing of rare beauty when covered with its large yellow flowers. Since it grows under arid and rather severe conditions it may be found useful as an ornamental plant in some parts of tropical America which, because of unfavorable climate and soil, are not well suited to the cultivation of many of the common tropical ornamentals. (Photographed by J. F. Rock, Oahu, Hawaii, March, 1918; P27003FS.)



A HAWAIIAN HIBISCUS THAT SHOULD BE WIDELY CULTIVATED. (HIBISCUS BRACKENRIDGEI A. GRAY, S. P. I. No. 50693.)

The deep canary-yellow flowers of this exceedingly rare Hibiscus are 6 inches across. Only a few wild plants are in existence (one is shown in Plate I), and the species seems not to have found its way into American horticulture, although Hillebrand called attention to the possibilities of its culture more than 30 years ago. (Photographed by J. F. Rock, Oahu, Hawaii, March, 1918; P27004FS.)

50694 to 50709.

From Honolulu, Hawaii. Seeds presented by Dr. H. L. Lyon, Department of Botany and Forestry. Collected by A. Schwarz near Tjibodas, Java. Received June 29, 1920. Quoted notes by Mr. Schwarz.

50694. ALBIZZIA MONTANA (Jungb.) Benth. Mimosaceæ.

A shrub or small tree with spreading branches and oblong-linear silky pubescent or glabrous leaflets. The flowers are on very short pedicels in cylindrical spikes. The somewhat falcate pods contain brownish black seeds. Native to Java. (Adapted from *Valton, Boomsorten van Java, vol. 1, p. 295.*)

50695. ALTINGIA EXCELSA Noronha. Hamamelidaceæ.

"A magnificent tree of the tropical evergreen forests of the Indian Archipelago and northeastern India. In Java it yields in small quantity an odorous medicinal resin known in Europe as storax, which is obtained by incisions in the trunk; the tree is not regularly cultivated. The soft reddish gray wood with lighter streaks is used in Assam for building and ordinary domestic purposes." (*Watt, Dictionary of the Economic Products of India, vol. 1, p. 201.*)

50696. ELAEOCARPUS SPHAERICUS (Gaertn.) Schum. Elæocarpaceæ.
(*E. ganitrus* Roxb.)

"*Djianitu.*"

A large tree found in Nepal, Assam, and the Konkan Ghats. The hard-grooved and elegantly tubercled nuts are polished and made into rosaries and bracelets. They are frequently set in gold and are often imported from Singapore, where the tree is common. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 3, p. 205.*)

50697. FICUS NOTA (Blanco) Merr. Moraceæ. Fig.

A medium-sized tree with broadly ovate leaves 15 to 25 centimeters long, more or less pubescent; numerous green or purplish, pear-shaped receptacles, 3 centimeters in diameter, are borne in masses on specialized leafless branches from the trunk and larger branches. This tree is common in the Philippine forests both in the lowlands and in the hills, reaching a height of 8 to 10 meters. The abundant milky sap when coagulated is similar in appearance and physical characteristics to the gum of *Achras zapota* (the gum chicle of commerce) which is used in the manufacture of chewing gum. (Adapted from *Merrill, New or Noteworthy Philippine Plants, No. 2, Bureau of Government Laboratories, No. 17, p. 10.*)

50698. FICUS ODORATA (Blanco) Merr. Moraceæ. Fig.

A Philippine tree, 15 to 18 feet high, marked by its peculiarly strongly inequilateral, very rough, fragrant leaves which are sublanceolate with a one-sided rounded margin at the base. It is not very well known. (Adapted from *Blanco, Flora de Filipinas, vol. 3, p. 89.*)

50699. FICUS ULMIFOLIA Lam. Moraceæ. Fig.

A Philippine plant with gray, woody branches covered at the tip with short rigid hairs. The ovate scaly leaves, unequally acuminate at base and tip, are sparsely bordered with shallow teeth which form remarkable sinuses at the summit. The globular, axillary fruits are mostly solitary and are the size of a small cherry or currant. (Adapted from *La Marck, Encyclopédie Méthodique Botanique, vol. 2, p. 499.*)

For previous introduction, see S. P. I. No. 35449.

50694 to 50709—Continued.

50700. *FICUS* sp. Moraceæ.

“(No. 1117.)”

50701. *PARKIA TIMOBIANA* (DC.) Merr. Mimosaceæ. Cupang.(*P. roxburghii* G. Don.)

“(No. 1183.)”

A huge and remarkably handsome quick-growing tree, attaining a height of 120 feet or more, with a clear smooth trunk and beautiful, fine-feathery pinnate leaves. Native to Malaya, Burma, etc., it has been introduced into and become well established in Ceylon, thriving in the moist low country up to 2,000 feet. The clusters of long pods contain a quantity of white, powdery, farinaceous substance. Easily propagated by seed. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting*, p. 311.)

For previous introduction, see S. P. I. No. 47948.

50702. *PTEROSPERMUM* sp. Sterculiaceæ.

“(No. 1182, from Siam.)”

50703. *QUERCUS JAVANICA* (Blume) Drake. Fagaceæ. Oak.“(No. 1112.) *Passang batoe.*”

An exceedingly beautiful tree with oblong-lanceolate glabrous tawny leaves; the aments and young leaves are reddish tomentose. (Adapted from *Blume, Bijdragen tot de Flora van Nederlandsch Indië*, vol. 1, p. 525.)

50704. *QUERCUS THELECARPA* Miquel. Fagaceæ. Oak.“(No. 1111.) *Passang soeroe.*”

A tree 25 meters tall with very smooth coriaceous leaves, shining above and glaucescent beneath. The cups of the sessile fruits are 12 millimeters high and 40 millimeters across. The thick hull is broadly ovate with a prominent graceful tip. The semiglobose acorn, 20 to 25 millimeters high, and 23 to 34 millimeters broad, is somewhat furrowed. Native to Java. (Adapted from *Valeton, Boomsoorten van Java*, vol. 10, p. 28.)

50705. *QUERCUS* sp. Fagaceæ. Oak.“(No. 1110.) *Passang bodas.*”50706. *QUERCUS* sp. Fagaceæ. Oak.“(No. 1109.) *Passang djamba.*”50707. *QUERCUS* sp. Fagaceæ. Oak.“(No. 1113.) *Passang kejan* or *keang.*”50708. *QUERCUS* sp. Fagaceæ. Oak.“(No. 1114.) *Passang tonogo.*”50709. *SCHIMA NORONHAE* Reinw. Theaceæ.

A tree 30 to 60 feet high, with elliptic-acute leaves 6 inches long, lead colored above. The white fragrant flowers are in a loose terminal corymb. Native to the eastern Indian Peninsula from Tenasserim to Penang. (Adapted from *Hooker, Flora of British India*, vol. 1, p. 289.)

50710. COLOCASIA sp. Araceæ.**Taro.**

From Quinto do Palheiro, Funchal, Madeira. Tubers presented by J. Ernest Blandy, American consul. Received June 18, 1920.

"*Igname branca*. A variety of taro apparently identical with the yellow tanyah grown in the coast regions of South Carolina and Georgia. The corms are intensely acrid in the raw state and require boiling for fully two hours to destroy this property and render them edible. They are of very pronounced flavor, but are preferred to most other taros by those who have acquired the taste for them. The buds are white, and the skin is without color beneath the brown fiber. It is of interest to note that the other taro, *igname vermeilho*, cultivated in Madeira, is apparently identical with the blue tanyah of the South Atlantic States." (R. A. Young.)

For previous introduction, see S. P. I. No. 19996.

50711 to 50725.

From Darjiling, Bengal, India. Seeds presented by G. H. Cave, curator, Lloyd Botanic Garden. Received June 30, 1920.

50711. ACACIA CATECHU L. Mimosaceæ.

A moderate-sized deciduous tree, common in most parts of India and Burma, with dark-brown much-cracked bark, bipinnate leaves, and spikes of white or pale-yellow flowers. The plant yields a pale-yellow gum, and a dull-red dye can be obtained from a solution of catechu, the commercially important astringent resinous extract obtained from the chopped wood by boiling for 20 hours.

Kath, largely used as an ingredient in the betel-leaf preparation which the natives are so fond of chewing, is a crystalline substance deposited upon twigs placed in the boiling solution of chopped wood. It is the kath in combination with lime in the betel-leaf preparation which gives the teeth and lips the red color so characteristic of Hindus. Continued use blackens the teeth.

The sapwood is yellowish white; the heartwood is either dark or light red and extremely hard. The wood is very durable, seasons well, and takes a fine polish. It is not attacked by white ants or by teredo. It is used for agricultural implements and wheelwright work. The fuel of the dead trees is much valued by goldsmiths and is one of the best woods for making charcoal. (Adapted from Watt, *Dictionary of the Economic Products of India*, vol. 1, p. 27.)

For previous introduction, see S. P. I. No. 45954.

50712. ALBIZZIA CHINENSIS (Osbeck) Merr. Mimosaceæ.

(*A. stipulata* Bolv.)

A shade tree of easy culture, which is a native of continental and insular southern Asia, extending to the Himalayas and China and ascending to altitudes of 4,000 feet. (Adapted from Mueller, *Select Extra-Tropical Plants*, p. 30.)

For previous introduction, see S. P. I. No. 42356.

50713. ALBIZZIA LEBBECK (L.) Benth. Mimosaceæ.**Lebbeck tree.**

A large deciduous spreading ornamental tree exceedingly good for avenues. Its roots do not penetrate very deep. It grows in the ever-green mixed forests in the sub-Himalayas from the Indus River east-

50711 to 50725—Continued.

ward, in Bengal, Burma, central and southern India, ascending to 5,000 feet in altitude. The bark is used in tanning; and the oil extracted from the astringent seeds is considered useful in leprosy. The leaves are used for camel fodder, and the tree is often cultivated for this purpose. It may be propagated readily by cuttings, grows rapidly, and flourishes in almost any soil, especially on canal embankments and roadsides, affording both fodder and fuel where these are otherwise scarce. The sapwood is white, and the heartwood is dark brown, hard, shining, mottled, with deeper longitudinal streaks. It seasons, works, and polishes well, and is fairly durable. It is used for picture frames, sugar-cane crushers, furniture, buildings, canoes, and wheelwork. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 156.*)

For previous introduction, see S. P. I. No. 42809.

50714. *ALNUS NEPALENSIS* D. Don. Betulaceæ.

A deciduous tree with elliptic-lanceolate entire or subentire leaves and fruiting spikes in large erect panicles; the nutlets have a membranous wing. Native to the temperate Himalayas and the Khasi Hills. (Adapted from *Hooker, Flora of British India, vol. 5, p. 600.*)

For previous introduction, see S. P. I. No. 47635.

50715. *BERBERIS NAPAULENSIS* (DC.) Spreng. Berberidaceæ. **Barberry.**

A shrub, native to the temperate Himalayas and the Khasi Hills, 3 to 20 feet high, leafy near the top only. The bipinnate leaves are coriaceous and the erect racemes of fascicled yellow flowers are followed by bitter, violet-glaucous berries. (Adapted from *Hooker, Flora of British India, vol. 1, p. 109.*)

For previous introduction, see S. P. I. No. 47646.

50716. *BOMBAX MALABARICUM* DC. Bombacaceæ.

A very large deciduous tree with branches in whorls, spreading horizontally, and the stem with large thorny buttresses. It is native to the hotter forests of India and Burma, and is the largest and most characteristic tree of eastern Rajputana. The trunk and branches are covered with large corky prickles. The inner bark yields a good fiber, suitable for cordage; the seeds yield the so-called silk cotton, too short and too soft to be spun, but largely used for stuffing pillows, etc., and for gun cotton. The flower buds are eaten as a potherb. The leaves and twigs are lopped for fodder. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 1, p. 156.*)

For previous introduction, see S. P. I. No. 48025.

50717. *ERIOBOTRYA HOOKERIANA* Decaisne. Malaceæ.

A small robust tree with elliptic-lanceolate coarsely serrate coriaceous leaves, thickly covered with rusty tomentum when young, glabrous when old. The panicles of white flowers are followed by yellow ellipsoid fruits, three-fourths of an inch long. Native to the eastern Himalayas, Sikkim, and Bhutan, at altitudes of 4,000 to 6,500 feet. (Adapted from *Hooker, Flora of British India, vol. 2, p. 371.*)

50718. *LOBELIA ROSEA* Wall. Campanulaceæ.

A tall suberect herb, 4 to 12 feet high, with short branches, horizontal with drooping tips, and narrowly lanceolate leaves, 6 inches long,

50711 to 50725—Continued.

velvety above. The rose or white flowers are crowded in short racemes. Native to the subtropical Himalayas from Kumaon to Bhutan, and the Khasi Hills at altitudes up to 4,000 feet. (Adapted from *Hooker, Flora of British India, vol. 3, p. 427.*)

For previous introduction, see S. P. I. No. 49648.

50719. *MISCANTHUS NEPALENSIS* (Trin.) Hack. Poaceæ. Grass.

A perennial grass with erect stems 3 to 6 feet high and linear leaves 6 to 18 inches long. The 1-flowered spikelets are partially enveloped in a tuft of long, silky, shining, golden yellow hairs. Native to the temperate Himalayas at altitudes of 5,000 to 8,000 feet, and to the Khasi and Naga Hills. (Adapted from *Collett, Flora Simlensis, p. 590.*)

For previous introduction, see S. P. I. No. 47735.

50720. *MORUS INDICA* L. Moraceæ. Mulberry.

A moderate-sized deciduous tree or shrub, found in the temperate Himalayas from Kashmir to Sikkim, ascending to 7,000 feet. It is largely cultivated in many parts of India for purposes of silk culture. The fiber was in very early times used by the Chinese for paper making and the twigs left by the silkworms and now thrown away might yield good half stuff for the paper maker. The fruit has an agreeable aromatic and acid flavor. The leaves are also valuable for fodder. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 5, p. 281.*)

50721. *PYGEUM ACUMINATUM* Colebr. Amygdalaceæ.

An evergreen tree with glabrous oblong-lanceolate leaves, 4 to 6 inches in length and equally long racemes of yellow-green flowers. The dark-purple drupe is 1 inch in diameter. Native to eastern Bengal and the Khasi Hills. (Adapted from *Hooker, Flora of British India, vol. 2, p. 318.*)

50722. *QUERCUS INCANA* Roxb. Fagaceæ. Oak.

A large evergreen tree found on the temperate Himalayas from the Indus River to Nepal, between altitudes of 3,000 and 8,000 feet. In spring it becomes purplish owing to the brush of fresh new leaves, which are softly tomentose. The bark yields a small quantity of a reddish fawn coloring matter which can be used in dyeing silk and cotton. The galls are used in the Punjab for dyeing hair. The bark is extensively employed for tanning purposes. The acorns form the astringent medicine known in the Punjab bazaars as balút; they are greedily eaten by monkeys and bears. The leaves are extensively lopped for fodder. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 6, pt. 1, p. 332.*)

50723. *RUBUS ROSAEFOLIUS* J. E. Smith. Rosaceæ.

An erect, branching Himalayan shrub which is very attractive because of its evergreen foliage, delicate white flowers, and especially its bright-red fruits, charming to the eye but rather insipid to the taste. (Adapted from *Curtis's Botanical Magazine, pl. 6970.*)

For previous introduction, see S. P. I. No. 39658.

50724. *SAPINDUS MUKOROSI* Gaertn. Sapindaceæ. Soapberry.

A tree 60 to 80 feet high, known as the *hou-erh-tsaou*, which occurs throughout the Yangtze Valley up to altitudes of 3,000 feet. The

50711 to 50725—Continued.

panicles of flowers are followed by shining brown, globose fruits about the size of large marbles. The fruits are used for washing white clothes, being considered for this purpose superior to *Gleditsia* pods. (Adapted from *Wilson, A Naturalist in Western China, vol. 2, p. 72.*)

For previous introduction, see S. P. I. No. 26280.

50725. *SPATHOLOBUS PARVIFLORUS* (Roxb.) Kuntze. Fabaceæ.

(*S. roxburghii* Benth.)

A gigantic climber common in the forests of the lower Himalayas in northeastern India and in Ceylon. A red gum resembling kino exudes from this plant; the seeds yield an oil used for cooking and for anointing purposes. A fiber obtained from the bark is twisted into ropes and bowstrings. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 6, pt. 3, p. 319.*)

50726 to 50966.

From Zanzibar, Zanzibar. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received June 8, 1920. Quoted notes by Doctor Shantz.

50726. *AMARANTHUS* sp. Amaranthaceæ. **Amaranth.**

“(No. 871. Nyanza, Urundi. March 19, 1920.) The leaves constitute the African spinach extensively eaten by natives and Europeans. Grown about every cabin.”

50727. *ANANAS SATIVUS* Schult. f. Bromeliaceæ. **Pineapple.**

“(No. 941. Zanzibar, Zanzibar. April 6, 1920.) A large type; not grown very extensively near Zanzibar.”

50728. *ANNONA MURICATA* L. Annonaceæ. **Soursop.**

“(No. 624. Kigoma, Tanganyika Territory. February 20, 1920.) Probably the same as No. 511 and 527 [S. P. I. Nos. 35695 and 49979]. It is grown in many places and yields a heavy crop.”

50729 and 50730. *ANNONA RETICULATA* L. Annonaceæ. **Custard-apple.**

50729. “(No. 620. Kigoma. February 20, 1920.) Probably the same as sent before. This fruit is planted almost everywhere in the European settlements. It is probably less abundant than the soursop.”

For previous introduction, see S. P. I. No. 49289.

50730. “(No. 869. Nyanza, Urundi. March 19, 1920.) Locally they often turn dark blue and dry up without ripening, due to drought.”

50731. *ANNONA SENEGALENSIS* Pers. Annonaceæ.

“(No. 667. M'Sala, Urundi. February 24, 1920.) Seed from an old fruit. I have had no opportunity to test this fruit. Leaves very large and broad.”

For previous introduction, see S. P. I. No. 38525.

50732. *ARACHIS HYPOGAEA* L. Fabaceæ. **Peanut.**

“(No. 639. Kigoma. February 21, 1920.) Peanuts. They are grown everywhere with corn, manihot, etc. A very important element of diet; much more widely grown than Voandzeia.”

50726 to 50966—Continued.

50733. ARECA CATECHU L. Phœnicaceæ. **Betel-nut palm.**

“(No. 924. Malongwe, Tanganyika Territory. March 29, 1920.) The nut is chewed by almost everyone with pepper leaf, tobacco, lime, and gambier.”

For previous introduction, see S. P. I. No. 45478.

50734. BAUHINIA KAPPLERI Sagot. Cæsalpiniaceæ.

“(No. 918. Tabora, Tanganyika Territory. March 27, 1920.) A handsome pink-flowered tree, like a mopaine [*Copaiva mopane*] with long pods (6 inches) and small seeds buried in flour.”

50735. BYRSOCARPUS sp. Connaraceæ.

“(No. 698. Nyanza, Urundi. February 29, 1920. Herb. No. 692.) A beautiful small shrub with highly ornamental ripe pod and seed.”

50736 to 50738. CAJAN INDICUM Spreng. Fabaceæ. **Pigeon-pea.**

50736. “(No. 660. M'Sala. February 24, 1920. Herb. No. 680.) A tall pea same as No. 531 [S. P. I. No. 49986] and grown by all natives both in the Kongo and about Lake Tanganyika. Usually eaten as a green pea; grows on woody bush 6 to 8 feet high.”

50737. “(No. 930. Dar es Salaam, Tanganyika Territory. April 1, 1920.) A gray or light chocolate pigeon-pea.”

50738. “(No. 934. Zanzibar. April 6, 1920.) Pigeon-pea similar to No. 930 [S. P. I. No. 50737].”

50739. CANAVALI GLADIATUM (Jacq.) DC. Fabaceæ. **Sword bean.**

“(No. 910. Kigoma. March 26, 1920.) A very large red bean, many in a pod. From gardens.”

For previous introduction, see S. P. I. No. 44806.

50740. CANNA sp. Cannaceæ. **Canna.**

“(No. 708. Nyanza, Urundi. March 2, 1920.) Abundant in the Kongo and occasional here. Seed used in rattles at the dances, which seems to be its chief use by the natives.”

50741. CANNA sp. Cannaceæ. **Canna.**

“(No. 868. Nyanza, Urundi. March 19, 1920.) Red canna; seeds used in rattles for dancing.”

50742 and 50743. CAPSICUM ANNUM L. Solanaceæ. **Red pepper.**

50742. “(No. 626. Kigoma. February 20, 1920.) A long red pepper, the principal type grown here. It is one-eighth of an inch in diameter.”

50743. “(No. 627. Kigoma. February 20, 1920.) A small red pepper, globular, and about one-fourth of an inch in diameter.”

50744. CASSIA SIAMEA Lam. Cæsalpiniaceæ.

“(No. 643. Ujiji, Tanganyika Territory. February 22, 1920. Herb. No. 676.) One of the principal street trees.”

For previous introduction, see S. P. I. No. 42362.

50745 and 50746. CEIBA PENTANDRA (L.) Gaertn. Bombacaceæ. **Капок.**
(*Eriodendron anfractuosum* DC.)

50726 to 50966—Continued.

50745. "(No. 673. Nyanza, Urundi. February 27, 1920.) Trees planted along the walks; also used as a street tree in towns. These trees are branched from the base and have very smooth green bark. The cotton is not used by the natives."

For previous introduction, see S. P. I. No. 49442.

50746. "(No. 765. Nyanza, Urundi. March 9, 1920.) Bombax or kapok, a very attractive street tree with green bark and leaves like *Manihot*. This tree was planted everywhere by the Germans and they are supposed to have perfected machinery to weave the silk cotton into cloth."

50747. *CISSUS* sp. Vitaceæ.

"(No. 776. Nyanza, Urundi. March 9, 1920. Herb. No. 706.) An ampelopsis or grapelike vine; a few dark fruits."

50748. *CLEMATIS* sp. Ranunculaceæ.

Clematis.

"(No. 848. N'gano N'gano, Urundi. March 17, 1920.) A low herb-like clematis."

50749. *CRACCA POLYSTACHYA* (E. Mey.) Kuntze. Fabaceæ.

(*Tephrosia polystachya* E. Mey.)

"(No. 697. Nyanza, Urundi. February 29, 1920. Herb. No. 693.) A legume with pink flowers and small hairy pods."

50750. *CRACCA* sp. Fabaceæ.

"(No. 731. M'Sala, Urundi. March 7, 1920. Herb. No. 704.) A small wild bean very abundant on sandy soil."

50751. *CROTALARIA STRIATA* Schrank. Fabaceæ.

"(No. 678. Nyanza, Urundi. February 28, 1920.) A plant with very small flowers arranged in spikes."

For previous introduction, see S. P. I. No. 34670.

50752. *CROTALARIA* sp. Fabaceæ.

"(No. 661. Nyanza, Urundi. February 26, 1920. Herb. No. 709.) A tall yellow-flowered attractive crotalaria which bears a heavy crop of seed and may be valuable as a green manure or as a fiber plant."

50753. *CROTALARIA* sp. Fabaceæ.

"(No. 671. M'Sala. February 24, 1920.) An unusually prolific and large-podded crotalaria, probably the same as No. 661 [S. P. I. No. 50752] or No. 672 [S. P. I. No. 50754]."

50754. *CROTALARIA* sp. Fabaceæ.

"(No. 672. M'Sala. February 24, 1920.) With smaller pod, but a very heavy yield. Similar to No. 671 [S. P. I. No. 50753]. I have not seen these plants used here by the natives, but they have ornamental value if no other."

50726 to 50966—Continued.

50755 to 50757. *CUCUMIS SATIVUS* L. Cucurbitaceæ. Cucumber.

50755. "(No. 641. Ujiji. February 22, 1920.) A large cucumber, 8 inches long and 4 inches in diameter, of very good flavor. It looks more like a squash. I have been unable to get a thoroughly ripe fruit. These seeds are somewhat immature."

50756. "(No. 925. Malongwe. March 29, 1920.) A brown-skinned cucumber."

50757. "(No. 926. Malongwe. March 29, 1920.) Coat yellow with dark-green streaks."

50758. *CUCURBITA PEPO* L. Cucurbitaceæ. Pumpkin.

"(No. 631. Kigoma, Tanganyika Territory. February 2, 1920.) A sweet, green pumpkin, prized locally."

50759. *CYMOPOGON* sp. Poaceæ. Grass.

"(No. 846. N'gano N'gano, Urundi. March 17, 1920.) A small Andropogonlike or Stipalike grass about 15 inches high, one of the good cattle grasses. Should do well in the mountain country of Arizona, New Mexico, Oregon, Washington, and California."

50760. *DOLICHOS LABLAB* L. Fabaceæ. Bonavist bean.

"(No. 701. Nyanza, Urundi. February 29, 1920. Herb. No. 701.) A bean which forms a long vine and grows abundantly on waste land. It is somewhat ornamental."

50761. *DOLICHOLUS* sp. Fabaceæ.

"(No. 704. Nyanza, Urundi. February 29, 1920.) A coarse beanlike vine with peculiar small blue seeds."

50762. *ELAEIS GUINEENSIS* Jacq. Phœnicaceæ. Oil palm.

"(No. 628. Kigoma, Tanganyika Territory. February 20, 1920.) The oil palm; planted extensively everywhere here. It is an important food plant."

50763. *ELEUSINE CORACANA* (L.) Gaertn. Poaceæ. Ragi millet.

"(No. 866. N'gano N'gano, Urundi. March 18, 1920.) A grain crop of the Urundi Mountains."

For previous introductions, see S. P. I. No. 48456.

50764 and 50765. *ERAGROSTIS TREMULA* Hochst. Poaceæ. Grass.

50764. "(No. 644. Ujiji. February 22, 1920.) A grass which grows well as a ruderal."

50765. "(No. 645. Ujiji. February 22, 1920. Herb. No. 677.) Similar to No. 644 [S. P. I. No. 50764], taller."

50766. *ERAGROSTIS* sp. Poaceæ. Grass.

"(No. 839. N'gano N'gano, Urundi. March 5, 1920. Herb. No. 714.) A semiruderal grass which may be a good forage plant."

50767. *ERAGROSTIS* sp. Poaceæ. Grass.

"(No. 851. N'gano N'gano, Urundi. March 17, 1920.) A grass similar to *Eragrostis major*. Abundant, but never very important in natural sod."

50726 to 50966.—Continued.

50768. *ERYTHRINA* sp. Fabaceæ.

“(No. 777. Nyanza, Urundi. March 9, 1920. Herb. No. 705.) An ornamental tree with a red bean, probably the same as No. 347 [S. P. I. No. 49588]. Planted as a windbreak and as an ornamental.”

50769. *FICUS* sp. Moraceæ.

Fig.

“(No. 861. N'gano N'gano, Urundi. March 18, 1920.) A small fig eaten by the natives. Plant about 1 foot high.”

50770. *GLADIOLUS* sp. Iridaceæ.

Gladiolus.

“(No. 665. M'Sala. February 24, 1920.) A few seed.”

50771. *GLADIOLUS* sp. Iridaceæ.

Gladiolus.

“(No. 863. N'gano N'gano, Urundi. March 18, 1920.) Blue gladiolus with two small reddish spots on the side petals. A very handsome flower.”

50772. *GLADIOLUS* sp. Iridaceæ.

Gladiolus.

“(No. 864. N'gano N'gano, Urundi. March 18, 1920.) Red mottled or streaked over yellow.”

50773. *GLORIOSA* sp. Melanthaceæ.

“(No. 666. Nyanza, Urundi. February 26, 1920.) Seed of a lilylike plant. No flowers seen.”

50774. *GOMPHOCARPUS PHYSOCARPUS* E. Mey. Asclepiadaceæ.

“(No. 729. M'Sala, Urundi. March 7, 1920. Herb. No. 703.) An attractive asclepiad which may have value as a fiber plant.”

50775. *GOSSYPIUM* sp. Malvaceæ.

Kidney cotton.

“(No. 646. Uji. February 22, 1920.) The type grown by the natives. The seeds stick together and can be removed from the lint without becoming separated.”

50776. *GOSSYPIUM* sp. Malvaceæ.

Kidney cotton.

“(No. 670. Nyanza, Urundi. February 26, 1920.) Cotton seed secured near a native hut. Lint and pod sent in. This is the principal type grown by the natives.”

50777. *GOSSYPIUM* sp. Malvaceæ.

Cotton.

“(No. 700. Nyanza, Urundi. February 29, 1920.) Sent to Chef de Poste for planting. A pink boll weevil is abundant here in native cotton. I know nothing about this variety.”

50778. *GOSSYPIUM* sp. Malvaceæ.

Kidney cotton.

“(No. 763. Nyanza, Urundi. March 9, 1920.) Seeds remain together; leaf, flower, and pod like *Egyptian*. A low plant, about 3 feet high, and yields a very heavy crop of cotton. One of the best plants I have seen. Boll-weevil damage noticeable.”

50726 to 50966—Continued.

50779 to 50829. *HOLCUS* spp. Poaceæ.

50779. *HOLCUS SORGHUM* L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)

"(No. 735. Nyanza, Urundi. March 7, 1920.) A collection of seeds from many different plants. It should all be planted and the different forms (if any) segregated. Collected from hundreds of plants."

50780. *HOLCUS SORGHUM SUDANENSIS* (Piper) Hitchc. Poaceæ. Sudan grass.

"(No. 657. M'Sala near Nyanza, 60 kilometers north of Kigoma. February 24, 1920. Herb. No. 679.) Sudan grass grows abundantly here. The plants are 6 to 10 feet tall."

50781 to 50808. "(Nyanza, Urundi. March 7, 1920.) The following numbers are heads of *Holcus*. The measurements here given are: (1) Height of plant, in meters; (2) heads, in centimeters (two or more measurements mean that there were that number of heads); (3) number of nodes; and (4) number of branches. The branching indicated as 4+1 means branched at fourth node below the top one."

50781. *HOLCUS SORGHUM SUDANENSIS* (Piper) Hitchc. Poaceæ. Sudan grass.

"(No. 709.) Measurements: (1) 3.35, (2) 45, (3) 13, (4) 0."

50782 and 50783. *HOLCUS SORGHUM EFFUSUS* (Hack.) Hitchc. Poaceæ.

50782. "(No. 710.) Measurements: (1) 4.39, (2) 39, (3) 16, (4) 0."

Kamerun grass.

50783. "(No. 711.) Measurements: (1) 4.42, (2) 46, (3) 15, (4) 0."

50784. *HOLCUS SORGHUM* L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)

"(No. 712.) Measurements: (1) 3.44, (2) 37, (3) 14, (4) 0."

50785. *HOLCUS SORGHUM EFFUSUS* (Hack.) Hitchc. Poaceæ.

Kamerun grass.

"(No. 713.) Measurements: (1) 3.97, (2) 43, (3) 18, (4) 0."

50786 to 50788. *HOLCUS SORGHUM* L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)

50786. "(No. 714.) Measurements: (1) 4.22, (2) 42, (3) 17, (4) 0."

50787. "(No. 715.) Measurements: (1) 4.08, (2) 42, (3) 19, (4) 5+1."

50788. "(No. 716.) Measurements: (1) 3.80, (2) 39, (3) 13, (4) 5+1; not matured."

50789. *HOLCUS SORGHUM VERTICILLIFLOBUS* (Steud.) Hitchc. Poaceæ. Tabucki grass.

"(No. 717.) Measurements: (1) 3.67, (2) 38, (3) 22, (4) 31; roots are nine nodes at base."

50726 to 50966—Continued.

50790. *HOLCUS SORGHUM* L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)
“(No. 718.) Measurements: (1) 3.45, (2) 29, (3) 12, (4) 2+1; three heads from two branches.”
- 50791 to 50794. *HOLCUS SORGHUM VERTICILLIFLORUS* (Steud.) Poaceæ. Tabucki grass.
50791. “(No. 719.) Measurements: (1) 4.22, (2) 41, (3) 16, (4) 4+1.”
50792. “(No. 720.) Measurements: (1) 2.53, (2) 44, (3) 10, (4) 3+1.”
50793. “(No. 721.) Measurements: (1) 3.67, (2) 42, (3) 24, (4) 4+1; heads on each branch.”
50794. “(No. 722.) Measurements: (1) 3, (2) 39, (3) 16, (4) 2+1; larger branch from sixth node.”
50795. *HOLCUS SORGHUM EFFUSUS* (Hack.) Hitchc. Poaceæ. Kamerun grass.
“(No. 723.) Measurements: (1) 4.50, (2) 45, (3) 18, (4) 3; heads.”
50796. *HOLCUS SORGHUM VERTICILLIFLORUS* (Steud.) Hitchc. Poaceæ. Tabucki grass.
“(No. 724.) Measurements: (1) 3.25, (2) 45, (3) 12, (4) 4+1; larger branches from first four nodes above ground.”
50797. *HOLCUS SORGHUM* L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)
“(No. 725.) Measurements: (1) 4.56, (2) 42, (3) 17; branches from nodes 1, 2, 4, 5, 6, 11, 12, 13, 14, 15.”
50798. *HOLCUS SORGHUM VERTICILLIFLORUS* (Steud.) Hitchc. Poaceæ. Tabucki grass.
“(No. 726.) Measurements: (1) 4.09, (2) 48, 40, 43, 30, 36, 30, 36; (3) 15; seven heads on branches measured from top to bottom.”
50799. *HOLCUS SORGHUM* L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)
(No. 727a.) Received without notes, but apparently belonging with the preceding collection.
50800. *HOLCUS SORGHUM VERTICILLIFLORUS* (Steud.) Hitchc. Poaceæ. Tabucki grass.
“(No. 734.) Wild sorghum.”
- 50801 and 50802. *HOLCUS SORGHUM EFFUSUS* (Hack.) Hitchc. Poaceæ. Kamerun grass.
50801. “(No. 762. Nyanza, Urundi. March 9, 1920.) A type in which the heads do not fully emerge from the upper sheath.”
50802. “(No. 769. Nyanza, Urundi. March 9, 1920.) Two unusually large heads of wild sorghum; grown in a field of kafir.”

50726 to 50966—Continued.

50803. *HOLCUS SORGHUM VERTICILLIFLORUS* (Steud.) Hitchc.
Poaceæ. Tabucki grass.
“(No. 841. N’gano N’gano, Urundi. March 15, 1920.) A tall, upright, large-fruited type of wild sorghum; good type.”
- 50804 to 50806. *HOLCUS SORGHUM* L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)
50804. “(No. 842. N’gano N’gano, Urundi. March 15, 1920.) Should be studied; a heavy-seeded form.”
50805. “(No. 843. N’gano N’gano, Urundi. March 15, 1920.) Low plant; heavy seed crop.”
50806. “(No. 844. N’gano N’gano, Urundi. March 15, 1920.) Similar to No. 843 [S. P. I. No. 50805]; very heavy seed crop.”
- 50807 and 50808. *HOLCUS SORGHUM VERTICILLIFLORUS* (Steud.)
Hitchc. Poaceæ. Tabucki grass.
50807. “(No. 870. Nyanza, Urundi. March 19, 1920.) Seed from hundreds of wild plants of various size and habit; an examination of the seed will give a fair idea of variation in flower structure.”
50808. “(No. 900. Nyanza, Urundi. March 21, 1920.) A collection of heads; could not be sent in separately for lack of envelopes.”
- 50809 to 50829. *HOLCUS SORGHUM* L. Poaceæ. Sorghum.
(*Sorghum vulgare* Pers.)
50809. “(No. 901. Nyanza, Urundi. March 21, 1920.) May be sterile kafir heads.”
50810. “(No. 638. Kigoma. February 21, 1920.) White kafir from the market.”
50811. “(No. 653. Ujiji. February 22, 1920.) A white kafir.”
50812. “(No. 654. Ujiji. February 22, 1920.) Similar to No. 653 [S. P. I. No. 50811]; a pure white strain.”
50813. “(No. 656. Ujiji. February 22, 1920.) A red or pinkish brown kafir. Well-shaped head and apparently much grown in this section, known as *Konge*, but not as well liked by the natives as *m’tama*, the white form.”
50814. “(No. 658. Ujiji. February 22, 1920.) Red kafir, larger than No. 656 [S. P. I. No. 50813] but very similar.”
50815. “(No. 659. Ujiji. February 22, 1920.) A variety probably identical with Nos. 656 and 658 [S. P. I. Nos. 50813 and 50814].”
50816. “(No. 668. Nyanza, Urundi. February 26, 1920.) Kafir, two heads collected near a native hut. It is grown everywhere here, but the seeds are usually eaten out by birds.”
50817. “(No. 669. Nyanza, Urundi. February 26, 1920.) A rather heavy head of kafir; may be distinct from the others. I have seen no gooseneck forms.”

50726 to 50966—Continued.

50818. "(No. 674. Nyanza, Urundi. February 27, 1920.) Deep red kafir known as *Conge* or *Konge*. This head is large, branches somewhat like broom corn, and has two seeds in each flower. This type may be especially interesting."
50819. "(No. 675. Nyanza, Urundi. February 27, 1920.) *Conge* with small head, central stem, but seed single in the flower."
50820. "(No. 676. Nyanza, Urundi. February 27, 1920.) Kafir; similar to No. 675 [S. P. I. No. 50819] may be the same."
50821. "(No. 732. Nyanza, Urundi. February 27, 1920.) A head of *Conge* or *Konge*, the red kafir, with double seed and good form."
50822. "(No. 733. Nyanza, Urundi. February 27, 1920.) A very small head of *m'tama*, the white kafir."
50823. "(No. 766. Nyanza, Urundi. March 9, 1920.) Several small heads of *m'tama*, white kafir, native grown."
50824. "(No. 767. Nyanza, Urundi. March 9, 1920.) A fine large head of *m'tama*, a white kafir. The seeds seem to be double; that is, two in each flower. This may be something new. I do not remember seeing anything just like it before."
50825. "(No. 768. Nyanza, Urundi. March 9, 1920.) Similar to No. 767 [S. P. I. No. 50824] but a more open, almost palmately branched, head. These numbers seem to be intermediate between the red and the white kafirs."
50826. "(No. 853. N'gano N'gano, Urundi. March 17, 1920.) *Conge*, red kafir, used largely to make pombe, or native beer."
50827. "(No. 865. N'gano N'gano, Urundi. March 18, 1920.) Red kafir (*Conge*) of type grown in the mountains."
50828. "(No. 916. Kigoma. March 27, 1920.) *M'tama*, white kafir, from native market."
50829. "(No. 935. Zanzibar. April, 1920.) White kafir."
50830. INDIGOFERA sp. Fabaceae. Indigo.
 "(No. 679. Nyanza, Urundi. February 28, 1910. Herb. No. 686.)"
50831. INDIGOFERA ENDECAPHYLLA Jacq. Fabaceae. Indigo.
 "(No. 909. Kigoma. March 26, 1920.)"
50832. IPOMOEA sp. Convolvulaceae. Morning-glory.
 "(No. 662. Nyanza, Urundi. February 26, 1920. Herb. No. 688.) A bush form, rather leafy; may be a good ornamental; flowers pale lavender and about 1 inch in diameter."
50833. IPOMOEA sp. Convolvulaceae. Morning-glory.
 "(No. 664. Nyanza, Urundi. February 26, 1920.) A fine flower; small vine with entire leaf."
50834. IPOMOEA PULCHELLA Roth. Convolvulaceae. Morning-glory.
 "(No. 764. Nyanza, Urundi. March 9, 1920.) A purple-flowered Ipomoea with a divided leaf; one of the most abundant types in central Africa."

50726 to 50966—Continued.

50835. *JATROPHA CURCAS* L. Euphorbiaceæ.

"(No. 830. Nyanza, Urundi. March 13, 1920. Herb. No. 708.) Black oil seed. Same as Nos. 459 and 611 [S. P. I. Nos. 50021 and 50239]. Planted as an ornamental."

50836. *LYCOPERSICON ESCULENTUM* Mill. Solanaceæ. Tomato.

"(No. 867. N'gano N'gano, Urundi. March 18, 1920.) Small red tomato, grown by natives."

50837 and 50838. *MANIHOT ESCULENTA* Crantz. Euphorbiaceæ.

(*M. utilissima* Pohl.)

Cassava.

50837. "(No. 677. Nyanza, Urundi. February 28, 1920.) The sweet cassava; the roots were eaten fresh and are sweet and very good. Seed is not usually produced but is quite abundant here. This is the chief money crop as well as the staple food on the lowlands in and about Nyanza and Kigoma. The roots are sold either (1) when fresh, peeled, fermented, dried, and pounded into flour; or (2) as a thick pasty cake (which has no flavor except that derived from wood smoke) made by cooking the flour in water; or (3) prepared by boiling fresh roots and pounding them in a mortar. The leaves are eaten as a green vegetable and the roots eaten in the following ways: Fresh, merely having been peeled; baked or boiled; boiled and pounded to a paste; peeled, placed in earthen vessels with water and allowed to ferment for three days, then sun dried. These dried roots, which are often perfectly white but at times are covered with a black or blue mold, are either boiled in fat or pounded in a mortar and sifted to a white flour, which is boiled to form a starchy paste. This doughy mass, wrapped in banana-leaf containers, constitutes one of the principal foods of the natives. Containers holding from 15 to 20 kilograms of cassava flour each are sold at a rate of about 1.50 francs for 100 kilograms. Corn is abundantly grown but is not as universal as Manihot. Drought may harm the corn crop, but even in severe drought a Manihot plantation can be dug up and the roots eaten. The elevated beds on which the plants are cultivated insure the penetration of water into the soil. The old Manihot stems are broken up and placed in the ground at the top of broad ridges 3 feet or so across and 1 to 2 feet high. Its growth is rapid and the weeds and grasses are kept out by occasional hoeing. When about 4 years old the plants are dug up and a new crop started. The fully matured crop forms an open thicket 6 to 10 feet high. At Nyanza a leaf spot seemed to be the only disease, and this, although abundant, caused very little damage. I have not found any of the bitter cassava; all plants which I have tasted are sweet."

Plate III illustrates the native methods of preparing cassava roots for use.

50838. "(No. 904. Nyanza, Urundi. March 21, 1920.) Sweet cassava."

50839. *MEIBOMIA* sp. Fabaceæ.

(*Desmodium* sp.)

"(No. 856. N'gano N'gano, Urundi. March 17, 1920.) A legume with sticky flower branches."

50726 to 50966—Continued.

50840 and 50841. *NICOTIANA TABACUM* L. Solanaceæ. Tobacco.

50840. "(No. 829. Nyanza, Urundi. March 13, 1920.) Tobacco, type grown by natives."

50841. "(No. 862. N'gano N'gano, Urundi. March 18, 1920.)"

50842. *OCHNA LEPTOCLADA* Oliver. Ochnaceæ.

"(No. 736. Nyanza, Urundi. March 7, 1920. Herb. No. 691.) An attractive low form about 1 to 2 feet high."

50843. *PENNISETUM GLAUCUM* (L.) R. Br. Poaceæ. Pearl millet.
(*P. typhoideum* Rich.)

"(No. 920. Njähna, Tanganyika Territory. March 28, 1920.) Grown more abundantly here than at any place I have seen in Africa."

50844. *PENNISETUM GLAUCUM* (L.) R. Br. Poaceæ. Pearl millet.
(*P. typhoideum* Rich.)

"(No. 932. Zanzibar. April 6, 1920.) Pennisetum from India."

50845 to 50901. *PHASEOLUS VULGARIS* L. Fabaceæ. Common bean.

"(Nyanza, Urundi. March 8, 1920.) Beans always are mixed in the field or market. They are marketed in large banana-leaf containers, which are either sack shaped or long and narrow. They are sold at 0.15 franc per kilo. It is one of the chief export crops."

50845. "(No. 781.) A short, thick, dark greenish brown or almost black bean; shows an indistinct dark stripe."

50846. "(No. 809.) Very dark tan, darker than No. 758 [S. P. I. No. 50886]; long, brown, flat bean."

50847. "(No. 811.) Dark chocolate with metallic sheen; short, thick bean."

50848. "(No. 694.) Light-brown, almost tan bean."

50849. "(No. 759.) Dark-brown, greenish, or deep-tan bean showing a stripe; yellow shows through at times; may be similar to No. 755 [S. P. I. No. 50857]."

50850. "(No. 788.) Tan-colored bean, more yellowish than No. 778 [S. P. I. No. 50852]."

50851. "(No. 789.) Darker than No. 788 [S. P. I. No. 50850]."

50852. "(No. 778.) Long, plump, dark-tan bean."

50853. "(No. 810.) Dark reddish or purple-tan bean, rather small."

50854. "(No. 757.) Rich deep tan-colored bean with mottled surface."

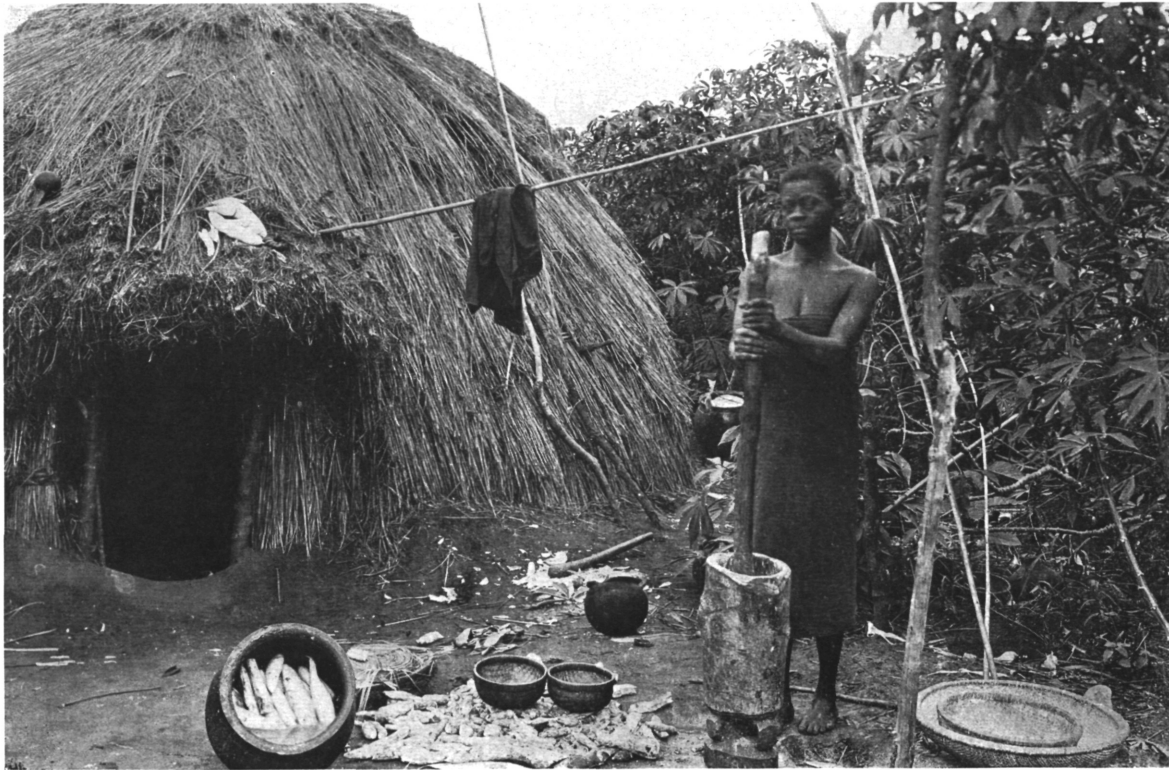
50855. "(Nos. 801, 804, and 806.) Wine-colored bean with dark stripe."

50856. "(No. 819.) Small, long, flat bean with light dots or stripes."

50857. "(Nos. 755, 782, and 800.) Yellow with brown markings, occasionally a brown stripe over a brown stripe. This is the favorite bean of the Watusi chiefs."

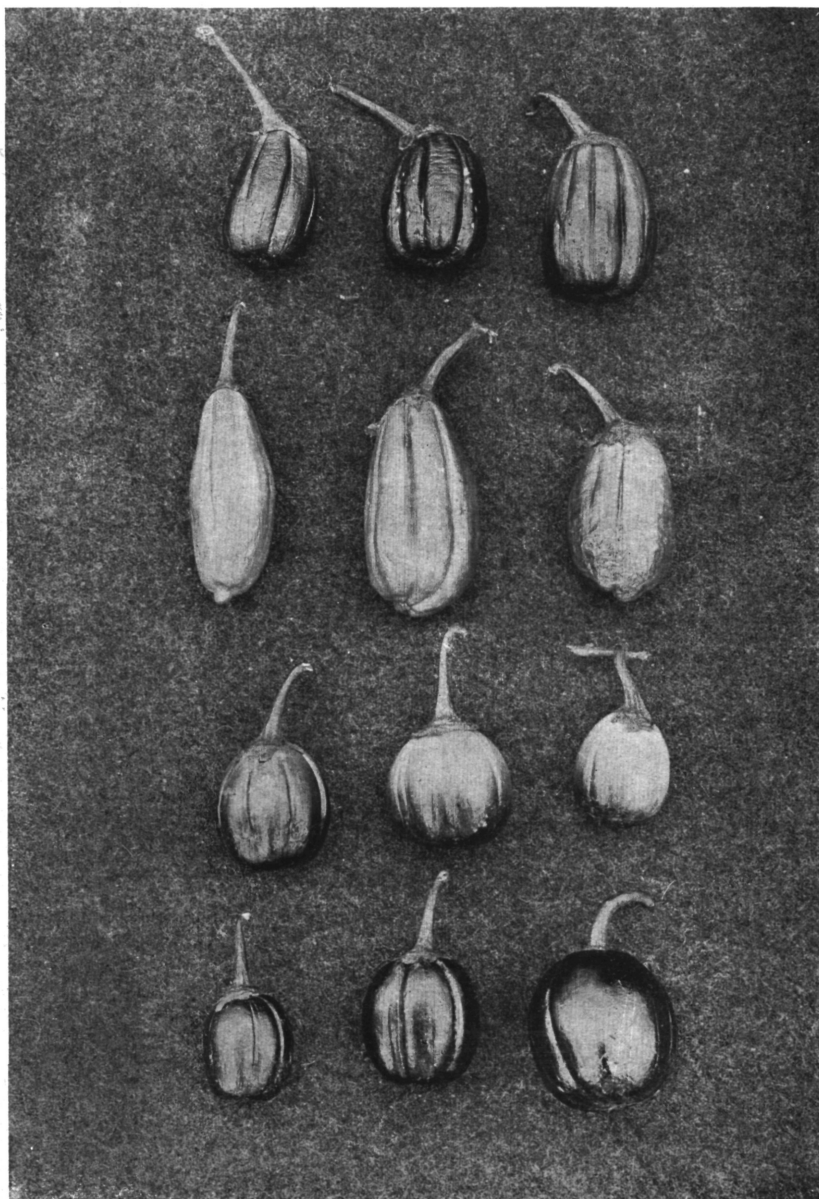
50858. "(Nos. 689, 759, and 799.) A gray mottled and striped bean similar to No. 690 [S. P. I. No. 50859]."

50859. "(No. 690.) Streaked and mottled yellowish bean; one of the most abundant, and prized by the natives."



PREPARING CASSAVA ROOTS IN TANGANYIKA TERRITORY. (MANIHOT ESCULENTA CRANTZ, S. P. I. No. 50837.)

Cassava is the staple food crop of many tribes in Africa, as it is along the Amazon. Doctor Shantz found that the variety introduced under S. P. I. No. 50837 serves many uses. The leaves are used as a green vegetable, and the roots are eaten in several ways—fresh, merely having been peeled; baked; or boiled and pounded into a paste, fermented in water for three days, then sun dried and made into a flour. The various methods are illustrated in this photograph. Since this plant grows luxuriantly in the Gulf States, its use as a table vegetable deserves much more consideration than it has hitherto received. (Photographed by Dr. H. L. Shantz, Nyanza, Urundi, February 27, 1920.)



TYPES OF EGGPLANTS FROM THE BELGIAN KONGO. (*SOLANUM MELONGENA* L.,
S. P. I. Nos. 50915 to 50918.)

These types of eggplants are very popular with the natives. Those in the top row (S. P. I. No. 50915) are red on the stem end and yellow on the blossom end; those in the second row (S. P. I. No. 50916) are yellow; those in the third row (S. P. I. No. 50917) have the colors of the first set reversed; while those in the bottom row (S. P. I. No. 50918) are entirely red. All of them are shown about one-third natural size. (Photographed by Dr. H. L. Shantz, Nyanza, Urundi, March 10, 1920; P37766FS.)

50726 to 50966—Continued.

50860. "(No. 752.) Very small flat bean, light-chocolate with black stripe."
50861. "(No. 816.) A light bean with a greenish gray stripe."
50862. "(No. 817.) Light kidney-shaped bean with bluish stripe."
50863. "(No. 802.) Deep yellowish brown bean with black stripe."
50864. "(No. 805.) Long bean, light chocolate with vine-colored stripe."
50865. "(No. 634.) Red beans, probably several varieties, mostly mottled or streaked."
50866. "(Nos. 745, 649, and 688.) Red mottled, stripes or mottling of a deep red."
50867. "(No. 761.) Purple mottling over light chocolate, appears purple."
50868. "(No. 780.) Deep-red or carmine-colored bean."
50869. "(No. 821.) A short, deep-red bean similar to No. 780 [S. P. I. No. 50868] in color, but smaller and more nearly spherical."
50870. "(No. 822.) A short, thick, deep-red wine-colored bean."
50871. "(No. 818.) Purplish tan, long, flat bean."
50872. "(No. 786.) Long, flat, red bean, lighter in color than No. 780 [S. P. I. No. 50868]."
50873. "(No. 814.) A small, deep-purple mottled bean."
50874. "(No. 751.) Long, flat bean, deep red over a lighter pink, mottled or striped."
50875. "(Nos. 691 and 695.) A reddish mottled bean."
50876. "(No. 760.) Long, flat bean, lavender-purple mottled."
50877. "(No. 784.) Long bean, black mottled over a gray base."
50878. "(Nos. 750 and 798.) A long, somewhat flattened, mottled reddish lavender bean; abundant."
50879. "(No. 797.) Long, flat bean, similar to No. 750 [S. P. I. No. 50878], but mottled bluish."
50880. "(No. 820.) Purple bean with light dot or stripe, or mottled."
50881. "(Nos. 693 and 795.) Purple-gray mottled bean."
50882. "(No. 783.) A dark or gray or brownish mottled bean (on white)."
50883. "(No. 812.) Yellowish tan mottled, long, large, and flat bean."
50884. "(Nos. 692 and 756.) Brown mottled bean."
50885. "(No. 791.) Thick, short, purple chocolate-colored bean."
50886. "(No. 758.) A very dark tan bean, uniform surface."
50887. "(No. 785.) Drab or gray bean, uniform color, darker than No. 787 [S. P. I. No. 50888]."
50888. "(No. 787.) Light-gray, short, thick bean."

50726 to 50966—Continued.

50889. "(No. 685.) A very common curry-yellow bean; probably the most abundant type."
50890. "(No. 754.) Probably imperfect seed of No. 685 [S. P. I. No. 50889.]"
50891. "(No. 815.) A rather round, straw-colored bean."
50892. "(Nos. 747 and 683.) Large white bean, especially prized by the natives. One of the best types grown here; not as abundant as the other types."
50893. "(No. 790.) Like a navy bean, but larger."
50894. "(Nos. 746, 652, and 684.) Small, round or short, and white, like a navy bean."
50895. "(No. 633.) A rather long white bean."
50896. "(No. 748.) Small, black bean, said to give the best yield; thick and short, about the size of a navy bean."
50897. "(No. 687.) A large black bean."
50898. "(No. 792.) Black bean similar to No. 748 [S. P. I. No. 50896], but flat, and longer."
50899. "(No. 793.) A very small black bean."
50900. "(No. 779.) Long, flat, black or blue bean."
50901. "(No. 813.) Long, narrow bean, with white dots, deep bluish black or black mottled."
50902. *PISUM SATIVUM* L. Fabaceæ. Garden pea.
 "(No. 855. N'gano N'gano, Urundi. March 17, 1920.) Field pea from the market. It grows well here in the cool mountain country."
50903. *PSIDIUM GUAJAVA* L. Myrtaceæ. Guava.
 "(No. 618. Kigoma. February 20, 1920.) Seed of a guava, grown in this section, which is 2 inches in diameter, has yellow rind and reddish flesh."
- 50904 to 50906. *RICINUS COMMUNIS* L. Euphorbiaceæ. Castor-bean.
 50904. "(No. 730. M'Sala. March 7, 1920.) Ricinus from native villages."
 For previous introduction, see S. P. I. No. 49369.
50905. "(No. 859. N'gano N'gano, Urundi. March 17, 1920.) Ricinus wild in the hills."
50906. "(No. 922. Titici, Tanganyika Territory. March 29, 1920.) Seed of Ricinus."
50907. *RUBUS* sp. Rosaceæ. Bramble.
 "(No. 860. N'gano N'gano, Urundi. March 18, 1920.) A red raspberry of fairly good flavor; a vinelike plant."

50726 to 50966—Continued.

50908. RUMEX MADERENSIS Lowe. Polygonaceæ.

"(No. 838. N'gano N'gano, Urundi. March 5, 1920.) Rumex called *saba saba*; the leaves are used as a green vegetable."

50909. SESAMUM ORIENTALE L. Pedaliaceæ. Sesame.

"(No. 637. Kigoma. February 21, 1920.) Sesamum; seed grown by the natives for oil production."

50910 to 50918. SOLANUM MELONGENA L. Solanaceæ. Eggplant.

50910. "(No. 614. Kigoma. February 20, 1920.) An eggplant about 2 inches in diameter, light-yellow color, ridges not pronounced. Probably this and the two following are much the same except for color. They are sold in the market, and seem to be a vegetable much used by the natives."

50911. "(No. 615. Kigoma. February 20, 1920.) Similar to No. 614 [S. P. I. No. 50910] but bright red in color. Looks much like the red tomato; similar to No. 496 [S. P. I. No. 50088] and No. 493 [S. P. I. No. 50087]."

50912. "(No. 616. Kigoma. February 20, 1920.) Similar to No. 614 [S. P. I. No. 50910] but of orange color; somewhat intermediate between No. 614 [S. P. I. No. 50910] and No. 615 [S. P. I. No. 50911]. If I mistake not, they are native eggplants."

50913. "(No. 625. Kigoma. February 20, 1920.) A green eggplant, light green with dark-green streaks, yellowish and a little reddish at the blossom end, longer than Nos. 614 [S. P. I. No. 50910], 615 [S. P. I. No. 50911], and 616 [S. P. I. 50912]."

50914. "(No. 640. Ujiji. February 22, 1920.) A long, slender eggplant, dark purple, and slightly curved, about 1½ to 2 inches in diameter and about 6 inches long. This form shows the decayed spots so common on our eggplant. Very similar to the types on our market."

50915. "(No. 772. Nyanza, Urundi. March 9, 1920.) Eggplant, yellow above and red below; popular type with the natives."

50916. "(No. 773. Nyanza, Urundi. March 9, 1920.) A long yellow eggplant, 3 inches long."

50917. "(No. 774. Nyanza, Urundi. March 9, 1920.) Short, yellow and red eggplant."

50918. "(No. 775. Nyanza, Urundi. March 9, 1920.) A very red eggplant that is almost spherical."

Of the varieties here listed Nos. 50915 to 50918 are illustrated in Plate IV.

50919. SOLANUM sp. Solanaceæ.

"(No. 862. N'gano N'gano, Urundi. March 18, 1920.) Large rough-fruited Solanum; used for medicinal purposes."

50726 to 50966—Continued.

- 50920.** *SPOROBOLUS* sp. Poaceæ. Grass.
 "(No. 728. M'Sala, Urundi. March 7, 1920.) A grass collected from sandy lake beach; probably same as No. 519 [S. P. I. No. 50037] and No. 845 [S. P. I. No. 50921]; if so, it is a valuable forage grass on the uplands and deserves a trial; it is perennial."
- 50921.** *SPOROBOLUS PYRAMIDALIS* Beauv. Poaceæ. Grass.
 "(No. 845. N'gano N'gano, Urundi. March 17, 1920.) One of the abundant grasses of the mountains."
- 50922.** *SYZYGIUM CUMINI* (L.) Skeels. Myrtaceæ. Jambolan.
 (*Eugenia jambolana* Lam.)
 "(No. 949. Zanzibar, Zanzibar. April 6, 1920.) *Eugenia* called *jambolancee*; looks about like a ripe olive; fairly good eating, and very abundant in the market."
 For previous introduction, see S. P. I. No. 43217.
- 50923.** *TETRASTIGMA* sp. Vitaceæ.
 "(No. 663. M'Sala, Urundi. February 24, 1920.) A wild grape about the size and appearance of a small Concord; bunch very irregular."
- 50924.** *TRICHODESMA ZEYLANICUM* (Burtt. f.) R. Br. Boraginaceæ.
 "(No. 680. Nyanza, Urundi. February 28, 1920. Herb. No. 687.) Borage; rather attractive plant and flowers."
- 50925 and 50926.** *TRICHOLAENA ROSEA* Nees. Poaceæ. Natal grass.
50925. "(No. 703. Nyanza, Urundi. March 1, 1920.) A very abundant and important grass; may differ slightly from other samples of the same plant."
 For previous introduction, see S. P. I. No. 49317.
50926. "(No. 850. N'gano N'gano, Urundi. March 17, 1920.) Abundant as a semiruderal."
- 50927.** *TRICHOPTERYX* sp. Poaceæ. Grass.
 "(No. 849. N'gano N'gano, Urundi. March 17, 1920. Herb. No. 738.) A slender oatlike grass with a habit like an annual; eaten by cattle even when other feed is abundant."
- 50928.** *TRICHOSANTHES* sp. Cucurbitaceæ.
 "(No. 705. Nyanza, Urundi. March 2, 1920.) A small white flower with darker markings, shaped like a small gladiolus; it is a low, ornamental vine."
- 50929.** *TRITICUM DURUM* Desf. Poaceæ. Durum wheat.
 "(No. 933. Zanzibar, Zanzibar. April 6, 1920.) Wheat from India."
- 50930 and 50931.** *VIGNA CYLINDRICA* (Stickm.) Skeels. Fabaceæ
 Catjang.
50930. "(No. 642. Ujiji. February 22, 1920.) A *Vigna* with lanceolate leaflets; very abundant in the fields and apparently planted, but seed not seen in the market."
50931. "(No. 903. Nyanza, Urundi. March 21, 1920.) Bush cowpea."
 For previous introduction, see S. P. I. No. 44765.

50726 to 50966—Continued.**50932 to 50942.** *VIGNA SINENSIS* (Torner) Savi. Fabaceæ. **Cowpea.****50932.** "(No. 632. Kigoma. February 21, 1920.) Cowpea grown everywhere by the natives."

For previous introduction, see S. P. I. No. 48793.

50933. "(No. 696a. Nyanza, Urundi. February 29, 1920.) Cowpea as marketed by the natives; many different types included. It is one of the important crop plants. The pods, with beans almost ripe but still soft, are boiled and eaten out of the pod."**50934.** "(No. 707. Nyanza, Urundi. March 2, 1920.) Native-grown cowpea."**50935.** "(No. 832. Nyanza, Urundi. March 13, 1920.) Purple-colored cowpea; not very numerous."**50936.** "(No. 833. Nyanza, Urundi. March 13, 1920.) Chocolate-colored cowpea with purple tinge. Similar to No. 832 [S. P. I. No. 50935]."**50937.** "(No. 834. Nyanza, Urundi. March 13, 1920.) Light chocolate or straw-colored cowpea with a purple streak below the eye."**50938.** "(No. 835. Nyanza, Urundi. March 13, 1920.) A light chocolate-colored cowpea, no purple streak."**50939.** "(No. 836. Nyanza, Urundi. March 13, 1920.) Uniform or reddish or purplish cowpea."**50940.** "(No. 837. Nyanza, Urundi. March 13, 1920.) Mixed lot after Nos. 832 to 836 [S. P. I. Nos 50935 to 50939] had been separated."**50941.** "(No. 902. Nyanza, Urundi. March 21, 1920.) Cowpeas from native field."**50942.** "(No. 931. Dar es Salaam. April 1, 1920.) Dark cowpea from the east coast."**50943.** *VITIS* sp. Vitaceæ.**Grape.**

"(No. 727. M'Sala, Urundi. March 7, 1920.) Wild grape seed. Flavor somewhat like a black currant and about the same size; the vine is low, almost shrublike."

50944 to 50946. *VOANDZEA SUBTERRANEA* (L.) Thouars. Fabaceæ.**50944.** "(No. 696. Nyanza, Urundi. February 29, 1920.) A groundnut grown by the natives. The ripe seeds are eaten occasionally when parched but they are very hard; they are yellowish in color. They are usually boiled while still green and eaten as one would potatoes."**50945.** "(No. 831. Nyanza, Urundi. March 13, 1920.) Voandzeia with deep wine-colored beans. These are distinct from No. 696 [S. P. I. No. 50944], which are yellowish."**50946.** "(No. 938. Zanzibar. April 6, 1920.) Voandzeia."

50726 to 50966—Continued.

50947 to 50956. *ZEA MAYS* L. Poaceæ.

Corn.

50947. "(No. 629. Kigoma. February 21, 1920.) Corn grown locally by the natives; somewhat mixed type."

50948. "(No. 630. Kigoma. February 21, 1920.) Like No. 629 [S. P. I. No. 50947]. The ear is not so long as the flint ear; not mixed. Corn is here one of the chief crops. It is always grown in elevated beds, 1 to 1½ feet high. This type of cultivation is best for the long droughts which occur here."

50949. "(No. 378. Nyanza, Urundi. March 8, 1920.) Corn from native fields. It is planted in hills, is a tall corn, so tall that it is often difficult to reach the ears. The ears when almost ripe are roasted and eaten. When ripe, the stem is cut off below the ear or ears and stacked on an open bamboo fence, the ears all pointing down on one side. Occasionally it is hung in trees or in the top of the hut. It is next in importance to Manihot as a food crop and is also sold as a money crop."

50950. "(No. 739. Nyanza, Urundi. March 9, 1920.) A yellow flint with occasionally purple and dented light-colored kernels."

50951. "(No. 740. Nyanza, Urundi. March 9, 1920.) A white flint with purple cob and an occasional purple kernel."

50952. "(No. 741. Nyanza, Urundi. March 9, 1920.) Flint with a carmine flush, a purple cob, and an occasional purple kernel."

50953. "(No. 742. Nyanza, Urundi. March 9, 1920.) White flint with an occasional purple kernel."

50954. "(No. 743. Nyanza, Urundi. March 9, 1920.) Purple and white flint."

50955. "(No. 744. Nyanza, Urundi. March 9, 1920.) White flint, All the above corn is tall with a large stalk; grown by the natives."

50956. "(No. 852. N'gano N'gano, Urundi. March 17, 1920.) Corn: Yellow, white, red, and blue; grown by Chief Rusoka."

50957. (Undetermined.)

"(No. 737. Nyanza, Urundi. March 8, 1920.) A red-fruited Vitis-like or Ampelopsislike vine."

50958. (Undetermined.)

"(No. 858. N'gano N'gano. March 17, 1920.) A small legume with a habit similar to our *Psoralea tenuiflora*."

50959. (Undetermined.)

"(No. 905. Nyanza, Urundi. March 21, 1920.) A dark fruit like a chokecherry; probably not edible."

50960. (Undetermined.)

"(No. 928. Dar es Salaam. April 1, 1920.) *Mopia*. Like a *Strychnos*."

50961. *PENNISETUM GLAUCUM* (L.) R. Br. Poaceæ. Pearl millet.
(*P. typhoideum* Rich.)

"(No. 936. Zanzibar, Zanzibar. April 6, 1920.) Pennisetum from east coast of Africa."

50726 to 50966—Continued.

- 50962 to 50964.** *PHASEOLUS AUREUS* Roxb. Fabaceæ. **Mung bean.**
50962. "(No. 702. Nyanza, Urundi. March 2, 1920.) Small green bean."
50963. "(No. 919. Tabora. March 2, 1920.) Small green bush bean. Plants covered with flies."
50964. "(No. 937. Zanzibar, Zanzibar. April 6, 1920.) Small green bean."
50965 and 50966. *PHASEOLUS VULGARIS* L. Fabaceæ. **Common bean.**
50965. "(No. 803. Nyanza, Urundi. March 8, 1920.) Long, narrow, mottled purplish bean with greenish stripe."
50966. "(No. 807. Nyanza, Urundi. March 8, 1920.) Similar to No. 757 [S. P. I. No. 50854], but a deeper reddish tan."

50967. CITRUS sp. Rutaceæ.

From Swatow, Kwantung, China. Seeds presented by A. H. Page. Received June 1, 1920.

"Fruits we call the Chinese lime. The one that is nearly ripe weighs now about 4½ ounces, the green one 2 ounces. Either would make a fairly good lemon pie, the riper one having the better flavor. The tree is very hardy and bears immense crops. I picked nearly 600 last fall from a tree about 9 feet high and of moderate spread. I certainly believe it is worth a trial for lime juice and citric acid." (Page.)

50968. PERSEA AMERICANA Mill. Lauraceæ. **Avocado.**
(*P. gratissima* Gaertn. f.)

From Miami, Fla. Originated at the Miami Plant Introduction Garden. Numbered July 31, 1920.

Variety *Dade*. This variety, which originated as a seedling from the Trapp avocado, ripens its fruit in November. The fruit is globose, green skinned, and of excellent quality. The tree grows vigorously and yields prolifically and regularly.

50969. PORTULACARIA AFRA Jacq. Portulacaceæ. **Spekboom.**

From San Diego, Calif. Cuttings presented by Miss Kate Sessions. Received at the Plant Introduction Garden, Chico, Calif., July 12, 1920. Numbered July, 1920.

A South African shrub or small tree with succulent shoots which are said to be keenly relished by live stock. The plant is reported to grow on dry waste places without requiring attention.

For a fuller description of this plant, see S. P. I. No. 48510, and also Nos. 9604 and 12020.

50970 and 50971.

From Monrovia, Liberia. Seeds presented by O. W. Barrett. Received July 1, 1920. Quoted notes by Mr. Barrett.

50970. *CARICA PAPAYA* L. Papayaceæ. **Papaya.**
 "A very fine red-fleshed papaya."

50971. *SOLANUM MELONGENA* L. Solanaceæ. **Eggplant.**
 "A shrubby, thorny, native eggplant, one of four rather important and interesting quasi-native Solanums used by the inhabitants here."

50972 to 50997. OLEA EUROPAEA L. Oleaceæ. Olive.

From Adelaide, South Australia. Cuttings presented by J. F. Bailey, director, Botanic Garden. Received July 14, 1920. The descriptions following, except as otherwise stated, are adapted from Lelong, California Olive Industry, pp. 53-55, and from Ruby, Recherches Sur l'Olivier en France, pp. 97-279.

50972. *Atrioviolacea Brun Bibier.*

50973. *Black Italian.*

50974. *Bouquetier.* A stout-branched tree with large thick leaves; fruits often clustered, large or small, bulging on one side; skin black and shining when ripe; flesh scanty, violet, very rich in oil. (*Ruby.*)

50975. *Bouteillon.*

50976. *Corregiolo.* A vigorous grower and prolific bearer, doing best on rich soils. The fruit, which ripens in November, yields a high-grade oil. (*Lelong.*)

50977. *Cushine.*

50978. *Frantoja.* "A synonym of *Corregiolo.*" (*A. T. Marvin.*)

50979. *Grossee Redowno.* "Produces large fruit, yielding very high returns of oil of the best quality." (*Agricultural Gazette of New South Wales, July 2, 1919.*)

50980. *Hardy's Mammoth.* "A local seedling with a large berry, yielding 27.4 per cent of oil." (*Journal of the Department of Agriculture of South Australia, vol. 5, p. 928.*)

50981. *Institute.*

50984. *Longue d'Ascoli.*

50982. *Large Fruiting.*

50985. *Lucca.*

50983. *Late Blanquette.*

50986. *Morchioso.* Concerning the quality and yield of oil, the Journal of the Department of Agriculture of South Australia, vol. 20, p. 549 gives the following: Moisture, 42.36 per cent; oil (fresh olives), 27.21 per cent; yield per ton of fruit, 66.73 gallons.

50987. *Morocco.*

50988. *Palermo.* Concerning the quality and yield of oil, the Journal of the Department of Agriculture of South Australia, vol. 20, p. 549, give the following: Moisture, 36.69 per cent; oil (fresh olives), 25.58 per cent; yield per ton of fruit, 61.83 gallons.

50989. *Picholin.* The tree is large and a strong grower. The oblong fruits, which ripen early, are pickled green. (*Lelong.*)

50990. *Pueblano.*

50991. *Royal de Languedoc.*

50992. *Rubra Caillon de Aix.*

50993. *Saint Catherine.* A medium-sized tree producing extra large fruits good for pickling green. (*Lelong.*)

50994. *Satome.*

50995. *Sir George Gray's Spanish.*

50996. *Verdale.* An early-ripening tree of dwarf habit; a shy bearer sensitive to cold. Fruits suitable for pickling. (*Lelong.*)

50997. *White.*

50998 and 50999.

From Kulare, via Cairns, northern Queensland, Australia. Seeds presented by J. A. Hamilton. Received July 20, 1920. Quoted notes by Mr. Hamilton.

50998. *ELEUSINE COBACANA* (L.) Gaertn. Poaceæ. **Bagi millet.**

"A very productive cereal from India. Grows well where wheat is not a success."

For previous introduction, see S. P. I. No. 46295. •

50999. *PHASEOLUS LUNATUS* L. Fabaceæ. **Lima bean.**

"Improved Dwarf Lima. A new variety of Lima bean, my Improved Dwarf being a natural cross between Burpee's Bush Lima and the Dwarf Lima. In this climate the heavy pods of Burpee's Bush Lima beans have the tendency to lie on the ground and so rot in our wet spells, but my Improved Dwarf holds its stems upright and so keeps sound; it is also very prolific."

51000 to 51002.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky, Jardin d'Acclimatation. Received July 20, 1920. Quoted notes by Dr. Proschowsky.

51000. *ALECTRYON SUBCINEREUM* (A. Gray) Radlk. Sapindaceæ.
(*Nephelium leiocarpum* F. Muell.)

"A small tree with beautiful evergreen foliage; it is very hardy here, so that it might eventually serve as stock on which to graft fruit trees like *Nephelium longanum*, *N. mutabile*, and especially *Litchi chinensis*."

51001. *FUCHSIA SPECIOSA* Hort. Onagraceæ. **Fuchsia.**

"A few ripe fruits (edible, as are those of several species of *Fuchsia*) of *Fuchsia speciosa*. Still it is not as a fruit plant that I recommend it, but mainly as a strikingly beautiful flowering evergreen bush, with its gracefully drooping branchlets covered with hundreds of red flowers. It is quite hardy here."

51002. *PASSIFLOBA* sp. Passifloraceæ.

"A very beautiful evergreen climber, with rose-colored flowers and edible fruits. It is quite hardy here."

Received as *Tacsonia jamesoni*, which does not seem to have been transferred to *Passiflora*.

51003 and 51004.

From Guayaquil, Ecuador. Seeds presented by James Birch Rorer, Asociación de Agricultores del Ecuador. Received July 20, 1920. Quoted notes by Mr. Rorer.

51003. *ANNONA CHERIMOLA* Mill. Annonaceæ. **Cherimoya.**

"(No. 44.) Seeds of a cherimoya; a large fruit containing only a small number of very large seeds."

51004. *CYCLANTHERA PEDATA* (L.) Schrad. Cucurbitaceæ.

"(No. 43.) A cucurbitaceous vegetable grown here, commonly called achoccha or achogcha."

An annual climber, native to western South America and Central America, where it is often cultivated for its edible fruits and shoots.

51003 and 51004—Continued.

It has 5-lobed leaves and inconspicuous flowers; the fruit, a pepo, is about 5 inches long, narrowly oval with a smooth skin or a few soft basal spines. (Adapted from *Contributions from the U. S. National Herbarium, vol. 13, p. 120.*)

For previous introduction, see S. P. I. No. 29330.

51005 and 51006.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received July 20, 1920.

51005. CARISSA CARANDAS L. Apocynaceæ.

Karanda.

A small bush, not much higher than a man, with dense, dark-green, shining foliage and sharp stipular thorns an inch in length. The coriaceous, oval, or emarginate leaves are about an inch long and broad. The flowers are small, white, and jasminelike. They come out in the hot weather, but the charm of the bush is in July when its half-ripe waxy berries hang in clusters all over the bush. They are the size of olives, a brilliant red on one side and cream on the other. When ripe they are a uniform dark-red with a bland milky juice; the fruit is sour, and is much used by the natives for making chutney [a sort of spicy pickle]. The little unripe berries, with the skin and seeds removed, cooked in pastry with sugar and cloves, make a fair substitute for apple tarts. (Adapted from *Gardener's Chronicle, vol. 24, p. 262.*)

For previous introduction, see S. P. I. No. 46636.

51006. MICROCOS LATERIFLORA L. Tiliaceæ.

(*Grewia asiatica* L.)

A small hazellike tree, native to the East Indies and cultivated throughout India. The small dark-purple berry is a pleasantly acid fruit and is much esteemed by the natives. A sherbet and wine are prepared from it in many parts of the country. From the bark a fiber is extracted which resembles European bast fiber and is much used in rope making. The mucilaginous juice of the bark is used in Seharunpur for clarifying sugar. The yellowish white, close-grained wood is strong and elastic and much prized for making banghy poles and for other purposes for which combined lightness and strength are desired. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 4, p. 177.*)

For previous introduction, see S. P. I. No. 43659.

51007. CYATHEA sp. Cyatheaceæ.

Tree fern.

From Lamao, Bataan, Philippine Islands. Spores presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received July 21, 1920.

"A tree fern with spiny midribs, collected in Baguio at an altitude of about 5,000 feet. The plant is exceedingly attractive and would unquestionably make a good conservatory plant." (*Wester.*)

51008 and 51009.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received July 26, 1920.

51008 and 51009—Continued.**51008.** *CESTRUM* sp. Solanaceæ.

"A very handsome *Cestrum* with yellow flowers, from Baguio, at an altitude of about 5,000 feet, which should be a valuable acquisition to the ornamental flora of Florida." (*Wester.*)

51009. *PANDANUS TECTORIUS* Parkius. Pandanaceæ.

A shrubby plant, up to 20 feet high, rarely erect; the stem is supported by aerial roots. The glaucous green leaves are coriaceous, sword shaped, and 3 to 5 feet long, with the marginal spines pointing forward, those on the midrib, forward or backward. The spadix of numerous cylindrical spikes of male flowers is 2 to 4 inches long and 1 to 1½ inches wide, and is inclosed in a long, white, fragrant spathe. A perfume which is much esteemed in Java is obtained from the male flowers. The solitary spadix of female flowers is followed by a yellow or red fruit which is an oblong or globose syncarpium, 6 to 10 inches long and broad. The plant is native of Konkan, Bombay, in sandy places near the seacoast. It is often planted and is known as the screw pine. (Adapted from *Cooke, The Flora of Bombay, vol. 2, p. 814.*)

For previous introduction, see S. P. I. No. 44779.

51010. *GOSYPIUM* sp. Malvaceæ.**Cotton.**

From Algiers, Algeria. Seed presented by Dr. L. Trabut, director, Service Botanique. Received July 28, 1920.

"An herbaceous cotton from the Oasis of El Golea." (*Trabut.*)

51011. *MICROCITRUS AUSTRALASICA* (F. Muell.) Swingle. Rutaceæ.
(Citrus australasica F. Muell.) **Finger lime.**

From Wellington Point, Queensland, Australia. Seed presented by James Pink. Received July 29, 1920.

One of the most curious and interesting of the citrus fruits, native to the mountainous scrubs of the coastal region of northern New South Wales and Queensland. The young plants have more or less horizontally arranged branchlets, with very short internodes, small oval leaves, and stiff erect spines. The long, slender, cylindrical-fusiform fruits, 6.5 to 10 centimeters long and 1.5 to 2.5 centimeters broad, are often slightly curved and frequently show a short blunt protuberance at both base and tip. The juice is sour and rather strongly pungent. The young plants of the finger lime showing the juvenile foliage arranged in tiers somewhat like a young araucaria plant, are very ornamental and should become better known for decorative purposes. It is a promising hedge plant, because it is very spiny and can be grown from cuttings. It is decidedly more hardy than the lime or lemon and may prove useful in breeding new types of hardy citrus fruits. (Adapted from *Journal of the Washington Academy of Sciences, vol. 5, p. 572.*)

For previous introduction, see S. P. I. No. 31877.

51012. *ARTOCARPUS INTEGRA* (Thunb.) L. Moraceæ. **Jack fruit.**
(A. integrifolia L.)

From Mayaguez, Porto Rico. Seeds presented by T. B. McClelland, horticulturist, Porto Rico Agricultural Experiment Station. Received July 2, 1920.

A very large tree native to southern India and the Malay Peninsula and Archipelago. It is valued chiefly for its enormous fruits, a single one of which

may weigh over 100 pounds. These fruits, which are borne on the trunk and older branches, are usually irregularly oblong and are always green, with the rind consisting of somewhat hexagonal knobs. When ripe the fruits have a powerful odor, and the stronger the latter the better the quality of the fruit. With the exception of the rind and core, the entire fruit is eaten, the white or cream-colored, soft, flaky pulp being used either raw, or boiled and fried. The large seeds are roasted and used in curries.

The timber of this tree is excellent for cabinetwork; it is lemon yellow at first, turning darker with age. (Adapted from *Macmillan, Handbook of Tropical Gardening and Planting*, p. 127.)

For previous introduction, see S. P. I. No. 40825.

51013 to 51015.

From Guayaquil, Ecuador. Seeds presented by James Birch Rorer, Asociación de Agricultores del Ecuador. Received July 3, 1920. Quoted notes by Mr. Rorer.

51013. *ANNONA CHERIMOLA* Mill. Annonaceæ. Cherimoya.

"(No. 32.) *Cherimoya de la Sierra* is listed by Martinez in his Flora of the Province of Tunguragua as *Annona cherimola*, and he also states that this fruit is believed to be a native of the Province of Loja. It grows well at 5,000 to 7,000 feet altitude and ought to do well in Florida. The fruit is quite smooth on the outside, but is white within and has a flavor similar to the tropical sugar-apples."

For previous introduction, see S. P. I. No. 47318.

51014. *ANNONA RETICULATA* L. Annonaceæ. Custard-apple.

"(No. 33.) Cherimoya; a large and very rough-skinned form."

For previous introduction, see S. P. I. No. 49289.

51015. *ANNONA SQUAMOSA* L. Annonaceæ. Sugar-apple.

"(No. 34.) Cherimoya; this form has a somewhat smooth skin."

For previous introduction, see S. P. I. No. 49290.

51016 to 51021. *ELAEIS GUINEENSIS* Jacq. Phœnicaceæ. Oil palm.

From Buitenzorg, Java. Seeds presented by the director, Plant-Breeding Station. Received July 3, 1920.

The following varieties are selected forms of different origin.

For general description, see S. P. I. No. 47124.

51016. (No. 6.) Variety *Nsombe B*. From Belgian Kongo.

For previous introduction, see S. P. I. No. 47307.

51017. (No. 8.) Variety *Nsombe C*. From Belgian Kongo.

For previous introduction, see S. P. I. No. 47305.

51018. (No. 11.) Variety *Singapore A*. From Singapore.

51019. (No. 13.) Variety *Banga*. From Kamerun.

For previous introduction, see S. P. I. No. 47504.

51020. (No. 23.) Variety *Iassombe*. From Kamerun.

51021. (No. 30.) Variety *Bundi C*. From Belgian Kongo.

For previous introduction, see S. P. I. No. 47306.

51022 and 51023.

From Buitenzorg, Java. Seeds presented by the director, Plant-Breeding Station. Received July 3, 1920.

The following seeds were received without description, accompanied only by the native names. Descriptions will not be available until the seeds have been grown.

51022. CUCURBITA PEPO L. Cucurbitaceæ. **Gourd.**
Laboe Batik Lohdor.

51023. LAGENARIA VULGARIS Seringe. Cucurbitaceæ. **Gourd.**
Laboe aer.

51024 and 51025.

From Bogota, Colombia. Seeds purchased from M. T. Dawe. Received July 7, 1920. Quoted notes by Mr. Dawe.

51024. ATTALEA sp. Phœnicaceæ. **Palm.**

"Nuts of the *Mamarrón palm*, from the Magdalena Valley, on the alluvial lands. An important source of vegetable oil in this country."

51025. (Undetermined.)

"Nuts of the *Palma de San Juan*, from the upper parts of the foothills of the Magdalena Valley region. May produce oil of value."

51026. DENDROCALAMUS GIGANTEUS Munro. Poaceæ. **Bamboo.**

From Peradeniya, Ceylon. Seeds presented by H. F. Macmillan, superintendent, Royal Botanic Gardens. Received July 7, 1920.

The tallest of the bamboos, a native of the Malay Peninsula but much cultivated in Burma, where it is known as *wabo* and in Assam as *worra*. It is used in Burma for posts and rafters in house building, for carts, and for joints for pails, boxes, flowerpots, etc. The large culms are often 120 feet long and 25 to 30 inches in circumference. Extra fine culms are cut into short lengths and prepared as umbrella stands.

The rapid growth of this strikingly handsome bamboo was tested in the botanic garden at Buitenzorg, Java, where the plant grew, on the average, 7.7 millimeters per hour by day and 13 millimeters per hour by night. One culm grew 57 centimeters in 24 hours. (Adapted from *Watt, Commercial Products of India*, p. 101, and *Schimper, Plant Geography*, p. 216.)

For previous introduction, see S. P. I. No. 45963.

51027 to 51033.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received July 7, 1920. Quoted notes by Mr. Popenoe.

51027. DOLICHOLUS PHASEOLOIDES (Swartz) Kuntze. Fabaceæ.
(*Rynchosia phaseoloides* DC.)

"(No. 397a. June 18, 1920.) Seeds of a slender climber from the mountains near San Pablo Tarrazu, elevation about 5,500 feet. Its trifoliate leaves, which are borne upon slender wiry stems, suggest those of the common bean (*Phaseolus vulgaris*), and its seeds are strikingly similar to those of *Abrus precatorius*, the crab's-eye of the West Indies; they are small, and bright red with a black eye. Of interest chiefly for its seeds."

51027 to 51033—Continued.

51028. *Gossypium* sp. Malvaceæ.

Cotton.

"(No. 398a. June 18, 1920.) Cotton seed from a plant growing in the park at Alajuela, Costa Rica. The variety is one with brown fiber, of unknown origin."

51029 to 51031. *Persea americana* Mill. Lauraceæ.

Avocado.

(P. gratissima Gaertn. f.)

51029. "(No. 400. June 18, 1920.) Bud sticks of avocado No. 45, from the property of Padre Zuñiga, in Alajuela, Costa Rica. This tree was called to my attention by Don Anastasio Alfaro, who has been familiar with it for years. He states that it is one of the best avocados in Alajuela, if not the best of all. I have seen very little of the variety. The parent tree is old, and not in good condition. It stands in an inclosed property behind the principal church of Alajuela. The fruit is slender pyriform in outline, green when ripe, and probably 12 to 16 ounces in weight. The quality is said to be very good, but I suspect the seed may be too large, by our standards. The variety is evidently of the West Indian race, and ripens its crop in July and August."

51030. "(No. 383 and No. 402. May 27 and June 18, 1920.) Bud sticks of avocado No. 43, from the garden of Pantaleon Cordoba, San Jose. This variety has something of a local reputation as an avocado of excellent quality, and in addition ripens later than the average. In some of its characters it looks much like a Guatemalan; but more likely it is simply a highland form of the West Indian race (there is, of course, no hard and fast line which separates the two races, anyway). The parent tree, which stands about 50 feet to the rear of Sr. Cordoba's house, is 25 or 30 feet high, with a scanty crown and a straight trunk nearly 2 feet thick at the base. The fruit at this time (June, 1920) is not half grown, but I have seen a model of the mature fruit, made by Don Anastasio Alfaro, Director of the National Museum. The form is nearly spherical, with a tendency to longitudinal ribbing; the weight is perhaps 18 ounces and the color deep green. I believe the seed is proportionately smaller than in most of the Costa Rican avocados, and the quality of the flesh is said to be excellent. The ripening season is September to November."

51031. "(No. 392a. June 18, 1920.) Seeds of *aguacate de antis*, the wild avocado, from the region of La Palma."

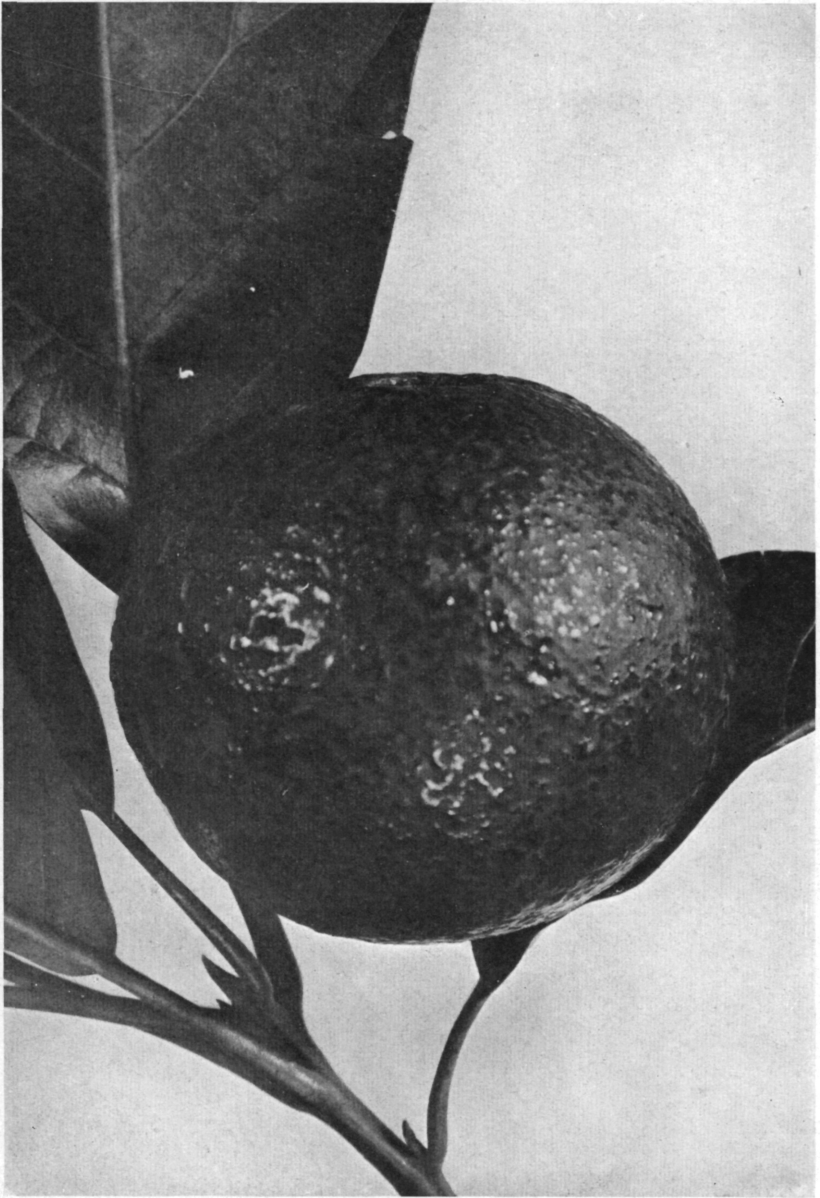
"The character of the tree and fruit is such as to suggest that this species, which is certainly indigenous in the mountains of central Costa Rica, is the wild prototype of the cultivated Guatemalan race, if not of the West Indian as well. The wild tree has been observed up to the present only at altitudes between 4,500 and 5,000 feet. It is not found in the forest, but frequents open places close to small streams and brooks, or is found associated with a few other trees along the margins of such watercourses.

"In general appearance the trees can scarcely be distinguished from Guatemalan avocados; the foliage is of a somewhat lighter shade of green than is common in the latter. The flowering season is March and April, and the fruits ripen a year from the following May or June—that is, in from 12 to 15 months. The



A WILD AVOCADO TREE IN COSTA RICA. (*PERSEA* SP., PROBABLY
P. AMERICANA MILL., S. P. I. NO. 51031.)

This wild avocado, which, up to the present, has been observed only on the slopes of the volcano Irazu, in central Costa Rica, is believed by its discoverers, Wilson Popenoe and Oton Jimenez, to be the wild prototype of the cultivated Guatemalan race of avocados, and probably of the West Indian as well. It is quite distinct from the Mexican avocado both in appearance of tree and foliage and in the character of the fruit. Because of its wild nature and the vigor of its growth it is believed this avocado may be of value as a stock plant on which to graft cultivated sorts. (Photographed by Wilson Popenoe, near La Palma, Costa Rica, June 9, 1920; P17902FS.)



THE AGUACATE DE ANÍS, OR WILD AVOCADO, OF COSTA RICA. (PERSEA SP.,
PROBABLY *P. AMERICANA* MILL., S. P. I. NO. 51031.)

In general character the wild avocado of Costa Rica closely resembles some of the cultivated sorts of the Guatemalan race. It has a thick, woody, coarsely granular shell, dark green on the surface. The flesh is yellow and unlike that of cultivated avocados in that it is strongly anise flavored and contains small gritty bodies like the stone cells in some of the Chinese pears. The seed is large and tight in the cavity. The average weight of specimens collected in Costa Rica was about 6 ounces. (Photographed by Wilson Popenoe, San Jose, Costa Rica, May 31, 1920; P17845FS.)

51027 to 51033—Continued.

fruits from some of the wild trees are harvested by the natives and carried into the villages, where they are sold.

"This species will be studied further to determine its relationship with the cultivated avocados. It is introduced with this object in view and in the hope that it may prove to be a vigorous stock plant on which to graft some of the cultivated avocados."

For further description, see S. P. I. No. 50585.

For illustrations of the tree and of a fruit of the wild avocado, see Plates V and VI.

51032. *PERSEA CAERULEA* (Ruiz and Par.) Mez. Lauraceæ.

"(No. 399a. June 18, 1920.) From the mountains near Frailes, Costa Rica. Altitude, about 5,500 feet. Seeds of a common tree in this region, found usually in half-open places of the mountainsides and not in the dense forest. It reaches about 30 feet in height, and has a leaf strongly resembling that of *Persea americana* but more narrow than in many varieties of the latter. The fruits, which are produced abundantly in racemes, are black, the size of large peas, with very little pulp surrounding the seed. Introduced for trial as a stock plant for the avocado."

51033. *RUBUS COSTARICANUS* Liebm. Rosaceæ.

Blackberry.

"(No. 401a. June 18, 1920.) Seeds of a wild blackberry, *mora*, from Frailes, Costa Rica. Altitude, about 5,500 feet. The plant is a vigorous, bushy grower, and the fruits, which are produced in reasonable profusion, are composed of few large drupelets, making them somewhat different in appearance from the common blackberries of the North. They are of good flavor, but not very large—rarely more than three-quarters of an inch long but nearly as broad as long. Of interest to those engaged in blackberry breeding."

51034 to 51036.

From Buitenzorg, Java. Seeds presented by the director, Plant-Breeding Station. Received July 7, 1920.

51034 and 51035. *CUCURBITA PEPO* L. Cucurbitaceæ.

Gourd.

The following varieties were received without description.

51034. *Laboe deppe*.

51035. *Laboe Batik hawaek*.

51036. *PLACUS BALSAMIFER* (L.) Bail. Asteraceæ.

(*Blumea balsamifera* DC.)

A rather bushy woolly plant with a tall branched stem and leathery leaves 4 to 8 inches long. The flowers, borne in numerous small heads, have red pappus. The whole plant smells strongly of camphor which may, indeed, be prepared from it, and a warm infusion of the leaves acts as a pleasant sudorific. (Adapted from Watt, *Dictionary of the Economic Products of India*, vol. 1, p. 458.)

51036. *PLACUS BALSAMIFER* (L.) Bail. Asteraceæ.

From Kashmir, India. Seeds presented by Charles Hadow, British Embassy, Washington, D. C. Received July 7, 1920.

"The 'Tunla' or 'Galmei sunflower,' collected at an altitude of 8,000 feet in Kashmir, India, on grassy slopes exposed to snow in winter." (*Hadow.*)

A very attractive sunflowerlike composite from the western Himalayas. The very stout stem is usually not more than a foot high, occasionally 18 inches, with yellowish green, thick-veined, finally serrate leaves and very broad thick bracts. The flowers are usually solitary and a brilliant orange in color, with crenate ray flowers. (Adapted from *Flora and Sylva*, vol. 1, p. 310.)

51038 to 51040. PSIDIUM GUAJAVA L. Myrtaceæ. Guava.

From Porto Alegre, Rio Grande do Sul, Brazil. Seeds presented by G. S. Froes. Received July 7, 1920. Quoted notes by Mr. Froes.

Three varieties.

51038. "Yellow fruited; used as sweet preserves."

51039. "Rose-colored fruit; used for guava jelly."

51040. "White fruited; eaten fresh."

For previous introduction, see S. P. I. No. 48575.

51041. NONNEA ROSEA Link. Boraginaceæ.

(*Anchusa rosea* Bieb.)

From Stockholm, Sweden. Seeds presented by Dr. Robert E. Fries, director, Botanic Garden. Received July 10, 1920.

An attractive hardy annual from the northern Caucasus. It has procumbent stems, oblong leaves, and funnel-shaped, purple-white flowers. (Adapted from *Bieberstein, Flora Taurico-Caucasica*, vol. 1, p. 125.)

51042 to 51046. SOJA MAX (L.) Piper. Fabaceæ. Soy bean.

From Nanking, Kiangsu, China. Seeds presented by John K. Davis, American consul. Received July 12, 1920.

"Five varieties; obtained from a grain market in the city of Nanking." (*Davis.*)

51042. *Black.*

51045. *Late yellow.*

51043. *Tsing.*

51046. *Yellow eighth month.*

51044. *Fifth month yellow.*

51047 to 51049.

From Auckland, New Zealand. Seed presented by J. W. Poynton. Received July 15, 1920. Quoted notes by Mr. Poynton.

51047. ENTELEA ARBORESCENS R. Br. Tiliaceæ.

"A beautiful tree with extremely light wood, half as heavy as cork. Its large, maplelike leaves are evergreen. It is the only representative of its genus. Its distribution is confined to two small areas in the North Island of New Zealand and one in the South Island. Will grow only in warm climates, but should do well in California and your Southern States."

For previous introduction, see S. P. I. No. 48165.

51048. METROSIDEROS TOMENTOSA A. Rich. Myrtaceæ.

"This tree, called *pohūtukawa* by the Maoris, loves the seashore and will grow where at high tides the sea water covers its roots. It will also grow inland, many fine specimens being found around Lake Taupo

51047 to 51049—Continued.

in the heart of the North Island. The timber is hard and durable and especially useful for boat building, as its limbs have many knees. About Christmas time (midsummer here) it is covered with a wealth of scarlet blossoms, and on this account the British colonists call it the Christmas tree. As it has thick evergreen foliage and is quite uninjured by salt-water spray, it makes splendid shelter in exposed seaside situations. It grows readily from slips; and a hedge, shelter belt, or plantation is quickly available. It will not grow in a cold climate, but should find a congenial second home in Florida, California, and the Gulf States, where it should be of considerable value. I gathered this seed from a well-shaped healthy specimen, which last summer was a picture with its abundant blossoms."

For previous introduction, see S. P. I. No. 48151.

51049. MERYTA SINCLAIRII (Hook. f.) Seem. Araliaceae.

"*Puka*. This small dioecious tree, grows from 15 to 20 feet high and has larger leaves than any other New Zealand plant. It is found native only in the North Island; once the rarest of trees, only one specimen being known. A missionary discovered it near a native village (pah). It was 'tapu,' and he was forbidden under pain of death to touch it. He sketched it and announced its discovery, which was skeptically received among botanists. He returned in 12 years and found the pah deserted. He obtained some of the leaves, and the plant was classified by the botanist, Sinclair, and named for him. Subsequently 27 plants were discovered on some small islands in the Hauraki Gulf (New Zealand). From them, all existing trees of this species originated. It is a very ornamental tree, much favored for parks and gardens. It will not stand much frost, but should grow well in your warmer areas. It makes a beautiful pot plant. Like nearly all our trees, it is evergreen. Trees vary much in the size and glossiness of their foliage. The tree from which I collected the inclosed seed is a very fine one."

For previous introduction, see S. P. I. No. 47570.

51050 and 51051.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the Bureau of Plant Industry. Received July 15, 1920. Quoted notes by Mr. Popenoe.

51050. ANNONA MURICATA L. Annonaceae.**Soursop.**

"(No. 407. June 24, 1920.) Bud sticks of the *Bennett* soursop. A choice variety of the soursop from the garden of the superintendent of Zent Farm, United Fruit Co., near Port Limon. The tree is more productive than any other I have seen, and the fruit is unusually large and handsome. Budded trees of this variety should be tested in Porto Rico, Cuba, southern Florida, and elsewhere; I believe they will prove decidedly superior to the average seedling. The name *Bennett* has been given in honor of Mr. George S. Bennett, agricultural superintendent of the Costa Rican division, United Fruit Company."

For previous introduction, see S. P. I. No. 49258.

For an illustration of the fruit of the soursop, see Plate VII.

51050 and 51051—Continued.

51051. *GUILIELMA UTILIS* Oerst. Phoenicaceæ. **Palm.**
(*Bactris utilis* Benth. and Hook.)

"(No. 411a. June 24, 1920.) Seeds of the *pejibaye* palm, from fruits obtained in Tucurrique."

For description, see No. 391a [S. P. I. No. 50679].

51052 to 51055.

From Chama, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received July 9, 1920. Quoted notes by Mr. Johnson.

51052. *ARDISIA* sp. Myrsinaceæ.

"(No. 228.) Seeds of a red-berried shrub collected at Xalave, at an altitude of about 1,500 feet. The berries are produced quite freely in flat-topped clusters, 2 to 3½ inches in diameter, along the larger stems on short branchlets as well as terminally; the bright, shining red berries are one-fourth to half an inch in diameter and, with the foliage, make the shrub quite ornamental. I have not noticed the birds molesting the fruits, and the bunches always appear well filled. The berries evidently last in perfection a long time, as I have observed them for two months or more and they are still perfectly fresh and clean. The shrub may be of value as a red-berried pot plant, for florists and for outside planting in Florida and California."

51053. *ARDISIA* sp. Myrsinaceæ.

"(No. 231.) Seeds of a color variety of No. 228 [S. P. I. No. 51052]. Fruits are rich wine purple. Quite pretty."

51054. *CAPSICUM ANNUM L.* Solanaceæ. **Red pepper.**

"(No. 226.) 'Rash-ik' (green Chile pepper), also 'Sal-ik' (white Chile pepper). A fine-flavored Chile pepper that is always in demand here and commands the best price. When immature it is creamy white, though some specimens are tinged with purple. When fully ripe it is a rich red and is very hot. For three days after cleaning this seed my hands burned. When not mature it is not very hot and may be eaten with impunity. The bush does not reach a very large size (3 feet) and bears when 1 foot in height."

51055. *PASSIFLORA LIGULARIS* Juss. Passifloraceæ. **Sweet granadilla**

"(No. 227.) Seeds from wild vines. The pulp is very pleasant, but the juice in the aril is very acid and almost takes the skin off one's mouth. This material was brought to me by an Indian."

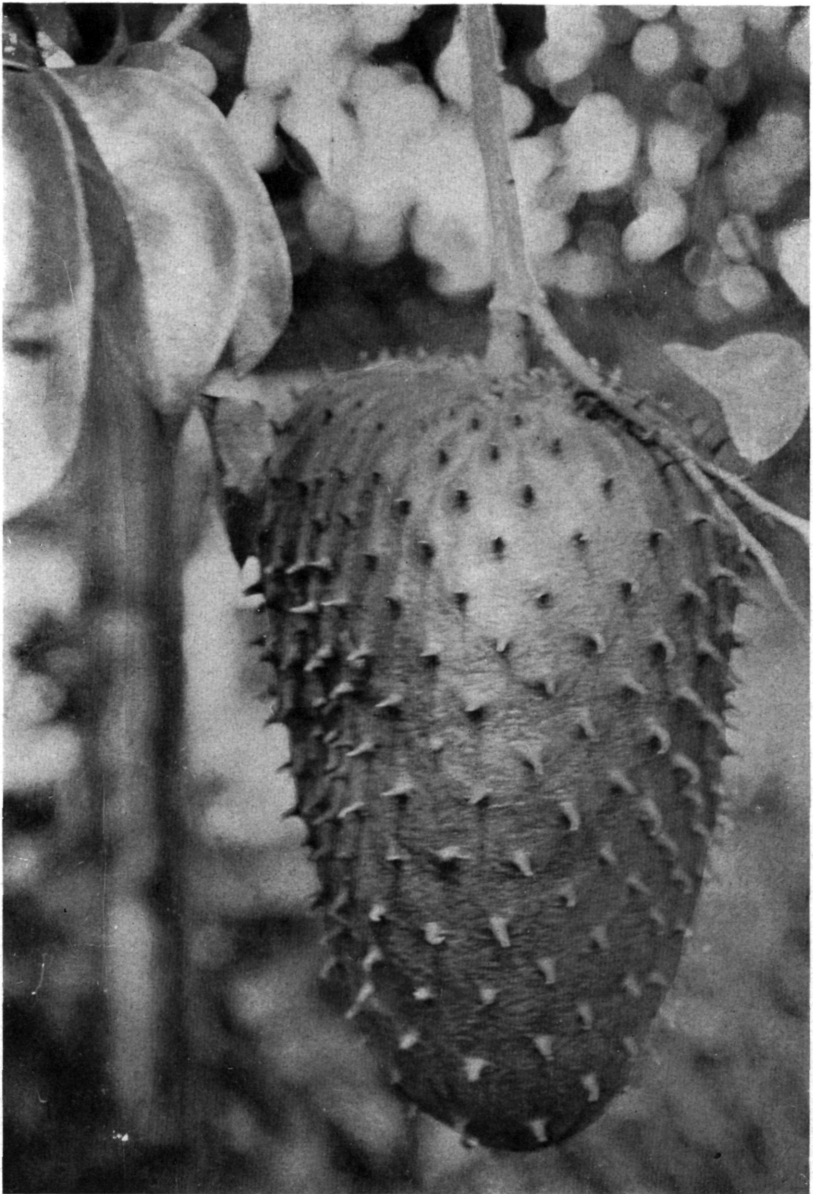
51056. *CHAYOTA EDULIS* Jacq. Cucurbitaceæ. **Chayote**
(*Sechium edule* Swartz.)

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received July 31, 1920.

"Fruits of *guisquil de papa*. These are known here at Coban as *peruleros*. They are quite small and rather wide and plump, pure white in color, mealy and dry." (Johnson.)

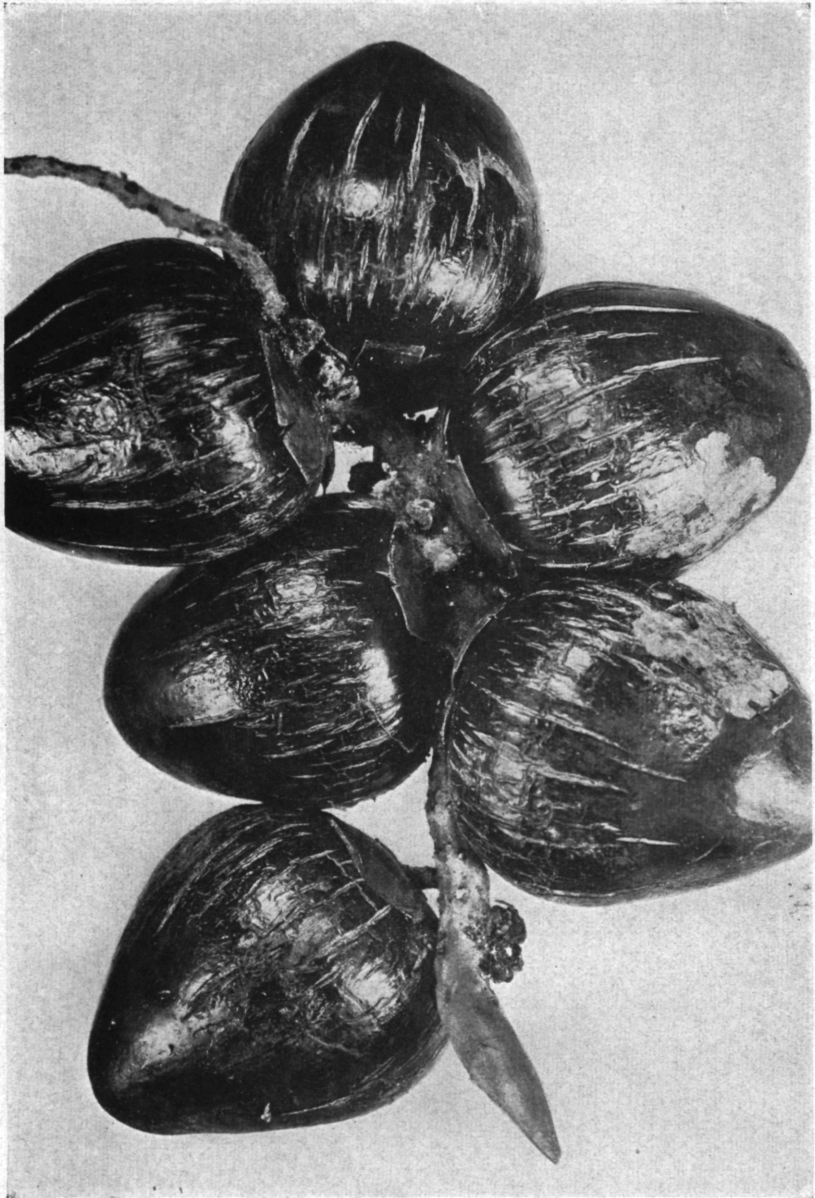
51057. *BROMUS* sp. Poaceæ. **Grass**

From Santiago, Chile. Seeds presented by Sr. Badilla, through C. A. McQueen, commercial attaché, embassy of the United States of America. Received July 26, 1920.



THE BENNETT SOURSOP, A CHOICE VARIETY FROM COSTA RICA. (ANNONA MURICATA L., S. P. I. No. 51050.)

Superior forms of the soursop, a valuable fruit of the American Tropics, have not yet been established horticulturally. Practically all of the trees now growing throughout the world are seedlings. Since they vary in productiveness and in the character of their fruit it is a simple matter to select the best ones and propagate them by budding or grafting. The variety here illustrated is one which was grown at the Zent Farm of the United Fruit Company near Port Limon, Costa Rica, and is considered unusually valuable because of the large size and excellent quality of its fruits as well as the productiveness of the tree. (Photographed by Wilson Popenoe, Zent, Costa Rica, June 21, 1920; P17957FS.)



A SEEDLESS FORM OF THE PEJIBAYE, OR PEACH PALM, OF COSTA RICA.
(GUILIELMA UTILIS OERST., S. P. I. No. 51092.)

Because of the food value and delicious character of its boiled fruits, the pejobaye has long ranked among the important economic plants of Costa Rica. While each fruit normally contains a large bony seed, there are a few trees in San Jose which produce seedless fruits. These trees are propagated by suckers, in the same manner as the date palm. It is not yet certain, however, that the suckers will produce seedless fruits when grown in other climates than that of San Jose. (Photographed by Wilson Popenoe in the garden of Don José Zeledón, San Jose, Costa Rica, June 17, 1920; P17947FS.)

"Seeds brought in by Stafford Hamm, an American mining engineer, a gift from Sr. Badilla, who owns an estate in the high mountains. This grass is said to be extremely resistant to cold and to grow almost without moisture. It is a good soil binder on lands which are subject to high winds and occasional heavy rains." (*McQueen.*)

51058 to 51060.

From Chama, Alta Vera Paz, Guatemala. Seed presented by Harry Johnson. Received July 12, 1920. Quoted notes by Mr. Johnson.

51058. BEGONIA sp. *Begoniaceæ.* **Begonia.**

"(No. 190.) *Begonia scandens* of gardeners(?)."

51059. PIPER TUBERCULATUM Jacq. *Piperaceæ.* **Pepper.**

"(No. 188.) *Cordoncilla.* The dried flower spikes are used in the same manner as *Piper nigrum.* It is used here in the preparation of cha-alcacao, a very good drink made by coarsely grinding the cacao with cinnamon and pepper. The flavor is a little different from black or white pepper and may be appreciated as a new condiment."

51060. HECKERIA sp. *Piperaceæ.* **Pepper.**

"(No. 189.) *Obel* (Kekchi name). The young leaves have a rather pleasant taste and are used to flavor fish, soups, stews, meats, etc. The plant is pretty when small, but soon grows 'leggy.' The large roundish leaves are green."

51061. CASSIA ELEGANS Voigt. *Cæsalpiniaceæ.*

From Cuzco, Peru. Seeds presented by A. A. Giesecke. Received July 15, 1920.

A shrubby ornamental Cassia with feathery pinnate leaves composed of obtuse lanceolate leaflets having yellowish midribs. Its original habitat is unknown, since the plant is known only in cultivation. (Adapted from *Voigt*, in *Sylloge Plantarum Ratisbonensi*, vol. 2, p. 55.)

51062 to 51068.

From East Melbourne, Victoria. Seeds presented by M. Medson. Received July 17, 1920.

51062. BACKHOUSIA CITRIODORA F. Muell. *Myrtaceæ.*

An Australian tree 18 to 20 feet high, with lemon-scented foliage like that of the scented verbena (*Lippia citriodora*). The essential oil from the leaves has been found suitable for scenting soaps, and the dried leaves give a very pleasant odor to linen closets, etc. The pinkish wood is hard and fine grained. (Adapted from *Maiden, Useful Native Plants of Australia*, pp. 290, 381.)

For previous introduction, see S. P. I. No. 33643.

51063. DORYANTHES PALMERI W. Hill. *Amoryllidaceæ.*

A beautiful member of the amaryllis family, native to Australia, where it grows to a height of 8 or 10 feet, with very numerous sword-shaped leaves up to 8 feet in length. The scarlet flowers are borne in a thyrsus about 3 feet long. (Adapted from *Curtis's Botanical Magazine*, pl. 6665.)

For previous introduction, see S. P. I. No. 23433.

51062 to 51068—Continued.

51064. EUCALYPTUS RISDONI Hook. f. Myrtaceæ.

A Tasmanian eucalypt rarely as tall as 50 feet, with smooth bark, pendulous branches, usually opposite lanceolate or heart-shaped leaves, and small flowers borne in axillary or lateral umbels. The wood is said to be rather poor. (Adapted from *Bentham, Flora Australiensis, vol. 3, p. 203*, and from *De Andrade, Manual do Plantador de Eucalyptos, p. 219.*)

51065. KENNEDIA MONOPHYLLA Vent. Fabaceæ.

(*Hardenbergia monophylla* Benth.)

An ornamental Australian leguminous vine with solitary obtuse leaflets up to 4 inches in length and numerous violet or rose-purple flowers borne in twos or threes in racemes. (Adapted from *Maiden, Flowering Plants and Ferns of New South Wales, pt. 1, p. 55.*)

For previous introduction, see S. P. I. No. 45790.

51066. SWAINSONA GALEGIFOLIA (Andrews) R. Br. Fabaceæ.

(*Colutea galegifolia* Sims.)

A low shrubby leguminous plant from New South Wales, with compound vetchlike leaves and scarlet-orange flowers borne on rather long axillary peduncles. (Adapted from *Curtis's Botanical Magazine, pl. 792.*)

The more common form in cultivation (variety *alba* Hort.) has pure white flowers.

51067. TELOPEA SPECIOSISSIMA (J. E. Smith) R. Br. Proteaceæ.

(*Embothrium speciosissimum* Smith.)

Waratah.

An Australian shrub 6 to 8 feet high, with obovate, unequally serrate, dark-green leaves and a headlike spike of brilliant red flowers. It is propagated by layering or seeds. (Adapted from *Curtis's Botanical Magazine, pl. 1128.*)

For previous introduction, see S. P. I. No. 44837.

51068. TRICONDYLUS FRASERI (R. Br.) Kuntze. Proteaceæ.

(*Lomatia ilicifolia* R. Br.)

An erect branching shrub or sometimes a small tree, with ovate or lanceolate leaves, irregularly prickly toothed or lobed, and long, loose racemes of white or light-yellow flowers. The wood is light and very hard, with beautiful markings, and is easily worked. (Adapted from *Bentham, Flora Australiensis, vol. 5, p. 536*, and from *Maiden, Useful Native Plants of Australia, p. 564.*)

51069 to 51072.

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Gustav Helmrich. Received July 20, 1920. Quoted notes by Mr. Helmrich.

51069. ARUNDINELLA BERTERONIANA (Schult.) Hitchc. and Chase.
Poaceæ. Grass.

"*Gjekerj* (tail of deer)."

"A tufted perennial grass with strong, slender, upright culms, 0.5 of a meter to 1 meter high, with long, narrow, folded, or involute blades and a many-flowered tawny panicle 20 to 30 centimeters long." (*Agnes Chase.*)

51069 to 51072—Continued.

51070. *CHAETOCHLOA GENICULATA* (Lam.) Millsp. and Chase. Poaceæ. Grass.

"*ue-k'im* (caterpillar grass)."

"A perennial grass producing short knotty branching rhizomes as much as 4 centimeters long. The culms are erect, spreading, or prostrate, up to 1 meter tall. The blades are flat, scabrous, and often glaucous, mainly straight, 20 centimeters long and 8 millimeters wide. The exerted panicle is yellow, purple, tawny, or greenish, 1 to 10 centimeters long and 4 to 8 millimeters thick. Native to open ground, salt marshes, and moist coast lands from Connecticut to Florida and Texas, in the interior north to Kansas and south through tropical America to Argentina and Chile." (*A. S. Hitchcock.*)

51071. *CHAETOCHLOA SULCATA* (Aubl.) Hitchc. Poaceæ. Grass.
(*Setaria sulcata* Raddi.)

"*Hots-kor* (scrape-leaf)."

"A perennial grass with robust culms as much as 4 meters tall, with flat blades, 1 meter long and 10 centimeters wide at the middle, tapering at each end. The green or purplish panicles are often 70 centimeters long. Native to southern Mexico, northern South America and north in the Windward Islands to Guadeloupe." (*A. S. Hitchcock.*)

For previous introduction, see S. P. I. No. 38776.

51072. *PASPALUM PANICULATUM* L. Poaceæ. Grass.

"*Gua-djue* (fodder of roe)."

A weedy branching perennial, commonly 1 meter tall, with harshly pubescent flat blades 20 to 30 centimeters long and 1.5 centimeters wide and very numerous slender racemes crowded in oblong panicles. Native to open or partly shaded savannas, mostly moist ground from Mexico and the West Indies to South America. (Adapted from *Hitchcock and Chase, Contributions from the National Herbarium, vol. 17, p. 317.*)

51073. *TRIFOLIUM RESUPINATUM* L. Fabaceæ. Clover.

From Cairo, Egypt. Seeds collected for Prof. S. C. Mason, arboriculturist, United States Department of Agriculture, by Thomas W. Brown, director, Horticultural Division, Ministry of Agriculture. Received July 20, 1920.

"A small prostrate clover common in the sod of the parks and gardens around Cairo, usually in heavy soils." (*Mason.*)

51074 and 51075. *BLAKEA* spp. Melastomaceæ.

From San Jose, Costa Rica. Seeds presented by Doña Amparo de Zeledón. Received July 23, 1920. Quoted notes by Sra de Zeledón.

51074. *BLAKEA* sp.

"An epiphyte with very large carmine-magenta flowers."

51075. *BLAKEA* sp.

"An epiphyte with very large carmine-magenta flowers."

51076 to 51084.

From Batum, Transcaucasia, Russia. Seeds presented by John Palibin, director, Botanic Garden, through Charles K. Moser, American consul, Tiflis, Transcaucasia. Received July 23, 1920. Quoted notes by Mr. Palibin.

51076 to 51084—Continued.

51076. *CICER ARIETINUM* L. Fabaceæ. Chick-pea.

"Cultivated in the the western part of Transcaucasia, harvested in 1919."

51077 and 51078. *CORYLUS AVELLANA* L. Betulaceæ. Hazelnut.

51077. "*Kobuletti*, considered the best variety in the commerce of Batum. Harvested in 1919."

51078. "The thin-shelled kind from Trebizond. Harvested in 1919."

51079 to 51084. *PHASEOLUS VULGARIS* L. Fabaceæ. Common bean.

51079. "A good kind, cultivated in the Kutais district. A short, thick bean with reddish brown marks and splotches on a white ground."

51080 to 51084. "Best kinds in Georgia, Transcaucasia; the beans of the best varieties are those with lilac-colored spots. From the Botanical Gardens of Batum."

51080. 1. Lilac spots on a light-tan ground.

51081. 2. Lilac spots on a dark-tan ground.

51082. 3. Clear grayish tan with a dark ring around the hilum.

51083. 4. Brownish tan with dark ring around the hilum.

51084. 5. Long, slender, dark-red bean.

51085. *PINUS HALEPENSIS PITYUSA* (Stev.) Gordon. Pinaceæ. Pine.

From Sukhum Kale, Caucasus. Seeds presented by J. Muszynski, director, Botanic Garden. Received July 31, 1920.

A much-branched bushy pine, found in mountainous regions of the western Caucasus and Asia Minor, especially in Georgia. It attains a height of 6 to 10 meters, with numerous spreading whitish branches and slender twigs. The very slender leaves are about 12 centimeters long, and the ovoid, slightly bent cones are quite small. (Adapted from *Beissner, Handbuch der Nadelholzkunde, ed. 2, p. 421.*)

51086 to 51094.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received July 26, 1920. Quoted notes by Mr. Popenoe.

51086 to 51090. *DAHLIA* spp. Asteraceæ. Dahlia.

"(Nos. 425 to 429. July 6, 1920.) A collection of Costa Rican tree dahlias presented by Sr. Alfredo Brade, of San Jose. I believe there are at least two species represented. They will prove interesting to dahlia breeders."

51086. *DAHLIA* sp.

"(No. 425.) Large double lilac pink. Considered by Sr. Brade the finest variety of the collection, the flowers being very large and very double."

51087. *DAHLIA* sp.

"(No. 426.) Small-flowered half-double pale lilac pink. This variety flowers earlier in the season than the others in the set, and for this reason is of particular interest for California, where most of the tree dahlias are cut down by frost before they come into bloom."

51086 to 51094—Continued.

51088. DAHLIA sp.

"(No. 427.) Small double-flowered lilac. This variety flowers later than the others."

51089. DAHLIA sp.

"(No. 428.) Single white. This looks much like a form of *Dahlia maxonii*. The preceding three varieties all have leaves and stems tinged with purplish, and leaves distinct in form from the present number. In this variety and in No. 429 [S. P. I. No. 51090] the leaves are light green, with the leaflets long pointed."

51090. DAHLIA sp.

"(No. 429.) Double white, like the single white except that the flowers are double."

51091 and 51092. GUILIELMA UTILIS Oerst. Phœnicaceæ. Palm.
(*Bactris utilis* Benth. and Hook.)

51091. "(No. 424. July 6, 1920.) Plants of the *seedless pejibaye*. I have already described the pejibaye in connection with a shipment of seeds made under No. 391a [S. P. I. No. 50679]. The suckers or offshoots sent under the present number, however, are of a choice seedless form growing in the garden of Sr. Alfredo Brade, in San Jose. Sr. Brade has generously presented us with the only two offshoots at present available, in the hope that they will grow in Florida. The *seedless pejibaye* is rare in Costa Rica, and very highly esteemed, as it should be. Its propagation must necessarily be slow, because of the very few offshoots which each palm produces. The only question is, will the progeny of these palms invariably retain the valuable characteristic of seedlessness? It seems possible that seedlessness may be due, in some instances at least, to local peculiarities of climate which affect the pollination of the flowers; and in such instances, the characteristic will not, of course, be heritable. The matter has not yet been sufficiently investigated, however, to permit any conclusions to be reached; and for the present we should make an effort to test all available seedless forms in our tropical dependencies and in southern Florida."

For previous introduction, see S. P. I. No. 44268.

51092. "(No. 431. July 6, 1920.) Plants of *seedless pejibaye*, presented by Doña Amparo de Zeledón, of San Jose. See remarks concerning seedless pejibayes under No. 424 [S. P. I. No. 51091]. The offshoots forwarded under the present number have been obtained for us by Sra de Zeledón from palms known by her to produce seedless fruits. The value of her gift can be appreciated only by those who know how difficult it is to procure offshoots of the seedless pejibaye."

For previous introduction, see S. P. I. No. 44268.

Fruits of this seedless form are shown in Plate VIII.

51093. PASSIFLORA QUADRANGULARIS L. Passifloraceæ. Giant granadilla.

"(No. 430. July 6, 1920.) Cuttings of *granadilla real*. From the garden of Sr. Alfredo Brade, in San Jose. Sr. Brade states that this vine is

51086 to 51094—Continued.

a free bearer, a condition quite rare with *Passiflora quadrangularis*. It is introduced for trial because of the possibility of its proving better than the average form."

51094. *RUBUS ERIOCARPUS* Liebm. Rosaceæ.

Raspberry.

"(No. 423a. July 6, 1920.) Seeds of *mora*. From the upper slopes of the Volcano Irazu, at 9,000 to 10,000 feet altitude. This berry, which is found only at altitudes of 9,000 feet and higher, is quite distinct from the several species which I have collected in Costa Rica at lower levels, mainly between 4,000 and 6,000 feet. It is more of a raspberry than a blackberry in character. The slender canes, which are of a deep reddish green color, grow to 8 or 10 feet in length and branch profusely, forming an impenetrable tangle. The leaves are trifoliolate and the flowers small and white. The fruits, which are produced in good-sized clusters, are oblong or oblong-oval, up to an inch in length, and composed of numerous small deep-red drupelets. The flavor is distinctly that of the raspberry and is very agreeable. The plant is a profuse bearer, and seems well worthy of trial in the southern United States."

51095 to 51097.

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Gustav Helmrich. Received July 31, 1920. Quoted notes by Mr. Helmrich.

51095. *ISCHAEMUM LATIFOLIUM* (Spreng.) Kunth. Poaceæ.

Grass.

"*Cux-kub* (Indian). A very good fodder for horses."

A stout decumbent grass, rooting at the lower nodes, with glabrous blades 20 centimeters long and 3 centimeters wide and a fan-shaped inflorescence. Native to moist shady places in southern Mexico and the Lesser Antilles to Brazil and Ecuador. (Adapted from *Hitchcock and Chase, Contributions from the U. S. National Herbarium, vol. 18, p. 332.*)

51096. *PASPALUM HUMBOLDTIANUM* Fluegge. Poaceæ.

Grass.

"*Taki pachadja* (white grass)."

"A handsome perennial grass producing strong scaly rootstocks, with tufted culms, 40 to 80 centimeters high, erect from a woody, decumbent base. The nodes are densely bearded with upwardly appressed white hairs; the flat, spreading blades, 8 to 18 centimeters long, 8 to 15 millimeters wide, are slightly narrowed toward the base into a stiff point. The margins are usually stiffly fringed with hairs, and the panicles, 10 to 15 centimeters long, are of pale lax, spreading spikelets, beautifully fringed with long, white glistening hairs. Native to rocky ground on the highlands from central Mexico to Argentina." (*Agnes Chase.*)

51097. *PANICUM MULTIRAMEUM* Scribn. Poaceæ.

Grass.

"*Chachach onim* (basket grass)."

A delicate grass with small open primary panicles of pubescent spikelets, lanceolate blades less than 10 times as long as broad, and basal leaves which are distinctly different from those of the culm, forming a winter rosette; the culms are at first simple, later becoming much branched. The autumnal phase is decumbent with the branches in fan-shaped clusters. Native to banks and dry, open ground from southern Mexico to Guatemala, and also in Jamaica. (Adapted from *Hitchcock and Chase, Contributions from the U. S. National Herbarium, vol. 18, p. 332.*)

51098. CONVULVULUS MAURITANICUS Boiss. Convolvulaceæ.**Morning-glory.**

From Pasadena, Calif. Plants presented by D. W. Coolidge, Coolidge Rare-Plant Gardens. Received August 4, 1920.

The blue rock bindweed is one of the most beautiful and graceful of all our hardy bindweeds. It is entirely free from rampant tendencies and is remarkable for its persistent flowering and neat elegant habit. Each plant forms a dense tuft and throws up innumerable long drooping shoots, each terminated by a cluster of clear blue flowers. Easily grown from cuttings. (Adapted from *The Garden*, vol. 39, p. 52.)

51099. PASSIFLORA MACROCARPA Masters. Passifloraceæ.

From Trujillo, Peru. Seeds presented by A. Martin Lynch, Sayapullo. Received August 9, 1920.

"The fruit grows to the size of a man's head and is one of the most delicious fruits grown in Peru, where the juice and pulp are made into a most delicious beverage." (*Alberto Larco Herrera.*)

51100. SYZYGIVM CUMINI (L.) Skeels. Myrtaceæ. Jambolan.
(*Eugenia jambolana Lam.*)

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received August 11, 1920.

"Seeds of the *duhat*, one of our most popular small fruits." (*Wester.*)

A tropical Asiatic tree 8 to 15 meters high, with ovate, coriaceous, shining leaves and numerous yellow flowers crowded in terminal or axillary panicles followed by loose clusters of 2 to 7 dark-purple or black, smooth, shining, ovoid fruits, 25 millimeters long and 20 millimeters across, with rather large clingstone seeds. The thin skin adheres to the sweet, juicy, pleasant, subacid pulp which is white tinged with purple; the texture somewhat resembles that of the cherry. The sugar content is 12.20 per cent, the protein 0.80 per cent, and the acidity (as malic acid) 87 per cent. The fruit may be eaten out of hand with relish, and it makes an excellent jelly. In India it is sometimes made into wine. It is probably of prehistoric introduction into the Philippines and is common throughout the archipelago. (Adapted from *The Philippine Agricultural Review*, vol. 10, p. 13.)

For previous introduction, see S. P. I. No. 43217.

51101. CORDIA sp. Boraginaceæ.

From Santiago de las Vegas, Cuba. Seeds presented by Gonzalo M. Fortun, director, Agricultural Experiment Station. Received August 17, 1920.

"A plant generally known in Cuba as *vomitel*; it is also called *gutaperi*. The fruits of this plant are edible, and we were told that an excellent preserve is made from them. The tree when loaded with its glorious heads of crimped, salver-shaped orange flowers makes a magnificent appearance." (*Fortun.*)

51102. CUCUMIS MELO L. Cucurbitaceæ. Muskmelon.

From Paris, France. Seeds presented by Prof. S. C. Mason, arboriculturist, United States Department of Agriculture. Received August 17, 1920.

"Immediately after arriving in Paris I noticed peculiar and very fine cantaloupe melons displayed in the windows of the groceries, as we would call them.

These melons continue all through August, they tell me, and are grown in open gardens, though I suspect that they are started in frames. They are roundish, a good deal oblate, deeply ribbed, inclined to be rough and warty (but not netted), and have a very distinct 'areole' (or smooth circle) around the calyx, sometimes as much as 2 inches in diameter. They range in size, apparently the same variety, from 4 inches in diameter up to 8 or even 9 inches, and in retail price from 2½ to 12, 14, and even as high as 17 francs for the finest specimens. In good restaurants one portion (about 8 or 10 to a large melon) is served for 4½ francs. The melons are picked when they become a mottled gray-green in color, never being allowed to ripen on the vines. They appear to carry remarkably well, but when well matured they are a dirty yellow color, not very attractive. The flesh is rich orange-yellow, thick, firm, not at all netted, and only moderately sweet but very satisfying. I am sending you the entire lot of seeds from one, of which I had a portion in the Grand Café de l'Alma, close to the Ponte l'Alma. I am sure I have never seen a melon anything like this type in the United States." (*Mason.*)

51103 and 51104. AMYGDALUS COMMUNIS L. Amygdalaceæ.

(*Prunus amygdalus* Stokes.)

From Gedera (Katra), near Jaffa, Palestine. Budwood presented by Amram Khazanoff. Received August 17, 1920. Quoted notes by Mr. Khazanoff.

"The two standard almond varieties of Palestine, which I consider worthy of the interest of almond growers in the United States. This budwood was selected with a view to possible bud variation."

51103. "Greek almond."

51104. "Victoria almond."

51105. PERSEA AMERICANA Mill. Lauraceæ. Avocado.

(*P. gratissima* Gaertn. f.)

From Rio Frio, near Santa Marta, Colombia. Budwood collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received August 19, 1920.

"(No. 432. Avocado No. 46. August 5, 1920.) A very choice variety of avocado, said to be the earliest known in the Rio Frio region. This is a fine oval fruit, green in color, about 1½ pounds in weight, with thick meat of excellent quality." (*Popenoe.*)

51106. OTOPHORA FRUTICOSA (Roxb.) Blume. Sapindaceæ.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received April 24, 1920. Numbered August 30, 1920.

"*Batinaonao*. A small tree with dark-red to black fleshy fruits about one-third the size of grapes, in bunches like grapes, up to 200 fruits in a bunch. The flesh is sweet and edible but rather insipid. The seeds taste like chestnuts roasted and are eaten to a slight extent. The plant is of slight economic value but is quite ornamental in the fruiting season by reason of its large bunches of dull rose-red fruits. The tree grows at Lamao and may succeed in Florida." (*Wester.*)

51107 to 51109.

From Buenos Aires, Argentina. Seeds presented by Benito Carrasco, director, Botanic Garden. Received July 12, 1920.

51107. *ASPIDOSPERMA FERROBA* Sald. Gama. Apocynaceæ.

This tree, whose wood is used in naval construction, has a thin, clear ash-colored bark, cracked longitudinally; a decoction of the inner bark is used medicinally. The heartwood is of rare beauty, with a wavy pattern. The tree is distinguished by its spreading, obovate-oblong, undulate leaves. (Adapted from *Saldanha da Gama, Configuração descriptiva de todos os órgãos fundamentais das principais madeiras . . . da Província do Rio de Janeiro, vol. 1, p. 140.*)

For previous introduction, see S. P. I. No. 42324.

51108. *GOMPHRENA ROSEA*. Griseb. Amaranthaceæ.

An herbaceous perennial, erect or ascending, found in stony situations in Cordoba, Argentina. The leaves are lanceolate and rather short, and the pinkish flowers are borne in a terminal head. (Adapted from *Grisebach, Plantae Lorentzianae, p. 32.*)

For previous introduction, see S. P. I. No. 33966.

51109. *PETUNIA VIOLACEA* Lindl. Solanaceæ. Petunia.

This petunia is a native of Buenos Aires, Argentina. With its dark-green oval leaves and profusion of purple flowers which appear from August to October in its native habitat, it forms a most attractive ornamental plant. (Adapted from *Edwards' Botanical Register, pl. 1626.*)

51110. *AELUROPUS BREVIFOLIUS* (Koen.) Nees. Poaceæ. Grass.

From Cairo, Egypt. Seeds presented by Dr. R. H. Forbes, Société Sultannienne d'Agriculture. Received September 8, 1920.

"A dwarf creeping grass with dense globose flower clusters, growing in saline soil both on the seacoast and inland from the Mediterranean coasts to Afghanistan and India. The species is very variable, with both glabrous and pubescent forms. Duthie in 'The Fodder Grasses of Northern India,' says of it: 'It is characteristic of saline tracts in the western parts of India, where it appears to take the place of dub (*Cynodon dactylon*), which it somewhat resembles in habit.'" (*C. V. Piper.*)

Introduced for testing as a lawn grass under alkaline conditions.

51111. *ANTHEPHORA PUBESCENS* Nees. Poaceæ. Grass.

From Pretoria, Transvaal. Seeds presented by Sydney Steub, Division of Botany, Department of Agriculture. Received August 24, 1920.

"Considered one of the best pasture grasses in parts of Bechuanaland where it grows." (*Agricultural Journal of South Africa, vol. 3, No. 17, p. 135.*)

51112. *XANTHOSOMA SAGITTAEFOLIUM* (L.) Schott. Araceæ. Yautia.

From Buitenzorg, Java. Tubers presented by Dr. J. C. Koningsberger, director, Botanic Garden. Received September 18, 1920.

"Received under the varietal name *romah*, which, according to a previous introduction (S. P. I. No. 17238) is a *Colocasia*." (*R. A. Young.*)

51113 to 51115.

From Rawalpindi, Punjab, India. Seeds presented by Dr. R. R. Stewart, Gordon College. Received July 7, 1920. Quoted notes by Doctor Stewart.

51113. *TULIPA STELLATA* Hook. Liliaceæ. Tulip.

A very delicate species which is certainly a valuable acquisition to our gardens. It is remarkable for the narrowness of the petals and their spreading out almost flat in the middle of the day when the sun shines, and closing again in the evening. The small broadly ovate bulb, capped with three or four lanceolate segments thickly lined with fulvous hair, flowers in two months. In India, where the plant is common, the bulbs are frequently eaten by natives and are sold for that purpose in some of the bazaars. The terete, glaucous stem, nearly 2 feet high in the cultivated species, bears four to five linear-lanceolate leaves. The dainty, erect flowers, oblong in the bud, are solitary or two upon the same stem. The lanceolate, concave petals are pure white, with a faint tinge of pink and green at the points, on the outside, and bright yellow at the base within. Three of the petals are longer than the rest and sometimes have a single tooth. (Adapted from *Curtis's Botanical Magazine*, pl. 2762; and *Watt, Dictionary of the Economic Products of India*, vol. 6, pt. 4, p. 203.)

51114. *ZIZIPHUS JUJUBA* Mill. Rhamnaceæ. Jujube.
(*Z. sativa* Gaertn.)

"Wild jujube bought in market. A form widely cultivated in the Punjab."

51115. *ZIZIPHUS* sp. Rhamnaceæ. Jujube.

"Wild jujubes bought in market."

51116 to 51125.

From San Jose, Costa Rica. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received July 14, 1920. Quoted notes by Mr. Popenoe.

51116. *BUNCHOSIA GLANDULIFERA* H. B. K. Malpighiaceæ.

"(No. 412. July 1, 1920.) *Cereza*. Plants presented by Carlos Wercklé, of El Coyolar, Costa Rica.

"A small, slender tree, reaching about 20 feet in height. It bears short racemes of yellow flowers which are followed by elliptic, bright-red fruits about 1 inch long. Mr. Wercklé thinks the fruit nearly as good in quality as that of the Japanese persimmon; in my opinion, however, it is considerably inferior. The thin skin surrounds a large elliptic seed and a small quantity of red pulp which, like that of the persimmon, must not be eaten until it is very soft."

51117. *CASTILLA NICOYENSIS* O. F. Cook. Moraceæ. Nicoya rubber.

"(No. 416a. July 1, 1920.) Seeds collected from a tree in the doorway of the ranch house at El Coyolar, Costa Rica. It is a Central American rubber tree, said to be a more vigorous grower than *Castilla elastica* and less exacting in its soil requirements."

For previous introduction, see S. P. I. No. 42386.

51116 to 51125—Continued.

51118. *CORDIA NITIDA* Vahl. Boraginaceæ.

“(No. 415a. July 1, 1920.) Seeds of *muñeco*. The *muñeco* is commonly planted in and about San Jose as a street tree, or as an ornamental tree in parks and gardens. It reaches a height of 40 feet, and forms a broad, shapely crown of deep-green foliage. It is quick growing and rather soft wooded, so that limbs are sometimes broken off by storms. The orange-red fruits, which are produced in clusters 4 to 6 inches across, are individually the size of small cherries. They are not edible, but since they remain on the tree a long time they are of decorative value.”

51119. *CROTALARIA VERRUCOSA* L. Fabaceæ.

“(No. 413a. July 1, 1920.) Seeds of a plant found abundantly at Puntarenas, in abandoned or uncultivated places close to the seashore. It seems less woody in character than *Crotalaria retusa*, and likely, therefore, to make a better crop for use as a green manure. It reaches about 18 inches in height, and bears attractive white and pale-blue flowers. Evidently it is an annual. It should be tested as a cover crop in the South, especially on sandy lands.”

51120. *CUPANIA* sp. Sapindaceæ.

“(No. 414a. July 1, 1920.) *Paraiso*. Seeds presented by Carlos Wercklé, of El Coyolar, Costa Rica. Mr. Wercklé states that this is a handsome ornamental tree, indigenous in the region about Coyolar, and probably not described botanically. It should be tested in southern Florida.”

51121. *PASPALUM NOTATUM* Fluegge. Poaceæ.

Grass.

“(No. 418a. July 1, 1920.) *Gengibrillo*. Seeds presented by Alfredo Quiros. From sea level up to 5,000 feet this is probably the most important of the pasture grass cultivated in Costa Rica; above 5,000 or 6,000 feet it is injured by frost and is not, therefore, extensively planted. In the lowlands it is especially esteemed; it makes a compact sod, crowding out weeds and other grasses, and affording an abundance of nourishing green forage, eaten readily by both horses and cattle. It rarely grows more than a foot in height, and where pastured constantly does not often reach more than 6 inches. For trial in the Everglades region of southern Florida.”

For previous introduction, see S. P. I. No. 37996.

51122. *POLAKOWSKIA TACACO* Pittier. Cucurbitaceæ.

“(No. 422. July 1, 1920.) Seeds of *tacaco*. Among Costa Ricans this is one of the most popular of all vegetables, and it is regularly sold in the market of San Jose during a large part of the year.

“In general character the *tacaco* suggests the chayote. The plant, which is commonly cultivated on arbors or allowed to climb over trees, has a leaf resembling that of the chayote in shape but differing in texture; and the fruit, which falls to the ground when mature, is about 3 inches long, elliptic in outline. Frequently it has a few short spines about the base; elsewhere it is smooth. When boiled it is considered to have a richer flavor than the chayote, but the flesh is somewhat fibrous.

“The *tacaco* should be tried in the chayote-growing regions of the United States. Doubtless it would be possible to reduce the proportion of fiber and otherwise improve the fruit by selection.”

For previous introduction, see S. P. I. No. 47329.

51116 to 51125—Continued.

51123. *RUBUS ADENOTRICHOS* Schlecht. Rosaceæ.

"(No. 417a. July 1, 1920.) *Mora*. Seeds of a wild blackberry from the roadside between Cartago and Tierra Blanca, at an altitude of about 6,000 feet. A vigorous, bushy species reaching about 8 feet in height and producing in abundance blackberries somewhat less than 1 inch long and of good flavor. Of especial interest for breeding purposes."

51124 and 51125. *WERCKLEA INSIGNIS* Pitt. and Standl. Malvaceæ.

51124. "(No. 419. July 1, 1920.) Cuttings presented by Dr. Ricardo Jiménez Núñez, of Guadalupe, San Jose. A rare and handsome plant, discovered a few years ago in the mountains near La Palma, Costa Rica. It is an arborescent shrub about 15 feet in height, usually branching close to the ground to form several main limbs, which in turn branch (though sparingly) to form long stiff shoots, each crowned with a cluster of orbicular leaves nearly a foot in breadth. The flowers, which appear among the leaves at the ends of the branches, are similar in size and form to those of *Hibiscus rosa-sinensis*, the common hibiscus of the Tropics. In color, however, they are quite distinct from those of the hibiscus, being bright lilac, turning to golden in the throat. Since it is found in Costa Rica at an altitude of 5,000 feet, the species may be sufficiently hardy to succeed in southern Florida. It probably requires a moist climate, and in its indigenous condition it grows upon heavy soil."

51125. "(No. 419a. July 1, 1920.) Seeds of the shrub of which cuttings were sent under No. 419 [S. P. I. No. 51124]."

51126. *MANIHOT ESCULENTA* Crantz. Euphorbiaceæ. **Cassava.**

(*M. utilisissima* Pohl.)

From Honolulu, Hawaii. Cuttings presented by J. M. Westgate, agronomist in charge, Agricultural Experiment Station. Received August 10, 1920.

"*Wiebke* cassava. A very superior variety from the island of Kauai, selected from volunteer seedlings by a man named Wiebke, in whose honor the variety has been named. Not only does it yield better than three long-established varieties [*Sweet*, white, early-maturing culinary cassava; *Bitter*, red, late-maturing stock-feed cassava; *Martin's Intermediate* cassava], but it also has the habit of remaining tender or at least not becoming woody as do most of our varieties if left growing several months after maturity.

"*Wiebke* cassava promises to be superior to any of the above-mentioned varieties for culinary, feeding, and starch-manufacturing purposes. Harvested on June 15, at the end of a 15-month growing period, at the Haiku substation, it yielded 17,776 pounds per acre of clean roots. This result was obtained on rough pineapple land, without fertilization and with little or no cultivation aside from the initial plowing under of the old pineapple stumps and one cross-plowing.

"In an 18-month growing period completed in August, 1920, on soil fertilized with 500 pounds of phosphates, half super and half reverted, the *Wiebke* cassava yielded 19,111 pounds of roots per acre; on soil fertilized with 1,000 pounds of phosphates, half super and half reverted, it yielded 22,211 pounds of roots per acre. The starch recovered was 20 per cent. The crops were grown on old pineapple land with a view to testing their adaptation as a rotation crop." (F. G. Krauss.)

51127 to 51141.

From Buitenzorg, Java. Seeds presented by Dr. I. Boldingh, acting head of the Division of Plant Breeding, Java Department of Agriculture. Received August 20, 1920.

51127. *ARECA CATECHU* L. *Phœnicaceæ*. **Betel-nut palm.**

Variety *alba*. The species is one of the most important and valuable palms and is widely distributed throughout the East; it forms an erect, slender stem, bearing at its summit a crown of graceful leaves, among which hang great clusters of egg-shaped fruits, each one formed when ripe of a thick fibrous pericarp, inclosing one seed about the size and shape of an ordinary nutmeg. Native to Cochin China and the Malay Archipelago; it does not succeed at any distance from the sea nor at an altitude above 3,000 feet. The average yield of a betel-nut palm is estimated at 300 fruits. The chief use of the seed is as an ingredient in the preparation of pan for chewing, a universal practice among all classes. The seed or nut is found in all the bazaars either whole, sliced, or cut into small pieces, the chewing of which is said to stimulate digestion and to prevent dysentery. In the preparation of pan use is made of lime, catechu, cardamoms, cloves, and other ingredients. Areca nuts are used in medicine because of their astringent properties, and when reduced to charcoal and finely powdered they are also used as a dentifrice. (Adapted from *The Garden*, vol. 64, p. 282.)

51128. *CARYOTA MITIS* LOUR. *Phœnicaceæ*. **Palm.**

A palm, 15 to 25 feet in height, with a low, stoloniferous stem and scurfily villous petioles, leaf sheaths, and spathes; the few, very large, broad, bipinnatisect leaves are 4 to 9 feet long. The bluish black fruits are half an inch in diameter. Native to Mauritius. (Adapted from *Baker, Flora of Mauritius and the Seychelles*, p. 423.)

For previous introduction, see S. P. I. No. 24616.

51129. *DAMMARA ALBA* Rumph. *Pinaceæ*.

(*Agathis loranthifolia* Salisb.)

A splendid tree, up to 100 feet high, with a stem 8 feet in diameter, straight and branchless for two-thirds of its length. It is of great importance on account of its yield of the transparent dammar resin, extensively used for varnish. Native to the Indian Archipelago and mainland, extending to the Philippine Islands. (Adapted from *Mueller, Select Extra-Tropical Plants*, p. 161.)

For previous introduction, see S. P. I. No. 34071.

51130. *DRYMOPHLOEUS* sp. *Phœnicaceæ*. **Palm.**

Received as *Actinophloeus macarthurii*, for which a place of publication has not been found.

51131. *LATANIA COMMERSONII* Gmel. *Phœnicaceæ*. **Palm.**

A dioecious palm 40 feet high, native to Mauritius, with dark-green fan-shaped leaves, 3 feet long, paler beneath, the blade deeply lacinate; the veins and margins of the lanceolate segments are tinged with red. The petioles, 4 to 6 feet long, are slightly tomentose with smooth margins, spiny in young plants. The globose drupes are 1½ inches in diameter. (Adapted from *Baker, Flora of Mauritius and the Seychelles*, p. 381.)

For previous introduction, see S. P. I. No. 45960.

51127 to 51141—Continued.

51132. LICUALA RUMPHII Blume. Phœnicaceæ. Palm.

A showy dwarf fan palm grown for its peculiar habit and handsome foliage. The slender stem bears a crown of long-petioled roundish leaves, 3 or more feet in diameter, with 12 to 15 segments, the inner ones 2 feet long and 1 foot wide at the apex, the lateral ones, 16 inches long and 4 inches wide, oblique; the petioles are spiny below. The simply branched spadix, 4 to 5 feet long, bears ellipsoid fruits. Native to Celebes and Borneo. (Adapted from *Blume, Rumphia, vol. 2, p. 41.*)

51133. NEPHROSPERMA VAN-HOUTTEANUM (Wendl.) Balf. f. Phœnicaceæ. Palm.

A monoëcious palm, 20 to 35 feet high, native to the Seychelles, with pinnate glabrous leaves, 5 to 7 feet long, and leaflets 3 to 3½ feet in length; the smooth petiole is under a foot long and the woolly, sparsely spiny leaf sheath is 1½ to 2½ feet long. The spadix is 4 to 8 feet long and bears orange-red fruits, half an inch in length. (Adapted from *Baker, Flora of Mauritius and the Seychelles, p. 386.*)

For previous introduction, see S. P. I. No. 45965.

51134. ONCOSPERMA FILAMENTOSUM Blume. Phœnicaceæ. Palm.

A very elegant palm with a trunk 30 to 40 feet high, distinctly annulate and armed, and a thick, graceful crown. The pinnate leaves are 10 to 12 feet in length with pinnæ about 2 feet long. This palm is quite common on the borders of paddy swamp in Malacca. (Adapted from *Calcutta Journal of Natural History, vol. 5, p. 464.*)

For previous introduction, see S. P. I. No. 45962.

51135. PANDANUS FURCATUS Roxb. Pandanaceæ.

Variety lais.

This screw pine occurs in India up to altitudes of 4,000 feet, and will be likely to bear a temperate climate and give a stately plant for scenic group planting. (Adapted from *Mueller, Select Extra-Tropical Plants, p. 347.*)

51136. PANDANUS LABYRINTHICUS Kurz. Pandanaceæ.

A shrub 15 to 20 feet in height, with erect-spreading branches and a slender, warty, glabrous stem sending out stiltlike, intricate aerial roots. The somewhat leathery linear leaves, 4 to 6 feet long, are shining above, glaucescent below, the margin and midrib densely spiny with curving white spines. The green, linear spathes inclose the eight to nine spikes of elliptic, oblong, drooping fruit clusters. The drupes are shining olive green, finally golden. (Adapted from *Miquel, Annales Musei Botanici Lugduno-Batavi, vol. 2, p. 53.*)

51137. PANDANUS POLYCEPHALUS Lam. Pandanaceæ.

A small diœcious Indian tree with spiny-margined, trifarious, narrow, coriaceous leaves. The red, spiccate, subglobose drupes have spinescent crowns. (Adapted from *Hooker, Flora of British India, vol. 6, p. 487.*)

Received as *Pandanus kurzianus*, which is now generally referred to *P. polycephalus*.

51138. PANDANUS TECTORIUS Parkins. Pandanaceæ.

"*Aggak.*" A small tree with a trunk which usually begins to branch very low, the branches often bending downward nearly to the ground;

51127 to 51141—Continued.

the leaves are long, sword shaped, armed with spines on the margin and keel, differing in color and texture from those of Guam, being glaucous and of great textile strength. Only one sex occurs on the island, so that it must be propagated by cuttings. These take root readily; indeed, a branch lying on the surface will often send out roots which penetrate the ground. The natives frequently plant this species in hedges, which serve the double purpose of defining their boundaries and of furnishing material for cordage and for mats, hats, and bags.

"Dried leaves stripped of the rigid, spiny keel are used either in their simple form or twisted together as lashings for the framework of buildings and for securing thatch to the roof. For making mats, hats, and bags, the leaves are steeped in hot water, scraped, and split into strips of various widths according to the fineness of the fabric desired, dried in the sun, and thoroughly cleaned. Mats are braided with the strips crossing diagonally, as in the mats of the eastern Polynesians, not woven with warp and woof, as are the mats of many of the Micronesians. Some of the hats and small bags are very fine. In the early days the natives of Guam made their sails of *aggak* leaves. The plant was undoubtedly introduced into the island in prehistoric times." (*Saford, Useful Plants of Guam, p. 344.*)

For previous introduction, see S. P. I. No. 44779.

51139. ROYSTONEA REGIA (H. B. K.) O. F. Cook. Phœnicaceæ.

(*Oreodoxa regia* H. B. K.)

Cuban royal palm.

The royal palm grows wild throughout the Antilles and also in southern Florida, Mexico, Central America, and in the northern part of South America. It is especially abundant on damp, fertile soil, such as is suitable for tobacco cultivation. In the west of Cuba it is found on land which was formerly cultivated but has since been abandoned. The trunk is often 70 to 85 feet high, with a diameter of nearly 2 feet. The wood is considered unsuitable for constructive purposes, but the external layer of hard wood is much used for walking sticks, stakes, fences, posts, tables, coffee mortars, and the partition walls of houses. The most useful portion of the tree is the *yagua*, or dried leafstalk. The large terminal leaves have clasping leafstalks, 4 to 9 feet long, and as wide as the circumference of the stem. Every three or four weeks a leaf falls; this is damped, flattened by means of weights, and dried. The dried leafstalks are sold per truss and provide the best packing material for export tobacco. The leaf bases supply a fiber from which ropes and string are made. In Cuba *yagua* is also used in the construction of the poorest houses. The terminal bud is edible, but its removal causes the death of the tree. This is one of the most elegant palms for planting in avenues. (Adapted from *La Hacienda, vol. 8, p. 91.*)

For previous introduction, see S. P. I. No. 34747.

51140. SCHEELEA INSIGNIS (Mart.) Karst. Phœnicaceæ.

Palm.

A palm with an erect stem, 50 to 60 feet in height, with 15 to 20 smooth, erect, pinnate fronds crowded into a dense crown. The yellowish green, smooth, fleshy, pistillate flowers are sessile on a spadix inclosed in a green spathe. The pale yellowish white, staminate flowers are inconspicuous. (Adapted from *Martius, Historia Naturalis Palmarum, vol. 2, p. 133.*)

51127 to 51141—Continued.

51141. *TILMIA CARYOTAEOFOLIA* (H. B. K.) O. F. Cook. Phœnicaceæ.(*Martinezia caryotaefolia* H. B. K.)

Palm.

Spiny fishtail. A small graceful Colombian palm, 30 feet in height, with an erect, closely ringed stem copiously armed with slender stiff black spines, 2 to 3 inches long; the rachis and midribs also bear these spines, though not so profusely. The spreading and drooping bright-green pinnate leaves, 4 to 5 feet long, are terminal. Each elongate leaflet is 9 to 12 inches long, more or less 3-lobed, and inserted by a broad base to the scurfy rachis. The yellow-green pistillate flowers are followed by globose drupes. (Adapted from *Curtis's Botanical Magazine*, pl. 6854.)

For previous introduction, see S. P. I. No. 25944.

51142. *GUNDELIA TOURNEFORTII* L. Asteraceæ.

From Jerusalem, Palestine. Seeds presented by Mr. J. Ettinger, director, Agriculture and Colonization Department, Zionist Commission. Received August 21, 1920.

Accoub de Syrie. A spiny composite from Persia with buttonlike flower buds, about the size of a large strawberry, which, when boiled and served with butter, make an extremely satisfactory dish. This delicious vegetable is said to be the equal of asparagus and more delicate in flavor than artichokes. The plant is perennial, requires four years to attain maximum production, and is as long lived, perhaps, as asparagus. (Adapted from *Bulletin, Société de National Acclimatation de France*, vol. 34, p. 450.)

51143 to 51154.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky, Jardin d'Acclimatation. Received August 24, 1920. Quoted notes by Doctor Proschowsky.

51143. *ALBIZZIA CHINENSIS* (Osbeck) Merr. Mimosaceæ.(*A. stipulata* Boiv.)

"A small tree."

For previous introduction, see S. P. I. No. 42356.

51144. *ELAEODENDRON CAPENSE* Eckl. and Zeyh. Celastraceæ.

"A small evergreen tree of very regular, straight growth; very hardy here."

51145. *GENISTA MONOSPERMA* (L.) Lam. Fabaceæ.

"A very graceful bush, much cultivated here for its beautiful white, fragrant flowers which are exported in early spring. Very resistant to drought."

For previous introduction, see S. P. I. No. 10698.

51146. *GLADIOLUS SEGETUM* Ker. Iridaceæ.

Gladiolus.

"One of the most beautiful wild flowers here. Might perhaps be used for hybridization, if such has not yet been the case."

For previous introduction, see S. P. I. No. 27844.

51147. *GREWIA OCCIDENTALIS* L. Tiliaceæ.

"A large evergreen bush with violet flowers."

51148. *LIMONIUM FRUTICANS* (Webb) Kuntze. Plumbaginaceæ.(*Statice fruticans* Webb.)

Sea lavender.

51143 to 51154—Continued.

"One of the plants cultivated here in early spring for cut flowers for export. Will grow in the driest places. Needs sunny exposure."

For previous introduction, see S. P. I. No. 48030.

51149. *MALVASTRUM CAPENSE* (L.) Garke. Malvaceæ.

"An evergreen bush with rose-colored flowers."

51150. *RONDELETIA AMOENA* (Planch.) Hemsl. Rubiaceæ.

"An evergreen bush or small tree with beautiful rose-colored flowers; hardy here."

51151. *SPARTIUM JUNCEUM* L. Fabaceæ.

Spanish broom.

"Bush of very regular globular growth when in open ground. One of the glories of the Mediterranean vegetation, when covered with its thousands of light-yellow flowers."

For previous introduction, see S. P. I. No. 43666.

51152 to 51154. *WIGANDIA* spp. Hydrophyllaceæ.

"These Wigandias, forming bushes several meters in height, are naturalized in my garden and spring up everywhere, especially on vertical walls, slopes, etc. They are strikingly ornamental with their enormous evergreen leaves and abundant flowers."

51152. *WIGANDIA CARACASANA* H. B. K.

"A plant with large dark-green leaves and violet flowers."

For previous introduction, see S. P. I. No. 43671.

51153. *WIGANDIA* sp.

"A plant with large, dark yellowish green leaves and violet flowers. In distinction from other Wigandias, this species has no stinging hairs."

Received as *W. chilensis*, a horticultural name for which a place of publication has not been found.

51154. *WIGANDIA* sp.

"This plant bears large grayish green leaves covered on the under side with white tomentum."

Received as *W. imperialis*, a horticultural name for which a place of publication has not been found.

51155. *MADHUCA INDICA* Gmel. Sapotaceæ.

Mowra tree.

(*Bassia latifolia* Roxb.)

From Allahabad, India. Seeds presented by William Bembower, Allahabad Agricultural Institute. Received August 24, 1920.

Mowra. One of the most useful plants found in the plains and forests of the East Indies; the tree yields food, wine, and oil. It is 40 to 50 feet high, with a short trunk and numerous spreading branches, forming a close, shady, rounded crown. It thrives on dry and stony ground in all parts of central India and is protected by the natives. The part eaten, the succulent corolla, is rich in sugar and is highly valued as a foodstuff and as the source of a spirituous liquor. Some conception of the value put upon the flowers for these purposes by the natives is gained from an estimate made some years ago, that in the Central Provinces over 1,000,000 people used these corollas as a regular article of food, each person consuming about 80 pounds per annum; throughout India they are looked upon as a valuable reserve in famine years.

The *mowra* tree sheds its leaves in February and the flowers appear in March and April, at which time the ground beneath the trees is carefully cleared.

The flowers have a thick, juicy, globe-shaped corolla of a pale-cream color, inclosed at the base in a velvety chocolate-colored calyx. The corollas fall in the early hours of the morning and are collected by women and children. They are spread out to dry on mats in the sun, when they wither to half their weight and develop a brownish red color. In some cases the flowers are collected before they drop, and in many places it is the practice to remove only the corollas, leaving the pistil to ripen to a fruit. A tree will yield 200 to 300 pounds of flowers in a year.

When fresh, the flowers are extremely sweet, with a peculiar pungent flavor and a characteristic color. When dry, the peculiar pungent flavor is less perceptible, particularly if the stamens are removed, and the flavor then resembles that of figs. The flowers are eaten either fresh or dried and cooked in many different ways with rice, shredded coconut, or flour.

The greater portion of the crop of flowers is used for the preparation by fermentation of *mowra* spirit.

The corollas are very useful for feeding cattle; they have extraordinary keeping qualities, as they dry well and are not attacked by weevils.

The composition of the flowers has been investigated at different times and the results vary considerably, particularly in respect of the quantity and nature of the sugar present. The total proportion of sugar recorded in the flowers of this tree varies from 40 to 70 per cent. The quantity of cane sugar recorded varies from 3 to 17 per cent, and that of invert sugar from 40 to 53 per cent, while one author has stated that the sugar is entirely invert sugar. Only a small quantity of protein is present, the maximum record being 7.25 per cent.

The nuts contain a solid fleshy kernel, which includes from 35 to 40 per cent of greenish grease, obtained by pressure. The oil cake possesses a bitter taste and can not be used for cattle feeding. The butter becomes rancid soon after manufacture and becomes a dirty yellow color. Its density at 15° C. is 0.972; it melts at from 43° to 44° C. and solidifies at 36°. It is very soluble in ether and partially so in alcohol. It saponifies easily with alkalis, and it constitutes a mixture of 80 per cent stearin and 20 per cent oleine, with crystals of stearic acid. This oil is used to adulterate clarified butter and for soap and candle making.

During the war interest was centered in the production of acetone from these flowers in India to supply the local demand in connection with the manufacture of munitions. The acetone was produced by the now well-known special fermentation process, and it has been alleged that the yield from the flowers of *Bassia latifolia* was one-tenth of their weight, or nearly ten times as much as is obtainable by distilling wood. The demand for acetone in India in peace times would not be large enough to justify the available supplies of flowers being entirely devoted to the manufacture of that product, but there remains the possibility of their being used for the manufacture of industrial alcohol. The yield of alcohol from the flowers is high compared with that from potatoes and other materials commonly used. It has been stated that about 90 gallons of 95 per cent alcohol is obtainable from 1 ton of dried flowers.

In view of the extended use that is now being made of alcohol for power purposes, it seems likely that the most profitable way of utilizing the flowers would be as a source of a mixed motor spirit of the natalite type, for local use in India. That motor spirit can be produced on a manufacturing scale in

India from Bassia flowers has already been demonstrated, and it is stated that running trials with the spirit proved satisfactory.

The tree is well adapted to withstand drought and is especially suited for planting on dry and waste lands where little else will grow. The tree takes about 20 years to produce flowers and seeds in large quantity, but during this period the land need not be entirely unproductive if interplanting were adopted at first. (Adapted from *Daily Commerce Reports*, No. 200, August 25, 1920, p. 952.)

51156 and 51157.

From Tiflis, Transcaucasia, Russia. Seeds presented by Charles K. Moser, American consul. Received August 25, 1920. Quoted notes by Mr. Moser.

51156. CUCUMIS MELO L. Cucurbitaceæ. **Muskmelon.**

"The famous *duthma melon* from Armenian authorities at Erivan."

"A celebrated local variety of muskmelon said to be very fine." (*F. N. Meyer.*)

For previous introduction, see S. P. I. No. 27805.

51157. MEDICAGO SATIVA L. Fabaceæ. **Alfalfa.**

"*Lucern* from Armenian authorities at Erivan."

51158 to 51161.

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Gustav Helmrich. Received August 25, 1920. Quoted notes by Mr. Helmrich.

51158. AGROSTIS sp. Poaceæ. **Grass.**

"*Cok-pechadya* (small grass)."

51159. AXONOPUS sp. Poaceæ. **Grass.**

"Native name not obtainable."

51160. SPOBOBOLUS INDICUS (L.) R. Br. Poaceæ. **Grass.**

A grass with erect culms up to 1 meter tall, in large clumps with numerous leafy shoots at the base; the panicle is 15 to 30 centimeters long, with slender, ascending branches, the short-pediceled spikelets mostly borne along the lower side. It often forms an almost pure stand on open slopes, and is an important constituent of native pastures. Found on grassy hills and dry savannas from the Bahamas and Mexico to northern South America. (Adapted from *Contributions from the National Herbarium*, vol. 18, p. 369.)

For previous introduction, see S. P. I. No. 48479.

51161. TRISETUM DEYEUXIOIDES (H. B. K.) Kunth. Poaceæ. **Grass.**

A fibrous-rooted grass with cespitose erect shining culms, glabrous nodes, and flat, linear, scabrous leaves. The branching panicle is whorled, often nodding, with lower branches spreading, upper appressed to the scabrous rachis. Native to the swamps along the bank of Lake Tezcuco, Mexico. (Adapted from *Bonpland and Humboldt, Nova Genera et Species Plantarum*, vol. 1, p. 147.)

51162 to 51179.

From Avondale, Auckland, New Zealand. Budwood presented by H. R. Wright, Avondale Nursery. Received August 31, 1920. Quoted notes by Mr. Wright.

51162 to 51179—Continued.

- 51162 and 51163. *AMYGDALUS PERSICA* L. Amygdalaceæ. Peach.
(*Prunus persica* Stokes.)
51162. "Dormant buds of *Allen's Late*."
51163. "Dormant buds of *Golden Queen* (improved)."
51164. *MALUS PUMILA* Mill. Malaceæ. Paradise apple.
"Blight-proof *Paradise* for use as a dwarfing stock; aphid resistant."
- 51165 to 51179. *MALUS SYLVESTRIS* Mill. Malaceæ. Apple.
51165. "*Aerial*, aphid resistant, used as a stock."
51166. "*Alpha*, aphid-resistant seedling from *Irish Peach*. The fruit is twice as large as the parent and much earlier. I consider it the earliest apple in existence. It is a gold mine to the fruit grower on account of its size, flavor, and extreme earliness; it is aphid proof and very productive. I predict a great demand for this apple as soon as I put it on the market, and when largely planted here, I think it will give the consignments of Canadian apples that arrive here in early summer a very nasty bump."
- The parent, *Irish Peach*, is described in the Wright catalogue as "A medium-sized oblong fruit with clear yellow skin handsomely striped with bright red. The yellowish white flesh is tender and very juicy; the tree is a regular cropper and aphid proof."
51167. "*Ballarat*, a large cooking apple, and a great cropper; not aphid resistant, but well worth growing."
51168. "*Bordeaux Reinette*, a very fine dessert apple, and I believe aphid proof."
51169. "*Coles Champion*, a very late-keeping dessert apple; aphid resistant, and used as a stock."
51170. "*Cowell's Red Streak*, striped, midseason apple; aphid resistant, and used as a stock."
51171. "*Frimley Beauty*, a fair dessert apple and a good cooking apple, said to be *Rome Beauty* × *Jonathan* cross; not aphid resistant, but well worth growing."
51172. "*Imm's Seedling*, a large cooking apple; aphid resistant, and used as a stock."
51173. "*Irish Peach* seedling, for top-working *Pyrus prunifolia* as an intermediate stock for working any commercial variety that lacks affinity to *P. prunifolia* direct."
51174. "*Lipplatt's*, aphid resistant, used as stock."
51175. "*Lord Nelson*, a cooking apple of great size; a heavy cropper."
51176. "*Mobb's*, aphid resistant, used as a stock."
51177. "*Mobb's Royal*, a very large cooking apple; tree hardy and prolific."
51178. "*Motion's*, aphid resistant, used as a stock."
51179. "*Ruby Gem*, a beautiful apple of medium size, brilliant red all over; flesh snowy white, tender, crisp, juicy, mild, sub-acid, and delicious; strong grower and early bearer; blight proof; medium."

For previous introduction, see S. P. I. No. 6740.

51180 to 51182.

From Naples, Italy. Seeds presented by Willy Mueller, Hortus Partenopensis. Received September 14, 1920. Quoted notes by Mr. Mueller.

51180 and 51181. *CITRULLUS VULGARIS* Schrad. Cucurbitaceæ.

Watermelon.

51180. "A white-seeded watermelon from Nocera; very good."

51181. "A black-seeded watermelon from Maddaloni, Province of Naples; extraordinarily good."

51182. *LYCOPESSICON ESCULENTUM* Mill. Solanaceæ.

Tomato.

"An extraordinarily large-fruited variety from Nocera."

51183. *DACTYLIS ASCHERSONIANA* Graebn. Poaceæ.

Grass.

From Dahlem, near Berlin, Germany. Seeds presented by Dr. A. Engler, director, Royal Botanic Garden and Museum. Received September 3, 1920.

A creeping perennial grass, native to Germany, with runners up to 4 inches in length and lax stems up to 2 feet in height. The bright-green, rough leaves are lax, mostly narrow, sharp ribbed, and over a foot long. The panicles are about 8 inches long and pendent. (Adapted from *Notizblatt des Königlichen Botanischen Gartens zu Berlin*, vol. 2, p. 274.)

For previous introduction, see S. P. I. No. 30232.

51184 to 51190.

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received July 30, 1920. Quoted notes by Mr. Johnson.

51184. *ARUNDINELLA DEPPEANA* Nees. Poaceæ.

Grass.

"(No. 329.) Grass collected above Quebradas Secas, 3,000 feet."

An erect, tufted perennial with strong slender simple culms up to 2.5 meters tall, with flat blades, scabrous at least on the upper surface, and rather densely flowered oblong panicles, 20 to 40 centimeters long. Native to moist places in Mexico and Brazil; also to central and western Cuba. (Adapted from *Contributions from the National Herbarium*, vol. 18, p. 290.)

51185 and 51186. *CHAETOCHELOA SULCATA* (Aubl.) Hitchc. Poaceæ.

(*Setaria sulcata* Raddi.)

Grass.

51185. "(No. 327.) Grass collected at an altitude of 3,000 feet along the roadside above Quebradas Secas."

A perennial grass cultivated in greenhouses or in the open in the Tropics for ornamental purposes, chiefly on account of the broad plaited blades, 2 inches wide, that resemble those of young palms. The dense, narrow panicles are 1 to 2 feet long. (Adapted from *Hitchcock, Genera of Grasses of the West Indies*, p. 243.)

For previous introduction, see S. P. I. No. 48776.

51186. "(No. 322.) A grass 2 feet tall, with reddish purple heads; collected along the roadside near Samac."

51187. *ISACHNE ABUNDINACEA* (Swartz) Griseb. Poaceæ.

Grass.

"(No. 326.) A grass collected along the roadside above Quebradas Secas, at an altitude of 3,000 feet."

A grass which climbs among shrubs or small trees to a height of as much as 6 meters, with strong canes and elongated branches; the scabrous blades are commonly 20 centimeters long and 1.5 to 2 centimeters wide.

51184 to 51190—Continued.

The panicles are about 12 centimeters long, the long lower branches at first ascending, finally wide spreading; the spikelets are crowded toward the ends of the branches. Native to wooded hillsides in Jamaica at an altitude of 1,000 to 2,000 meters; also from Mexico to northern South America. (Adapted from *Contributions from the National Herbarium*, vol. 18, p. 343.)

For previous introduction, see S. P. I. No. 49447.

51188. *Panicum olivaceum* Hitchc. and Chase. Poaceæ. Grass.

"(No. 325.) Grass collected along the roadside above Quebradas Secas, at an altitude of 3,000 feet."

A grass with olive-green vernal culms, erect, or somewhat spreading at the base, 20 to 40 centimeters high, velvety villous with short hairs, and with bearded nodes. The blades are rather stiffly erect or ascending or some of the lower spreading, 4 to 7 centimeters long, 5 to 8 millimeters wide (the uppermost erect, 1 to 3 centimeters long), puberulent on both surfaces. The autumnal form is bushy with the branches evenly distributed. Native to gravelly banks and cultivated fields from Mexico to Costa Rica and also in Venezuela. (Adapted from *Contributions from the National Herbarium*, vol. 15, p. 225.)

51189. *Paspalum conjugatum* Berg. Poaceæ. Grass.

"(No. 279.) *Sac pachadya* (white meadow grass) from Chama, 6 to 12 inches high, rooting at the nodes. Very abundant in all places."

An extensively creeping perennial with compressed culms; the suberect flowering branches are sometimes 1 meter tall; the flat thin blades are up to 20 centimeters long and 8 millimeters wide; the spikelets bear long, scant, silky hairs around the margin. It is one of the commonest grasses of moist savannas and ditch banks, forming extensive and close mats. It is said by some to be an excellent forage grass. (Adapted from *Contributions from the National Herbarium*, vol. 18, p. 318.)

For previous introductions, see S. P. I. No. 38031.

51190. *Paspalum paniculatum* L. Poaceæ. Grass.

"(No. 277.) *Rash tzimaaj* (green bow) from Chama. This is a tall-growing species reaching 2½ to 3 feet, with flower heads 7 feet long. It grows in clumps, stooling out in growing."

For previous introduction see S. P. I. No. 49379.

51191 to 51193.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received August 2, 1920.

51191. *Capparis micracantha* DC. Capparidaceæ.

A large shrub or small tree with smooth bark, glabrous branches, and very small straight conic spines. The coriaceous, shining, broad-lanceolate leaves are 4 to 8 inches long, and the flowers, 2 to 4 in a series in vertical lines on the branches, are 1½ inches in diameter and have oblong petals 1 inch long. The smooth subglobose fruit is 2 to 3 inches long. (Adapted from *Hooker, Flora of British India*, vol. 1, p. 179.)

For previous introduction, see S. P. I. No. 43243.

51191 to 51193—Continued.

51192. *IPOMOEA NYMPHAEAEFOLIA* Blume. Convolvulaceæ.(*I. peltata* Choisy.)

Morning-glory.

"A white-flowered perennial species which should be of interest to your correspondents in Porto Rico, Cuba, and extreme southern Florida. The plant is of medium growth and blossoms during the winter months, the tourist season." (*Wester.*)

For previous introduction, see S. P. I. No. 47920.

51193. *TALINUM PATENS* (L.) Willd. Portulacaceæ.

"An upright-growing perennial herb from Java, with tender, succulent leaves absolutely free from fiber. The leaves are boiled and eaten with meat, fish, or eggs, like spinach or turnip greens, and make an excellent dish for the table.

"The seeds should be sown very shallow, where they are well protected from heavy rains, as the young plants are very delicate. As soon as the plants are 15 centimeters high they can be cut off a few centimeters above the ground, where they rapidly take root. Once the *Talinum* plants are through the seedling stage they grow very rapidly and are easily multiplied from cuttings 10 to 12 centimeters long, both from the tender tops and the mature stems. In the vegetable garden plants should be set out above 25 centimeters apart, in rows 30 to 35 centimeters apart." (*Wester.*)

51194. *BISCHOFIA TRIFOLIATA* (Roxb.) Hook. Euphorbiaceæ.(*B. javanica* Blume.)

From Buitenzorg, Java. Seeds presented by Dr. J. C. Koningsberger, director, Botanic Gardens. Received August 5, 1920.

A deciduous tree native to the tropical slopes of the Himalayas. The red, rough, moderately hard wood is esteemed one of the best timbers in Assam, where it is used for bridges and other works of construction. It is sometimes called "red cedar." (*Adapted from Watt, Dictionary of the Economic Products of India, vol. 1, p. 454.*)

For previous introduction, see S. P. I. No. 47835.

51195 to 51197.

From Chama, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received August 23, 1920. Quoted notes by Mr. Johnson.

51195. *ACHIMENES* sp. Gesneriaceæ.

"(No. 435.) A fine gesneriad with sky-blue flowers, borne in terminal racemes of 3 to 22 or more, about 1 inch in diameter and with a white and yellow throat. The plant produces small round scaly tubers and should make a good basket plant."

51196. *COIX LACRYMA-JOBI* L. Poaceæ.

Job's-tears.

"(No. 171.) *K-ohl*. The Indians prize the seeds for necklaces. *K-ohl* means necklace, in Kekchi."

For previous introduction, see S. P. I. No. 49516.

51197. *ISACHNE ARUNDINACEA* (Swartz) Griseb. Poaceæ.

Grass.

"(No. 434.) Grass."

A grass climbing among shrubs or small trees to a height of as much as 6 meters, with strong canes and elongate branches; the scabrous blades are commonly 20 centimeters long and 1.5 to 2 centimeters wide;

51195 to 51197—Continued.

the panicles are 12 centimeters long, the long lower branches at first ascending, finally wide spreading; the spikelets are crowded toward the ends of the branches. Native to wooded hillsides of Jamaica, and from Mexico to northern South America at altitudes of 1,000 to 2,000 feet. (Adapted from *Contributions from National Herbarium, vol. 18, p. 343.*)

For previous introduction, see S. P. I. No. 49447.

51198. PHASEOLUS VULGARIS L. Fabaceæ. Common bean.

From Santiago, Chile. Seeds presented by Salvador Izquierdo. Received August 27, 1920.

The Chilean bean, as this most interesting variety is called, is a climber with whitish flowers and pods which become purple at maturity; each pod contains 5 to 7 almost globular, chamois-colored seeds. The foliage is equally abundant at flowering and fruiting time. During rainy periods this plant matures with no signs of mold or rot. The seeds are sown May 10, and are harvested the latter part of September.

When green, this variety makes an excellent dish; the ripe seeds dried are especially good in meat stews and soups. The seed is very starchy; it cooks well without splitting, and the seed coat is much more digestible than that of the Soissons bean and similar varieties. (Adapted from *Bulletin de la Société Nationale d'Acclimatation de France, vol. 65, p. 350.*)

51199. AVENA SATIVA L. Poaceæ. Oats.

From Cadiz, Spain. Seeds presented by B. Harvey Carroll, American consul. Received August 27, 1920.

"The only cultivated variety of Spanish-grown oats on sale in the market of Cadiz; on account of its isolated position, Cadiz is not the best market for agricultural products, and no new varieties have been produced in recent years." (*Carroll.*)

51200. GARCINIA MANGOSTANA L. Clusiaceæ. Mangosteen.

From Peradeniya, Ceylon. Seeds presented by C. Driberg, secretary, Ceylon Agricultural Society. Received August 30, 1920.

"The mangosteen is renowned as one of the delicious fruits of the world and has been called the 'queen of tropical fruits.' The tree is strictly tropical and can be successfully grown only under the most favorable soil and climatic conditions." (*R. A. Young.*)

For previous introduction, see S. P. I. No. 49441.

51201. EUGENIA CURRANII C. B. Robinson. Myrtaceæ.

From Lamao, Bataan, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Lamao Horticultural Station. Received September 1, 1920.

A very attractive Philippine tree attaining a height of 9 meters or more, with gnarled trunk and tortuous branches and quadrangulate-winged young growth. The oblong-ovate, entire, leathery leaves are dark green and shining; the fruit is congregated 20 to 50 in clusters on the bare branches or between the leaves on the more mature twigs; the individual fruit is about the size of a grape with a thin, smooth, dark-red skin which changes to black at full maturity. The flesh is red near the skin, otherwise white, rather dry and crisp, and pro-

nouncedly acid with a pleasant flavor not unlike that of the crab apple. The relatively large seed which clings to the flesh is sometimes absent. The fruit is too acid for use as a dessert but would, in all probability, make an excellent jelly. The fruit is used in some localities for making preserves, wine, and pickles.

The tree is of vigorous growth, succeeds well where the wet and dry seasons are strongly accentuated, and requires well-drained land for the best results. In productiveness it is apparently exceeded by no other species in the genus, and it ripens principally from April to June. (Adapted from *Philippine Agricultural Review*, vol. 8, p. 105.)

For previous introduction, see S. P. I. No. 38375.

51202 and 51203.

From Seville, Spain. Seeds presented by Robert Harnden, American consul. Received September 3, 1920. Quoted notes by Mr. Harnden.

51202. *AVENA SATIVA* L. Poaceæ. Oats.

"Gray oats, one of the only two kinds grown in Andalusia."

"Apparently similar to *Winter Turf* (Gray Winter)." (C. W. Warburton.)

51203. *AVENA STERILIS* L. Poaceæ. Oats.

"Fair oats, one of the only two kinds grown in Andalusia."

51204. *PACHIRA FASTUOSA* (DC.) Decaisne. Bombacaceæ. (*P. macrocarpa* Walp.)

From Santiago de las Vegas, Cuba. Seedlings presented by Gonzalo M. Fortun, director, Agricultural Experiment Station. Received September 4, 1920.

Seedlings of a handsome tropical tree, native to Mexico. The flowers in their size and color are both exceptional and attractive, as they measure about a foot in diameter; the strap-shaped petals are white, and the large brushlike cluster of stamens crimson and yellow. The foliage is not unlike that of the horse-chestnut, but it is more leathery in texture. (Adapted from *Gardeners' Chronicle*, vol. 54, p. 325.)

51205. *PASSIFLORA MOLLISSIMA* (H. B. K.) Bailey. Passifloraceæ.

From Guayaquil, Ecuador. Seeds presented by James Birch Rorer, Asociación de Agricultores del Ecuador. Received September 9, 1920.

"Seeds of a fruit which is grown in the valleys of the Sierra and which is commonly called 'taco.' The flavor of the fruit is somewhat like that of currants. A very delicious sherbet or ice cream can be made from it and also a fine drink or 'refresco.'" (Rorer.)

51206 and 51207.

From Buitenzorg, Java. Bulbs presented by Dr. P. J. S. Cramer, chief, Plant-Breeding Station. Received September 9, 1920.

51206. *AGAVE CANTALA* (Haw.) Roxb. Amaryllidaceæ.

A species long grown in the Philippine Islands for "maguey fiber," probably originally introduced from Mexico. The short, thick stem bears an aloelike cluster of large fleshy leaves and a tall flower stalk, on which grow a large number of small bulbils or "pole plants." The spiny-edged leaves are grouped compactly around the stem and terminate in a hard, sharp spine. The plant lives from 7 to 25 years and does

51206 and 51207—Continued.

not flower until it is 7 or 8 years old, hence the belief that it flowers only once every century and the popular name "century plant."

A long dry season and a light rainy one are essential for the best growth of this plant; while warm, clear, dry weather, with bright sunshine, is required to dry and bleach the fiber. The thick and pulpy leaves of the maguey render it capable of withstanding long droughts which would be disastrous to most other economic plants. The most essential step in maguey cultivation is the selection of a well-drained soil. Shallow, rocky, limestone soils and soils formed by the disintegration of coral rock are best suited for maguey growing.

The fiber is large, inflexible, slightly yellowish, and of a great tenacity. This latter quality renders it very valuable in all cases where sudden strains are anticipated, while its lack of elasticity prevents it from being used to advantage in power transmission. In the United States it is largely used for the manufacture of binder twine, fodder yarns, and various other cordage purposes. In the Philippine Islands carefully selected young leaves are cleaned by the same process used in cleaning pineapple leaves; the fiber thus obtained is very fine and silky and is used for making cloth, fine handkerchiefs, and other articles. (Adapted from *Philippine Agricultural Review*, vol. 3, p. 424.)

For previous introduction, see S. P. I. No. 33508.

51207. CROTALARIA USARAMOENSIS Baker f. Fabaceæ.

A tall herb, native to German East Africa and allied to *C. lanceolata* E. Mey. from which it differs in its broader and shorter leaflets, which are glabrous above and strigose pubescent below. The racemes are 15 to 25 centimeters long.

In Buitenzorg the grayish fiber is not so smooth and silky as that of *Hibiscus cannabinus*, but that does not necessarily mean that it is not suitable for the spinning of yarn. The same is the case with sunn hemp (*Crotalaria juncea*), which in British India is more highly esteemed than Deccan hemp (*Hibiscus cannabinus*). A great drawback is that the total quantity of fiber obtained up to the present differs very materially in strength and ordinarily is not very strong. How this will be influenced by different climatic and cultural conditions and soil can be determined only by making tests elsewhere, which is strongly recommended.

The practical utility of the fiber can be determined only by spinning and weaving tests. Adequate specimens are available for these tests, but unfortunately tests can not be carried out on account of the difficulty in exporting.

The leaves are used as a green manure and as cattle feed. Analyses made by Dr. A. W. K. de Jong, of the Agricultural Chemical Laboratory, give the following percentages for fresh and dry leaves, respectively: Albumin, 5.3 and 26.7; nitrogen, 0.87 and 4.27; fat, 1.4 and 7.0; starch 1.9 and 9.6; crude fiber, 4.0 and 20.1; crude ash, 0.9 and 4.5. The water content of the fresh leaves was 80.1 per cent and their nutritive value 34.4 per cent.

The roots and stems will perhaps be suitable for the manufacture of paper, where the transportation facilities are favorable. The wood which remains after the removal of the fiber is very thin and smooth, but burns well and without smoke and is much in demand by the inland

51206 and 51207—Continued.

women as firewood. It has no commercial value, but is very acceptable in regions where firewood is scarce.

The seed from an old planting is very plentiful; from a planting harvested solely for fiber there are perhaps enough seeds for a new planting. Whether from the seeds a profitable by-product can be made has not yet been demonstrated. Probably they are good chicken feed. An analysis of the seeds shows the following percentages: Water, 12.9; oil, 2.98; albumin, 23.5; nitrogen, 3.72.

In the neighborhood of a *Crotalaria* plantation bees multiply rapidly and produce very good honey. (Adapted from *Journal of the Linnean Society*, vol. 42, p. 346, and *Buitenzorg, Mededeelingen uit den Cultuurtuin No. 12, 1918.*)

51208. PERSEA AMERICANA Mill. Lauraceæ. Avocado.
(*P. gratissima* Gaertn. f.)

From Orange, Calif. Seeds presented by C. P. Taft. Received September 11, 1920.

"Seedling avocados, first generation from plants grown from the Chilean seed you gave me. They resemble very closely the fruit of the original tree and are as hardy as any. I find that I have several trees of the type." (*Taft.*)

51209 to 51211.

From Haifa, Syria. Seeds collected by Amram Khazanoff, Jewish Colonization Association. Received September 14, 1920. Quoted notes by Mr. Khazanoff.

"These grains have recently been introduced into our colonies west of the Jordan and are giving good results there. Collected at Ayelette Hashahar (I. e., Morning Star), near the Waters of Merom, Syria."

51209. HORDEUM VULGARE COELESTE L. Poaceæ. Barley.

"*Nebawi* barley, glumeless, from the Mountain of Nebo in the Land of Moab, whence its name."

51210 and 51211. TRITICUM DURUM Desf. Poaceæ. Durum wheat.

51210. "*Mahmoodi* wheat, of Tunisian origin, best adapted for heavy moist soils."

51211. "*Reyati* wheat, from Lebanon, where it does very well."

51212 and 51213.

From Melbourne, Victoria. Seeds purchased from F. H. Brunning, Pty. Ltd. Received August 19, 1920.

51212. TRIFOLIUM SUBTERRANEUM L. Fabaceæ. Clover.

An annual clover, native to the Mediterranean countries, with prostrate stems up to a foot in length and long-petioled leaves. The fertile flowers are borne in clusters of two to seven, and the infertile flowers are very numerous. The petals are white, marked with pink. This clover is usually found in cultivated places, especially in sandy locations. (Adapted from *Ascherson und Graebner, Synopsis der Mitteleuropäischen Flora*, vol. 6, p. 596.)

For previous introduction, see S. P. I. No. 38983.

51212 and 51213—Continued.**51213. LOLIUM PERENNE L. Poaceæ.****Wimmera rye-grass.**

"A tufted short-lived perennial which makes a fair crop of hay and is especially valuable in pastures. It usually grows to a height of 1 to 2 feet, and produces an abundance of long, narrow leaves near the base of the plant. This has been a popular grass in England for at least three centuries and was early introduced into America.

"The chief uses to which this grass should be put are as an ingredient in pasture mixtures, as a temporary covering to prevent the washing of the soil, for lawns, and for winter grazing on Bermuda grass pastures in the South. It is valuable for these purposes because of its rapid germination and growth. It should have a fertile, moist soil with a cool, damp climate." (*Lyman Carrier.*)

For previous introduction, see S. P. I. No. 36099.

51214. CHENOPODIUM ALBUM L. Chenopodiaceæ.

From Calcutta, India. Seeds presented by H. G. Carter, director, Botanical Survey of India. Received July 3, 1920.

"The plant grows to the height of 6 feet, and the seeds ripen in October. When young the leaves and tender branches are gathered as a potherb, much resembling spinach, and are regarded as very wholesome; but the plant is chiefly valued for its seeds, which are used as a cereal. The seed is said to be superior to buckwheat and rich in certain salts. The hill tribes of certain parts of the western Himalayas cultivate *Chenopodium* as one of the principal crops." (*Carter.*)

51215. CITRUS SINENSIS (L.) Osbeck. Rutaceæ.**Orange.**

From Jerusalem, Palestine. Budwood presented by J. Ettinger, director, Agriculture and Colonization Department, Zionist Commission. Received August 2, 1920.

"Bud sticks of the Jaffa orange, *Shamooti.*" (*Ettinger.*)

The Jaffa orange is one of the largest, larger even than the Washington Navel. Its form is obovate, its skin very thick, and its fruit seedless. The tree is not spiny, and the fruit, therefore, is never scarred by thorns. Its shipping qualities are excellent.

The Jaffa oranges seen in Tunis and Algeria and those grown in America and illustrated in American publications have very little resemblance to the real Jaffa orange. They are represented as having seeds, while the true Jaffa orange is seedless. (Adapted from *Aaronsohn, Agricultural and Botanical Explorations in Palestine, p. 26.*)

For previous introduction, see S. P. I. No. 37461.

51216 to 51248.

From Kenya. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received July 30, 1920. Quoted notes by Doctor Shantz.

51216. ABUTILON sp. Malvaceæ.

"(No. 974. Voi, Seyidie Province, Kenya. April 19, 1920.) A very attractive yellow-flowered mallow; flowers 1 inch in diameter."

51216 to 51248—Continued.

51217. *ANNONA CHERIMOLA* Mill. *Annonaceæ*. **Cherimoya.**

"(No. 958. Moshi, Tanganyika Territory. April 15, 1920.) An anona with a large heart-shaped fruit 8 inches long, not unlike the soursop, and of excellent flavor."

51218. *CALOPHYLLUM INOPHYLLUM* L. *Clusiaceæ*.

"(No. 950. Zanzibar, Zanzibar. April 7, 1920.) A large tree, with a leaf like that of a magnolia or *Ficus*, and bearing a fruit about 1 inch in diameter, the pulp of which is often eaten by natives."

51219. *CASSIA LAEVIGATA* Willd. *Cæsalpiniaceæ*.

"(No. 975. Embu, Kenia Province, Kenia. May 3, 1920. Herb. No. 800.) A small cassia extensively used as a hedge and ornamental in this section. It appears everywhere and behaves as a wild plant. It is exceptionally useful, and will stand a cool climate but may not withstand frost. The climate here is very cool, but frost does not occur. Try it out in Florida and California, but if it will stand frost, it will do well over a much wider range."

51220. *CASSIA OCCIDENTALIS* L. *Cæsalpiniaceæ*.

"(No. 973. Voi, Seyidie Province, Kenia. April 19, 1920.) A yellow legume, similar in habit to *Glycyrrhiza*."

For previous introduction, see S. P. I. No. 42830.

51221. *CUCUMIS* sp. *Cucurbitaceæ*. **Cucumber.**

"(No. 971. Voi, Seyidie Province, Kenia. April 19, 1920.) A warty cucumber, 2 to 2½ inches long, which when ripe is eaten by animals."

51222. *CUCUMIS ANGURIA* L. *Cucurbitaceæ*. **Cucumber.**

"(No. 960. Moshi, Tanganyika Territory. April 15, 1920.) A rough-fruited cucumber, probably not used as food."

For previous introduction, see S. P. I. No. 46893.

51223. *CYPHOMANDRA BETACEA* (Cav.) Sendt. *Solanaceæ*. **Tree-tomato.**

"(No. 970. Moshi, Tanganyika Territory. April 17, 1920.) Brazilian tree-tomato."

For previous introduction, see S. P. I. No. 44913.

51224. *DIOSCOREA* sp. *Dioscoreaceæ*. **Yam.**

"(No. 965. Moshi, Tanganyika Territory. April 16, 1920.) Growing in a native garden. I have noticed only one of these plants. A very luxuriant growth with aerial tubers very numerous."

51225. *GLADIOLUS* sp. *Iridaceæ*. **Gladiolus.**

"(No. 964. Moshi, Tanganyika Territory. April 16, 1920. Herb. No. 795.) A plant with irislike leaves and very attractive white flowers."

51226. *HETEROPOGON CONTORTUS* (L.) Beauv. *Poaceæ*. **Grass.**

"(No. 982. Nairobi, Ukamba Province, Kenia. May 15, 1920.) The dominant grass of the Ati Plains, an excellent forage grass which produces seed readily and is perennial. Its habit is somewhat like that of *Andropogon scoparius* in the eastern portion of its range. This is one of the most important African grasses and should be given a thorough test in the highlands of California, Arizona, and New Mexico and in the pinelands of the South, especially in Florida."

For previous introduction, see S. P. I. No. 15357.

51216 to 51248—Continued.

51227. *HIBISCUS* sp. Malvaceæ.

"(No. 983. Nairobi, Ukamba Province, Kenia. May 25, 1920.) A very attractive flower about three-fourths of an inch in diameter."

51228. *HOLCUS SORGHUM* L. Poaceæ.

Sorghum.

(*Sorghum vulgare* Pers.)

"(No. 952. About 50 miles above Tanga, Tanganyika Territory. April 7, 1920.) An especially interesting form, differing in habit from all others seen here."

51229. *HORDEUM VULGARE COELESTE* L. Poaceæ.

Naked barley.

"(No. 963. Moshi, Tanganyika Territory. April 16, 1920.) Hull-less barley, said to grow much better than wheat; a local crop. Small grains suffer from rust chiefly and a rust-resistant variety is essential."

51230. *LUFFA ACUTANGULA* (L.) Roxb. Cucurbitaceæ. Loofah gourd.

"(No. 967. Moshi, Tanganyika Territory. April 17, 1920.) A very large long type with outstanding ribs on the fruit. Seems distinct from other types seen here."

For previous introduction, see S. P. I. No. 42069.

51231. *MUSA ENSETE* Gmel. Musaceæ.

"(No. 976. En route from Embu to Meru, Kenia Province, Kenia. May 3, 1920.) A beautiful ornamental which grows along mountain streams; not eaten by natives here, although the large starchy seeds are occasionally seen in bead strings and as charms. The leaves are long, upright, and beautifully colored; they are used as skirts by the Kukuyu women, and also to tie up bundles. There are about a dozen seeds in each banana, and the natives say, 'Banana fruit poison.' The plant should grow wherever frost does not occur too frequently."

For previous introduction, see S. P. I. No. 35236.

51232. *NICOTIANA TABACUM* L. Solanaceæ.

Tobacco.

"(No. 966. Moshi, Tanganyika Territory. April 16, 1920.) The type grown by the natives and sold in powdered form, a small banana-leaf package to each person. The women usually sell the tobacco in the markets."

51233. *OBYZA SATIVA* L. Poaceæ.

Rice.

"(No. 954. Moshi, Tanganyika Territory. April 12, 1920.) Grown as a dry-land crop on dark, rich soil previously supporting a splendid high forest. Only a few heads are ripe at this time."

51234. *GLORIOSA SIMPLEX* L. Melanthaceæ.

"(No. 984. En route from Embu to Muzambi, Kenia Province, Kenia Colony. May 20, 1920.)" A showy plant somewhat similar to *Gloriosa superba* and producing a profusion of flowers with stalked reflexed spreading segments 2 inches long, yellow at the base, red on the outside, and recurved at the points. The flowers are one-third smaller than those of the common *Gloriosa*, and the segments are nearly oval, entire, acuminate, and scarcely undulated except toward the point. The leaves resemble those of the common *Gloriosa* and are in like manner terminated by a tendril. (Adapted from *Curtis's Botanical Magazine*, pl. 5239; and *Gardening Illustrated*, vol. 26, p. 556.)

51216 to 51248—Continued.

51235. *PTEROCARPUS INDICUS* Willd. Fabaceæ.

“(No. 951. Zanzibar, Zanzibar. April 7, 1920.) A tree with a seed similar to that of *Burkea*. Useful as an ornamental.”

51236 to 51238. *RICINUS COMMUNIS* L. Euphorbiaceæ. Castor-bean.

51236. “(No. 972. Voi, Seyidie Province, Kenia. April 19, 1920.) Castor-bean.”

51237. “(No. 977. En route from Meru to Embu, Kenia Province, Kenia. May 3, 1920.) A large-seeded reddish type, which grows into treelike plants in the high, cool, mountainous country. This crop is used chiefly for external decoration; the oil is extracted by boiling, mixed with red clay, and this worked into the hair and smeared over the body of both men and women.”

51238. “(No. 978. En route from Meru to Embu, Kenia Province, Kenia. May 3, 1920.) Large, and similar to No. 977 [S. P. I. No. 51237], but lighter in color.”

51239. *COLEUS BARBATUS* (Andrews) Benth. Menthaceæ.

“(No. 979. En route from Thika to Embu, Kenia Province, Kenia. May 8, 1920.) A salvia or mint, forming a beautiful blue shrub or half shrub. It has a rather fleshy base and is probably propagated by cuttings, but it grows wild everywhere in this section. It forms a beautiful hedge, a mass of sky-blue flowers above the foliage. The natives have made hedges of it in many places.”

51240. *THUNBERGIA GIBSONI* S. Moore. Acanthaceæ.

“(No. 981. Nairobi, Ukamba Province, Kenia. May 15, 1920. Herb. No. 828.) A very attractive low-growing vine with profuse orange-colored trumpet flowers. Very abundant in high forest regions of British East Africa.”

51241 and 51242. *TRITICUM AESTIVUM* L. Poaceæ. Common wheat.
(*T. vulgare* Vill.)

51241. “(No. 961. Moshi, Tanganyika Territory. April 16, 1920.) Wheat grown on the slopes of Mount Kilimanjaro.”

51242. “(No. 962. Moshi, Tanganyika Territory. April 16, 1920.) Wheat grown on the slopes of Mount Kilimanjaro.”

51243. *VIGNA* sp. Fabaceæ.

“(No. 956. Moshi, Tanganyika Territory. April 15, 1920. Herb. No. 793.) A small wild pea with a long and slender pod. The vine grows over low bushes.”

51244. *ZEA MAYS* L. Poaceæ. Corn.

“(No. 953. Moshi, Tanganyika Territory. April 12, 1920.) Corn collected in a native field. Corn is a crop of first importance here. All stages of development were seen, planting and harvesting at the same time.”

51245. (Undetermined.)

“(No. 955. Moshi, Tanganyika Territory. April 15, 1920. Herb. No. 794.) A small bean said by the natives to be good food. Only 2 seeds in each pod. The plant is abundant in the brush or second-growth areas about Moshi.”

51216 to 51248—Continued.

51246. (Undetermined.)

"(No. 968. Moshi, Tanganyika Territory. April 17, 1920.) A small cucumber, reddish yellow when ripe, 1 inch in diameter and 2 to 2½ inches long. This fruit has a very strong taste, but others which look like this are very good to eat."

51247. (Undetermined.)

"(No. 969. Moshi, Tanganyika Territory. April 17, 1920.) Similar to No. 968 [S. P. I. No. 51246] but with pale markings."

51248. (Undetermined.)

"(No. 980. Nairobi, Ukamba Province, Kenia. May 15, 1920. Herb. No. 839.) A very beautiful low, well-rounded, mound-shaped shrub with nearly white bell-shaped flowers in graceful clusters, which should prove an attractive ornamental. It looks like one of the mallow fiber plants; its bast fiber is very good."

51249 to 51251.

From Pernambuco, Brazil. Seeds presented by Hugh Matheson, through I. P. Roosa, New York. Received September 14, 1920. Quoted notes by Mr. Matheson.

51249. ANACARDIUM OCCIDENTALE L. Anacardiaceæ.

Cashew.

"*Caju*. A West Indian tree, 30 to 40 feet in height, with large leathery leaves and small kidney-shaped nuts borne on swollen pea-shaped stalks 2 to 4 inches long. Its juicy, acidulous stalk is used in preserves and the edible seed is roasted and served as a dessert."

For previous introduction, see S. P. I. No. 45095.

51250. CARICA sp. Papayaceæ.

Papaya.

"*Mamão Caranus*."

51251. (Undetermined.)

"*Mangabas*."

51252. FICUS sp. Moraceæ.

Fig.

From Pernambuco, Brazil. Plants presented by Hugh Matheson, through I. P. Roosa, New York, N. Y. Received September 24, 1920.

A Brazilian tree of possible value as a shade or avenue tree in southern Florida.

51253. MEZONEURUM SCORTECHINII F. Muell. Cæsalpiniaceæ.

From Burringbar, New South Wales, Australia. Seeds presented by B. Harrison. Received September 16, 1920.

"A vine or trailing shrub called *barisber*, which would make a first-class hedge if trained on a wire fence. It is a strong, thick, prickly vine with splendid fern-like foliage and large racemes of bright-yellow flowers." (*Harrison*.)

51254. OLNEYA TESOTA A. Gray. Fabaceæ.

From Coachella, Calif. Seeds presented by William R. Faries. Received September 14, 1920.

A handsome flowering tree, with wood that is dark, heavy, and hard, like ebony, and with nutritious foliage and flowers that are eaten with avidity by animals. The tree bears heavy crops of pods not unlike those of garden beans, and each pod may have several seeds of the size, appearance, and texture of

small peanuts and having the same agreeable flavor when roasted. The fleshy young pods probably could be cooked and eaten like green beans, since they do not taste bitter, even in the raw state. The largest pods have nine fully developed and two abortive beans.

The *Olneya* is the largest as well as the most attractive native tree in the driest deserts of the Southwest, away from the stream beds and with full exposure to heat and drought. The large taproot remains entirely unbranched for 7 or 8 feet. Such a habit of growth would indicate little or no interference with surface crops and would suggest the value of the tree for planting in or near cultivated lands where it may serve very well for hedges or windbreaks, as well as for holding terraces or as barriers against erosion. Even on desert lands that are too broken for irrigation it might prove worth while to plant belts of *Olneya* across the washes, to hold back and spread the flood waters. More moisture would be absorbed by the soil, and more vegetation could grow in addition to the forage that the *Olneya* itself would afford. (Adapted from O. F. Cook, *Journal of Heredity*, vol. 10, p. 321.)

For previous introduction, see S. P. I. No. 4537.

51255 and 51256.

From Alexandria, Egypt. Seeds presented by Prof. S. C. Mason, arboriculturist, United States Department of Agriculture. Received September 21, 1920.

51255. *ALLIUM CEPA* L. Liliaceæ. Onion.

A variety cultivated near Alexandria that may be useful for breeding work.

51256. *CUCUMIS MELO* L. Cucurbitaceæ. Muskmelon.

"*Aggur* muskmelon." (*Mason.*)

51257. *DIGITARIA IBURUA* Stapf. Poaceæ. Grass.

From Kaduna, Nigeria. Seeds presented by P. H. Lamb, director of Agriculture, Northern Provinces. Received August 24, 1920.

"*Iburu* is grown by the natives of Northern Nigeria as a cereal. The grains separate fairly readily from the husks when pressure is applied, and the seeds are pure white. They weigh in their husks on the average 0.7 mgr., so that over 40,000 go to one ounce. As one raceme may contain as many as 200 spikelets, a single head may yield between 1,000 and 2,000 grains." (*Kew Bulletin of Miscellaneous Information*, No. 8, 1915, p. 331.)

"Introduced for testing as a forage crop." (*Piper.*)

51258 to 51265.

From Coban, Alta Vera Paz, Guatemala. Seeds presented by Harry Johnson. Received September 15, 1920. Quoted notes by Mr. Johnson.

51258. *DESMONCUS* sp. Phœnicaceæ. Palm.

"(No. 585.) A very spiny ornamental vine climbing, by hooks at the tip of the rachis, to the tops of forest trees."

51259. *PANICUM MILLEGRANA* Poir. Poaceæ. Grass.

"(No. 438.) From Chipok, Coban. A creeping grass, rooting at the nodes, growing luxuriantly on clay banks."

51260. *PANICUM FASCICULATUM* Swartz. Poaceæ. Grass.

"(No. 496.) Grass from Chama. More or less stooling in habit; leaves rather sparse."

51258 to 51265—Continued.

51261. *PASPALUM DENTICULATUM* Trin. Poaceæ. Grass.

"(No. 439.) A coarse, tall, cattaillike grass, 4 to 5 feet tall, always found growing in wet places. From Chipok, Coban."

51262. *PASPALUM NOTATUM* Fluegge. Poaceæ. Grass.

"(No. 441.) A grass, 6 to 12 inches tall, which forms a close mat. Grows in potiero, where it does well. From Chipok, Coban."

51263. *PASPALUM PLICATULUM* Michx. Poaceæ. Grass.

"(No. 440.) A grass, 2 to 4 feet tall, from Chipok, Coban. Seeds taken from a haystack of which this grass formed a large part."

51264. *PIPER* sp. Piperaceæ.

"*Cordoncilla*."

For previous introduction, see S. P. I. No. 51059.

51265. *SOLANUM* sp. Solanaceæ.

"(No. 586.) *Macui*, in Kekchi dialect. Similar in habit and appearance to *Solanum douglasii* of California, but more shrubby. The tender young tips, picked and sorted and the tougher stems discarded, are widely used throughout this region as greens. During the hot summer season vegetables become scarce, but the *macui* is always to be had. The *macui* greens have an excellent flavor, are said to have medicinal properties, and seem to have more body than others. They are sometimes fried with eggs stirred in."

51266 and 51267. *MYRCIARIA CAULIFLORA* (Mart.) Berg. Myrtaceæ. Jaboticaba.

From Deodoro, Federal District, Brazil. Seeds presented by Dr. Aristides Calre, Campo Experimental. Received September 21, 1920.

51266. "A remarkably interesting tree with a compact symmetrical head of small bright-green leaves. The jaboticaba grows wild in southeastern Brazil, and is also cultivated to a greater extent than almost any other native fruit. The delicious fruits, abundantly produced directly upon the bark of the tree, are round, half an inch to 1½ inches in diameter, with thick, glossy, maroon-purple skin and translucent juicy white or rose-tinged pulp, of a most agreeable, vinous flavor. The oval compressed seeds, one to four to a fruit, are about half an inch long. The tree comes into bearing when 6 to 8 years old, and withstands little frost." (*P. H. Dorsett*.)

For previous introduction, see S. P. I. No. 45750.

51267. "*Jaboticaba murta mineira*. This variety is very good, with a fine skin, and very succulent. It is mostly cultivated in Rio de Janeiro, Minas Geraes, and Sao Paulo." (*Calre*.)

51268. *HIBISCUS SABDARIFFA* L. Malvaceæ. Roselle.

From Formosa, Argentina. Seeds presented by A. Wetmore, Biological Survey, United States Department of Agriculture. Received September 15, 1920.

An Old World tropical annual, 5 to 7 feet high, with almost sessile yellow flowers, each with a red eye, which open only one day. In three weeks the fleshy reddish calyxes are ready for the making of an unexcelled jelly. Each plant averages a yield of 2 pounds of calyxes.

Roselle sauce makes an excellent substitute for cranberry sauce. Analysis (by the Food Laboratory of the Bureau of Chemistry) of the calyx of roselle and the fruit of the cranberry show striking resemblances between them, the respective percentages being as follows: Water, 88.91 and 88.53; solids, 11.09 and 11.47; ash, 0.89 and 0.25; marc (insoluble matter), 6.67 and 4.60; acid (as malic), 2.77 and 2.74; reducing sugar (as invert), 0.33 and 1.90; sucrose, 0.03 and 0.10. Benzoic acid is absent in the roselle calyx and present in the cranberry fruit. Starch is absent in the roselle calyx.

Weight of fruit of roselle, 6.11 grams; cranberry, 0.94 grams. Percentage of edible portion: Roselle, consisting of calyx minus portion of its base which is cut away in removing the seed pods, 50.22; cranberry, 100.

The young roselle stems also make good jelly, and for such use the plants can be grown almost anywhere in the North or South. Roselle is grown in India for its fiber, which is used in the manufacture of cordage and coarser textile products, and could be cultivated for this purpose in the southern United States. For fiber the crop is cut while in flower, dried, made into bundles, and soaked in water for 15 or 20 days. It is then possible to wash out a strong silky fiber known as roselle hemp, considered by some to be the equal of jute. The leaves are sometimes used as a salad, and the seeds are supposed to have medicinal properties. They are also fed to cattle and poultry. (Adapted from *United States Department of Agriculture, Farmers' Bulletin 307.*)

For previous introduction, see S. P. I. No. 47119.

51269 to 51279. PHELEUM PRATENSE L. Poaceæ. Timothy.

From Copenhagen, Denmark. Seeds presented by Axel Lange, curator, Botanic Garden. Received September 24, 1920. Quoted notes by Mr. Lange.

Introduced for experimental work by the Office of Forage-Crop Investigations.

51269. "Native, from Lystrup Skov."

51270. "Locally grown, from Dansk Kvarter."

51271. "Locally grown, from Stranghojgaard."

51272. "Native, from Lystrup Skov."

51273. "Locally grown, from Koge."

51274. "Native, from Mose s. p., for Lystrup Skov."

51275. "Locally grown, from Biologisk Kvarter."

51276. "Locally grown, from Undervisningskvarter."

51277. "Locally grown, from Farum."

51278. "Locally grown from Farum Bregnersd."

51279. "Locally grown, from **Amazir.**"

51280. SOLANUM HAEMATOCLODUM Dunal. Solanaceæ.

From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky. Received September 20, 1920.

"An ornamental shrub with rather beautiful grayish blue flowers and blood-red fruits, growing dense and to a height of about 2 meters; it is quite hardy here. Native to Bolivia." (*Proschowsky.*)

51281. CANAVALI sp. Fabaceæ.

From Bahia, Brazil. Seeds presented by Dr. V. A. Argollo Ferrão. Received September 21, 1920.

"A wild bean that grows in the coconut plantations along the seacoast. The beans are found where the sands are fertile and receive subterranean irriga-

tion from the fresh-water lagoons whose water must run to the sea, by filtering beneath the sandy coast soil. These beans have very persistent vegetative parts and may be good pasture. On the place where I found these seeds mules and donkeys were feeding. The plant may be very useful for pasture and green manure for salt lands, for it grows quite close to the seaside." (*Argollo Ferrão*.)

51282 and 51283.

From Blackwood, South Australia. Seeds presented by E. Ashby. Received September 21, 1920. Quoted notes by Mr. Ashby.

"Seeds of these species were collected on Kangaroo Island in 1909 and grown in the wild part of my place, 'Wittunga,' where they have done well amongst the other scrub, absolutely without water or any attention; and this last season we had about the worst season we have ever known. The later spring rains were entirely absent, and the winter rains did not start until June."

51282. *CALLITRIS CUPRESSIFORMIS* Vent. Pinaceæ.

"A plant with handsome cones, very upright growth, and somewhat dingy green foliage commonly characteristic of the genus."

For previous introduction, see S. P. I. No. 47151.

51283. *CALLITRIS DRUMMONDII* (Parl.) Benth. Pinaceæ.

"This plant is undoubtedly a real acquisition as a dwarf, globose, bright-green, ornamental, cypresslike tree."

51284. *TRICHILIA EMETICA* Vahl. Meliaceæ.

From Lourenco Marques, Portuguese East Africa. Seeds presented by John A. Ray, American consul. Received September 23, 1920.

"Known in Portuguese East Africa under the native names *umkuhlu*, *marba*, *marva-maava*, *gnande*, *mafouriera*, *mafura*, or *mafurrera*, where they have long been known as the source of 'mafura' tallow, a vegetable fat used by the natives for greasing the skin. The fat consists of about 55 per cent oleic acid and 45 per cent palmitic acid, and has been used in the manufacture of soap." (*W. W. Stockberger*.)

For previous introduction, see S. P. I. No. 21965.

51285. *ALLIUM SATIVUM* L. Liliaceæ.

Garlic.

From Seoul, Chosen. Sets presented by Dr. S. Hashimoto, director, Agricultural and Industrial Station of the Government General of Chosen, Suigen, Chosen, through Ransford S. Miller, consul general, Seoul. Received September 30, 1920.

"Sets of the best commercial varieties of garlic." (*Miller*.)

51286. *PENNISETUM PURPUREUM* Schumach. Poaceæ. **Grass.**

From Wynberg, Cape Colony. Seeds presented by J. B. Taylor. Received September 17, 1920.

"A good fodder grass from the Mazoe Valley in Rhodesia; it grows in clumps like Napier fodder. It is a sweeter, more succulent, and softer grass than Napier. Mr. Holland, of Port Elizabeth, is a breeder of pedigreed shorthorns, and has a large dairy; he has experimented with *fufu* grass and is loud in praise of it." (*Taylor*.)

51287 to 51297. ZEA MAYS L. Poaceæ. Corn.

From Maison Carree, Algeria. Seeds presented by Prof. L. Ducellier, Laboratoire d'Agriculture, Ecole d'Agriculture Algerienne. Received September 28, 1920.

"Maize cultivated at the School of Agriculture. The seeds I am sending were obtained from a single plant. This hybrid corn did better during the exceptionally dry season of 1920 than Navajo maize." (Ducellier.)

51287. No. 1. Small flattish red grains.

51288. No. 2. Small, rounded, red grains.

51289. No. 3. Ear with equal number of yellow and grayish, small, flat to roundish grains.

51290. No. 4. Small, flattish, orange-colored grains.

51291. No. 5. Small, flat, yellowish orange grains.

51292. No. 6. Ear with three-fourths of its grains yellow, one-fourth grayish violet; grains small, flat to roundish.

51293. No. 7. Small, flat to roundish, yellow grains.

51294. No. 8. Small, flat to roundish, very pale-yellow grains.

51295. No. 9. Very small, thick, whitish grains.

51295. No. 9. Very small, thick, whitish grains.

51297. No. 11. Small, rounded, dark-red grains.

51298 to 51305. Avena SATIVA L. Poaceæ. Oats.

From Madrid, Spain. Seeds presented by the director, Escuela Especial de Ingenieros Agrónomos, through Ely E. Palmer, American consul. Received September 28, 1920.

"These are of the type of our *Winter Turf* or *Virginia Gray* oats." (C. W. Warburton.)

51298. *Avila*.

51302. *Segovia*.

51299. *Ciudad Real*.

51303. *Toledo*.

51300. *Guadalajara*.

51304. *Toledo*.

51301. *Madrid*.

51305. *Valladolid*.

51306 to 51333.

From Kisantu, Belgian Kongo. Seeds presented by Father Hyacinth Vanderyst. Received July 29, 1920.

Numbered for convenience in testing by the Office of Forage-Crop Investigations.

51306 to 51308. CHLORIS spp. Poaceæ. Grass.

51306. CHLORIS sp.

51308. CHLORIS sp.

51307. CHLORIS sp.

51309. CYMBOPOGON sp. Poaceæ. Grass.

51310. CYPERUS sp. Cyperaceæ. Sedge.

51311. CHLORIS RADIATA (L.) Swartz. Poaceæ. Grass.

51312. ELEUSINE CORACANA (L.) Gaertn. Poaceæ. Ragi millet.

This is the well-known millet of the tropical regions of the Old World, where it forms a large part of the diet of many of the natives of India and tropical Africa.

For previous introduction, see S. P. I. No. 48456.

51313. ERAGROSTIS sp. Poaceæ.

51314. INDIGOFERA sp. Fabaceæ.

51306 to 51333—Continued.

51315. MELINIS MINUTIFLORA Beauv. Poaceæ. **Grass.**

A Brazilian grass which forms a dense carpet 3 or 4 feet thick; the blades of this grass are covered with a kind of wax, which is said to be sufficient to polish one's boots when walking through a thick growth of it. It is unusually palatable to cattle and horses. (Adapted from *note under S. P. I. No. 41148*, which see for previous introduction.)

51316. PANICUM sp. Poaceæ. **Grass.**

51317. PASPALUM SCRIBICULATUM L. Poaceæ. **Koda millet.**

An erect annual grass, averaging 2 feet in height, native to India, where it is also extensively cultivated for the edible grain. The grain is poisonous, however, unless kept for a number of years. Cattle are fond of the grass before it ripens; when it is ripening it is poisonous to stock. (Adapted from *Watt, Dictionary of the Economic Products of India, vol. 6, pt. 1, p. 111.*)

For previous introduction, see S. P. I. No. 35332.

51318 to 51323. SPOROBOLUS spp. Poaceæ. **Grass.**

51318. SPOROBOLUS sp. **51321. SPOROBOLUS** sp.

51319. SPOROBOLUS sp. **51322. SPOROBOLUS** sp.

51320. SPOROBOLUS sp. **51323. SPOROBOLUS** sp.

51324 to 51331. SYNTHESISMA spp. Poaceæ. **Grass.**

51324. SYNTHESISMA sp. **51328. SYNTHESISMA** sp.

51325. SYNTHESISMA sp. **51329. SYNTHESISMA** sp.

51326. SYNTHESISMA sp. **51330. SYNTHESISMA** sp.

51327. SYNTHESISMA sp. **51331. SYNTHESISMA** sp.

51332 and 51333. TRISTACHYA spp. Poaceæ. **Grass.**

51332. TRISTACHYA sp. **51333. TRISTACHYA** sp.

51334 to 51343.

From Kenia, British East Africa. Seeds collected by Dr. H. L. Shantz, Agricultural Explorer of the United States Department of Agriculture. Received September, 1920.

A collection of grasses from British East Africa.

51334. ANDROPOGON TRICHOPUS Stapf. Poaceæ. **Grass.**

"(No. 1093. Fort Hall, Kenia Province. June 17, 1920.) A tall grass abundant along roadways."

51335. CAPRIOLA DACTYLON (L.) Kuntze. Poaceæ. **Grass.**

"(No. 1060. En route from Meru to Embu, Kenia Province. June 16, 1920.) A grass which forms large mats in the roadway in this mountain country."

For previous introduction, see S. P. I. No. 44098.

51336. CHAETOCHELOA AUREA (Hochst.) Hitchc. Poaceæ. **Grass.**

"(No. 1077. Embu, Kenia Province. June 17, 1920.) A tall grass, abundant but never dominant over large areas."

For previous introduction, see S. P. I. No. 38773.

51334 to 51343—Continued.

51337 and 51338. *CHAETOCHLOA SULCATA* (Aubl.) Hitchc. Poaceæ.

Grass.

51337. "(No. 1063. Chuka, Kenia Province. June 16, 1920.) A very large grass with broad leaves and many ribs."

For previous introduction, see S. P. I. 38776.

51338. "(No. 1068. Chuka, Kenia Province. June 16, 1920.) A grass with rather large leaves; grown in clumps."

51339. *CHLOEIS RADIATA* (L.) Swartz. Poaceæ. Grass.

"(No. 1076. Embu, Kenia Province. June 17, 1920.) A very fine grass with small stipalike seeds."

For previous introduction, see S. P. I. No. 51311.

51340. *CYMBOPOGON CYMBARIUS* (L.) Rendle. Poaceæ. Grass.

"(No. 1061. En route from Meru to Embu, Kenia Province. June 16, 1920.) A coarse grass, not dominant anywhere, but relatively common in the mountain country."

51341. *ECHINOCHLOA CRUSGALLI EDULIS* Hitchc. Poaceæ. Grass.

"(No. 1053. Meru, Kenia Province. June 16, 1920.) A tall grass growing along waterways. It produces excellent growth on wet lands."

For previous introduction, see S. P. I. No. 49693.

51342. *MELINIS MINUTIFLORA* Beauv. Poaceæ. Grass.

"(No. 1055. En route from Meru to Embu, Kenia Province. June 15, 1920.) A purple-topped grass occurring only in the hill country, where it forms small colonies to the exclusion of other plants."

For previous introduction, see S. P. I. No. 51315.

51343. *PANICUM* sp. Poaceæ. Grass.

"(No. 1066. Chuka, Kenia Province. June 16, 1920.) A delicate form growing in the bush and open forest region."

51344. *ANIGOZANTHOS MANGLESII* D. Don. Amaryllidaceæ.

From Perth, Western Australia. Seeds presented by H. C. Trethowan, Undersecretary for Agriculture. Received September 21, 1920.

An amaryllidaceous plant native to the Swan River country of southwestern Australia. It bears scorpioid racemes on stout, woolly, bright-red stems. The lustrous green, tomentose spathes are square at the end, recurved, and bear the stamens on the curve. (Adapted from the *Pacific Garden*, vol. 7, p. 11.)

51345 and 51346.

From Aguascalientes, Aguascalientes, Mexico. Presented by Luther K. Zabriske, American consul. Received September 25, 1920.

51345. *DAHLIA* sp. Asteraceæ. Dahlia.

Dahlia roots included in the shipment of tubers of *hierba de chicle*.

51346. *EUPHORBIA* sp. Euphorbiaceæ.

Tubers of the *hierba de chicle*.

"These were brought to my attention by Redick R. Moore, an American mining engineer, who interested himself in the plant after noting the fact that the skin or husk of the tuber was commonly employed by the natives as chewing gum, and that the same resolved itself into an India-rubberlike substance after being chewed. The plant grows in

51345 and 51346—Continued.

crevices between volcanic rocks, rhyolitic in nature, at an elevation of about 7,000 feet. These tubers came from the so-called 'La Punta Hacienda,' about 7 miles northwest of Rincon de Romos, Aguascalientes." (*Zabriskie.*)

51347 to 51350.

From Bogota, Colombia. Collected by Wilson Popenoe, Agricultural Explorer of the Bureau of Plant Industry. Received September 25, 1920. Quoted notes by Mr. Popenoe.

51347. *CANNA* sp. Cannaceæ.

Canna.

"(No. 433a. Santa Marta, Colombia. August 5, 1920.) Seeds of a common wild plant in the mountains south of Santa Marta, at altitudes not exceeding 2,000 feet. Its stems reach to 8 or 10 feet and are surmounted by clusters of small flowers, bright yellow, spotted with orange-red. Of interest only to those engaged in canna breeding."

51348 and 51349. *SOLANUM TUBEROSUM* L. Solanaceæ.

Potato.

51348. "(No. 435. Bogota. August 27, 1920.) Tubers of the *Caicera* potato, from the Bogota market. A somewhat flattened, smooth-skinned, rose-colored potato of very good quality. One of the favorite varieties in this part of the Andes."

51349. "(No. 436. Bogota. August 27, 1920.) Tubers of the *Tempranera* potato (early). From the Bogota market. An early variety of round form, rather small size, and light-brown skin. One of the principal varieties of this part of the Andes."

51350. *ZEA MAYS* L. Poaceæ.

Corn.

"(No. 434a. Bogota. August 27, 1920.) Native pop corn. The ears are from 4 to 6 inches long, the grains pale straw colored and translucent. It is said to come from the lowlands, and is much used as an article of food in Bogota, the grains being popped in the same manner as in the United States."

51351 to 51357.

From Bogota, Colombia. Collected by Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture. Received September 29, 1920. Quoted notes by Mr. Popenoe.

51351. *DATURA* sp. Solanaceæ.

"(No. 441a. Bogota. September 4, 1920.) Seeds of *borrachero*, or *chocolate sabanero*, from above Esperanza, Cundinamarca, at an altitude of about 6,000 feet. The common tree datura of the Bogota mesa and surrounding regions, used by the ancients as a narcotic."

51352. *FRAGARIA VESCA* L. Rosaceæ.

Strawberry.

"(No. 445. Bogota. September 4, 1920.) Plants of the *fresa*, the common wild strawberry of this section of the Andes, found in Cundinamarca on mountain slopes at altitudes of approximately 6,000 to 8,000 feet. The fruit is brought into the Bogota market in considerable quantities, and is said to be available at all seasons of the year. It is small, rarely over half an inch long, broadly oval to nearly round, and of pleasant flavor."

51351 to 51357—Continued.

51353. SOLANUM sp. Solanaceæ.

"(No. 440a. Bogota. September 4, 1920.) Seeds of a half-woody vine which climbs over small trees in the vicinity of Cachipay, on the railway between Bogota and Girardot (altitude about 6,000 feet). It has a leaf much like the tomato vine, and its small, white, star-shaped flowers are followed by clusters of egg-shaped fruits about half an inch long and of a bright brownish orange. I am told that these fruits are not edible, but I am inclined to think they are harmless."

51354. RUBUS URTICAEFOLIUS Poir. Rosaceæ.

Blackberry.

"(No. 438a. Bogota. September 4, 1920.) Seeds of a wild blackberry which is excellent, though the fruit is rather small. It is found on the mountain slopes at altitudes of 5,000 to 6,000 feet, above Esperanza, on the railway from Bogota to Girardot. The canes reach a length of about 10 feet and are more or less erect in habit. The flowers are small and white. The berries are produced in large clusters; individually they are one-half to three-quarters of an inch long, with the drupelets which compose them small, deep purple, and set closely together. The flavor of the ripe berry is sweet and pleasant."

51355. SOLANUM TUBEROSUM L. Solanaceæ.

Potato.

"(No. 442. Bogota. September 4, 1920.) Tubers of the *Criolla* potato from the Bogota market. One of the principal varieties cultivated in this region. A round, rather small, red-skinned potato with deep eyes."

51356. ZEA MAYS L. Poaceæ.

Corn.

"(No. 443a. Bogota. September 4, 1920.) Seeds of a peculiar variety of corn, with sulphur-yellow, starchy kernels; from the Bogota market."

51357. ERYTHRINA EDULIS Triana. Fabaceæ.

"(No. 437a. Bogota. September 4, 1920.) Seeds of a plant called *balu* in Cundinamarca; *chachafruto* in Antioquia; and *frijol nopas* in Santander.

"A small, soft-wooded tree whose seeds are an important article of food in certain parts of Colombia, notably on the western slope of the Cordillera Oriental. It is sometimes planted among coffee trees to provide shade for them, and it is often seen in dooryards and about the gardens of the natives. Anolaima, in Cundinamarca, is said to be one of the most important centers of production. The tree is grown in this part of Colombia at altitudes of 5,500 to 6,500 feet. The fact that it is seen only within this narrow zone would indicate that it is rather exacting in its climatic requirements.

"The tree grows to a height of 25 or 30 feet. The leaves are trifoliate, with the oblong-ovate to ovate, acute leaflets sometimes as much as 8 inches long. The flowers, produced in erect spikes, are about three-quarters of an inch long, and orange-scarlet. The fruit is a plump pod 6 to 18 inches long and about an inch thick. It contains several brown seeds of the form and character of the common bean, but much larger; they are usually 1 to 2 inches long, and very plump.

51351 to 51357—Continued.

“When fully mature, the pods (which are often borne in clusters of four or five) are picked and the beans prepared for eating by boiling in salted water. The leathery brown integument must first be removed; the cotyledons are then found to be white, tender, of very fine, somewhat mealy texture, and of an agreeable flavor suggesting that of the white bean, but more delicate, with a trace of sweetness.

“The Indians reckon the balu among their best foods. I believe the plant will succeed in southern Florida, but it is probably too tender for California.”

INDEX OF COMMON AND SCIENTIFIC NAMES.

- Abutilon* sp., 51216.
Acacia catechu, 50711.
Achimenes sp., 51195.
Aeluropus brevifolius, 51110.
Agathis loranthifolia. See *Dammara alba*.
Agave cantala, 51206.
 Aggak, *Pandanus tectorius*, 51138.
Agrostis sp., 51158.
Albizia chinensis, 50712, 51143.
 lebbeck, 50713.
 montana, 50694.
 stipulata. See *A. chinensis*.
Alectryon subcinereum, 51000.
 Alfalfa, *Medicago sativa*, 51157.
Allium cepa, 51255.
 sativum, 51285.
 Almond, *Amygdalus communis*, 51103, 51104.
Alnus nepalensis, 50714.
Altingia excelsa, 50695.
Alvaradoa amorphoides, 50652.
 Amaranth, *Amaranthus* sp., 50726.
Amaranthus sp., 50726.
Amygdalus communis, 51103, 51104.
 persica, 51162, 51163.
Anacardium occidentale, 51249.
Ananas sativus, 50649, 50727.
Anchusa rosea. See *Nonnea rosea*.
 Andes berry, *Rubus glaucus*, 50691.
Andropogon sp., 50686.
 trichopus, 51334.
Antgozanthos manglesi, 51344.
Annona cherimola, 51003, 51013, 51217
 muricata, 50728, 51050.
 reticulata, 50729, 50730, 51014.
 senegalensis, 50731.
 squamosa, 51015.
Antheophora pubescens, 51111.
 Apple, *Malus pumila*:
 Paradise, 51164.
- Apple, *Malus sylvestris*:
 Aerial, 51165.
 Alpha, 51166.
 Ballarat, 51167.
 Bordeaux ReINETTE, 51168.
 Coles Champion, 51169.
 Cowell's Red Streak, 51170.
 Frimley Beauty, 51171.
 Imm's Seedling, 51172.
 Irish Peach seedling, 51173.
 Lipplatt's, 51174.
 Lord Nelson, 51175.
 Mobb's, 51176.
 Mobb's Royal, 51177.
 Motion's, 51178.
 Ruby Gem, 51179.
Arachis hypogaea, 50732.
Ardisia spp., 51052, 51053.
Areca catechu, 50733, 51127.
Artocarpus integra, 51012.
 integrifolia. See *A. integra*.
Arundinella berteroniana, 51069.
 depeana, 51184.
Asclepias curassavica, 50678.
Aspidosperma peroba, 51107.
Attalea sp., 51024.
Avena sativa, 51199, 51202, 51298-51305.
 sterilis, 51203.
 Avocado, *Persea americana*, 50680, 50688, 50968, 51029-51031, 51105, 51208.
 Dade, 50968.
Axonopus sp., 51159.
Backhousia citriodora, 51062.
Bactris utilis. See *Guiljelma utilis*.
 Balinaonao, *Otophora fruticosa*, 51106.
 Balu, *Erythrina edulis*, 51357.
 Bamboo, *Dendrocalamus giganteus*, 51026.
 Schizostachyum sp., 50648.

- Barberry. See *Berberis* spp.
- Barisber, *Mezoneurum scortechinii*, 51253.
- Barley, *Hordeum vulgare coeleste*:
naked, 51229.
Nebawi, 51209.
- Barreto, *Plocosperma busifolium*, 50687.
- Bassia latifolia*. See *Madhuca indica*.
- Bauhinia kappleri*, 50734.
- Bean, bonavist, *Dolichos lablab*, 50760.
common, *Phaseolus vulgaris*, 50845-50901, 50965, 50966, 51079-51084, 51198.
Lima, *Phaseolus lunatus*, 50999.
mung, *Phaseolus aureus*, 50962-50964.
soy, *Soja max*, 51042-51046.
sword, *Canavali gladiatum*, 50739.
wild, *Canavali* sp., 51281.
- Begonia* sp., 51058.
- Bejuco blanco, *Ipomoea* sp., 50661.
- Berberis napaulensis*, 50715.
- Berry, Andes, *Rubus glaucus*, 50691.
- Bischofia javanica*. See *B. trifoliata*.
trifoliata, 51194.
- Blackberry, *Rubus* spp., 50681, 51033, 51123, 51354.
- Blakea* spp., 51074, 51075.
- Blumea balsamifera*. See *Placus balsamifer*.
- Bombax malabaricum*, 50716.
- Borrachero, *Datura* sp., 51351.
- Brachiaria brizantha*, 50687.
- Bramble, *Rubus* sp., 50907.
- Brazil, *Haematoxylum brasiletto*, 50660.
- Bromus* sp., 51057.
- Broom, Spanish, *Spartium junceum*, 51151.
- Bunchosia glandulifera*, 51116.
- Byrsocarpus* sp., 50735.
- Cacho de chibo, *Tabebuia* sp., 50673.
- Caesalpinia exostemma*, 50653.
- Cajan indicum*, 50736-50738.
- Caju, *Anacardium occidentale*, 51249.
- Callitris cupressiformis*, 51282.
drummondii, 51283.
- Calophyllum inophyllum*, 51218.
- Campana, *Cydista pubescens*, 50656.
- Canavali* sp., 51281.
gladiatum, 50739.
- Canna* spp., 50740, 50741, 51347.
- Capparis micracantha*, 51191.
- Capriola dactylon*, 51335.
- Capsicum annum*, 50742, 50743, 51054.
- Carcomo, *Caesalpinia exostemma*, 50653.
- Carica* sp., 51250.
papaya, 50970.
- Carissa carandas*, 51005.
- Caryota mitis*, 51128.
- Cashew, *Anacardium occidentale*, 51249.
- Cassava, *Manihot esculenta*, 50837, 50838, 51126.
- Cassia bicapsularis*, 50654.
elegans, 51061.
emarginata, 50655.
laevigata, 51219.
occidentalis, 51220.
siamea, 50744.
- Castilla nicoyensis*, 51117.
- Castor-bean, *Ricinus communis*, 50904-50906, 51236-51238.
- Catjang, *Vigna cylindrica*, 50930, 50931.
- Ceiba pentandra*, 50745, 50746.
- Cereza, *Bunchosia glandulifera*, 51116.
- Cestrum* sp., 51008.
- Chaetochloa* sp., 50689.
aurea, 51336.
geniculata, 51070.
lutescens, 50690.
sulcata, 51071, 51185, 51186, 51337, 51338.
- Chayota edulis*, 50682, 51056.
- Chayote, *Chayota edulis*, 50682, 51056.
- Chenopodium album*, 51214.
- Cherimoya, *Annona cherimola*, 51003, 51013, 51217.
- Chick-pea, *Cicer arietinum*, 51076.
- Chloris* spp., 51306-51308.
radiata, 51311, 51339.
- Chocolate sabanero, *Datura* sp., 51351.
- Choreque, *Securidaca sylvestris*, 50671.
- Chununo, *Macrocepsis obovata*, 50658.
- Cicer arietinum*, 51076.
- Cissus* sp., 50747.
- Citrullus vulgaris*, 51180, 51181.
- Citrus* sp., 50967.
australasica. See *Microcitrus australasica*.
sinensis, 51215.
- Clematis* sp., 50748.
- Clover. See *Trifolium* spp.
- Coccolobis* sp., 50683.
- Cochlospermum hibiscoides*. See *Maximiliana vitifolia*.
- Coix lacryma-jobi*, 51196.

- Cok-pechadya, *Agrostis* sp., 51158.
 Cola de pato, *Cassia bicapsularis*, 50654.
Coleus barbatus, 51239.
Colocasia sp., 50710.
Colutea galegifolia. See *Swainsona galegifolia*.
Convolvulus mauritanicus, 51098.
 Coralillo, *Stigmaphyllon* sp., 50672.
Cordia sp., 51101.
nitida, 51118.
 Cordoncilla, *Piper tuberculatum*, 51059, 51264.
 Corn, *Zea mays*, 50947-50956, 51244, 51287-51297, 51356.
 pop, *Zea mays*, 51350.
Corylus avellana, 51077, 51078.
 Cotton, *Gossypium* spp., 50775-50778, 51010, 51028.
 kidney, *Gossypium* spp., 50775, 50776, 50778.
 Cowpea, *Vigna sinensis*, 50932-50942
Cracca sp., 50750.
polystachya, 50749.
Crotalaria spp., 50752-50754.
striata, 50751.
usaramoensis, 51207.
verrucosa, 51119.
 Cruzito, *Podopterus guatemalensis*, 50669.
 Cucumber, *Cucumis* spp., 50755-50757, 51221, 51222.
Cucumis sp., 51221.
anguria, 51222.
melo, 51102, 51156, 51256.
sativus, 50755-50757.
Cucurbita pepo, 50758, 51022, 51034, 51035.
 Cuero de zapo, *Petrea arborea*, 50665.
 Cupang, *Parkia timoriana*, 50701.
Cupania sp., 51120.
 Custard-apple, *Annona reticulata*, 50729, 50730, 51014.
Cyathea sp., 51007.
Cyclanthera pedata, 51004.
Cydista pubescens, 50656.
Cymbopogon spp., 50759, 51309.
cymbartus, 51340.
Cyperus sp., 51310.
Cyphomandra betacea, 51223.

Dactylis aschersoniana, 51183.
Dahlia spp., 51086-51090, 51345.

Dammara alba, 51129.
Datura sp., 51351.
Dendrocalamus giganteus, 51026.
Desmodium sp. See *Meibomia* sp.
Desmoncus sp., 51258.
Digitaria sp., 51311.
iburua, 51257.
Dioscorea sp., 51224.
 Djianitu, *Elaeocarpus sphaericus*, 50696.
Dolicholus sp., 50761.
phaseoloides, 51027.
Dolichos lablab, 50760.
Doryanthes palmeri, 51063.
Drymophloeus sp., 51130.
 Duruche, *Jacquinia gracilis*, 50662, 50663.

Echinochloa crusgalli edulis, 51341.
 Eggplant, *Solanum melongena*, 50910-50918, 50971.
Elaeis guineensis, 50762, 51016-51021.
Elaeocarpus ganitrus. See *E. sphaericus*.
sphaericus, 50696.
Elaeodendron capense, 51144.
Eleusine coracana, 50763, 50998, 51312.
Embothrium speciosissimum. See *Telopea speciosissima*.
Entelea arborescens, 51047.
Eragrostis spp., 50766, 50767, 51313.
tremula, 50764, 50765.
Eriobotrya hookeriana, 50717.
Eriodendron anfractuosum. See *Ceiba pentandra*.
Erythrina sp., 50768.
edulis, 51357.
Eucalyptus risdoni, 51064.
Eugenia curranii, 51201.
jambolana. See *Syzygium cumini*.
Euphorbia sp., 51346.
leucocephala, 50657.

 Fern, tree, *Cyathea* sp., 51007.
Ficus spp., 50700, 50769, 51252.
nota, 50697.
odorata, 50698.
ulmifolia, 50699.
 Fig. See *Ficus* spp.
 Flor de mico, *Phyllocarpus septentrionalis*, 50666.
 de pascua, *Euphorbia leucocephala*, 50657.

- Fragaria vesca*, 51352.
 Fresa. See Strawberry, 51352.
 Fruta de pava, undetermined, 50692.
Fuchsia speciosa, 51001.

Garcinia mangostana, 51200.
 Garlic, *Allium sativum*, 51285.
 Gengibrillo, *Paspalum notatum*, 51121.
Genista monosperma, 51145.
Gladiolus spp., 50770-50772, 51225.
 segetum, 51146.
Gloriosa sp., 50773.
 simplex, 51234.
Gomphocarpus physocarpus, 50774.
Gomphrena rosea, 51108.
Gossypium spp., 50775-50778, 51010, 51028.
 Gourd, *Cucurbita pepo*, 51022, 51023, 51034, 51035.
 Lagenaria vulgaris, 51023.
 Loofah, *Luffa acutangula*, 51230.
 Granadilla, giant, *Passiflora quadrangularis*, 51093.
 sweet, *Passiflora ligularis*, 51055.
 Granadillo, undetermined, 50675.
 Grape, *Vitis* sp., 50943.
 Grass, *Aeluropus brevifolius*, 51110.
 Agrostis sp., 51158.
 Andropogon sp., 50686.
 trichopus, 51334.
 Anthephora pubescens, 51111.
 Arundinella berteroniana, 51069.
 deppeana, 51184.
 Axonopus sp., 51159.
 Brachiaria brizantha, 50687.
 Bromus sp., 51057.
 Capriola dactylon, 51335.
 Chaetochloa sp., 50689.
 aurea, 51336.
 geniculata, 51070.
 lutescens, 50690.
 sulcata, 51071, 51185, 51186, 51337, 51338.
 Chloris spp., 51306-51308.
 radiata, 51311, 51339.
 Cymbopogon spp., 50759, 51309.
 cymbarius, 51340.
 Dactylis aschersoniana, 51183.
 Digitaria iburua, 51257.
 Echinochloa crusgalli edulis, 51341.

 Grass, *Eragrostis* spp., 50766, 50767, 51313.
 Eragrostis tremula, 50764, 50765.
 Fu-fu, *Pennisetum purpureum*, 51286.
 Heteropogon contortus, 51226.
 Isachne arundinacea, 51187, 51197.
 Ischaemum latifolium, 51095.
 Izophorus unisetus, 50650.
 Kamerun, *Holcus sorghum effusus*, 50782, 50783, 50785, 50795, 50801, 50802.
 Melinis minutiflora, 51315, 51342.
 Miscanthus nepalensis, 50719.
 Natal, *Tricholaena rosea*, 50925, 50926.
 Panicum spp., 51316, 51343.
 fasciculatum, 51260.
 millegrana, 51259.
 multirameum, 51097.
 olivaceum, 51188.
 Paspalum conjugatum, 51189.
 denticulatum, 51261.
 humboldtianum, 51096.
 notatum, 51121, 51262.
 paniculatum, 51072, 51190.
 plicatum, 51263.
 scrobiculatum, 51317.
 Pennisetum purpureum, 51286.
 Phleum pratense, 51269-51279.
 rye, Wimmera, *Lolium perenne*, 51213.
 Sporobolus spp., 50920, 51318-51323.
 indicus, 51160.
 pyramidalis, 50921.
 Sudan, *Holcus sorghum sudanensis*, 50780, 50781.
 Syntherisma spp., 51324-51331.
 tabucki, *Holcus sorghum verticilliflorus*, 50789, 50791-50794, 50796, 50798, 50800, 50803, 50807, 50808.
 Trichopteryx sp., 50927.
 Trisetum deyeuxioides, 51161.
 Tristachya spp., 51332, 51333.
 Wimmera rye, *Lolium perenne*, 51213.

Grewia asiatica. See *Microcos lateriflora*.
 occidentalis, 51147.
Guaiacum guatemalense, 50659.

- Guayacan, *Guaiacum guatemalense*, 50659.
- Guava, *Psidium guajava*, 50903, 51038-51040.
- Guilicima utilis*, 50679, 51051, 51091, 51092.
- Gundelia tournefortii*, 51142.
- Haematoxylum brasiletto*, 50660.
- Hardenbergia monophylla*. See *Kennedya monophylla*.
- Hazelnut, *Corylus avellana*, 51077, 51078.
- Heckeria* sp., 51060.
- Heteropogon contortus*, 51226.
- Hibiscus* sp., 51227.
brackenridgei, 50693.
sabdariffa, 51268.
- Hierba de chicle, *Euphorbia* sp., 51346.
- Holcus sorghum*, 50779, 50784, 50786-50788, 50790, 50797, 50799, 50804-50806, 50809-50829, 51228.
sorghum effusum, 50782, 50783, 50785, 50795, 50801, 50802.
sudanensis, 50780, 50781.
verticilliflorus, 50789, 50791-50794, 50796, 50798, 50800, 50803, 50807, 50808.
- Hordeum vulgare coeleste*, 51209, 51229.
- Iburu, *Digitaria iburua*, 51257.
- Igname branca, *Colocasia* sp., 50710.
- Indigo. See *Indigofera* spp.
- Indigofera* spp., 50830, 51314.
endecaphylla, 50831.
- Inula royleana*, 51037.
- Ipomoea* spp., 50661, 50832-50833.
nymphaeaefolia, 51192.
peltata. See *I. nymphaeaefolia*.
putchella, 50834.
- Isachne arundinacea*, 51187, 51197.
- Ischaemum latifolium*, 51095.
- Izophorus unisetus*, 50650.
- Jaboncillo, *Sapindus saponaria*, 50670.
- Jaboticaba, *Myrciaria cauliflora*, 51266, 51267.
murta mineira, *Myrciaria cauliflora*, 51267.
- Jack fruit, *Artocarpus integra*, 51012.
- Jacote mico, *Simarouba glauca*, 50676
- Jacquinia gracilis*, 50662, 50663.
- Jaffa orange, *Citrus sinensis*, 51215.
- Jambolan, *Syzygium cumini*, 50922, 51100.
- Jatropha curcas*, 50835.
- Job's-tears, *Coix lacryma-jobi*, 51196.
- Jujube, *Ziziphus* spp., 51114, 51115.
- Kapok, *Ceiba pentandra*, 50745, 50746.
- Karanda, *Carissa carandas*, 51005.
- Karwinskia* sp., 50677.
- Kennedia monophylla*, 51065.
- K-ohl, *Coix lacryma-jobi*, 51196.
- Lagenaria vulgaris*, 51023.
- Lairen, *Maranta* sp., 50684.
- Latania commersonii*, 51131.
- Lavender, sea, *Limonium fruticosum*, 51148.
- Lebeck tree, *Albizia lebeck*, 50713.
- Licuala rumphii*, 51132.
- Lime, Chinese, *Citrus* sp., 50967.
finger, *Microcitrus australasica*, 51011.
- Limonium fruticosum*, 51148.
- Lobelia rosea*, 50718.
- Lolium perenne*, 51213.
- Lomatia ilicifolia*. See *Tricondylus fraseri*.
- Lucern, *Medicago sativa*, 51157.
- Luffa acutangula*, 51230.
- Lycopersicon esculentum*, 50836, 51182.
- Macrocepis obovata*, 50658.
- Macui, *Solanum* sp., 51265.
- Madhuca indica*, 51155.
- Malus pumila*, 51164.
sylvestris, 51165-51179.
- Malvastrum capense*, 51149.
- Mamão Caranus, *Carica* sp., 51250.
- Mangabas, undetermined, 51251.
- Mangosteen, *Garcinia mangostana*, 51200.
- Manihot esculenta*, 50837, 50838, 51126.
utilissima. See *M. esculenta*.
- Manzanito, *Karwinskia* sp., 50677.
- Maranta* sp., 50684.
- Martinezia caryotaefolia*. See *Tilimia caryotaefolia*.
- Maximiliana vitifolia*, 50664.
- Medicago sativa*, 51157.
- Meibomia* sp., 50839.

- Melinis minutiflora*, 51315, 51342.
Meryta sinclairii, 51049.
Metrosideros tomentosa, 51048.
Mezoneurum scortechinii, 51253.
Microcitrus australasica, 51011.
Microcos lateriflora, 51006.
Millet, koda, *Paspalum scrobiculatum*,
51317.
pearl, *Pennisetum glaucum*, 50843,
50844, 50961.
ragi, *Eleusine coracana*, 50763
50998, 51312.
Miscanthus nepalensis, 50719.
Mopia, undetermined, 50960.
Mora, *Rubus* spp., 51094, 51123.
de Castilla, *Rubus glaucus*, 50691.
Morning-glory, *Convolvulus mauritanicus*,
51098.
Ipomoea spp., 50661, 50832-50834.
nymphaeaefolia, 51192.
Morus indica, 50720.
Mowra tree, *Madhuca indica*, 51155.
Mulberry, *Morus indica*, 50720.
Muñeco, *Cordia nitida*, 51118.
Musa ensete, 51231.
Muskmelon, *Cucumis melo*, 51102,
51156.
Aggur, *Cucumis melo*, 51256.
Myrriaria cauliflora, 51266, 51267.
Nectandra glabrescens, 50685.
Nephelium leiocarpum. See *Alectryon*
subcinereum.
Nephrosperma van-houtteanum, 51133.
Nicotiana tabacum, 50840, 50841, 51232.
Nonnea rosea, 51041.
Oak. See *Quercus* spp.
Oats, *Avena sativa*, 51199, 51202,
51298-51305.
Avila, 51298.
Ciudad Real, 51299.
Gray, 51202.
Guadalajara, 51300.
Madrid, 51301.
Segovia, 51302.
Toledo, 51303, 51304.
Valladolid, 51305.
Oats, *Avena sterilis*, 51203.
Fair, 51203.
Obel, *Heckeria* sp., 51060.
Ochna leptoclada, 50842.
Olea europaea, 50972-50997.

- Olive, *Olea europaea*, 50972-50997.
Atroviolacea Brun Bibier, 50972.
Black Italian, 50973.
Bouquetier, 50974.
Bouteillon, 50975.
Corregiole, 50976.
Cushine, 50977.
Frantoja, 50978.
Grossee Redowno, 50979.
Hardy's Mammoth, 50980.
Institute, 50981.
Large Fruiting, 50982.
Late Blanquette, 50983.
Longue d'Ascoli, 50984.
Lucca, 50985.
Morchioso, 50986.
Morocco, 50987.
Palermo, 50988.
Picholin, 50989.
Pueblano, 50990.
Royal de Languedoc, 50991.
Rubra Caillon de Aix, 50992.
Saint Catherine, 50993.
Salome, 50994.
Sir George Gray's Spanish, 50995.
Verdale, 50996.
White, 50997.
Olneya tesota, 51254.
Oncosperma filamentosum, 51134.
Onion, *Allium cepa*, 51255.
Orange, Shamooti, *Citrus sinensis*,
51215.
Oreodoxa regia. See *Roystonea regia*.
Oryza sativa, 51233.
Otophora fruticosa, 51106.
Pachira fastuosa, 51204.
macrocarpa. See *P. fastuosa*.
Palm, *Attalea* sp., 51024.
betel-nut, *Areca catechu*, 50733,
51127.
Caryota mitis, 51128.
Desmoncus sp., 51258.
Drymophloeos sp., 51130.
Guilielma utilis, 50679, 51051,
51091, 51092.
Latania commersonii, 51131.
Licuala rumphii, 51132.
Martinezia caryotaefolia. See *Til-*
mia caryotaefolia.
Nephrosperma van-houtteanum,
51133.

- Palm, oil, *Elaeis guineensis*, 50762, 51016-51021.
Oncosperma filamentosum, 51134.
Oreodoxa regia. See *Roystonea regia*.
 royal, Cuban, *Roystonea regia*, 51139.
Scheelea insignis, 51140.
Tilimia caryotaefolia, 51141.
- Palo de la Cruz, *Plumeria acutifolia*, 50668.
- Pandanus furcatus*, 51135.
labyrinthicus, 51136.
polycephalus, 51137.
tectorius, 51009, 51138.
- Panicum* spp., 51316, 51343.
brizanthum. See *Brachiaria brizantha*.
fasciculatum, 51260.
millegrana, 51259.
multirameum, 51097.
olivaceum, 51188.
- Papaya, *Carica* spp., 50970, 51250.
- Paraiso, *Cupania* sp., 51120.
- Parkia roxburghii*. See *P. timoriana*.
timoriana, 50701.
- Paspalum conjugatum*, 51189.
denticulatum, 51261.
humboldtianum, 51096.
notatum, 51121, 51262.
paniculatum, 51072, 51190.
plicatulum, 51263.
scrobiculatum, 51317.
- Passang batoe, *Quercus javanica*, 50703.
 bodas, *Quercus* sp., 50705.
 djamba, *Quercus* sp., 50706.
 keyan or keang, *Quercus* sp., 50707.
 soeroe, *Quercus thelecarpa*, 50704.
 tonogo, *Quercus* sp., 50708.
- Passiflora* sp., 51002.
ligularis, 51055.
macrocarpa, 51099.
mollissima, 51205.
quadrangularis, 51093.
- Pea, garden, *Pisum sativum*, 50902.
- Peach, *Amygdalus persica*:
 Allen's Late, 51162.
 Golden Queen, 51163.
- Peanut, *Arachis hypogaea*, 50732.
- Pennisetum glaucum*, 50843, 50844, 50961.
purpureum, 51286.
typhoideum. See *P. glaucum*.
- Pepper, *Heckeria* sp., 51060.
Piper tuberculatum, 51059.
 red, *Capsicum annum*, 50742, 50743, 51054.
- Persea americana*, 50680, 50688, 50968, 51029-51031, 51105, 51208.
caerulea, 51032.
gratissima. See *P. americana*.
Petrea arborea, 50665.
Petunia violacea, 51109.
- Phaseolus aureus*, 50962-50964.
lunatus, 50999.
vulgaris, 50845-50901, 50965, 50966, 51079-51084, 51198.
- Phleum pratense*, 51269-51279.
Phyllocarpus septentrionalis, 50666.
- Pigeon-pea, *Caján indicum*, 50736-50738.
- Pine. See *Pinus* spp.
- Pineapple, *Ananas sativus*, 50727.
 Montufar, 50649.
- Pinus halepensis pityusa*, 51085.
oocarpa, 50651.
- Piper* sp., 51264.
tuberculatum, 51059.
- Pisum sativum*, 50902.
- Placus balsamifer*, 51036.
- Plocosperma buxifolium*, 50667.
- Plumajillo, *Alvaradoa amorphoides*, 50652.
- Plumeria acutifolia*, 50668.
- Podopterus guatemalensis*, 50669.
- Polakowskia tacaco*, 51122.
- Portulacaria afra*, 50969.
- Potato, *Solanum tuberosum*:
 Calcera, 51348.
 Criolla, 51355.
 Tempranera, 51349.
- Prunus amygdalus*. See *Amygdalus communis*.
persica. See *Amygdalus persica*.
- Psidium guajava*, 50903, 51038-51040.
- Pterocarpus indicus*, 51235.
- Pterospermum* sp., 50702.
- Pumpkin, *Cucurbita pepo*, 50758.
- Pygeum acuminatum*, 50721.

- Quercus* sp., 50705-50708.
incana, 50722.
javanica, 50703.
thelecarpa, 50704.
- Rash tzimaaaj, *Paspalum paniculatum*, 51190.
- Raspberry, *Rubus criocarpus*, 51094.
- Rice, *Oryza sativa*, 51233.
- Ricinus communis*, 50904-50906, 51236-51238.
- Rondeletia amoena*, 51150.
- Roselle, *Hibiscus sabbdariffa*, 51268.
- Roystonea regia*, 51139.
- Rubber, Nicoya, *Castilla nicoyensis*, 51117.
- Rubus* spp., 50681, 50907.
adenotrichos, 51123.
costaricanus, 51033.
criocarpus, 51094.
glaucus, 50691.
rosaeifolius, 50723.
urticaefolius, 51354.
- Rumex maderensis*, 50908.
- Rynchosia phaseoloides*. See *Dolicholus phaseoloides*.
- Saba saba, *Rumex maderensis*, 50908.
- Sac pachadya, *Paspalum conjugatum*, 51189.
- Sapindus mukorossi*, 50724.
saponaria, 50670.
- Scheelea insignis*, 51140.
- Schima noronhae*, 50709.
- Schizostachyum* sp., 50648.
- Sechium edule*. See *Chayota edulis*.
- Securidaca sylvestris*, 50671.
- Sedge, *Cyperus* sp., 51310.
- Sesame. See *Sesamum orientale*.
- Sesamum orientale*, 50909.
- Setaria sulcata*. See *Chaetochloa sulcata*.
- Simarouba glauca*, 50676.
- Soapberry. See *Sapindus* spp.
- Soja max, 51042-51046.
- Solanum* spp., 50919, 51265, 51353.
haematocladum, 51280.
melongena, 50910-50918, 50971.
tuberosum, 51348, 51349, 51355.
- Sorghum, *Holcus sorghum*, 50779, 50784, 50786-50788, 50790, 50797, 50799, 50804-50806, 50809-50829, 51228.
- Sorghum vulgare*. See *Holcus sorghum*.
- Soursop, *Annona muricata*, 50728, 51050.
- Spanish broom, *Spartium junceum*, 51151.
- Spartium junceum*, 51151.
- Spatholobus parviflorus*, 50725.
roxburghii. See *S. parviflorus*.
- Spekboom, *Portulacaria afra*, 50969.
- Sporobolus* spp., 50920, 51318-51323.
indicus, 51160.
pyramidalis, 50921.
- Stacte fruticans*. See *Limonium fruticans*.
- Stigmaphyllon* sp., 50672.
- Strawberry, *Fragaria vesca*, 51352.
- Sugar-apple, *Annona squamosa*, 51015.
- Suquinay, *Vernonia patens*, 50674.
- Swainsona galegifolia*, 51066.
- Syntherisma* spp., 51324-51331.
- Syzygium cumini*, 50922, 51100.
- Tabebuia* sp., 50673.
- Tacaco, *Polakowskia tacaco*, 51122.
- Tacso, *Passiflora mollissima*, 51205.
- Talinum patens*, 51193.
- Taro, *Colocasia* sp., 50710.
- Tecomasuche, *Maximiliana vitifolia*, 50664.
- Telopea speciosissima*, 51067.
- Tempranera, *Solanum tuberosum*, 51349.
- Tephrosia polystachya*. See *Cracca polystachya*.
- Tetrastigma* sp., 50923.
- Thunbergia gibsoni*, 51240.
- Tilmia caryotaefolia*, 51141.
- Timothy, *Phleum pratense*, 51269-51279.
- Tobacco, *Nicotiana tabacum*, 50840, 50841, 51232.
- Tokan-uuk, *Rubus glaucus*, 50691.
- Tomato, *Lycopersicon esculentum*, 50836, 51182.
- Tree-tomato, *Cyphomandra betacea*, 51223.
- Trichilia emetica*, 51284.
- Trichodesma zeylanicum*, 50924.
- Tricholaena rosea*, 50925, 50926.
- Trichopteryx* sp., 50927.
- Trichosanthes* sp., 50928.
- Tricondylus fraseri*, 51068.

- Trifolium resupinatum*, 51073.
subterraneum, 51212.
Trisetum deyeuxioides, 51161.
Tristachya spp., 51332, 51333.
Triticum aestivum, 51241, 51242.
durum, 50929, 51210, 51211.
vulgare. See *T. aestivum*.
 Tulip, *Tulipa stellata*, 51113.
Tulipa stellata, 51113.
 Undetermined, 50675, 50692, 50957-50960, 51025, 51245-51248, 51251.
 Vainillo, *Cassia emarginata*, 50655.
Vernonia patens, 50674.
 Viborana, *Asclepias curassavica*, 50678.
Vigna sp., 51243.
cylindrica, 50930, 50931.
sinensis, 50932-50942.
Vitis sp., 50943.
Voandzeia subterranea, 50944-50946.
 Waratah, *Telopea spectosissima*, 51067.
 Watermelon, *Citrullus vulgaris*, 51180, 51181.
- Wercklea insignis*, 51124, 51125.
 Wheat, common, *Triticum aestivum*, 51241, 51242.
durum, *Triticum durum*:
 (India), unnamed, 50929.
 Mahmoodi, 51210.
 Reyati, 51211.
Wigandia spp., 51153, 51154.
caracasana, 51152.
Xanthosoma sagittaeifolium, 51112.
 Yam, *Dioscorea* sp., 51224.
 Yautia, *Xanthosoma sagittaeifolium*, 51112.
 Zacate blanco, *Ixophorus unisetus*, 50650.
Zea mays, 50947-50956, 51244, 51287-51297, 51350, 51356.
Ziziphus sp., 51115.
jujuba, 51114.
sativa. See *Z. jujuba*.