Hunt Institute for Botanical Documentation
5th Floor, Hunt Library
Carnegie Mellon University
4909 Frew Street
Pittsburgh, PA 15213-3890
Contact: Archives
Telephone: 412-268-2434
Email: huntinst@andrew.cmu.edu
Web site: www.huntbotanical.org

About the Institute
The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

November 15, 1940

Mr. John G. Smith
Finca Moca
Guatalon
Guatemala, C. Am.

Dear Mr. Smith:

Under a separate cover I am returning to you six (6) botanical specimens of high-yielding Cinchonas from Helvetia which you sent to me together with your letter of October 2, 1940. The duplicate specimens are being kept for my files. The specimens were poisoned, mounted, and supplied with permanent labels here.

The following notes will be of interest to you:

H.807 - Original Ledger - 5.0% quinine sulphate - "female" (macrostyle).

H.818 - Original Ledger - 6.5% quinine sulphate - "male" (microstyle) - (bark from secondary trunks).

H.819 - Original Ledger - 7.3% quinine sulphate - "male" (microstyle) - (bark from secondary trunks).

H.1213 - Original Ledger - 11.5% quinine sulphate - "male" (microstyle).

H.1229 - Original Ledger - 12.6% quinine sulphate - "male" (microstyle).

H.2492 - Coban Ledger - 6.3% quinine sulphate - "Female" (macrostyle).

For convenience, I refer to trees with long pistils and short stamens ("macrostyle") which are largely "female" in their function as "females". I refer to trees with short pistils and long stamens ("microstyle"), which are largely "male" in their function, as "males".

As you know, Dutch breeders in Java usually segregate in a single "seed garden" four "female trees" and one "male". It is the high-yielding "female trees" that we will largely be interested in when, and if, we will be concerned with establishing seed gardens in Guatemala.

In my judgement it would be useful to make an attempt to get the following data concerning these trees, presumably in 1941 (during the next flowering and fruiting seasons):

(1) to ascertain whether or not ##H.818, H.819, H.1213, and H.1229, which are largely "male" in their function, produce fertile seeds (or at least set fruits);

(2) to record the flowering season for each tree, as it is obviously essential to segregate in a single seed garden only those that as a rule flower at the same time;

(3) to ascertain whether or not a given tree produces one kind of flower (with short or long pistils) year after year. This, of course, may be easily done by obtaining flowering botanical specimens from the same trees as in 1940. I would be only too pleased to examine the flowers again.

Please let me know the condition of specimens upon their arrival at Guatemala. I hope they are not damaged in Guatemala mail.

Sincerely yours,

B. A. Krukoff

Bak/Jd

cc - Mr. Lukens
Mr. Rosengarten Jr. - Mr. Pennock
~~Research Files~~

C
O
P
Y

THE NEW YORK BOTANICAL GARDEN
Bronx Park (Fordham Branch P.O.)
New York, N. Y.

February 25, 1941

Mr. R. P. Lukens
Merck & Company, Inc.
Rahway,
New Jersey

Dear Mr. Lukens:

In searching for plants that may be of interest to us in connection with our project on treatment of malaria, I find two of these plants that are native to Guatemala. I think it would be helpful if Mr. Rosengarten and Mr. Pennock would keep them in mind and would collect material if and when they should come across these plants. They are as follows:

1) Rauwolfia heterophylla - (Apocynaceae).

This plant is usually referred to locally as "Chalchupa". A sample of this was brought back by Col. Ruehl some years ago and was lost in storage at Rahway. It is used locally in treatment of malaria. The plant is listed on Sr. Pacheco's list of plants of Guatemala which you sent to Dr. Major together with your memo of 6/7/40. Of this plant we would like to have several pounds of dried bark for chemical testing and a few leaves to verify the identification.

2) Calycophyllum candidissimum - (Rubiaceae).

This is a large tree commonly referred to in Guatemala as "Madrono" or "Salamo". The tree is fairly closely related to Cinchona, and I am enclosing a small packet with leaves and seeds which likely will be helpful to Mr. Rosengarten and Mr. Pennock. You will note that the seeds superficially resemble those of Cinchona. This tree is amply covered by Standley in Flora of Costa Rica page 1277 and in Flora of British Honduras page 376. It is my understanding that these books are now available at El Naranjo library. I find that we have botanical specimens of this tree from Guatemala, one collected Sierra de las Minas, San Angustina Baja Verapaz, and the other Cenizas, road from Guaon to Copan, alt. 600 met. Of this tree we would like to have several pounds of dried

bark for chemical testing and a few leaves to verify the identification.

In connection with the establishment of the library at El Naranjo, I think it would be helpful if Mr. Rosengarten would purchase in Guatemala City volume #3 of Elementos de Botanica General by Ulises Rojas, 1936. I think it might be useful as I find a lot of common Guatemalan names for plants in it, and these names are usually helpful in tracing scientific names of plants known to natives only under local names.

Very truly yours,

(Signed) B. A. Krukoff

B. A. Krukoff

Bak/Jd
Enc.

cc - Mr. Lukens
Dr. Popenoe

August 30, 1941

Mr. F. Rosengarten, Jr.
Experimental Plantations Inc.
Finca El Naranjo
Chicacao, Such.,
Guatemala, C. Am.

Dear Mr. Rosengarten:

You will recall that when you visited me in my office early in July you stated that you were interested in trying out some cover crops on cinchona plantations at El Naranjo.

I have communicated with several people in different parts of the world asking their advice on cover crops that would be suitable, in their opinion, in the Tropics at the elevation of 3,000-6,000 feet. Enclosed herewith you will find a copy of a letter which was received today, and which is self-explanatory.

I should think that if you are interested in obtaining seeds of Dolichos Hosei (Vigna oligosperma) and Indigofera endecaphylla, then perhaps it would be better to address an inquiry to Messrs. Francis Peek & Co., P. O. Box 465, Singapore, from El Naranjo rather than from New York. If these seeds are purchased by me from New York then we would have to go through various formalities in importing them here and then exporting them to Guatemala. However, if for some reason or another, you should prefer to have me place the order for seeds let me know and I shall be pleased to do so.

I am not familiar with your proposed plans for cover crops at El Naranjo, and, therefore, I am not in a position to suggest what quantity would be desirable. I should think, however, that for trial purposes the quantity of seeds sufficient for one acre would be justified.

Very truly yours,

B. A. Krukoff

Bak/Jd
Enc.

R. No. 2 in D.A. 156/41. - Airmail.

C
O
P
Y

Department of Agriculture,
S. S. & F.M.S.,
Kuala Lumpur.

August 19th, 1941.

B. A. Krukoff Esq.,
New York Botanical Garden
Bronx Park, N. Y.

Sir:

I have the honour to acknowledge the receipt of your letter dated 14th July, 1941, on the subject of cover crops suitable for cultivation at high elevations.

Experience at Cameron Highlands, Panang (elevation 4,000 to 5,000 feet) shows that Dolichos Hosei and Indigofera endacaphylla both flourish at that altitude. In this connexion I might draw your attention to the remarks offered by the Agricultural Officer, Cameron Highlands on these two covers in connexion with permanent crops.

> "Dolichos Hosei (Vigna oligosperma) flourishes very well here and forms about as perfect a ground cover as one could desire. Its one and only disadvantage is the tendency to harbour Helopeltis which is a rather serious drawback with tea and cinchona. Indigofera endacaphylla grows freely and forms a useful cover, but suffers from the disadvantage of scrambling upwards and tending to smother bushy crops. It comes up through the tops of tea bushes, and has therefore been abandoned for tea."

I regret that I am unable to supply you with seed of either of these covers. I would suggest that you address an enquiry to Messrs. Francis Peek & Co., P.O. Box No. 465, Singapore, who advertise these seeds. The latest prices which I can find are Dolichos Hosei (this is listed by the firm as Vigna Hosei) $5 (say dollars five only Malayan currency) ($2.50 U.S.A. currency) per lb. and Indigofera endacaphylla $1 (say dollars one only Malayan currency) per lb. $1 Malayan currency = $0.48 United States Currency approximately.

With regard to planting notes on these two cover crops I append herewith extracts from the latest edition of the Departmental Leaflet on Cover Crops.

> "Dolichos Hosei. Sarawak Bean. A low, creeping, perennial herb of rather weak growth. Leaves trifoliate and slightly hairy. Several small yellow flowers are produced on a short raceme. The seed is brown in colour, blotched with chocolate markings. About 18,000 seeds weigh 1 lb.

The Sarawak bean thrives on a loose porous soil and is of particular value on the lighter types of alluvial coastal clay. It is most difficult to establish on undulating land that has suffered from soil erosian. Further, it is a shallow-rooting, moisture-loving plant, and will thrive under dense shade. It has a particular liking for wood-ashes, and on new clearings with abundant residues from burnt-off jungle, or where wood-ashes are applied to the land, vigorous growth is made. Owing to its prostrate habit, little or no trouble is experienced in preventing it from encroaching upon any permanent form of cultivation. It is an excellent cover crop in the fruit orchard or on flat nursery land.

Indigofera endecaphylla. A low, creeping herb with dark green pinnate leaves and small purplish-pink flowers. The seeds are minute, light brown in colour and number about 220,000 per lb.

This cover plant thrives on land which has not suffered from erosion and it requires a moist rooting surface. It thrives from sea-level up to considerable elevations and is a suitable cover crop under tea. The plants send out trailers, which produce numerous adventitious roots, thus forming a dense low mat over the land. Indigofera is stated to develop a strong tap-root which assists materially in opening up the soil.

Propagation. The several methods of propagating the cover crops described are detailed below in tabular form. Cuttings may be used when seed is expensive or difficult to obtain.

In planting cover crops, whether from seed or cuttings, advantage should be taken of rainy weather and the land be as clean of weeds as possible. Before planting, the rows are lightly forked or cultivated. In the case of small seeds, an admixture of sand facilitates distribution. Seeds that have a hard seed coat or have been stored for some time will germinate more readily if soaked for a period of 24 hours in water raised to a temperature of 110°F. Seeds so treated should not be allowed to dry before sowing. On soils where erosion has already taken place, the addition of either basic slag or rock phosphate mixed with the seed in the proportion of about 10 lbs. of fertilizer to 1 lb. of seed and the mixture sown forthwith assists in establishing the cover plants.

Cover Crop	Method of Propagation	Rate per acre	Remarks
Dolichos Hosei	Seed	5 lbs.	Rows 3 ft. apart.
	Cuttings	8 sacks	Rows 3 ft. apart.
Indigofera endecaphylla	Cuttings (9 ins. long)	4 sacks	2 ft. x 2 ft. Seed may be used to provide nurseries for cuttings.

Upkeep. The main operations in establishing cover crops are systematic weeding between planting and maturity, and removal by hand of all noxious grasses and other growths that may appear through the cover crops. Further, in order to prevent competition for plant nutrients, it is important that a fiar-sized circle round the main crop should be kept free from the cover plant.

Digging in the cover plant at intervals of one or two years may be adopted with beneficial results, but when funds are not available for this operation, slashing down the surface growth is recommended to allow of better aeration of the soil."

I have the honour to be,
Sir,
Your obedient servant,

Chief Research Officer,
S.S. & F.M.S.

Antigua, Guatemala, 2 January 1942

Dr B A Krukoff,
New York Botanical Garden,
New York City.

Dear Doctor Krukoff:

If you are back in the States again, I want to remind you of my interest in obtaining a photostat copy of the work you mentioned by Dr Rusby, giving his views on the botany of the calisayas. If you can get this for me I shall be most grateful. It should be sent to me at the Tela Railroad Co., Teguicgalpa, Honduras, since we are going over to Tegucigalpa tomorrow and shall be there indefinitely, except for occasional trips over to Guatemala and perhaps elsewhere.

I spent several days at Naranjo last week. Things are coming on nicely. Your seedlings which were planted out in the field shortly before your visit have held up well in spite of considerable dry weather in recent weeks. The rainfall figures for the year are now complete, by the way, and I think you may be interested in looking at them. At the staff house the total for the year was 167 inches; at Loja, which as you know is approximately 1000 ft higher, 142 inches, and at Chimborazo, another thousand feet higher, 124 ins. I feel rather pleased to see the distribution of rainfall at the staff House: January and February were the only really dry months, with 1.21 ins in January and .19 in Feb. November showed 5.57 and December 3.25; the remaining months all had plenty.

Best regards always.

Sincerely yours,

Wilson Popenoe

cc Mr R P Lukens

There seems to have been little revival of interest until the present decade, when, with the hearty cooperation of the Guatemalan government and the United States Department of Agriculture, Merck and Company of New York, through its subsidiary Experimental Plantations Inc., undertook to sponsor the development of Cinchona cultivation for supplying the North American market with quinine. Seeds of the best Ledger types were obtained, and later, several other promising strains were brought into the country. Nurseries were established in several parts of Guatemala under the supervision of two horticulturists, Hans Franke and Jorge M. Benitez, who had been trained at Lancetilla Experiment Station in nearby Honduras.

It is appropriate to mention the enthusiastic support which has been given the project since its inception by Don Mariano Pacheco, Director General de Agricultura of the Republic of Guatemala, and the service rendered by such active cooperators as Gordon P. Smith and his sons Owen Smith and John Smith; L. Lind Pettersen of Finca El Zapote, Gustavo Helmrich of Finca Samac, Pedro G. Cofino of Antigua, the late Doctor Goebels and Herr Erich Zoller of Finca El Porvenir, Mrs. R. W. Hempstead and her sister Miss Rosita Dieseldorff of Coban, and Erwin P. Dieseldorff. All of these people placed land and facilities at the disposal of ~~Experimental Plantations Inc.~~ the experiment