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P L A N T I M M I G R A N T S

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Genera Represented in This Number.

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Arbutus	36529	Oryza	36533
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Hibiscus	36528	Triticum	36498-527
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PLATE: Perennial Rice. Oryza sp.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.)

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

Amygdalus persica. (Amygdalaceae.) 36485. Seeds of a peach from the Kurram Valley, Northwest Frontier Province, India. Presented by Consul-General Henry D. Baker, who secured them from Major G. J. Davis, Commandant, Kurram Militia, Parachinar, Kurram Valley. "The Shalil grows like a peach which it much resembles, and has about the same blossom. The flesh is yellow and sweet, but it is not so juicy as that of the peach. Major Davis considers that it would be a particularly valuable fruit for cooking or canning, as the flesh being harder than that of a peach would probably not break so easily and could be more easily manipulated for such purposes. It grows at about 5600 feet elevation. The only reference I can find to the Shalil in any book I have on India is in the Imperial Gazetteer of the Northwest Province, wherein it states as regards the Kurram Valley: The climate varies. In the winter even Lower Kurram is very cold and a bitter wind prevails while in the summer it is hot and dry. Upper Kurram is never unpleasantly hot even in summer, while in winter snow covers the ground for weeks. Wherever water is available for irrigation the soil is highly productive, but owing to the absence of a settled government and the internal feuds of the people, the cultivable area is not all under cultivation, and irrigation is only carried on by small canals constructed and maintained by a single hamlet or family. Apples, pears, grapes, cherries, pomegranates, peaches, and a fruit peculiar to the Kurram and Tirah, known as the Shalil, also grow; and with improved communications fruit-growing will probably become an important industry. Famine is unknown in Kurram." (Baker.) For distribution later.

Arbutus canariensis. (Ericaceae.) 36529. Seeds of the madronho from Teneriffe, Canary Islands. Presented by Dr. George V. Perez, Puerto Orotava. "The madronho is becoming very rare here, but it is still found in the mountain ravines. It will not stand frost." (Perez.) "It is one of the most beautiful shade trees that is grown around Naples and should be tested for park and street purposes in Florida and Southern California. Its clean pink and green bark and dark green foliage make it a most strikingly beautiful object." (Fairchild.) For distribution later.

Carica papaya. (Papayaceae.) 36273, 36275-278. Seeds of papayas from Theophilo Ottoni, Minas Geraes, Brazil. Presented by Mr. Fred Birch. Several varieties of papayas, some with small seed cavities, and of excellent quality, others from so-called "male" trees, others of good keeping and shipping qualities. For distribution later.

Chenopodium spp. (Chenopodiaceae.) 36304-312. Seeds of quinoas and caneguas from Peru. Collected by Mr. W. F. Wight, of this Bureau. Eight species and varieties of this interesting Peruvian grain crop from La Paz, the Puno district and Cuzco. For distribution later.

Garcinia oblongifolia. (Clusiaceae.) 36497. Seeds from Hongkong, China. Presented by Mr. William J. Tutcher, Superintendent, Botanical and Forestry Department. A yellow-flowered tree from Southern China, related to the mangosteen, and introduced for the purpose of trying it as a stock for that fruit. For distribution later.

Hibiscus sp. (Malvaceae.) 36528. Cuttings of a new variety of hibiscus from Honolulu, Hawaii. Presented by Dr. E. V. Wilcox, Hawaiian Agricultural Experiment Station. "One of the most attractive of the new varieties, originated by Mr. V. S. Holt, and named by him Ruth Wilcox. It is a good form of shrub of free-flowering habit, and one of the few hibiscuses which emit a delicate perfume." (Wilcox, in report of Hawaiian Agricultural Experiment Station, 1912.) For distribution later.

Karatas plumieri. (Bromeliaceae.) 36260. Seeds of the curujujúl from Caracas, Venezuela. Collected by Mr. H. Pittier, of this Bureau. "One of the peculiar fruits common on the market at Caracas during the months from January to April is the curujujúl, said to be produced by the above-named species. It is a slender pod, somewhat alike in shape to a very young banana finger and of a pale greenish yellow color. Its thin skin contains a translucent fluid of syrupous consistency and very sweet, in which are imbedded the numerous black seeds. The curujujúl is very much relished on account of its refreshing qualities and its delicate perfume, being either sucked off hand or served in the form of a sherbet. It is also used in the preparation of a fine preserve. This plant grows wild in the lower belt of Venezuela; it is also planted at times in hedges. As it is, the fruit is a valuable addition to the Venezuelan fruit market, and it could very likely be improved by cultivation. The same plant is reported from Colombia, Central America and Mexico. I had previously partaken of the fruits in Nicoya, Costa Rica, where the plant is known as 'piñuela de garrobo' and in Chepo, Panama, where it is called 'piro' but they were much smaller and of a very inferior quality. These may have belonged to distinct species. The fruits of the Mexican 'piñuela' as sold 'cooked' on the market at

Tehuantepec, are smaller, according to a natural size photograph taken by Messrs. G. N. Collins and C. B. Doyle." (Pittier.) For distribution later.

Opuntia spp. (Cactaceae.) 36350-357. Seeds of prickly pears from Peru. Collected by Mr. W. F. Wight, of this Bureau. Eight varieties from Cuzco and Arequipa, Peru, and Oruro and La Paz, Bolivia. Among them are some tunas of very good quality, and some from an elevation of 13500 feet. For distribution later.

Oryza sp. (Poaceae.) 36533. Seeds of the interesting perennial rice from the Colonial Garden, Nogent-sur-Marne, France. This is the first introduction of seeds of this species, plants of which were introduced previously under number 34092 and are now being experimented with by Mr. Chambliss of the Office of Cereal Investigations. In quality this rice is said to be superior to the annual rices of the West African coast. It may also have an unusual alkali resistance. For distribution later. See halftone.

Panax quinquefolium. (Araliaceae.) 36282. Ginseng seeds from Songdo, Korea. Presented by Mr. N. Gist Gee, Soochow University, Soochow, China. "The soil is prepared by mixing sand and loam in the proportion of 1:1. The sand is frequently obtained by sifting it from the bed of a nearby stream. In order to get as near as possible to the natural wild environments of the plant, the leaves of the oak or chestnut trees are collected, allowed to decay, and then dried. When dry the leaves are crumbled very fine, and then mixed half and half with sand sifted from the hill-side. This is obtained by first removing the top layer and getting the unexposed earth. The plants are cultivated on elevated beds about 6 or 8 inches above the pathways between them. These are usually about wide enough for one to work them from one side (about 2 or 2½ feet.) The length of the bed varies with the kind of field, short on hillside, quite long in the valley. Fertilizer one inch thick is spread upon the beds before the seeds are planted. The beds are covered over with sheds with top and one side stationary and a curtain which can roll up and down forming the other side. They seem to keep the plants sheltered throughout their entire period of growth, and regulate the amount of sunlight by the curtains. Before planting soak the seeds in water for four days until they swell and are nearly ready to burst. Then take them out and dry them. This should be done before Fall. In the Fall bury a vessel in the earth in a shady place and put the seeds as already prepared in it,

leaving it uncovered. Allow them to freeze, leaving them in the vessel until Spring. Drive nails as large as ginseng seeds in a plank, making them about 1 inch apart. Use this to plant the seeds regularly about five-eighths of an inch in depth. Place a seed in each hole and cover lightly with the hand. The rows should be about six inches apart. Spray with a very fine stream of water twice a day. Allow the planted seeds to receive the sunlight until the sprouts appear. During all of this time the beds should be protected from rains but sprayed regularly twice a day. The soil should be kept in good condition by hand cultivation after the young plants come up. This care must be constantly given to the plants. The plants are taken up at the time they are about one year old and only the best ones are saved for transplanting. Many planters do this each year for six years after the plant comes up. Others transplant and select for only the first two or three years. The plants are planted out about 6 inches apart and in rows about 1 foot apart. Care must be taken to give the two regular waterings each day during the growing seasons. (Gist Gee.) For distribution later.

Passiflora spp. (Passifloraceae.) 36361-363. Seeds of passionfruit from Peru and Bolivia. Collected by Mr. W. F. Wight, of this Bureau. Two species from Lima and Arequipa, Peru, and Oruro, Bolivia, common in the markets. "The problem of producing crosses between these fine flavored species and our Southern 'May Pop' is one which ought to attract plant breeders in this country." (Fairchild.) For distribution later.

Solanum aculeatissimum. (Solanaceae.) 36271. Seeds from Caravellas, Brazil. Presented by Mr. Fred Birch. "Seeds of the sweet hollow tomato, 18 inches to 2 feet high, forming a branched bush which is exceedingly spiny. The leaf is about the size of a medium maple leaf but shaped like those of the ordinary tomato; the skin of the fruit is tough, and scarlet in color; the flesh about three-sixteenths to one-fourth of an inch in thickness, white, granular soft and sweet; the seeds grow in a loose dry cluster in the center. Plants grown in the richest soil are much less spiny than those growing on the dry hillside." (Birch.) For distribution later.

Triticum aestivum. (Poaceae.) 36498-527. W eats from Tashkent, Turkestan. Presented by Dr. Richard Schroeder, Tashkent Agricultural Experiment Station. Thirty varieties of spring and winter wheats concerning which Dr.

Schroeder writes: "Our Turkestan spring wheats are often sown in the late fall or in the winter and do fairly well, though our winter is rather hard. They are sown on non-irrigated land and stand drought exceedingly well, better than Durum. The most of our precipitation we get in the spring, maximum in March, the summer and fall being exceedingly dry, some years without a drop of rain. So I think that our spring wheats will not suit your southern states, nor even your central states, Kansas for instance, for they must suffer from rust in rainy summers. But in California and Utah, where they do not have summer rains, these wheats will probably be found of high value." For distribution later.

NOTES FROM CORRESPONDENTS ABROAD.

Mr. Dorsett writes from on board S. S. "Vandyck", Monday night, October 20, 1913: We are within a few hours' ride of Rio. Yesterday was rainy and a high wind. To-day has been even higher and our good ship has rolled quite a good deal. I have enjoyed it very much. We arrived in the bay of Bahia about 6 A. M. Saturday. It was not long, about 8 A. M., when the Port Doctor came aboard. A little later officials from the city came aboard to meet Colonel Roosevelt. We were advised that the ship would sail at 1:00 P. M. As our time on land was limited, we did not complicate matters by trying to get in touch with Colonel Roosevelt's party, but secured a row-boat and went ashore at once. On landing we purchased stamps and mailed our letters; then called at the office of the American Consul. He was not in. I presume had business helping to receive the Colonel. We tried to hire an auto but all were engaged, so we secured information from one of the Consul's Portuguese assistants in regard to how to get out to a *Bahia Navel Orange Orchard* at Cobulla. We took a street car for that place. It proved to be about $1\frac{1}{2}$ or 2 miles out. On getting off the car we noticed to our right the way the car was running a hill several hundred feet high, upon which was an orange orchard. Prof. Hays was with us. We made a bee-line for the orchard. It proved to be a good sized *Bahia Navel Orchard*, and, as you can well imagine, Mr. Shamel was soon examining the fruit. The trees were not heavily laden with fruit, but Mr. Shamel thinks there is plenty to enable us to make the observations we want to make. We found blossoms, fruit just setting, fruit the size of pigeon eggs and fruit just beginning to change color. Mr. Shamel thinks the bulk of the crop is on in May or June. We spent about two hours looking through this orchard. We

observed what we feel quite sure is mottle leaf, gummosis, wither tip and brown rot. We also noticed several scales. After looking the field over, we thought the best thing to do would be to proceed to Rio and meet the officials there, see Dr. Willis, and spend two or three weeks in the *Library* and *Botanical Garden*; then return to Bahia and systematically study the *Bahia Navel Orange* proposition.

Brazil. Rio Janeiro. Mr. A. D. Shamel writes from on board R. M. S. P. "Alcala", November 6, 1913: We have left Rio after a strenuous three weeks and are on our way to Bahia. We had a most interesting and I believe profitable stay at Rio: It is a most wonderful city. It was a great surprise to me, a pleasant one. The combination of bay, mountains, tropical vegetation and picturesque buildings is irresistible and most fascinating.

Through an acquaintance we made on the "Van Dyck" we were given unusual opportunities for studying citrus and other tropical fruits in the vicinity of Rio. He is A. G. Foutes, a native of Brazil. He owns a fine country place and farm about 12 miles from Rio. He introduced us to a neighbor, a multi-millionaire farmer, who has an unrivaled collection of farm plants and animals. On these farms we got next to the real thing. We were given "Carte blanche" to everything on both farms, including fine dinners. We took full advantage of those conditions. In this district and in Nictheroy (across the bay) we got considerable amount of what I hope will prove valuable material, budwood, illustrations, methods, etc.

One of the most striking methods that we have found is the practise of orange growers renewing their orchards. They cut back old trees to within about a foot of the ground, allow them from one to three sprouts to grow, from which a new top is developed. A few trees in each orchard are treated in this way each year, renewing the grove as a whole gradually.

No means of combating the numerous insect pests and fungus diseases are practised. In spite of the conditions the trees are fairly productive, bearing from 200 to 500 fruits each. Considering the planting, 12 ft. by 12 ft., this means a heavy production per acre.

Oranges sell for 10 cts. apiece in Rio. Not enough are produced to supply the local demand even at this or higher prices.

No fertilizer and usually no cultivation is used. Little pruning except to cut off the lower branches so that people can walk under the trees easily. All labor is hand labor. The fruits are pulled from the trees and handled just like we handle potatoes. The loss from decay

in market is very heavy naturally. I have tried to point out these matters more fully in our notes to you under separate cover.

Through our consul, Mr. Lay, I got in touch with the leading nursery firms of Brazil. We can secure such further material, budwood, trees or plants or seeds from them by correspondence. In their citrus nursery we found a citrus tree having marvelous leaf variability. We secured budwood, etc., and I know that it will be of great value in further breeding work. The leaf mutations are as marked as our fruit mutations in California.

We have found about all the California citrus types here and many others besides. I really feel that we have been well repaid for our trip already. It has been of inestimable value to me. For one thing I have been forced to work out a satisfactory fruit and tree scoring system that will give definite and concrete data. It works like a charm.

We have found the female nematode *Tylenchus semipene-trans* but have not gotten the male yet. We have had but little daylight to devote to it so far. We found the galls and living nematodes in the galls of tomato plants. At Bahia we will have time to go into this matter carefully. If we could discover any signs of stock resistance to the nematod here, it would be a great thing. It is too much to hope for.

We are going directly back to Bahia because the trees and fruits of the navel orange should be studied now. Otherwise we should have to wait until next summer to get adequate ripe fruits for study. So we decided to return directly to Bahia and get our data. From what we saw on our way down, I believe we will hardly be able to complete our studies at Bahia before I shall have to return. There is much more material there than we anticipated or were given any reason to expect.



Oryza sp. Senegal Perennial Rice, S.P.I. No. 34092.

Two plants of this interesting newly discovered rhizome-forming West African red rice were received June 3, 1912. From these two, fourteen plants were secured by division, two of which were sent to Crowley, La., the remainder being grown in the Department greenhouses. The Crowley plants have grown well, one of them, shown in the halftone above, having spread to a diameter of about nine feet. The greenhouse material has grown to a height of over ten feet, has flowered and is still flowering, but has not set seed. Being a red rice, this perennial rice in its present form may never have any commercial value as a cereal in the United States. It is possible, however that this plant, may prove of great value in hybridization experiments, and it is hoped that the rhizome-forming habit may be transmitted to some of the hybrids. Photo by Office of Cereal Investigations, August, 1913. See also S.P.I. No. 36533.