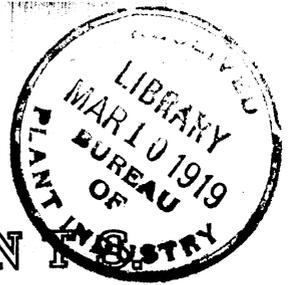


76915



PLANT IMMIGRANT

No. 143.

MARCH, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acacia	1291	Myrciaria	1294
Cephaelis	1291	Oryza	1295
Chenopodium	1291, 1292	Pterocarpus	1296
Coix	1292	Rosa	1296
Colocasia	1292	Solanum	1296
Dodonaea	1293	Stryphnodendron	1296
Elaeis	1293	Tutcheria	1297
Holcus	1293	Vitis	1297
Kennedyia	1293, 1294		

Plates:

- Pl. 235. A hardy relative of the Cherimola, *Rollinia emarginata*.
- 236. The effect of a freeze on Papaya fruits.

Foreign Seed and Plant Introduction.

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

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

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

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

David Fairchild,

Agricultural Explorer in Charge.

January 18, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Acacia spheroccephala (Mimosaceae), 45792. **Bull-horn Acacia.** From Zacuapam, Mexico. Presented by Dr. C. A. Purpus. One of a group of acacias remarkable for their large, stipular, inflated spines which closely resemble the horns of a buffalo. This particular species is a shrub or small tree. The leaves are bipinnate, and have remarkable glands, rich in oil, on the rachis and leaflets. The thorns are utilized by certain stinging ants of the genus *Pseudomyrma* as nesting places for their young. The thorns which are connate at the base, are hollowed out by the insects, which perforate one of the spines near the tip, so that no water can enter. Belt suggests that in return for quarters and subsistence on the minute wax-like bodies on the leaflets, the little ants serve their host as a body-guard of soldiers. Jacquin in describing a bullhorn acacia growing near Cartagena, (Colombia) in 1763, tells how the little insects rush from the thorns when the tree is struck however lightly, falling upon the unwary intruder and inflicting upon him myriads of burning stings. The flowers are borne in globose heads on long thick peduncles, clustered in the axils of the long forklike spines. The seeds when ripe are surrounded by a sweetish yellow or orange-colored pulp which causes the fallen pods to be eagerly sought after by pigs and other animals. (Adapted from Safford in Bailey's Standard Cyclopaedia of Horticulture, p. 598.)

Cephaelis sp. (Rubiaceae), 45730. **Raicilla or Ipecacuana.** From Panama, R. P. Presented by Mr. Ramon Arias-Feraud. "A small shrub belonging to the Rubiaceae, 8 to 16 inches high with ascending or erect simple stem and somewhat creeping root. It is one of the sources of the medicinal **Ipecacuana**. The typical plant grows in Peru, but specimens of closely allied or identical species from Central America are in the economic collection of the United States Department of Agriculture." (W. E. Safford.)

Chenopodium sp. (Chenopodiaceae), 45722. From Mexico. Presented by Mrs. Zelia Nuttall, Casa Alvarado, Coyoacan, Mexico City. "Native name, **Tilihuauhtli**, 'Black huauhtli'. A plant used by the Mexicans as a potherb, possibly the original form from which the pale-seeded **xochihuauhtli** has been developed by cultivation. Like the latter, the immature inflorescence (**huauhtzontli**, or huauhtli-heads) is used for food. The seeds of this

variety, discoid in form with the periphery crenated, resemble very closely those of *Chenopodium album* and *Chenopodium paganum*. The plant should not be confused with the common forms of *Amaranthus* which are used when young by the Mexicans as potherbs, and which have jet black, very highly polished seeds." (W. E. Safford.)

Chenopodium quiliti (Chenopodiaceae), 45721. From Mexico. Presented by Mrs. Zelia Nuttall, Casa Alvarado, Coyoacan, Mexico City. "Native name, **Xochuauhtli**, 'Flowering huauhtli'. A plant cultivated near the city of Mexico for the sake of its prolific branching inflorescences, which are gathered before they are quite mature and while the seeds are still soft. They are cooked with other ingredients as a vegetable. This variety, with yellowish or pale brown discoid seeds, is the most popular. The inflorescences are known by the Aztec name **huauhtzontli**, signifying 'huauhtli heads'. Botanically the plant is closely allied to *Chenopodium paganum*, and *Chenopodium album*. It is quite distinct from *Chenopodium quinoa*, the celebrated food-staple of the Peruvian highlands; and it must not be confused with the plant called **michihuauhtli**, 'fish-egg huauhtli', which is a white-seeded *Amaranthus*, not a *Chenopodium*." (W. E. Safford.)

Coix lacryma-jobi ma yuen (Poaceae), 45767. **Job's tears**. From Soochow, China. Presented by Prof. N. Gist Gee, Soochow University. This variety might be called the cultivated edible **Job's tears**, and includes many forms, all of which are characterized by having a thin, loose, easily broken shell. They are often longitudinally striated, and in many examples are constricted at the base into what is called an annulus. In the central provinces of India, among the aboriginal tribes, this grain forms an important article of food. In Japan, where the plant has been introduced, the seeds are pounded in a mortar and eaten as meal. (Adapted from the Agricultural Ledger, No. 13, p. 217-225, 1904.)

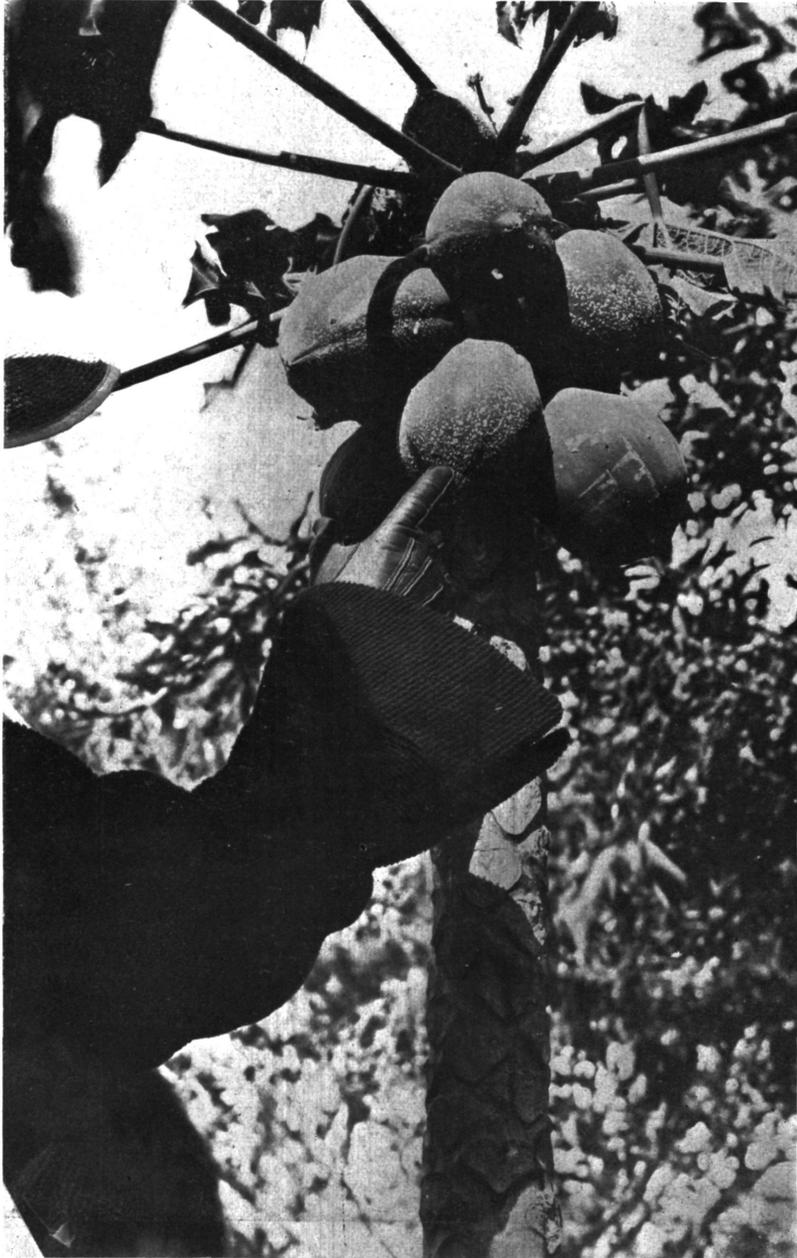
Colocasia esculenta (Araceae), 45779. **Taro**. From Sienkii, Chekiang, China. Presented by Mrs. M. M. Loosley. "**Ts'ing yii**, or blue yii, is a little bluish on the point and stalks, and has a large leaf. This variety also cooks mealy, but is said to be better to eat after a few months keeping. It keeps well." (Loosely.)



A HARDY RELATIVE OF THE CHERIMOLA.

(*Rollinia emarginata*, S. P. I. Nos. 25528, 27610, and 28135.)

The class of plants to which the sugar-apple and cherimola belong is notably tender, and one of the great hindrances to its extensive cultivation in California and Florida lies in its susceptibility to frost. The young tree, the photograph of which is here shown, is standing in the test orchard at Buena Vista, Fla., and although all the species and varieties of *Annona* and *Rollinia* standing near it were killed back by the freeze ($+26^{\circ}$ F.), this specimen remained untouched and is producing new young leaves. According to T. R. Gwynn, of Paraguay, it is a small bush there, but grows on almost any kind of soil and produces large fruit of "the best class of all." (Photographed by David Fairchild, February 23, 1917, at Buena Vista, Fla.; P20454FS.)



THE EFFECT OF A FREEZE ON PAPAYA FRUITS.

The Florida freeze of February 3, 1917, occurred early in the morning, the temperature dropping to $+26.5^{\circ}$ F. just before sunrise. Almost immediately the green papaya fruits became studded with drops of coagulated papain which issued by the thousand from breaks in the thin skin. The photograph here reproduced was taken at about 10 o'clock on the morning of the freeze. Few plants would appear to be more ideal for use than this papaya (*Carica papaya*) in the studies which are urgently needed into the physiology of death by freezing. (Photographed by David Fairchild at Miami, Fla., February 3, 1917; P20390FS.)

Dodonaea viscosa (Sapindaceae), 45726. From Giza, Cairo, Egypt. Presented by Mr. F. G. Walsingham, Horticultural Section, Ministry of Agriculture. "A very interesting hedge plant, beautifully dense and green, responds to the shears perfectly, and when taken in hand early makes a perfectly compact wall clear to the ground. The seedling plants form a rather deep taproot, and must be transplanted with some care on that account. This is one of the most perfect tropical hedge plants I have ever seen. The shrub is called **tattas** by the natives." (Prof. S. C. Mason.)

Elaeis guineensis (Phoenicaceae), 45766. Oil palm. From Buitenzorg, Java. Presented by Mr. P. J. S. Cramer, Chief, Plant Breeding Station. This palm is very important economically. The fruit is used by the natives for food; an intoxicating drink is made from the juice of the stem; the leaf stalks and leaves are used for thatching the native houses; and the fruit kernels yield the well-known palm-oil, or kernel oil, of commerce. It is a native of west tropical Africa and occurs over immense areas both wild and in cultivation. (Adapted from MacMillan, Handbook of Tropical Gardening and Planting. p. 538.)

Holeus sorghum sudanensis (Poaceae), 45773. Sudan grass. From Cairo, Egypt. Presented by Mr. W. Carl McQuiston. Introduced about ten years ago, this grass has become very popular as a forage crop. It is easily cured, as easily handled as hay, and very drought resistant. It is much superior to ordinary sorghum in the above qualities; in yield, drought resistance, and palatability it appears distinctly to outclass Johnson grass. It does best in the south, but has been grown in some of the northern states. Probably best adapted to the drier portions of Texas, Oklahoma and Kansas. Sudan grass seems well adapted for growing with cowpeas for hay and silage. (Adapted from R. A. Oakley, Yearbook of the Department of Agriculture for 1912. p. 495.)

Kennedyia monophylla (Fagaceae), 45790. From Summer Hill, New South Wales, Australia. Presented by Mr. Hugh Dixon. Grows well in my garden which is rather stiff soil. Should stand 10 degrees F. if not continuous. *Kennedyia monophylla* is a mass of royal blue when in flower. It is better to cut it half back after flowering or after the seed is ripe. It does

well in a sunny hedge, untrimmed in winter." (Dixson.) A climbing plant with solitary, ovate or lanceolate, coriaceous, strongly reticulate leaflets, which are two to four inches in length. The numerous flowers occur in pairs or rarely three together on pedicels rather longer than the calyx. Native of Queensland, New South Wales, Victoria, Tasmania, and South Australia. (Adapted from Bentham, *Flora Australiensis*, vol. 2, p. 246.)

Kennedyia nigricans (Fabaceae), 45791. From Summer Hill, New South Wales, Australia. Presented by Mr. Hugh Dixson. "*Kennedyia nigricans* grows well in my garden which has a rather stiff soil. Will stand 10 degrees F. if not continuous." (Dixson.) A large twining plant usually somewhat pubescent. The broadly ovate leaflets are two to three inches long, and very often only one to each leaf. The deep violet-purple flowers are about 1 inch in length, and are borne in racemes which are shorter than the leaves. The flattened pod is glabrous or slightly pubescent. Habitat, Western Australia. (Adapted from Bentham, *Flora Australiensis*, vol. 2, p. 249.)

Myrciaria cauliflora (Myrtaceae), 45750. **Jaboticaba**. From Lavras, Minas Geraes, Brazil. Presented by Mr. B. H. Hunnicutt, Director da Escola Agricola de Lavras. "One of the best indigenous fruits of Brazil, and at the same time one of the most curious and interesting, due to its habit of producing its fruits directly upon the trunk and larger branches. Several species are grown under the name of **jaboticaba** and they are still somewhat confused botanically, but it appears that most of the plants common in cultivation belong either to *M. cauliflora* or *M. jaboticaba*, fruits of the latter being distinguishable from those of the former by the presence of a slender stem. The **jaboticaba** occurs in in southern Brazil both wild and cultivated. It is a very handsome tree, reaching a height of 35 or 40 feet, with a dense dome-shaped crown. The leaves are small, lanceolate, light green in color; flowers white, with four petals and a conspicuous tuft of stamens. The fruits are produced in the greatest abundance, and are the size of large grapes, with a tough, leathery skin, white, juicy pulp of rather acid, aromatic flavor, and 2 to 4 flattened oval seeds. The resemblance between the **jaboticaba** and some of the grapes of the Muscadine group, e.g. **James**, is very striking, not

only in the general appearance of the fruit, but also in flavor. The *jaboticaba* prefers a soil that is rich and deep, and is rather slow of growth, coming into bearing after 6 or 8 years. It withstands slight frosts, and gives promise of being successful in South Florida, and perhaps also in sheltered locations throughout Southern California. At the present time seed propagation is the only means of multiplication which is commonly employed, but inarching or some other means of propagation should be utilized to perpetuate good varieties." (Wilson Popenoe.) "The *jaboticaba* in South Florida was not killed by a temperature of + 26° F. and appears to be semihardy. at least." (Fairchild.)

Oryza barthii (Poaceae), 45717. From Algiers, Algeria. Presented by Dr. L. Trabut. An interesting African species, used both for human food and for forage. In habit it differs markedly from the cultivated rices, throwing out rootstocks to a length of several decimeters, with scattering stems rising from them. The foliage remains green for 2 or 3 months, and converts many swampy lands into excellent pastures. The stems rise to a height of 1 to 1.5 meters, even more in deep water. The panicle is short; and the ripe grain, which is small, falls out of the husk very easily. For this reason it is impossible to cut the heads for thrashing without losing most of the grain. To obviate this difficulty, the aborigines, in those regions where the plant is common, paddle among the ripe grain in their canoes, shaking the panicles over a small calabash or basket held in one hand. Most of the grain falls into the basket and is saved. If it is late in the season, the ripe grain will float on the surface of the water, and that which falls outside of the basket may be recovered. This species is not cultivated; and in fact, the grain has very limited use, due to the difficulty of harvesting it. It is sold at a very high price, however, and is considered a product of unusually choice quality. The grain is not so important, from an economic standpoint, as the forage which the plant furnishes. It is considered one of the very best forages of West Africa. (Adapted from Chevalier in Bulletin du Museum National D'Histoire Naturelle, No. 7, pp. 406-407, 1910.)

Pterocarpus indicus (Fabaceae), 45719. **Padouk.** From Hongkong, China. Presented by Mr. W. J. Tutcher, Botanical and Forestry Department. A tall tree with ascending glabrous branches; leaves compound, 6 to 9 inches long, leaflets 2 to 4 inches long; flowers yellowish, in large terminal or axillary panicles; pod orbicular, 2 inches broad. Distributed throughout the Malay Archipelago, Philippines, and China. (Adapted from Hooker, Flora of British India, vol 2, p. 239. Macmillan, in Handbook of Tropical Gardening and Planting, lists this tree as a shade tree suitable for low moist regions (annual rainfall 70 inches or more). He also lists it as a valuable timber tree.

Rosa helenae (Rosaceae), 45729. **Rose.** From Jamaica Plain, Mass. Presented by the Arnold Arboretum. "*Rosa helenae* is very abundant in rocky places from river-level to 1,500 m., everywhere in western Hupeh and eastern Szechwan, but has not yet been reported from farther west. It forms, in wayside thickets and by the banks of streams, tangled masses often 6 m. tall and as much through, and in the margins of woods it rambles over small trees. When covered with masses of its white fragrant flowers this rose is very beautiful. It has proved quite hardy and has flowered profusely at the Arnold Arboretum." (Plantae Wilsonianae, vol. 2, part 2, p. 311.)

Solanum bullatum (Solanaceae), 45751. From Lavras, Minas Geraes, Brazil. Presented by Mr. B. H. Hunnicutt, Director da Escola Agricola de Lavras. **Capoeira branca.** An interesting plant which grows on the rolling prairies of the state of Minas Geraes, Brazil, and which is said to have unusual value as a feed for live stock, especially horses. Analyses made by the Bureau of Chemistry, United States Department of Agriculture show that this plant contains an unusual quantity of protein. The analyses follow.

	Leaves	Branches
Moisture.....	8.36 per cent	7.04 per cent
Ether extract.....	2.29 " "	0.59 " "
Protein.....	20.88 " "	14.06 " "
Crude fiber.....	28.03 " "	37.45 " "

Stryphnodendron barbatimam (Mimosaceae), 45752. From Lavras, Minas Geraes, Brazil. Presented by Mr. B. H. Hunnicutt, Director da Escola Agricola de Lavras. A

small leguminous tree which occurs commonly on the plains of the state of Minas Geraes, and is said by Pio Correa to be distributed from Para, in northern Brazil, to Sao Paulo in the southern part of the country. The bark contains a high percentage of tannin, and is known as *casca da virgindade*; the seeds are said to be poisonous, and the leaves to have medicinal qualities. It is the bark, however, that seems to have economic interest, being considered of value for use in tanning. According to Brazilian authorities it contains as high as 40 per cent of tannin; an analysis made by the Bureau of Chemistry, United States Department of Agriculture, gave the following results:

Total dissolved solids.....	31.6	per cent
Soluble solids in cold water.....	28.6	" "
Non-tannins.....	6.7	" "
Tannins.....	20.1	" "

Tutcheria spectabilis (Theaceae), 45720. From Hongkong, China. Presented by Mr. W. J. Tutcher, Botanical and Forestry Department. A handsome, ornamental, small tree or shrub, indigenous to the island of Hongkong. The leaves are alternate, short-petioled, coriaceous and shining. The flowers are about $2\frac{1}{2}$ inches in diameter usually having 7 white, roundish-obovate petals. Fruit is a woody capsule, the size of a small apple, retaining at the base the persistent sepals, and containing several large seeds. The plant flowers in May and fruits in November. (Adapted from Champion, Transactions of the Linnean Society vol. 21, p. 111, 1850.)

Vitis tiliaefolia (Vitaceae), 45797. **Grape.** From Zacuapam, Mexico. Presented by Dr. C. A. Purpus. "A small-fruited wild grape excellent for jelly. This is essentially a tropical grape." (Purpus.) A grape which is widely distributed in the American tropics. It varies greatly and often runs into white-leaved forms. The cluster of fruit is long and long-peduncled, large and compound; the purple berries are small and globose. This species is considered promising as a pomological grape for the tropics. (Adapted from Bailey, Standard Cyclopaedia of Horticulture, vol. 6, p. 3489.)

THE PROBLEM OF STOCKS FOR AMERICAN FRUIT GROWERS.

By B. T. Galloway.

For a good many years the Office of Foreign Seed and Plant Introduction of the Department of Agriculture has been engaged in bringing in plant material that gave promise of value for stocks. Special attention has been given to fruit stocks, particularly stocks for the apple, pear, peach, apricot and plum. Since 1898 something over 400 types of pears have been introduced and disseminated. Many types of peach and plum have also been introduced and have been placed in the hands of specialists and others for work in connection with securing disease and insect resistance, soil and climatic adaptability, and congeniality.

Recently the Federal Horticultural Board announced a proposed quarantine on nursery stock and other plants and seeds imported into the United States. On and after June 1, 1919, all plants and plant materials will be excluded except two groups one of which will be admitted without restrictions and regulations and the other with restrictions and regulations. Fruits, vegetables, cereals, and other plant products imported for medicinal, food, or manufacturing purposes; and field, flower, and vegetable seed will have unrestricted entry, - unless on account of some dangerous disease or insect, when there may be issued either a temporary or permanent quarantine. It is conceivable, for example, that there might be a disease affecting the lemon in a foreign country which would make it necessary to quarantine against that country. The Federal Horticultural Board has issued a number of these special quarantines and will no doubt continue to issue them in cases of emergency.

PLANTS ADMITTED UNDER RESTRICTIONS.

The plants and plant materials that will be allowed to come in under restrictions and regulations are lily bulbs, lily of the valley, narcissus, hyacinths, tulips, and crocus. In case any of these materials are packed in sand or soil, the sand or soil must previously be sterilized by heat in a manner satisfactory to the Board. Seedling fruit stocks, cuttings, scions, and buds of fruits for propagating will also be admitted under regulations, together

with rose stocks for propagation. All nuts, including palm seeds, will be admitted, as well as seeds of fruit, forest, ornamental, and shade trees, together with seeds of deciduous and evergreen ornamental shrubs, and seeds of hardy perennial plants.

PLANTS EXCLUDED.

The groups that will be automatically excluded, include such things as budded and grafted fruit trees; grape vines; bush fruits; forest and ornamental deciduous trees; ornamental deciduous shrubs; coniferous trees, including pines; evergreen trees and shrubs, including the broad leaf types; and a considerable list of what is commonly known as field-grown florist's stock.

ADMISSION OF NEW AND RARE PLANTS AND NOVELTIES.

The Board makes provision for the importation, through the Office of Foreign Seed and Plant Introduction in the Department of Agriculture, of new plants, seeds, bulbs, etc., for experimental and scientific purposes and for propagation in this country. The Board also makes provision for the importation in limited numbers of novelties from all parts of the world under safeguards that will assure their freedom from dangerous diseases and insects.

The machinery for this work is already organized in the Office of Foreign Seed and Plant Introduction; and, while it will not be practicable to undertake large commercial importations for private firms, it will be within the province of the Office to handle the necessary limited shipments of novelties that may be brought in for propagation here. While lily bulbs, narcissus, hyacinths, and related bulbs, fruit stocks, and rose stocks will be admitted under regulations, it will doubtless be the policy of the Federal Horticultural Board to exclude these plant materials when it would seem assured that the commercial needs of the country can be met by home grown supplies.

THE PROBLEM OF STOCKS.

The Office of Foreign Seed and Plant Introduction is primarily interested in the broader constructive problems of stock production in this country, and in the securing of types of stocks for the principal

fruit crops and for some of our more important ornamentals like the rose. It recognizes that the whole question of stocks is a broad and complex one and that much work will need to be done to secure light on the many questions involved. We are beginning to appreciate more and more that our future successful fruit culture is intimately associated with the problem of stocks. With the exception of the grape, no far-reaching studies have been made on stocks in this or any other country. We have followed certain empirical practices in the past, but as competition becomes greater and the demand for the highest grades of fruits and plant products increases, we must know more of the actual relation of stocks to quality of product, to the length of life of the tree or plant, to adaptability to soil and climate, to resistance to disease and insect attacks.

The question of stocks would seem to resolve itself into two main groups of problems: (1) The practicability of producing in this country the millions of ordinary apple, pear, plum, and cherry stocks which hitherto have been largely secured abroad. (2) The systematic study of stocks with a view to their improvement and their better adaptability to the wide variety of conditions and needs that exist here and are likely to develop in the future as our great fruit industries become more complex. It is imperative that if our fruit industries are to be maintained, there must be full supplies of the usual or ordinary stocks. The securing of special stocks is a long time process and will have to proceed slowly and carefully, building up cautiously on the foundations we already have and must maintain.

Pear growing is not one of our paramount fruit industries, yet it is safe to say with no other fruit is there a greater proportion of trees lost each year which must be replaced if normal production is to be maintained. Fire blight is the chief cause of the loss of pear trees in this country, and while it is highly desirable to find stocks, or to develop stocks, that may in a measure prevent some of the losses to pear growers from fire blight, the pressing need is to maintain the supplies of French and Japanese seedlings required to keep the number of trees up to normal. If stocks are to be produced in this country to take the place of those hitherto secured abroad, it would seem proper that efforts should be made by the Government to aid those who are anxious to know where

the work can best be done and how it may be done to the best advantage. The problems involved are so complex that private interests can not well handle them.

Briefly then, the chief problems connected with the production of commercial stocks of apple, pear, plum, cherry, and rose are to find regions and soils in this country where such stocks may be commercially grown and to demonstrate on a commercial scale that such stocks are equal to - or better than - those grown abroad. We use the word "commercial" here in the sense that the procedure throughout should be such that the results secured may be satisfactorily applied by the trade. Such work as is proposed will need the help and cooperation of the trade. Nurserymen have not been idle in the past in this field. As recently pointed out by Mr. Wm. Pitkin and others, nurserymen have tried for years to develop the business of producing fruit tree seedlings but, with the exception of the apple, no material progress has been made. It has been further pointed out that many nurserymen prefer to import French apple seedlings and pay more for them, believing that thereby they would secure better blocks of better trees.

Correlated with the problem of commercial stock production, is that of securing seeds for stocks. There are no contemplated restrictions, so far as we are aware, on the importation of fruit seeds. The restrictions brought about by war conditions, and the general situation with respect to seed for stocks, show the need for developing our own home supplies. This is a long time proposition, as there are few recognized sources of supply here, such as exist in Europe.

DEFINITIONS OF THE PLANTS AND PLANT MATERIALS ADMITTED UNDER RESTRICTIONS.

1. **Lily bulbs.** - Herbaceous perennials with scaly bulbs, belonging to the genus *Lilium*, and consisting of numerous species and varieties.

2. **Lily of the valley.** - Horizontal rootstocks, "pips", and clumps (without soil), of *Convallaria majalis*.

3. **Narcissus.** - Hardy bulbs of three species, *Narcissus Pseudo-narcissus* (the common daffodil), *N. bulbocodium* (hoop-petticoat daffodil), and *N. tazetta* (polyanthus narcissus), represented by numerous varieties.

4. **Hyacinth.** - Hardy spring-flowering liliaceous bulbs of many varieties derived chiefly from five species - namely, *Hyacinthus orientalis*, *H. amethystinus*, *H. azureus*, *H. lineatus*, and *H. fastigiatus*. Used for outside planting and forcing under glass.

5. **Tulip.** - Hardy and forcing bulbs of the genus *Tulipa*, family Liliaceae, imported chiefly from Holland.

6. **Crocus.** - Spring-flowering and autumn-flowering plants, all members of the genus *Crocus*, with solid bulbs or corms, represented by numerous species and varieties.

7. **Fruit stocks** (free stocks). - Seedlings or plants or parts of plants upon which a scion or bud may eventually be set. Carries neither grafts nor buds.

8. **Cuttings.** - Severed portions of plants used for propagating purposes by rooting in sand, soil, or other medium.

9. **Scions.** - Severed portions of plants which may be mechanically inserted on other plants (free stocks) for propagating purposes.

10. **Buds.** - Severed leaf buds with bark and wood attached, used for propagating purposes.

11. **Rose stocks.** - Seedlings or rooted plants of the genus *Rosa*, upon which cultivated varieties of the rose may be grafted or budded.

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

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
D. A. Bisset, Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. Harry Johnson, R. N. Jones and P. G. Russell, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
H. N. Veen, Assistant in Plant Introduction.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Tucson, Ariz.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.