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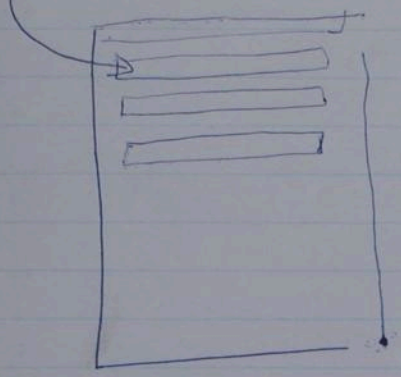
Demonstration in Rm 152 Johnson

Long narrow branch,



Hungerford Hotel
MA 3 3900
618

Plng comm. for summer system. Smithsn Inst.
to meet in Sept. or Oct. - see Dick Cowan

J. B. Gillett
E. Afr. Herb. (E. Afr. Agr. & For. Res. Org.)
Nairobi
Storey's material available?

$2t^3$
$2+2$
$b \neq 0$

⇒ Peter Greenway - same addr. as above
worked with Storey
what hobbies? to the crosses & clones

Ref: Botany of the Slave Trade - ask Joe Ewan

Scottish Horticultural Research Institute
INVERGOWRIE DUNDEE DD2 5DA Telephone INVERGOWRIE 441
Director C. H. Cadman BSc, PhD, FRSE
Secretary N. D. Anderson

DLJ/MC

23rd December, 1969

Professor J. Rogers,
Department of Biology,
University of Colorado,
Boulder,
COLORADO 80302,
U.S.A.

Dear Professor Rogers,

I have now had some replies from Africa about cassava so I can give you a slightly better picture of the situation there than I was able to in my last letter.

I believe the largest collection of breeding material is probably the one at Mtwapa in the Coastal Province of Kenya. The person in charge is Mr. J. R. Goldson, Coast Agricultural Research Station, P.O. Kikambala, Via Mombasa, Kenya. He has 31 varieties and hybrids.

To give you a general picture I think I should first give some more background. In my paper on breeding for virus resistance (E.A.A.J. v.22, 217-8) I described how varieties with only moderate resistance seemed to stand up well enough in Uganda and inland areas of Kenya and Tanzania, but that a higher level of resistance was required for the coast, with some areas needing a very high level of resistance. To be more specific, certain intervarietal hybrids remained virus free inland, but hybrids from the third backcross of the M. glaziovii x cassava series were generally more satisfactory on the coast, th ough they failed to remain healthy in certain parts. To overcome this, I attempted to build up resistance by intercrossing these third backcross hybrids to concentrate genes for mosaic virus resistance and produced several hybrids which were virtually field immune. Unfortunately, but as one might expect, only a few were in this category of very high resistance and hence opportunities for selection among them for resistance to Brown streak virus and for yield were restricted. Several were distributed for extension trial, however. We were interested also in the very high yield potential of M. melanobasis derivatives and crossed some of them with the near-immune M. glaziovii material. My information on the latter is incomplete but I suspect that a further generation of breeding is needed to restore the full measure of resistance to mosaic virus.

The problems on the coast were the most urgent and so we tried to fill the gap before the ultra-resistant forms were available by building up large blocks of two third back-cross M. glaziovii hybrids. The main area for this was at Mkinga, north of Tanga towards the Kenya border of Tanzania. By the time I left we had built up about 200 acres of the hybrid known as 46106/27 and were taking in lorry loads of cuttings to built it up further. Where we were able to compare it with moderately resistant

native material we found that 46106/27 yielded twice as much, but frequently the native cultivators could only provide diseased material for comparison and this was often a total failure due to bad establishment. The last I heard was that cuttings of 46106/27 were being 'stolen or bought' from Korogwe to Mombasa. In the early days I noted about 8% mosaic in it. It is a strongly growing variety with a good capacity to recover from the disease, and since the virus seems not to remain systemic in infected plants it is not inevitable that the disease has built up in it. It is very important to know the health status of this material before considering further policy in the area. In addition to the 46106/27 block we had one of hybrid 4763/16 in the Muhesa area, also near Tanga; 4763/16 is of the same vintage, it was higher yielding over a 15 month period though it was not so good on the sandy coastal soils as 46106/27, which had a remarkable capacity for establishing from cuttings under difficult conditions, and gave better yields in the short term (10 months). Small amounts of the more resistant later material were released to this area and though it was the plan to replace 46106/27 with this I have no further information. The possibilities are that the later material was not so good for yield, that 46106/27 maintained sufficient resistance to make this unnecessary or - and most likely - that the situation was not appreciated by new staff and the plans lost sight of during numerous staff changes.

Information from the Kenya coast is more recent but less extensive. Six hybrids have been selected for yield and recommended for propagation. Of these, two are intervarietal hybrids and one a named variety. I would regard them as only moderately mosaic resistant and fear that their performance will deteriorate rapidly in many areas when the disease spreads and clean stocks for planting become scarce. Of the remainder, one is 46106/27, one is a fourth backcross M. glaziovii hybrid and one is a derivative of M. melanobasis selected for very high yield. The latter is not top quality and recommended only as stock feed (possibly for export to Europe as dry cassava for livestock). But all six of these varieties have only intermediate virus which previous experience suggests will not be maintained in coastal regions. Their selection is probably based on yield performance under conditions less severe for virus spread than will be met in many areas. I have heard also from Dr. K. R. Bock, who is Head of Plant Pathology of the East African Agriculture & Forestry Research Organisation (E.A.A.F.R.O.), Nairobi. He tells me that there is concern that the virus resistance of certain varieties has 'broken down' and that he has written around appropriate research stations in Uganda, Kenya & Tanzania for more information. He hopes to have replies by February in advance of his own visits to such centres, and promises to send me information as soon as he can. It will be interesting to know whether the so-called 'break down' refers to intervarietal hybrids which we always rated low for resistance or to things like 46106/27.

It rather looks as though there is some revival of interest in the cassava work. The previous set up was that the breeding work was done

by E.A.A.F.R.O. for the three East African territories, which each received breeding material for screening in their own areas. The Tanga area mentioned differed in being near to Amani and hence near enough for me to be directly involved. When E.A.A.F.R.O. ceased to be involved there seems to have been a general lack of co-ordination among the territories. Some areas have made their choice for further propagation but they have not chosen the most virus resistant kinds. The big questions are whether this will have sufficient virus resistance, whether the more virus resistant kinds have had sufficient tests, or whether more breeding is needed to combine the higher level of virus resistance obtained with better yield and palatability.

We distributed cuttings or seed to practically every territory of Africa - former British, French or Portuguese territories - but I have no information about it apart from the Nigerian material which I mentioned last time.

I hope this takes you a little further. It is difficult to get an overall picture at such a distance but I will keep in touch if I learn more. I still hope to receive more replies to my enquiries.

Best wishes for 1970!

Yours sincerely,

D. L. Jennings

Copy to: Dr D. Starnes, E.A.A.F.R.O., Box 30148, Nairobi, Kenya.

Armory 101

December 15, 1969

Dr. J.L.Jennings
Scottish Horticultural Research Institute
INVERGOWRIE, DUNDEE
Great Britain

Dear Dr. Jennings:

Thank you for your very cordial letter. We are certainly disturbed to hear about the current status of the fine work done by you in the Amani project. It is very unfortunate that most of the work is lost or on the shelf. We look forward to the time when you will have the opportunity to gather more information about the cassava situation in Africa. Our concern is not that immediate. We will probably write to Dr. Ordway Starnes.

We too have been invited to the forthcoming tropical root crop symposium to be held at Hawaii, and so far we have no support for our travel either. We intend to explore possibilities with the Agency for International Development, and at the same time would be happy to investigate possibilities for your travel also. The first International Root Crop Symposium held at Trinidad in 1967 was supported largely by Rockefeller Foundation funds, and I suspect that Rockefeller foundation is heavily involved again in this second symposium. I would be happy to support a request from you to the Rockefeller Foundation for travel funds.

We hope to have the privilege to continue to be in touch with you through correspondence and hope to have the pleasure of meeting you at Hawaii.

Sincerely,

David J. Rogers
Professor of Biology

Scottish Horticultural Research Institute
INVERGOWRIE DUNDEE ANGUS Telephone INVERGOWRIE 441
Director C. H. Cadman BSc, PhD, FRSE
Secretary N. D. Anderson

DLJ/MC

5th December, 1969

Professor D. J. Rogers,
University of Colorado,
Boulder,
Colorado 80302

Dear Professor Rogers,

I may be able to help you concerning your enquiry about Cassava in the near future but I have little information at the moment. The reason is that I have been invited to attend the International Symposium and Interchange on Tropical Root & Tuber Crops to be held in Hawaii from August 22-31, 1970, in order that I may sit with a discussion panel and give some account of the cassava situation in Africa. Prospects of obtaining financial support for this visit still look rather remote, but I have written a number of letters to Africa to get the latest position and have not yet had time for replies. I shall send a written contribution if financial aid does not materialise.

I am sorry to report that Dr. Storey died recently.

Some background information will help you. Amani was the site of the East African Agricultural Institute until about 1951, when this organisation formed the nucleus of the new East African Agriculture & Forestry Research organisation, centred at Nairobi, Kenya. Cassava work was the only project left at Amani in 1951, and this was because the Nairobi climate is not sufficiently tropical for cassava work. The Amani buildings then became the centre of medical research, leaving just my few rooms for the cassava project. When I left Amani the collection of germ plasm was still being maintained there, but I do not know what has happened since. At that time, at least several of my advanced hybrid selections were being widely grown in the Tanga Province and elsewhere and were in great demand by African growers. I suspect that you would not find a visit to Amani very rewarding, though you would be able to judge the success of the hybrids from native growers in the area.

I suggest that if time is not short you could allow me until the end of the month to obtain replies to my enquiries, or alternatively,

you could write to Dr. Ordway Starnes, Director, E.A.A.F.R.O., KIKUYU, Kenya. So far I have had replies only from Nigeria, where it seems that my material was all being tested in Eastern Nigeria and must be presumed lost, together with the experimental results, because of the war.

You will see from this letter that I still feel very much concerned with cassava. It is a great pity that the benefits of the 16-year project started by Dr. Storey and finished by me are not being more fully exploited. This is perhaps inevitable because of the political changes of the last decade. I am anxious to involve myself in any efforts to improve this situation so I shall be glad to assist with your plans in any way possible.

The symposium that I mentioned plans to hold a discussion and review of a proposal to establish an "International Tropical Root & Tuber Crop Association". I don't know what they have in mind but I wonder if such a body could usefully collaborate with your Agency for International Development? Incidentally, my hopes for aid to participate in this meeting are based on the Symposium Organisers and on our Commonwealth Foundation, neither of whom are encouraging, so if you have any suggestions of other sources I would be interested.

I will write again as soon as I have information and look forward to hearing of any further developments with you.

Yours sincerely,

Derek Jennings

D. L. Jennings

WALTER P. NAQUIN, JR.
CONSULTING SERVICES

MANAGEMENT
AGRICULTURAL
SUGAR CANE GROWING

P. O. BOX 1144
WAILUKU, MAUI
HAWAII 96793

November 26, 1969

University of Colorado
Taximetrics Lab., Dept. Biology
Mr. S. G. Appan
Boulder, Colorado, 80302

Dear Mr. Appan:

Thank you for your October 13 reply to my inquiry with reference to Cassava Production.

I am interested primarily in yield information that would be applicable to the production of Tapioca (Cassava) Starch in Nicaragua or Colombia.

I need evidence to illustrate the yield of roots and starch that could be obtained from a unit area under enlightened scientific management of a Cassava plantation. This assumes adequate fertilization and a variety development and selection program designed to produce or identify plants most suited to the particular area chosen.

Specific information on yield trials is the information I seek.

I appreciate your assistance.

Sincerely yours,

W. P. Naquin Jr.

wpn/v

Walter P. Naquin Jr.

Taximetrics Laboratory
Armory 101

25 December 1969

Walter P. Naquin Jr.
Consulting Services
P.O.Box 1144
Wailuku, Maui
Hawaii 96793

Dear Mr. Naquin:

This is in response to your letter dated November 26, 1969.

In a program of improving the yield of any crop, two courses of action can be resorted to.

1) Manipulation of the environment to facilitate optimum expression of the existing genetic potentials in the available genotypes (cultivars, varieties, strains etc,).

2) Synthesizing new superior gene combinations to optimally suit any specific environment.

Cassava research centres in almost all the cassava growing countries have attempted to manipulate the environment to optimally suit the locally grown varieties, by determining the best season of planting, the best method of planting, the right dose offertilizers, the best time for the application of fertilizers etc. etc. Many varietal selectionstrials have also been carried out to select cultivars best suited to the local conditions. However very little genetic improvement has been done in this crop, as you perhaps know. There are indications that many of the existing cultivars have become adapted to low soil fertility conditions, as a consequence of cassava being grown year after year in poor soils (the usual practice in most of the cassava growing regions), and these cultivars do not respond in the optimum fashion to higher soil fertility conditions. Therefore maximization of cassava output under intensive farming conditions would necessitate efficient programs of genetic engineering of the crop to mold it to suit man's needs better. So far practically no concerted effort has been made in this direction comparable to what has been attempted in corn, wheat, rice etc. However the results of the limited amount of improvement work done in this crop so far seem to be very encouraging. In India,Magoon(1967) reports new cassava selections capable of yielding 20 to 30 tons per acre, maturing in about 10 months. In Africa, Jones(1959) reports yielda as high as 35 to 67 tons per hectare, maturing in about 18 months.

Some improvement work in cassava is being carried out at the Estacion Agricola Experimental (Ministrio de Agricultura) at Palmira, Colombia. Herrera (1949) reported some preliminary work. We do not have any recent reports of this station in our reprint collection. Perhaps you may wish to correspond with them and get data of their yield trials.

We are not aware of any work on cassava in Nicaragua.

The second international symposium on tropical root crops is scheduled to be held at the University of Hawaii in August 1970. You may already have been informed of this. I intend to participate in the symposium and perhaps I might be able to have the pleasure of meeting you there.

I am sorry we do not have any specific data on yield trials conducted at Colombia or Nicaragua, but I do hope you might be able to get some information from the Palmira station.

Sincerely yours,

Dr. S.G.Appan
Post Doctoral Fellow

Jones, W.O. 1959 Manioc in Africa. Stanford Univ. Press, Stanford.

Herrera, J.L. 1949 Resultados preliminares sobre las investigaciones en yuca. Notas Agronomicas 2(4): 43-56

Magoon, M.L. 1967 Recent trends in cassava breeding in India. Proc. Intl. Symp. Tropical Root Crops, Trinidad. 1(1):100-116.

November 26, 1969'

Dr. D. L. Jennings
Scottish Horticultural Research Institute
INVERGOWRIE, DUNDEE
Great Britain

Dear Dr. Jennings:

We are in the process of preparing a study report on manioc (Manihot esculenta Crantz) for the Agency for International Development. We would like to visit the East African Agriculture and Forestry Research Organization at Amani Tanganyika, where excellent work has been carried out by yourself, Dr. Storey and late Dr. Nichols, with respect to breeding for virus resistance.

We would very much appreciate to have information on the following points, to enable us to chalk out travel plans to visit Amani.

1) Is the work being continued, if so where and by whom?
2) Is the germ plasm collection being maintained, if so where?
3) Who would be the best person to get in touch with for making arrangements for our visit?
4) Is Dr. Storey still at Amani. What is his address?
5) Any other point which you feel would be of help to us.

Your advice would be very much appreciated.

Sincerely,

David J. Rogers
Professor of Biology

November 26, 1969

Research Division
Minute Tapioca Co.
Orange, Massachusetts

Dear Sir:

An article by Kaufman, C. W. (General Foods Corp.) in Food Industries Vol. 22 (4): 614-617, 1950, indicates that Dr. Lee Shipman of your laboratories carried out some research on tapioca, a product obtained from the roots of Manihot esculenta Crantz.

We would appreciate to have reprints of any further work in your laboratory with respect to tapioca.

Sincerely,

David J. Rogers
Professor of Biology

November 26, 1969

Research Division
Minute Tapioca Co.
Orange, Massachusetts

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We would appreciate to have reprints of any further work in your laboratory with respect to tapioca.

Sincerely,

David J. Rogers
Professor of Biology

November 26, 1969

Dr. D. W. Kent-Jones
18 Welsby Court
Eaton Rise
Ealing
London W5

Dear Dr. Kent-Jones:

With regards to your letter dated 14 November 1969 to Professor David J. Rogers, I am sending herewith few reprints. I hope this will be of help.

We would be glad to be of help if you need any further information.

Sincerely,

S. G. Appan
Post Doctoral Fellow

November 24, 1969

General Foods Corporation
Corporate Research Department
555 S. Broadway
Tarytown, New York

Dear Sir:

We are in the process of preparing a study report for the Agency for International Development, on cassava (Manihot esculenta Crantz) the source of tapioca which is used as an ingredient of puddings, baby foods, etc. We understand that (at least periferally) the Research Division of General Foods Corp. has been, or was, interested in research on tapioca. We have the reprint of one publication from your laboratories. "Kaufman, C. W. 1950. This 10-test plan clinched tapioca quality. Food Industries 22 (4): 614-617." We would very much appreciate to have any further publications on tapioca. Please let us know whether Dr. Frank Hollis and his group, at the Central Laboratories of General Food Corp., Hoboken, N.J., is still engaged in research on tapioca.

Your cooperation would be very much appreciated.

Sincerely,

David J. Rogers
Professor of Biology

November 24, 1969

General Foods Corporation
Corporate Research Department
555 S. Broadway
Tarytown, New York

Dear Sir:

We are in the process of preparing a study report for the Agency for International Development, on cassava (Manihot esculenta Crantz) the source of tapioca which is used as an ingredient of puddings, baby foods, etc. We understand that (at least periferally) the Research Division of General Foods Corp. has been, or was, interested in research on tapioca. We have the reprint of one publication from your laboratories. "Kaufman, C. W. 1950. This 10-test plan clinched tapioca quality. Food Industries 22 (4): 614-617." We would very much appreciate to have any further publications on tapioca. Please let us know whether Dr. Frank Hollis and his group, at the Central Laboratories of General Food Corp., Hoboken, N.J., is still engaged in research on tapioca.

Your cooperation would be very much appreciated.

Sincerely,

David J. Rogers
Professor of Biology

Universidade Federal Rural do Rio de Janeiro (UFRRJ)
Departamento de Fitotecnia
Rio de Janeiro, ZC 00, caixa postal 25

Dr. David J. Rogers

Mr. Alcides Teixeira sent to this University a copy of your letter from 25/10/68, asking for propagating material of both wild and cultivated species of Manihot. That copy arrived in our department on 12/1/69, when I was abroad.

I am very interested to cooperate with you and Dr.J. Popenoe because I am working with cultivated varieties of Manihot esculenta Crantz, 1766 during the last three years. There are some 25 varieties being tested in field experiments. Some of which are supposed to have a rather toxic concentration of cyanogenic glucosideus.

I am willing to send you all material we have, but it will be available only in harvesting time, beginning in May. Please, ask Dr.Popenoe to get in contact with me in April. I wonder if he knows a source of a wild variety called "Manihot saxicola". I want it very badly for crossing.

Sincerely yours

Joachim F. W. von Bülow
Chefe do Depto. de Fitotecnia

November 24, 1969

Dr. John Popenoe, Director
The Fairchild Tropical Garden
10901 Old Cutler Rd.
Miami, Florida 33156

Dear John:

Enclosed is the first response to our appeal for germ plasm of Manihot - only some eleven months later. Maybe something will come of this fellow's letter, but I'll believe it when I see it.

We haven't given up on Manihot, but have been so busy just finding sufficient funds to keep alive that there has been no opportuhity to do any honest work. Howard Irwin (NYBG) is going back to Brazil in January, and we hope he will turn out some good seed material for us. On his last trip, he was in Manihot territory at the wrong time of year.

Hopefully, I will get some travel money next spring, and can get some specimens myself. How are the plantings there? Did the M. pringlei survive?

Best regards.

David J. Rogers
Professor of Biology

November 21, 1969

Dr. Joachim F. W. von Bülow
Chefe, Departamento de Fitotecnia
Rio de Janeiro, ZC 00, caixa postal 25

Dear Dr. Bülow:

Thank you very much for your letter, and your interest to collaborate with us in Manihot work. I shall inform Dr. Popenoe of your offer to send him material.

I believe that Manihot saxicola is being grown in the Landbouw-proefstation at Paramaribo, Surinam. I think that you should be able to obtain propagating material of this species from them.

Sincerely,

David J. Rogers
Professor of Biology

Manihot Monograph

The Colophon of Quality

HAFNER PUBLISHING COMPANY

31 EAST 10th STREET, NEW YORK, N.Y. 10003

Telephone: (212) 674-6210
Cable Address: STECHAFNER, NEW YORK

Sept. 11, 1969

Professor David J. Rogers
Department of Biology
Taximetrics Laboratory
University of Colorado
Armory 101
Boulder, Colo. 80302

Dear Professor Rogers:

Your letter to Harry Lubrecht dated September 4, 1969 has been received.

Mr. Lubrecht is on vacation and will return next week.

At that time he will be pleased to answer your question regarding the format of Flora Neotropica.

Sincerely yours,

HAFNER PUBLISHING CO.

Harold Wehlau

HW/fi

Taximetrics Laboratory

Armory 101

24 September 1969

Dr. Grady L. Webster
Arboretum, Department of Botany
University of California
Davis, California 95616

Dear Grady:

Last things first - with respect to Gary Breckon, my graduate student working with me on Manihot has prepared some very nice distribution maps and requests for information about Manihot. If Gary goes anywhere near the areas with which we are concerned to get more material, I think the enclosures are self explanatory.

We haven't very much to say about data construction in print because we feel that each set of data probably requires its own formatting and therefore it is difficult to generalize about what you ogght to do with your data as you prepare it for machine storage and retrieval. With respect to this, if you could tell us the objectives you have for collecting the data and you could give us some actual example of the data you are and will be collecting, we could give you better notions of how to prepare it tailored to your needs.

Regarding the eventual work on the whole family Euphorbiaceae I would love to do a systems analysis approach so that we could plan the work and division of labor in a more modern method than has been the usual case for such undertakings. This, of course, includes the use of various computer programs we have, and can as well give us some measure of stepwise procedures, time and needs for assistants as well as a very precise measure of costs. I believe that if we do this in advance, the opportunity to actually get the work going will have a better chance of survival with granting agencies. Naturally this is not unrelated to the actual information from the family that we need to know.

I will sometime not too far off begin to expand these ideas so that you can see what I mean.

Sorry you missed our paper on Sunday afternoon. I believe that what we had to say made more sense than most of the rest of them. That is a completely unbiased remark, of course.

Best regards,

David J. Rogers
Professor of Biology

DJR:gm

Taximetrics Lab., Armory 101 Oct. 23, 1969

Dear Grady:

I have a student, Jerry Arp, who is finishing his undergraduate work here this year, and he's looking around for a home in grad. school. I write to you about him because I think he would be a natural to act as a good interface between you and me with respect to our mutual interest in the whole Euphorbiaceae.

Jerry and I have talked about our interest, and he finds himself much attracted to the ideas of a reworking of the family. He has taken my course in taximetrics, has done work under Askell Löve, has (or will next semester) take a course in population genetics under Wilson Crumpacker, and other useful background for good taxonomic work. He is much dedicated to plant taxonomy, having done quite a bit of work on his own on the cacti, and I am impressed with his maturity in the field already.

Would you consider him as a candidate under your direction? You might have to work hard to get the red-tape types in your administration to let him in because his grade point average probably isn't the best that ever came out of here. Just between you and me, however, I consider the fact that he made a D in the introductory genetics course a tribute to him, because he wouldn't knuckle under to the idiot who taught the course. When working under good circumstances, and with a challenging problem in front of him, he comes through with flying colors.

But before I say anything else, you might want to look this guy over personally to see if my claims are supportable in your own eyes. Let me know if you want to have this guy, and I'm sure he'll find a way to come out for an interview. You might also ask the admissions office there to send him forms. His address is

Mr. Gerald Arp
13850 Berry Road
Golden, Colorado 80401.

Thanks for your consideration,

Sincerely,

David J. Rogers.

UNIVERSITY OF CALIFORNIA, DAVIS

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF BOTANY

September 17, 1969

DAVIS, CALIFORNIA 95616

Dr. David J. Rogers
Department of Biology
University of Colorado
Boulder, Colorado 90302

Dear Dave:

By now you should have recovered from all the over-stimulation at the Congress and are back to work on Manihot. I think maybe they have the right idea in increasing the interval from five to six years!

One of the catastrophes of scheduling was that I completely missed the Sunday afternoon session on numerical biosystematics (being instead trapped into substitute chairing of abyssmally dull session on vegetative organs of seed plants). From some of the titles, it looked to be one of the more interesting sections.

However, since we're plunging ahead this fall with our anatomical and morphological surveys, I am very interested in techniques of recording and processing this data. Any copies of programs or other software you may have on hand would be much appreciated. We are concerned to get the data properly recorded for eventual punching on cards, so will consider any suggestions.

The idea of doing a joint analysis of the entire family Euphorbiaceae is more and more appealing on further reflection. It even has a certain inevitability about it. It isn't clear to me at the moment exactly where to start; however, I don't think we have to worry about writing up grant proposals until we get our teeth into it a bit more. This fall, if there is time, I will jot down my preliminary ideas and send them on to you.

Gary Breckon is definitely going back to Mexico at the end of the year, so if you have any manihotoid desiderata, just let us know.

Sincerely,

Grady

Grady L. Webster
Director of the Arboretum

GLW/jn

MORTON COLLECTANEA
UNIVERSITY OF MIAMI
CORAL GABLES, FLORIDA 33124
Box 8204

September 23, 1969

Dr. David J. Rogers,
Professor of Biology
Taximetrics Laboratory - Armory 101
Department of Biology
University of Colorado
Boulder, Colo. 80302

Dear Dave:

Thought you'd like to know: Dr. Victor Manuel Patiño, Apartado Aereo 2154, Cali, Colombia, is collecting cassava seeds for Rockefeller Foundation project near Palmira.

I returned 3 weeks ago from two months of field work in Colombia, Venezuela, Curacao and Bonaire. Saw a great deal of cassava being interplanted with cashew near Rio Frio, Colombia, replacing banana plantations.

Did you hear from Dr.Hendershott, head of Hort., U.of Georgia, whom I told to write you about his plan to write "all about cassava" ??

All good wishes,

As ever

Julia

P.S.: Hope you approved the SEB "history" in last issue.

Air Letter

22 September 1969

Dr. Peter J. Greenway
East African Herbarium
East African Agricultural and Forestry Research Org.
Nairobi, Kenya

Dear Dr. Greenway:

In a recent conversation with Dr. Purseglove I was informed that you could probably best tellme the present status of the breeding for resistance to mosaic virus breeding program for Manihot esculenta started by Dr. Storey. As a student of the species M. esculenta I have admired the work done there with respect to the selection of crosses between M. esculenta and M. glaziovii. Dr. Purseglove thought that you would be able to tell me if there exists any documentary herbarium specimens of the parents used in these crosses and some of the offspring. It would be interesting to me as a taxonomist to see the morphological expression of the hybrids if these are available.

I would be pleased if you could also tell me the present status of the work, if any has continued. I will appreciate your response.

Sincerely yours,

David J. Rogers
Professor of Biology

DJR:gm

Taximetrics Laboratory

Armory 101

3 June 1969

Dr. M. L. Magoon, Director
Central Tuber Crops Research Institute
Vazuthacaud
Trivandrum-10
Kerala, India

Dear Dr. Magoon:

Considerable time has elapsed since I had the pleasure of meeting you at the Root Crops Symposium at Trinidad. Though we had no direct correspondence during this period I keep myself informed of the excellent work you and your team continue to do through Appan. Mr. Pusey of the Tropical Products Institute, who visited you last year, had some very nice words to say about the work being carried out under your guidance.

Appan has been doing excellent work here, and it has been a pleasure guiding his research in Manihot. As you know he has been engaged in delimiting and defining closed gene pools (biological species) of Manihot, by the application of Taximetric methodologies, employing electronic data processing equipment. As has been abundantly proved in several cultivated crops, natural interbreeding populations representing wild species of Manihot, are a potential source of donor parents of desirable genes, which could very profitably be utilised in an interspecific breeding program aimed at improving the genetic constitution of M. esculenta genotypes. Extracting and incorporating alien wild genes has become a profusely rewarding aspect of any crop improvement program, especially since the outcome of elegant modern plant breeding techniques which make even widely distant crosses possible. This can play a significant role in cassava improvement program too (Fig. 1), but unfortunately it has been largely neglected, despite the fact that the approximately 200 wild species of Manihot represent a rich, practically unexplored, and unexploited reservoir of valuable genetic material. Interspecific cassava improvement program may be flowcharted for sequential implementation as shown in Figure 2. The basic requirement is to delimit and recognise closed gene pools. We have completed the delimitation of the Mexican and Central American segment of the genus (Figure 3). I want Appan to continue and complete the delimitation of the South American segment of the genus also. Simultaneously, we intend to continue investigations of the Mexican and Central gene pools, along the lines indicated in Figure 2. As the investigations outlined are of immense magnitude in terms of time, personnel, talent, facilities, etc. we are considering possible collaborations.

I would appreciate having your view about collaborative work with possible financial support from PL 480 funds. The Smithsonian information sheet on PL 480 funds for India says, "the problems of performing research under our programs in India are manifold, though not insuperable." But I would rather rely upon first hand information from you regarding the pros and cons involved. May I request you to let me know (1) whether you will be in a position to undertake collaborative work, and (2) the difficulties, if any, which we may have to face in initiating this collaborative effort.

In February, I was at the Fairchild Tropical Garden, Miami, Florida, having been invited to give the annual Fairchild lecture, and I had the pleasure of discussing Manihot work with Dr. Popenoe, the Director. He is very enthusiastic about work along these lines especially possible interspecific hybridization aimed at increasing the protein content and reducing the prussic acid. He has already initiated some work. If necessary, a tripartite collaborative effort with you, Dr. Popenoe, and me may be worked out.

I hope to send Appan to Mexico in August-September this year, to undertake field studies. This would be an ideal opportunity to collect seeds of all the Manihot species which have been delimited so far (Fig. 3). Would you be interested to raise the wild Mexican seedlings and maintain them in advance of the official initiation of the PL 480 scheme? With best regards.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

University College London
Gower Street London W.C.1. England

24 April, 1969

Dear Professor Rogers,

Thank you for your reprints, which have just arrived.

As you suggested, I have written to Alvaro Montaldo and to Luiza S. E. Hermann; so far I have received no reply from the former, but have been sent a copy of Dr. Hermann's bibliography, which should be very useful.

Yours sincerely,

Barbara Field.

Barbara Field.

April 1, 1969

Dr. Jorge Leon
Via delle Terme di Carcalla
FAO of the UN
Rome
Italy

Dear Jorge:

I should have contacted you sooner to report my complete failure to secure funds to support my graduate student for collecting trips. It is a tragedy when we are so close to an opportunity to do a good job that we have no way to get money to support any kind of research. I appeal to you to discover if FAO itself would not be willing to at least keep one graduate student alive here and support his travel to collect Manihot in South America.

I do hope that there is some way you can suggest to make funds available for my Indian student.

Best regards,

David J. Rogers
Professor of Biology

srh
Air Mail

4 April 1969

Dr. Lee A. duBridge
Presidential Science Adviser
The White House
Washington, D. C. 20506

Dear Dr. duBridge:

Over the past few years more and more statements in various authoritative articles have appeared concerning the importance of cassava (Manihot esculenta) as a tremendous source of food in the underdeveloped countries of the world. We know that cassava is the world's sixth largest food crop, feeding at least 200 million people (FAO statistics). Also it is possible to discover that very little is known about the plants, the crop, the distribution and marketing systems, and what part the crop can play in overall economic development. (It has greater internal use than merely as a human food source - it is being exported to Europe as a base for composite cattle feed and is an excellent starch source for textile sizing and corrugated cardboard manufacture. In spite of the discussions which have indicated the significance of this crop, nothing seems to be getting done. If one compares what we know today about cassava with, say, corn we will discover that our knowledge is equivalent to what we knew about corn in 1869. What I would like to discover is: what authoritative group in the United States could make a decision that an intensive investigation into improving this crop should be made? I personally have studied this crop and its related species for the last 15 years and have consistently attempted to bring the need for much more work to the attention of various United States agencies as well as those abroad. I have, for example, tried to interest the Rockefeller Foundation, the United Nations through FAO, the U.S. Foreign Aid program, the USDA; all to no avail.

That more food for developing nations is needed is evident. That cassava has a potential to meet some of these needs greater than is now being met is immense, but it is beyond me to discover how we attract the funds necessary to study this crop in all its multitudinous aspects.

I would be happy to find some route to the appropriate individuals who could make a decision, to establish in Puerto Rico, or other suitable tropical area a well-rounded, well-financed study. If, by chance, you can suggest the route to go, I would be pleased to heed your suggestion.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm
CC: H. F. Robinson

4 April 1969

Dr. Lee A. duBridge
Presidential Science Adviser
The White House
Washington, D. C. 20506

Dear Dr. duBridge:

Over the past few years more and more statements in various authoritative articles have appeared concerning the importance of cassava (Manihot esculenta) as a tremendous source of food in the underdeveloped countries of the world. We know that cassava is the world's sixth largest food crop, feeding at least 200 million people (FAO statistics). Also it is possible to discover that very little is known about the plants, the crop, the distribution and marketing systems, and what part the crop can play in overall economic development. (It has greater internal use than merely as a human food source - it is being exported to Europe as a base for composite cattle feed and is an excellent starch source for textile sizing and corrugated cardboard manufacture. In spite of the discussions which have indicated the significance of this crop, nothing seems to be getting done. If one compares what we know today about cassava with, say, corn we will discover that our knowledge is equivalent to what we knew about corn in 1869. What I would like to discover is: what authoritative group in the United States could make a decision that an intensive investigation into improving this crop should be made? I personally have studied this crop and its related species for the last 15 years and have consistently attempted to bring the need for much more work to the attention of various United States agencies as well as those abroad. I have, for example, tried to interest the Rockefeller Foundation, the United Nations through FAO, the U.S. Foreign Aid program, the USDA; all to no avail.

That more food for developing nations is needed is evident. That cassava has a potential to meet some of these needs greater than is now being met is immense, but it is beyond me to discover how we attract the funds necessary to study this crop in all its multitudinous aspects.

I would be happy to find some route to the appropriate individuals who could make a decision, to establish in Puerto Rico, or other suitable tropical area a well-rounded, well-financed study. If, by chance, you can suggest the route to go, I would be pleased to heed your suggestion.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm
CC: H. F. Robinson

FEB 11 1969

MINISTRY OF AGRICULTURE AND FISHERIES
AGRICULTURAL UNIVERSITY - WAGENINGEN

DEPARTMENT OF TROPICAL CROP HUSBANDRY
32 RITZEMA BOSWEG
WAGENINGEN - THE NETHERLANDS

TELEPHONE: 08370-6111

YOUR REFERENCE:

OUR REFERENCE : No. 76/38

ENCLOSURE(S) :

WAGENINGEN, 7th February 1969

Prof.D.J. Rogers,
Taximetrics Laboratory,
Department of Biology,
Armory 101,
University of Colorado,
BOULDER,
Colorado 80302, U.S.A.

Dear Mr. Rogers,

Thank you very much for your kindness of placing me on the list of interested persons for the Bibliography of Mr. Montaldo, in which you co-operated for cassava literature. I think the bibliography is a very good and highly complete one.

Some months ago I returned from the Ivory Coast and now I have started to prepare my work for publication. In the meantime I am performing some small experiments. In the end of this year I hope to return to the Ivory Coast for some three months for further research on possible practical applications of my results concerning the preparation of cassava for human and animal consumption.

Until now I did not collect any herbarium material, I will do this in my next stay in the Ivory Coast. I wonder whether you are interested, for your collection, in herbarium specimens of cultivars which have practical importance, or in clones in general, wheter cultivated or not. Most of my clones are not cultivated, they are only a result of former crossing experiments in the Ivory Coast.

I think my thesis will be published about September 1970. I will try to prepare it before leaving for the Ivory Coast and to finish it as soon as possible after my return.

Very sincerely yours,

G.H. de Bruijn

(G.H. de Bruijn).

MORTON COLLECTANEA
UNIVERSITY OF MIAMI
CORAL GABLES, FLORIDA 33124

Box 8204

February 26, 1969

Dr. David J. Rogers, Professor of Biology
Taximetrics Laboratory - Armory 101
Department of Biology
University of Colorado
Boulder, Colo. 80302

Dear Dr. Rogers:

We are sending herewith xerox copies of the six articles/ bulletins on CASSAVA which you selected from our subject file.

Reimbursement for the actual cost of photocopying the 82 pages @ .08 each ($6.56) may be made at your convenience to the order of the Morton Collectanea.

Trusting that this material may be useful to you, I remain

Yours sincerely,

Mary Rosa, Research Assistant
Morton Collectanea
University of Miami

Encs.

bill forwarded 4 March

WASHINGTON UNIVERSITY

ST. LOUIS, MISSOURI 63130

PLEASE SEND ALL
CORRESPONDENCE TO ME
AT THIS ADDRESS:

6644 WATERMAN AVENUE
SAINT LOUIS, MISSOURI, 63130
U.S.A.

GRADUATE INSTITUTE OF EDUCATION
McMILLAN HALL

February 26, 1969

Professor David Rogers
Dept. of Biology
University of Colorado
Boulder, Colorado

Dear Dr. Rogers:

I am writing to you in the hope that you can help me in the following matter. I have been told that manioc is produced as sweet manioc or sour manioc depending on conditions or fertility of the soil.

I would be grateful to you if you could tell me whet..er this is correct, and if it is what are the conditions or what is the particular fertility of the soil which gives rise to sweet manioc as compared to sour manioc.

Thank you.

Sincerely yours,

Albert Schatz (m.s.)

Albert Schatz
Professor, Science Education

AS:ms

March 4, 1969

Professor Albert Schatz
6644 Waterman Avenue
Saint Louis,
Missouri 63130

Dear Professor Schatz:

There are two general categories of manioc in cultivation one, "sweet", the other "bitter," these referring to the purported content of HCN. Many varieties of the crop exist in each of these categories, and many variations in content of HCN. The fact that two varieties grown side-by-side may be one sweet, the other bitter, indicates that some genetic control exists. However, variations in response to fertilizer, environmental factors of soil, moisture, etc., which indicates a "mix" of genetic and environmental influences.

We do not have anybbasic studies which indicate the various roles, though this is a very interesting problem. Our knowledge about this crop is very primitive.

Sincerely yours,

David J. Rogers
Professor of Biology

18 February 1969

Miss Susan Emley
6622 Del Playa #2
Goleta, Calif. 93017

Dear Miss Emley:

Thank you for your letter of February 10. Please note that my address has changed again.

I have one or two general comments before attempting to answer your specific questions. First, the decision that Manihot esculenta was first cultivated in Mesoamerica was derived primarily from botanical evidence, and secondly from archeological evidence. Second, manioc, or cassava, or yuca, which we know today is probably a far different plant than when it was first cultivated, and certainly there must have been contributions over time from various parts of Latin America which make up parts of the complex gene pool, now called "M. esculenta." So the problem of origins is not a simple one-time happening, such that the crop of today came into being all at one point and time. Similarly, Zea mays when first cultivated in Mexico was a very much different crop than today's cultivars, and only by hybridization, mutation, and selection over long periods of time do we have the modern crop. Contributions to corn's evolution came from several parts of tropical America, and I'm sure that when we have equivalent knowledge about M. esculenta, we'll have a similar picture, differing in details, but generally much the same. I feel that much more sophisticated archeological and anthropological work in Latin America will be necessary to combine with botanical knowledge to fit the puzzle together.

We are now putting the final touches on a classification of the cultivars of Manihot esculenta. This classification was derived with the aid of some very powerful computer procedures, and is, we feel, the sort of solid rock work needed before any of the more complex problems are solved.

From the above paragraphs, I believe that you can see my answer to your question about possible origins (or first cultivations) of M. esculenta. I simply don't know the answer.

Concerning Gertrude Dole's work: she extracted most of the informatinn for her paper from the seven volume Handbook of South American Indians. If the reports in those volumes are accurate, so are her facts accurate. But she recognized the short-comings in that work, as we all do, knowing that the information is very fragmentary, and was a compilation merely of what was known at that time. I think Dole did good work in pointing out some possibilities

but think that we all agree that much more evidence is needed to make any real decisions. I discussed this paper with Dr. Dole when I was in New York, and we were both of the opinion that she did the best she could with the data available, but that we would not call that paper the final, definitive answer. So my answer is: yes, that is useful work, and certainly the anthropologists can't wait forever to get the back-up botanical knowledge. But maybe we should try to push the ethnobotanists' work a little harder.

This ties with your last question, and I can only make some suggestions, not lay out a pathway. Any anthropologist who enters these fascinating areas ought to be cognizant of botanical efforts, should make all efforts to wither become familiar with botanical procedures, or tie up very closely with a botanical expert. The synergistic effects of such collaboration improve both botanical and anthropological endeavors.

If you're looking for a good problem, I can suggest one where you have the opportunity for very interesting combined work with geneticists, taxonomists, and anthropolcgists, where some preliminary work has already been done, and a chance to produce some very valid studies. But the problem is one that I want to have some control over, and I'm not sure that is what you want. If I knew your status, I could be more definite, but since I do not, I hesitate to come out with it.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

February 10, 1969

Dr. David J. Rogers
Professor of Botany
Dept. of Botany and Plant Pathology
Colorado State University
Ft. Collins, Colorado 80521

Dear Dr. Rogers,

I am a student at the University of California, Santa Barbara currently engaged in an anthropological study of various methods of discovering the origin and spread of tropical crops in the tropical forest of South America. I would hope that you might aid my research by answering a few questions.

I have read with interest your article in Economic Botany (1965 19:369-377), "Some Botanical and Ethnological Considerations of Manihot esculenta," and I would like to know if you have written anything further on the subject. I noticed the basis of your thesis that manioc originated in Mesoamerica stems from direct archaeological remains of the plant found in Mexico. Does this rule out the possibility that Manihot esculenta was cultivated first in the tropical areas of South America but is not found there in archaeological sites because of the rapid rate of decay in tropical climates? Because this opportunity for direct evidence is usually absent, what other methods do you especially recommend for the study of cultigen origin? Would you include or discount Vavilov's method of discovering origins?

I am also interested in your opinion about the paper by Gertrude E. Dole on "Techniques of preparing manioc flour as a key to culture history in Tropical America" (In Men and Cultures, ed. A.F.C. Wallace, Philadelphia, 1960). Do you believe studies such as this are worthwhile or is the anthropologist better off waiting for further ethnobotanical research?

One final question, Dr. Rogers, do you feel there may be some yet untapped areas of profitable research for the anthropologist, perhaps in geography, botany or agronomy, which may be helpful in a study of agricultural origins?

I thank you for any help you might give me. Needless to say I will defray any xerox costs that might arise. Enclosed is a stamped addressed envelope for your convenience. Thank you again.

Sincerely,

Susan Emley

Susan Emley
6622 Del Playa #2
Goleta, Calif. 93017

March 6, 1969

Susan Emley
6622 Del Playa #2
Goleta, Calif. 93017

Dr. David J. Rogers
Taximetrics Laboratory
Dept. of Biology
Armory 101
University of Colorado
Boulder, Colorado 80302

Dear Dr. Rogers,

Thank you for your reply to my letter requesting recent information on the possible origins of manioc.

I am sorry I did not indicate the precise nature of my studies in my first letter. I am a senior majoring in anthropology and my present research into the origins of tropical forest agriculture was initiated this quarter for a class in South American Archaeology. I find the subject of agricultural origins fascinating, but as you can see, I have not yet finished my undergraduate work, and as a consequence, I do not have sufficient opportunity to enter the subject in depth nor would I probably be qualified to engage in any particular problem you might suggest.

I am thinking of attending graduate school, however, and perhaps I may decide to enter this area of study more seriously. If so, I hope you will permit me to request further information at such a future time.

Thank you again for your assistance.

Sincerely,

Susan Emley

Susan Emley

APARTADO AEREO 67-13
BOGOTA, COLOMBIA
CABLE: CINATROP

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

B 314

March 6, 1969

Dr. David J. Rogers
Professor of Biology
University of Colorado
Boulder, Colorado 80302

Dear Dave:

I have delayed answering your letter of January 23 until I had a bit more information. I feel that we should not move ahead with collecting programs at this time until we have our personnel in place. So far, we have not moved ahead with hiring our personnel to work in the yuca program, and at this point we are not completely sure of what this personnel will consist.

I am sure that we will collaborate with the people at IITA, and next week I will be discussing this possibility with Dr. Herb Albrecht to see what the possibilities are.

We are just now in the planning stages of our facilities, and I cannot at this time predict when they will be ready. Until we have our own facilities I do not think we can accept people such as yourself for sabbatic leaves. After we obtain our facilities and get our program going we will be in position to do so.

If your interest continues in this direction, please keep in touch with us and we may be able to give you more definite information in the relatively near future.

Sincerely yours,

U. J. Grant
Director

UJG/caa

Department of Geography,
University College London
Gower Street London W.C.1. England

MAR 17 1969

12th March, 1969

Dear Professor Rogers,

Thank you very much for your letter, and for your suggestions on reference sources. I have written to the two authors you mentioned.

I shall be interested to see your next paper - where is it to be published?

Yours sincerely,

Barbara Field.

Barbara Field.

Taximetrics Laboratory,
Department of Biology,
Armory 101,
University of Colorado,
Boulder, Colorado 80302.

19 February 1969

Miss Barbara Field
Department of Geography
University College London
Gower Street
LONDON W.C.1, England

Dear Miss Field:

Thank you for your letter. I am sending separately reprints of the articles you mentioned. The next paper on Manihot will be a new computer-aided classification of M. esculenta.

The best source of references is the "Bibliografia de Raices y Tuberculos Tropicales" by Alvaro Montaldo, Alcance No. 13, Dic. 1967. Universidad Central de Venezuela, Facultad de Agronomia, Maracay, Venezuela. This is organized by crops, and subdivided into various topics; but not annotated; in both English and Spanish.

Another source is "Bibliografia da Mandioca", compiled by Luiza S. E. Hemmann, Boletim No. 182, Instituto Agronomico do Estado Sao Paulo (Caixa Poatal 28) Campinas, Sao Paulo, Brasil, Febereiro de 1968. Both of these bibliographies cover the international literature.

I hope that you will be able to find the materials you need.

Sincerely yours,

David J. Rogers
Professor of Biology

DJR:gm

Department of Geography,
University College London
Gower Street London W.C.1. England

14th February, 1969

Dear Professor Rogers,

I am registered in the University of London as a postgraduate student for an M. Phil. degree; my thesis is to be on native agriculture in tropical lowland South America, with particular reference to root crops, and especially manioc.

It is therefore with great interest that I have read your papers in Bulletin of the Torrey Botanical Club, and Economic Botany. I am finding that the literature is extremely diffuse, and as you mention in the earlier paper (1963) that you give only a selection of references, I was wondering whether you could give me any help with additional ones.

I should also be very grateful to receive any reprints you have available.

Hoping these requests will not cause you any inconvenience,

Yours faithfully,

Barbara Field (Miss)

Taximetrics Laboratory
Department of Bioloby
Armory 101

11 February 1969

Ing. Agr. Armando T. Hunziker
Museo Botanico
Facultad de Ciencias E. F. y Naturales
Avenida Vélez Sarsfield 249
CORDOBA, Argentina

Dear Sir:

We are in the process of revising the genus Manihot employing computer-aided Taximetric methodologies. We would be thankful to receive herbarium specimens representing the newly described species M. Hunzikeriana and other Manihot species, on loan from your collection in the Cordoba Herbarium.

The usual conditions of loan will apply.

Sincerely yours,

Aerogramme 10 February 1969

Raul Martinez-crovetto
Facultad de Agronomia y Veterinaria
Universidad Nacional del Nordeste
Sgto. Cabral 2139
Corrientes, Argentina

Dear Mr. Martinez-crovetto,

I thank you for sending the reprint of your paper, describing the new Manihot species M. Hunzikeriana.

We are in the process of preparing a taxonomic monograph on the genus Manihot. We would be thankful to receive herbarium materials of the new species, for study and inclusion in the monograph. I have enclosed herewith a request to the Director of CORD. I would appreciate if necessary arrangements are made to send the specimens to us, on loan.

Sincerely yours,

The Herbarium
University of Colorado Museum
Boulder, Colorado 80302

4 February 1969

Dr. Alcides R. Teixeira, Director General
Instituto de Botânico
Caixa Postal 4005
São Paulo, Brasil

Dear Alcides:

The Manihot monograph progresses slowly. Might we ask for the loan of your herbarium specimens ~~66r~~ the genus? The usualy conditions would apply.

Henry and Mary Fleming send their best regards from Colorado.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

The Herbarium
University of Colorado Museum
Boulder, Colorado 80302

4 February 1969

Ing. Agrón. Arturo E. Ragonese, Director
Instituto de Botánica Agrícola del I.M.T.A.
Araoz 2875, Castelar
Buenos Aires, Argentina

Dear Señor Ragonese:

We are in the process of revising the genus Manihot (Euphorbiaceae). We would be honoured to have specimens representing this genus, on loan from your herbarium. The usual conditions of load will apply.

Sincerely yours,

David J. Rogers
Associate Curator

DJR:SGA:gm

The Herbarium
University of Colorado Museum
Boulder, Colorado 80302

4 February 1969

The Curator
Instituto Miguel Lillo
Calle Miguel Lillo 205
Tucumán, Argentina

Dear Sir:

We are in the process of revising the genus Manihot (Euphorbiaceae). We would be honoured to have specimens representing this genus, on loan from your herbarium. The usual conditions of loan will apply.

Sincerely yours,

David J. Rogers
Associate Curator

DJR:SGA:gm

The Herbarium
University of Colorado Museum
Boulder, Colorado 80302

4 February 1969

The Curator
~~Jardim Botanico~~
~~Rua Jardim Botanico,1008~~ Divisão Botânica do Museu Nac
Quinta da Boa Vista
Rio de Janeiro, Brazil

Dear Sir:

We are in the process of revising the genus Manihot (Euphorbiaceae). We would be honoured to have specimens representing this genus, on loan from your herbarium. The usual conditions of loan will apply.

Sincerely yours,

David J. Rogers
Associate Curator

DJR:SGA:gm

JAN 21 1969

The Rockefeller Foundation
111 WEST 50th STREET, NEW YORK, N.Y. 10020

AGRICULTURAL SCIENCES

CABLE: ROCKFOUND, NEW YORK
TELEPHONE: COLUMBUS 5-8100

January 17, 1969

Dear Dave:

Thank you for your recent letter inquiring into the possibility of support for continued research with Manihot esculenta. Inasmuch as we are providing substantial support to CIAT in Colombia in the development of research on tropical crops we would anticipate concentrating our limited grant support to species and problems which staff of that institute determine are to be their major interests in the future. May I suggest that you write directly to Dr. U. J. Grant, Director, International Center for Tropical Agriculture, Oficina 601, Carrera 13 No. 48-47, Bogota, Colombia, advising him of your interest in research and plans for leave of absence next year to spend 8-10 months in Latin America working with this species.

We are very interested to learn that you and John Popenoe have discussed the possibilities of establishing a more intensive investigation of cytogenetics problems in Manihot and in introducing species into the Fairchild Tropical Gardens.

Support for a graduate student of yours to join an assistant to Dr. Jorge Leon in a collecting expedition in northern Paraguay, southern Brazil and eastern Bolivia would again be contingent upon the degree of emphasis which CIAT staff expect to place upon this species. Additionally, we would of course require further background information concerning the capability of Dr. Leon's assistant and your graduate student.

I am sorry not to send you a more encouraging reply but do urge that you contact Dr. Grant concerning these proposals. We will expect to rely very heavily upon his recommendations.

Incidentally, Dr. Grant will also be able to provide you with the latest information on CIAT's development. We understand here that land has now become available in the Cauca Valley and that program definition and planning have been moving ahead very satisfactorily.

With best personal regards,

Sincerely yours,

Ralph

R. W. Richardson, Jr.
Associate Director

Dr. David J. Rogers
Professor of Biology
Taximetric Laboratory
Department of Biology
Armory 101
University of Colorado
Boulder, Colorado 80302

RWR:emw
cc: Dr. U. J. Grant

7 January 1968

Dr. Jorge Leon
FAO of the UN
Via delle Terme di Caracalla
Rome, Italy

Ref: PL 10/19

Dear Jorge:

I enclose a letter written to the Rockefeller Foundation for help to support a trip to the regions mentioned in your letter. You will note that my request was for the travel for one individual. However, if additional funds for you are needed for equipment or other necessary expenses to make this trip a useful one, I am certain that I can expand the request to include those items as well. I think the Rockefeller Foundation now is more willing to support efforts in the direction of Manihot than they have been in the past. I hope that this is true.

You will note that in the copy of the letter also that Dr. John Popenoe, Director of the Fairchild Garden in Miami, has become interested in Manihot also. I am hoping that he will be able to establish a considerable collection of wild species and we are attempting to work together now toward the establishment of some good work in cytogenetics. Incidentally I have also seen the work done by Varón at Palmira. There is certainly good work there but the Cauca Valley is so rich in soils that almost any good program would be successful. I am also interested in the experimental work in Colombia done at Villavicencio for the llanos.

It is certainly a pleasure to see FAO's new interest in Manihot. I recall in my early days of investigation that FAO took a dim view of the crop. That it has changed its attitude is praise-worthy. I will keep you informed of the results of the Rockefeller Foundation's decision.

Thanks for your letter. With best wishes for the New Year,

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm
Enc - copy letter to R Richardson

Taximetrics Laboratory

Armory 101

23 January 1969

Dr. U. J. Grant, Director
International Center for Tropical Agriculture
Oficina 601
Carrera 13, No. 48-47
Bogota, Colombia

Dear Jerry:

You have probably received a copy of the letter by Ralph Richardson by now. I had written to him inquiring about support for two kinds of studies of yuca, one for myself and one for support of travel for collecting wild species of Manihot for a student of mine. As his reply to me suggests I should contact you to determine whether these types of endeavors fall under your interest at CIAT.

For my own requirements I am expecting a leave of absence from the University sometime next year and would like to spend eight to ten months making observations which I have never had an opportunity to do. This would include, for example, some of the following:

Overall development of the plant from initial stages through maturity to discover time of initiation of root enlargement and circumstances surrounding this initiation;

Foliage production (quantitative and qualitative);

Initiation of flowering;

Observation of pollination mechanisms;

Fruit and seed development;

Sites of production of HCN, and variation of production rates.

I expect to work at some experimental site, perhaps at Palmira, if such an arrangement would be agreeable to you. The reason I want to do the study is that we simply have never documented the growth habits of these plants and this information is necessary for me to make a fundamental contribution to the botanical aspects of the crop. To accomplish the work I would need travel funds and salary as well as a small sum for equipment and supplies.

We have an opportunity to get some wild species of the genus for cytogenetic analyses by cooperating with Jorge Leon and his assistant whose laboratory is established in Lima in the IAIAC, Andean Zone. As you may know, Dr. Leon has long had an interest in yuca and he and I have worked informally together for a number of years. We have both recognized that one of the areas of great significance for wild species is in the area of southern Brazil, northern Paraguay and eastern Bolivia and have

projected a trip into that area to bring back living and dried materials of the wild species. Dr. Leon is capable of supporting himself and his assistant on this travel but cannot provide any support for my student. I would like very much to send a Ph.D. candidate of mine on this trip, and he needs travel and expense support. We would, if we had support from Rockefeller, naturally supply you with material of these species to be brought into a germ plasm garden for CIAT.

As I indicated in my letter to Dr. Richardson, Dr. John Popenoe of the Fairchild Tropical Garden and I are working together toward the establishment of a collection of species in Miami for purposes of cytogenetic analysis. My student would be responsible for sending material to Dr. Popenoe as well as to CIAT.

I hope that these requests are within the scope of your interest in yuca and that we might apply formally to you for funds to support these efforts. I will also be interested to hear of the developmental plans for CIAT and whether you are intending to investigate yuca. Looking forward to a favorable reply,

Best regards,

David J. Rogers
Professor of Biology

DJR:gm
DD: Dr. Jorge Leon
Dr. John Popenoe

20 January 1968

Dr. G. T. Prance
INPA
Caixa Postal 478
Manaus, Amazonas. Brazil

Dear Ian:

Through the good offices of Dr. John Popenoe of the Fairchild Tropical Garden, address 10901 Old Cutler Road, Miami, Florida 33156, we have the opportunity to establish a garden of Manihot species. I would therefore have to burden you with the task of picking up some of the wild species of Manihot and sending propagating material of these (seeds and stem cuttings, if possible). I suppose that wrapping the stem cuttings in wet newspsper and surrounding them with plastic would be as good a way as any to keep the material viable. I would hope that your relations with the Brazilian government will make it such that it will not be too difficult to export this material from Brazil. Of course, any expense on this operation will be assumed by me.

I am enclosing a plant quarantine sticker and the material should be addressed to Dr. John Popenoe. I hope you are having a successful adventure. Happy hunting!

We have now have Frank Bisby with us for six months. He is a very promising young fellow and we are pleased that Frank White saw fit to send him over. He will, I hope, in the six months here pick up a sufficient amount of our operational procedure to carry on at Oxford. At least that is our objective.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm
Enc.

Dr. Howard S. Irwin
Seccao do Taxonomia Vegetal
Inst. Central de Biologia
Univ. de Brasilia
BRASILIA, D. F.
Brazil

Dear Howard,

Through the good offices of Dr. John Popenoe of the Fairchild Tropical Garden, address 10901 Old Cutler Road, Miami, Florida 33156, we have the opportunity to establish a garden of Manihot species. I would therefore have to burden you with the task of picking up some of the wild species of Manihot and sending propagating material of these (seeds and stem cuttings, if possible). I suppose that wrapping the stem cuttings in wet newspaper and surrounding them with plastic would be as good a way as any to keep the material viable. I would hope that your relations with the Brazilian government will make it such that it will not be too difficult to export this material from Brazil. Of course, any expense on this operation will be assumed by me.

I hope you are having a successful adventure into Minas Gerais and other parts. Happing hunting -

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm
P.S. I am enclosing a plant quarantine sticker and the material should be addressed to Dr. John Popenoe.

December 20, 1968

Dr. Howard S. Irwin
The New York Botanical Garden
Bronx, New York 10458

Dear Howard:

It was good to talk to you even for the short time we had. With respect to an individual who might be considered by you to head your data processing activities and at the same time be knowledgeable about plant taxonomy, I was reminded today by George that there is a young man, Kent Bridges, now getting his degree under Arthur Boughey at the University of California, Irvine, (Department of Population and Environmental Biology). We have met him once when he came Here for the demonstration. He was very knowledgeable about computers having spent time with systems at the University of California. We do not know anything about his botanical competence but you can check with Arthur Boughey if you like. I frankly would suggest a telephone call rather than a formal letter to investigate this matter. Possible you might also check with Herb Wagner who may have a student who has the necessary botany and computer knowledge.

Once again thanks for your time on Saturday. Have a good trip to Braxil and bring me back some more Manihot goodies.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

January 3, 1969

Dr. Ralph W. Richardson, Jr.
The Rockefeller Foundation
111 West 50th Street
New York, New York 10020

Dear Ralph:

I write to inquire about the possibilities for a grant to continue research with Manihot esculenta. I am just finishing up the basic classification of the cultivars, and now am ready to proceed with other studies on the species. I hope to be able to get a leave of absence from the University one year from now, and need assistance to spend eitht to ten months in Latin America (site not yet definite) working directly with the plants in their normal growing regions.

In addition to my own support, I would like to help with work now developing at two other institutions, both of which want to establish germ-plasm gardens. Dr. John Popenoe and I have begun to consider possibilities of establishing a more intensive investigation of cytogenetic problems in Manihot, and need to bring viable materials to the Fairchild Tropical Gardens. Likewise, Dr. Jorge Leon (now on leave from his regular post in Lima, working as Plant Introduction Officer in FAO, Rome) and I have long desired to bring in living materials from northern Paraguay, southern Brazil and eastern Bolivia, an area rich in species and cultivars. Dr. Leon has an assistant whom he wishes to send into the aforementioned areas, and I would like to send a graduate student of mine with this expedition. He could bring materials back to both of the institutions mentioned, providing thereby a much better chance to compare growing plants and study varied problems. Funds needed in this case are to provide travel and subsistence funds for the graduate student.

I hope that you have funds available for this work. Incidently, I haven't heard any more about the development of CIAT. How is it progressing?

Sincerely,

Dr. David J. Rogers
Professor of Biology

Project Director

DJR:sw
CC:Dr. John Popenoe
Dr. Jorge Leon

ORGANISATION DES NATIONS UNIES POUR
L'ALIMENTATION ET L'AGRICULTURE

ORGANIZACION DE LAS NACIONES UNIDAS
PARA LA AGRICULTURA Y LA ALIMENTACION

FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

Via delle Terme di Caracalla ROME | Cables: FOODAGRI ROME | Telex: 61181 FOODAGRI | Telephone: 5797

Ref. PL 10/19

DEC. 19 1968

Dear Dave:

You may recall that some months ago we discussed by letter the possibility of organizing exploratory work in cassava in Paraguay and the adjacent lowlands of Bolivia and Brazil. This is the richest area and has never been explored properly.

My idea, when I was in Lima, was to assign this job to Ingeniero Julio Rea, then my assistant. Rea has a general knowledge of the area and has done some work on variability in yuca, and he is the most suitable person for the job. At present, he is working under Dr. Fernández, and it would be necessary to see if he is available. Even in that case, the contribution that IAIAS/Andean Zone would make, would have to be augmented by other funds - for travel and other expenses. FAO is especially interested in obtaining this material, both for the American and for other continents, so they may contribute with some funds. If you could contribute also, I think the economic side of the expedition would be covered. But I don't want to see too many organizations mixed in what is a small expedition.

Regarding the establishment and maintenance of the collection, I think this could be arranged by Dr. Fernández. He may find out which is more convenient - if one or several sites.

During a recent trip to Colombia, I was very impressed by the work done in Palmira by Ingeniero Luis Alberto Varón at the CINA, but there are other places.

Dr. David J. Rogers
Department of Biology
University of Colorado (Armory 101)
Boulder, Colorado 80302
U. S. A.

As you may see, this is all in a preliminary stage. I am forwarding a copy of this letter to Dr. Fernández, and I suggest that you also send copies of your letter to keep him completely informed.

With best wishes for Christmas and New Year.

Yours sincerely,

Jorge León
Plant Introduction Officer
Crop Ecology and Genetic Resources Branch
Plant Production and Protection Division

copy for Fernandez

UNIVERSITY OF COLORADO

BOULDER, COLORADO 80302

TAXIMETRICS LABORATORY
DEPARTMENT OF BIOLOGY
ARMORY 101

PHONE: 303-443-2211
Ext. 6712

7 January 1969

Dr. Jorge León
FAO of the UN
Via delle Terme di Caracalla
Rome, Italy

Ref: PL 10/19

Dear Jorge:

I enclose a letter written to the Rockefeller Foundation for help to support a trip to the regions mentioned in your letter. You will note that my request was for the travel for one individual. However, if additional funds for you are needed for equipment or other necessary expenses to make this trip a useful one, I am certain that I can expand the request to include those items as well. I think the Rockefeller Foundation now is more willing to support efforts in the direction of Manihot than they have been in the past. I hope that this is true.

You will note that in the copy of the letter also that Dr. John Popenoe, Director of the Fairchild Garden in Miami, has become interested in Manihot. I am hoping that he will be able to establish a considerable collection of wild species and we are attempting to work together now toward the establishment of some good work in cytogenetics. Incidentally I have also seen the work done by Varón at Palmira. There is certainly good work there but the Cauca Valley is so rich in soils that almost any good program would be successful. I am also interested in the experimental work in Colombia done at Villavicencio for the llanos.

It is certainly a pleasure to see FAO's new interest in Manihot. I recall in my early days of investigation that FAO took a dim view of the crop. That it has changed its attitude is praise-worthy. I will keep you informed of the results of the Rockefeller Foundation's decision.

Thanks for your letter. With best wishes for the New Year,

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

THE UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURE
ATHENS, GEORGIA 30601

DIVISION OF HORTICULTURE

January 2, 1969

Dr. David J. Rogers
Professor of Biology
The University of Colorado
Boulder, Colorado 80302

Dear Professor Rogers:

Thank you for your helpful letter of 20 December 1968.

I have forwarded your letter to Dr. C. H. Hendershott, Head of the Department and Dr. C. C. Murray, Regents Professor in charge of foreign programs for the University of Georgia, who originated the request for a proposal. I hope one of them will be able to take advantage of your kind offer.

Yours sincerely,

Francis E. Johnstone, Jr

Francis E. Johnstone, Jr
Professor

FEJ/kas
cc: Dr. Hendershott

20 December 1968

Professor Francis E. Johnstone, Jr.
Division of Horticulture
College of Agriculture
University of Georgia
Athens, Ga. 30601

Dear Dr. Johnstone:

Thank you for your letter of December 11. As you have already suspected, I am quite interested in the study of cassava. In as much as there is a very great amount of work to be done from the very basic type of research up through the various agricultural problems to economics, it is almost impossible to pin point new projects which might specifically interest you.

I have recently served as a consultant to the Rockefeller Foundation for the development of an extensive research program on cassava which hopefully the Rockefeller people will incorporate in the new Lowland Tropical Research effort in Cali, Colombia. In that capacity as a consultant I designed for them a very extensive research and development program. I am not certain that the information included in the report to them is privy but I definitely would not care to release such a document without their prior approval.

With the above considerations in mind I would like to recommend that you come here to Boulder so we may spend a day or two discussing the kind of effort which we would find most meaningful. I hope that this is possible for you to do. If not, perhaps we would find it helpful for me to act as a consultant for you in your effort. Please let me know which of these proposals is most feasible for you.

Sincerely yours,

David J. Rogers
Professor of Biology

DJR:gm

THE UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURE
ATHENS, GEORGIA 30601

DIVISION OF HORTICULTURE

DEC 17 1968

December 11, 1968

Dr. David J. Rogers
Department of Botany and Plant Pathology
Colorado State University
Fort Collins, Colorado 80521

Dear Dr. Rogers:

I have been asked by our administration to propose a research projects or a program of several research projects and extension activities designed to extend the usefulness of Cassava in tropical countries. Presumably this work will be done in Brazil.

I know very little about Cassava. My tropical experience consists of two years horticultural advisory work in Cambodia and Vietnam and several short trips to Sierra Leone and some South Pacific islands. I have never worked with Cassava. In searching the literature files, I find you are listed as the author of a number of publications on Cassava. I note also that there is considerable research reported on this crop.

I would appreciate your ideas or suggestions of new projects or programs needed for improving the use of this crop. Any literature reprints or other information would be welcomed. Thank you in advance for any help you can give us.

Yours truly,

Francis E. Johnstone, Jr.

Francis E. Johnstone, Jr.
Professor of Horticulture

CC Dr. C. H. Hendershott
Head, Dept. of Horticulture

2 December 1968

Dr. Carlos E. Fernandez
I.I.C.A. - Zona Andina
Apartado 478
Lima, Peru

Dear Dr. Fernandez:

We had hoped to hear by now from Dr. Jorge Leon about the details of the Manihot program but to date have received no information about it. You will recall that earlier I wrote asking about about the collection expedition that was at least projected. Since the time is becoming short that we need to make arrangements to support the travel of my graduate student, I wonder if you can give me details about your proposal so that I may make plans for any additional support needed from me. Would you please also give me Dr. Leon's address in Rome?

Best regards.

Sincerely yours,

David J. Rogers
Professor of Biology

DJR:cm

INSTITUTO INTERAMERICANO DE CIENCIAS AGRICOLAS DE LA OEA

El Instituto es un organismo especializado de la Organización de los Estados Americanos. Fué establecido por los Gobiernos de las Repúblicas Americanas en 1944 para promover su desarrollo económico y social a través de la educación y la investigación.

ZONA ANDINA
Apartado 478
Lima, Perú
Cables: IICA - Lima

ZA/INV-287

October 31, 1968

Dr. David J. Rogers
Professor of Biology
Taximetrics Laboratory
Department of Biology
Armory 101
University of Colorado
Boulder, Colorado 80302

Dear Dr. Rogers:

I trust that Dr. Jorge León has already got in touch with you regarding the Manihot Program initiated by him, giving you the details of it.

As soon as we have any additional information, I will communicate with you again.

Sincerely yours,

Carlos Enrique Fernández
Research Program

CEF-agc

cc- Dr. León

27 August 1968

Dr. Carlos E. Fernandez
I.I.C.A.
Apartado 478
Lima, Peru

Dear Dr. Fernandez:

Jorge Leon has told me of your work with Manihot. He further iddicated that you probably would be in charge of a collecting expedtition some time next year. Earlier I had suggested to Dr. Leon that I would like to have one of my students accompany that expedition.

I would be very pleased if you could let me know the proposed objectives of the collecting expedition and the proposed area where you expect to make collections. Perhaps my graduate student could be added as a team member if the expedition if we can find satisfactory funds to aid in his living and allied expenses.

I would be pleased to hear from you soon concerning your plans.

Sincerely yours,

David J. Rogers
Professor of Biology

DJR:gm

INSTITUTO INTERAMERICANO DE CIENCIAS AGRICOLAS DE LA OEA

El Instituto es un organismo especializado de la Organización de los Estados Americanos. Fué establecido por los Gobiernos de las Repúblicas Americanas en 1944 para promover su desarrollo económico y social a través de la educación y la investigación.

ZONA ANDINA
Apartado 478
Lima, Perú
Cables: IICA - Lima

ZA/INV-167

Lima, July 23, 1968

Dr. David J. Rogers
Professor of Biology
Taximetrics Laboratory
Department of Biology (Armory 101)
University of Colorado
Boulder, Colorado 80302
U. S. A.-

Dear Dave:

The yuca project has been revised and probably the expedition will take place some time next summer. Dr. Carlos E. Fernández will be incharged of the work and he will let you know the details.

Without your permission I made reprints of the photographs showing a yuca on the field and attached it to forms in which the information of the different clon is being collected. I hope you will not mind.

I am moving to F.A.O., Rome, to work on a germplasm project. I will write you about details.

With best regards,

Sincerely yours,

M. Alvarez
p Jorge León
(Letter dictated by Dr. J. León on July 18, and signed in his absence)

JL/mau

14 October 1968

Sr. Alvaro Montaldo
Apartado 97
MARACAY, Venezuela

Dear Sr. Montaldo:

The magnificent "Bibliografia" arrived today. You have done a very find job on this, and are to be congratulated. I trust that we can extend this work together as new material comes along.

I would be very pleased if you can come to work with us for a while here in Boulder. I have some ideas about new computer procedures for producing bibliographies which we might work on together. I will be pleased to ask you to consider the possibility of working here.

Sincerely yours,

David J. Rogers
Professor of Biology

DJR:gm

28 August 1968

Dra. Nuesa Diniz da Cruz
Instituto Agronomico
Caminas, S. P., Brazil

Dear Dra. Cruz:

Thank you very much for sending separates describing the species Manihot jolyana. Because we are making a world monograph of the genus Manihot it is very important for us to incorporate your new species into our study. We would be pleased, therefore, if you would send on load the specimen cited in your description of this species, including any allied material to your own holotype.

Thank you for your consideration.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

SECRETARIA DA AGRICULTURA
INSTITUTO DE BOTÂNICA

Caixa Postal 4005, São Paulo (SP) Brazil

N.º.....

30 July 1968

Dear Dave:

I recently saw at the Instituto Agronômico in Campinas a long bibliography on all phases of mandioca, including its botany. I thought you might be interested in obtaining a copy by writing them. It is Boletim 182, "Bibliografia da mandioca". It costs 5 new cruzeiros. Since the exchange rate now is about 3,30 cruzeiros (3 cruzeiros and 30 centavos), I imagine if you sent a check for US $1.70 it would cover the price and postage.

By the way, did you ever describe that new species of Manihot I sent you the seeds of? I have to know because the article on that region will come out soon. If you want to describe it please do so anywhere (or if you wish, in my article). If you have no time, I'd do it, but I'd rather you did since you recognized it as new.

Yours truly,

George Eiten

P.S. How's things? Please send any reprints of yours that I don't have yet.

Taximetrics Laboratory

Armory 101

27 August 1968

Dr. George Eiten
Caixa Postal 4005
Sao Paulo (SP), Brazil

Dear George:

Thanks for your letter of 30 July. I have already received the bibliography on mandioca and have corresponded with its author.

I am sorry to say that the Manihot species seeds which you sent when we were in New York died. The usual care of the plants was given by the gardners of the N.Y.B.G. It seems that I do not have any herbarium material of that species, and therefore am in no position to describe it. In as much as I have to borrow all of your Manihot material from Sao Paulo would you be kind enough to include your collection of that species along with that general loan. Furthermore, is it proper for me to ask you directly for the loan of Manihot from your Herbarium? Or should I write a letter to Alcides to make the request for the loan formal? If it is proper to ask for the loan through you could you consider this letter to be a formal request to send the materials? I know that this lady, Nuesa da Cruz in Campinas, has described a new species of Manihot from Sao Paulo State. It is certain that I have to see this species in order to incorporate it into my monographic studies.

Our efforts here are bent mostly toward developing a new computer programming method for taxonomy. Our latest efforts are to develop an information retrieval system for taxonomy. We have not yet made any formal publication on this system but now have it just about completed and ready to be tested in several different museumssettings. Some of our other efforts in this line can be seen from the reprints which I am sending separately.

Thank you for your letter, and best regards to all there in Sao Paulo.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

2 July 1968

Dr. Howard S. Irwin
The New York Botanical Garden
Bronx Park
Bronx, New York 10458

Dear Howard:

The enclosed letter of comments is self-explanatory. I am sending whatever reprints I have available and from reading the comments you will be able to see which ones you will have to have Xeroxed. I still think that the only way to get Brieger into the right frame of mind is to have him visit us some way or other.

With regard to the root specimens I am sorry that I have not previously indicated the real significance which these root specimens have for us. They are very important. For that reason I will ask you the favor of going to the extra bother of returning those which you have sorted out according to your letter of June 28.

Thank you for your efforts.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

JUN 19 1968

UNIVERSITY OF CALIFORNIA, DAVIS

BERKELEY · DAVIS · IRVINE · LOS ANGELES · RIVERSIDE · SAN DIEGO · SAN FRANCISCO · SANTA BARBARA · SANTA CRUZ

DEPARTMENT OF BOTANY

DAVIS, CALIFORNIA 95616

June 13, 1968

Dr. David J. Rogers
Taximetrics Laboratory
Department of Biology
University of Colorado
Boulder, Colorado 80302

Dear Dave:

Before I could answer your previous letters, your latest of May 29 arrived with the reference form for the Fulbright application. I will be glad to do what I can on your behalf. Your project certainly looks exciting, and it should be a wonderful way to spend a year. As a matter of fact, I have had a very similar idea in mind for spending my sabbatical leave in 1970-71 or 71-72. This summer I hope to spend a few weeks in Queensland hunting for rain-forest euphorbs, and may be able to give you some suggestions after that. Of course the desert species are probably the most interesting, and I will not be seeing any of those. Maybe after both our trips we can start a gigantic survey of the euphorbs of Australia.

We have three new prospective graduate students in taxonomy coming this fall, but I have not been able to get any of them to agree to spend a semester in your lab during the coming year. Two of them are married and feel the logistics problem is insuperable, while the third one may still change his mind. I will let you know if there are any further developments.

We are sending you a package containing 14 miscellaneous specimens of euphorbs for your lab or herbarium. The sheets of Manihot are mostly (perhaps all) duplicates of collections sent to you before; ones which are duplicated you are welcome to keep, or you can return them sometime. Most of the euphorbs collected in 1962 are still not distributed, but if I can get some help around here next year, you may be receiving another shipment.

Sincerely,

Grady

Grady L. Webster
Director of the Arboretum

GLW:bl

3 July 1968

Dr. Grady Webster
Department of Botany
University of California
Davis, California 95616

Dear Grady:

Thanks a heap for your recommendation for me on the Fulbright to Australia. I think it would be wonderful if we could have a collaborative "go" at the Euphorbs of that continent. I would be pleased to hear what you have to say after your sojourn in Queensland.

We will hope that your graduate student (the unencumbered one) does indeed decide to join us for a session of taximetrics.

Your materials on Manihot, Stillingia and others has arrived. We are pleased to have them. The Manihot specimens are all "dups" of ones of yours we have already but provide good additional information. Do you mind if I mount these up? We would rather work with them that way than chance the complete fragmentation of the material kept in newspaper. They will of course be returned after we have done our job.

I hope your field work is successful and I look forward to hearing from you on your return.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

Taximetrics Laboratory

Armory 101

18 July 1968

Dr. A. G. G. Menon
Agricultural College and Research Institute
Vellayani P.O.
TRIVANDRUM, Kerala, India

Dear Dr. Menon:

Thank you very much for sending a copy of your paper on the effects of Seradix on the yield of tapioca.

I am sending some papers on Manihot which may be interesting to you.

Sincerely,

David J. Rogers
Professor of Biology

DJR:qm

A. G. G. MENON, M. Sc. (Ag), M. S. U. S. A.
Professor of Extension.

AGRICULTURAL COLLEGE & RES. INSTITUTE
VELLAYANI. TRIVANDRUM

9th July 1968.

To

Dr.David J.Rogers,
Professor of Biology,
Taximetrics Laboratory,
Department of Biology,
ARMORY101,
University of Colorado,
Boulder, Colorado, U.S.A.

Dear Dr.Rogers,

Please find enclosed a copy of the article you desired in your letter dated 27th June 1968.

More material on the subject can be had from Indian Council of Agricultural Research, Krishi Bhavan, New-Delhi.

With Compliments.

Yours faithfully,

(A.G.G.Menon)

UNIVERSITY OF CALIFORNIA, DAVIS

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO — SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF BOTANY — DAVIS, CALIFORNIA 95616

April 18, 1968

Dr. David J. Rogers
Taximetrics Laboratory
Department of Biology
University of Colorado
Boulder, Colorado 80302

Dear Dave:

I was just about to answer your last letter when the one of April 16 arrived. As it happens, I am beginning to sort out the 1962 Mexican collections this week, and the label of Manihot pringlei is at hand. We collected it 15 miles by road southwest of Ciudad Victoria on the road to Jaumave, as you guessed. It was growing on a steep hillside of large boulder-rubble on one of the main ridges, from which you could look back down the winding road and see Victoria in the distance. We saw it only at the one spot, but as we were not particularly hunting for Manihot there (the main target being Cnidoscolus), it may well have been present in other places in the area.

Your trip sounds like it will be fun. I hope you will remember to gather us extra euphorb seed-capsules when it is not inconvenient. We are especially interested in getting more accessions of Cnidoscolus, Croton, Jatropha, and Sebastiania.

With regards to the information retrieval field, I have a new graduate student coming in during the fall who will be brainwashed into working on either Croton or Cnidoscolus. It might be possible to send him to your lab for one quarter, as he is on an NSF fellowship and will not have to teach. Much as I would like to come and see your set-up myself, it will not happen soon, as I am spending the summer on a field trip to Fiji and New Caledonia looking for primitive euphorbs, and will probably be tied down with teaching in the fall.

By all means keep us posted on developments. Do you still recommend, for example, to start off using the port-a-punch system when recording data for a new study?

Sincerely,

Grady

Grady L. Webster
Director of the Arboretum

GLW:bl

SMITHSONIAN TROPICAL RESEARCH INSTITUTE

P.O. Box 2072
BALBOA, CANAL ZONE
29 April 1968

Dr. David J. Rogers
Taximetrics Laboratory
Dept. of Biology, Armory 101
University of Colorado
Boulder, Colorado 80302

Dear Dave:

My 1957 collection data book is on the Island, but I remember the Manihot and the locality quite well. Aldama, or Villa Aldama, is reached by a side-road from the Ciudad Mante - Tampico highway. The 1959 Humble road map shows the road as leaving from the town of Manuel, after González and about 47 miles from Mante. I think that this is correct. From Aldama there was a bad, rocky dirt road to Rancho Las Yucas (one branch worse than the other). The road may be much better by now. If not, one can hire local transportation.

When you get to Las Yucas, please give my greetings to Don Ignacio González. He and his family are very nice people, and very helpful. As I recall, the Manihot was on a steep, rock slope of the hill behind the ranch-house, and within sight of the house. I would guess about half-way up, but it is only a guess. The people there do not know the word "yuca," as such, and were much interested when I suggested that the ranch might have gotten its name from the plant.

Good luck.

Sincerely,

Bob

R. L. Dressler

24 May 1968

Inter Documentation Co.
Researc h Publishers N.V.
Rijnsburgerweg 177
Leiden, The Nederlands

Gentlemen:

Can you tell me, please, if microfisches of the actual specimens of the De Candolle Prodromus Herbarium exist? I am particularly interested in the specimens representing the genus Manihot. Is it possible to buy separate parts of the Prodromus Herbarium microfische?

Will you please let me know the answers to these questions, and the prices?

Sincerely,

David J. Rogers
Professor of Biology

DJR:am

McGILL UNIVERSITY
MONTREAL

Botany Department

May 7, 1968

Dr. David J. Rodgers,
Taximetrics Laboratory,
Department of Biology,
Armory 101,
Boulder, Colorado 80302,
U.S.A.

Dear David:-

I am afraid that I cannot help you with the nomenclatural problem. I never came across a term which does describe the distance you are interested in. And I could not get any information from the literature available here at McGill. I doubt that any word exists for this distance. But I am not quite sure about this.

All, I think, I can do for you is to make a number of suggestions. You could write either to Dr. Shirley Tucker, 1022 Baird Dr., Baton Rouge, Louisianna 70808 or Dr. Elisabeth Cutter, Botany Dept., University of California, Davis, Calif. If anyone knows such a word, these two persons are perhaps the most likely ones to know it. Another possibility would be to coin a term, or to use a descriptive phrase like "the distance between two leaf scars of an orthostichy" Still another possibility would be to use the terms internode and node. In the case of 2/5 phyllotaxy two leaf scars along one orthostichy are separated by 5 internodes and 4 nodes. If you take the measurement from the centre of one leaf scar to the centre of the other, than you would have to add 2 x 1/2 internode; hence, the 2 scars would be separated by 5 internodes and 5 nodes. Now, since the length of 5 internodes plus 5 nodes is a useful taxonomic characteristic, the length of 1 node (or 1 node + 1 internode) should be of the same usefulness.

Perhaps one of these suggestions is of a little help to you. I am sorry that I cannot give you a direct answer to your question.

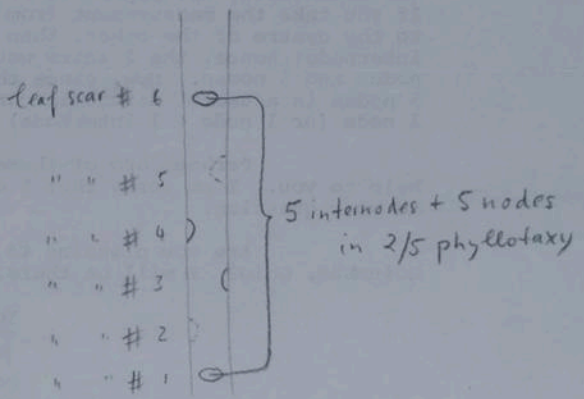
Are you planning to attend the AIBS meeting at Columbus, Ohio? I will be there, and I would be glad to meet you.

Yours sincerely,

Rolf Sattler,
Assistant Professor of Botany

RS:emf

over →



1022 Baird Drive
Baton Rouge, La. 70808
May 20, 1968

Dear Dr. Rogers,

Since receiving your letter of inquiry, I've given some thought to your problem of finding a term for the stem segment between superposed leaves. No specific term exists that I know of, and no one else has used this segment experimentally, to my knowledge. (I assume you mean superposed leaves, as you say the plant has 2/5 phyllotaxy.)

I would suggest that you make up your own term, as do most workers dealing with phyllotaxic problems; so often a new plant presents a need for new terms. If the leaves are truly in a vertical row, you could call it an "orthostichous interval" or "orthostichous unit", etc. If the vertical row is canted, it is a parastichy, and you could use "parastichous interval". Then you can define this unit or interval, in terms of Manihot.

I may have misinterpreted your explanation of the interval you are working with; I assume you mean the distance between leaves 1 and 6, 6 and 11, etc. If you alternatively mean the internode distance between one node and the next, I would think the term internode would do (this would be the distance between leaves 1 and 2, 2 and 3, etc.)

Sincerely,

Shirley Tucker

Shirley Tucker

Reply - May 24
Postcard - I gave me [illegible]
a ref.

13 May 1968

Dr. Shirley Tucker
1022 Baird Drive
Baton Rouge, Louisiana 70808

Dear Dr. Tucker:

In the last few weeks I have been attempting to discover a term in descriptive morphology and wonder if by chance I might enlist your aid in finding the appropriate terminology.

In my studies of the systematics of Manihot esculenta I have used a character with three states which essentially measures the distance on the mature stem between one node and the next node directly above it. This is a convenient measure but I have no term to describe the character: that is, the term for this distance. I understand that the term for nodes directly one above the other, in a line, is the orthostichy - this term, however, does not define the actual distance. My plants have a 2/5 phyllotaxy.

I wonder if I may impose on your time and knowledge to suggest an appropriate term.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

13 May 1968

Dr. Elisabeth Cutter
Botany Department
University of California
Davis, California 95616

Dear Dr. Cutter:

In the last few weeks I have been attempting to discover a term in descriptive morphology and wonder if by chance I might enlist your aid in finding the appropriate terminology.

In my studies of the systematics of Manihot esculenta I have used a character with three states which essentially measures the distance on the mature stem between one node and the next node immediately above it. This is a convenient measure but I have no term to describe the character: that is, the term for this distance. I understand that the term for nodes directly one above the other, in a line, is the orthostichy - this term, however, does not define the actual distance. My plants have a 2/5 phyllotaxy.

I wonder if I may impose on your time and knowledge to suggest an appropriate term.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

2 May 1968

Dr. Robert L. Dressler
Smithsonian Tropical Research Institute
P. O. Box 2072
Balboa, Canal Zone

Dear Bob:

Thank you for your prompt answer to my query about *M. Pringlei*. We will most likely visit your locality and we will certainly give a greeting to Don Ignacio.

I am sorry that you didn't give me a run-down on your present activities. I would like to hear what's cooking with the orchids, etc.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

2 May 1968

Dr. Grady L. Webster
Department of Botany
University of California
Davis, Calif. 95616

Dear Grady:

Thanks for the information on Manihot Pringlei. I hope we can get back to your locale for it.

We would be pleased to have your graduate student come and spend time with us. It would be preferable for him to take our course in Taximetrics. He could at the same time do some preliminary work with either Croton or Cnidoscolus. The only problem that I can see is that we are on the semester system. Could you spare him for two quarters - say winter and spring? Let's try to make some accomodation for this fellow. Could you let me have a little of his past experience.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

1 May 1968

Monsieur le Professeur J. Miege
Conservatoire et Jardin Botaniques
Route de Lausanne 192
Geneve, Switzerland

Dear Professor Miege:

I would be pleased if you could tell me whether microfisches are available for the Manihot species of the DeCandolle Herbarium. If microfisches can be obtained would you please let me know theircost.

Thank you for your attention and information.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

1 May 1968

Dr. Rolf Sattler
Botany Department
McGill University
Montreal, Quebec

Dear Rolf:

I wonder if you can help me with a problem in descriptive nomenclature. In my study of Manihot esculenta I have found that a useful characteristic is the distance on the stem from one leaf scar to the next scar directly above it. I have not been able to find a term which describes that distance.

Knowing of your interest I thought that perhaps you might be able either to tell me the word used to describe such a distance or to give me a reference wherein such may be found. I believe that the phyllotaxy of M. esculenta is a 2/5 phyllotaxy (alternate leaves) Different cultivars of Manihot may be differentiated on the basis of the distances from one scar to the next directly above it. I am aware of the fact that one describes the lines passing through the vertical of the leaf scars as orthostichy but this does not tell me the descriptive word I need. I hope that it will not be too difficult for you to help me with this problem.

Thank you.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

24 April 1968

National Weather Records Center
Federal Office Building
Asheville, N. C. 28801

Gentlemen:

I have been told that you could provide information concerning actual rainfall records for Mexican localities.

I am interested to know the amount of rain (if any) that has fallen in the vicinity of Ciudad Victoria, state of Tamaulipas, Mexico, from February 1st of this year to the present time; and the same for the cities (towns) of Mante and Valles in the state of San Luis Potosi. The reason for my interest is that I want to collect some plant materials in these regions, and the plants are particularly dependent upon recent rains for their best growth and development. Without recent rains, the plants may remain in a dormant condition without leaves, and in this condition, they are next to impossible to locate.

Could you, at the same time, discover whether last year's hurricane dropped any rain on the above mentioned localities.

I will be most appreciative of any such information you can provide.

Sincerely,

David J. Rogers
Professor of Biology

DJR"gm

8 May 1968

Dr. Jorge Leon
I.I.C.A. de la O.E.A.
Zona Andina
Apartado 478
Lima, Peru

Dear Jorge:

I was very pleased to receive your paper yesterday and I am glad to see you are progressing with studies of yuca. In as much as we both have some similar objectives I wonder if I could not provide you with some assistance with your studies there. If you are interested, we can provide a computer-based classification of your cultivars. We could also provide you with the information which tells how your varieties are related to varieties all across the distribution of the species.

Assuming that you are interested in collaborative work, I am taking the liberty to suggest some procedures for gathering the information necessary to make a computer-based classification. Specifically I am enclosing with this letter a list of field data which should be consistently gathered for each cultivar. This list of data can be exnanded as you like but the pieces of information are the ones that we have found useful so far in our classification.

We feel that it is vital to study the herbarium specimens which are the documents on which we will have to base the classification. We would therefore like to have a herbarium specimen from you for each of your cultivars made according to the enclosed recommended procedures, including the listed field data.

I hope that we can collaborate in this endeavor. If you find these suggestions meaningful and interesting, let me know.

I hope that you will have some information about the projected trip into Paraguay and southern Brazil soon. I believe that the Rockefeller Foundation is interested sufficiently to aid in supporting such a collecting expedition. I would be glad to contact them in your behalf (and mine).

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

INSTITUTO INTERAMERICANO DE CIENCIAS AGRICOLAS DE LA OEA

El Instituto es un organismo especializado de la Organización de los Estados Americanos. Fué establecido por los Gobiernos de las Repúblicas Americanas en 1944 para promover su desarrollo económico y social a través de la educación y la investigación.

ZONA ANDINA
Apartado 478
Lima, Perú
Cables: IICA - Lima

ZA/INV-74

Lima, April 30, 1968

Dr. David J. Rogers
Professor of Biology
Department of Biology
Armory 101A
University of Colorado
Boulder, Colorado 80302
U. S. A.

Dear Dave:

Enclosed is a copy of the paper sent to the meeting in Caracas.

I still don't know about the expedition to collect cassavas in Paraguay and Brasil. Last year we got some clones from lowlands of Bolivia, which were planted here at the Agrarian University. As soon as the plans for the trip are decided, I let you know.

With best regards,

Jorge León

JL/mau

FILE

UNIVERSITY OF COLORADO

BOULDER, COLORADO 80302

TAXIMETRICS LABORATORY
DEPARTMENT OF BIOLOGY
ARMORY 101

PHONE: 303-443-2211
Ext. 6712

9 April 1968

Dr. Jonathan D. Sauer
Department of Geography
University of California
Los Angeles, Calif. 90024

Dear Jon:

I was pleased to get your reprint on Geographic Reconnaissance of Seashore Vegetation along the Mexican Gulf Coast - I guess more technically it is not a reprint but a separate publication. As usual with all the rest of your papers I have read, it was very enjoyable. I was particularly pleased to see your comments on the origins of cotton and G. punctatum as a truly wild plant.

This leads me to ask if by chance you made any observations further back from the coast than reported here. As you know I have hypothesized that Manihot esculenta was first cultivated in the Yucatan and Meso-American regions. What I would like to know is how far north up the coast you could find, if you did notice, Manihot esculenta growing. About the most northerly representatives that I saw were at Boca del Rio, just south of Vera Cruz City. Were there any to the north of that that you ran into? Let me know your findings.

Thanks again for sending the paper.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

16 April 1968

Dr. Robert L. Dressler
Smithsonian Institution
Washington, D. C. 20560

Dear Bob:

I wonder if you could dredge up from your memory some knowledge of your collecting trip in the Sierra de Tamaulipas in 1957. We have a specimen of yours (#1913), Manihot Pringlei, collected 40 km NNW of Aldama on July 20, 1957. Were you on any sort of recognizable highway? If so, are there any landmarks which would tell something about what sort of habitat you might have found this specimen in? Was the 40 km a guess or an actual measure? Is the starting point, Aldama, a recognizable entity?

I hope you can jiggle your memory a little on this request because we are headed for that area and that species of Manihot particularly.

Thank you for your efforts.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

16 April 1968

Dr. Grady Webster
Department of Botany
University of California
Davis, Calif. 95616

Dear Grady:

On your Mexican field trip in 1962 collecting M. Pringlei (specimen #11229) 15 miles SW of Ciudad Victoria, please search your memory for additional locality information. We would like to put our hands on this plant on a proposed trip this summer. Any and all identifying features in the landscape that you can recall will be muchly appreciated. Were you on the road to Jaumave?

When do we hear from you about information retrieval?

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

Dr. A. P. Singh
M.S. (Maine), Ph.D. (Okla.)
Botanist

Indian Grassland & Fodder
Research Institute, Jhansi,
U.P., India

April, 2, 1968

Dear Dr. Rogers.

Sometime back when I was working on tuber crops at the Central Tuber Crops Research Institute, Trivandrum here in the state of Kerala I had received three of your publication reprints and they were quite informative in our research on Cassava in this country. I could know through Dr. Magoon that you also participated in the Symposium held at Trinidad in 1967 but so far I am unaware of the subject matter and the details of the paper you presented over there. Since then I had been looking for your publications. May I now request you to please send a set of your publications especially on classification side. My one paper on pollen studies in Cassava is in press and will be out very soon. I shall make it a point to send the reprint of it as soon as I have them.

While I was at Trivandrum I was told that some Indian student is working with you on Cassava as a problem for his Ph.D. degree. If so, it is very nice. During my stay in Oklahoma at the Stillwater Campus from 1960 to 1963 I was aware of the studies on numerical taxonomy that were in progress at the Colorado State University but somehow I missed the pleasure of meeting you there.

These days I am engaged in evaluation of grasses and legumes suitable for fodder purposes. At a latter stage, however, I plan to assess the potentialities of some of the root crops as green fodder.

Hoping to hear from you and with my kindest regards,

Truely yours

Singh

2/4/68

(A.P. Singh)

16 April 1968

Dr. A. P. Singh
Indian Grassland & Fodder Res. Inst.
JHANSI, U.P., India

Dear Dr. Singh,

Thank you for your letter. Our recent publications have dealt with the use of computers in classification, with emphasis on the methematical aspects of the problem. The paper which was presented in Trinidad was on a Computer-Aided Classification of Manihot esculenta Crantz, but that version has not been published, and it is being rewritten and expanded. At the present time we have no reprints to send you, but when the paper is published we will send you a copy.

Mr. S. G. Appan who was the farm manager at Trivandrum is working in our laboratory toward his PhD. He is an excellent student and his practical experience contributes to our studies.

We will be interested to see your paper on Cassava pollen.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

THE NEW YORK BOTANICAL GARDEN
BRONX • NEW YORK 10458 212/933-9400

APR 2 1968

March 29, 1968

Dr. David J. Rogers
Professor of Biology
University of Colorado
Boulder, Colorado 80302

Dear Dave:

Thank you for your letter of March 19. The punctuation of the field notes on specimen 2389 was incorrect. It should read as follows:

> "Capoeira on high sloping bank at Terra Firme on Rio Purus opposite Boca do Acre. Scandent, flowers white, fruit green, ribbed; leaves and young stems all green, woody stems grey."

I am sorry to have caused this confusion.

With best wishes.

Sincerely,

Ghillean T. Prance
Associate Curator

GTP:JT

correction made

Aerogramme

Taximetrics Laboratory
Department of Biology
Armory 101A
University of Colorado
Boulder, Colorado 80302
8 April 1968

Dr. Jorge Leon
Instituto Interamericano de Ciencias
Agricolas de la OEA
Apartado 478
Lima, Peru

Dear Jorge,

I have the summary of the paper you gave at the VII Reunion Latinoamericana de Fitotecnia. Have you a full copy of the text of that paper? If so I would be pleased to have one.

I have a student working on the genus Manihot and would like to have him do some field work collecting South American species. Have you thought anymore about sending collectors into the region of southern Brazil and northern Paraguay? Could you work up something for my student to go along?

Thanks and best regards.

David J. Rogers
Professor of Biology

DJR:gm

4 March 1968

Dr. Jerome H. Maner
Animal Science Department
Iowa State University
Ames, Iowa 50010

Dear Jerry:

Would you be kind enough to send me all the reprints you have giving production data with yuca as the fedding medium? I would be pleased to receive them.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

O material deixa de ser enviado, por ter sido apreendido pela Defesa Sanitária Vegetal.

Lamento sinceramente.

Belém, Pará, Brasil.

11 de janeiro de 1968.

Dr. David J. Rogers
Department of Biology
University of Colorado
Bouder, Colorado 80302

Caro Rogers :

Sòmente agora pude atender ao pedido feito pelo amigo e pelos doutores Alfred Jones e Franklin W. Martin referente a sementes de Batata-doce (Ipomea), por não dispôr antes de material em condições.

A remessa que segue, através de Murça, consta de tubérculos de 3 cultivares que foram introduzidas no Instituto há 4 anos atras (1964), procedentes da Escola Nacional de Agronomia, onde já são cultivadas há muito tempo. São, portanto, cultivaras.

O material não está muito bom, pòrém se desejarem mais, estarei em condições de enviar em fevereiro outra remessa em perfeito estado.

Peço ao amigo o obséquio de ceder aos doutores Martin e Jones uma parte dessa amostra e, também, que mande dizer se o material serviu e se desejam nova remessa.

Desejando-lhes um Novo Ano muito feliz aqui ficamos sempre à disposição do bom amigo.

Milton de Albuquerque

Nota - Estou esperando até agora um exemplar de teu trabalho sôbre "Classificação da Mandioca ".

Bgota February 9, 1968

May thanks. Maybe they can help a bit.

Mr. James Algert
74 E. Street
Chula Vista
California

Dear Mr. Algert,

Mr. David Rogers very kindly suggested that I contact Colorado State University about their Brazil yuca (cassava, tapioca, manioc) project about preparation of chips. Mr. Knievel replied suggesting that I contact you for more detailed information.

What we would like to know is:

1) How could we get the right machine to make the chips, name, address, cost, etc.

2) What it the best method to sun dry these chips- any special stands, plastic covering, cleaning methods etc. which might be needed.

3) If possible- any data on use of yuca in rations for egg producing chickens.

We are the largest egg producer in Colombia and looking for substitutes for milo and corn which cost $ 78 and $ 100 per ton here.

Any data, reports or information you might have would be greatly appreciated.

Sincerely,

GEORGE S. BASS.
CC Dr. Stutts, Upland, Calif.
Mr. Knivel.
Dr. Rogers , Biology Dept. University Colorado.

GB/ha.

Taximetrics Laboratory
Department of Biology
Armory 101A
University of Colorado
Boulder, Colorado 80302
16 January 1968

Dr. Luis Eduardo Patiño
Centro Nacional de Investigacion
Agropecuarias
Apartado Aereo 233
Palmira, Valle
Columbia

Dear Dr. Patiño:

I am sadding under separate cover a set of reprints concerning the genus Manihot, with my compliments. It was a pleasure to have seen your Experiment Station recently and the excellent Manihot work that is being done there.

I trust that we will have an opportunity to visit at more length sometime in the future.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

EXTRA

11 Jan 1968

Mr. F.Q. Enriquez
Department Of Poultry Science
University of Hawaii
Hawaii, USA

Dear Mr. Enriquez,

I wrote you yesterday about yuca chips, but I am afraid I was a bit too brief in my questioning. We are thinking of using the local cassava rootd after they had been ~~drinnix~~ cut into chips about ~~⅜~~ ½ inch thick with a machete or a knife. Then they would be put on concrete outdoor drying area and left until they were sufficiently dry.

What we would like to know is it possible to store these chips for a long period of time, 6 months or more. If so, what is the ~~maximum~~ moisture content that the chips should have. Also, is there any special way that chips should be stored.

Any help would be greatly appreciated.

Sincerely,

George S. Bass
Owner & Manager.

ROWER

11 Mar 1968

Economic Officer
U.S. Embassy
Bangkok, Thailand

Dear Sir,

We are an American company and the largest producer of eggs in Colombia with 75,000 birds. Corn here is over 2 and ½ times more expensive than it is in the U.S., but at times the local egg price is below that in the U.S. Feed as you may know are 70 persent the value of egg costs. We are caught in a dangerous price squeeze.

We think that perhaps manioc, cassava, or yuca as it is called here may be the answer to our problems. But to make its use feasible we would have to store the roots in chip form, or gaplek as it is called in Indonesia. I understan that great quantities of dried chip are shipped from Thailand to Germany, etc.

Could you do us a great favor and try to answer a few questions for us. We need to know :

1) How long is the chip left in the sun to dry for the correct moisture content.
2) What is the maximum moisture content for safe and long storage.
3) What is the maximum storage tiie for dried chips.
4) What is the best method, or methods for storage- special sacks, aeration, fumigation etc.

If we had solid answers to these questions we would then be in a position to seriously consider the use of yuca. Any help would be greatly appreciated. I write to you since I feel that perhaps you would be one of the few people who would know or could gi e us honest answers. We look forward to your reply with great interest. Sincerely,

George S. Bass
Owner and Manager.

PRE-COLUMBIAN RIDGED FIELDS

In four areas of tropical lowland in South America there are huge arrays of ancient earthworks. Many of them are ridges put up to farm land subject to seasonal flooding

Dr. Rogan - Epilogue page 95 might be of interest.
George S Burt

by James J. Parsons and William M. Denevan

In South America thousands of square miles of tropical lowlands are submerged in shallow floodwaters for weeks or months during the rainy season and are parched by drought during the dry season. Covered either with savanna grasses or with forest, these poorly drained river floodplains have generally been considered unfit for agriculture since the Spanish Conquest. When they are exploited at all, it is usually as cattle range. In the open savanna the grass is renewed by annual burning; in some wooded areas today the trees are being cleared to make way for planted pasture.

Recently the surprising discovery has been made that areas in several such regions were once intensively farmed. The pre-Columbian farmers had a specialized system of agriculture that physically reshaped large parts of the South American continent. Aerial reconnaissance and surface exploration have now located the intricate earthworks required by this system in the tropical lowlands of four widely separated regions: eastern Bolivia, western Ecuador, northern Colombia and coastal Surinam (Dutch Guiana). Similar earthworks are said to exist in other parts of the continent, but such reports have not yet been substantiated. Here we shall describe the earthworks in the four areas that have been identified and mapped thus far, review what is known about prehistoric earthmoving for agricultural purposes elsewhere in the Americas (both lowland and highland) and then examine the implications of these early works with respect to the rise of civilization in the New World.

Except for two brief references in early chronicles, the first mention of agricultural earthworks in South America was made in the 1900's by the Swedish ethnographer Erland Nordenskiöld, in connection with his studies in the Llanos de Mojos (Plains of Mojos) of northeastern Bolivia. Located in the heart of the South American continent, between the Andes and the Brazilian highlands, most of the Mojos plains area is less than 800 feet above sea level. Bounded by the Beni and Mamoré rivers, these broad lowlands are a sea of grass in which occasional islands of forest mark the higher, better-drained ground; indeed, the vegetation is locally known as *pampa-isla*. Here for as much as seven months of the year floods cover the grasslands with a sheet of water ranging in depth from a few inches to several feet.

Faced with a hostile environment of this kind people everywhere usually adapt their lives to the circumstances; a commonplace example in areas subject to flooding is the building of houses on stilts. The modern cattle ranchers of the Llanos de Mojos do much the same: they simply select high ground for building sites. The pre-Columbian inhabitants of the area chose instead to modify the landscape. They raised mounds, causeways and serried ridges for their crops, all of which stood high enough to surmount the floodwaters. To this day the wet savannas are crisscrossed with narrow causeways that connect the natural islands of high ground. The causeways are as much as seven miles long; their total length in the Llanos de Mojos, as measured on aerial photographs, exceeds 1,000 miles. Also visible in the area are many artificial mounds that served as sites for burials, for houses and even for small villages.

The agricultural earthworks in the area cover at least 50,000 acres. They are of three kinds. West of the town of Trinidad the prevailing pattern is narrow, closely spaced ridges. South of Lake Rogoaguado the ridges are much larger: as much as 80 feet wide and 1,000 feet long. In other areas there are rows of small circular mounds six to eight feet in diameter. Whatever their form, most of the earthworks are less than two feet high. Originally they were doubtless high enough to stand above the average flood level.

In 1908 and 1909 Nordenskiöld excavated several burial mounds east of the Mamoré River that were associated with some of the Mojos causeways. Within the mounds he found fragments of elaborately decorated pottery, which he attributed to the ancestors of the region's Arawak Indians. This work of half a century ago is the only serious archaeology that has been undertaken in the area. Early Jesuit accounts of the region imply that the socioeconomic development of the Indians was advanced enough to enable them to construct the kinds of earthworks found there, but such literature, some of which is quite detailed, makes no mention of any agricultural ridges. Indeed, the extent of the ridges was not realized until 1960, when swamp buggies engaged in petroleum exploration encountered seemingly endless ridges near the town of Trinidad. Thereafter the ridge system was examined on aerial photographs. Here in Bolivia, however, the lack of archaeological investigation

ANCIENT EARTHWORKS visible in the aerial photograph of the San Jorge River area in Colombia on the opposite page are evident where the forest still stands and where trees have been cleared for pasture (*upper left*). In pre-Columbian times the inhabitants of this seasonally flooded river lowland built such ridged fields over an area of some 30,000 acres.

JAN 19 1967

GEORGE S. BASS
CALLE 31 No. 6-42
BOGOTA, COLOMBIA
TELEFONO 32-19-13

Mr. David Rogers
Professor of Biology
University of Colorado
Boulder, Colorado

19 JAN 1967

Dear Dave,

Well, Jane and I certainly feel hurt that you didn't call us finally when you were down here in December. It is not very often that we have the chance to entertain visitors to Bogota so we feel espeically slieghted when people don't look us up. You will have to promise that next time you will definetely have to drop in on us.

Many thanks for your helpful letter of 10 Jan. The rum might be difficult to ship, but how about some genuine Colombian coffee I will try.

I didn't contact any of the people at the Foundation although I have been in quite close contact with them and Mr. Grant personally helped get our manager's kids into the American school.(I think I told you the manager left six weeks after he got here.) I didn't contact them because I wanted to keep this project secret. They of course want to help the country and the farmers particularly, while my goal is very selfish - to make money for myself. I came here with more humanitarian gaols, but after they stoned my wife, xxxxx stole hers engagement ring, practically ruined our company, I feel different than when I came. We are the leaders here in the poultry industry and everthing we do is copied to the last detail- except in those factors requiring work and planning. Therefore, I am hopefully trying to develop the use of yuca without much notice in order to have a competitive advantage. Nevertheless, I will approach the people that you have very kindly mentioned, without telling the too much of our plans. I hope you will forgive my attitude, but these people are just like the Japanese when it comes to copying.

Again, Dave, many thanks for your help and ideas. I hope you will pay us a visit if you ever get this way again. Perhaps, the time will finally come when you can do some consulting for us. Are you still actively pursuing yuca?

Sincerely,

George

George S. Bass

Cra 7 #83-51

GEORGE S. BASS
Calle 31 No. 6-42
Bogota, Colombia
Telefono 32-19-13
Cra. 7 No.83-51

14 Jan 1968

Director
Office of International Programs
Colorado State University
Fort Collins
Colorado

Dear Sir,

Dr. David Rogers very kindly suggested that you might be able to put me in contact with some engineers in Bahia, Brazil who are working with manioc (cassava, yuca).

We have the largest egg producing farm in Colombia and are very interested in the possible use of yuca. What we would specifically like to know is:

1. Can yuca chips be stored.
2. If so, how should they be best prepared
3. Also, how should they be stored.
4. For how long can they be stored.

If you have someone there who can answers these questions it would be of great help. Alternatively, we would greatly appreciate the names and addresses of those engineers who might be able to answer these questions.

Sincerely,
George S. Bass

George S. Bass
Carrera 7 No. 83-51
Bogota, Colombia
S. America

UNIVERSITY OF TEXAS
HERBARIUM
B. L. TURNER
DIRECTOR

THE UNIVERSITY OF TEXAS
BOTANICAL LABORATORIES
AUSTIN, TEXAS 78712

B. C. TRAMP
DIRECTOR EMERITUS

January 11, 1968

Dr. David J. Rogers,
Taximetrics Lab, Armory 101,
University of Colorado,
Boulder, Colorado 80302

Dear Dave:

Thanks very much for the treatment of Manihot for Texas. Since I gave you poop on the proper format, Donovan changed the ground-rules, so I am moving some of the information around, will have it re-typed and send you a carbon for approval or disapproval.

With best wishes,

Marshall C. Johnston

Jan 14 1968

Dear Mr. Rogers.
By any chance could you help us out on this question. Nobody seems to know.
George

8 January 1968

Mr. William O. Jones
Food Research Institute
Stanford University
Stanford, Calif.

Dear Mr. Jones,

You perhaps may remember that I stopped in at your office about two years ago to ask you some questions about cassava. I greatly appreciated this opportunity to talk with you.

If possible, could you anser another question? Is it possible to store cassava chips for 6 to nine months? If so, what storage methods could be used, and what is the maximum moisture content of the chips for shuch storage?

The reason I ask is that I'm interested in using the sun dried chips as feed for egg laying chickens. But to really make this worth while we would have to store for considerable time. We could then buy from one producer his entire crop at harvest time after it had been dried.

Any help you could give us on this subject would be of tremendous help. I have searched your book and all my material with-out success. Corn is horribly expensive here and is still going up. Yuca could be our salvation. My best address: Cra. 7 No.83-51
Bogota, Colombia

Sincerely,
George S. Bass
George S. Bass

2 January 1968

Dr. Julian A. Steyermark
Instituto Botanico
Apartado 2156
Caracas, Venezuela

Dear Julian:

The Manihot specimen, 99,980, has arrived. It will be difficult to find a good "home" for this relatively interesting specimen. It has some mixture of qualities between three or four entities.(which is really normal for this crazy mixed-up genus). First of all has affinities with certain Guiana species but then it is a curious carrier of some floral characteristics which I attribute to material further to the west of you in the Santa Margaritas. I would certainly like to have more representations of it if it would be possible to have some.

You will note our change of address. We moved out to this place in July 1967. Several things dictated the move. Unfortunately our grant for the Cinchona study was not funded. The heavy hand of Fosberg was evident in the comments from the anonymous reviewer who turned it down for several reasons none of which I consider to be valid.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

REPUBLICA DE VENEZUELA

MINISTERIO DE AGRICULTURA Y CRIA

DIRECCION Instituto Botanico
Apartado 2156
Caracas, Venezuela

No.

DEC 19 [illegible]

December 11, 1967

Dr. David J. Rogers
Colorado State University
Fort Collins, Colorado 80521

Dear Dave:

Via air parcel post I am sending you a specimen of a recent collection of mine from the foothills of the Sierra de Perijá, Estado Zulia, Venezuela. You may, of course, retain the specimen for your herbarium.

I would greatly appreciate a determination of this plant from the master's own voice. Thanks.

I expect to be up at N.Y.B.G. for rubiaceae work from about the end of April to the end of August approximately, and will be pleased to offer any consultation on Cinchona at that time.

Hope all is going fine with you and your staff,

Best wishes for the coming year,

Sincerely,

Julian

Julian A. Steyermark

Taximetrics Laboratory

Armory 101

2 January 1968

Sr. Rafael Girard
11 Avenida "A" 8-03, Zona 2
Guatemala, America Central

Dear Doctor Girard:

With respect to your card, I have the following answers:

1. My only idea that Manihot was found in southern Florida in the pre-Columbian epoch is from the ethnological studies of William C. Sturtevant, "Taino Agriculture", reprinted from Antropologica Supplement No. 2, The Evolution of Horticultural Systems in Native South America: Causes and Consequences - A Symposium, Caracas 1961. As to the date of the introduction I am not at all certain. Most of my conjectures concerning the distribution of the crop have as a background the fact that the first Spanish contacts were not agricultural but exploitive and that if a movement of the crop was to be made, it would have been made by a more peaceful group of people, not the conquistadores. I look to the Indians as being the more peaceful.

2. Concerning the name cuacamote, I must refer you to the Babianus manuscripts. As I understand the stem "camote" is nothing but a "root crop" and camote with prefixes used by the Indians designated the specific root crop. The European languages adopted the stem and through usage people have come to designate camote as Ipomoea batata.

3. Concerning Ipomoea batata I must be cautious in interpreting its origin on a similar basis as that of Manihot. It would surprise me if any group of Indians did not make many efforts to use many different types of roots. If you look under the ground there are very large numbers of roots of plants with storage organs on the roots. Thus, for example, certain varieties of Phaseolus vulgaris have an edible root. Therefore, Ipomoea batata could have been found or used or exploited either with, earlier than or later than Manihot and its application would be a chance finding.

4. From the work of Douglas Yen I think we can probably be certain that sweet potatoes (Ipomoea batata) are indeed American in origin.

Thank you for your Christmas card. I send to you my hopes for a prosperous and happy New Year.

Sincerely yours,

David J. Rogers
Professor of Biology

DJR:gm

JAN 4 1968

GEORGE S. BASS
CALLE 31 No. 6-42
BOGOTA, COLOMBIA
TELEFONO 32-19-13

Cra 7 #83-51

22 Dec 1967

Mr. Ray Frankel
75 E 55th St.
NY, NY.

Dear Ray,

Dear Mr Rodgers,

Again I'm sorry I never answered your letter. I was in a terrible situation - we moved, our manager quit, we had a crisis in the egg industry - we started mixing feed etc. etc. I was working like a poor dirt farmer. By any chance do you know the answers to the questions below. I'm getting very interested in the yuca - chicken possibilities here. Sorry I'm late. Thank. George

All our friends in NY are types like lawyers or psychiatrists (Sp. - 4:15 AM) so I don't have much of a business contact. Could you do me a great favor + find out how long tapioca root chips dried in the sun can be stored + how? The reason I ask is our chickens eat corn at $100/ton here (VS $41.= in VS). Tapioca (also called manioc, yuca) roots can be fed - using the chips ground in a hammermill - I believe. There have been studies done with chickens.

I have found someone who will provide me with the sun dried chips. But this is a seasonal crop + I want to know how long they can be stored + the exact storage techniques employed. (And if, in fact, sun drying is sufficient)

I know there is a large export (about 500,000 tons) to Germany from Thailand of the dried chips (sometimes called "gaplek"). I also believe Morningstar is shipping

GEORGE S. BASS
CALLE 31 No. 6-42
BOGOTA, COLOMBIA
TELEFONO 32-19-13

Chips to some of their starch factories in Maine. I have addresses of companies in the field as of 1959.

1) Mornington, Nicol, Inc
630 West 51st St, NY 19

2) General Foods Corp
250 North Ave, White Plains, NY

3) S Zein Davis Co.
285 Madison Ave, NY, NY

4) Tapioca Institute of America
441 Lexington Ave, NY, NY

National Starch Co + Corn Products also have been or are involved in tapioca but I don't have their addresses. Maybe you would have contacts in some of these companies. If not, I think [illegible] a frank head on approach - mentioning a Chicken farmer in Colombia - might give some replies.

Would greatly appreciate any help. This looks like it might be our salvation. We might take a vacation in Fiji or Brazil + hope to see you there.

Merry Christmas
George

DEC 2 8 1967

Rafael Girard

Desea a usted y apreciable familia,
Feliz Navidad y Venturoso
Año Nuevo.

Diciembre de 1967.

11 Avenida "A" 8-03, Zona 2.
Guatemala, América Central. Teléfono 88.13.87.

Distinguido y muy apreciado Dr.Rogers,
Nuevamente le felicito por sus importantisimos trabajos que he citado en mi libro en preparación.En referencia con su carta del 17 agosto,tiene Ud.plena seguridad que Manihot fué conocido en el sur de Florida en la epoca precolombina? En este caso,si ha sido introducida por los caribes,debe ser en tiempo muy reciente,antes de la Conquista.Otro hecho de gran interes es el nombre cuacamote que los mayas dan a la yuca.Podria pesugerir este hecho linguistico que el camote(Ip.batata) fué cultivado antes o contemporáneamente al manihot?Que piensa Ud. de esto? Ha encontrado variedades silvestres de camote en la costa Pacífica,en el área de la yuca? En este caso que daria comprobado el orígen americano y no polinesio del camote.Espero ser favorecido por sus buenas noticias al respecto.Felicidades para 1968.Su afmo.ss. y admirador,

Huevos Oro Ltda®
SIEMPRE FRESCOS

Dr. David Rogers
Dept. of Botony
Colorado State University
Fort Collins, Colo.

2 Jan 1967

Dear Dr. Rogers,

As you can see from copies of these letters I am still interested in yuca. My idea is to use the dried chips in chicken feed replacing some of the corn.

The big question is how long can we store these chips. I suppose they could be sun dried to about 15% moisture if we are careful - but I'm not sure. Could you possibly give us an idea of a) we can store chips for 3 or 4 months + b) what should be the maximum humidity + c) can this maximum be achieved.

I'm still too busy to really get involved on

(OVER)

SUBA, D. E., COLOMBIA, SURAMERICA, TELS., 535328, 535175, 535135

a large scale yuca plantation for starch production, but if the factors are favorable we could start with chickens.

I would greatly appreciate any information you could develop on the 3 above points. Again, I'm sorry about not answering your letter of earlier this year sooner. I just could handle a well planned visit from you then.

Sincerely,

George

P.S. Please reply to my home address:

Cra 7 #83-51

Bogota

GEORGE S. BASS
CALLE 81 No. 5-42 CRA 7 83-51
BOGOTA, COLOMBIA
TELEFONO 32-19-13

Jan 2, 1968

Mr. E. C. Stutts
Scientific Nutritional Service
Upland, Calif.

Dear Dr. Stutts,

The following is taken from page 274 of MANIOC IN AFRICA by William Jones, Stanford University and is the only good resume I have seen regarding manioc for chickens:

"Experimental feeding of animals in various parts of the world has demonstrated the suitability of manioc rations, especially for chickens, cattle, and hogs. Manioc and its products appear to be less efficient in terms of weight gained per pound of feed than corn, but this relative inefficiency can be more than offset by differences in cost. Laying hens tolerated substitution of up to 40 percent "tapioca meal" (manioc flour) for maize meal, wheat middlings, and ground oats according to a report of experiments in England in 1941, "... without the ration being unpalatable or causing constipation. Egg production was somewhat lower than on an ordinary ration, but changes in body weight and mortality were similar (3). Earlier investigations in the philippines had shown meal made from manioc refuse to be 77 per cent as efficient as rice bran for feeding chicks, while a combination of the two feeds was 92 per cent as efficient as bran meal alone (2). During a period when maize was scarce in Southern Rhodesia in 1943, feeding trials were undertaken in which "cassava meal" (probably flour) was substituted for maize in the rations of growing chickens and laying hens. The report of these trials states that "Cassava meal was proved to be a good substitute for maize meal ..." (1)"

The reference numbers are the same ones I gave in my letter of Dec 26. However, in regard to (2) I made a mistake in this letter. It should be "T.T.Tabayoyong, "The Value of Cassava Refuse Meal in the Ration of Growing Chicks" Phil. Agr. (Los Baños, Laguna), 1935, as summarized in Nutr. Abstr. and Rev (agerdeen, Scot.), Apr. 1937.

I think it might be of great interest and use if it were possible to secure full copies of these reports, especially number(1) ad number (3). Do you know the best way that I could do this¿

Our houses (all of them except for the older No. 1) are doing very very well. We don't know if it is the weather, putting 2 hours more of lights in the night, or the formulation. House 1. already had a lighting program. The other didn't because the daylight here is constant more or less and we have gotten almost equal results without lights. In any case we are quite pleased. I look forward to any ideas you could give use about using yuca chips in our ration. We have found a man who says he could provide a lot under contract. First, however, it would be best to make a feed trial and a search of the literature.

Sincerely

xxxxxxxxxxx Cra. 7, No. 83-51
GEORGE S. BASS
CALLE 31 No. 6-42
BOGOTA, COLOMBIA
TELEFONO 32-19-13

26 Dec., 1967

Messrs. F. Q. Enriquez and E. Ross
University of Hawaii
Hawaii, USA

Dear Sirs:

I was very interested to read Dr. Morrison's article in "Feedstuffs," July 6, 1967 commenting on your work, originally published in "Poultry Science," Vol. 46, No. 3, pp. 622-626, May 1967. We are very interested in exploring the use of cassava for our layers here in Bogota. We are the largest egg producer in Colombia and are looking for any method which will reduce our feed costs. Corn here, at U.S. $100/ton, is very expensive.

I thought perhpas you might be able to advise us and keep us posted on your work. In return, we would experiment here, in a small way or later on a commercial basis and inform you of our results. Perhaps we would both benefit in this way.

We have 55,000 layers, all Leghorns excpet for 10,000 HARCOS. We keep daily production, consumption, and mortality records for each house. We are considered by many to be the best organized farm in South America. Therefore, data we sent you ought to be accurate and meaningful.

In addition, I have accumulated a considerable library on the subject of cassava. I have material from France, Belgium, Malgash, Brazil, Holland, etc. I have visited cassava sites in the Philippines, Malgash, and India and therefore am fairly well acquainted with this plant. I hope therefore that we can develop an interchange which will be mutually satisfactory and beneficial.

Sincerely,

10 January 1968

Mr. George S. Bass
Cra 7 #83-51
Bogota, Colombia

Dear George:

I have your various epistles in front of me including a Christmas card with a recipe for eggnog. (Would you please send me the necessary Huevos Oro to make this; also some rum?)

Seriously, the literature does not provide a decent answer to your question on storing chips. Shooting from the hip and using ideas from other stored carbohydrate sources,, I would think that if you could get to 8 - 15% moisture there is no reason why you could not store these chips in some suitable protected spot. May I suggest that you write to the Office of International Programs, Colorado State University, Fort Collins, Colo. 80521, and request that they put you in touch with the engineers who have been working on a similar problem in the state of Bahia, Brazil. These people may have had some recent experience in this connection. I know that they were making an effort to design appropriate equipment to make the chips and to dry them properly. Other than this, I am sorry no information is available to me.

Did you know that I had visited Colombia the first week in December? I was an adviser to the Rockefeller Foundation and made one or two feeble efforts to contact you then by telephone. However, you know about the telephone system there and its efficiency. Sorry I did not make it. I think you have a tremendous ally for the study of various problems on yuca through Dr. Gerry Grant whom you should certainly look up. His address is Apartado Nacional 32-79. There may be some phone number you can get him on. I understand you know Dr. Waugh who can put you in touch with Dr. Grant. At the moment some experimental work on yuca is being done at the experiment station in Palmira and you can probably contact the director of that station, Dr. Luis Eduardo Batino (Apartado Aereo 233). One of the Rockefeller staff, Dr. Jerry Maner (unfortunately now on leave in the States) has recently made some hog feeding trials there and is very excited about the use of yuca in this connection. I'll bet that if you try to push your own interests with both the Colombian people at Palmira and the Rockefeller people under Grant you will get some help locally.

I think you would be well advised to get in touch with a man now acting as consultant for the Rockefeller Foundation and in the same office as Dr. Grant: Dr. Rodenhiser. Dr. Rodenhiser is doing his best to help with the establishment of a tropical research station sponsored by Rockefeller and would be interested, I am sure, to help your own interest in yuca. He is a very pleasant guy and a solid scientific citizen.

Sorry not to be able to give you any more information, but there you are. Perhaps I will be coming your way again if Rockefeller decides to take up an intensive study of yuca in this new tropical research center.

Happy New Year.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

4 January 1968

Dr. Marshall C. Johnston
Herbarium - B.L. 222
The University of Texas
Austin, Texas 78712

Dear Dr. Johnson:

Enclosed is my write-up for Manihot. I am terribly sorry for having taken so long and feel bad that you had to job my memory over such a small task.

You will notice that I have decided not to reduce the species to a subspecific status as originally noted. I will maintain it in the species because it is a more flexible taxon to deal with, and I think it valid for purposes of a flora. Let me know if there is other writing required.

Happy New Year.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

Manihot Tourn. ex Adans. Fam. II. 1763, 356

Perennial herbs, shrubs and trees of the drier areas of the American tropics and sub-tropics. Roots tuberous in many species, carrot shaped in the Texas species, with large, white fleshy storage parenchyma. Very strong odor of HCN in all parts. Outer surface of root roughened, with lateral lenticel-like bands in the epidermis, very dark brown. Stems herbaceous, becoming woody with age, mostly prostrate in the Texas species, ascending in others; the Texas species dying back to the root crown with the advent of dry weather. Stems mostly green, but frequently with a typical "Euphorbiaceous" red pigment developing on the surfaces exposed to the sun. Leaves alternate, simple, deeply five-lobed (sometimes 3- or 7-lobed), pandurate to halberd shaped; the lower two, smaller, lobes of the fully developed, vegetative leaves frequently projecting at a sharp angle downward, the median lobe from 2 to 5 cm. long. Plants monoecious, the staminate flowers opening later than the pistillate. Staminate flowers borne in a simple raceme, the pistillate most often on single peduncles arising at the base of the staminate inflorescence. Perianth of a single row of tepals. Staminate flowers, greenish white, trombiform, with a gibbous base, the tepals 6 to 10 mm. long, united for half their length; 6, 8, (rarely 10) free stamens (in the Texas species) in two whorls of shorter and longer, slender filaments arising between the lobes of a circular disc; the anthers versatile. Pistillate flowers with five, separate strap-shaped tepals, 5 to 8 mm. long; stigmas 3, many-branched, on very short styles. Ovary three locular, inserted above a circular disc. Fruit a dry, dehiscent capsule; seeds three, carunculate.

Generic synonyms: Janipha HBK in Nov. gen. et sp. pl II, p. 106. Jatrophae sp. L. et auct. pr. p.

(over)

A genus of more than 150 species of the warmer parts of the New World Tropics, of which we have only one. The genus is economically important in that M. esculenta (yuca, cassava, mandioca, manioc, etc.) is a root crop grown in most of the world's low-land tropics, and several minor rubber-bearing species are exploited in Brazil.

1. Manihot walkerae Croizat. Very rare on caliche cuestas near the Rio Grande in extreme southern Texas (Hidalgo County) and in adjoining Tamaulipas, Mexico. Vigorous colony transplanted to the campus of the University of Texas, Austin, south side of biology building. April-September, following rains. Nearest relative is M. angustiloba (Torr.) Mull. Arg. from which it differs in broader leaf-lobes, numbers of stamens, (10 in M. angustiloba), in distribution and habitat.

write-up for Johnson's Flora of Texas
Jan 4, 1968

Manihot Tourn. ex Adans. Fam. II. 1763, 356

Perennial herbs, shrubs and trees of the drier areas of the American tropics and sub-tropics. Roots tuberous in many species, carrot shaped in the Texas species, with large, white fleshy storage parenchyma. Very strong odor of HCN in all parts. Outer surface of root roughened, with lateral lenticel-like bands in the epidermis, very dark brown. Stems herbaceous, becoming woody with age, mostly prostrate in the Texas species, ascending in others; the Texas species dying back to the root crown with the advent of dry weather. Stems mostly green, but frequently with a typical "Euphorbiaceous" red pigment developing on the surfaces exposed to the sun. Leaves alternate, simple, deeply five-lobed (sometimes 3- or 7-lobed), pandurate to halberd shaped; the lower two, smaller, lobes of the fully developed, vegetative leaves frequently projecting at a sharp angle downward, the median lobe from 2 to 5 cm. long. Plants monoecious, the staminate flowers opening later than the pistillate. Staminate flowers borne in a simple raceme, the pistillate most often on single peduncles arising at the base of the staminate inflorescence. Perianth of a single row of tepals. Staminate flowers greenish white, trombiform, with a gibbous base, the tepals 6 to 10 mm. long, united for half their length; 6, 8, (rarely 10) free stamens (in the Texas species) in two whorls of shorter and longer, slender filaments arising between the lobes of a circular disc; the anthers versatile. Pistillate flowers with five, separate strap-shaped tepals, 5 to 8 mm. long; stigmas 3, many-branched, on very short styles. Ovary three locular, inserted above a circular disc. Fruit a dry, dehiscent capsule; seeds three, carunculate.

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UNIVERSITY OF TEXAS
HERBARIUM

B. L. TURNER
DIRECTOR

UNIVERSITY OF TEXAS HERBARIUM
BIOLOGICAL LABORATORIES BUILDING
THE UNIVERSITY OF TEXAS
AUSTIN, TEXAS 78712
AREA CODE 512 GR 1-5262

December 29, 1967

Dr. David J. Rogers,
University of Colorado,
Boulder, Colorado

Dear Dave:

This is to inquire when you will have ready a treatment of Manihot for Don Correll's and my MANUAL OF THE VASCULAR PLANTS OF TEXAS. The manuscript is all assembled except for scattered genera which laggard 'contributors' have not come through with. Don and I will soon have to set up an absolute deadline, after which we will prepare our own treatments of the missing genera. Naturally, we would be happier if the things were written up by those most familiar with the groups.

With best wishes of the season,

Sincerely,

Marshall

Marshall C. Johnston

Manihot File

Taximetrics Laboratory
Department of Biology
Armory 101A
University of Colorado
Boulder, Colorado 80302

Jan 1968

Mr. David P. Cuthbertson
Department of Pathological Biochemistry
University and Royal Infirmary of Glascow
Glascow, Scotland, U.K.

Dear Mr. Cuthbertson:

I read with interest your comments on cassava in the Symposium Proceedings of the I.P.B. in the Nutrition Society Proceedings. Perhaps it is not known to you that there are a very large number of native processers of manioc in South Americaninvolved in uncontrolled fermentation in the preparation of an edible product. I have seen these prescesses all the way from the mouth of the Amazon westward. I wonder if it would not be useful to observe their processing before making some investigation in the laboratory of selected yeasts or other organisms. Perhapstthen the type of organisms that would be useful would be more easily derivable.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

Aerogramme

DEC 2 0 1967

FMC CORPORATION

CENTRAL ENGINEERING LABORATORIES

1185 COLEMAN AVENUE, BOX 580, SANTA CLARA, CALIFORNIA 95052
TELEPHONE: (408) 289-0111

December 14, 1967

Dr. David J. Rogers
Professor of Botany
Department of Botany and
Plant Pathology
Colorado State University
Ft. Collins, Colorado 80521

Dear Dr. Rogers:

I am interested in the properties of "Cassava" as human food and, I read your very informative publication in the October, 1965, issue of ECONOMIC BOTANY on the botanical and ethnological considerations of Manihot esculenta.

Would it be possible to send me a reprint of your earlier publication "Studies of Manihot Esculenta Crantz and Related Species" in the Bull. Torrey Bot. Club, 1963. I also would appreciate your sending me any related article you may have published elsewhere. Do you know of any source in the United States where I may obtain fresh "Cassava" roots or dried meal?

Thank you very much for your cooperation.

Sincerely yours,

Jürgen Strasser

Jürgen Strasser, Ph.D.

JS:ph

13 December 1967

Dr. W. R. Stanton
Tropical Products Institute
56/62, Gray's Inn Road
London, W.C.1

Dear Dr. Stanton:

Thank you for your letter of December 7. Unfortunately I have myself not pursued the research in which the micro-organisms are examined with relationship to their fermentation capacity in Manihot. I am a taxonomic botanist.

Incidentally, Mr. Coursey of your organization and I are in relatively constant contact. You might check with him concerning my interest in this area.

I am sending under separate cover some of my papers concerning these plants so that you may know of my interest and direction. I shall be interested in any publications of yours concerning these plants and their uses and food value.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

A.F.

DEC 1 1 1967

DIRECTOR
P. C. SPENSLEY, M.A., B.Sc.
D.Phil., F.R.I.C.
Our ref.: RS 13/1 Vol. 2.
Your ref.:

MINISTRY OF OVERSEAS DEVELOPMENT
TROPICAL PRODUCTS INSTITUTE,
56/62, GRAY'S INN ROAD,
LONDON, W.C.1.
Telephone: 01-242 5412.
Telegraphic: Troprods, London.

7th December, 1967

Dear Professor Rogers,

Information has come to me from Sir David Cuthbertson, via the Director of this Institute (Dr. P. C. Spensley) that you have data on the indigenous methods of processing manioc in South America by fermentation.

The study of the organisms using cassava as a substrate is one of my projects within the international Biological Programme, and I confirm your observation that my knowledge of the South American processes involving cassava (manioc) are conducted in many other parts of the world including the Caribbean area, Africa and South East Asia, and we have built up a collection of organisms based on materials derived from the technologies of these parts of the world.

The literature on the indigenous food technologies of South America is relatively sparse in comparison with that of some of the other tropical areas of the world and the difficulty of obtaining material is relatively great. I would be most grateful for any assistance which you might be able to give me in obtaining either first hand material, references or contacts through whom I might be able to obtain such material or first hand accounts of the processes themselves.

If in exchange, we can be of any assistance by sending you cultures from our collection of economic organisms we shall be pleased to do so and I am arranging for a copy of our catalogue to be sent to you under separate cover.

Yours very sincerely,

W. R. Stanton.

Professor David J. Rogers,
Professor of Biology, Taximetrics Laboratory,
Department of Biology,
Armory 101A,
University of Colorado,
Bolder,
Colorado, U.S.A.

UNIVERSITE AGRONOMIQUE - WAGENINGEN - PAYS-BAS

CENTRE NEERLANDAIS

FONDATION ATTACHEE AU CENTRE O.R.S.T.O.M. D'ADIOPODOUME

BOITE POSTALE 20 - ABIDJAN - COTE D'IVOIRE

TELEPHONE: ORSTOM 284-45

VOTRE REFERENCE:

ADIOPODOUME, 23 september 1967.

Mr D.J. Rogers
Professor of Biology
Taximetrix Laboratory
Department of Biology. Armory 101
University of Colorado Boulder
Colorado 80302.

Dear Mister Rogers,

Your letter of July 18 arrived just on the day I was planting the experiment of organic manure combined with space of planting and another experiment about direction of planting combined with wether or not weed-control. It seems that plants which suffer are more toxic; I think close spacing and absence of weed control are less favorable factors. On the other hand manure will favorise growing conditions. Cuttings which are planted upside down are said to be more toxic but this has not yet been demonstrated clearly. I observed in my experiment that cuttings planted upside down have difficulties, sprouts appear later than by normal planting.

I thank you very much for your valuable suggestions.

I will abandon crossing experiments. When the plants have a proper shape I will make herbarium specimens of my cultivars and send you specimens of it.

In the experiment I perform in four regions of the Ivory Coast to detect climatical influences on toxicity I also measure the length and maximal diameter of the roots. I got the idea that in the loose sandy soil near Abidjan the roots are bigger and the number of roots is lower than in heavier soils in the North of the country. It is possible that when the soil is heavier the resistance for root formation is to high and the plants react by forming more but smaller roots. Length of plants and the moment of branching varies also with the region. Also the total dry matter and the ratio (dry matter roots) : (dry matter stems + leaves) varied greatly between the regions. Here in Abidjan the moment of branching depends on the season of planting and probably also on soil fertility.

Last month I started an experiment in plastic barrels (55 kg). I would try to detect whether there is a valid correlation between toxicity of thickened of not-thickened roots. Perhaps I could perform my toxicity experiments with young plants in stead of waiting the thickened roots. The barrel experiment is a factorial one in which I test influence of shade, dryness and soil fertility on the toxicity.

Furthermore I will pay more attention to toxicity of leaves and tho the enzym activity.

I hope the above will be of sufficient interest to you.

Yours very sincerely,

G.H. de Bruijn.

UNIVERSITY OF TEXAS HERBARIUM
B. L. TURNER
DIRECTOR

UNIVERSITY OF TEXAS HERBARIUM
BIOLOGICAL LABORATORIES BUILDING
THE UNIVERSITY OF TEXAS
AUSTIN, TEXAS 78712
AREA CODE 512 GR 1-5262

AUG 21 1967

August 16, 1967

Dr. David J. Rogers,
Taximetrics Laboratory
Armory 101
University of Colorado
Boulder Colorado 80302

Dear Doctor Rogers

I have your letter of August 15. I believe that someone will be here at the herbarium to permit visitors to look at specimens throughout the time of the meetings in College Station. As to the one plant of Manihot "Walkerae" is outside the building (Biological Laboratories Building) on the south side right along the sidewalk, so you need not even go into the building to see it.

As you see, you will not need to be guided to this plant so your schedule need not jibe with mine. On the other hand, we would be delighted to have you visit the herbarium when you come here. I would like to see you. If I happen not to be at the building when you arrive please phone me at home (GL 3-6589) and announce your presence. Thanks.

Sincerely, Thursday

Marshall C. Johnston.

UNIVERSITY OF TEXAS
HERBARIUM
B. L. TURNER
DIRECTOR

UNIVERSITY OF TEXAS HERBARIUM
BIOLOGICAL LABORATORIES BUILDING
THE UNIVERSITY OF TEXAS
AUSTIN, TEXAS 78712
AREA CODE 512 GR 1-5262

25 May 1967

Dr. David J. Rogers
Taximetrics Laboratory
Department of Botany etc.
Colorado State University
Fort Collins, Colorado 80521

Dear Doctor Rogers:

Returned today to find your letter of May 17 plus a box containing 4 sheets representing return of loan. If you need to have these back for your continuing studies please let me know. I did not mean to emphasize in my previous letter that you have had these specimens for a long time. We realize what time-intervals are needed for long-range monographic studies and have never been known to pressure anyone to return specimens. Keep them as long as they are of any use in your work.

I neglected to mention that the Manihot mexicana ssp. Walkerae is now flowering on our campus and that I could obtain cytological of palynological or other types of material if desired.

Thanks very much for your willingness to contribute Manihot to the MANUAL OF THE VASCULAR PLANTS OF TEXAS. I am attaching herewith a sheet telling some of the details of the format. We try to avoid using the decimal point in measurements, thus saying "leaves 35--88 mm. long" rather than "leaves 3.5--8.8 cm. long." In a treatment of 1 species such as yours will be, the description willbe a generico-specific description with variability confined to the taxon occurring in Texas.

I amasking Mr. Robert Irving, our "curator", to send you the Manihot specimens mentioned in a previous letter, which you say you would like to see. I'll have him enclose the invoice with this letter.

Gratefully,

Marshall C. Johnston

Taximetrics Laboratory

Armory 101

15 August 1967

Dr. Marshall C. Johnston
University of Texas Herbarium
Biological Laboratories Building
The University of Texas
Austin, Texas 78712

Dear Dr. Johnston:

I would like to stop by Austin either before or after the meetings at College Station. I suspect that you will be very busy during this time and wonder which of the two ends of the meetings would be best for me to visit to see the Manihot plants you have growing there.

I would prefer to stop by after the meetings either Thursday, the 31st, in the afternoon or Friday, the first, in the morning. Would you please suggest which is the more convenient time?

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

- Taximetrics Laboratory

June 2, 1967

Dr. Marshall C. Johnston
University of Texas Herbarium
Biological Laboratories Building
The University of Texas
Austin, Texas 78712

Dear Dr. Johnston:

The specimens have arrived and the green sheet is signed and enclosed herewith. I am pleased to have these specimens. I will proceed with the write-up and it should not be too long before you have the rough draft copy.

I would indeed be very pleased to have cytological materials of Manihot mexicana ssp. Walkerae. We can certainly improve our knowledge of the group with this.

I hope that I will be able to stop by Austin on the way to the AIBS meetings and get a first hand look at the specimens you have growing there.

Sincerely,

David J. Rogers
Professor of Botany

DJR/ch

Enc.

THE NEW YORK BOTANICAL GARDEN
BRONX • NEW YORK 10458 212/933-9400

September 29, 1967

Dr. David J. Rogers
Professor of Biology
Taximetrics Laboratory
Department of Biology
Armory 101
University of Colorado
Boulder, Colorado 80302

Dear Dave:

Enclosed are the 11039 labels which I neglected to send with the plants. Hold on to the entire collection until you are finished with it.

Thanks for the lead to Jimmy Atz, from whose institution we are inheriting a large number of exhibit cases. I'll look him up the next time I'm down there.

Regards to all,

Cordially,

Howard

Howard S. Irwin
Acting Head Curator

HI:ES
Enc.

29 September 1967

Dr. Grady L. Webster
Department of Botany
University of California
Davis, California 95616

Dear Grady,

On your Manihot material from Mexico - we are working on it now and I'll give you a rundown on those names shortly.

As regards your request for help with respect to indexing the euphorbs, I may have a system you will want to use. The details of it are still in the computer stage but it should be coming out shortly. Yes, we do want to collaborate with you. We think we will have information for you within a month. What I will do is tell you how to set up your information so that recording of it can begin in a way that is amenable to our computer system.

Drop by to see me if you can, for this is the best way for me to get the ideas to you.

Regards,

David J. Rogers
Professor of Biology

DJR:gm

SEP 28

UNIVERSITY OF CALIFORNIA, DAVIS

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO • SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF BOTANY

DAVIS, CALIFORNIA 95616

September 26, 1967

Dr. David J. Rogers
Taximetrics Laboratory
Department of Biology
Armory 101
University of Colorado
Boulder, Colorado 80302

Dear Dave:

Thanks a lot for the determination of Tyson's Manihot specimen. If the collection is unmounted and not marked 'unicate', it is yours to keep (my recollection is that it's a duplicate). Incidentally, do you have any names for the Manihot specimens I sent to you from Purdue? I'm particularly interested in the determinations for the unmounted duplicates of the 1962 Mexican collections, as these may get distributed this fall.

By the way, for your information we are now assembling here a complete nomenclatural card index to all Euphorbiacease (culled from Index Kewensis, Gray Card file, and annotated). I would like eventually to convert it into a complete taxonomic index by including data as well as names. If you come upon any happy solutions how to do this (apparently you're in some sort of a project of this kind with the IBP), we'd be happy not only to know about it but to collaborate in any way that might be feasible.

Sincerely,

Grady

GRADY L. WEBSTER
Director of the Arboretum

GLW:jg

22 September 1967

Dr. Grady Webster
Department of Botany
University of California
David, California 95616

Dear Grady:

The plant sent me from the MGB, collected by Edwin I. Tyson, labelled by you as *M. grahamii* is *M. gualanensis* Blake.

Do I recall that this specimen is for me to keep (the herbarium specimen has "ex Herb. MBG")?

Are there other specimens of this number in the MGB? If so, do you want annotation labels for them?

Regards,

David J. Rogers
Professor of Biology

DJR:gm

THE NEW YORK BOTANICAL GARDEN
BRONX • NEW YORK 10458 212/933-9400

SEP 13 1967

September 7, 1967

Dr. David J. Rogers
Department of Botany
University of Colorado
Boulder, Colorado 80302

Dear Dave:

In answer to your pre-Texas card, I am sending all of our material of 11039 so that you can sort out the stuff. I agree that it appears that two taxa are involved. Please number one of them 11039A and let us have one of the names under that designation in association with the relevant exsiccatae. It was good to see you again and to participate in the symposium. I'll be anxious to know how things go with you all (yawl, that is), especially as regards feedback from the symposium. For my part, it was very stimulating to be a part of your work.

Cordially,

Howard

Howard S. Irwin
Acting Head Curator

HI:ES

25 September 1967

Dr. Howard S. Irwin
Acting Head Curator
The New York Botanical Garden
Bronx Park
Bronx, New York 10458

Dear Howard,

I have separated 10039 as you suggested into separate numbers. If you care to send me blank labels (I will need twelve) I will supply the pertinent data and number (11039 and 11039a).

Since the flowering data applies apparently to only one of the two, I shall make a note to the effect in both collections. If you don't mind I will hang on to the whole collection of these two numbers until they are identified.

We have had feedback on the symposium from many different places. The only people who really complained were statistic clans like David Goodall, an ecological statistician, who has moved to the University of California at Irvine. He made the objection that we were too "informal" about the mathematical model and seemed too ready to pitch out the mathematics in favor of the biology. This to a statistician is anathema, but you heard him say these words and his were not so vehement as others might have been who did not open their lips.

We spent a profitable week at the Smithsonian gaining insight into the information retrieval problem. It seems now that we may have some practical solutions generating for harried curators and taxonomists who want to do monographs. Any developments that occur will be forwarded to you. You might be interested from the standpoint of information retrieval of literature to take a look at the project that Jimmy Atz is doing at the American Museum. It might be relevant at NYBG.

Best regards,

David J. Rogers
Professor of Biology

DRJ:gm

Taximetrics Laboratory
Department of Biology
Armory 101
University of Colorado
Boulder, Colorado 80302
5 September 1967

Dr. Alvaro Montaldo
Head of Institute of Agronomy
University Central of Venezuela
Maracay, Venezuela

Dear Dr. Montaldo:

I am interested in having Ingeniero Agronomo Jose Luis Sanchez take some training with me. I would be interested to know whether Sr. Sanchez is interested in some formal university credit for his work, or rather if he desires only an informal instruction in our methods. Either way is agreeable to me. However if he desires formal university recognition we will have much paper work, as you are aware.

If he comes informally I will include him in our research program so that he can get full benefit of our methods. Please let me know as soon as possible the desires both you and he have for this study.

I am very desirous to collaborate with you and him in this work and if satisfactory arrangements can be made I would like to ask that he prepare some specimens of your Venezuelan collection to bring with him. I will provide full instructions on the method of specimen preparation in the event that he desires to work with us.

Sincerely yours,

David J. Rogers
Professor of Biology

DJR:gm

UNIVERSIDAD CENTRAL DE VENEZUELA
FACULTAD DE AGRONOMIA
INSTITUTO DE AGRONOMIA
MARACAY

SEP 8 1967

No. 335-011

Maracay, 29 de agosto de 1967

Professor
David J. Rogers
Taximetrics Laboratory
Department of Biology
Armory 101, Univ. of Colorado
Boulder, Colorado 80302
U.S.A.-

Dear Dr. Rogers:

With our librarian, Prof. Celestino Bonfanti, who met you at the New York Botanical Garden in 1962, we are considering the possibility of using the cross reference index in the Bibliography of Tropical Root Crops.

Bonfanti thinks that because our work gives only a Bibliographic reference and not a quotation of the article considered, the advantages of the cross reference would be minimized.

Any way we would like to hear your authorized opinion on this subject to take the final action.

The Bibliography itself is ready for printing and we will proceed to it, nevertheless we have left out the cross index waiting for your always desinterested suggestions.

Very sincerely yours,

Alvaro Montaldo
Head Institute
Agronomy

AM/yb.-

UNIVERSIDAD CENTRAL DE VENEZUELA
FACULTAD DE AGRONOMIA
INSTITUTO DE AGRONOMIA
MARACAY

AUG 2 8 1967

No. 322-011

Maracay, august 22, 1967

Professor
David J. Rogers
Taximetrics Laboratory
Department of Biology.
Armory 101, University of Colorado
Boulder, Colorado 80302
U.S.A.-

Dear Professor Rogers:

Thank you for your letter of June 29, 1967. I certainly would like to have the assistance of BioScience Information Service to improve the Bibliography on Root Crops. I am now correcting the references as far as I can.

I have also the money to pay the expenses for this special work.

I would like to ask a new favour to you. We have about 200 cassava types, some from Venezuela and others Central America.

We would like to have one of our Assistant Professor Ingeniero Agronomo José Luis Sánchez to take some training under your supervision on Manioc classification and also to see other subjects on root and tubers crops in Colorado.

Our course on Root and Tuber Crops includes: potatoes, cassava, yams, tania, taro and sweet potatoes.

He can be there for one or two months on March or April of 1968.

Very sincerely your,

Alvaro Monta[illegible]
Head of Ins[illegible]
Agronomy

AM/yb.-
22-8-67.-

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Quarantine Division
209 River Street, Hoboken, N.J.

August 28, 1967

Prof. David J. Rogers
University of Colorado
Department of Biology
Boulder, Colorado 80302

Dear Prof. Rogers:

Unless noted below, the enclosed permit allows entry of the plant material named in your communication. Before ordering any other material please write this office to learn if it is enterable. WHEN WRITING, BE SURE TO MENTION YOUR PERMIT NUMBER.

Permittees are responsible for informing shippers of the freedom from soil requirement, prohibition on seedlings of woody plants, size and age limitations, certification, labelling, invoicing, addressing, etc., all of which are discussed in enclosed Circular Q.37-2.

Method of Importation. If you desire the economy and convenience of mail importation (Pars. 11 and 12 of Cir. Q.37-2), apply for green-and-yellow mailing labels, one for each parcel. Material entered as baggage may require the services of a bonded carrier to get it to an inspection station which may make it worthwhile to consider importation by mail.

Where Material Must Clear Quarantine. Material may not move across country uninspected and untreated. Authorized inspection stations for all types of material are located at New York, N.Y. (N.Y. International Airport and Hoboken N.J.); Miami, Fla.; New Orleans, La.; Brownsville and Laredo, Tex.; San Francisco and San Pedro, Calif.; Seattle, Wash.; San Juan, P.R.; and Honolulu, Hawaii. In addition, provision is made for clearance of orchids and cacti and other succulents at El Paso, Tex.; Nogales, Ariz.; and San Diego and San Ysidro, Calif. Seeds may also be entered at El Paso, Nogales, and San Diego. All of the more common bulbs may clear at any port where plant quarantine inspectors are stationed. Your permit has been made valid on port or ports in the light of information you furnished. If it does not provide for clearance at the authorized station nearest the port of first arrival please write us promptly.

Permittees must arrange for customs clearance of express and freight shipments, both air and surface means, (Par. 16, Circular Q.37-2).

Sincerely yours,

C E Andrews
In Charge, Permit Section

Enclosures: Q.37-2

OVER

When Mr.Appan offers the Manihot cuttings for entry at the port of entry in the United States, please be sure to instruct him to get in touch with the plant quarantine inspector on duty to arrange for the movement of the cuttings to an inspection station for plant quarantine clearance. In doing so he should mention that the cuttings are being imported under the University of Colorado's permit and give him the permit number. Transportation charges, if any, involved in forwarding the cuttings to an inspection station must be borne by you.

Fold this form on arrows for mailing in window envelope

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT QUARANTINE DIVISION
209 RIVER STREET, HOBOKEN, N. J.

IMPORT PERMIT FOR PLANTS AND PLANT PRODUCTS

NO. 37-31665

NAME AND ADDRESS OF PERMITTEE

University of Colorado
Department of Biology
Boulder, Colorado 80302

Permittee should notify Plant Quarantine Division promptly of change of address.

VALID THROUGH JUNE 30, 1969

UNDER AUTHORITY OF THE PLANT QUARANTINE ACT, AS AMENDED, PERMISSION IS HEREBY GRANTED TO PERMITTEE TO IMPORT IN ACCORDANCE WITH:

Quarantine No. 37

THE PLANTS OR PLANT PRODUCTS HEREIN SPECIFIED, GROWN OR PRODUCED IN:

India

THROUGH THE PORT OR PORTS OF:

New York, N.Y. (Including Hoboken, N.J.)

QUANTITY AND DESIGNATION OF PLANTS OR PLANT PRODUCTS

MANIHOT - Under Regulation 6.

TRANSMIT YOUR PERMIT NUMBER TO YOUR SHIPPER BUT RETAIN YOUR PERMIT.

BY C E Andrews

DATE August 28, 1967

FOR Director, Plant Quarantine Division

PQ FORM 907 AUG. 1963

EXISTING STOCK OF PQ FORM 907, JULY 1962, WILL BE USED UNTIL EXHAUSTED.

Q. 37-2
(1-65)

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Quarantine Division
209 River Street, Hoboken, N. J. 07030

RESPONSIBILITIES OF PLANT IMPORTERS

1. To avoid delay in the clearance of importations of plant propagating material importers have four important responsibilities to assume. Failure to assume all of these may result in loss or deterioration of material.

These responsibilities are:

a. To obtain, before placing orders, an import permit or to make certain that an existing permit provides for the entry of the desired material. If in doubt, obtain written assurance from the Plant Importations Branch, 209 River Street, Hoboken, N.J. 07030.

b. To transmit appropriate instructions to the foreign shipper. Please read carefully ¶2 below and the ¶¶ cited therein.

c. To make advance arrangements for meeting all Customs requirements. See ¶16.

d. To supply labor, materials, etc. through broker or agent, when necessary. See ¶17.

WHAT THE FOREIGN SHIPPER MUST BE TOLD

2. The permittee should instruct the foreign shipper concerning the freedom from soil requirement; the use of approved packing materials; the woody seedling prohibition, the size-age limitations, the defoliation requirement, when necessary; the need for labeling, invoicing, and certification; and the means by which shipment is to be made. Information on these requirements appears in ¶¶3 to 13 which follow.

3. FREEDOM FROM SOIL. All plant material must be free from sand, soil, and earth. Leafmold and other decayed vegetable molds are considered as soil. Plants arriving in or contaminated with sand, soil, or earth may be refused entry.

4. PACKING MATERIAL. (a) Only approved packing material should be used. Leaves, forest litter, woods moss, and any similar material taken from or out of the ground and dried grasses, weeds, hays, and straws are not approved. Among the commonly used packing materials which are approved are peat moss, sphagnum, pulp-free coconut or other vegetable fibers (excluding sugarcane and cotton), osmunda fiber, excelsior (woodwool), shavings, sawdust, ground cork, buckwheat hulls, and vermiculite. Willow withes should not be used to tie bundles.

Taximetrics Laboratory

Armory 101

17 August 1967

Sr. Rafael Girard
11 Avenida "A" 8-03 Zona 2
Guatemala
Dear Sr. Girard:

I am very pleased to correspond with you concerning the very interesting subject of the origin of cultivated plants in the Meso-American areas. I am sorry that I have been narrowly specialized in my studies and am not as familiar with some of the other crops as I should be.

With respect to the question concerning the two areas of concentration noted in my maps, one to the north and one along the Pacific to the south. I did not intend to indicate (with this map) that I considered these areas to be any more than a distribution of wild species. We must use evidence such as you have been so good as to provide as to how and where and when mankind first developed these plants.

You ask me to indicate exactly the number of species which exist in the Pacific region of the Mayan area. I am sorry that I can give you no more than approximations because my research has not focused on that particular problem. I hope to be able to answer that one in another year. You also ask where did yuca reach in North America. I think that only the southern tip of the state of Florida received yuca, and I think that it was brought to Florida via the Antilles by the Carib Indians.

I trust that these remarks are useful and I look forward to a continuing correspondence with you.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

AUG 14 1967

Guatemala, August 8, 1967

Prof. David J. Rogers
Taximetrics Laboratory
Dept. of Biology
Armory 101
University of Colorado
Boulder, Colorado 80302

Dear Prof. Rogers:

I wish to express my warmest thanks for your letter of July 25th., in which you gave me names and addresses of interest to me. I particularly appreciate your photo, which I shall reproduce as a courtesy of yours, mentioning its source, as well as your interesting data; I shall of course send you a copy of my book as soon as it appears.

I shall also publish your map taken from your pamphlet on the distribution of wild varieties of Manihot. You establish two main centers of mayor concentration of the species in Middle America, one in the area of the Pacific, approx. from Tehuantepec to Nicaragua, and the other in the North and Center of Mexico, along the Pacific. It seems that the one of most interest is the one in the Pacific Mayan area according to your map, as on this zone there are mythic-historical informations of a very ancient domestication of the yucca and sweet potatoe as well as the jicama, while nothing is known about this in the North. Apart from the fact that the word 'camotle', taken by the Nahuas from the Maya seems to confirm the above mentioned, i.e. that the Pacific Mayan area was the probable primary center, you place this center with 10 or more species. I take it that your opinion is in the sense that this area was the probable primary center of domestication of the yucca; it is there, where the mythical-historical sources place it, thus agreeing with your criterion. Is this your opinion? Could you indicate me exactly the number of species which exist in the Pacific region of the Mayan area? Until where did the cultivation of the yucca and the sweet potato reach in North America? Perhaps it was not diffused there for climatic reasons. If there was a cultivation of those tubercles in Florida, would it also come from Central America, or from the Antilles?

Please excuse my unending curiosity, but I don't intend to take up your attention again, until I send you the book I am preparing.

I wish to congratulate you once again for the magnifficent discoveries which change the concept one had about the origin of the cultivation of the yucca, and beg to remain

Sincerely yours,

Rafael Girard

Rafael Girard
11 Avenida "A" 8-03 zona 2
Guatemala

Taximetrics Laboratory

Armory 101

17 August 1967

Dr. Howard S. Irwin
Bronx Park New York Botanical Gardens
Bronx, New York 10458

Dear Howard:

Five Manihot specimens collected by Basset and Celia, et. al., showed up yesterday. These are unmounted specimens. Are you aware of them? Should I acknowledge there receipt to you or to Basset?

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

Taximetrics Laboratory

Armory 101

17 August 1967

Mr. C. E. Andrews
Plant Quarantine Division
209 River Street
Hoboken, New Jersey

Dear Mr. Andrews:

Following your phone conversation I would like to request a permit number for the purpose of introducing a small number of stem cuttings of Manihot esculenta. I expect that we will be introducing about 20 to 30 cuttings from the state of Kerala in India. These cuttings should be coming in in the hands of Mr. S. G. Appan who has been for the past eight years the farm manager of the Root Crop Experiment Station at Trivandrum. These cuttings will be a part of Mr. Appan's research work under my direction as he works for his Ph.D. at the University of Colorado. The plants will, of course, be given our best attention since they are research material and there will be no commercial enterprise with them. To my knowledge Manihot esculenta is only grown commercially near Miami, Florida, and at no other location in the United States. We, of course, anticipate that these plants will be given the usual inspection and fumigation treatment by your division.

I expect that Mr. Appan will be in New York via Air India some time next month. I appreciate your attention to this request.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

Taximetrics Laboratory

Armory 101

15 August 1967

Dr. Marshall C. Johnston
University of Texas Herbarium
Biological Laboratories Building
The University of Texas
Austin, Texas 78712

Dear Dr. Johnston:

I would like to stop by Austin either before or after the meetings at College Station. I suspect that you will be very busy during this time and wonder which of the two ends of the meetings would be best for me to visit to see the Manihot plants you have growing there.

I would prefer to stop by after the meetings either Thursday, the 31st, in the afternoon or Friday, the first, in the morning. Would you please suggest which is the more convenient time?

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

McGILL UNIVERSITY
MONTREAL

Department of Biochemistry

August 14, 1967.

Dr. David J. Rogers,
Professor of Biology,
Taximetrics Laboratory,
Department of Biology, Armory 101,
University of Colorado,
Boulder, Colorado 80302, U.S.A.

Dear Dr. Rogers,

Thank you for your ~~lecture~~ letter of August 9th. I regret that I have no more copies of my previous paper in JSFA 16 300 (1965).

I found your comments on the function of linamarin and linamarase interesting. I agree that if their combined function is to protect the plant from insects that this is not always successful, however, it seems possible to me that certain insects might fortuitously have a metabolism which is tolerant to HCN while others (the Cassava beetle?) may have evolved such a resistance, but I have no evidence for this.

Yours sincerely,

T. Wood

T. Wood, Ph.D.,
Assistant Professor.

Taximetrics Laboratory

Armory 101

10 August 1967

Dr. Louis C. Whiton
49 Partrick Road
Westport, Conn. 06882

Dear Dr. Whiton:

The poisonous substance of the bitter manioc is a cyanogenic glucoside; that is, a sugar with a cyanide radical attached. In the plant the cyanide is bound to the sugar, but apparently on severing the root from the plant, some enzyme system causes the cyanide radical to be broken away from the sugar molecule. Incidentally, the name of the substance is "linamarin". Clearly the substance is not a salt, and the cyanide is both soluble in water and volatile so that the combined grating and cooking removes all but a trace.

I call all cultivated species, bitter or sweet, no matter where found, Manihot esculenta.

I am sorry that I do not have at my finger tips the name of the alkaloid derivable from Lonchocorpus densiflorus. I am certain that the information is available in standard references.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

AUG 10 1967

LOUIS C. WHITON
49 PARTRICK ROAD
WESTPORT, CONN. 06882

TELEPHONE
(203) 227-4794

July 27th, 1967

Dr. David Rogers,
University of Colorado,
Boulder, Colo.

Dear Dr. Rogers:

I was talking yesterday with Dr. McGuire, with whom I was discussing poisons that are sometomes used by the Bush Negroes in Surinam. I have about completed a paper based upon field work that I carried out Dree Tabiki in 1959,1964 and 1965. Since my work is of an ethnological nature and not botanical, I am anxious to know in what form the cyanide occurs in bitter manioc, and Dr. McGuire has referred me to you.

I assume that it is HCN rather than a salt as it certainly is evaporated or changes its structure when the filtered root is cooked, and I believe also, when the sap is boiled. I do not imagine that this would be the case if it were in the form of a salt. Could you let me know, as I would like to include this information in one of the notes to my paper.

Incidentally would you please give me the botanical name of the plant in South America?

Also do you know whether the nekku bush (lonchocorpus densiflorus or rufescens) which as you know is used by the natives to stun fish in pools, has an alkaloidal poison, and what its name is?

Since I am about to forward my paper to one of the Anthropological journals, I hope that this letter reaches you promtly, although I realize that this is during the vacation period.

With my sincere appreciation in advance, I am

Sincerely yours,

Louis C. Whiton

Taximetrics Laboratory

Armory 101

9 August 1967

Mr. P. H. Haynes
Department of Agricultural Crop Production
University of the West Indies
St. Augustine
Trinidad, W.I.

Dear Mr Haynes:

This is a long overdue letter to thank you for your kindness and activities during the Root Crop Symposium. The orchid you gave me is doing nicely and we are pleased with it.

I am sending along a set of my reprints on Manihot for inclusion in your collection. I hope we can soon settle on some procedure for the library and the center for root crops.

You may be interested to know that we are going ahead to establish a collaborative procedure for the classification of the sweet potato. Frank Martin and a chap by the name of Alfred Jones, a geneticist at the U.S.D.A. Experiment Station in Tifton, Georgia, and I will soon meet to plan our collaboration on this project. Perhaps Mr Williams would also be interested in this work.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

Taximetrics Laboratory

Armory 101

9 August 1967

Dr. T. Wood
Department of Biochemistry
McIntyre Medical Sciences Centre
McGill University
Montreal, Quebec

Dear Dr.Wood:

I appreciate very much receiving your fine paper "The Isolation, Properties, and Enzymic Breakdown of Linamarin from Cassava," a separate of which you recently sent. May I please ask for the first of your papers in this series, published in the Journal of the Science of Food and Agriculture, Vol. 16, page 300, 1965.

I cannot help but comment however, on the conclusion that your paper states that "the combined function of linamarin and linamarase is that of protecting the plant from insects." I suspect that this cannot be defended in as much as I have seen any number of caterpillars chewing happily away on poisonous Manihot leaves, and have seen any number of gall wasps laying eggs in the leaves of these plants. A number of insects attack the growing points of these plants and apparently suffer no harm. I suggest therefore that the statement warrants modification.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

Taximetrics Laboratory

Armory 101

9 August 1967

Mr. Emmanuel V. Doku
Faculty of Agriculture
University of Ghana
P.O. Box 68
Legon, Ghana

Dear Mr. Doku:

Thank you kindly for your reprint "Breeding for Yield in Cassava." Unfortunately the paper you sent earlier has not arrived. You ask that I send "Origins and Development of M. esculenta and Allied Species," which appeared in the American Journal of Botany. I have no reprints of that paper, unfortunately, but it was only an abstract of a talk given, and most of the material is contained in the papers I am sending you.

It was a pleasure to meet you at the International Root Crop Symposium.

Sincerely yours,

David J. Rogers
Professor of Biology

DJR:gm

AUG 8 19[illegible]

UNIVERSITY OF GHANA

LEGON, ACCRA

TELEPHONE: ACCRA { 77351 / 77631

P.O. Box 68, LEGON.
CABLES: UNIVERSITY, LEGON

OUR REF:

YOUR REF:

2nd August, 1967.

FACULTY OF AGRICULTURE

Dr. D.J. Rodgers,
Taximetrics Lab.,
Dept. of Biology,
Armory 101,
University of Colorado,
Boulder, Colorado 80302,
U.S.A.

Dear Dr. Rodgers,

BREEDING FOR YIELD IN CASSAVA

I have already sent you a copy of this publication in response to your first letter but in case you have not received it, I am sending you another copy.

I should be grateful for a copy of your "Origins and development of M. esculanta and allied species" which appeared in American Journal of Botany (1962) 49.

Yours sincerely,

E.V. Doku
LECTURER IN CROP HUSBANDRY

Encl.

Taximetrics Laboratory
Ta
Armory 101

8 August 1967

Dr. Grady L. Webster
Department of Botany
University of California
Davis, California 95616

Dear Grady,

I am sorry I've been jumping around so much but I hope I have landed for a while. I am glad to help your efforts on the euph euphorbs of Panama as best I can do for you now (the specimen still has not showed up). I will give a guess at what you are sending because I think I know what it will turn out to be, but if I am wrong I can correct it at a later date. You can stop heaping ashes on your head about the names of that genus. Up to now it looks as though people looked in the Kew Index, picked a name and hit the plant with it. They might as well have done that because Pax and Hoffman"s monograph is a mess of confusion.

Now here is what I am willing to tell you. If we have evidence that the plant is not cultivated, I am going to call it M. guatemalensis Blake, the best name for the plants occurring along the west coast of Central America down into Panama. Your plant is not M. carthaginensis nor is it M. grahamii. The plant growing in the Climatron is most likely M. flabellifolia. This is a species which has been introduced from the estuarian areas of the La Plata River in Argentina into the coastal plains along the Gulf coast (Texas east to Florida), and grows quite nicely in green houses. M. grahamii is a synonym for M.-Arg.'s species flabellifolia (as is M. tweediana). I hope this sufficiently confuses the issue.

Stop by and see us.

Sincerely,

David J. Rogers
Professor of Biology

DJR:gm

MISSOURI BOTANICAL GARDEN
"SHAW'S GARDEN"

SECOND CENTURY
1859

2315 TOWER GROVE AVENUE
ST. LOUIS, MISSOURI 63110
TOWNSEND 5-0440

28 July 1967

Dr. David Rogers
Dept. of Botany
University of Colorado
Boulder, Colo.

Dear Dave:

It is getting hard to keep up with you, but the latest word is that you've moved downstate from Ft. Collins. If you keep working your way west we may get to be neighbors one of these years.

Well, here am I in your old stamping grounds, working on the euphorbs for the flora of Panama. This place seems to be making something of a come-back; at least it's been stimulating working around here this summer.

The intent of this letter, though is to cry for HELP! I'm writing up Manihot, and can't decide what name to put on the Panama species with large staminate flowers. It is the one I foolishly tagged as M. grahamii in the Euphorbs of the Southeast (just out in Jour. Arnold Arb.), but which seems dangerously close to M. carthaginensis. (The same plant, incidentally is labelled as M. esculenta in the Climatron here: the public is going to get a weird idea of what a cassava plant looks like!)

To cut a miserable story short, I am in despair over this, & we are sending you on loan a Panama specimen which I blithely annotated as M. grahamii in a moment of sublime (& ignorant) confidence. Your comments, however, derogatory, will be much appreciated.

I'm leaving here on August 3rd, so your decision should be sent back to Davis. The specimen comes back here to MBG, though, when you're through with it.

Yours in total confusion,

Grady

Grady L. Webster

(Dept. Bot., U C Davis 95616)

Taximetrics Laboratory

Armory 101

25 July 1967

D. G. Coursey, Esq.
Tropical Products Institute
56/62 Gray's Inn Road
London, W.C. 1, England

Dear Mr. Coursey:

Your letter of 10th July has been sitting in front of me for some days now. I have put off a decision about your request not because I do not wish to participate on a book on cassava, but because I know that it is one more committment on top of a heavy schedule. However, if you can get Jones to join us in this effort, I will be pleased to participate in it because I think that this group could do a good job. I am pleased that you will be willing to put your considerable ability to work on it.

So please proceed with your approach to Longmans and see what transpires. I agree therefore that your point on lending out of reprints is premature.

For convenience in filing of information, I am replying to your ITRIC sub-committee on a separate paper.

Sincerely yours,

David J. Rogers
Professor of Biology

DJR:gm

Taximetrics Laboratory

Armory 101

18 July 1967

Mr. G. H. de Bruijn
Centre Neerlandais
Orstom B.P. 20
Abidjan, Cote d'Ivoire

Dear Mr. de Bruijn:

I am very pleased to have your letter of June 28 concerning your investigations with special regard to the toxicity of cassava roots. In general I think your program is fundamentally important because we have in the past had too few scientifically sound experiments to determine the situation concerning the production of the cyanogenetic glycoside in roots of manioc. You can make a very fine contribution to the understanding of these complex plants.

One comment perhaps will be useful. You have indicated that you are planning a study of different spacing of plants. I believe that this particular work has been done on many occasions, but I am not sure that, unless you have soils of unusual fertility, you will contribute much with this particular study. Might I suggest an alternative?? It has been my experience that the consistency of the soils (whether loose and friable as sandy soils or some laterites) or heavy clays) has an influence on the distribution and shape of the roots. Perhaps a study of this t pe of variation which, to my knowledge, has not been done would be a useful contribution and an adjunct to the spacing and direction of planting.

Another comment I would like to make in response to the idea you mention, conserning the crossing of toxic and less toxic varieties: in this respect I recommend that you do not attempt to derive information from crosses of locally occuring cultivars, unless you have some competent plant breeder (geneticist) working with you. I recommend this because of the extremely complex nature of the hereditary mechanism of these plants. I can also predict the crosses of locally occurring cultivars will give you nothing but a very confused product. I recommend strongly therefore that this part of the possible work be left until such time as you may collaborate with some other worker. I trust that this information is useful to you,, and I look forward to continued correspondence with you.

I have one more suggestion to make: as you proceed in your studies, you definitely should make documenting herbarium specimens. Since I have spent some time in developing useful techniques to collect these plants, I took the liberty of sending you a set of these directions. I will be very pleasedtto receive and will hold specimens documenting your work along with my fairly extensive collection of over a thousand cultivars which is possibly the most extensive of this plant species. I cannot overemphasize the importance of documenting with plant specimens the work that you do with these cultivars in the Ivory Coast.

Very sincerely yours,

David J. Rogers
Professor of Biology

DJR:gm
Enc.

JUL 17 1967

TROPICAL PRODUCTS INSTITUTE
56/62 Gray's Inn Road, LONDON, W.C.1
Telegrams: Troprods London W.C.1
Telephone: Chancery 5412

Director: P. C. SPENSLEY
M.A., B.Sc., D.Phil., F.R.I.C.

Our ref.: B/2
Your ref.:

10th July 1967

Prof. D.J. Rogers
Taximetrics Laboratory
Department of Biology
Armory 101
University of Colorado
Boulder, Colorado 80302
U.S.A.

Dear Prof. Rogers,

I am replying separately to your letter of 23rd ult., as your point (d) has brought to my mind a matter quite apart from ITRIC affairs, in which you might be interested.

Although in the long term these papers to which you refer could obviously be deposited with ITRIC when it gets going, if, in the meantime you were to be writing anything more general on cassava, you might still need them yourself. This brings me to the real point of this letter, as follows. There is a serious need for an authoritative, but reasonably compact book on cassava, and, since the Symposium I have been wondering whether it would be possible to get together a small group - of which one hopes you would be one - to prepare such a book. I am thinking of something of the order of 60,000 to 100,000 words in all, so that if say four of us collaborated, there would only be 15,000 to 25,000 words to write each, which is not an insuperable labour, if spread over a year or so. If you would be prepared to write something of this order on the botany and taxonomy of the genus Manihot, with especial reference to esculenta, I would be quite prepared to do the chapters on the post-harvest side - i.e. chemical composition, nutritive value, processing and storage, toxicity, etc. Possibly Dr. Jones would do a section on the historical and geographical aspects of the plant in cultivation, and if we could find a fourth to do agronomy and pests and diseases, that would be that.

Please let me know what you think of the idea of such a collaborative venture. If you are interested, and agreeable, I could make a preliminary approach to Longmans, who are doing my book on Dioscorea (which is now, by the way, past page proof stage, and should be out by the end of the year) as part of a long series of short monographs on various tropical crops.

Pending your reply, I am not putting your proposal in point (d) specifically before the Committee, although it is covered in general terms by my suggestion about reprints, etc.

Yours sincerely,

D.G. Coursey

PS. Thanks for supporting my abbreviation "ITRIC" - I rather like it. As you can probably guess, I thought it [illegible] a bit [illegible]!

Taximetries Laboratory

Armory 101

25 July 1967

Sr. Rafael Girard
11 Avenida "A" 8-03 Zona 2
Guatemala

Dear Sr. Girard:

Your very complimentary letter strikes a considerable number of notes on my own interests. I will respond to it in a way which I think to be the same order in which you asked me the questions. I will indeed be pleased and honored to have you use the illustrations that you request. I am sending the photograph of Figure 4 which you request. This should be adequate for publication.

In answer to your question as to whether the Maya cultivated the poisonous yuca in the early days, I am really only able to give specific answers to this question by making the following suggestions: These are:

1. There are many variations in the techniques used today to extract the bitter principle. These range from very simple basket-like devices (nothing more than woven mats) through the complex device known as the "tipiti, and various modern milling devices.

2. The variation in the plant's content of prussic acid makes it possible to use some varieties whose content of prussic acid would be sufficient to be called "bitter" but still not sufficiently poisonous to be deadly.

3. It is not known to me how much variation exists in the prussic acid content from one locality to another. As a matter of fact, I am at present in correspondence with a young Dutch scientist who is working on this very problem in the Ivory Coast of Africa. After his investigation I believe we can be more precise in our analysis of the bitter and sweet yuca.

Therefore, I conclude that the Maya could have used some form of the poisonous varieties even though we have no archeological evidence of some device to extract the poison.

You ask my opinion on the approximate time from which yuca could exist. I believe that species of Manihot were present all the way from northern Mexico south through present-day Panama long before man appeared in this area. The very earliest opportunity, I believe, for their use would have been on the order of 9,000 to 15,000 B.C. You request ecological information on the Pacific Coast toward the end of the Pleistocene.

May I please refer you to a man whose experience in this connection is greater than my own. It would be very useful for you to correspong with Dr. Lawrence Kaplan, Department of Biology, University of Massachusetts, Boston, Mass. 02116. Dr. Kaplan has had considerable experience with the West Coast of Mexico and has some interesting hypotheses about the changes in the vegetation which have occurred since man entered the region. I suggest also that you ask Dr. Kaplan your question about beans since he has much interest and knowledge particularly on Phaseolus species.

Your question concerning the origin of Mayan domestication of maize is one which I would rather refer you to Dr. Robert C. Galinat, Agricultural Experiment Station, Waltham, Mass. Dr. Galinat will be able to give you the most recent concepts on maize domestication since he has for a long time worked with Dr. P. C. Mangelsdorff who is the world authority on maize. I am sure that their publications should be available to you if you request them. Another person who would be interested in your question is Dr. Ephraim Hernandez X. at Chapingo near Mexico City. Dr. Hernandez has much experience with the cultivated plants of the southeastern lowlands of Mexico. He is also very simpático.

I am very sorry that I cannot tell you of the address of Dr. Norvell. Perhaps the information service of the Smithsonian Institute in Washington, D.C., would be able to locate him. I am also ignorant of the origins of tobacco, a very interesting but also puzzling study.

Thank you for your interest, and I hope that I have been of some service to you.

Most sincerely,

David J. Rogers
Professor of Biology

DJR:gm

JUL 17 1967

July 10, 1967

Mr. David J. Rogers

Taximetrics Laboratory
Colorado State University

My dear friend:

It is with great pleasure that I acknowledge receipt of your letter dated June 20th. The book "Los Mayas" which I sent you, is a little tribute of admiration to your important botanical-historical investigations about the 'manihot', which in my opinion definitely solve the question. I warmly congratulate you.

My own investigations in the ethno-historical field reached the same conclusion, as the Maya and Quiché mythical sources establish that the sweet yucca, the sweet potato and the 'jicama' were cultivated in the Mayan area of the Pacific (Chiapas, Guatemala and El Salvador) since very remote times and even before the maize. On the other hand, the yucca cultivators were the primitive pickers, who domesticated the tubercles in that same area, i.e., that the step from picking to cultivation is appointed in that place. However, these data, which proceed only from documental sources, were lacking the botanical and archeological evidence. In my opinion, you have brought this evidence with your magnifficent work. This work of yours, which I consider trascendental, will be duly emphasized by me in the work I am preparing on the History of the antique civilizations of America, which I shall send you when it gets published. I will make ample reference of your work and, if you permit it, I would like to use your map of the distribution of the wild species of 'manihot'. I would also like to reproduce the photo of the yucca plantation which you publish on page 375 of 'Some Botanical and Ethnological Considerations of Manihot Esculenta'. Would it be possible to obtain a photograph of your Fig. 4? Regarding this photo, it intrigues me very much that you refer to poisonous yucca in Yucatán. Nevertheless, did the Mayas really cultivate the poisonous yucca in Yucatán without having any device for eliminating prussic acid? It is believed that the yucca began to be cultivated in that area around 7000 B.C. I would like to know your valuable opinion in this regard. Due to the exceptionally favourable conditions of the Maya area of the Pacific, i.e. to the South of the isthmus of Tehuantepec, at the beginning of the Holocene or even before that, at the end of the Pleistocene, (as the phenomenon of glaciation did not happen in that region), I would like to know your opinion of the approximate time at which the wild yucca could already exist; I consider this a matter of exceptional interest, as this region was already inhabited by superior hunters armed with proyectiles of the clovis type (around 9000 B .C.) and by primitive pickers or inferior hunters, who reached the region long before the first ones. Do you have any indication about the ecology of the Pacific coast towards the end of the Pleistocene or beginning of the Holocene, and about the time of aparition of tubercles in that region?

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ask Dr. Lawrence Kaplan, U Mass Biol. Boston 02116

As I have the honor of changing impressions with one of the greatest American botanists of our time, I would like to know your opinion about the possible place of origin of maize domestication. The same Mayan and Quiché sources also situate

R. S. MacNeish

the origin of maize cultivation in the same region where they first domesticated the yucca and it seems that this was domesticated there for the first time. In the highlands of Guatemala, in the region of Huehuetenango, there is a great number of maize varieties, among them the type which is scarcely contaminated with tripsacum or teocinte; this suggests, in my opinion, that it is a direct descendant of its wild progenitor, the maize. At the same place, there exist in great abundance the only two wild relatives of the maize, tripsacum and teocinte.

I would also like to know your opinion as regards the center of mayor concentration of varieties, or else, of domestication of the beans, among them Ph. vulgaris and Ph. lunatus. Dr. Oliver W. Norvell, who especially investigated about beans, told me that these and other wild species were original from the Zone Guatemala-El Salvador. Speaking about Dr. Norvell: Do you know his current address?

Apart from the beans, I would also like to know your opinion about the origin of tobacco. In regard to this, I must inform you that there is a wild variety of tobacco in Guatemala, which in the popular tongue is called 'tabaco bobo' ('fool tobacco').

Some sources speak about the cultivation of yucca in Florida; would this be sweet or poisonous yucca? It seems to be sure that the primary center of domestication of the poisonous yucca is at the Orinoco.

I wish again to offer you my warmest congratulations and thanking you very much for your attention, I wish to remain

Yours very truly

Rafael Girard

Rafael Girard
11 Avenida "A" 8-06 Zona 2
Guatemala

UNIVERSITY OF COLORADO

BOULDER, COLORADO 80302

DEPARTMENT OF BIOLOGY
Armory 101

July 7, 1967

Mr. I. Donald Bowden
Encyclopedia Americana
New York

Dear Mr. Bowden:

The photo you sent is, as I suspected, not cassava. The plant pictured probably belongs to the genus Jatropha, but I cannot fully identify it from the picture. All cassava plants are in the genus Manihot, and all are of the species M. esculenta.

I hesitate to send you my photographic negatives, and would also hate to have to choose the specific photo you would want. There is a wide variety in the choice, and what I would prefer doing would be to send you several contact prints (or slight enlargements) of 2¼ x 2¼ negatives, and ask you to pick the most appropriate ones.

Would this be a satisfactory procedure? Could you reimburse me for the effort of having the prints made, etc.? If so, I will be glad to comply.

Sincerely yours,

David J. Rogers
Prof. of Biology.

P.S. Do you want your glossy print of the Jatropha back again? I have no use for it particularly.

THE ENCYCLOPEDIA AMERICANA
575 LEXINGTON AVENUE · NEW YORK, N.Y. 10022
Office of the Editor · PLaza 1-3600

June 29, 1967

Dr. David Rogers
Department of Biology
University of Colorado
Boulder, Colorado 80304

Dear Dr. Rogers:

The Encyclopedia Americana is going through a major revision at this time and we are most anxious to obtain your help for our article CASSAVA.

Specifically, I would like you to identify the enclosed CASSAVA photograph as to genus and species. This picture is to be used to illustrate Cassava in our forthcoming revision. If this is not a Cassava would you have a photo of Manihot esculenta also the fleshy roots and M. dulcis. Your photographs would be reproduced in The Encyclopedia Americana and we will be very happy to extend a courtesy credit line.

Thank you for any help and information that you can give me, your courtesy and cooperation is greatly appreciated.

Sincerely yours,

I. Donald Bowden
Photo Editor

CENTRE NEERLANDAIS
ORSTOM B.P. 20
ABIDJAN. COTE d'IVOIRE.

Adiopodoumé, June 28, 1967.

Professor D.J. ROGERS,
Taximetrics Laboratory,
Dept. of Botany & Plant Pathology,
Colorado State University,
Fort Collins. Colorado 80521.

Dear Mr Rogers,

Thank you very much for your letter and your interesting papers about your study on cassave.

I am studying the influences of environmental factors on the toxicity of cassava roots: I am working with only a few varieties. The different toxicity levels of the varieties are probably due to polygenic factors. The variation within a variety is,in my opinion, principally due to soil fertility and metabolic activity, this possibly in relation with the activity of the enzym linamarase.

The subjects I study on the moment are:
- fertilizer (N, P, K, Ca and Mg) and organic manure influences on toxicity,
- age of plant influences, as a matter of course confounded with climatic influence. An experiment with 3 varieties is performed in four regions of the Ivory Coast with different climate and soil. Samples are taken at 6,9, 12 and 15 months after planting. Toxicity levels greatly vary in the different regions and seem to raise (generally speaking) with age in different ways, depending on variety and climate. This means that a variety which is harmless in one region (or in one period) may be toxic in another region (or another period),
- I am trying to develop a method to determine the linamarase activity in order to detect any possible relation between enzym activity and toxicity,
- I am starting an experiment with different spacing of plants and different ways of planting the cuttings
- I am also trying to develop a nutrient solution for cassava, to use this for more regulated experiments.

I try to include the toxicity level of the leaves in my study, but this very globally. I think it would be interesting to cross toxic and less toxic varieties and measure the toxicity level of the offspring; I have no time to do this and I do not know whether any study of importance has been done in this way.

I did not yet publish any result; all will be published together as a dissertation, probably in 1969. I will send you a specimen of the work but it may interest you to correspond about it. Whereas you did study thoroughly the cassava plant I would be very glad to hear your opinion on my study. I am thanking you in advance for this.

Yours sincerely,

G.H. de Bruijn.

- Taximetrics Laboratory

June 2, 1967

Director
Herbarium Universitatis Florentine
Istituto Botanico
Via Lamarmora n. 4 -
Firenze, 1, Italy

Dear Sir:

I am pleased to receive all of the specimens which you sent to us on the genus Manihot. The information contained in them was of great use. These specimens are being returned to you under separate cover.

Upon completion of the monograph, I will send to you some additional specimens as well as the publication about Manihot. Thank you for your attention.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/ch

INSTITUTO INTERAMERICANO DE CIENCIAS AGRICOLAS DE LA OEA

Año del 25 Aniversario

ZONA NORTE

El Instituto es un organismo especializado de la Organización de los Estados Americanos. Fue establecido por los Gobiernos de las Repúblicas Americanas en 1942 para promover su desarrollo económico y social a través de la educación y la investigación.

OFICINA EN MEXICO
Londres 40, 1er. Piso México 6, D. F.
Teléfonos: 11-22-12 y 11-24-18 Cables: IICAGROEA MEXICODF

ZN/HR/310
May 17, 1967

DR. DAVID J. ROGERS, Professor of Botany
Department of Botany and Plant Pathology
Taximetrics Laboratory
COLORADO STATE UNIVERSITY
Fort Collins, Colorado 80521
USA

Dear Dr. Rogers:

Thank you for your letter of May 8 and the publications on manioc which arrived today. I will be waiting to receive a copy of the full bibliography as soon as more copies are available.

I am very pleased to know that you will be able to spend a few days with me in Mexico in December. At the time you plan to visit there will be a good supply of nearly mature plants of those varieties and cultivars included in the collection of Campo Cotaxtla and I will be glad to offer you samples of this material.

We can discuss the details of your visit to Mexico City and Veracruz at the ASHS Meeting in Texas. If possible, I will try to arrange for a trip to Colorado to visit you.

Sincerely yours,

Montoya

Luis A. Montoya
Associate Horticulturist

El Instituto tiene su Dirección General en Costa Rica, Apartado 4359, San José. Sus tres Oficinas Regionales abarcan los siguientes países: Zona Andina, Apartado 478, Lima, Perú (Bolivia, Colombia, Ecuador, Perú y Venezuela); Zona Norte, Apartado 1815, Guatemala, Guatemala (México, Istmo Centroamericano y Antillas Mayores); Zona Sur, Casilla de Correos 1217, Montevideo, Uruguay (Argentina, Brasil, Chile, Paraguay, y Uruguay). Mantiene dos Centros: Centro de Enseñanza e Investigación, Turrialba, Costa Rica; y Centro de Investigación y Enseñanza para la Zona Templada como parte del Centro de Investigaciones Agrícolas del Uruguay, La Estanzuela, Colonia, Uruguay. Administra el Proyecto 206. (Reforma Agraria) del Programa de Cooperación Técnica de la OEA, patrocinado por el Consejo Interamericano Económico y Social (CIES). Mantiene también núcleos de investigación y enseñanza para graduados en Instituciones de los países miembros.

- Taximetrics Laboratory

May 17, 1967

Dr. Marshall C. Johnston
University of Texas Herbarium
Biological Laboratories Building
The University of Texas
Austin, Texas 78712

Dear Dr. Johnston:

First of all, I shall be pleased to write up the whole genus Manihot for the Texas flora. My opinion is that the only taxon occurring in the Texas flora is that very interesting plant along the Texas border with Mexico variously referred to as M. walkerae by Croizat and by others as M. angustiloba. My opinion is that there is a good case to call this a subspecies of Mexicana and it is largely thrgugh your collections in Mexico that I have been able to see the connections. I will, therefore, call the Texas plant M. mexicana ssp. walkerae comb. nov.

I really am embarrassed about keeping your specimens so long. The material has not been idle, however, and I have been doing my level best to get my hands on the generic variations in order to make a meaningful revision of the genus. Just chalk it up to my being rather dense in grasping the meanings of variations in this group. However, I trust you will bear with me and that it will not be too long before I make an honest man out of myself.

I would indeed be pleased to see the 10 Mexican specimens you have accumulated there. The Texan material you requested is on its way.

Sincerely yours,

inserted parcel post

David J. Rogers
Professor of Botany

DJR/ch

UNIVERSITY OF TEXAS HERBARIUM

B. L. TURNER
DIRECTOR

UNIVERSITY OF TEXAS HERBARIUM
BIOLOGICAL LABORATORIES BUILDING
THE UNIVERSITY OF TEXAS
AUSTIN, TEXAS 78712
AREA CODE 512 GR 1-5262

May 9, 1967

MAY 1967

MAY 1 2 1967

Dr. David J. Rogers,
Taxonomy Laboratory,
Department of Botany and Plant Pathology,
Colorado State University,
Fort Collins, Colorado 80521

Dear Doctor Rogers:

Very soon now I will be preparing a treatment of the Euphorbiaceae of Texas for the MANUAL OF THE VASCULAR PLANTS OF TEXAS which Donovan S. Correll and I are writing. Dr. Correll and I have been asking various specialists to contribute treatments of "their" special taxa, and so I am now getting around to asking you to contribute Manihot. With only one species in the state, this should be simple, assuming that you have now arrived at an idea of what the name of this species should be.

Contributors to the MANUAL are acknowledged by footnote on the page where their contribution appears, and are again mentioned in the Preface.

~~Then~~ should you not be willing to prepare Manihot for the MANUAL, please help me by sending me for a short time the Texas specimens of the genus which you have had on loan for such a long time, and clue me in on your ideas as to the correct name of the species.

Since you borrowed our specimens of this genus, about 10 Mexican specimens have accumulated in our herbarium. Would you be interested in seeing this new material?

Sincerely,

Marshall C. Johnston

- Taximetrics Laboratory

May 9, 1967

Dr. M. L. Magoon, Director
Central Tuber Crops Research Institute
'Iran Villa'
Kowdiyar, TRIVANDRUM - 3
Kerala, INDIA

Dear Dr. Magoon:

Your letter of May 5th and mine of May 8th probably passed each other in air planes somewhere over the Atlantic Ocean. In my letter yesterday, I acknowledged receipt of Mr. Appan's application, that it is in the process of being evaluated by various administrative offices at the University of Colorado, and that we are certain that we have some sort of research appointment for him.

I have just noted in our files that I have sent to Dr. S. K. Sinha, Plant Physiologist at your research institute all of the publications that I have made on Manihot. I also included to Dr. Sinha a short bibliography listing a number of important references on Manihot. I would appreciate it if you could have copies made of the bibliography for other interested workers there because this is only a typewritten listing and is not published in any form. I am sending to you under separate cover copies of my other reprints for your personal file. Would you please let me know when these arrive because of the uncertainty of the mail service. If they do not arrive in some satisfactory time, I will send other copies. I would also be pleased to know whether or not Dr. Sinha received his materials (these were mailed March 24, 1967).

Best personal regards,

sincerely yours,

David J. Rogers
Professor of Botany

DJR/ch

Encl: Econ Bot 17(3) - 1963
Econ. Bot 13(3) - 1959
Econ. Bot 19(4) - 1965
Bull. Torrey Bot. Club 90(1) - 1963

Dr. M.L. Magoon,
Director,
Central Tuber Crops Research Institute,
'Iran Villa',
Kowdiyar, TRIVANDRUM - 3, Kerala, INDIA.

May 5, 1967.

MAY 9 [redacted]

Dear Prof. Rogers,

This is just to thank you for the useful discussions I have had the privilege of having with you on several research topics of current interest during our stay at Trinidad. I am sure, the elegant techniques and methods described by you for studying the complexities of interrelationships amongst the cultivated species, will be of immense help and value to us in our research program on cultivated root crops at this Institute. May I also take this opportunity to request you once again to kindly arrange to send me the reprints of your papers in the genus Manihot for the use of the various scientists and students of this Institute. I should also be grateful if you could kindly include my name in your regular mailing list for the same.

I hope you recall the discussions I had with you regarding Mr. S.G. Appan, Farm Manager at this Institute and I am sure you must have by now received the application, requesting for admission as well as Research Assistantship, from him for favour of consideration and found it in order. The application is also accompanied by two supporting letters and if any additional information or any other supporting letter you may need about him, the same can be arranged to be despatched shortly. As already discussed with you at Trinidad, that he is very keen to do his Ph.D. work under your guidance at Colorado in the genus Manihot and I feel confident, if given the chance, he will prove worthy of your considerations and high standard normally expected at your University. He has impressed me as a man of considerable promise and he is indeed an asset to this Institute. I trust that you will do all that you can in providing him an opportunity to do his Ph.D. work under your guidance in this xxx genus. His training with you at Colorado will undoubtedly be of immense help to us in our research program on the different tuber crops on his return to India.

I shall greatly appreciate your reply in this connection so that his program can be adjusted accordingly.

I really enjoyed meeting you at the symposium and, expect that we shall have much to exchange in the years ahead.

With best regards,

Yours sincerely,

MMagoon.

(Dr. M.L. Magoon)

Prof. D.J. Rogers,
Professor of Botany,
Taximetrics Laboratory, Department of
Botany, Colorado University,
Fort Collins, COLORADO, U.S.A.

- Taximetrics Laboratory

May 8, 1967

Mr. L. A. Montoya
IICA, Officena en Mexico
Londres 40
Mexico 6, D.F.
Mexico

Dear Mr. Montoya:

Thank you for your letter of May 4 which came this morning. We are sending you under separate cover several pieces of information on Manihot. Shall we call it yuca?

I am not at the moment able to send you a copy of the full bibliography. I have exhausted my supply and have sent off two copies, one to Mantaldo at Maracay. As soon as other copies are made, I will forward one to you.

I look forward to seeing you in Texas and hope that you will be able to visit us here in Colorado. I will let you know now that I am expecting to be in Mexico City during the week of December 18-20 for a symposium on "Information Problems in the Natural Sciences" sponsored by the Universidad Nacional Autonoma de Mexico. This seems to me to be an opportune time to make a few collections of Manihot esculenta.

I am writing at this early date to inform you of my anticipations because I hope that you can make some plans to allow me to make collections of materials of mature or nearly mature plants from the experiment station at Cotaxtla near Vera Cruz. Since I recall that your harvesting usually falls sometime in December or January, I would hope that I could plan to have a few plants of each of your cultivars in the collection available for sampling.

Please let me know if it is convenient to make these arrangements so that I may plan ahead for the trip and for the time necessary. I hope that we can get together in December.

Very sincerely yours,

David J. Rogers
Professor of Botany

DJR:ch

Sent under separate cover:
1. Directions for collecting Manihot Liberum species
2. Econ Bot. 17(3): 211 1963
3. Econ Bot. 13(2): 261 1959
4. Econ Bot 19(4): 369 1965
5. Bull Torrey Bot Club 90(1) 1963

INSTITUTO INTERAMERICANO DE CIENCIAS AGRICOLAS DE LA OEA

Año del 25 Aniversario

ZONA NORTE

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OFICINA EN MEXICO
Londres 40, 1er. Piso México 6, D. F.
Teléfonos: 11-22-12 y 11-24-18 Cables: IICAGROEA MEXICOOF

ZN/HR/287
May 4, 1967

DR. DAVID J. ROGERS
Department of Botany
Colorado State University
Ft. Collius, Colorado 80521

Dear Dr. Rogers:

I am very glad to have had the opportunity to meet you at the Symposium in Trinidad and appreciate the friendship you offered me. Since I have only began to work on manioc very recently, making the acquaintance of the most outstanding workers in this area such as you, was one of the principal benefits I obtained from the Symposium.

I am quite anxious to receive the material you offered to send me, which included a series of papers related to the classification of manioc, information on how to dry the leaves, bibliography on manioc and whatever reprints of articles on manioc that you can spare.

In August I plan to attend the annual meeting of the ASHS in Texas and if possible, I would like to continue on to Colorado after the meeting in order to see you.

Thank you very much for your help and kindness.

Sincerely,

Luis A. Montoya
Associate Horticulturist

THE ROCKEFELLER FOUNDATION

AGRICULTURAL SCIENCES

COLOMBIA OFFICE
APARTADO AEREO 58-13
APARTADO NACIONAL 12-79
BOGOTA, COLOMBIA
CABLE ADDRESS: ROCKFEL

May 8, 1967

Dr. David J. Rogers
Taximetrics Laboratory
Dept. of Botany and Plant Pathology
Colorado State University
Fort Collins, Colorado 80521

Dear Dave:

I appreciate receiving your 57 pages of references on Manihot. I have glanced over the references and I'm sure many of them will be very helpful to us. I am sending you a personal check for $9.90 in payment of cost incurred in copying and sending of this list.

I am sorry to say that there isn't any literature available as yet on the development of the new center in Colombia, in fact the agreement isn't yet signed, but should be next week. If any is made available I will be happy to send you copies.

I look forward to seeing you in the future.

With best regards.

Sincerely,

Jim

Jerome H. Maner
Associate Animal Scientist

JHM.mvh

encl. Check for $9.90

c.c. Dr. Robert Waugh

REGISTERED NO. 7843

POSTMARK

APR 18 1967

Value $ N.V. Spec. del'y fee $

Fee $ .25 Ret. receipt fee $

Surcharge $ Rest. del'y fee $

Postage $ 3.45 ☐ Airmail

Postmaster, By

From David Rogers
Star Lab. CSU

To Dr. Jerome H. Holland
Apartado Aereo 58-13
Bogota, Colombia

POD Form 3806—May 1964

648—16—70493-6

11.70
3.30
15.00
7.45 — air mail charge
.75 — registration fee
4.20 — total
5.70 — copying charge
+ 9.90 — TOTAL
$

- Taximetrics Laboratory

April 17, 1967

Dr. Jerome H. Maner
Rockefeller Foundation
Apartado Aereo 58- 13-
Bogota, Colombia

Dear Jerry:

I can't remember if the above epithet for addressing you is correct or whether you called yourself by some other name. Anyway, herewith is the list of references on Manihot. The price for this job, including the cost of sending it air mail, is $9.90.

If there is any kind of literature on the development of this new institute in Colombia, I would like to hear about it.

It was a pleasure to meet you and chat with you during the meeting in Trinidad. I hope our tracks cross again.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/ch

Enc.

UNIVERSIDAD CENTRAL DE VENEZUELA
FACULTAD DE AGRONOMIA
INSTITUTO DE AGRONOMIA
MARACAY

No. 139-01V

Maracay, april 25th., 1967

Doctor
D. J. Rogers
Dept. of Biology
University of Colorado
Boulder, Colorado 80302
U.S.A.-

Dear Dr. Rogers:

Thank you very much for your valuable work in cassava Bibliography that I am including together with my references.

As soon as I wil have typpewritten all together, I will send you, as I think that your name have to appear as a cooperator in the Section of Manihot esculenta.

Very truly yours,

Alvaro Montaldo

AM/yb.-

REGISTERED NO. 7675

POSTMARK

FORT COLLINS, COLO.
APR
12
1967
USPO

Value $ N/I Spec. del'y fee $

Fee $ .15 Ret. receipt fee $ .13

Surcharge $ Rest. del'y fee $

Postage $ 2.56 Airmail

Postmaster, By

From David Rogers
Dept of Botany

To Mr. Alvaro Mendiola
Facultad de Agronomia
Maracay Venezuela

POD Form 3806—May 1964

c48—16—70493-6

- Taximetrics Laboratory

April 11, 1967

Mr. Alvaro Montaldo
Facultad de Agronomia
Universidad Central da Venezuela
Maracay
Venezuela

Dear Mr. Montaldo:

It was a pleasure to make your acquaintance at the root crop symposium in Trinidad. As promised, I am sending a bibliography of yuca. Please be aware that this listing has not been thoroughly checked for its accuracy. It might be well if you have some assistance to discover how correct the entries are. I am also sending copies of my yuca reprints which you may find interesting.

Would you please let me know when you have received this material?

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/ch

Enc. Econ. Bot. 17(3) 1963
" " 13(3) 1959
" " 19(4) 1965
Bull. of Torrey Bot. Club 90(1) 1963
Carbon copy of yuca bibliography

- Taximetrics Laboratory

April 11, 1967

IR. J.H. de Bruyn
Centre Neerlandais O.R.S.T.O.M.
Adiopodaume
Côte d'Ivoire

Dear Mr. de Bruyn:

Dr. Bolhius of Wageningen gave me your name while we were together at the Tropical Root Crop Symposium in Trinidad. He also gave me the interesting information that you are studying the production and concentration of HCN in the roots of Manihot esculenta. I am very much interested in this from the standpoint of the comparative production of this substance in various varieties of cassava. If you have done any work which has been published along these lines, I would be pleased to have a copy of it. If not, I would be pleased to be placed on your mailing list to receive any of your future work which you may do. I am sending copies of my own work which may be of interest to you.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/ch

Enc. Econ. Bot. 17(3) 1963
" " 13(3) 1959
" " 19(4) 1965
Bull. of Torrey Bot. Club 90(1) 1963

THE NEW YORK BOTANICAL GARDEN
BRONX • NEW YORK 10458 LU 4-8500

April 4, 1967

Dr. David J. Rogers
Dept. of Botany & Plant Pathology
Taximetrics Laboratory
Colorado State University
Fort Collins, Colorado 80521

Dear Dave:

Many thanks for the tentative schedule of the August symposium. My title suits me fine. I'm still waiting for the Memoir that will carry the relevant paper, but waiting is part of the game.

Your imminent move came as a surprise. As for the Manihot, just cross CSU and enter UC on the forms, then route them back to us through Weber.

Let me know when the abstract is due.

Sincerely yours,

Howard S. Irwin
Herbarium Administrator

HSI:gg

- Taximetrics Laboratory

March 24, 1967

Dr. Peter H. Raven
Division of Systematic Biology
Stanford University
Stanford, California 94305

Dear Peter:

I had just mailed out a letter to you when yours arrived. Most of the things interesting you are included in that letter, but now that you offer me an opportunity, I will add one or two other things.

Breedlove's specimens seem to be relatively immature. Can you get more mature ones? I am sending an extra set of instructions in this letter which I hope the collectors can read and follow those instructions.

As I pointed out in the first letter, one of Laughlin's collections (335) is exciting but I can't say much about it until more material is in hand. In addition to the specimens sent, it is extremely helpful in cultivar classification to have a scaled photograph of the plant. Failing a scaled photograph, at least a sketch of the branching pattern should be given with some sort of scale. I know that it is difficult to collect these kinds of data, but with this type of classification work, it is very significant.

Actually, the materials you sent are much better than most of the collector's, and I am pleased with them. I will be very pleased to have more materials. I am very much interested in the cultivation practices used with these plants to know how these tie in with those in Yucatan. Also I am interested in enthnological information that you may be able to gather.

Thanks.

Sincerely,

David J. Rogers
Professor of Botany

DJR:ch

Enc. sent instructions in another letter March 28, 1967

STANFORD UNIVERSITY
STANFORD, CALIFORNIA 94305

Department of Biological Sciences
DIVISION OF SYSTEMATIC BIOLOGY

March 23, 1967

Dr. David J. Rogers
Department of Botany
Colorado State University
Fort Collins, Colorado

Dear Dave,

Under separate cover I am sending you a few specimens of Manihot from Chiapas, including one mounted unicate which I would like to have returned in due course. The others are for you to retain, and I would very much appreciate having your names for them. Fairly extensive notes are included with these collections and we would be glad to amplify these if there are any additional characteristics that you would like to have information on. If you want us to examine any of these strains further this summer, we shall be happy to do so. Anything you can tell us about the origin or cultivated range of these strains would be extremely helpful in our studies as would any references which might illuminate these facets of their biology.

With many thanks for your kind help with this material and hoping that you will find it interesting, I am,

Yours sincerely,

Peter

Peter H. Raven
Associate Professor
Biological Sciences

PHR:pb

- Taximetrics Laboratory

March 24, 1967

Dr. Peter H. Raven
Division of Systematic Biology
Stanford University
Stanford, California 94305

Dear Peter:

We received six specimens of Manihot from Chiapas yesterday, and assume that these were collected by your colleague (or students) in the combined anthrolopological-ethnobotanical studies.

In your letter of March 8, 1966, you mentioned that there seemed to be two varieties recognized by the natives in the Tenejapa area. I have attempted to relate these specimens (particularly the collections by Breedlove, numbers 14846, 14932, and 14935) to your descriptions of them, but cannot be sure that I understand what you mean by "shallowly lobed" versus "deeply lobed" leaves. The specimens here all seem to have a similar depth of lobing, though the shape of the lobes differ. One cv., Breedlove No. 14932, has narrow, almost linear lobes, another, No. 14935, has what we lump together as "obovate-lobed." Does this come close to your designation?

Although the other three specimens sent (Laughlin 335 and 1125; Breedlove 14574) are very interesting, the specimens are too incomplete to do anything with. I am particularly excited about Laughlin 335, collected near Acala on 26 February, 1966, for the foliage of that specimen is reminiscent of cultivars found almost exclusively in the Guianas and further south along the coast in northeastern Brazil. Too bad that specimen is so incomplete, both from the specimen and note standpoint. Are there more data for all of these?

I have progressed far enough in the cultivar classification to be able to assign Breedlove 14932, 14935 and 14846 to groups. These are:

Breedlove 14932: Group I, linear-lobed, silver stemmed group.
Breedlove 14935: Group II, obovate-lobed, silver stemmed group.
Breedlove 14846: Group III, linear-lobed, brown stemmed group.

Laughlin 1125 is a wild species of Manihot that has a description, but the names are confused, and I haven't straightened it out yet.

The three Breedlove specimens assigned to groups indicate some improvement in data collection, but still not quite far enough along to accurately designate the specimens. I hope he (and any others who will be making these collections) will reread the instructions I sent you last year. If more instruction sets are wanted, I can send you some.

I am assuming you intend these specimens for my collection. I trust this is the case, because these are valuable additions to our knowledge of manioc in Mexico. Please keep them coming, and I hope that the designations given are helpful.

On another subject, I enjoyed yours and Dick Holm's paper in Society of Systematic Zoology on the place of systematics in the level-of-organization approach.

Also, I have resigned here at Colorado State University and am moving over to Boulder to join the Biology Department there, and work with Askell Löve. I think we can move ahead more rapidly there. Things are too practically-oriented here to suit our taste.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR:ch

- Taxonomy Laboratory

March 24, 1966

Dr. Peter H. Raven
Division of Systematic Biology
Stanford University
Stanford, California 94305

Dear Peter:

I am sorry I delayed answering your letter of the 8th for I am really excited to hear of your interest in the ethnobotanical work in Chiapas, and your findings on Manihot there.

The enclosed reprint gives some ideas I have about the early cultivation of M. esculenta, and indicates that the area you are working in may be very significant in this connection. There was an earlier paper with other details in the Bull. Torrey Bot. Club (90:43-54. 1963) but I am out of reprints.

Also enclosed are a set of instructions for the collection of data and specimens of Manihot cultivars. I have evolved this procedure over a number of years of study, and it covers the main points for the study of the morphological variability of the cultivars. For an ethnological study, I have not developed any clear set of instructions for data gathering, but can suggest a few items that might be useful. You should discover the cultivation techniques employed: when planted, whether interplanted with other crops or single-crop culture; any local superstitions about planting (dark of the moon, etc.); when harvested (month, or after the maize is harvested, or at irregular intervals); do they plant a single cultivar, or do they mix several together (I know you found only two, but look around--they may have more that they lump together under a single epithet). Take note of the way they use the roots: simple boiling, or more complex preparation; do they use any special utensils, baskets, or griddles. Note any specification they may have for the places of planting; close by their dwellings or removed; is the facing of the planting on an east-west, or north-south side of hills, or in valleys, etc. Any folklore should be investigated.

These are but suggestions for your data gathering. They are intended to discover whether the natives have a long history of cultivation, or whether rather recent. If they have a long history of using this crop, they will probably have a number of specific requirements. Your own interests will dictate the types of information

required for the project. You are fortunate to be working with anthropologists in this work--they can suggest good means of gathering useful information which will have meaning to botanists. Whatever you do, when you make up your labels of herbarium material, include the ethnological data along with the other interesting information. This way, the specimen becomes a source-document for information retrieval.

You mentioned that the plants you saw were not in flower. There may be several reasons for this: remember that these plants are selected for their root production; they are mostly reproduced by stem cuttings, (at least in cultivation) and unconsciously the natives may have selected some variant that doesn't flower frequently; you may have seen the plants during a vegetative flush, or conversely, during a dry period. I have so little information on the course of development of an individual plant that I can't be sure about any of these factors. I do know that there are varying times to maturity of the cultivars, and you may have found varieties that take much longer to mature (or flower) than others.

But whether the cultivar is in flower or not, take specimens of it, because we have to classify the plants. We can do quite a bit with the vegetative characters, indeed we must, because we are dealing with a plant used largely for its vegetative parts.

Manihot is complicated in meso-America. While you are working amongst the indians, ask them if they know of any wild species of M. in the neighborhood. There are some, I know, and the Indians may be aware of them. Be sure to make specimens of the wild ones, and include in the data any comments of the natives.

I hope these comments are useful, and that you will keep me up-go-date on your findings. Thanks, and good luck !

Sincerely,

David J. Rogers
Professor of Botany

DJR:ch

Enc.

STANFORD UNIVERSITY
STANFORD, CALIFORNIA 94305

Department of Biological Sciences
DIVISION OF SYSTEMATIC BIOLOGY

March 8, 1966

Dr. David Rogers
Department of Botany
Colorado State University
Fort Collins, Colorado

Dear Dave,

I am not sure whether I mentioned this to you before or not, but for the past two years I have been investigating the ethnobotany of an area in highland Chiapas jointly with a group of anthropologists. The results we have obtained have been most interesting thus far, and we hope that quite a bit of general information may eventually be produced by our project.

In this connection, I am writing to ask you about the state of knowledge of manioc in this area. In working with the economically important plants, we are anxious to provide descriptions which will readily fit in with the generally recognized terminology for varieties. I know that this particular group is very complicated in South America, but perhaps the situation is simpler in Mexico; and perhaps you will have some suggestions about how we should approach the problem on a local basis.

In Tenejapa (the area we are studying most intensively) the natives recognize two varieties of manioc: one, which they consider to be "genuine manioc" which has shallowly lobed leaves which are more or less the same color on both sides; and the other which they call "Spanish manioc" which has much more deeply lobed leaves which are dark green above and very pale below. On the face of it, this sort of terminology suggests that the second variety was introduced more recently than the first variety. However, at present, I have no idea of when manioc as a whole or any of its varieties were introduced into southern Mexico; perhaps you will have some ideas about this, and perhaps you will be able to suggest references on the subject.

I shall greatly appreciate any help you can give me with this matter, which I realize may be quite complicated. Neither variety of manioc flowers in our area and both appear to be prepared in the same way.

With very best wishes, I am,

Yours sincerely,

Peter

Peter H. Raven
Assistant Professor
Biological Sciences

PHR:pb

STANFORD UNIVERSITY
STANFORD, CALIFORNIA 94305

Department of Biological Sciences
DIVISION OF SYSTEMATIC BIOLOGY

May 13, 1966

Dr. David J. Rogers
Department of Botany and Plant Pathology
Colorado State University
Fort Collins, Colorado 80521

Dear Dave,

Under separate cover I am sending you one duplicate specimen of a Manihot from Chiapas hoping that you may have some comments to make on it. This is the one about which I wrote you earlier, "Spanish manioc." We shall certainly be doing more with this group in the coming summer and I shall pass the information on to you as it accumulates.

With good wishes,

Sincerely,

Peter

Peter H. Raven
Assistant Professor
Biological Sciences

PHR:pb

- Taximetrics Laboratory

April 11, 1967

Dr. Peter H. Raven
Department of Biological Sciences
Division of Systematic Biology
Stanford University
Stanford, California 94305

Dear Peter:

I have just discovered that a young man by the name of Montoya is putting together a collection of cultivars of Manihot esculenta. I am sure he would be happy to have cuttings of the varieties that your people are collecting in Chiapas. I note that your boys are off already but perhaps you could communicate with them. Thanks for your help. Montoya's address is as follows:

Mr. L. A. Montoya
IICA, Officena en Mexico
Londres 40
Mexico 6, D.F.
Mexico

Sincerely,

David J. Rogers
Professor of Botany

DJR/ch

STANFORD UNIVERSITY
STANFORD, CALIFORNIA 94305

Department of Biological Sciences
DIVISION OF SYSTEMATIC BIOLOGY

April 5, 1967

Dr. David J. Rogers
Department of Botany and Plant Pathology
Colorado State University
Fort Collins, Colorado 80521

Dear Dave,

Thank you very much indeed for your notes on our specimens of manioc and your suggestions for future work. Dennis Breedlove is leaving for Chiapas for the month of April, and he will take your notes with him. Perhaps he can do something about obtaining additional materials while there, and as he will be in contact with Bob Laughlin in Chiapas, they may collectively be able to advance the position. At any rate, I shall attempt to answer your detailed questions when he returns.

Also, my best congratulations on your move to Boulder! I am sure that will be an excellent place for you to work, and that you will enjoy it very much. As always, if there is anything I can do for you in this area, just let me know.

With very best wishes, I am,

Yours sincerely,

Peter

Peter H. Raven
Associate Professor
Biological Sciences

PHR:pb

STANFORD UNIVERSITY

DIVISION OF SYSTEMATIC BIOLOGY STANFORD, CALIFORNIA

2 April 1966

Dear Dave,

Many thanks for the interesting information on Manihot. We shall certainly investigate the matter farther this summer, and keep you posted on our findings.

With good wishes,

Sincerely,

Peter

Peter H. Raven

THE NEW YORK BOTANICAL GARDEN
BRONX • NEW YORK 10458 LU 4-8500

January 18, 1967

Mr. Raphael Girard
11 Avenida "A" 8-03 zona 2
Guatemala (America Central)

Dear Mr. Girard:

Thank you for your letter of January 10 concerning the work of Dr. David J. Rogers on yuca and its varieties. I am forwarding your letter to Dr. Rogers, since he is now at Colorado State University. I am sure that he will send you a copy of what he has written and he will also be interested in the varieties that you have available.

If you have an extra copy of "Los Mayas, su civilisacion, su historia" we would be delighted to have it for the library of The New York Botanical Garden because of the very considerable amount of work in Latin America that has been conducted through the years by this institution.

Sincerely yours,

William C. Steere
Director

WCS/gd

cc: Dr. David Rogers

cc Rogers + letter

Guatemala 10 January 1967

Director of
New-York Botanical Garden
Bronx Park
New-York 58. N.Y.

Dear Sir,

I permit me to require your help in the following case:
I got to know that Dr.David J.Rogers,of this institution,published a paper about the origin of Yucca and the varieties of this plant,wich can be found in Guatemala or Central America.

I am very interested to know more about this publication.Dr.Willey Go Gordon,of Peabody Museum (Un.Harvard),gave me your address.Therefore I would be very obliged to you for sending me this paper of Dr.Rogers or telling me the address of the publisher printing it.I shall send you the value in dollars by return post.I would be delighted to send you my book of 500 pages,entitled "Los Mayas,su civilisación,su historia" in Spanisch edition of 1966 with illustrations as well,if you are interested in.

I am looking forward to your answer and thanking you in advance for your help,I remain ,

Yours faithfully

Raphael Girard
11 Avenida "A" 8-03 zona 2
Guatemala(America Central)

sent Torrey Bot. Club 90(1) 2/2/67
Econ. Bot. 1964):

MISSOURI BOTANICAL GARDEN
"SHAW'S GARDEN"

2315 TOWER GROVE AVENUE
ST. LOUIS, MISSOURI 63110
TOWNSEND 5-0440

January 18, 1967

Dr. David J. Rogers
Department of Botany
Taximetrics Laboratory
Colorado State University
Fort Collins, Colorado 80521

Dear Dr. Rogers:

Thank you for your letter of December 5 received on return from Panama.

Let me answer as best I can a number of your queries.

1) Clusters of cultivars: your descriptive, morphological epithets would be fine.

2) Our total 1966 distribution was 625 copies, largely to institutions, many of which are tropical. Perhaps this helps, but I can't be too precise about your agricultural audience.

I should note that, beginning in 1967, we are charging a fee of $25.00 per printed page to help defray some of our mounting expenses. For a paper of your length we might, of course, come up with a different figure as arranged through the Director's Office, but this we can discuss later.

I hope you will get by to see us some day soon.

With best wishes for the New Year, I am

Sincerely yours,

Walter H. Lewis
Director of the Herbarium
and
Editor of the ANNALS

WHL/dp

MISSOURI BOTANICAL GARDEN
"SHAW'S GARDEN"
2315 TOWER GROVE AVENUE
ST. LOUIS, MISSOURI 63110
TOWNSEND 5-0440

December 9, 1966

Dr. David J. Rogers
Department of Botany
Taximetrics Laboratory
Colorado State University
Fort Collins, Colorado 80521

Dear Dr. Rogers:

Just a short note in reply to your letter of the 5th to Dr. Lewis which has just been received.

Dr. Lewis is on a collecting trip in Panama and will be away from the Garden until December 22nd. I am certain he will be in touch with you as soon after his return as possible.

With best wishes from all at the Garden for the coming Holidays,

Sincerely,

Dorothy Panos

(Mrs.) Dorothy Panos
Herbarium Secretary

- Taximetrics Laboratory

December 5, 1966

Dr. Walter H. Lewis
Director of the Herbarium
Missouri Botanical Garden
2315 Tower Grove Avenue
St. Louis, Missouri 63110

Dear Dr. Lewis:

Thank you for your prompt and pleasing reply to my letter to Dr. Gates on the proposed monograph of Mahihot esculenta. I am pleased to know that you are interested in this type of publication. I am also aware that you cannot buy a "pig in a poke", and that you will have to see the paper before any final acceptance. As a matter of fact, I think that I will need a considerable amount of editorial advice concerning the method of presentation and the inclusion of certain descriptive methods. For example, though this be called a monograph, I do not intend to establish a set of formal names for the clusters of cultivars. Rather, I would like to give the clusters an informal name which will be a descriptive, morphological epithet, for example, the "obovate lobed, rough-rooted group", the "linear lobed, smooth-rooted group", etc. Other than this type of difference, I expect to follow something of a "standardized monographic formula."

One question in my mind concerns the distribution of the Annals. Since I hope that this monograph will be widely circulated, not only amongst the taxonomic institutions of the world (to which I am sure the Annals are distributed), I would also like to get the paper in the front of as many tropical agricultural types as I can. My question, therefore, is how extensive is the distribution of the Annals to these types? Assuming the normal distribution of the Annals not to include many agricultural people, we can overcome this problem to some extent by distributing reprints. This is not as satisfactory solution as I would like because the inclusion of the paper in the regular distribution patterns is much the most satisfactory.

Distribution, while a matter of concern, is not uppermost in my mind, and no immediate solution is required.

I have fully intended on several occasions to stop by my Alma Mater to see what interesting things you people are doing. My latest effort to come (for the Annual Systematics) was shot down by a blizzard

Symposium

in Denver, but I will keep trying because I have some other ideas about machine handling of taxonomic data which I should like to talk over with you and Dr. Gates. So I shall attempt to be there and I will give you fair warning.

Best wishes for the Holiday Season,

Sincerely yours,

David J. Rogers
Professor of Botany

DJR:ch

MISSOURI BOTANICAL GARDEN
"SHAW'S GARDEN"

2315 TOWER GROVE AVENUE
ST. LOUIS, MISSOURI 63110
TOWNSEND 5-0440

November 29, 1966

Dr. David J. Rogers
Department of Botany
Taximetrics Laboratory
Colorado State University
Fort Collins, Colorado 80521

Dear Dr. Rogers:

Dr. Gates has forwarded me your letter of November 22 regarding a monograph of Manihot esculenta for the ANNALS.

question— Where are MBG annals Distributed?

Your contemplated paper sounds very interesting and I feel certain that it should be written. In 1968 we might have space for a 100-page paper, but of course until receipt and review we could in no way commit the journal, even with outside funds, to publish it in its entirety. If you wish to proceed we shall certainly consider your paper for publication and, hopefully, by that time our editorial staff will be enlarged sufficiently to handle a major outside contribution.

I hope you have the chance to come by St. Louis in the future so that the "new" members of the Garden might have the pleasure of meeting you.

With best wishes,

Sincerely,

Walter H. Lewis
Director of the Herbarium

WHL/dp
cc: Dr. David M. Gates

- Taximetrics Laboratory

November 22, 1966

Dr. David Gates
Missouri Botanical Garden
2315 Tower Grove Avenue
St. Louis, Missouri

Dear Dr. Gates:

I am writing to inquire about the possibility of publishing a rather longish monograph of Manihot esculenta in the pages of the Annals. The work I propose to publish is the first computerized classification of a group the size of mine (about 500 cultivars) yet attempted. It is also among the first modern systematic, morphological analysis of a group of cultivars of a single species.

As I see it, the monograph should be in two parts, the first of which discusses the methods used, and the second, the actual results of the methods. I would indicate the values of the computer methods, and some of the new insights about the plants which result from the clustering methods employed.

I have had to develop a series of new methodologies for work with cultivar classification, from the part of specimen and data collection, through data correlation, to the designation of the various hierarchical levels to be employed within a group where the relationships are highly reticulate. Discussions of these methodologies would also be included.

Since my work has already been subsidized by NSF, NIH and ONR, I shouldn't think there would be any difficulty in getting financial assistance for the publication. But this is premature to the immediate problem of knowing your interest in such publication in the Annals. I have not commenced writing the monograph, but the whole will probably not exceed 100 printed pages.

Sincerely,

David J. Rogers
Professor of Botany

DJR:ch

REGISTERED NO. 05108

POSTMARK

FORT COLLINS, COLO. NOV 25 1968

Value $ ..... Spec. del'y fee $ .....

Fee $ .75 Ret. receipt fee $ .13

Surcharge $ ..... Rest. del'y fee $ .....

Postage $ .65 ☑ Airmail

Postmaster, By .....

From David Rogers
C.S.U.

To Sr. Milton de Albuquerque
Secção de Fitotecnia
C.P. 48 Belem Para
Brazil

POD Form 3806—May 1964 45-110—70193-6

- Taximetrics Laboratory

November 21, 1966

Sr. Milton de Albuquerque
Seccao de Fitotecnia
IPEAN
C. P. 48 Belem,
Para Brasil

Dear Milton:

I am sending a copy of the bibliography you requested in your recent letter.

I have set the bibliography up under the following headings: chemical analysis, cultivation, disease, distribution, ethnology, general, taxonomy, technical, uses. Some of the references will apply to more than one of these headings, but they are listed only once.

Please be aware that the references may not be entirely correct. I have not thoroughly checked each of them to see whether they have the correct volume and page numbers, nor whether the author's names are all correct. However, I think there is sufficient accuracy for you to find all of them. I hope this proves to be useful to you.

Very sincerely yours,

David J. Rogers
Professor of Botany

DJR:ch

Enc.

- Taximetrics Laboratory

November 4, 1966

Sr. Milton de Albuquerque
Seccao de Fitotecnia
IPEAN
C.P. 48 Belem,
Para Brasil

Dear Milton:

I was very pleased to hear from you on your letter of 26 October. I will send to you as soon as it is completed a copy of all the references that I have accumulated on mandioca.

In the meantime, you have my permission to use my paper on the amino acids in any way you choose. I am sending two or three copies of the paper with this letter.

I am sorry that I have not had an opportunity to visit you again. I really want to visit there but have been very busy completing the classification of M. esculenta. I think I will be finished with this classification within the next few months.

I expect to visit Trinidad next April 2 - 8 at the University of the West Indies, St. Augustine. There is a meeting at that time for The International Symposium on Tropical Root Crops. If you have not been advised of this meeting, I suggest you contact Mr. P. H. Haynes of the Department of Agriculture-Crop Production. It would be very nice to see you there.

I trust that I shall be able to send you the Manihot bibliography within the next few weeks.

Very sincerely,

David J. Rogers
Professor of Botany

DJR:ch

Enc.

Dear Friend Rodgers:

I am, since some time ago, gathering the maximum possible amount of data on Mandioca, in order to use them in a publication for the students.

So, at the same time that I ask the friend to send all you can related to the culture, I also ask permission to print the table about amino acids from your work printed in 1962 (Leaf Protein Tests on Manioc Leaves from Jamaica and Brazil).

We are, until the present moment, waiting for your promised visit to the Institute, which has, since the beginning of this year, a new section of research that is very promising, related to several scientific institutions, among which is the Smithsonian Institute; it is the APEG (Area of Ecological Research of Guamá).

Thanking you for the attention you have given to my request, I remain looking forward to your answer and always at the disposal of a good friend.

Yours truly,

Note: The IAN now is called Instituto de Pesquisas e Experimentação Agropecuárias do Norte (IPEAN). Silly change of name...

Belém, 26 de Outubro de 1966

Caro amigo RODGERS :

Estou, já faz algum tempo, reunindo o máximo possível de dados informativos sôbre a Mandioca, afim de enfeixá-los numa publicação despretensiosa, destinada a estudantes.

Assim sendo, ao mesmo tempo em que solicito ao amigo o envio do que puder arranjar referente á cultura, peço também, permissão para transcrever o quadro sôbre amino-acidos do seu trabalho impresso em 1962 (Leaf Protein Tests on Manioc Leaves from Jamaica and Brazil).

Estamos, até o presente momento, esperando sua prometida visita ao Instituto, o qual possui, dêsde o início do ano corrente, um novo setor de pesquisas dos mais promissores, ligado a várias instituições científicas entre as quais o Smithsonian Institute, trata-se do APEG (Àrea de Pesquisas Ecológicas do Guamá).

Agradecendo dêsde já a atenção que dispensará ao meu pedido, aqui fico aguardando a resposta e sempre á disposição do bom amigo.

Um abraço do,

Milton de Albuquerque
Secção de Fitotecnia
do
IPEAN - C. P. 48

Nota: O IAN chama-se agora Instituto de Pesquisas e Experimentação Agropecuárias do Norte (IPEAN). Mudança desta de nome ...

INPA,
Caixa Postal 478,
Manaus,
Amazonas
Brazil
oct 2, 1966

Dear Dave,

I have just got your letter. I have just returned from Boca do Acre in the interior after an interesting collecting trip. I shall be in Brazil until March. I Manihot so far.

Pennington's address is:

Dr T. D. Pennington,
Forest Herbarium,
Commonwealth Forestry Institute,
South Parks Rd.,
Oxford, U.K.

with best wishes
Sincerely,

Jair

P.S. Thanks for running this data; please send him your instructions on how to read the print-out.

- Taxonomy Laboratory

November 14, 1966

Professor Daniel W. Gade
Department of Geography
Old Mill Building
The University of Vermont
Burlington, Vermont 05401

Dear Professor Gade:

The reprints requested are being sent. With respect to your comment on the collections of "sweet cultivars" in Peru and the statement by Weberbauer on the bitter manioc, there are no considerations in my estimation which can make any geographic differentiation between the "sweet" and "bitter" variations. I make some comments about this in these papers.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR:ch

THE UNIVERSITY OF VERMONT
COLLEGE OF ARTS AND SCIENCES
BURLINGTON, VERMONT 05401

DEPARTMENT OF GEOGRAPHY
OLD MILL BUILDING

10 November 1966

Professor David J. Rogers
Dept. of Botany & Plant Pathology
Colorado State University
Fort Collins, Colo.

Dear Professor Rogers:

I would like to request a reprint of the important article you wrote some time ago on taxonomic variation in cultivated Manihot, ~~and~~ which appeared in Bulletin of the Torrey Botanical Club. I have great interest in the culture history of this crop, and am formulating some research on it with consideration to southward diffusion of the crop by Guarani peoples. If you have published some more on this topic, I would greatly appreciate reprints of those as well.

Incidentally, in my research in the Urubamba Valley back in 63-64, I found five important cultivars below 1,980 m. All were sweet, and so I wondered about the validity of Weberbauer's claim that bitter manioc was grown on the eastern slopes of Peru from 1500 to 2200 m.

Sincerely yours,

Daniel W. Gade

Daniel W. Gade,
Assistant Professor

- Taxonomy Laboratory

September 13, 1966

Mr. George S. Bass
Calle 31 #6-42
Bogota, Colombia

Dear George:

Thanks for your post card with your interests in my coming to see you. I could not get additional funds to carry me down to the meeting in Argentina, and that is why I dropped, for the moment, plans to visit you in Colombia.

What is the best season for you and for finding Yuca growing at its maximum? For example, are your rains distributed through the year, or is there a specific dry period where your hoped-for or existing plantation is. I know that along a considerable amount of coast there is a dry period in which everything is leafless or nearly so. It would not be profitable to visit during one of these dry periods.

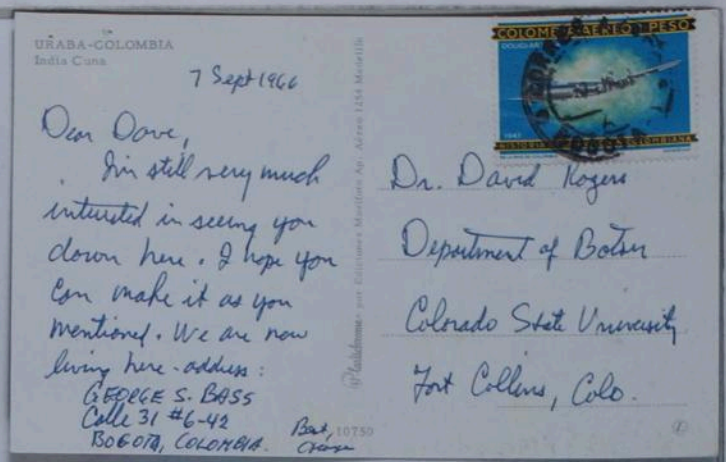
Let us try to get the time where all of these variables are considered and let us consider that my trip will not be combined with some other hegira.

If you wish to plan it this way, fine. I personally would prefer to visit you when the snows are on the ground here, but that is not the most critical element. Looking forward to your reply.

Sincerely,

David J. Rogers
Professor of Botany

DJR:ch



URABA-GOLOMBIA
India Cuna

7 Sept 1966

Dear Dave,

I'm still very much interested in seeing you down here. I hope you can make it as you mentioned. We are now living here - address:

GEORGE S. BASS
Calle 31 #6-42
BOGOTA, COLOMBIA.

Bat, Crow

Dr. David Rogers
Department of Botany
Colorado State University
Fort Collins, Colo.

Taxonomy Lab.

June 6, 1966

Mr. Sammie Sides
Biology Department
Pan American College
Edinburg, Texas

Dear Mr. Sides:

Thank you kindly for your offer to help locate Manihot specimens for me.

I am sorry that I have no more explicit localities for the plants near Mission and La Joya, but the specimens I have found in herbaria so far have no other data with them. I have a suspicion, but no actual information, that the plants will be found in or near caliche areas. Many of the other species of Manihot seem to prefer areas with high calcium salt content. This may not be true for these particular plants. I only mention this to give you as much of a clue as to where to look as I can.

If this turns out to be a troublesome problem, I trust that you will not spend too much time on it. These plants may occur only sporadically, and the ones so far collected may have been "chance" plants in those two areas.

Once again, thanks for your efforts.

Sincerely yours,

David J. Rogers
Professor of Botany

PAN AMERICAN COLLEGE WHERE TWO CULTURES BLEND

EDINBURG, TEXAS
Biology Department
June 1, 1966

Dr. David Rogers
Dept. of Botany & Plant Pathology
Colorado State University
Fort Collins, Colorado 80521

Dear Dr. Rogers:

In regard to your letter of May 16, 1966, we do not have any specimens of the genus Manihot and I am not familiar with the species in question, but I will do everything in my power to try to find the plants in the locations you mentioned. If it would be possible for you to send the exact direction from Mission and La Joya where the plants have been collected, it would be a great help.

I will get to work on it as soon as the summer session is under way.

Sincerely yours,

Sammie Sides
mar

Sammie Sides
Instructor of Biology

SS:mar

- Taxonomy Laboratory

May 17, 1966

Dr. Howard Irwin
Department of Botany
Universidide de Brasilia
Brasilia, F.D., Brazil

Dear Howard:

I am very pleased to have received last week two packets of Manihot. Seeds We have already put these into germinating chambers and hope that they will become growing plants some day. All the people I have talked to seem to be quite ignorant about the requirements for germinating of Manihot seeds. We will go on the assumption that Manihot will not be too different from castor-oil seeds. Here is hoping.

At any rate, I am very pleased to have these. I wish I had seeds of all my plants because there seems to be some excellent characters in them. Unfortunately, a very small percentage of the specimens have them.

Life continues to be pleasant here in Colorado. Spring has come and at least on the foothills there is a marvelous spring flora. I must admit that it takes a bit of adjustment after experiencing the spring in the mesic conditions of the East. Perhaps the thing that impresses me is this difference. I don't know whether I told you that we have bought a house that overlooks a lake and the mountains. The lake, to be sure, is an impounded reservoir, but so what, it has water in it! We now have as a second car a jeep with which to get to places we may not otherwise be willing to take our Chevy. This makes for good field work.

I am planning a little 3-week trip down into northwestern Mexico this summer to fill out some holes in Manihot distribution and types of variation to be found in that area. Being continually optimistic, I am hoping that this will give me the knowledge that I need to finish off the monograph of the genus.

I recently had a post card from Bob Breach saying that the grant for publication of our paper has been approved and that it should make the memoirs this summer. I will certainly be glad to see that paper published.

Our computer work goes on apace. Most of this year has been recouping and rewriting of our programs. As you might expect, we had trouble in getting to the right machine and getting the right machine to speak our

language. When we came we had high hopes that we could use a computer in Los Angeles to which we were tied by a teleprocessing line. This has proved to be not at all satisfactory and we have settled on the use of an IBM 7044 which has much the same capacity as the 7094 but just a little slower. This machine is on the campus of the University of Colorado at Boulder, and we have to commute back and forth to use it. While this is an inconvenience, we are glad to put up with it because we have found the people who run these 7044 to be extremely helpful and knowledgeable.

I am teaching a course in taximetrics this quarter. I think it is very exciting and that the students who have been exposed to it will not be the same as other groups of taxonomists. Two of the students have shown very good progress in understanding what we are attempting to do, and I hope that they will continue as taxonomists.

I spent a day at NYBG last month and saw most of the people there. It still looks like the same place, and I still get the same feeling I had while there. That is, McGuire is still the same character and all the rest are the same with their problems with McGuire. I was pleased to find that Prance is now more independent and will pursue his interests in Brazil next year.

Give my best to Mary and the kids. I hope your work progresses according to your expectations and that local politics haven't bugged you too much.

Best regards,

David J. Rogers

Manihot genus

- Taxonomy Laboratory

May 16, 1966

Mr. Sammie Sides
Department of Biology
Pan American College
Edinburg, Texas

Dear Mr. Sides:

Mr. Earl Camp of Texas Tech was kind enough to recommend that we write to you. In my monographic studies of the genus Manihot, one intriguing species, described as Manihot walkerae, has a very few number of collections. The only localities that we know of are along the Rio Grande, one at Mission, Texas and the other at LaJoya. These old collections, unfortunately, gave little, if any, data about these particular plants.

I wonder if I may trouble you to discover if you have any specimens of these plants already collected, or if you are familiar with them. From the material I have, it seems that the plants are about one to two feet tall. They probably grow rather sporadically. They grow from a tuberous root. Other than this I can't really describe much about them.

If you or your students have an opportunity to be in the field in the area near where these earlier collections were made and have an opportunity to dig up a plant, I would very much appreciate the opportunity to see them and to have at least a root or two such that I may cultivate them here in our greenhouses.

Incidentally, it may be that another name given to the species is M. angustilobia. You might even find this plant listed as Janipha. It is not certain in my mind how the plants might be identified in your local flora.

Whatever you may be able to help me with in this direction, will be very much appreciated.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR:ch

Manihot

- Taxonomy Laboratory

May 9, 1966

Dr. Jose de Js. Jimenez
Calle Maximo Gomez 34
Santiago de los Caballeros
Republica Dominicana

Dear Dr. Jimenez:

Please forgive my long delay in answering your letter of March 9th. I have made no final decision regarding the herbarium name Manihot domingensis, but I fear that it will not be kept as a separate species. I am of the opinion that these plants belong to a complex of species with wide and sporadic distribution, of which the plants from Samana form the northernmost extension. The oldest valid name for the species is M. brachyloba, described by Mueller von Argau in Flora Brasiliensis. Muell. Arg.'s plants came from the state of Para, in Brazil, but his specimens and descriptions fits the plants from Samana very well.

Perhaps the plants from the Dominican Republic will stand as a subspecies of M. brachyloba, but I have not yet made a final decision in this respect. At any rate, I shall be certain to inform you when I have made the appropriate decision.

With respect to your question concerning Quantitative Taxonomy, I fear that you will find it difficult to locate any descriptive work in this area precisely defined as Quantitative Taxonomy. There are, however, many papers which essentially deal with this area although not under these terms. You will find references to "numerical taxonomy," to "taximetrics" and other similar terms. I am enclosing a reprint which will give you some ideas about what is intended by these terms. We are attempting to discover means by which we can make the science of taxonomy more precise. We must do this if we are to use the computational devices known as computers to aid us in our studies. Computers do not think, but will follow a set of instructions given to it. If we want to determine a classification, with an appropriate set of instructions (written as a set of mathematical statements) we can put in the data about the plants, and get out of the computer a much more precise classification than we would have been able to, if we did not have the computers available to us.

In many genera and families, we have never achieved a good classification because of the complexity of the species. The genus Manihot

is a good example of a genus of plants that has never been well classified. We are attempting to use computers to aid us in the formation of a classification which can be useful to taxonomists. In Manihot, the species M. esculenta is one which is very difficult to classify because of its wide cultivation, and extreme variability. We hope the computer will aid us in making a good classification of this cultivated species.

This is the sense of the terms "quantitative taxonomy." It merely is a set of words for which many synonyms exist. I trust that this description is meaningful to you.

Very sincerely yours,

David J. Rogers
Professor of Botany

DJR:ch

Enc.

31 publications on manihot

- Taxonomy Laboratory

May 4, 1966

Dr. Carl Moh
IICA Centro De Ensenanza E Investigacion
Turrialba, Costa Rica

Dear Dr. Moh:

The cuttings of the 3 cultivars of Manihot esculenta arrived in excellent condition yesterday. It is hard for me to tell you how much I appreciate your endeavors in this work. I hope that I may be of some assistance to you in the future.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR:ch

INSTITUTO INTERAMERICANO DE CIENCIAS AGRICOLAS DE LA OEA

El Instituto es un organismo especializado de la Organización de los Estados Americanos. Fue establecido por los Gobiernos de las Repúblicas Americanas en 1944 para promover su desarrollo económico y social a través de la educación y la investigación.

CT/FIA/342
Centro de Enseñanza e Investigación
TURRIALBA, COSTA RICA
Cable: IICA - Turrialba

April 19, 1966

Dr. David J. Rogers
Professor of Botany
Department of Botany & Plant Pathology
Colorado State University
Fort Collins, Colorado 80521

Dear Dr. Rogers:

It was a pleasure to hear from you. In January, we chilled a few Manihot cuttings in a refrigerator for 24 hours and found that all cuttings were killed. This is why I did not send the cuttings to you last winter. As the weather is turning warmer now, we will have the cuttings sent to the Costa Rican office for quarantine and then will senf them to the Miami USDA as suggested in your December letter.

With best regards,

Sincerely yours,

Carl C. Moh

Carl C. Moh, Head
Nuclear Energy Program

JOSEPH MORNINGSTAR
CHERRY VALLEY ROAD
GREENWICH, CONN.
AREA CODE (203)
TO 9-5154

April 18, 1966

APR 20 1966

David J. Rogers, Esq.
Professor of Botany
Colorado State University
Dept. of Botany and Plant Pathology
Fort Collins, Colorado 80521

Dear Professor Rogers:

The correspondence which you had with our office during February has only just reached me as I have been down South and have only just returned.

I wish there was something that I could do to help you and normally this would be a matter for the Tapioca Association, but in view of the very disagreeable experience we have had with the man we sent there, I do not think that the Association would be at all inclined to move further in this direction. I think I told you what a disgraceful situation he created and were it not for the fact that at the time I was under a terrible strain, I certainly would have brought it to the attention of the Department of Agriculture.

I have been out of things now for a year so there is very little help that I can give you at this time, but I do remember with a great deal of pleasure my meeting you and the pleasant hours we spent together.

As ever,

Cordially,

Joseph Morningstar

JM:cg

MORNINGSTAR PRODUCTS
DIVISION OF INTERNATIONAL LATEX & CHEMICAL CORPORATION

630 WEST 51ST STREET, NEW YORK, NEW YORK 10019 / TELEPHONE 212-582-3790

February 14, 1966

David J. Rogers
Professor of Botany
Colorado State University
Department of Botany and Plant
Pathology - Taxonomy Laboratory
Fort Collins, Colorado 80521

Dear Professor Rogers:

Your letter of February 8th, addressed to Mr. J. Morningstar has been referred to the writer for attention. We are unable to pass this letter along to Mr. J. Morningstar since he is no longer connected with our firm, having retired almost a year ago. Morningstar-Paisley, Inc., is now a Division of the International Latex & Chemical Corporation, whose headquarters are in Dover, Delaware.

When Mr. Morningstar returns from his winter vacation in Florida, I will see that he receives a copy of your letter for any suggestions he might care to make.

Yours very truly,

MORNINGSTAR PRODUCTS

Earl C. Lenz
Marketing Manager

ECL:ms

TELEPHONE
JUDSON 2-3790

ESTABLISHED 1851

CABLE ADDRESS
"ETINCELANT" NEW YORK

Morningstar-Paisley, Inc.
630 West 51st Street
New York, New York 10019

EXECUTIVE OFFICES

25 February 1964

Dr. David J. Rogers, Curator
Quantitative Taxonomy
The New York Botanical Garden
New York 58, New York

Dear Dr. Rogers:

Through your good offices in recommending Dr. Krochmal to us, the Thai Tapioca Association has agreed to underwrite his visit to Thailand for the start of a program to improve the cultivation of tapioca. I thought you would be glad to hear this because if it had not been for you, we would not have had this opportunity.

I hope to see you soon.

With my kindest personal greetings, believe me

Sincerely,

J. Morningstar

JM:nem

- Taxonomy Laboratory

February 24, 1966

Dr. Annetta Carter
University of California
Department of Botany
Berkeley, California 94720

Dear Dr. Carter:

Thank you for your offer of Manihot collections from Baja California. I would be very pleased to see this material as I am sure that it will fill out some gaps I have in that area. May I caution, however, that the identification may take a little time. I still have to sort out that which should receive names.

Sincerely,

David J. Rogers
Professor of Botany

DJR/pam

FEB 2 4 1966

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY · DAVIS · IRVINE · LOS ANGELES · RIVERSIDE · SAN DIEGO · SAN FRANCISCO · SANTA BARBARA · SANTA CRUZ

DEPARTMENT OF BOTANY

BERKELEY, CALIFORNIA 94720

February 21, 1966

Dr. David Rogers
Department of Botany
Colorado State College
Fort Collins, Colorado

Dear Dr. Rogers:

During the course of my field work in the Sierra de la Giganta of Baja California, Mexico, I collected material of Manihot. Would you be interested in having me send it to you for identification?

Sincerely,

Annetta Carter

Annetta Carter
Principal Herbarium Botanist

AC:aqh

- Taxonomy Laboratory

March 1, 1966

Dr. Jacques Barrau
sous. directeur au Museum National d'Histoire Naturelle
Laboratoire d'Ethnobotanique
57, RUE CUVIER
PARIS, 5, FRANCE

Dear Jacques:

I am interested in your new address and position. Are you in charge of the Journal D'Agriculture Tropicale and Et De Botanique Appliquée? Could you give me information concerning the cost of subscribing to these journals? What will be your duties in the laboratory? I always wondered what a person interested in ethnobotany was supposed to do in a museum. My own experience as curator of economic botany never provided me with an answer.

I would be interested in your program, if you have time to write me about it.

Sincerely,

David J. Rogers
Professor of Botany

DJR/pam

MINISTÈRE DE L'ÉDUCATION NATIONALE

MUSÉUM NATIONAL D'HISTOIRE NATURELLE

LABORATOIRE D'ETHNOBOTANIQUE

CENTRE D'ÉTUDES ET D'INFORMATIONS
ETHNOBOTANIQUES

JOURNAL D'AGRICULTURE TROPICALE
ET DE BOTANIQUE APPLIQUÉE

57, RUE CUVIER - PARIS-V°
TÉL. : (608) 402-69-57

PARIS, LE 24 feb. 1966

Dear Dave,

I am indeed sorry to answer so late Your kind note dated december 22, 1966 which reached me here where - after a trip to Brasil and Venezuela - I am now settling into my new job.

Hal Conklin has probably contacted you re/ the Manihot slides.

I hope to see you in the States as I expect to pass through your country from time to time.

With best regards

Yours sincerely

Jacques

New adress. Jacques Barrau,
sous. directeur au Museum National d'Histoire Naturelle,
Laboratoire d'Ethnobotanique,
57, rue Cuvier
PARIS, 5,
FRANCE

GEISMAR & COMPANY, INC.
10 EAST 40TH STREET • NEW YORK, N.Y. 10016

GEISMAR & COMPANY, INC.
NEW ORLEANS 12, LA.

GEISMAR & CIA., LTDA.
SAO PAULO, BRAZIL

TELEPHONE
MURRAY HILL 6-0442

CABLE ADDRESS
MARABRES NEW YORK

February 14, 1966

Dr. David J. Rogers
Professor of Botany
Colorado State University
Fort Collins, Colorado 80521

Dear Dr. Rogers:

I have for acknowledgement your letters of January 27th and February 8th which reached me within a few days of each other.

The information which you were kind enough to give me on the potential use of Manioc Leaves for animal feed, as well as the reprints of your work on this subject were all very much appreciated. Obviously, the utilization of these leaves is not a simple matter to organize on a commercially profitable basis. Assuming that feeding tests with cattle were to give satisfactory results, the problem of integrating the harvesting of the leaves with the root harvest still exists, particularly in South Brazil where the roots are usually harvested during the winter when the plants are without leaves. The situation may be simpler in tropical areas where the roots are harvested after 10 to 12 months of growth and where the foliage is present at the time of the harvest.

With regard to the monograph about which we have been corresponding with Dr. Normanha, I am sorry to report that I received a letter from Dr. Normanha, mailed late in December, in which he advises me that, having retired from his position at the Institute as of October 20th, he does not think that he is in a position to undertake this work. Perhaps you have heard from him directly, along the same lines.

I still think that a monograph, or a similar type of publication, covering the various aspects of the culture, industrialization and use of the Manioc Plant would be of considerable value.

I should be glad to make contributions to such a publication on the subjects of the manufacture of tapioca starch and other products from the manioc roots and the utilization of these products in the industrialized nations. However, I do not feel that I have the time, at least for the present, to undertake the editing of such a monograph, unless it be in cooperation with others. Perhaps you have some suggestions in this respect and, in any case, you might want to keep the matter in mind for future action.

GEISMAR & COMPANY, INC.

Dr. David J. Rogers ...cont'd. February 14, 1966

With regard to your letter of February 8th I was happy to hear of the honor conferred upon you by being invited to the Symposium in Belem. Unfortunately, our company does not have funds available to further research by assisting private scholars, nor do I know where such funds might be obtained. No doubt you are more familiar than I am with the various private, government and United Nations organizations who may be in a position to supply such funds. In any case, I hope that you will be successful in obtaining the help you need to attend this Symposium.

Best regards.

Yours sincerely,

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Public relations

January, 3rd, 1966

Dr. David J. Rogers
Professor of Botany
Colorado State University
Fort Colins Colorado - USA

Dear Dr. Rogers:

Thank you very much for your letter of November 18, 1965, in answer to my question regarding the possibility of your contribution in submitting a paper concerning Manihot esculenta.

As I have already written to Dr. Van Biema, I shall not be able to carry out that kind of work, just as I imagined it, because since last October 20 I retired from the Instituto Agronomico , and cannot use the facilities of it.

As a retired agronomist I made a program to give private assistance to particular enterprises dealing with cassava production in Mexico, Guatemala and Brazil.

I am sure that you and Dr. Van Biema with your tremendous scietific experience will carry on briliant that work. If I may be of any kind of assistance, I shall be honored to hear fom you.

Sincerely yours

Eng. agro. Edgard S. Normanha
Rua Boaventura do Amaral 692
Campinas - S. P. - Brazil -

- Taxonomy Laboratory

February 1, 1966

Dr. Marshall C. Johnston
Department of Biology
Sâll Ross State College
Alpine, Texas

Dear Dr. Johnston:

I am trying to get more precise localities for specimens of the genus Manihot. I have a specimen which you collected on April 26, 1960, number 5363B which has been identified as M. walkerae. Your locality indicates that the specimen was collected in the state of Tamulipas, Mexico on the Rancho Loreto.

I would appreciate it very much if you could give me a more precise locality for this particular plant.

Thank you for your efforts.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/pam

- Taxonomy Laboratory

January 17, 1966

Dr. Thomas P. Myers
University of Illinois
Department of Anthropology
137 Davenport Hall
Urbana, Illinois

Dear Dr. Myers:

Thank you for your letter and inquiry on Manihot esculenta. Enclosed are the two reprints you requested. I do not understand your comment: "You mention that you know of no manioc from coastal Peru." In re-reading the paper I find no such statement. I have collected M. esculenta near Lima myself, and have other botanical vouchers for the coastal areas. It is unlikely that I would have intended such a statement under any circumstances. I also know Margaret Towle personally and have her book in my collection.

In answer to your question concerning botanical reasons for Sauer's assertion that bitter manioc drops out at extra-tropical latitudes and altitudes, I have the following comments. Since we have no botanical information to differentiate between "bitter" manioc and "sweet" manioc I cannot make any reasonable responses. Unless Sauer defines what he means by "bitter," there is no way to argue the point. He is going under the mistaken opinion that some differences do exist. I have no evidence that they do. For example, we know that soil and climate have a marked effect on the CN^- content of the roots, and that in the same general area, we can modify the concentration of CN^- in the same cultivar merely by growing it in two different habitats.

As you are aware, we have to treat statements by natives about the bitterness, or lack of it, with utmost caution. Some cases have been found where the processing of "sweet" manioc followed exactly that for the "bitter", merely for reasons of habit. Or, the practictioner was really aware that he couldn't distinguish one cultivar from another, and would rather treat the roots as though they were poisonous just to be on the safe side.

I must say that I am far from knowledgeable of the total botanical problems of these plants and recognize that many more studies will have to be made.

Sincerely,

David J. Rogers
Professor of Botany

DJR/pam

P.S. I've added two more reprints on M. that may interest you.

UNIVERSITY OF ILLINOIS
DEPARTMENT OF ANTHROPOLOGY
137 Davenport Hall, Urbana, Illinois 61803

January 10, 1965

Dr. David J. Rogers
Department of Botany and Plant Pathology
Colorado State University
Fort Collins, Colorado 80521

Dear Dr. Rogers

Your recent article on manihot esculenta in Economic Botany was pointed out to me a few days ago. As an anthropologist I was very pleased to see it because all too little attention has been given to this staple of the Indians of the tropical forest. I would very much appreciate a reprint of the article if you have one available. I would also appreciate a copy of your 1963 article which appeared in the Bulletin of the Torrey Botanical Club.

You mention that you know of no manioc from coastal Peru. I don't know if any is grown on the coast today, but I have seen it in coastal markets and have eaten it in criollo households. Manioc has also been reported archaeologically on the Peruvian coast in contexts dating to at least the beginning of the Christian era. Margaret Towle's Ethnobotany of Pre-Colombian Peru is the best summary reference.

Are there any botanical reasons for Sauer's assertion that bitter manioc drops out at extra-tropical latitudes and latitudes? Certainly you seem to assert otherwise by your report of bitter manioc in the Maya area. Also, at least the tools for the preparation of bitter manioc--graters and squeezers--were recorded by Paul Marcoy in the upper montaña in the middle of the nineteenth century.

Very truly yours,

Thomas P. Myers

Thomas P. Myers

31-I

- Taxonomy Laboratory

January 14, 1966

Dr. Howard Irwin
Department of Botany
Universidade de Brasilia
Brasilia, D. F. Brazil

Dear Howard:

This is a long overdue response to your letter of the 8th of November and also to the fine Christmas card which we received from Marian giving some later data about your folk's operation there in Brazil. Marian mentioned that you still hadn't received at Christmastime the needed bus. In other-words, we can paraphrase this and I'm sure you must have by now, by calling it the "wayward bus." I'm sure you have become an expert at stack blowing by now. I wonder how you make out when you're doing it in Portuguese. We read in the papers about the terrific rain storms that they had in Rio. I suppose that the same general rains are occurring somewhere around your area and I can imagine that some of those roads back there must be real beauts by now.

I'm certainly glad to hear that you are getting some field work in and that Manihot is being looked after very nicely. I certainly look forward to your fine material. It does me a great deal of good when I pull out your specimens and can see the whole cotton-picken plant right there in front of me so that I know what I'm dealing with rather than little ole scrappy pieces of junk that I've been trying to work on for so long. You mentioned the problem of sending seeds. I would guess that the best thing to do is to hang on to seeds that you may collect until, say, about the first of May. When you send them it seems to me that probably the easiest is to send small amounts and send them air mail directly to me. This way we can circumvent any problems that might occur when dealing with the introduction of these things. Just give me a little notice ahead of time when the seeds are being sent and I will be on the watchout for them.

After much searching about here in Fort Collins we finally found a house that we liked very much and that we could afford.

Strangely enough, after living near great bodies of water in the East for so long we finally have a place in the semi-arid West that looks out over the water. There is a reservoir right behind our house and so we have now, a room with a view and also a guarantee that we're not going to have a hundred houses built right next door to us. This place, like all other university centers is growing like a weed and the typical pattern for house building is to buy up huge tracts of land and then plunk down as many houses as you can jam onto them. The place that we got has about three fourths of an acre and on one side faces up to a highway and on the other side faces the lake (reservoir). The neighbors are sufficiently distant and have a sufficient amount of land around their property that we feel nicely isolated. The address, incidentally, is

Route 2, Box 44-H
Fort Collins, Colorado

Our work on computer classification is finally getting into high gear. It took us alot longer to get moving than we thought it would. We're still in the process of rewriting the programs that we had in New York and still haven't yet got the whole process of clustering running on the I.B.M. 7094 computer that we have available to us. I might say that we are very pleased with the financial arrangement. Our bills, so far, have run something like $30 and $40 each for computer work per month. You should remember in New York any one bill that we got would be somewhere in the hundreds and more likely in the thousands. This is a great relief. Within the next two or three years this institution will have in its own shop a computer which will very nicely handle the kind of work that we want to do. Therefore, we look forward to collaboration again on the genus Cassia and any other projects that you may wish to give us. Incidentally, have you heard any more about the application to NSF to publish our joint efforts in the Memoirs? Clark Rogerson wrote to me and asked back last fall for some words to be said about why the particular paper should be supported and I hope I gave him what was needed. Since then, however, I have heard nothing and wondered if you had.

Well, Buddy, I hope that you are able to get on with your work as you had planned it and that everything is finally smoothed out. Incidentally, did you ever think about becoming the director of the university there?

Best wishes,

David J. Rogers
Professor of Botany

DJR/pgm

8 November 1965

Dr. David J. Rogers,
Dept. of Botany & Plant Pathology,
Colorado State University,
Fort Collins, Colorado 80521, EE. UU.

Dear Dave,

It was good to hear from you and learn that you, Connie, and the children, as well as Henry and George have settled into what sounds like something far closer to the type of setting you had sought so long. After so many years of batting your head on NYBG's walls, the present turn must indeed seem like poetic justice at long last realized.

Your fear that "something must have gone awry" with our fancy arrangements has been all too true on several fronts, although I'm happy to say my work has been going apace, and Marian is enjoying her teaching duties at the Am. school. I think the girls are accepting her in her dual role with better grace in the last few weeks; at least I haven't seen any curling of lips recently.

As yet we have not received the shipment I sent from NYBG in July. Thus, I am operating with whatever I can scrounge locally (the stuff I stashed here last November mysteriously disappeared, but has been partially replaced at U. expense after I blew my stack). The bus has also yet to make the scene, but the snag there was with GM in New York. A couple of days before I left I went over to the body shop presumably installing the special fittings, only to find the wrong vehicle had been shipped. After a lot of waiting, nasty letters, a wire or two, and a note to Bob K. to get on the horn and DO something, I received notice and bills of lading showing the bus had sailed out of NY harbor on the 28th of October. Now comes the battle of Rio.

The real problem here at the Universidade, the snag that is in back of all the others, is the fact that the U. hardly exists any longer. When we arrived on August 30 there were about 250 profs on the staff and a student body of about 400. Today there are over 200 resignations in the works and just about all the students have departed. Reason: in its clean-up campaign to get rid of corrupters and grafters, the fed. gov't. has decided that pinks, reds, and "subversives", alleged or otherwise, must go. That seems admirable on the surface, but the problem has been the method. In the case of U.B., the rector (=our U. pres.), a political appointee sworn to follow govt. policy, asked his deans for lists of undesirables. When they refused, he fired them. This brought on a roar of protest from the rest of the faculty, dramatizing their outrage by going on strike. Thereupon the rector sent for the military police who surrounded the campus and, for a time, excluded all profs from the campus. This, of course, was the death knell, especially in a country with university

teaching jobs going begging. Resignations were filed by the score as whole departments have been absorbed in other institutions. Antonio Cordeiro, for example, a protoge of Dobzhansky and onetime grad. student of Patterson & Stone (Drosophila), had a first rate dept. of experimental genetics going, supported by Ford and Rockefeller money as well as by several Brazilian industrial organizations. He was given the gate, and has decided to open his own institute in Bahia. Friedrich Gottlieb, one of Brazil's top organic chemists (recently working on differential chemistry of Machaerium spp.), and a magnet for young talent in the field, had a dept. of 15 comers, now all gone. The entire dept. of psychology has been invited to my old stamping grounds, the Univ. of Texas. On and on it goes, all very sad.

Meanwhile Murça Pires is on top of Neblina with BM, and I wonder how much he knows about all this, especially as nothing much had happened up to the time he departed in mid-September. I am more concerned about his plans once he does learn of UB's fate. I expect he may return to IAN in Belem, in which case this project would probably have a shift of headquarters. On the other hand, things may simmer down before he returns. We'll just have to hang on and see.

While all this has transpired, we (Raimundo Reis and Raimundo Souza, the same two from the IAN I used last year) have really been "baling hay". To wit, we now have some 2500 collection numbers, largely in sets of 7 - 10, of which 27 are of Manihot, and most of them with roots and copious notes. Seeds we will be on the lookout for, but the time is not now. We're just at the beginning of Manihot's flowering season here. Hard seed will probably follow in a couple of months. If things proceed apace, you'll probably get about 100 collections of Manihot from this tour, perhaps half with seed. The seed I'll send on separately, as you've asked. What about Manihot's (seed of, that is) resistance to subfreezing temperatures? Cerrado soils are very deficient in calcium and phosphorous; you may want to take that into consideration in preparing a greenhouse soil. This is all disconnected, but relevant I think.

While in Brasilia, we work out of a shack I commandeered from a local contractor doing U. construction work. It's right in back of the apt. we at last got on the edge of the U. grounds (after a wait of 7 weeks). Every other week, on the average, we are away to such places as Chapada dos Veadeiros (where Yale Dawson, with the Machris Exped. in '56, worked for 8 months), Cristalina (Serra dos 'Chrystaes' in Fl. Bras.), Cabeceiras, Serra Dourada, etc., all within 1 day of Brasilia by 4x4 jeep wagon. Once the bus is here, our trips will be more distant and for longer periods.

Well that's our story for the moment. Let us here further from you as time permits. And rest assured Manihot seed will be collected; I'll wait to hear from you again before sending any.

Abraços para os todos, Harold

- Taxonomy Laboratory

February 8, 1966

Dr. Gerhard Van Biema
Geismar & Company, Inc.
10 East 40th Street
New York, New York 10016

Dear Dr. Van Biema:

I wonder if I may call upon you for advice and possible assistance. I have been invited to present a paper on Manihot esculenta at a symposium on the Amazonian Biota to be held at Belém, Brazil in June of this year. I would like very much to participate in this symposium but find myself without any available travel funds. The regular channels that I would normally request assistance from have indicated that this year, because of tightening federal budgets, they cannot fund travel to this symposium.. I would like to inquire if you have available any funds to assist private workers, and if so, how should I apply? Or failing in that, if there are no funds available to you is it possible for you to suggest other sources of money to pay for my travel to Belém and back?

I will appreciate any advice or assistance that you can give me.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/pam

A re-working of letter dated Feb. 1
Also, new address

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- Taxonomy Laboratory

February 8, 1966

Dr. Marshall C. Johnston
Department of Botany
University of Texas
Austin, Texas

Dear Dr. Johnston:

I am trying to get more precise localities for specimens of the genus Manihot. I have a specimen which you collected on April 26, 1960, number 5363B which has been identified as M. walkerae. Your locality indicates that the specimen was collected in the state of Tamulipas, Mexico on the Rancho Loreto.

I would appreciate it very much if you could give me a more precise locality for this particular plant, and other Manihot specimens which you collected on the same trip.

Thank you for your efforts.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/pam

- Taxonomy Laboratory

February 8, 1966

Mr. J. Morningstar
Morningstar-Paisley, Inc.
630 West 51st Street
New York, New York 10019

Dear Mr. Morningstar:

Since our last contact I have moved my operations from New York to the present address. This has not diminished my interest in the study of tapioca plants. Strangely enough I am able to pursue these studies with more intensity here than when I was in New York.

I wonder if I may call upon you for advice and possible assistance. I have been invited to participate in a symposium on the study of tapioca plants to be held at Belém, Brazil in June of this year. Unfortunately, I find myself without any financial assistance available to cover my travel expenses. Is there some fund available to you or can you suggest some resources that might permit me to participate in this very important meeting?

I will appreciate any advice that you may have on the subject.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/pam

- Taxonomy Laboratory

February 4, 1966

Dr. Harold C. Conklin,
Chairman
Department of Anthropology
Yale University
New Haven, Connecticut 06520

Dear Hal:

I am sending you two separate packages: one, the kodachromes and two, three specimens. The specimens are being sent express, collect. Will you please note the care that I have used in packaging these materials and return them to me in the same type of packaging. I need not emphasize how important these specimens are. Since we are still working with these and other specimens of Manihot esculenta, I will appreciate it if you could use them and return them to me within, say, a month.

Amongst the kodachromes you will find a series of slides numbered 1 - 5 which represent the processing of Manihot as it is done by Indians on the Upper Mazaruni River of British Guiana. The slides that you have here are copies of ones that I, unfortunately lost through the malpractice of Richard Evans Schultes of Harvard University. This is the last record of these slides.

The other kodachromes give some pictures of various structures of Manihot - flowers, leaves, roots - and variations in habit of the species. There are seven of these slides. I will also appreciate their return as soon as you have had an opportunity to use them.

Sincerely,

David J. Rogers
Professor of Botany

DJR/pam

- Taxonomy Laboratory

February 4, 1966

Dr. Richard Evans Schultes
Botanical Museum
Harvard University
Cambridge, Massachusetts

Dear Dick:

I am disturbed that I have not received back the original copies of the Manihot kodachromes sent to you earlier this past year. These slides are extremely important to me and I do not know how to tell you of the grievance of the loss that this imposes upon me.

Have you any suggestions for their replacement?

Sincerely,

David J. Rogers
Professor of Botany

DJR/pam

, Taxonomy Lab.
2/7/66

Mr. Mulford Martin
The New York Botanical Garden
Bronx Park,
Bronx, New York 10458

Dear Mulford:

May I take you up on your offer to help me with library work? I recognize that now that you're back with your first love, the mosses, that you aren't in the bookery all the time, but maybe you could spare me one or two minutes.

Some way or other, I neglected to get one description of Manihot copied while I was there. The species in questionx is M. foetida (HBK) Pohl. I would like to have a copy of Pohl's transfer of HBK's species from Janipha foetida to the genus Manihot. The reference I would like Xeroxed is:

Pohl
Plantae Brasiliensis Icones et Descriptiones
I (1827) p. 55.
Manihot foetida.

I do not think that this species was pictured, so there should be only the description. If you could get this Xeroxed, I will certainly appreciate it.

We are enjoying ourselves here in Colorado. The university is growing, and we're glad to be where there are students. Though this campus has a few "Vietniks" about, in contrast to Berkeley or Chicago, we are remarkably free of such people who are "agin" everything. They're mostly just normal types of students. We've just bought another house, and have been busy since the first of the year moving in.

I will certainly appreciate your aid in the above matter. I may even send you a most species in exchange!

Sincerely,

D.J.Rogers

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Yale University *New Haven, Connecticut 06520*

DEPARTMENT OF ANTHROPOLOGY

25 January 1966

Professor David J. Rogers
Department of Botany and
Plant Pathology
Taxonomy Laboratory
Colorado State University
Fort Collins, Colorado 80521

Dear Dave:

I've just returned from a long break in the Philippines. Jacques is back in Paris, and I am finishing up our joint course. With regard to our previous correspondence, I can still use any slides or specimens such as Jacques outlined in his letter of November 23rd, if you can spare the time to put the material in a package and send it on. Because of the irregular nature of this last semester's course meetings, we will be continuing likewise on through the spring semester. Anything at all that you can send on will be most appreciated. Many thanks.

Best regards.

Sincerely,

Harold C. Conklin
Chairman

HCC:mae

- Taxonomy Laboratory

January 27, 1966

Dr. Gerhard Van Biema
Geismar & Company, Inc.
10 East 40th Street
New York, New York 10016

Dear Dr. Van Biema:

May I apologize for not having answered your letter of November 23, 1965 any sooner. I am glad to hear that you are interested in contributing to the monograph suggested by Dr. Normanha. I have no notion as to whether or not this work will be published in any time that will be very useful to any of us. I have not yet submitted my own contribution on the systematics of manioc.

In your letter you requested information on the use of manioc leaves as animal feed. I enclose two reprints of my own that will indicate about as much as I know about this possibility. Unfortunately, I cannot give you the information that you asked for, namely, the approximate weight of leaves on a dry basis which could be obtained per plant growing. I cannot supply this information either for Thailand, Central America, or for Brazil. May I suggest, however, that there are a number of variables involved herein. There is no way to determine the amount of leaf per plant unless we specify the age of the plant. In the individual plant's development, it would probably have more foliage per plant at an age of 3 - 5 months, long before the plant is ready for harvesting for it's roots. As the plant approaches maturity (for the roots) much of the foliage has dropped off and there are usually only leaves near the apex of each of the stems. However, the greatest variability is not on the individual plants, but between different varieties. That is, there will be a great variation from one type of manioc to the next and we would have to make a considerable study in order to determine that variety most suitable for the production of leaf material.

I suspect that you are interested in getting as much from

one plant as possible and you would, therefore, be interested in harvesting the leaves at the same time the root is harvested. This probable condition would require that you investigate the different varieties to determine that one which has the most potential interest to you.

As you can see from the enclosed reprints, there is a wide range of variation in the crude protein content of the leaves. This would be another factor of consideration when you go to select the most appropriate ones for the purposes you have in mind.

I hope that these comments are useful to you.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/pam
Enclosures