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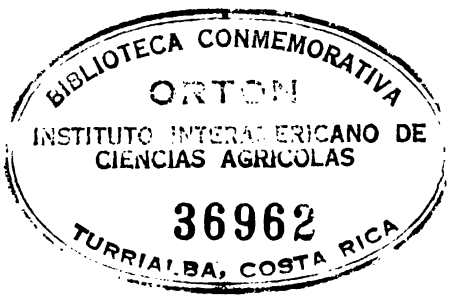
REPORT OF THE ADMINISTRATIVE COMMITTEE TO THE BOARD OF DIRECTORS OF THE INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES

HELD AT THE PAN AMERICAN UNION

FROM NOVEMBER 13 TO 15, 1947

PAN AMERICAN UNION
Washington, D. C.



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February 1948.

His Excellency,
Dr. Juan B. de Lavalle
Chairman, Board of Directors
Inter-American Institute of Agricultural Sciences
Pan American Union
Washington, D. C.

Dear Mr. Chairman:

We are hereby supplementing our preliminary report of the Administrative Committee with a more detailed account of deliberations during the meeting of November 13-15, 1947. Certain aspects of the Institute program merit special mention.

It now seems obvious that the Institute of Agricultural Sciences must assume responsibility for inter-American action in applying science to the problems of agriculture and rural life. Its scope should include plant crops, livestock, and forestry; the elaboration and marketing of products; homes and communities; nutrition and food science. Its influence is exerted through research at its own stations and in cooperation with institutions of member countries; extension of its own findings and those of the world to member countries plus the development of effective methods of extension; training of personnel for research, extension, and agricultural education.

The Institute is rapidly equipping itself to serve these important ends in collaboration with the Inter-American Economic and Social Council and the Division of Agricultural Cooperation of the Pan American Union, the Pan American Sanitary Bureau, and the Inter-American Statistical Institute. Plans are also well advanced for close cooperation with the Food and Agriculture Organization and the United Nations Educational, Scientific and Cultural Organization.

If the Institute is to fulfill its intended function and also play its role in strengthening the inter-American system, it should have the unanimous participation of the American Republics. Ten countries have ratified the convention: the United States of America, Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Venezuela, and the Dominican Republic. Five countries are, according to our information, in the process of ratification: Cuba, Colombia, Ecuador, Argentina, and Chile. It is our feeling that the Board of Directors may wish to urge the remaining countries to ratify during the year 1948.

The income of the Institute has been augmented considerably during the current year by grants. Aside from the financial assistance involved, these investments in the inter-American system

demonstrate the faith which the donors concerned have in our efforts to contribute to world stability by improving the welfare of our peoples. Grants received are as follows:

1.	The American International Association	$ 133,000
2.	The American Cocoa Research Committee	50,000
3.	The Standard Oil Development Company	14,100
	Total. . .	$ 197,100

Respectfully,

H. Harold Hume, Chairman
Administrative Committee

MEETING
of the
ADMINISTRATIVE COMMITTEE
of the
INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES

November 13 to 15, 1947.

Members Present

Dr. H. Harold Hume	-	University of Florida
Dr. Robert E. Buchanan	-	Iowa Agricultural Experiment Station
Sr. Ing. Luis Cruz B.	-	San José, Costa Rica
Mr. Ralph H. Allee	-	Director of the Institute
Mr. J. L. Colom	-	Secretary of the Institute

I. Research, Education, and Extension

A. Current Research

Progress reports of the four Departments were reviewed and approved. The following suggestions were made:

1. Forage crops and pastures, the basic feeds for cattle are receiving renewed attention. All possible arrangements should be made to assure that the forage and pasture program of the Institute and those in the various countries reinforce each other. It would, for instance, be desirable to establish close relations with the four regional programs being developed in the United States. Cooperative trials should be established in several countries.

2. The plants research is far enough advanced to demand definite organization for getting seeds and other results out into general use. Several points should be emphasized:

   a. Seeds of proven materials should be placed with commercial seed dealers.

   b. The Extension Service as it develops its program can establish trial plantings with cooperating farmers.

   c. A regular quarterly report should be made of requests and of material sent out.

   d. A "Projects Committee" should be formed at the Institute to certify new varieties, to study new projects, and relate work done to desirable results. A particular emphasis should be given to restricting the number of projects so as to permit accomplishment.

A new era of plant exploration is beginning in several countries. Arrangements should be made to obtain material from certain of the expeditions for our work. Peanuts, potatoes, and forage plants were mentioned particularly. A closer relationship should be established with the new plant introduction programs of the Land Grant Colleges and the United States Department of Agriculture. Turrialba might in some cases serve as a point at which to maintain collections of species for future needs of plant breeders.

A head for the Institute's corn program should be procured as soon as funds are available and the proper man can be found. A discussion of corn programs should be held in Turrialba in the near future attended by the several scientists now concerned with this crop in Central and South America.

3. It was agreed to change the name of the Department of Economics and Rural Welfare to the Department of Economics and Rural Life. The Spanish would remain Departamento de Economía y Bienestar Rural. The change puts the title more in line with the research objectives of the Department and is less likely to be confused with the Extension Service of the Institute.

The teaching program in Agricultural Economics and Sociology is handicapped by the fact that many schools of the member countries give few of the basic courses in these fields. It will, in many cases, be necessary to combine research training of the Institute with basic courses taken in universities which offer more extensive studies in social science.

II. Cooperative Projects and Grants

A. Research Projects.

1. The Inter-American Cacao Center -- American Cocoa Research Committee grant of $50,000 per year.

On July 1, 1947 an agreement was signed between the Institute and the American Cocoa Research Committee under the terms of which the Committee would support research on cocoa production and the training of technicians for the various member countries. This agreement followed a meeting called by the Inter-American Economic and Social Council of the Pan American Union at which representatives of the cocoa processors and all those responsible for research and development on cacao agreed as to the necessity of improving the

culture of this important American crop.

On instructions from the Economic and Social Council the Institute convened a meeting of technical representatives of the cacao-producing countries at which a basic program was agreed upon. The two meetings indicated above have been fully reported elsewhere and we need mention here only the fact that the cacao program represents a close cooperation between purchasers and those carrying out important activities under the auspices of the inter-American system.

A sub-station of the Institute specializing in cacao is being established in the Atlantic Zone of Costa Rica on land obtained under very advantageous terms from the Compañía Bananera de Costa Rica.

2. Demonstration Farm and Vocational Education -- American International Association grant of $158,000.

This grant was made on July 1, 1947, payable at the rate of $133,000 during the fiscal year 1947-48, and the remaining $25,000 during the fiscal year 1948-49. The purpose of the grant is to develop a Demonstration Farm on the Institute property and a program for the training of leaders in vocational education applied to farming. In return for the grant the Institute agrees to supply training to individuals proposed by the American International Association, but will in the very near future expand the program to serve as a center for training teachers of practical farm schools, extension agents, and other individuals throughout the American countries concerned with the education of farmers and farm families.

3. Testing of Chemical Coumpounds -- Esso Fellowships grant of $14,100.

Also available during the fiscal year 1947-48 are funds from Standard Oil Development Company to support investigations as to the applicability of a wide range of chemical compounds to farming in equatorial regions. It is expected that through this project a creditable program can be developed in improving the welfare of farming through the application of the newer advances in chemistry.

4. Livestock -- Colombia.

The Animal Industry Department has recently entered into a project whereby they will consult with the officials of the Colombian Government in the continuance of research on the justly famous Romo Simuano breed of cattle. It is expected that the Institute staff will be of some assistance to the effective program which Colombia

is developing with this breed, and the experience will also strenghten the ability of the Institute to assist other member countries in their livestock breeding program.

B. Proposed Projects.

1. Coffee Research.

In addition to the projects under way on disease control, shade management, cultural practices and such, plans are being laid for a coffee program involving increased research, the training of workers from stations of the member countries, and a general inter-change of information and coordination of effort throughout the hemisphere.

2. Plant and Animal Pests and Diseases.

Since the diseases and pests which attack plants and animals are by their nature international, this Institute should play a central role in promoting the combined efforts of the groups of countries concerned with the various types of infestations. Projects include an animal parasitology center with chief immediate emphasis on the tórsalo, or nuche fly, but expansion to cover other elements of the field. In this connection the Committee took careful note of developments in the foot-and-mouth disease program, recognizing that this disease must be worked on where it occurs and hence cannot be an active project of the Institute; nevertheless all effort should be made to encourage member countries to increase their efforts to avoid the entrance of the disease and to be prepared for control activities should an outbreak of the virus occur.

The control of the migratory grasshopper has been receiving increasing effective attention in several countries and regions of the hemisphere. Research on the nature of the infestations and on determining the most feasible methods of control, combined with training of technical personnel, should be undertaken by the Institute as soon as possible. A program to this end has been prepared which awaits only the necessary funds to be initiated.

3. Livestock Breeding -- Venezuela.

The Ministry of Agriculture and Animal Husbandry of the Venezuelan Government has recently requested Albert O. Rhoad, head of the Institute's Animal Industry Department, to assist in drawing up plans for an extensive animal breeding program which is being planned. If initiated, the research program will capitalize a great many years of extremely effective breeding work carried out by a Venezuelan farmer. To promote continuity in the program, to assure that all technical resources available in the

hemisphere are applied, and to capitalize this experience for the benefit of the other American countries, an international committee is proposed and Mr. Rhoad has been asked to serve as Chairman. Tentative plans are also under way to have a representative of the Food and Agriculture Organization of the United Nations serve on this Committee.

4. Testing of Fungicides -- E. I. du Pont de Nemours & Co.

The E. I. du Pont de Nemours & Company, Inc. has proposed the granting of two fellowships totaling $2,700 per year, one of which would test the du Pont fungicides under equatorial conditions and the other would be applied to basic research included in the Institute program. It is expected that this project will be under way in the very near future.

5. Rural Demonstration Center.

It is considered that the Institute should give an important emphasis to the development of methods for translating the r sults of science into the welfare of farming and farmers and should train personnel for this important function. To this end a Rural Demonstration Center will be developed from which research will be carried on in the conduct of demonstrations and the development of extension method. It will also be used as a training center. Preliminary developments will be started on this project under Dr. D. Spencer Hatch in March 1948. It is expected that the center will require financing beyond that available from the regular budget, and a source of financial support is being sought.

6. Social Science Research -- Michigan State College.

An agreement has recently been completed with the Social Science Service of Michigan State College under which their social scientists will serve as consultants in the community studies of the Institute's Department of Economics and Rural Life. Dr. Charles P. Loomis, best known for his sociological research in connection with improving the efficiency of extension work, will spend a consultatory period each year at Turrialba, and one of his advanced graduate students will be maintained on the staff of the Institute taking responsibility for sociological investigations in the socio-economic program being developed by Dr. Julio Morales, head of that Department.

This is considered an important step in the integrated community studies program which is being developed. A qualified home economist will be added to this program in February 1948, and it is hoped that a nutritionist can be added in July 1948. This program will be closely correlated with the Rural Demonstration Center and is expected, in addition to developing methods of approach,

to serve as an important training center for social scientists from the member countries.

7. Tropical Horticulture.

It is expected that the sum of $4,200 will be granted to the Institute by the National Research Council of the United States of America in the near future. It is proposed to use this fund to retain Dr. J. J. Ochse, famous plant scientist from the Netherlands East Indies, as a consultant. The plan is that Dr. Ochse should spend four months of each year at the Institute, assuring that the great advances in tropical agriculture made in the Netherlands East Indies are applied to the work of this hemisphere. The fund available, plus some support from the regular budget, will assure the project for the year 1948. It is hoped that a means can be found for continuing Dr. Ochse's participation in our program over a period of years.

8. Beef Cattle and Horse Breeding.

A project is under consideration by which the Animal Industry Department would receive a special grant of funds for increasing its work on the development of beef breeds suitable to equatorial regions and also the improvement of horses. It seems likely that this grant can be announced in the very near future, assuring an additional sum of approximately $50,000 for this program.

9. Relations with International Organizations

Plans have progressed for developing a close cooperative relationship with the Food and Agriculture Organization of the United Nations. It is expected that the Institute and the FAO will in many respects combine their efforts in the American countries.

Preliminary plans have also been discussed with the United Nations Educational, Scientific and Cultural Organization for close relationship between the Institute and the proposed Hylean-Amazon program. It seems apparent that the stimulation of basic scientific research by UNESCO should be of great assistance to the agricultural improvement of the American countries included in the Amazon and also those with similar physiographic conditions elsewhere.

The work of the Caribbean Commission, and particularly of its Research Council, has been followed with the greatest of interest by the Institute, and it is expected that close and profitable relations will be maintained in the future.

III. Library and Publications.

As indicated in the Progress Report of librarian Angelina Martínez, the organization of the Institute's reference material has proceeded at a faster rate than had been anticipated. The library is serving as an important adjunct to the work of students and staff and should in the not too distant future be able to supply a bibliographic service to the institutions of member countries. Its holdings have been augmented by several important donations of books and professional journals. It is hoped that others having collections of technical books available may desire to deposit them with the Institute so that they can contribute to the advance of agricultural science in the hemisphere.

As a part of the Cacao Center program it has been decided to start a Cacao Bulletin, which will be circulated to all technical workers and others directly concerned with the development of cacao production. This will be circulated monthly and will bear news items concerning the central program at the Institute and also progress of work on cacao in the various countries. Requests from experiment stations throughout the world for information concerning our program have increased to the extent that it now seems necessary to publish periodic progress reports. It is proposed to mimeograph semi-annually a concise description of progress in the various research projects for the benefit of scientists engaged in similar activities in other institutions.

IV. Administration and Organization.

A. Administrative Committee Membership.

The Committee desires to suggest to the Board of Directors that the present Committee be increased to five. This would include a replacement for Manuel Elgueta, who has resigned from the Committee, having entered the staff of the Institute; a member made necessary by the expiration of the term of Luis Cruz; and an additional member. If the Board so agrees, it might be desirable to have one of the members appointed from a South American country and another from Mexico.

B. Personnel.

Several additions to the staff of the Institute are currently under consideration. A corn breeder is needed to carry on and expand the work of the Institute in this universal American crop. Mario Gutiérrez of Costa Rica will return from graduate work at Iowa State College in April of 1948 to serve as associate in corn breeding. Several promising candidates have been considered for this position, which it is hoped will be filled by a competent individual acquainted with the corn problems of South America.

Dr. Ora Smith of Cornell University is serving part time as plant physiologist with the main responsibility for the

chemical compounds investigations. This position should, however, be raised to full time in order that physiological investigations can be associated with the many plant projects which require these services. Dr. Laura Lee Smith (Mrs. Ora Smith) has also been serving part time as nutritionist and this position also should in the near future be increased to full time.

A veterinarian with specialization in animal parasitology should be added to the staff not later than July 1948. It is desired to obtain an appointee for this position who has had ample experience with livestock under tropical conditions.

The insect problems associated with our current research, plus the urgent necessityfor making a contribution to the migratory grasshopper control programs, and also the requirements of the project,which is now being planned to study insect infestation of stored grains, impose the necessity of adding an entomologist. Several individuals have been under consideration and it is hoped that a fully qualified man can be appointed at least for part time service during the coming year.

As indicated previously, Miss Marta Coll, home economist in the Farm and Home Administration of Puerto Rico, and with graduate training at Cornell University, will be added to the staff as of February 1948.

Other urgent needs for which budgetary provisions are not likely to be available during the coming year are for a forester and a soilsman.

For list of Institute personnel as of November 15, 1947, see page 10.

C. Appointment Form.

In order to emphasize the duties of international civil servants, an appointment form has been prepared which contains the following statement:

> "All appointees to this Institute shall recognize that they have become international civil servents. Their loyalty to their own countries must henceforth be expressed in impartial service to all countries. Their direct responsibility is to serve to the limit of their abilities the welfare of all the peoples of the American Republics. No purely personal interest nor any particular concern for political, sectarian, or racial considerations can be allowed to impede in any way the higher service to which we are devoted."

D. Visiting Scientists.

The number of scientists visiting the Institute has increased to such an extent that in the future it will be necessary to choose those who can be accepted in relation to the contribution which they can make to the program at the Institute or to programs in the member countries. It is expected that for the immediate future it will be possible to accept visiting scientists at the maintenance rate of ₡10 -- approximately $1.50 per day.

E. Integration of the Program.

As a program develops there is a tendency toward the development of new Departments. However, there is much to be gained by maintaining integration around the four essentials: plants, animals, engineering, and human relations. Those programs which cut across these Departmental lines, such as Extension, should be designated as "Services" to indicate their relationship to the whole program. It is foreseen that we shall require at some time in the future separate heads for research, teaching, and extension, who will, however, work in the closest cooperation. After reviewing experience to date, it also seems desirable to combine research and teaching in each of the Departments and Services. The main emphasis should continue to be on investigations and the development of extension methods with the training of students associated.

V. Budget and Finances.

A review of the 1947-48 expenditures to date indicates that the year can be completed within the budget if all member countries pay their quotas and if approximately $14,000 can be collected from the few countries which have quota payments yet to make for preceding years, and if at least one of the several countries which are in the process of ratification completes the necessary formalities in time to pay a portion of its 1947-48 quota. Otherwise, in spite of our attempts to manage the program with frugality, essential aspects of the work will have to be curtailed.

INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES

PERSONNEL

November 15, 1947

Ralph H. Allee	Director
José L.Colom	Secretary
Lowell Curtiss	Treasurer

Plant Industry Department

Ing. Manuel Elgueta G.	Chief of Department
Mr. Joseph L. Fennell	Horticulturist
Ing. Ernesto H. Casseres	Olericulturist
Dr. Frederick L. Wellman /1	Pathologist
Dr. Ora Smith/2	Physiologist
Dr. Allan G. Newhall /3	Pathologist
Ing. Guillermo Bonilla A.	Assistant
Ing. Napoleón Murillo E.	Assistant

Note: Mr. George Bowman will join the permanent staff in January 1948, as Head of the Cacao Program.

Dr. J. J. Ochse, famous plant scientist from the Netherlands East Indies, will spend four months of the year at the Institute, serving as consultant the remainder of the year.

Ing. Mario Gutiérrez will return to the Institute in April 1948 to serve as Associate in Corn Breeding

Animal Industry Department

Mr. Albert O. Rhoad	Chief of Department
Ing. Oscar Echandi M.	Assistant
Ing. Romano Orlich	Assistant

Agricultural Engineering Department

Mr. Norton C. Ives	Chief of Department
Sr. Tomás Zeledón P.	Assistant
Mr. Otto Stadsklev	Assistant

/1 In cooperation with United States Department of Agriculture
/2 In cooperation with Cornell University - Dept. of Vegetable Crops
/3 On leave from Cornell University

Department of Agricultural Economics and Rural Life

Dr. Julio O. Morales	Chief of Department
Mr. Jorge León	Analyst
Dr. Charles P. Loomis /1	Consultant on Sociology

Note: Miss Marta Coll will join the permanent staff in 1948 as Home Economist.

Extension

Dr. D. Spencer Hatch	Chief of Extension
Mr. Claude Kellogg	Interim Chief, in absence of Dr. Hatch Sept. 1947 to March 1948

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Miss Angelina Martínez	Librarian
Mr. A. W. Allen	Records and Publications
Mr. George M. Slater	Business Manager

/1 In cooperation with Michigan State College.

PROGRESS REPORT

ANIMAL INDUSTRY DEPARTMENT

A. O. Rhoad

October 30, 1947

During the spring and summer of 1947 the Animal Industry Department made considerable progress. This is especially true in developing the physical plant from funds granted by the American International Association of New York. For a more complete statement on this see special report for first quarter July 1 to September 30. Since this latter date, construction has continued at an encouraging rate with few interruptions due to rains. Some delays have been caused, however, by scarcity and slowness of delivery of materials ordered in the United States. The entire construction program, however, is ahead of schedule.

The purchase of dairy animals has progressed slower than desired. At this writing there are 14 females of breeding age on hand of which two are in milk and three soon to freshen. Negotiations are still to be terminated on 14 other females. The locally purchased cows are of the criollo type, most of them showing some breeding of the Montgomery or Sahival (Indian) from early importations from Jamaica. Six are imported Hosteins.

The foundation herd for use in the grading-up program with beef cattle using part Brahman bulls has been purchased. The herd consists of 50 criolla cows from Nicaragua and 26 local Guanacaste cattle of mixed breeding. These cows have been divided into three breeding herds of 25-25 and 26 cows headed by a Santa Gertrudis, a Brahman Angus and a Brahman Angus bull, respectively.

In the research program data on one complete yearly cycle on "tórsalo" infestation and control have been obtained. This material will be prepared for publication and will also serve as a basis for comparison of the effectiveness of certain commercial insecticides now under study.

Studies on the feeding value of coffee pulp silage will be continued. For this purpose the construction of several semi-trench silos has been hurried in order to fill them this crop season, now getting well started.

In regard to Department personnel a dairyman has been added to the staff. He is Sr. Romano Orlich, Costa Rican and a graduate in dairy husbandry from Cornell. Also contact has been made with a Brazilian, who has a post graduate degree in animal nutrition from California, with the possibility of organizing the nutrition section

of the Department. In view of the importance of the "tórsalo" problem and because of the excellent leads to its solution, it is hoped that means will be found for furthering this work with the addition of an animal parasitologist to the staff.

Concerning additional grants I am happy to inform the Committee that assurance has been received that the King Ranch of Texas will make available certain funds to set up facilities to carry out the horse-breeding program of the Institute.

Under consideration are certain grant funds to develop facilities for the nutritional and physiological laboratories planned by the Department.

International Cooperation. The Department has had to decline two invitations, one to address the Brahman Cattle Breeders Congress in Sarasota, Florida on October 29-30, and the second to spend about three weeks in Cuba during November classifying Brahman cattle for registration. On the other side the Department has officially asked to participate in an extensive and far reaching tropical dairy cattle breeding program in Venezuela, known as the "O Campo" project. The Department has also been invited to participate in judging at the forthcoming National Fair in Panama in February.

QUARTERLY REPORT ON PROGRESS OF DEVELOPMENT

PROGRAM IN COOPERATION WITH THE AMERICAN INTERNATIONAL ASSOCIATION

July to September 30, 1947

A. O. Rhoad

On July 1, 1947 the first spade was turned in the poultry unit building program previously designated as the first unit to be developed and placed in operation. Since that date I am happy to inform you that the construction program has progressed very satisfactorily and at the present writing, September 30, it is about six weeks ahead of schedule.

At the end of the first quarter the poultry unit is about three-fourths completed, the swine unit one-half completed, and the corrals about one-fourth completed. Likewise, considerable work has been done in preparing and improving pastures.

It was not possible to construct the electric power line as previously planned because of technical difficulties that had to wait for the return of the Institute engineer. These have now been satisfactorily solved and work has started.

All construction work planned for the first quarter has, therefore, been started. Furthermore it was found possible, because of economy of construction in the swine unit, to purchase a 12 x 24 quonset hut which should be assembled during the next quarter.

Certain phases of the construction have been delayed because of difficulties in obtaining materials. This is especially true with poultry netting and hog fencing. It will be several months before this material is on hand.

Concerning the purchase of animals the schedule is completed with respect to beef cattle. With dairy cattle it has not been possible to have on the farm one-fourth of the dairy herd as planned. Only six Hostein Fresian heifers imported from the States are on hand. One is in milk. In the search for local cattle of the criollo type, visits were made to eight dairy farms and more than 4,000 head were inspected. Of these four have been purchased, ten others are now in negotiations.

Additional visits will be made to the States and it is anticipated that one-fourth of the herd will be obtained within the next quarter. Farmers are reluctant to sell the class of animals needed in this program at the price the Institute can pay.

With reference to the purchase of equipment, orders have been placed covering purchases of poultry and creamery equipment, and a few minor items for the swine and dairy cattle units. We are ahead of schedule in that a pick-up truck and a trailer wagon have been purchased and are on hand. A tractor and accessories have been ordered and were to be on hand, but due to political disturbances and strikes, it has not been possible to get them from warehouses at point of entry into Costa Rica.

During the July-September quarter the personnel of the Department has been increased under the AIA agreement. A dairy cattle specialist, a Costa Rican graduate of Cornell University, has been placed in charge of the dairy unit. Another Costa Rican has been added as expeditor, purchasing agent and fiscal control agent for work in progress under the AIA grant.

On a temporary basis, a construction gang of two foremen and thirty-one artesians and laborers has been hired. Over-all supervision of the construction operations is given by Mr. Rhoad, with the assistance of members of his Department staff. In connection with the construction of the creamery, which is to start shortly, several contractors were permitted to bid on this job as the specifications for this structure are more exacting than for the barns and corrals. It was felt, however, that the quality of work and supervision on the present structures indicated sufficient skill to construct the creamery without the aid of outside contractors. A considerable economy would also be effected.

Concerning the Demonstration Farm as a whole the division of responsibilities between the livestock and plant industries have been determined awaiting the appointment of a permanent manager. Likewise the division of areas for specific crops and pastures has been determined. Work has progressed in planting some of the area in sugar cane and preparation of other lands for convenient operations.

A fiscal and accounting system has been determined whereby expenditures on each operation can readily be determined.

RESEARCH, PERSONNEL AND LABORATORY EQUIPMENT

Albert O. Rhoad

October 15, 1947

In order to give a partial picture of our many necessities with reference to the animals research program I have drawn up the following outline.

General Research Program:

As the all well-rounded livestock departments the over-all research program includes projects in animal breeding, nutrition and health with each of four major classes of livestock, namely dairy cattle, beef cattle, swine and poultry. Routine work with horses, sheep, pastures and livestock products is also planned.

Obviously with the proposed size of the herds, actual funds for research and scientific personnel, only well-considered key problems can be undertaken for study. The selection of the problems to be studied is based on several points:

1. Economic importance i. e., as a source of food.
2. Regional aspects, i. e., general to the tropics.
3. Present status of knowledge, i. e., work published and under study at other experiment stations.
4. Fundamental or applied research.

Based on the above; major emphasis will be placed on the following problems:

Dairy cattle - Production of low-cost milk from animals adapted to tropical environment. Largely nutritional, but health factor is important, while breeding is important to both (see below). Because of this the cow herd will be more than a group of milk cows. It will also be a collection of important genetic material. Fundamental genetic studies will form a part, because of a polyallel system of mating involving criollo and three standard breeds of cattle.

Beef cattle - This will involve a practical as well as a fundamental genetic study because a grading-up program will be employed using hybrid sires in a polyallel system of mating.

Swine - This is mostly a nutritional problem seeking practical ways of feeding tuberous and other carbonated root crops as substitute for corn. Some minor but not fundamental genetic studies are also planned.

Poultry - This project is basically a practical one involving studies in nutrition, housing and health in order to develop the almost non-existent commercial poultry industry in tropical countries.

Health - An urgent health problem requiring major attention is that of the skin parasite Dermatobia hominis, commonly called "tórsalo", "nuche", or "berne". This entails fundamental research in the biology of the parasite, as well as methods of control through use of modern insecticides.

Climatology - In recent years climatology has emerged as a most promising field of research in the animal field. It is fundamental to livestock improvement in the tropics. Happily it is one of the few fields of study that encompasses various biological sciences. In animals, genetics is involved because of breed and individual differences in heat tolerance in cattle, sheep, and poultry. Animal nutrition is also involved as efficiency of feed utilization is influenced by climatic factors. This in turn is closely associated with the physiology of metabolism. It directly and indirectly influences the health of farm animals in the tropics. All three influence production and reproduction.

In animal climatology the Department should find its most far-reaching field of research as a leader in world-wide tropical livestock experimentation and as an auxiliary to its own projects.

Personnel - An animal parasitologist should be added to the staff at an early date not alone for urgency of the "tórsalo" problem, but also because it would involve less expenditure for equipment and facilities than other experimental projects. With $3,000 for an isolation barn and $2,000 annually for equipment and supplies some very fundamental work could be started. (A program of studies has been prepared by Dr. V. Swanson, an experienced animal parasitologist.) A salary of about $6,000, with residence, would be required to obtain the services of an experienced veterinarian in this field.

An animal nutritionist should be added to the staff as soon as minimum facilities are available to carry on nutrition work. A grant request for sufficient funds to establish minimum facilities has been made. Also contact with a Brazilian, Sr. Alberto Kok, M.S. of São Paulo, has been made with the intention of obtaining his services when above facilities are in sight. An initial salary of $4,000.00, and residence, has been offered.

PROGRESS REPORT

PLANT INDUSTRY DEPARTMENT

Manuel Elgueta

October 30, 1947

Since July 1, there have been many changes to report. Personnel has increased by Dr. Manuel Elgueta, head of the Plant Industry Department and Dr. A. G. Newhall on sabatical leave from Cornell University and in charge of cacao disease investigations. Also by Dr. F. L. Wellman from the United States Department of Agriculture, who has been working on coffee diseases since last May.

The Cacao Conference took place from September 30 to October 4, 1947. All references to cacao work appear in a special publication on the proceedings of the Conference. During next November work will begin on the "finca" "La Lola". There are already several projects ready to be developed as soon as the Institute takes charge of the finca.

This report gives a short summary of the projects under way at present.

I. FERTILIZATION TRIALS

Under Manuel Elgueta and Napoleón Murillo.

Project No. 82. There is a general project of several factorial trials to ascertain the effect of application of N. P. K. and Ca. in all 16 combinations in different crops. Up to now there are two trials under way.

a) Cowpea trials. Date of sowing, August 1, 1947. Ready for harvest in a few days. A great beneficial effect was visible from the first due to phosphorous and possibly due to calcium.

b) Sorghum trials. Sown on September 17, 1947. Also show a great visible effect from phosphorous.

Sub-Project 42a. Project No. 42. This concerns the preparation of Compost following the Indore process. Each of the former fertilization trials has an adjacent trial on the effect of compost in comparison with the complete formula applied in the factorial trial and with a check without fertilization.

There are two trials: one on Cowpeas and the other on Sorghum sown on the same day as the former. There was a visible effect of the chemical formula.

II. COMPOST

Under Guillermo Bonilla.

Project No. 42. Compost elaboration following the Indore process. Initiation June 1947. Five piles have been prepared. The material has a pH 7-8. Samples were sent to the laboratory of the University of Costa Rica for analyses. Besides the Sub-Project of Compost application in Cowpeas and Sorghum there are the following:

Sub-Project No. 42b. Compost on Coffee Nursery. Objectives: to study effect on germination, vigor of seedlings and diseases. Sown September 29, 1947.

Sub-Project No. 42c. Compost on Bananas. Planted, August 29 to 30, 1947.

III. SUGAR CANE

Project No. 68. Under Napoleón Murillo. Fertilizer trials. 100 N., 50 lb. P_2O_5 and 150 K_2O in all combinations. Applied on a commercial plantation of 4-1/2 and 7-1/2 months old. Fertilizer applied on January 14 and 15. Harvest will take place on old plantation about January 1948 and in the younger about April or May 1948. No visible influence has been noted.

Project No. 70. Under Elgueta and Murillo. Sugar cane collection. There are now 68 varieties of Saccharum officinarum, s. spontaneum, s. sinense and s. barberi and some hybrids. From these collections 62 were already in the country and 4 have been recently introduced by the Institute. Observations have been made on date and percentage of germination, growth vigor, diseases, etc.

Propagation lots: Under the former project the best varieties are being propagated to have material for future trials.

Project No. 72. Under Murillo. Variety trial in Nicoya, Guanacaste in cooperation with the Institute of Inter-American Affairs. Seven varieties were planted among different farmers on April 14, 1947. There are observations on germination and tillering.

Project No. 73. Under Murillo. Fertilizer trial in Cervantes. The objective was to determine if a certain discoloration symptom of the plantation was due to potassium deficiency. Application of sulphate of potash was made on special plots. After 3 months there was no change in the symptom.

Project No. 75. Under Murillo. Effect of tetrafosfoglucosate of calcium on sedimentation and incrustations of heaters and evaporators of a sugar mill. Tests were made between September 10 and 30, 1947. Results were very satisfactory if not definite due to the short time of the experiment and lack of replication.

Project No. 83. Under Elgueta and Murillo. Variety trial of sugar cane under two conditions: with and without fertilization. Ten of the best varieties were planted on 12 plots of which 5 were for harvest at a 12 months period, 5 at 15 months period and 2 to study a curve of sugar accumulation. Sown, August 29, 1947. Germination was counted 45 days later. Statistical analyses showed great significant difference in varieties. There was interaction between variety and fertilizer, three of them showing significant and positive influence of fertilization on germination. The two tests left for sugar content determination will be sample harvested weekly after the twelfth month.

Project No. 84. Under Murillo. Fertilizer trials in Sugar Cane at the Victoria Cooperative, Grecia, Costa Rica. This trial was made in 1944 using some commercial fertilizer formulas. The analysis of variance has now been made. Significance due to some of formula was obtained.

IV. COFFEE

Dr. F. L. Wellman is in charge of disease work on coffee, a report on which is given separately. Only the agronomic projects will be listed here.

Project No. 37. Planned by Dr. W. N. Bangham. Now under Elgueta and Bonilla. Old coffee plantation renovation through fertilizer and cultural practices. Initiation, November 1946. Four different progress reports have been made. In 1946 the harvest of the plots was done previous to any treatment. Data were analyzed. As expected, no significant differences were obtained in any of the treatments. Calculation was done as a uniformity study.

Project No. 87. Under Elgueta and Bonilla. Different shade intensities with different prune and fertilizer treatment. Initiation, October 1947. All major and simple plots are marked. Harvest for uniformity trial is being done as if treatments were under way. As soon as harvest is over, shade intensity will be arranged and other treatments begun.

V. SORGHUM

Under Elgueta and Murillo

Project No. 94. Variety trial. Objective: to compare the mass selections of the Institute with common varieties. Four selections and 2 varieties are compared. Sown, September 10, 1947.

VI. POTATOES AND VEGETABLES

Under Ernest H. Casseres.

Project No. 39. Studies with Irish Potatoes.

A. Fertilizers: A second comprehensive fertilizer experiment set out in the potato area near Cartago is scheduled for harvesting November 5th. Observations in the field during the growth period indicated that nitrogen and phosphorous probably will show increased yields. Analysis of this data should give further information for comparison with the results from the first factorial experiment, which showed a highly significant increase in yield by the addition of superphosphate and increases due to nitrogen significant at the 5% level. (See Annual Report for 1946-1947 for details).

B. Variety Tests:

1- The second planting of the fifteen late-blight resistant varieties made on June 21, 1947 was harvested on October 22, 1947. Phytophthora infestanus occurred from trace to slight degree when the plants were 2-1/2 months old. However, they may still be classified as "resistant" although not immune. This is in agreement with observations carried out in New York State at about the same time.

The six best lines in vegetative performance were

EVI_2, DAC_1, DAB_3, DUA_2, EVI_2, FBY_1

At harvesting it was found that CUI_2 and CYJ_1 yielded more tubers than the last two lines mentioned in the first group. Sixty pounds of the best six lines have been ordered from the United States for further testing and increase during 1947 and 1948.

2- Failure to obtain a normal increase of tubers of seven commercial United States potato varieties is laid to the age of the planting stock used. Ten pound samples of Sebago, Houma, Katahdin, Ontario, Chippewa, Smooth Rural and Pontiac harvested in the United States in the fall of 1946 arrived too late in Costa Rica for the current planting season. These were held until the following June. Two months later it was evident that nearly all of the seed tubers were producing only a few small potatoes but no foliage. This indicated the need for further study of the reasons for such behavior from "physiologicaly old" potatoes, a situation, which according to Dr. Ora Smith, is not yet well understood.

C. Cut-seed Test

Observations from a test made with three varieties of potatoes comparing cured cut seed with freshly cut seed and whole tubers of equivalent size indicate the following:

a) It is feasible to grow normal plants from both cured and freshly cut potatoes when grown during the rainy season in the cool well drained soils of the highlands.

b) A good tuberization of cut surfaces of potatoes can be obtained without difficulty in Turrialba.

c) There are other indications that freshly cut tubers will decay when planted during the hotter, drier periods in the highlands or at Turrialba.

D. Sprout-inhibitor Test:

Application of a commercial preparation containing 2.2% of Methyl ester of Naphthaleneacetic acid on the Morada Negra and Chilena varieties of potatoes failed to produce the desired results upon examination of treated and untreated lots. Two months after treatment both

varieties showed about 50% of the tubers sprouting. Use of this hormone is becoming popular in the United States and in the tropics a knowledge of the proper technique may aid the planter and possibly the plant breeder.

Project No. 63. Trials of Imported Vegetable Varieties. The poor results of the 1946 trials due to diseases and insects prompted the testing of several fungicides and inseticides during the last few months. Good examples of satisfactory controls found are: the use of tribasic copper plus DDT for the control of an *Alternaria sp.* and most insects on cabbage; the use of Benzene Hexachloride spray to prevent much of the severe damage of leaf-eating *Diabrotica* insects on beans.

Vegetable seed from the United States is now on hand of the promising varieties of the following four kinds: lettuce, cabbage, onion, snap beans and tomatoes. Plans are to obtain performance records during the rainy and dry seasons on these crops only before more extensive trials are made.

Project No. 62. Standardization of Vegetables Commonly Grown in the Tropics.

A. Peppers: A collection of hot and sweet peppers is being maintained. Plants from a third mass selection of a pimento type sweet pepper are now growing. This appears to have resistance to Cercospora and is prolific. Release of this vegetable is planned for the near future after production data have been obtained under the name of "Pimento Aragón".

B. Chayotes: A collection of this widely-used vegetable is being maintained. There are 18 introductions. Currently, production figures are being kept on eight varieties. Release of introduction No. 3006 which appears consistently prolific and of good quality is planned for the near future under the name "Chayote Coronado".

C. Ayotes: (*Cucurbita spp.*) The work of separating the native squash into its various types is getting under way. 25 types were planted September 4; of these 21 came from open pollinated fruits and 4 from fruits selfed once.

D. Other variety collections currently growing:

Beans	(dry)	20 varieties
Yuca	(Cassava)	6 varieties
Sweet potato		3 varieties

Project No. 40. Fertilizing Vegetable Crops. Two factorial fertilizer experiments studying three rates of application of N, P and K (as for potatoes) are in progress, as follows:

Sweet Corn: Planted Aug. 25,1947. To be completed in Dec.
Cabbage : Set out Aug. 16,1947. To be completed in Nov.

VII. PROGRESS REPORT ON PLANT PATHOLOGICAL WORK AT IAIAS

Dr. F. L. Wellman arrived on May 28, 1947. The first month was spent in orientation and on investigation, following a request, of the Cinchona diseases in the United States Cinchona Plantation projects. Certain project outlines were prepared, and work started. Towards the latter part of the second month the first work was begun on setting up the pathological laboratory. By that time specific projects were in full swing. The main objective in plant pathology is in the direction of coffee diseases, most specifically on the severe leaf spot, "ojo de gallo" caused by Omphalia flavida, and the serious root rot, "Maya" caused by Rosellinia. Other coffee diseases are not being neglected, and general consultations are being conducted on miscellaneous diseases of all kinds on other crops. Every effort is being made to maintain a hemispherical outlook in all plans and projects.

Dr. Wellman's assistants at present are: Miss Lucy Hastings, Sr. Hernán Granados and Ing. Guillermo Bonilla (part time). A laboratory worker and preparator is to be obtained. Some six to eight students plan to work on pathology during the coming calendar year.

Accomplishments in connection with projects presented for approval are as follows:

No. 85. "Seed (Coffee treatment) fungicides", was started. Seeds from diseased and healthy fruits were dusted with 16 different dust treatments and planted. Due to natural slow germination and growth no data are as yet on hand to be reported.

No. 88. "Coffee spraying tests" and No. 89, "Coffee seedling tests, Bordeaux" are still in the planning stage. Some equipment still has to be obtained, and the start of these projects will be dependent upon the arrival of a student for assignment.

No. 86. "Coffee seedling transplanting", was planned to study effects of three different treatments in the nursery. Results consist of data obtained in growth, vigor, and disease occurrence. Results are not complete but, for the first time quantitative data are being secured on testing three standard types of nursery treatment and two methods of transplanting. Best results, both pathologically and horticulturally, were obtained with seedlings transplanted at the stage when cotyledons were expanded under a shade house with about 20 percent shade.

No. 90. "Coffee root-rot control", is in progress. It has consisted thus far in survey and selection of areas where work can be established. Identification of organisms involved in the disease complex in Costa Rica indicated that material and conditions at hand in the country are sufficiently variable so that results of studies here can be applied in all Latin America.

No. 91. "Coffee fungi study I. Omphalia flavida", is in progress. This organism, causing the severe "Ojo de Gallo" leaf spot, causes great damage in localized areas in many countries. The organism has been isolated, and is being studied on different media in preparation for determining the limiting factors for its growth and spread.

No. 92. "Coffee fungi study II. Pellicularia koleroga", is in progress. While this organism is not so important as Omphalia flavida it causes serious local losses in many countries. It has been isolated and is being studied in pure culture.

No. 85. "Seed (bean) treatment, fungicides", is in progress. Fungi and bacteria that commonly occur on bean seeds have been isolated and are being studied for pathogenicity and are being identified. Controlled laboratory and greenhouse tests are being conducted using several well known proprietary seed treatment compounds that are of recognized value in the United States and other temperate regions. Their adaptability to the tropics and the economy of the less advanced growers in the tropics are under investigation.

It should be pointed out that the pathology laboratory is being augmented by the start of work on diseases of cacao, at present under the supervision of Dr. A. G. Newhall. As the work develops it is planned that a number of scholarship students will also work in diseases of the crop in the laboratory.

From time to time numerous visiting scientists work at the Institute for short periods. They are also furnished with facilities and space for their work. In the last four months assistance has been given to a distinguished

worker studying light effects on plants; two herpatologists; one young botanist just beginning a career; a botanist specializing in bryophytes; and mammologist studying the smaller animals of the region and their life histories.

A two weeks trip was just completed by Dr. Wellman identifying and planning control measures for a serious disease of the fiber plant (kenaf) in Cuba; consulting with technicians about coffee disease and other problems in Guatemala, and working with Dr. Wilson Popenoe in Honduras on disease discussions to be included in his general text book, now in preparation, on new and important crop plants of Latin America.

VIII- ESSO PROJECTS July 1 to September 30, 1947.

The program under the Standard Oil Company grant has up to now only one graduate student, Mr. Milton Gertsch. He is developing the following projects which were planned by Dr. Ora Smith. Mr. Morua, technical assistant, and a group of laborers have also been on these projects.

Project No. 38. Supplement No. 1. Study of the effect of growth substances on the ripening and shattering of coffee berries. Methyl 2; 4 Dichloropheno-oxyacetate and Naphaleneacetic acid have been applied to coffee weekly from September 3 to October 29, inclusive. The number of coffee berries dropped from the trees were counted and are still being counted.

Project No. 55, Supplement No. 1. Preemergence applications of herbicides to corn and beans. Herbicides were applied after planting. Weed counts were taken and on the final count the weeds were cut and weighed. Part of the bean crop has been harvested already and some plots are free of weeds. Where 2-4D was applied heavy enough to damage beans, corn was also damaged. Some of the combinations which keep the soil weed-free will be tried on other crops.

Project No. 55. Supplement No. 3. Chemical weed control on sugar cane. Three preemergency sprays were applied to a new plantation of sugar cane a week after planted on October 29 and 30.

Project No. 55. Supplement No. 2. Post shoveling application of herbicides to coffee. Herbicides sprays were applied to coffee one and three weeks after shoveling. As it became necessary, second applications have been applied.

Project No. 55. Supplement No. 6. Chemical weed control on rice. Rice has just been planted.

PROGRESS REPORT

DEPARTMENT OF ECONOMICS AND RURAL LIFE

J. O. MORALES

October 30, 1947

The research and teaching program of the Department was started in January 1947. Up to the present, we have formalized the research program in specific projects, and a preliminary plan for the teaching of students has been outlined.

I. Research -

A) Community Study - this project involves the combined approach of health, nutrition, economics, sociology and home economics to the solution of basic rural life problems.

Progress to date -

1) Arrangements were made with Michigan State College for them to take over the part of the Rural Sociologist of the research team. His research program was discussed and outlined during Dr. Loomis' visit to the Institute in August.

2) The data on the labor force of the Turrialba district have been summarized.

3) Outlines for the census of the area have been completed and were discussed with various census experts.

4) Candidates for Home Economist were interviewed in Puerto Rico and selection of the person is awaiting the receipt of formal applications from them.

B) Coffee Processing Plant Study - this project covers the economic and engineering aspects of coffee processing. It involves the segregation of coffee processing in its various phases so as to determine the most efficient ways of performing each phase and the possible combination of these into a more efficient general process.

Progress to date -

Considerable general information on Costa Rican processing plants has been gathered. The selection of the sample to be studied can be based on what we have now, and also a great deal of insight will be secured from its analysis, such as variations in volume of business from year to year, and organization and operation of these plants.

C.) Study of "Panela" (Block Raw Sugar) Processing Plants

A similar study to the one above, covering the processing of sugar cane in small plants (trapites)

Progress to date -

Some information has been secured on the geographical distribution, organization and operation of this industry.

D.) Prices of Agricultural Products - Some data on seasonal and long-term variations in local prices of "panela", sugar, corn, and beans are being collected.

II. Teaching -

Plans to have two students during the coming teaching year have been concluded - the first, Mr. Francisco Gómez, a Colombian, who will be helping on the Coffee Study; the second, a graduate student of Dr. Loomis from Michigan State College, who will work in the Community Study.

Some effort has also been made to secure travel fellowships for our students.

III. Other Activities -

A) Dr. Phil S. Eckert, Head of the Department of Agricultural Economics and Rural Sociology has spent his sabbatic leave of six months with us at the Institute. He has been outlining and editing a series of selected readings in Farm Management for use in Schools of Agriculture and other educational institutions in the Spanish-speaking American republics. He also studied the Price Support Program of the Costa Rican National Bank.

B.) We have secured the services of Mr. Jorge León to assist with the work of the Department

C.) We have carried farther the negotiations with the Inter-American Statistical Institute to hold a Census Institute at Turrialba for Central American and Caribbean countries.

D.) I participated in the meetings of the Commission of the 1950 Census of the Americas held in Washington from September 2 to 18, representing the Institute. At the same time I participated in the meetings of the Inter-American Statistical Institute and in the International Statistical Conferences.

PROGRESS REPORT

AGRICULTURAL ENGINEERING DEPARTMENT

Norton C. Ives

October 30, 1947

Erosion Project

Within a month it is planned that all final construction details of the soil erosion check plots, concrete catchment tanks, and wood plot borders will be in place and ready for taking data during the expected heavy rains of December.

Crops will be changed and rotated according to plan, and all run-off data kept for the next three years, by which time further plans will have been developed.

Special effort is being made through Claud Horn of the Office of Foreign Agricultural Relations of the United States Department of Agriculture and Mark Nichols of Soil Conservation Service to enlist the active cooperation of OFAR and SCS to assist in research study at the Institute in soil erosion and soil permeability on these typical tropical soils.

Drainage Project

Likewise within two or three weeks the construction of test holes will be ready for continuous cycle readings to determine the drainage characteristics of the eleven acre tiled area, during the hoped-for and quite probable heavy rains of December. Readings and observations on the effect of crop growth due to the sub-surface drainage will continue during the wet and dry cycles for at least the next three years.

Lumber Study

A quite simple but time-consuming study of the commercial lumber varieties of Costa Rica has been started in connection with the lumber that is being purchased and installed as borders of the erosion check plots.

Some 32 kinds are being secured and the tests will include:

1. Average moisture content when delivered
2. Rate of natural drying

3. Specific gravity
4. Strength
5. Preservative treatment penetration
6. Field study of the effect of "permatox" preservative treatment.
7. Equilibrium moisture content in this climate

Grain Storage and Drying

To be initiated when equipment and aparatus arrive and time permits are the all important grain drying and storage studies. Detailed plans and preparation are being made and a more detailed project write-up is near completion. When the above three projects can be placed on an operation basis this project will receive major interest attention.

Agricultural Engineering Building

Little more planning can be effectively done until the amount of funds to be available is determined.

Institute Residence Plans

A basic floor plan has been prepared and is now up for agreement among the present Institute residents. Detailed plans and material also will be made up when agreement is attained. It is hoped that a somewhat standard plan can be obtained that will provide the necessary variety of basic facilities or requirements for the kind of families to come, and the environmental conditions existing here in the Reventazón valley, all at a cost that will enable several such houses to be built instead of just one or two. Present housing facilities are most critical and will continue to be so until several houses are built.

Institute Survey

As time permits, the detailed topographic survey of the Institute land will continue with the hope of getting a detailed map completed within the next six months.

Guest Scientist Consultation

A formal invitation has been extended to A. W. Turner of the Bureau of Plant Industry of the United States Department of Agriculture to spend some time at the Institute and to visit, probably, parts of Colombia and Peru to study and consult with the Institute on Agricultural Engineering problems of the Central American tropics.

Lagoon Drainage

Detailed survey and drainage plans have been completed for the lagoon area which runs parallel with the public road and the railroad and which practically splits the Institute in half. This not only called for a detailed topographic map of the lagoon area but also the determination of the watershed above it and a general plan of drainage of this entire watershed. In the study it was found that nearly all this watershed lay within the boundary of, and comprised the major portion of the Institute property. This makes an excellent opportunity to study the hydrological characteristics of a typical tropical watershed and for tropical soils. Estimations had to be made for the rainfall intensities and times of concentrations from 24-hour rainfall data. It is felt, however, that an ample capacity is provided to prevent flooding nine years out of ten. The plan as developed calls for deepening and enlarging the present drainage ditch. Initial work should open up the ditch as far as the lower end of the lagoon. This will provide preliminary studies of the drainability of this type of soil and soil profile. Work ought to be started in January, 1948, the beginning of the next dry season.

Farm Machinery and Farm Equipment Facilities

As funds and time permit, every effort will be made to continue the development of the shop repair and mantenance facilities and the power and farm machinery facilities of the Institute. This means more extensive effort on land preparations for machinery operation such as stone removal, grassed water-way development to eliminate sharp ditches, field rearrangement and drainage as well as the training of operators and mechanics, and the provision of additional necessary tools and equipment in the shop.

ORTON MEMORIAL LIBRARY

REPORT

Angelina Martínez

Fiscal year 1946-47

Library collection

A. Bulk of collection. The Library's main collection is composed of several collections that were donated to the Institute or were purchased at a very low cost. The following are included:
   1. Orton's collection consists of about 600 books and 10,000 separate items including pamphlets and journals. This collection was presented to the Institute by the Board of Trustees of the Tropical Plant Research Foundation when the Foundation was dissolved in 1943.
   2. Pearson's collection is composed of about 60 books and 300 journals on economics. These materials were bought by the Economics Department at a very reasonable price.
   3. Sancho's collection consists of 103 books on chemistry and related fields. This collection was donated to the Institute by the relatives of the late Mr. Francisco Sancho Jiménez of Cartago, Costa Rica.
   4. Myers' collection consists of 139 bound volumes of pamphlets on economics and farm management.

B. New acquisitions.
   1. By purchase.
      113 of the books that were ordered were received.
   2. By donation.
      a) 182 books were received through the Embassy in San José as part of the United States Department of State donation. These books were selected from a list of 440 titles that we sent to the American Library Association.
      b) About 200 old books were received from the Library of the United States Department of Agriculture.

C. Total number of Library holdings.
   The total number of our book holdings came close to the 2,000 mark in June. Adding these book holdings to our other materials in the Library, i. e., journals and pamphlets (about 10,000 in all), we can say that at the end of the fiscal year the approximate number of volumes in the Library came close to 12,000. We shall easily pass the 15,000 mark before the clos of the coming year.

Library expenses

A. The Library budget for the year was very limited. The Library was assigned $4,080.00, allocated as follows:

Staff	$2,400.00
Supplies and services	180.00
Books and journals	1,500.00
Equipment	720.00
	$4,080.00

B. The expenses for the year were as follows:

Staff	$2,369.77
Supplies and services (including equipment)	428.80
Books and journals	1,777.53
	$4,576.10

We spent $496.10 over the assigned allocation for the Library.

Selection and ordering of materials

The selection of the materials to be ordered was done largely by the members of the staff. The following materials were ordered:

171 books
1,442 Experiment Station bulletins
Library supplies: book pockets and cards, mending supplies, etc. Some equipment was made in San José.

Cataloging and classification

1371 sets of Library of Congress cards were ordered through the Pan American Union. Of these we have received 1,007 sets. 1,045 books were classified.

712 were fully cataloged and processed. The records for this division included the following at the end of the year:
Card catalog with 3,144 cards alphabetically arranged.
Shelf list with 712 cards arranged in the order in which the books appear on the shelves.
Accession record with 712 cards.
A total of 4,568 cards were prepared for these records.
In the processing of the materials the following operations were performed:

1757 book plates were pasted
1757 date-due slips were pasted
712 book pockets were typed and pasted
712 book cards were typed
712 backs of books were lettered

A total of about 10,000 pamphlets and journals were stamped and about 4,000 of these were classified.

Reference work

The Encyclopedia Britannica, dictionaries and other books of reference value are kept outside in the reading room.

About 250 reference questions were answered, and the Librarian spent considerable part of her time looking up materials for both students and staff members.

Circulation

Library materials circulated among staff members, students, and visiting scientists. 974 volumes were charged out of the Library during the year, as follows:

	333 books
	316 pamphlets
	325 journals
Total	974

Journals

The Library subscribed to 42 scientific journals and abstracts, including some British abstracts; 17 other subscriptions were received either as complimentary subscriptions or on an exchange basis. About 170 periodicals from Latin American countries were received on an exchange basis. It was decided to bind all important journals and abstracts. The binding of the Biological Abstracts was almost completed.

Microfilm service

A microfilm reader was purchased and about 100 pieces of microfilm materials were received.

Equipment

The following pieces of furniture were made at the carpentry shop:

2 6-drawer card cabinets
2 magazine racks
1 reference shelf
1 bulletin board
1 charging tray
2 correspondence trays
2 3-shelf book trucks
2 newspaper racks
1 dictionary stand
2 waste paper baskets
1 display shelf

Designs for eight double-faced book shelves were worked out by the Librarian and the Head Carpenter and the work was started on the same. A gate to match the banister at the end of the stairs was also designed. A 60-tray card catalog cabinet was received from the States.

Preservation of materials

All the books in the Library were treated with mildew inhibitor to prevent them from getting mildewed. This treatment has not proved very satisfactory. Another ten gallons of this chemical were ordered.

General comments:

The organization of the Institute's Library was started in August 1946. The work was done by the Librarian with the help of an untrained part-time clerk who also spent some of her time doing office work. We are happy to know that starting with July first we will have the services of an Assistant Librarian and a full-time clerk. We hope that this will signify an expansion of our services in many ways.

An increase in the Library budget is essential if we are going to hope for really marked improvements in our service and efficiency. This increase in the budget would help us in building up a well-rounded collection in our field. Several items are of major importance:

1. Purchasing of back numbers of important journals so that our files may be complete.
2. Filling in gaps in the collection.
3. Getting as many Spanish titles as possible.
4. Binding complete volumes of important journals.
5. Increasing our magazine subscriptions.

INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES

Turrialba, Costa Rica

COURSES OF STUDY

Outline of Basic Course

Methods of Science

		Leaders	Meetings: Lectures	Meetings: Practice
1st Quarter - Introduction				
(Oct. Nov. Dec.)	Science as a body of knowledge	(Allee (Rhoad (Elgueta	4	
	Library reference technique	(Casseres (Martínez		4
	English-Spanish (Technical)		8	8
2nd Quarter - Methods of Inquiry				
(Jan. Feb. March)	Plants sciences	Elgueta	3	3
	Engineering	Ives	3	3
	Economics and Sociology	Morales	3	3
	Animal sciences	Rhoad	3	3
3rd Quarter - Methods of dissemination				
(Apr. May-June)	Extension procedures	(Hatch (Allee	8	8
	Philosophy of science	(Allee (Rhoad (Elgueta	4	Seminar thesis

INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES

Concepts of Subject Matter and Teaching Method
for Basic Course in Methods of Science

(Following Outline Approved in Staff Meetings
of August 22, 1947)

1st Quarter

		Meetings	
Introduction	Leaders	Lectures	Practice
Science as a body of knowledge	(Allee (Rhoad (Elgueta	4	
Use of library resources	(Casseres (Martínez		4
English-Spanish (Technical)	( )	8	8

For the 4 introductory lectures the following subject matter is suggested:

1st lecture: A survey of the sciences - Mr. Allee.
See article in SCIENCE same title,
by Tolman - August 15, 1947

2nd lecture: What science has accomplished in agriculture.
Plants (see histories - experiments). Elgueta.

3rd lecture: What science has accomplished in agriculture.
Animals. Rhoad

4th lecture: Social Sciences. - Morales

Remainder of quarter given over to drill in English and Spanish as well as library technique.

2nd Quarter

		Meetings	
Method of Inquiry	Leaders	Lectures	Practice
Plants sciences	Elgueta	3	3
Engineering	Ives	3	3
Social Sciences	Morales	3	3
Animal sciences	Rhoad	3	3

This quarter will require some coordination between sections to obtain a coherent conception of science in action. For this purpose some one crop or plant should be used as illustrative material throughout as far as possible. This plant or crop should be as universal to the Americas as possible, and also one upon which a great deal of study has been done. Such crops as corn or potatoes would serve this purpose. In the absence of such a "binder" there is danger that the material used to illustrate methods of inquiry would be so varied and diverse that the objectives of the course during this quarter would become confused.

To illustrate how this "binder" would coordinate the subject matter, the following outline is suggested:

Plant sciences - Elgueta - 3 lectures - 3 practices
Lecture 1. Plant breeding - hybrid corn
" 2. Plant physiology - photosynthesis in corn
" 3. Cultural methods - tillage - distance rows in corn

Engineering sciences - Ives - 3 lectures - 3 practices
Lecture 1. Machinery design - corn - planters - cultivators
" 2. Farm structures - corn dryers - storage
" 3. Soil erosion - corn (row crop) vs. sed, etc.

Economics - Dr. Morales - 3 lectures - 3 practices
Lecture 1. Management - corn production costs
" 2. Land tenure - corn belt contracts
" 3. Marketing - corn marketing

Animals sciences - Rhoad - 3 lectures - 3 practices
Lecture 1. Nutrition - corn vs. milo
" 2. Breeding - corn belt vs. range cattle
" 3. Physiology - corn and heat increment

In all the above, corn, the corn plant, and the corn crop are used to illustrate methods of inquiry as applied in the various fields of agricultural science. There is ample literature on all these phases. The main objective in this quarter is to get across to the student what the experimentor thinks, his rationalizing approach, and something of his methods when confronted with problems in the above fields. Corn is used here to illustrate the processes.

3rd Quarter

Methods of Dissemination	Leaders	Meetings: Lectures	Meetings: Practice
Extension procedures	(Hatch (Allee	8	8
Philosophy of Science	(Allee (Rhoad (Elgueta	4	Seminar thesis

Educational Methods: Hatch - Allee - 8 lectures - 8 practices

1. Extension agent system -

   Necessity of and history - Allee
   Organization scheme - Allee
   Modification as used in various Latin American countries - Allee

2. Official demonstration farm and pilot industries - Allee
   Puerto Rico Dev. Co. - AIA - SCIPA - El Alto

3. Community unit plan - 2 lectures - Hatch
   Family unit plan - 2 lectures - Hatch

Philosophy of Science

Lecture 1	Allee
Lecture 2	Rhoad
Lecture 3	Elgueta
Lecture 4	Visitor

Sept. 10, 1947