

EXPLANATORY NOTE

PLANT IMMIGRANTS is designed principally to call the attention of plant breeders and experimenters to the arrival of interesting plant material. It should not be viewed as an announcement of plants available for distribution, since most introductions have to be propagated before they can be sent to experimenters. This requires from one to three years, depending upon the nature of the plant and the quantity of live material received. As rapidly as stocks are available, the plants described in this circular will be included in the Annual List of Plant Introductions, which is sent to experimenters in late autumn. Introductions made for a special purpose (as for example to supply Department and other specialists with material needed in their experiments) are not propagated by this Office and will not appear in the Annual List.

Descriptions appearing here are revised and later published in the Inventory of Seeds and Plants Imported, -the permanent record of plant introductions made by this Office.

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Office of Foreign Seed and Plant Introduction.*

Issued April 4, 1924, Washington, D. C.

ACACIA SCORPIOIDES (Mimosaceae), 58379. From Giza, Egypt. Seeds presented by the Director, Horticultural Section, Ministry of Agriculture. A large proportion of the gum arabic of commerce is furnished by this tree, which is native to the tropical regions of northern Africa and southwestern Asia. True gum arabic, however, is said to come only from another species, *Acacia senegal*. The pods and bark of *A. scorpioides* are used for tanning, and the leaves and young pods are sometimes fed to cattle. The wood is hard and durable, and is used in India for making tools. (Adapted from Holland, Useful Plants of Nigeria, pt. II, p. 288.)

AGATI TOMENTOSA (Fabaceae), 58377. From Honolulu, Hawaii. Seeds presented by C. S. Judd, Superintendent of Forestry, Board of Commissioners of Agriculture and Forestry. "This plant is now almost extinct in this part of the Hawaiian Islands because the foliage is such an attractive forage for cattle and goats. The brilliant-red flowers make the plants very ornamental. From the twigs the frigate birds make their nests." (Judd.)

CORNUS BRETSCHNEIDERI (Cornaceae), 58144. **Dogwood**. From Kew, England. Seeds presented by Dr. A. W. Hill, director, Royal Botanic Gardens. "A hardy shrub, up to 12 feet in height, with green or purplish branches, oval, hairy leaves, and dense clusters of bluish black berries. Native to northern China." (Alfred Rehder.)

COTONEASTER HARROVIANA (Malaceae), 58134. From Glasnevin, Dublin, Ireland. Seeds presented by the Director, Royal Botanic Gardens. An evergreen shrub with a loose, spreading habit, about 6 feet in height, with shining, dark-green, bristle-tipped leaves, dense corymbs of white flowers, and red fruits. Native to Yunnan, China, and therefore suitable only for the mild-wintered regions of the United States.

COTONEASTER spp. (Malaceae), 58147, 58149, 58150. From Kew, England. Seeds presented by Dr. A. W. Hill, director, Royal Botanic Gardens.

58147. **COTONEASTER HEBEPHYLLA**. A very ornamental deciduous shrub 10 to 18 feet in height. It has long, rambling branches, white flowers and dark-carmine fruits. It is native to the high altitudes of Yunnan, China, where the temperature goes only slightly below freezing.

58149. **COTONEASTER LINDLEYI**. A large shrub or small tree, with semideciduous dark-green leaves, corymbs of white flowers, and bluish black fruits. Native to the mild-wintered regions of the northwestern Himalayas.

58150. **COTONEASTER MELANOCARPA LAXIFLORA**. A spreading shrub which becomes about 12 feet high, with oval, dark-green leaves, grayish white

beneath, gracefully pendulous clusters of pinkish white flowers, and black, globose fruits. This hardy Siberian species is one of the most attractive of the black-fruited cotoneasters. (Adapted from Bean, *Trees and Shrubs Hardy in the British Isles*, vol. 1, p. 412.)

EREMOCHLOA OPHIUROIDES (Poaceae), 58389. **Grass.** From Canton, China. Seeds presented by Prof. G. Weidman Groff, Canton Christian College. This is the second most common lawn grass in southern China, and is recommended as the best lawn grass for that region. Its usual height is 3 or 4 inches, the blades are smooth and soft, and the seed stalks insignificant. The attractive deep-green color is maintained during the winter in southern China, if the grass gets a good hold during the summer. Propagation is easily affected by means of runners. (Adapted from Bulletin No. 25, Canton Christian College.)

FLACOURTIA EUPHLEBIA (Flacourtiaceae), 58092. From Manila, Philippine Islands. Seeds presented by P. J. Wester, agricultural adviser, Bureau of Agriculture. A large shrub or small tree, 15 to 25 feet high, native to the Philippine Islands, which bears a profusion of roundish, smooth, shining dark-purple fruits about three-fourths of an inch in diameter, with an edible subacid pulp. The coarsely serrate leaves are rich wine red when young and tender. It is likely that this species will endure little or no frost.

HEDYSCEPE CANTERBURYANA (Phoenicaceae), 58369. **Palm.** From Sydney, New South Wales. Seeds presented by J. H. Maiden, director and government botanist, Botanic Gardens. This very handsome palm is known in a wild state only on Lord Howe Island, over four hundred miles east of Australia, where it is called the "umbrella palm." It is a tall, spineless palm with a comparatively short, thick stem, from the end of which arise the dense, graceful leaves, composed of long narrow segments. In habit and foliage it resembles a *Kentia*, and in general its cultural requirements are the same.

HEMEROCALLIS FORRESTI (Liliaceae), 58135. From Glasnevin, Dublin, Ireland. Seeds presented by the Director, Royal Botanic Gardens. A very handsome plant about 2 feet high, with a thick rootstalk, narrow lanceolate leaves and deep golden orange, tubular, flowers 2 to 3 inches long borne in many-flowered spikes. It flowers only in very early spring, and is suited only for pure limestone soil. Native to southwestern China, where the winters are very mild.

HYDRANGEA BRETSCHNEIDERI (Hydrangeaceae), 58152. From Kew, England. Seeds presented by Dr. A. W. Hill, director, Royal Botanic Gardens. A stout bushy shrub 8 to 10 feet high, with dull-green, slender-pointed leaves, and flattened corymbs, 4 or 5 inches wide, of white

flowers which become rosy. This hardy hydrangea was first discovered in the mountains near Peking, China, and thrives best in a sunny position in good soil. (Adapted from Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 624.)

MECONOPSIS CAMBRICA (Papaveraceae), 58373. From Cambridge, England. Seeds presented by H. Gilbert-Carter, director, The University Botanic Garden. The Welsh poppy, native to the British Isles, is a very desirable garden perennial. The typical form, about a foot high, has single, bright-yellow flowers. Very attractive double forms with orange-colored flowers also have been produced. (Adapted from Gardeners' Chronicle, ser. 3, vol. 52, p. 54.)

PENTAGONIA PHYSALODES (Solanaceae), 58130. From Ures, Sonora, Mexico. Seeds presented by Roberto A. Morales, Forest Inspector. "A blue-flowered solanaceous plant with the fruit inclosed in the husk as in *Physalis*. The campanulate flowers, an inch or more in diameter, are light blue with a lighter throat; they are produced singly in the axils of the leaves." (Harry Johnson.)

A stout, spreading plant 3 to 4 feet high, grown as an annual.

ZEA MAYS (Poaceae), 58371. **Corn.** From Bawlf, Alberta, Canada. Seeds presented by A. W. Petrick. "A yellow flint corn, originally grown in northwestern Manitoba by the Mennonites. It is a very early variety, earlier than squaw corn, with a very short growing season." (Petrick.)

Notes on the Behavior of Previous Introductions.

BRASSICA PEKINENSIS (Brassicaceae). **Pai ts'ai.** J. B. Keil, Stark Bros. Nurseries and Orchards Co., Louisiana, Mo., has had the following results with two strains of pai ts'ai:

45188. From Hankow, China, where it is called "Chiang kan pai ts'ai." "Tall-growing plants with long, white, leaf stems and dark-green leaf blades, resembling Swiss chard in appearance. There is no indication of heading, the edible parts evidently being the crisp white stems. These are very juicy and brittle, of a mildly pungent turnip or radish flavor, and should be acceptable when eaten raw like celery."

46400. From China. "Yo pai ts'ai." "A dwarf variety with short, broad, leaf stems, and very dark-green leaves. When cooked the white stems were found equal to cabbage."

PRUNUS PSEUDOCERASUS (Amygdalaceae), 18587. **Tangsi cherry.** From Tangsi, China. "I received this tree in 1921, and last April it bore its first fruits. These were about the size of the variety Eastern

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May, light yellow blushed with red, and had the appearance of being waxed. The tree is about 4½ feet high." (J. H. Arnold, Shafter, Calif., January 1, 1924.)

The Tangsi cherry is the earliest fruiting cherry in the United States, the trees maturing their fruit in California as early as the latter part of March or the first part of April. Although the fruit is small, as compared with the commonly cultivated varieties, it is of excellent quality. The quality, of the fruit, combined with the early-maturing habit of the tree, make this species promising for breeding experiments.

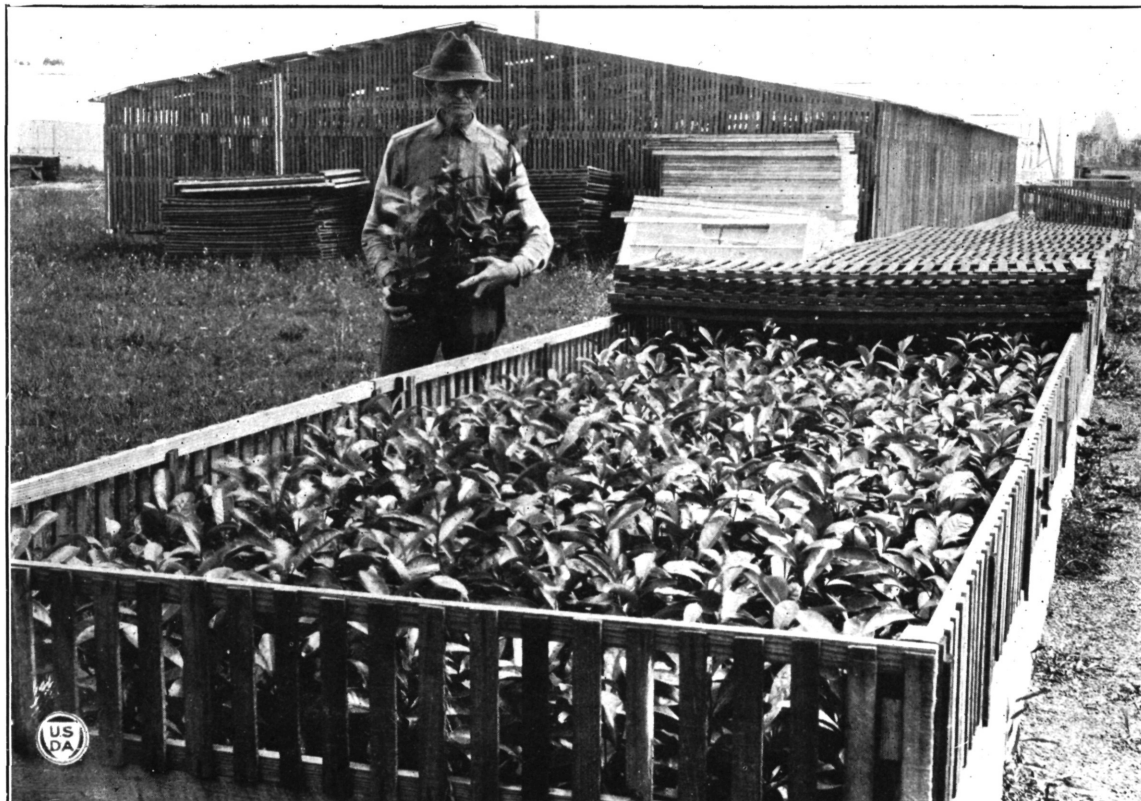
PRUNUS SALICINA (Amygdalaceae), 43176. **Japanese plum.** From Auckland, New Zealand. Variety "Alpha." Last summer this bore remarkably well, and the fruit was very fine, with a real plum flavor. We planted the tree three years ago." (Mrs. William Mulligan, Santa Barbara, Calif., December 29, 1923.)

PYRUS CHINENSIS X COMMUNIS (Malaceae), 28497. **Pear.** Originally from the collection of the late Dr. Walter Van Fleet at Little Silver, N. J. "This hybrid pear, received four years ago, bore for the first time this year. The crop consisted of nine pears, weighing about 10 ounces each, of uniform size and appearance. They resemble somewhat the Kieffer pear, but are shorter, thicker, and have a more uneven surface. In color the skin is a greenish yellow. The flesh is white, and although somewhat coarse in texture, is finer than that of Kieffer. For canning also we found them superior to Kieffer." (F. M. White, Romeo, Mich., January 9, 1924.)

Yerba Mate

(*Ilex paraguariensis* St. Hil.)

Few plants have had so much mystery and romance associated with them as the yerba mate of South America. Originally used by the natives in the making of a ceremonial and invigorating drink, it was early adopted by the Portuguese and Spaniards and very soon became of such prime importance commercially that many attempts were made to monopolize its culture and preparation for market. These efforts led to many conflicts, considerable bloodshed, petty wars and in one case the setting up of a sort of a little kingdom, governed in such fashion that no outsiders were allowed to enter it lest they learn the secrets of the wonderful drink, and carry the knowledge to the outside world. Some adventurous spirits finally dared to enter the forbidden country, and were seized and kept in bondage for many years. A few escaped with their lives but with practically no knowledge of the mysterious plant, its culture and propagation.



YERBA MATE, OR PARAGUAY TEA.

(*Ilex paraguariensis* St. Hil.; S. P. I. No. 55489.)

After numerous attempts to obtain seeds or plants of the true yerba mate, or Paraguay tea, the Office of Foreign Seed and Plant Introduction has at last secured, through D. S. Bullock, American Agricultural Trade Commissioner at Buenos Aires, viable seeds from which several thousand sturdy young plants have been grown. This photograph shows a propagating frame containing three thousand of these plants at the Plant Introduction Garden, Bell, Md. *Ilex paraguariensis* is too tender for cultivation in most parts of the United States, but it will be tested in Cuba, Porto Rico, Hawaii, and other tropical regions. (Photographed by Wilson Popenoe, August 27, 1923; P35033FS.)



KAÁ HÊ-É, THE "SWEET HERB" OF PARAGUAY.

(*Stevia rebaudiana* Bertoni; S. P. I. No. 53918.)

The leaves of this plant contain a glucosid whose sweetening power is 150 to 200 times that of cane sugar. It is claimed in Paraguay that the leaves may be used for sweetening in the natural state, drying and grinding only being required, or they may be soaked in water and the liquor used for sweetening preserves. It has been suggested that kaá hê-é may prove valuable as a sweetening material which can safely be used by persons suffering from diabètes. The plant is propagated readily by means of cuttings and grows rapidly. Eight hundred young plants, ready for distribution to experimenters, are shown above in a propagating frame at the Plant Introduction Garden, Bell, Md. (Photographed by Wilson Popenoe, August 27, 1923; P35032FS.)

Something of this strange fatalism seems to have followed attempts to introduce and disseminate the plant in this country. The imported prepared product, however, is a more or less common article of commerce obtainable in many of our markets, especially in the East.

Time has served to show that plants distributed some years ago by the National Botanic Garden at Washington and by the United States Department of Agriculture, under the name *Ilex paraguariensis* are not of this species. It is doubtful, in fact, if there are any plants of the true yerba mate growing in the United States except those recently introduced by the Office of Foreign Seed and Plant Introduction. One species which was sent out under the name *I. paraguariensis* is *Elaeodendron quadrangulatum*. This is found among ornamental plantings in South Florida but it has no resemblance and no relation to the true *Ilex*. Another plant, distributed by this Office under the name *I. paraguariensis*, proved to be *Ehretia microphylla*, the so-called "forest tea" of the Philippines. The leaves of this *Ehretia* contain no caffeine but are used by the natives as a substitute for tea. It is of interest to note the difference in the fruits of the *Ehretia* and of *I. paraguariensis*, for the fruit characters are important in identification work. We are indebted to Homer C. Skeels for the following:

"The fruits of *Ehretia microphylla* and *I. paraguariensis* are nearly spherical and about 4 mm. in diameter. Each has the remains of a stigma about 2 mm. long at the apex of the fruit. The grayish black surface of each fruit is irregularly wrinkled, that of the *Ehretia* being slightly darker in color and duller than that of the *Ilex*. The *Ehretia* fruit in falling from the plant drops out of the calyx. The *Ilex* fruit carries the calyx with it, but this calyx, 1 to 2 mm. broad, is nearly the same color as the fruit and is closely appressed to it. The fruits differ greatly, however, in internal structure. The *Ilex* contains 4 one-seeded nutlets which separate easily and which are shaped like the quarters of an apple. The *Ehretia* fruit contains one globular nutlet with 6 to 8 cells and is usually 4-seeded."

In the months of May and June, 1922, the Office of Foreign Seed and Plant Introduction was fortunate enough to secure seed of *I. paraguariensis* from three sources. The first lot, S.P.I. No. 55489, was presented by D. S. Bullock, Agricultural Commissioner of the Bureau of Agricultural Economics of this Department, located at Buenos Aires, Argentina. Mr. Bullock secured the seeds in the territory of Misiones early in April and the shipment reached us June 7, 1922. On the same date a small lot, No. 55493, was secured through Vilmorin-Andrieux & Co., Paris, France. A few weeks previous to these introductions a sample, No. 55566, arrived from C. Fiebrig, Director of the Botanical Garden at Asuncion, Paraguay. All three lots of seeds were sown at our Plant Introduction Garden, Bell, Md., and from them several thous-

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and fine plants have been secured. The plants grow rapidly when once started.

In the South American countries where this *Ilex* is cultivated it is planted in orchard form. It makes a small, bushy, evergreen tree with alternate leaves resembling the hollies of the North. The plant is tender, too much so in fact for any but sheltered and practically frostless spots. For this reason there would seem to be no place for its commercial exploitation in the continental United States.

The plant will be of interest to amateurs and plant lovers who can give it proper care and protection. In Paraguay, Uruguay and Argentina it thrives best on moist, cool mountain slopes where the heat is not excessive and frost does not occur.

There is considerable mystery surrounding the preparation of mate for market. In this connection it is interesting to note that George F. Mitchell, of the Bureau of Chemistry of this Department, has perfected a method for the harvesting, curing and preparing for market of an American plant known as cassina or *Ilex vomitoria*. This product appears to be fully equal to imported mate in cup quality and caffeine content. According to Mr. Mitchell cassina grows naturally and luxuriantly on poor sandy soils over an area of 40,000 square miles extending from the James River, Va., along the coast of all the Southern and Gulf States to the Rio Grande River in Texas. So it would seem that we have an abundant source of mate in our own native *Ilex*, much hardier than the South American species and more amenable in certain ways to modern manufacturing processes.

In the summer of 1923 we sent Mr. Mitchell twelve plants of *I. paraguariensis* for the purpose of determining: (1) Whether the leaves could be removed, cured and treated by the methods worked out for cassina; (2) whether caffeine was present in the plant grown by us. The caffeine content was found to be about the same as found in the South American product. Mr. Mitchell's conclusions on the other points were given us in a memorandum as follows:

"I have subjected the *I. paraguariensis* plants (No. 55489) to the same methods that I have used for curing cassina and find that the material I secured from them behaves exactly like cassina; that is, that all the leaves can be removed from the branches with 'live steam' and that the fermented product can be made either by rolling the leaves and oxidizing them, as in the case of tea, or by steaming off the leaves and inoculating them with enzymes in the tea rolling machine. Since these plants behave exactly like cassina, we will be able to include *I. paraguariensis* as well as *I. vomitoria* in our public service patents."

The patents referred to by Mr. Mitchell are taken out in the name of the Government and are for the purpose of preventing private monopolization of the methods and practices.

B. T. Galloway.

A Shipment of Seeds from Eastern Siberia.

During the summer of 1923 Dr. T. D. A. Cockerell, of the University of Colorado, made a trip to the southeastern part of Siberia. While his principal object was the collection of fossils, a large number of seeds of agricultural crop plants were obtained from the vicinity of Vladivostok, through the Maritime Provincial Agricultural Bureau, for the Office of Foreign Seed and Plant Introduction.

Southeastern Siberia is a region in which long, severe winters and short hot summers have given rise to varieties of crop plants especially adapted to trying conditions. It is likely, therefore, that many plants from this region will prove of value in those parts of the United States where similar conditions obtain, such as the Northern Great Plains Area and the more elevated regions where early and late frosts, cold and drying winds in winter and spring, together with hot days and cold nights in summer, make the climate a very trying one for nearly all cultivated crops.

Included in this collection of seeds sent in by Dr. Cockerell are nearly forty varieties of oats, more than twenty varieties each of rye, proso, and buckwheat, fifteen varieties each of wheat, corn, flax, and soybeans, besides seeds of beets, cabbages, onions, tomatoes, peas, and beans. Most of these are local strains with distinct possibilities.

FOREIGN SEED AND PLANT INTRODUCTION

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