

MEETINGS HELD IN CENTRAL AMERICA DURING MAY, 1967

- I. REGIONAL SYMPOSIUM ON "ECONOMIC IMPACT THROUGH SOIL AND PLANT ANALYSIS", HELD IN TEGUCIGALPA, HONDURAS.
- II. INAUGURATION OF SOIL-PLANT LABORATORIES IN GUATEMALA, EL SALVADOR, AND HONDURAS.
- III. PLANT DIAGNOSTIC CLINICS IN GUATEMALA, EL SALVADOR, HONDURAS, NICARAGUA, AND COSTA RICA.

J. W. FITTS, DIRECTOR
INTERNATIONAL SOIL TESTING

CONTRACT AID/csd-287
NORTH CAROLINA STATE UNIVERSITY
AT RALEIGH

BEST AVAILABLE

MEETINGS HELD IN CENTRAL AMERICA DURING MAY, 1967 - CONTRACT AID/csd-287

J. W. Fitts, Project Director

During the first two weeks of May 1967, a series of important meetings were conducted in the five Central American countries. These meetings included a Symposium on the "Economic Impact Through Soil and Plant Analysis" in Honduras, the Inauguration of Soil-Plant Analysis Laboratories in Guatemala, El Salvador and Honduras, and Plant Diagnostic Clinics in Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica.

I. REGIONAL SYMPOSIUM ON "ECONOMIC IMPACT THROUGH SOIL AND PLANT ANALYSIS"

The first regional meeting of the Central American countries, Panama and Mexico, in relation to soil-plant analysis as a guide to soil fertility practices, was held in Tegucigalpa, May 8-13. At the invitation of the Ministry of Natural Resources in Honduras, the International Soil Testing Project was co-host for the occasion. During the first two days of the program, emphasis was given to the economic impact that the proper use of fertilizers, lime, and other soil amendments could have upon the countries. The last three and a half days were devoted to discussions by the technicians from the various countries relative to their programs.

Over fifty persons registered for the Symposium (attachment No. 1); however, a number of persons attended the meeting who were not registered. There was a good representation from most of the countries other than Panama. The largest delegations were from Costa Rica, El Salvador and Guatemala (other than the host country of Honduras). Mexico was represented by IMPA rather than the Ministry of Agriculture.

Key addresses at the Symposium were given by Chancellor John T. Caldwell of North Carolina State University; Ing. Arturo Pino Navarro of the Inter-American Development Bank; Dr. James M. Spain of the Rockefeller Foundation; Dr. S. E. Younts of the American Potash Institute; and Mr. Richard Hughes, USAID/Honduras. A front page report of Chancellor Caldwell's talk which was published in EL DIA, the daily newspaper of Tegucigalpa, is attached (attachment No. 2). A copy of the general program is also attached (attachment No. 3).

Two committees were appointed among the technicians for the last part of the Symposium. These included a Committee on Research and a Committee on Operations. Resolutions were prepared by these committees and adopted by the participants. These Committees and Resolutions are as follows:

Committee on Research

President	Ing. Miguel E. Menéndez, Ministry of Agriculture, El Salvador
Members	Dr. Flora Espinosa, Coffee Research Institute, El Salvador Dr. Bonifacio Ortiz V., Sugar Research Institute, Mexico Dr. José A. Martini, IICA-OAS, Costa Rica Ing. Jorge Diaz Zelaya, FFHC-FAO, Nicaragua Ing. John Mannix, Ministry of Agriculture, Costa Rica Ing. Carlos Rivera H., Ministry of Natural Resources, Honduras Lic. Oscar Ortíz, Ministry of Agriculture, Guatemala

Recommendations of the Research Committee

Considering that studies on soil fertility and plant nutrition are necessary for agricultural development, it is recommended that the International Soil Testing project be continued and strengthened. The purpose of this Project is to increase agricultural production through the efficient utilization of soil and plant analyses.

For the same reason, the following specific recommendations are given:

1. Due to the fact that soil analyses frequently show low available phosphorus levels and that very high fixation capacities are observed in some important agricultural soils, such as latosols and those rich in amorphous material, investigations related to phosphorus fixation and calibration of analytical methods should be continued.
2. In the areas where soil analyses indicate adequate potash levels, potassium-magnesium interaction and crop response to application of potassium in the presence of adequate quantities of the other nutrients should be investigated. In the deficient areas, basic studies are justified.
3. In view of the fact that there are strong indications of sulphur deficiency in some agriculturally important areas in Central America, the delimitation of the areas and soils that respond to the application of this element should be undertaken as well as investigations on the use of sulphur-bearing fertilizers; the relationship of soil properties, yields, and the most reliable analytical methods to use should also be studied.
4. Because there is not sufficient local information for making lime recommendations, investigations on lime requirements in acid soils should be made.
5. Because of the importance of magnesium deficiencies in some coffee areas and the negative effect produced by magnesium application in other areas and with other crops, this nutrient should be studied; the relationship of this element with calcium and potassium should be investigated; routine analytical methods and the determination of critical levels through correlation with greenhouse and field studies is required.
6. In Central America we have neither enough studies nor sufficient basis to discard the determination of soil organic material; therefore, further study is recommended including the possibilities of simplifying the routine analytical methods. In areas where there are soil maps, soil color and texture may serve to indicate soil organic matter contents. The initiation of interpretation of the analytical data is also recommended.
7. Because the correct interpretation of soil analytical results depends upon establishing correlations through experiments in the laboratory, greenhouse and field, it is recommended that correlation studies be continued and intensified. Greenhouse studies should be the first phase when previously established field experiments are not available. It is also recommended that fertilizer trials not be initiated without first performing soil analyses.
8. Permanent files of soil samples from experimental fields should be established for future calibration of new methods.
9. Considering that the increasing quantity of data obtained by the soil analysis laboratories constitutes a valuable source for making maps, graphs and fertility summaries, of much value as guides for soil specialists, it is recommended that modern classification systems (Kardex or IBM) be used to tabulate these data.

1. That the Ministries assign the funds necessary to provide continuity of programs and, where feasible, make no changes in annual budgets once they have been approved. Funding of annual budgets and yearly increases should not be delayed.
2. As members of the International Soil Testing Project, we should create in our Soils Budgets specific funds to enable sending yearly participants to the seminars offered by North Carolina State University. In one year's time the great impact of these seminars on the Soil Fertility and Analyses Programs has been demonstrated.
3. That the Coordinating Committees of the National Programs be allowed to accept donations from private businesses to be utilized strictly for studies recommended by the Committee.
4. That the creation of programs favoring conservation of natural resources is urgently needed. Due to bad management practices, irreparable losses seriously menacing forests, fauna and soil are occurring and affecting the potential productivity of these Natural Resources.

Cultural Considerations

1. That the unity between the laboratories established by the International Soil Testing Project be maintained and that a goal of regional planning at the Central American-Mexican-Panamanian level be established through: a) free exchange of data and information related to common problems; b) mutual help in exchanging working materials; and c) holding of meetings between the heads and technicians of the soils departments and labs.
2. That, in accord with the agreement of the General Assembly and in addition to the International Soil Testing Program, because of the urgent need to unite ourselves extra-officially, the Soil Science Society, Central America, Mexico and Panama Chapter is formed. A President, Vice-President and two Secretaries, residing for 1967-68 in Costa Rica and Guatemala have been elected.
3. That thanks be expressed to North Carolina State University and to the Ministry of Natural Resources of the Republic of Honduras for the magnificent idea of uniting us in the First Symposium. Without the material and technical direction and support they gave, this grand event would not have been possible, which today has produced its first fruit: the Society just founded. We ask the Governments to help this new organization so that it

*Soil Science Society, Central America, Mexico and Panama Chapter--Results of election by General Assembly:

President: Dr. José A. Martini, IICA-OAS, Costa Rica

Vice-President: Dr. James L. Walker, International Soil Testing Project,
N.C. State University-AID

Secretaries: Ing. Agr. John Mannix, Ministry of Agriculture, Costr Rica
Ing. Agr. Jorge A González, Ministry of Agriculture, Guatemala

can, in turn, serve to resolve international problems in soil fertility and analyses.

4. That the Ministers of Agriculture consider granting a Diploma to North Carolina State University in recognition of its meritorious collaboration in the Mexico-Central America and Panama region.

There is little doubt but what the Symposium focused the attention of the government administrators in all of the countries of Central America, Panama and Mexico upon soil problems in crop production. The Symposium has made them much more familiar with the necessity for research in soil testing-soil fertility programs and for "action" programs to put the information gained into operation. Likewise, there is little doubt but that the Symposium was very stimulating to the technicians. All went home with renewed vigor and a cooperative attitude toward trying to solve many of their problems. Such conferences require much work and Dr. Walker put in many long hours advising and consulting with the Ministry personnel in Honduras to assure the success of the Symposium. Much work in the various countries was done by both Dr. Walker and Dr. Hunter in acquainting all groups with the Symposium and in organizing attendance. These were the men behind the scenes that made the meetings a success.

II. INAUGURATION OF LABORATORIES

A soil-plant analysis laboratory which is equipped with multiple unit apparatus is an impressive sight. An inauguration of a carefully planned and well equipped soil-plant analysis laboratory offers a concrete means of acquainting local administrators with a soil testing program as a method of increasing crop production. The administrators can be shown that they now have a means of analyzing samples rapidly and accurately, and that the laboratory can be used to test samples for farmers as well as conduct research.

The soils laboratories in Guatemala, El Salvador and Honduras are fully operative and ready to handle almost any number of samples which they are likely to receive. Inauguration ceremonies were held for the laboratories in Guatemala on May 3, in El Salvador on May 5, and in Honduras on May 8. The inauguration of the laboratory in Honduras was conducted as part of the Symposium on the Economic Impact Through Soil and Plant Analysis. All three programs lasted three to four hours and concluded with a tour of the laboratory facilities. From 50 to 100 persons attended each of the inauguration ceremonies.

The impact of the two seminars conducted in Raleigh in 1966 was readily apparent in all three laboratories. There was much enthusiasm among the 1966 seminar participants for developing their own programs, including the laboratory phase. A big problem confronting the laboratories, however, is the rapid turnover in personnel. This includes all positions from the Minister of Agriculture to the laboratory technician.

Guatemala

The group was greeted by Ing. P. A. Hector Cabarrus, Vice Minister of Agriculture. Remarks relative to the soil testing program were made by Ing. José Manuel Tárano, Director General of Agriculture. A thermo-fax copy of the program is attached (attachment No. 3).

Many improvements have been made in the laboratory in Guatemala City, and maximum use is now being made of the space available. The rooms were not designed for laboratory use but rearrangement of desks, etc. has been made to facilitate the handling of samples.

Ing. Salvador Castillo, who was largely responsible for improving the laboratory, has just resigned to accept a position with the University of Guatemala.

He will not be lost to the International Soil Testing Project, however, since, in his new capacity, he will direct research which can be used for correlation purposes.

El Salvador

A new building has been constructed to house the soil-plant testing laboratory in Santa Tecla, El Salvador. It is an excellent laboratory and superior to most laboratories of similar nature in the United States. The laboratory was very well displayed during the inauguration. Small signs had been placed by each piece of apparatus or equipment which identified it and listed its use.

An excellent potted plant study, with appropriate signs, was on display in the greenhouse adjacent to the soil testing laboratory. Samples of soil from twenty soil types were included in the soil test correlation study. Techniques outlined in Tech. Bul. No. 3 of the International Soil Testing Series were being followed in this experiment.

Ing. René David Escalante Orozco, Minister of Agriculture, welcomed the group and then outlined the work of the Soil Testing Project in El Salvador. He was very complimentary of the program. Other administrators of the government of El Salvador who participated in the inauguration included: Ing. Luis Alonzo Vanagas, Vice-Minister of Agriculture; Sr. Ricardo Cabezas R., Director General, Agronomic Investigation; and Ing. Armando Alas Lopéz, Sub-Director General, Agronomic Investigations. Following the tour of the facilities, Minister Orozco and Director General Cabezas expressed much interest in the program, and indicated that increased support would be given to it. Sr. Cabezas was very enthusiastic about the possibilities of having similar tours for farm groups in El Salvador to better acquaint them with the Soil Testing Project

and with the activities of the Ministry of Agriculture in general. A thermo-fax copy of the program is attached (attachment No. 5).

Honduras

The program for the inauguration of the laboratory in Tegucigalpa, Honduras is given in the program for the Symposium "Economic Impact Through Soil and Plant Analysis"-attachment No. 3. The Minister of Natural Resources of Honduras, Ing. Julio C. Pineda, was unable to participate in the program due to the death of his mother. The inauguration speech was given by the Vice-Minister of Natural Resources, Ing. Oscar Alemán. The tour of the laboratory was very impressive, as were the tours in Guatemala and El Salvador. The facilities are very good and the laboratory should have the capacity to handle almost any situation that is likely to be encountered. Ing. Carlos Rivera House has done an outstanding job in organizing the laboratory in Honduras and in getting the soil testing program initiated.

III. PLANT DIAGNOSTIC TECHNIQUES

Plant tissue testing, like soil analysis, can be a useful tool in assessing the nutrient status of plants. Plant tissue testing is complimentary to soil testing and both should be used in conjunction with each other. There was considerable interest among the 1966 seminar participants in plant tissue testing as a diagnostic technique. As a follow-up to the introduction of the subject during the 1966 seminar, a series of field meetings were arranged in the five Central American countries for Dr. A. N. Plant of the American Potash Institute to demonstrate this technique. The demonstration in Honduras was part of the economic Symposium. The clinics in El Salvador and Guatemala

were held in the afternoon at a research station following the inauguration of the soil testing laboratory in the morning. The demonstrations are listed in the inauguration programs which are attached (attachments No. 4, No. 5, and No. 3). More than thirty persons attended each of the field demonstrations. Dr. Plant was very effective in presenting the material and much interest was shown by the participants. The agricultural leaders of the Central American countries have a much better concept of the role of tissue analysis and how this technique can be used to diagnose nutrient problems as a result of these clinics.

A copy of Dr. Plant's report relative to the Diagnostic Clinics is attached (attachment No. 6).

ATTACHMENT NO. 1

BEST AVAILABLE

LIST OF THE PARTICIPANTS OF THE SYMPOSIUM CONCERNING
THE ECONOMIC IMPACT THROUGH SOIL AND PLANT ANALYSIS

COLOMBIA:

Dr. Spain, James
Rockefeller Foundation, Apto. Nacional
32-79
Bogotá, Colombia

COSTA RICA:

Ing. Acosta, Rodolfo
Assistant Technician Fertica Management
(Costa Rica, S.A., Apartado 5128, San
José, C. R.)

Ing. Mannix, John Fernández
Department of Natural Resources
Ministry of Agriculture and Animal
Husbandry
San José, Costa Rica

Mr. Martini, José A.
Interamerican Institute of Agronomic
Sciences of the OEA
Turrialba, C. R.

Ing. Vargas Vaglio, Oscar
Department of Natural Resources
Ministry of Agriculture and Animal
Husbandry
San José, Costa Rica

EL SALVADOR:

Ing. Tenorio, Hernán L.
Representing the Sub-Secretary of
Agriculture and Animal Husbandry

Ing. Menéndez, Miguel E.
Head of the Soils Section,
General Direction of Agronomic Research
Santa Tecla, El Salvador, C. A.

Ing. Agr. Salazar, José Roberto
Head of the Fertility Section of the Soils
Section, General Direction of Agronomic
Research
Santa Tecla, El Salvador, C. A.

Dr. Espinosa, Flora
Salvadorian Institute of Coffee Research
Santa Tecla, El Salvador, C. A.

Mr. Jaimes, José Ernesto
Department of Planning and Technical
Collaboration, (Ministry of Agriculture
and Animal Husbandry)

Mr. López, Armando Alas
Sub Director of the General Direction
of Research

GUATEMALA:

Bennanton de Steinle, Ana	Interpreter
Dr. Cowgill, William	Agronomist, ROCAP/AID, Galerías España 50 Piso, Zone 9 Guatemala, G. A.
Ing. González, Jorge	Head, Soils Laboratory, Department of Soils, D.G.I.E.A., "La Aurora", Z. 13, Guatemala
Lic. Ortiz, Oscar	Head, Fertility Section, Department of Soils, D.G.I.E.A. "La Aurora", Z. 13, Guatemala
Agr. Tarano, José Manuel	Director General of Research and Extension Agriculture, M.Ag., "La Aurora", Z. 13, Guatemala
Dr. ter Kuile, C.H.H.	Regional Director, FAO - FFHC Guatemala City, Guatemala

HONDURAS:

Ing. Escoto, Edgardo	Banco Nacional de Fomento (Division of Agriculture Development)
Mr. Jova, Joseph John	His Excellency, the Ambassador of the United States of America to Honduras
Ing. Romero, Fabio Gómez	General Direction of the National Agrarian Institute
Ing. Químico López Lardizábal, Ernesto	
Rivera, María Teresa de	Soils Laboratory, General Direction of Agriculture Tegucigalpa
Ing. Alemán, Oscar	Sub-Secretary of Natural Resources
Ing. Montes Umada, Eduardo	Experto of FAO, of Edificio del BANAFOM
Lic. Mancía, Alvaro	Head, Farming Section, Superior Council of Planning
Ing. Pinel, Arturo	Superintendent of Sales, c/o Esso Standard Oil, S.A. Limited, Apartado Postal 25-C Tegucigalpa, Honduras
Ing. Peraza, Felipe Antonio	Director of DESARRURAL, Comayagua, D. C.

Ing. Rivera House, Carlos	Head, Soils Laboratory, General Direction of Agriculture and Animal Husbandry M.RR.NN.
Mr. Simmons, Charles S.	Director FAO of the United Nations, BANAFOM, Tegucigalpa, Honduras
Ing. Membreño, Mauro	Representing the General Direction of Irrigation, Tegucigalpa, D. C.
Ing. Rivera Henry, Armando	Director, General Direction of Agriculture and Animal Husbandry, Ministry of Natural Resources, Tegucigalpá, Honduras
Mr. Minges, Robert J.	Director, USAID/Honduras
Sra. Ada Rubí de Espinal	Soils Laboratory
Mr. Johnson, Samuel	Peace Corps
Ing. Agr. Cáceres, Manuel Antonio	Desarrural (Jefe Extensión Agropecuaria)
Mr. Díaz, Flavio Tinoco	Head, Agronomy Department, Desarrural
Mr. Muller, Albert	Esc. Agrícola Panamericana
Mr. Lizarraga, Héctor J.	FAO Mission, Honduras - Fertilizer Program
Ing. Pereza, José Antonio	Desarrural
Dr. Fernández de Córdova, Fernando	Professor of Soils, Pan American School of Agriculture
Ing. Castellanos, Vladimiro	Head, Department of Soils DIGAG, MEN, Honduras
Ing. Nufio, Mario	Head, Division of Animal Husbandry Banco Nacional de Fomento

MEXICO:

Dr. Ortiz Villanueva, Bonifacio	Director, Department of Soils, Institute for the Betterment of the Production of Sugar Bolívar 510, México, D. F.
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NICARAGUA:

Ing. Agr. Díaz Zelaya, Jorge	FAO, Campaign Against Hunger, Experimental Farm Center "La Calera" Managua, Nicaragua
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UNITED STATES:

Dr. Caldwell, John T. Chancellor, North Carolina State University at Raleigh, Raleigh, North Carolina U.S.A. 27607

Mr. Hughes, Richard Representing Head, Rural Development Division, Office of Institutional Development, Bureau for Latin America Department of State, Washington, D. C. 20523

Dr. Dahnke, William C. Agronomist, Products Research Division ESSO Research and Engineering Co., P.O. Box 51, Linden, N.J. 07036, U.S.A.

Dr. Fitts, J. W. Director, International Soil Testing Project, 101 Williams Hall North Carolina State University Raleigh, North Carolina U.S.A. 27607

Dr. Girsch, Milton W. Soil Scientist, ESSO Coral Gables, Florida

Ing. Pino Navarro, Arturo R. Representing Director of Project Analysis Division, Interamerican Development Bank Washington 25, D.C. U.S.A.

Dr. Plant, Al American Potash Institute, c/o J. W. Fitts, International Soil Testing Project 101 Williams Hall, North Carolina State University, Raleigh, North Carolina, U.S.A. 27607

Dr. Younts, Gene Director for Latin America, American Potash Institute and the Foundation for International Potash Research, 403 W. Ponce de Leon Avenue Decatur, Georgia, U.S.A.

Dr. Walker, James L. Regional Director, International Soil Testing Project, North Carolina State University, Raleigh, North Carolina U.S.A.

Dr. Hunter, Arvel H. International Soil Testing Project North Carolina State University, Raleigh North Carolina, U.S.A. 27607

SECRETARIAL PERSONNEL (Honduras)

Sra. Estela Pavón Castillo	Secretary for the Coordinating Committee
Sra. Ninoska Lefebvre	Executive Bilingual Secretary
Sra. Haydée Padilla	Parliamentary Secretary
Sra. Orfilia de Bier	Shorthand Secretary
Srta. Magda Munguía	Public Relations

ATTACHMENT NO. 2

Fundador
JULIAN LOPEZ PINEDA

AÑO XIX N° 5771

JUEVES 11 DE MAYO DE 1967

REPUBLICA DE HONDURAS
AMERICA CENTRAL
TEGUCIGALPA, D. C.

El Esia

Diario Libre - Doctrinario - Informativo

MIEMBRO DE LA SOCIEDAD INTERAMERICANA DE PRENSA

SIMPOSIO SOBRE ANALISIS DE SUELOS Y DE PLANTAS

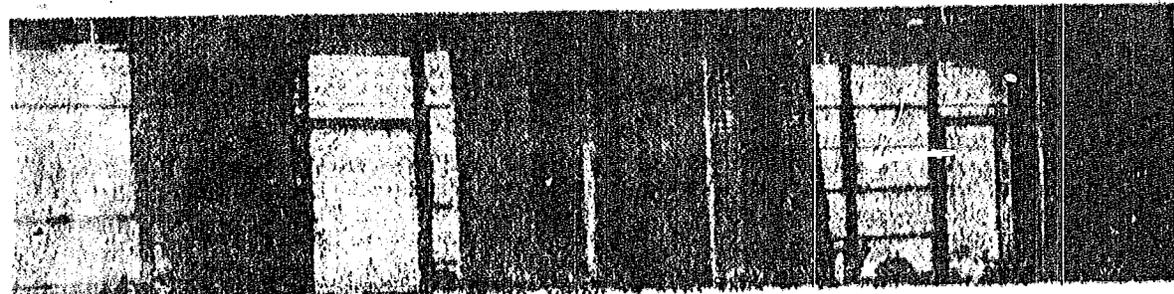
El Ing. Agrónomo Oscar Alemán, Sub Secretario de Recursos Naturales en representación de Ministro del Ramo, Ing. Julio C. Pineda, inauguró el lunes pasado en el Salón de Conferencias de Banco Central de Honduras, el Primer Simposio sobre el Impacto Económico a Través del Análisis de Suelos y Plantas importante evento internacional al que asisten distinguidas personalidades del continente.

En el discurso inaugural, el Ing. Alemán se refirió al papel que desempeñarán los países en proceso de desarrollo de Latinoamérica en la producción de alimentos, y a la aceptación del resto de la explosión demográfica que trae como secuela el hambre en algunos puntos de la tierra. Dijo además, que la oportunidad en la que nueve países del continente se reúnan, era propicia para trabajar conjuntamente en la búsqueda de soluciones para el enriquecimiento de los suelos, y el momento oportuno para intercambiar conocimientos, experiencias e ideas en pro del mejoramiento del agro. Finalmente expresó: "Debemos alejarnos de la idea que la tierra es únicamente el manto que nos cobija eternamente, para crear más firmemente que es el suelo que se abre para darnos el fruto que mitiga nuestra hambre."

Este importante evento, el primero de su clase que se celebra en el Continente, es patrocinado por el Ministerio de Recursos Naturales y la Universidad de Carolina del Norte, Estados Unidos de América. En tal virtud, el Embajador de los E. U. Joseph John Joya, invitado especial también hizo uso de la palabra para expresar entre otras cosas, que veía con buenos ojos la participación de



El Dr. John T. Caldwell, Rector de la Universidad de Carolina del Norte, hace uso de la palabra en el Primer Simposio sobre el Impacto Económico a Través del Análisis de Suelos y Plantas.



ATTACHMENT NO. 3

SYMPOSIUM:

ECONOMIC IMPACT THROUGH SOIL AND PLANT ANALYSIS

Monday, May 8, thru Saturday, May 13, 1967

SPONSORED BY:

The Ministry of Natural Resources of the Republic of Honduras

and

The International Soil Testing Project of the University of
North Carolina at Raleigh, U. S. A.

P R O G R A M

Monday, May 8th, 1967

- 8:00 A.M. Registration and Distribution of Programs
- 9:00 A.M. Inauguration of the First Symposium on "Economic Impact Through Soil and Plant Analysis" by His Excellency, The Vice Minister of Natural Resources of Honduras, Ing Oscar Alemán.
- Recognition of Honored Guests by His Excellency. The Vice Minister of Natural Resources of Honduras, Ing. Oscar Alemán.
- "Economic Impact Through Soil and Plant Analysis," Dr. J. W. Fitts, Director, International Soil Testing Project, North Carolina State University at Raleigh, N. C., U.S.A.
- Address by His Excellency, The Ambassador of the United States of America to Honduras, Mr. John Joseph Jova.
- "Systems Planning for Agricultural Development," Mr. Richard Hughes, Rural Development Officer, USAID/Honduras, Tegucigalpa, Honduras
- 12:00 LUNCH
- 2:00 P.M. Embus, Lincoln Hotel, Tegucigalpa, to the laboratory of soil analysis, El Picacho.
- Inauguration of the Soil Analysis Laboratory of the National Program for Soil Fertility and Analysis of The Republic of Honduras by His Excellency. The Vice Minister of Natural Resources of Honduras, Ing. Oscar Alemán.
- Address by: Ing. Armando Rivera Henry, Director General of Agriculture, Ministry of Natural Resources, Honduras.
- Address by: Dr. J. W. Fitts, Director, International Soil Testing Project, North Carolina State University.
- Address by: Mr. Robert J. Minges, Director, Agency for International Development (USAID), Honduras
- Address by: Ing. Vladimiro Castellanos, Head, Soil Science Dept., Ministry of Natural Resources, Honduras.
- Open House, Laboratory of Soil Analysis
- 5:00 P.M. Trip from Laboratory of Soil Analysis to Hotel Lincoln, Tegucigalpa.

Tuesday, May 9th, 1967

8:30 A.M. "Role of the University in a Developing World" by the Chancellor of North Carolina State University, Dr. John T. Caldwell.

"Agriculture and The Interamerican Development Bank," by Ing. Arturo R. Pino Navarro, Project Analysis Division Interamerican Development Bank.

"Agronomic Data in the Development of Land Settlement Program," Dr. J. M. Spain, Rockefeller Foundation, Bogotá, Colombia

12:30 LUNCH

2:30 P.M. "How Soil Classification Can be Used in Helping to Understand and Delimit Soil Fertility Problems", Mr. Charles S. Simmons, Director, F.A.O., United Nations, Honduras.

"How Soil Testing has Helped in the Discovery of Unexpected Phosphorus and Potash Deficiencies", Dr. Gene Younts, Director for Latin America, Foundation for International Potash Research and the American Potash Institute.

Wednesday, May 10th, 1967

8:30 A.M. Trip from the Banco Central to the Experimental Field.

(Experimental Field) "Plant Tissue Diagnostic Techniques", Dr. Al Plant, American Potash Institute

12:00 Return to Banco Central

12:30 P.M. LUNCH

2:00 - 5:40 P.M. WORK SESSIONS ON RESEARCH

2:00 P.M. Fixation studies on Phosphorus and Potash. Discussion Leader: Dr. Bonifacio Ortiz V., Mexico

3:00 P.M. Lime requirement. Discussion Leader: Ing. Jorge Gonzalez, Guatemala

3:30 P.M. Discussion. Moderator: Dr. Bonifacio Ortiz V., Mexico

4:00 P.M. Organic Matter. Discussion Leader: Ing. Jorge González, Guatemala

4:30 P.M. Other Elements

- 4:30 P.M. Sulfate Discussion Leader: Ing. Miguel Menendez,
El Salvador
- 4:45 P.M. Magnesium: Discussion Leader: Ing. Carlos Rivera H.,
Honduras
- 5:00 P.M. Discussion: Moderator: Ing. Miguel Menendez, El Salvador
- 5:30 P.M. Closure of session, summary of next day's activities,
Ing. Oscar Alemán.

Thursday, May 11, 1967

- 8:30 A.M. Correlation Studies, Laboratory and Greenhouse. Discussion
Leader: Ing. José Roberto Salazar, El Salvador
- 9:30 A.M. Correlation Studies, Laboratory and Field. Discussion
Leader: Lic. Oscar Ortiz, Guatemala
- 10:30 A.M. Discussion: Moderator: Ing. José Roberto Salazar,
El Salvador
- 12:00 LUNCH
- 2:00 - 4:00 P.M. Summaries of Soil Test Results
- 2:00 P.M. Maps for Phosphorus and Potash deficient areas. Discussion
Leader: Ing. Salvador Castillo O., Guatemala
- 2:30 P.M. Tables for Phosphorus and Potash deficient areas. Discussion
Leader: Ing. Carlos Rivera H., Honduras
- 3:00 P.M. Discussion: Moderator: Ing. Salvador Castillo O., Honduras
- 4:00 P.M. Work sessions on General Considerations

Obtaining Support and Recognition for National Programs

- 4:00 P.M. Groups (International Organizations, Commercial Companies,
Government Agencies, Farmers groups, others). Discussion
Leader: Ing. Jorge Gonzalez, Guatemala
- 4:30 P.M. Methods (Exhibitions, bulletins, broadcasts, newspapers,
training sessions, follow-up on soil test suggestions,
field days and sample drives). Discussion Leader: Ing. Carlos
Rivera H., Honduras
- 5:00 P.M. Discussion: Moderator: Ing. Jorge Gonzalez, Guatemala
- 5:30 P.M. Closure of session, summary of next day's activities,
Ing. Oscar Alemán

Friday, May 12, 1967

- 8:30 - 9:30 A.M. Laboratory Management
- 8:30 A.M. Use and exchange of Control Samples and Laboratory Modernization. Discussion Leader: Ing. Salvador Castillo O., Guatemala
- 9:00 A.M. Flow Pattern of Samples, Data and Reports and Procurement of Laboratory Supplies. Discussion Leader. Ing. Félix Montes, Nicaragua
- 9:30 A.M. Discussion. Moderator: Ing. Felix Montes, Nicaragua
- 10:00 - 11:00 A.M. Fertilizer Suggestions
- 10:00 A.M. Preparation, Revision and Use of Guide Sheets. Discussion Leader: Ing. Miguel Menéndez, El Salvador
- 10:30 A.M. Methods of Making Fertilizer Suggestions: Forms Used, Units Used for Reporting Results, Units Used for Making the Suggestions. Discussion Leader: Dr. Reinmar Tejeira, Panama
- 12:00 LUNCH
- 2:00 - 5:30 P.M. Committee Meetings: Each committee will prepare written recommendations and conclusions

Committee on Research

Chairman: Ing. Miguel Menendez, El Salvador
Members : Dr. Bonifacio Ortiz V., Mexico
 Ing. Salvador Castillo O., Guatemala
 Lic. Oscar Ortiz, Guatemala
 Ing. Carlos Rivera H., Honduras
 Ing. Felix Montes, Nicaragua
 Ing. John Mannix, Costa Rica
 Ing. _____, Panama
Advisor : Dr. Arvel Hunter, ISTP, North Carolina State University

Committee on General Considerations

Chairman: Ing. Jorge Gonzalez, Guatemala
Members : Ing. Alejandro Fuentes, Guatemala
 Dra. Julia Torres, El Salvador
 Ing. José Roberto Salazar, El Salvador
 Ing. Vladimiro Castellanos, Honduras
 Ing. Lope Chavez, Nicaragua
 Ing. Oscar Vargas V., Costa Rica
 Dr. Reinmar Tejeira, Panama
Advisor : Dr. James L. Walker, ISTP, North Carolina State University

- 5:30 P.M. Closure of session, summary of next day's activities,
Ing. Oscar Alemán
- 6:30 P.M. Additional committee sessions may be held if committee
Chairman feel that an extra session will be necessary to
prepare the formal report to the Symposium Work Group.
Committee Chairman should notify the President of the
Symposium, Ing. Oscar Alemán of their needs for evening
use of conference rooms as soon as possible.

Saturday, May 13, 1967

- 8:30 - 11:30 A.M. General Meeting of Symposium Work Group
- 8:30 A.M. Call to order by President of Symposium. Ing. Oscar
Alemán, Honduras
- 8:40 A.M. Roll Call of Delegates
- 8:45 A.M. Presentation of Recommendations and Conclusion of the
Committee on Research. Ing. Miguel Menendez, El Salvador
- 9:00 A.M. Presentation of Recommendations and Conclusions of the
Committee on General Considerations. Ing. Jorge González,
Guatemala
- 9:15 A.M. Discussion. Moderator: Ing. Oscar Alemán, Honduras
- 10:45 A.M. Closure of the Symposium, concluding remarks by the
President, Ing. Oscar Alemán, Honduras

ATTACHMENT NO. 4

MINISTERIO DE AGRICULTURA
Dirección General de Investigación y Extensión Agrícola
"La Aurora", Guatemala, C.A.

DEPARTAMENTO DE SUELOS

PROGRAMA NACIONAL DE FERTILIDAD Y
ANÁLISIS DE SUELOS

ACTO INAUGURAL

INAUGURACION DE LOS NUEVOS SISTEMAS
DE ANÁLISIS DE SUELOS RELACIONADOS A FERTILIDAD

Guatemala, C.A.

PROGRAMA

LA DIRECCION GENERAL DE INVESTIGACION Y EXTENSION AGRICOLA DEL MINISTERIO DE AGRICULTURA, SE COMPLACE EN INVITAR A USTED PARA QUE SE SIRVA ASISTIR A LA INAUGURACION DE LOS NUEVOS SISTEMAS DE ANALISIS DE SUELOS, RELACIONADOS A FERTILIDAD - DEL DEPARTAMENTO DE SUELOS - QUE TENDRA LUGAR EL DIA 3 DE MAYO DE 1967, A LAS 9:00 HORAS, EN EL AUDITORIUM DE ESTA DIRECCION.

Por su asistencia muy agradecidos,

Guatemala, Abril de 1967.

MAÑANA

- 9:00 Palabras del Sr. Ministro de Agricultura o su representante.
- 9:30 Palabras del Director General de Investigación y Extensión Agrícola,
Agr. J. Manuel Táranos.
- 10:00 Impacto Económico a través del Análisis de Suelos y Plantas.
Dr. J. Walter Fitts, Director del Proyecto Internacional de Análisis de Suelos.
- 10:30 Proyecto Internacional de Análisis de Suelos,
Ing. Agr. Neptalí Monterroso.
- 11:00 Programa Nacional de Fertilidad de Análisis de Suelos,
Ing. Agr. Jorge González.
- 11:30 Visita a las Instalaciones del Laboratorio.

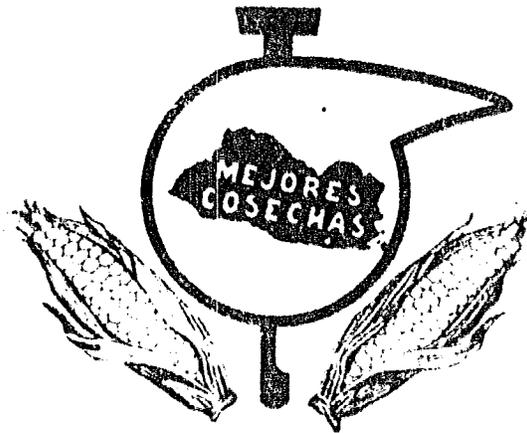
TARDE

- 14:00 Reunión de las personas invitadas en las localidades de esta Dirección.
- 15:00 Visita a la Estación Experimental "Cuyuta".
- 16:00 Análisis rápidos de Tejidos de Plantas como un complemento del Análisis de Suelos y Guía de Campo del desarrollo de los cultivos,
Dr. Al Plant, Experto del American Potash Institute.

ATTACHMENT NO. 5

**DIRECCION GENERAL DE
INVESTIGACIONES AGRONOMICAS**

Santa Tecla. El Salvador, C.A.



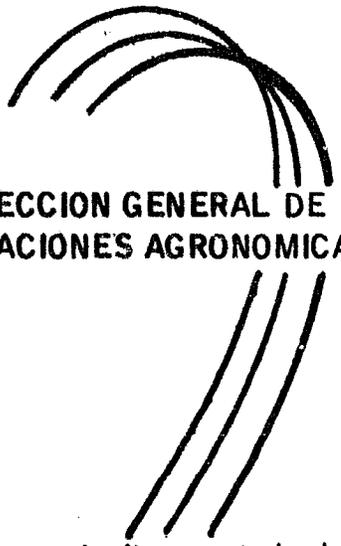
**OFFSET MAO
Depto. de Inf. Agrícola
Santa Tecla, abril 1967**

**INAUGURACION DE LOS NUE-
VOS SISTEMAS DE ANALISIS
DE SUELOS.**

5 de mayo de 1967.

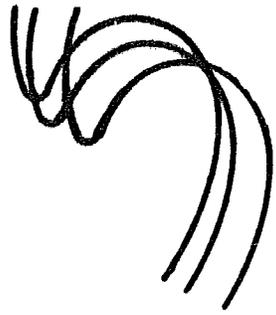
**Auditorium de la Dirección General
de Investigaciones Agronómicas.**

Hora: 9 A.M.



**LA DIRECCION GENERAL DE
INVESTIGACIONES AGRONOMICAS**

Se complace en invitar a usted a la inauguración de los nuevos sistemas de análisis de suelos relacionados con la fertilidad y producción de cosechas, que tendrá lugar el día 5 de mayo, a partir de las 9 horas, en esta Institución.



RICARDO CABEZAS R.
Director General

Coordinación:

SECCION DE SUELOS D.G.I.A.

PROGRAMA:

MAÑANA:

- 1) Palabras a la concurrencia y presentación de los doctores del I.S.T.P. por el Ing. René David Escalante Orozco, Ministro de Agricultura y Ganadería.
- 2) El Proyecto Internacional de Fertilidad y Análisis de Suelos, por el Dr. J. L. Walker, Director Regional para México y el Norte de Centro América, Proyecto Internacional de Fertilidad y Análisis de Suelos.
- 3) Palabras del Dr. J.W. Fitts, Director del Proyecto Internacional de Fertilidad y Análisis de Suelos, Universidad de Carolina del Norte, Raleigh, N.C. 27607, U.S.A.
- 4) Los nuevos sistemas de análisis de suelos, servicio al agricultor y objetivos futuros, por Ing. Agr. Miguel Ernesto Menéndez, Jefe de la Sección de Suelos, D.G.I.A.
- 5) Película corta.
- 6) Recorrido por el Laboratorio de Suelos e Invernadero, en grupos de 10 personas.

TARDE:

Jira al campo por la Estación Experimental de San Andrés.

Punto de Reunión: Dirección General de Investigaciones Agronómicas.

Hora: 2.30 P.M.

Transporte: Camioneta de la D.G.I.A.

- A) Demostración práctica del análisis rápido de tejidos de las plantas, su alcance y cuidados en la interpretación, por el Dr. Al Plant, American Potash Institute 403 W Ponce de León Ave. Decatur, Georgia.

PH

N

P

K

Ca

Mg

≡

D

G

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ATTACHMENT NO. 6

DIAGNOSTIC TECHNIQUES AND RECOGNITION OF PROBLEMS IN THE FIELD

A. N. Plant

In 1965 a U.S. Advisory Committee was appointed to serve in an advisory capacity to the International Soil Testing Project. The committee is composed of representatives from land-grant universities, other than N.C. State University, from the U.S. Department of Agriculture and from industry. Members of the committee include:

Dr. D. J. Lathwell	Cornell University
Dr. J. C. Engibous	International Minerals & Chemical Corp.
Dr. W. L. Nelson	American Potash Institute
Dr. R. W. Pearson	USDA/ARS-SWC
Dr. V. L. Sheldon	Esso Chemical Company, Inc.
Dr. W. H. Garman	National Plant Food Institute

The purpose of the committee is to review the accomplishments of the project in relation to the objectives and to advise on future activities. Recommendations are prepared by the committee relative to phases of the program that need more attention and where less emphasis should be placed.

The first meeting of the U.S. Advisory Committee was in January 1966. The recommendations prepared by the committee were, in part, as follows:

1. Major activities of the program should be the continuous training of people in
 - a. Laboratory techniques
 - b. Correlation experiments between fertilizer response and soil test results with emphasis on removal of limiting factors.
 - c. Diagnostic approach on growing crops in farmers fields.

Field problems are limiting factors. As such, they can cut the response of a crop to added plant nutrients--often 50+ percent and sometimes to the degree that no response to added nutrients is observed. Thus, to be valid, correlations between fertilizer response and soil test results must come from experiments where limiting factors are absent.

Dr. S.E. Younts, Director for Latin America, Foundation for International Potash Research and the American Potash Institute, and this agronomist were requested

to demonstrate diagnostic techniques and methods of recognizing problems in the field for the two research seminars which were conducted in Raleigh during the summer of 1966. Countries represented included Brasil, Bolivia, Peru, Ecuador, Colombia, Nicaragua, Honduras, El Salvador, Guatemala and México.

Any successful program involves people. The stronger the people, the stronger the program. The pilot program for diagnostic techniques and methods of recognizing problems in the field indicated weaknesses rather than strength in this area. A reflection perhaps of their educational backgrounds and curricula. However, since many of the participants had done graduate work in the United States, it may also indicate a void in our degree requirements for many foreign students. Figuratively speaking, we train these students on X-ray diffraction equipment and send them home to deal with machetes.

The groups were very receptive to field diagnosis and tissue testing procedures for here were additional tools to help them accomplish their tasks.

On the requests of Dr. J.L. Walker and Dr. A.H. Hunter, International Soil Testing Project Regional Directors for El Salvador, Guatemala, Honduras, México and Panama, Costa Rica, Nicaragua, respectively, the International Soil Testing Project requested me to demonstrate the techniques of field diagnosis and tissue testing utilizing crops grown on their experiment stations to the official Agriculturists of the following countries: Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica.

The trip was timed to coincide with the inauguration of the soil testing laboratories in Guatemala, El Salvador and Honduras as well as the Symposium on the Economic Impact Through Soil and Plant Analysis held in Tegucigalpa, Honduras, May 8-13, 1967.

VISITATIONS

1. Soil Testing Laboratory at Guatemala City
Inauguration of the soil testing laboratory
2. Cuyuta Experiment Station
Demonstrated field diagnostic techniques. On this station we observed corn in three stages of development; mature, tasseling and less than knee high. Rows were 1 meter wide and population was about 12-13 thousand plants per acre. The fields of tasseling and young corn had a severe out-grass problem as well as a moderate pigweed problem. Tissue tests showed the tasseling corn to be very high in nitrogen, low in phosphorus and low medium in potassium. If limiting factors were removed (weeds and stand) this field would very probably have responded to additional phosphorus and potassium. Tissue tests of the young corn showed the crop to be low in nitrogen, phosphorus and potassium. Visual phosphorus deficiency symptoms were present throughout this field. Tests of the nut-grass and pigweed showed these plants to contain over twice the concentration of phosphorus as the corn crop. It is doubtful if this field would respond to fertilization unless the nut-grass problem is licked.
3. Soil Testing Laboratory at Santa Tecla, El Salvador
Inauguration of the soil testing laboratory
4. San Andrés Experiment Station
Demonstrated field diagnostic techniques. On this excellently run station we again observed corn in various stages of growth. Two adjoining fields just beginning to tassel were selected for demonstration purposes. Stands in these two fields were approximately 25,000 plants per acre. Potassium deficiency symptoms were present on the lowermost leaves remaining (5-6 leaf) on scattered plants throughout the fields. Tissue tests showed the plants to be very low in nitrogen, low in phosphorus and low medium in potassium, yet the plants had a fairly dark green color. Here was a perfect example of "Hidden Hunger"--the imbalance of one nutrient obscuring the deficiency of another element. This

corn probably started firing within a few days after our visit.

Visual symptoms indicated potassium deficiency sometime during the early part of the season, but tissue tests indicated a level of potassium higher than the deficiency symptoms would indicate. Questioning of the Experiment Station Supervisor gave the answer. The corn was planted and several rains got it off to a fast start, then drought. The marginal level of potassium in the soil was not adequate to supply the plant under the low soil moisture level.

The demonstration was repeated for the students of the Agricultural School of San Andrés.

5. Soil Testing Laboratory, Tegucigalpa, Honduras
Inauguration of the soil testing laboratory
6. Banco Central
Symposium--Economic Impact Through Soil and Plant Analysis
7. Experimental field, Tegucigalpa, Honduras
Demonstrated field diagnostic techniques. Due to the prolonged dry season most crops had not been planted. On this station we worked with Guatemala grass and Ramie. Deficiency symptoms of nitrogen and potassium were evident in both crops. Tissue tests showed both crops to be low in nitrogen, phosphorus and potassium. On this station we were hard pressed to find a higher level of N, P, or K on any crop. Pigweed came through for us again and showed a strong medium level for phosphorus.
8. Soil Testing Laboratory, Managua, Nicaragua
Tour of facilities
9. Escuela Nacional de Agricultura, Managua, Nicaragua
Tour of facilities and lecture to the students and staff on field diagnosis and tissue testing
10. Experiment Station, Managua, Nicaragua
Demonstrated field diagnosis and tissue testing. On this station we observed corn, cotton, and forages. The place selected was the site of some earlier phosphorus rate studies. Tissue tests showed nitrogen to be high throughout

the area. Phosphorus varied from spot to spot; however, it was interesting to note that any time the phosphorus level was medium, the potassium level dropped to low, otherwise it read an average medium to low medium. This was with a plant population of about 11,000 plants per acre. The reason for the low population was that they were trying to increase the seed from a promising selection. However, adequate populations would have shown potassium to be deficient in all probability.

11. Soil Testing Laboratory in San José, Costa Rica
Tour of facilities
12. Experiment Station at Alajuela, Costa Rica
Demonstration of field diagnosis and tissue testing. On this station we observed a large variety of crops. Corn, sugar cane, tomatoes, cucumbers, beans, etc. Corn was chosen for the indicator crop for tissue testing. Tissue test showed fields to be low in nitrogen, low medium in phosphorus and low in potassium. Sugar cane tested very low in N, P, and K. Tomatoes tested medium in nitrogen and potassium and high in phosphorus.

It is interesting to note that a standard statement in all of the countries was as follows: "Our soils are derived from volcanic materials and are all high in potash; therefore, you will not find any potash deficiency in any of our crops." Yet, tissue tests revealed potash deficiency on every experiment station visited. It was also observed that premature internal breakdown of the corn stalks was evident in all corn when it tasseled.

It is very probable that as soon as other factors limiting crop yields are removed potassium will become a limiting factor in many instances. As long as corn yields stay in the range of 15 to 30 bushels per acre, release of native potassium will be adequate to meet the needs of the crop.

PERSONAL CONTACTS

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