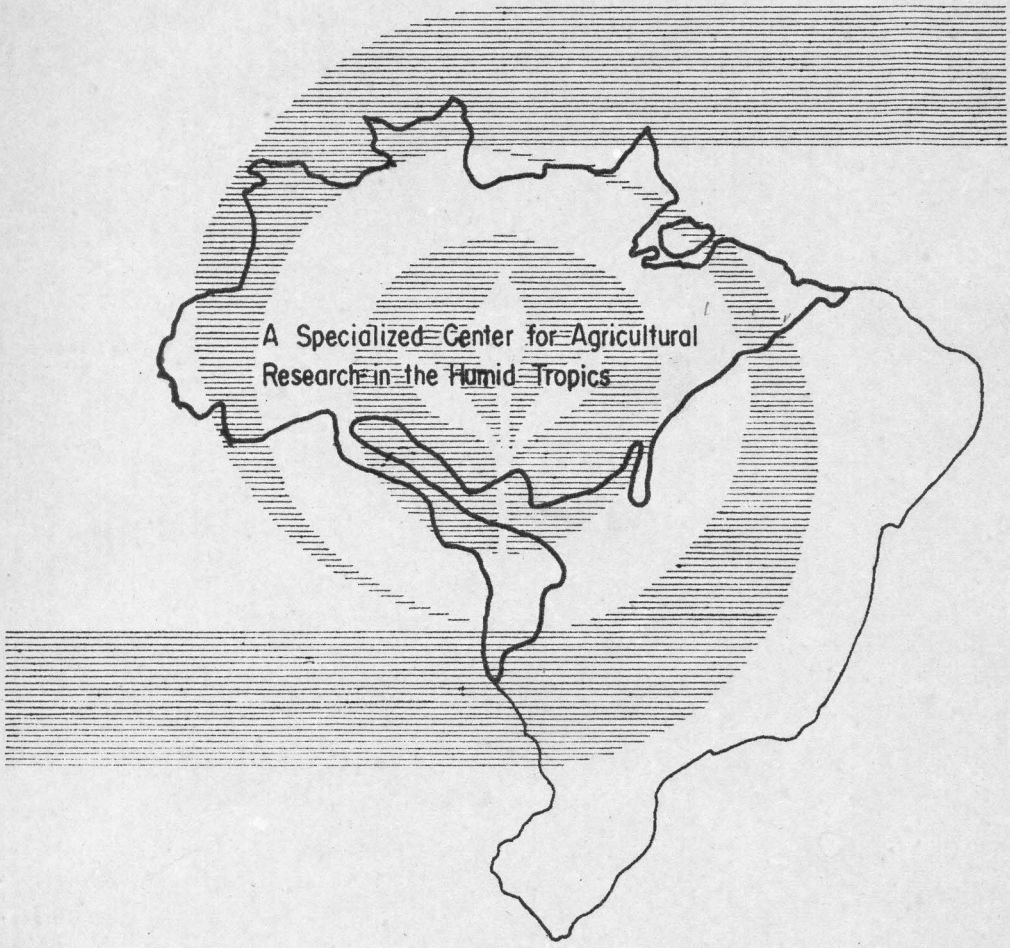
AGROPECUÁRIA

HUMID TROPIC RESEARCH CENTER



BELÉM – PARÁ – BRASIL

EMBRAPA

HUMID TROPIC RESEARCH CENTER

Director : HERMÍNIO MAIA ROCHA

Assistant Directors: WALMIR SALLES COUTO
JOSÉ FURLAN JÚNIOR

Address : Tv. Dr. Enéas Pinheiro s/n
P. O. Box - 48
66.000 - Belém, Pará, Brazil.
Telephones : 26-1941
26-1541

EMBRAPA
CENTRO DE PESQUISA AGROPECUÁRIA DO TRÓPICO ÚMIDO

HUMID TROPIC RESEARCH CENTER

PURPOSE:

The creation of the Humid Tropic Research Center (CPATU) was inspired by the Institutional and Operative Model of the Brazilian Agricultural Research Service (EMBRAPA). Its goal is to substantially increase the development of new technologies to serve brazilian agriculture.

CPATU, with headquarters in Belém, State of Pará, has as its main objectives the utilization of the renewable natural resources available in the region of the humid tropics and the creation of more profitalbe and permanent production systems.

As a research unit concerned with renewable natural resources, it is CPATU'S responsibility to study soil-plant-climate and soil-plant-animal-climate interactions for developing better production systems, without detriment to the balance of the natural ecosystems.

The aim of the Center is to function in close connection with organizations devoted to research and technical assistance in the states, with universities, with private organizations, and with regional organs within the brazilian humid tropics in order to combine efforts and avoid the unnecessary duplications of research activities.

Tv. Dr. Eneas Pinheiro s/n.° - Cx. Postal, 48 - Fones PABX 26-1541 - Diretoria 26-1941 - CEP 66000
BELÉM PARÁ

The objective of CPATU is, therefore, to generate technology which can be made available to the producer of the Amazon Region in such a way as to permit an increase in production and productivity within areas of structured agriculture and to make possible the conquest of new areas through expansion of the agricultural frontier.

FUNCTIONAL STRUCTURE

The functional structure of CPATU is characterized by a high concentration of human and financial resources devoted exclusively to the development of agricultural technology suited to the conditions of the Humid Tropics.

Administration: Advisory Council, Director and Assistant Directors.

Technical Activities: Coordination of Projects and Coordination of Systems and Economic Analysis, Dissemination of Technology and Satellite Activities.

Support Activities: Documentation and information Sectors, Laboratories, Experiment Stations, and Administrative Services.

The technical and scientific personnel, in accordance with EMBRAPA'S own Institutional Model,are multidisciplinary, involved with problems or a whole complex of problems, covering the various areas of agricultural research.

AREA OF OPERATION

CPATU is developing a concentrated effort in strategically selected areas in the humid tropical region, according to guidelines brought about by earlier studies which, at the moment, constitute centers of interest due to their potential and the facilities provided for a more rapid development.

Basically, these areas are included in the POLAMAZONIA*, located on or near to connective highway networks, which are undergoing intensive colonization.

This approach attempts to avoid scattering of activities over areas which are unrepresentative of the region and direct research toward meeting the demand for information which undoubtedly will be required during the process of exploitation or occupation.

The Center's research activities are carried out in CPATU's own facilities (Belém, Tracuateua, Marajó, Baixo Amazonas) and in conjunction with other EMBRAPA units (National Center of Rubber Research, State Research Units of Altamira, Manaus, Porto Velho, and Rio Branco) in addition to Cooperative efforts with other organizations and producers.

RESEARCH PROGRAM

The Center is developing a dynamic and flexible program whose final objetive is to generate technology for the formulation of agricultural production systems appropriate for the Humid Tropics. Initial efforts are being made with the idea of producing results over a short period of time, guided by practical considerations, in order to provide the support required by development programs in progress or to be initiated through the POLAMAZONIA program or through other special programs of an official or private nature.

* Programa de Polos Agropecuárias e Agrominerais da Amazonia.

HIGH PRIORITY PRODUCTS:

Initially, greater emphasis was given to products which have proved to be more important in the regional agricultural production, or to those with prospects of contributing, within a short period of time, to an improved performance of the sector, given the favorable ecological conditions of extensive areas and the potential of domestic and foreign markets.

For the flood plain areas, high priority was given to research on jute, rice, and beef and dairy water buffaloes.

In the upland areas, products with better prospects are cacao, African oil palm, black pepper, guaraná, rubber and Brazil nuts among the perennial crops, and malva (a fiber plant) upland rice, cowpea, cassava and corn as short-cycle crops.

As for livestock production in the upland areas, special emphasis was given to research on beef and dairy cattle, involving aspects of animal management and livestock improvement, through breeding, in conjunction with the aggressive Pasture Improvement Program in the Brazilian Amazon Region (PROPASTO), being carried out by CPATU.

The program, in its initial phase, consists of three projects:

INVENTORY OF NATURAL AND SOCIO-ECONOMIC RESOURCES

This project is an attempt to discover, delineate and evaluate natural and socio-economic resources of the humid tropical region for their best utilization in agricultural activities.

Based on available and current knowledge on soils, vegetation, climate, water resources, occurance of minerals used in agriculture, species of native forage crops, rural structures, input market, etc., maps will be prepared to help

define priority areas for the implementation of research oriented to the best use of resources and to development of production systems.

The outcome of this work will make it possible to bring together data on various levels which will permit the definition of different ecological systems, besides pointing out, in varying degrees, factors which limit agricultural activities.

Once these areas have been selected and a more detailed evaluation made, the priority aspects to be researched will be defined with the objetive of identifying ecosystems representative of the great amazonian geosystem.

In a later phase, information will be obtained for each ecosystem and as a result, production systems compatible with their potential, as well as with maintenance of ecological equilibrium, will be defined.

Component sub-project are listed in Annex I.

UTILIZATION OF NATURAL AND SOCIO-ECONOMIC RESOURCES

This project is designed to generate technology to overcome or reduce factors limiting the best utilization of natural and socio-economic resources. Basically, the limiting factors are: low natural fertility and high levels of acidity in most soils; periods of heavy rainfall or of prolonged drought in some areas; environmental conditions favoring the incidence and dissemination of pests and diseases of crops, etc.

The research undertaken through this project seeks to provide the necessary tools for the maintenance of the balance of nature, either of the soil-climate-plant and or soil-climate-plant-animal ecosystems associated with the dynamics of utilization of these resources. In the particular case of the amazon region, this research takes on a fundamental importance for profitable and permanent utilization of the resources

in traditional agricultural areas and in those where the productive process will be incorporated through expansion of agricultural frontiers.

Component sub-projects are listed in Annex I.

PRODUCTION SYSTEMS

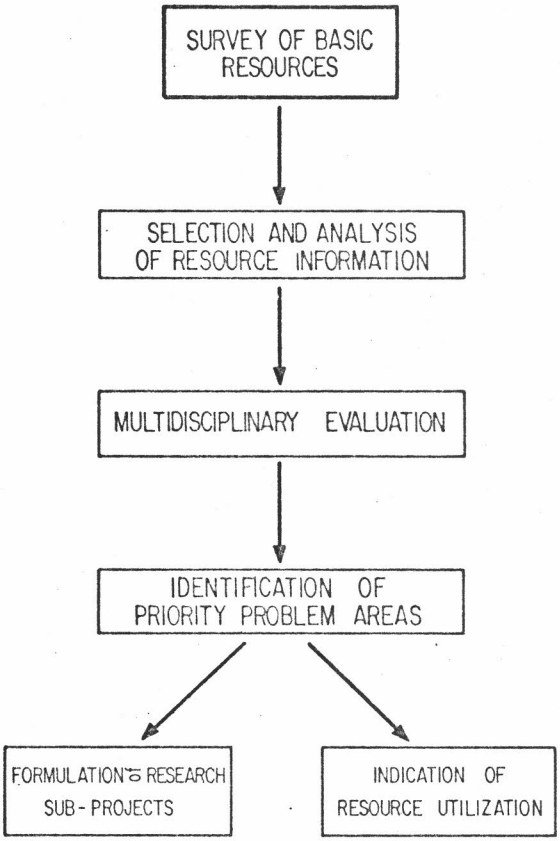
This project aims to implement new production systems by product or by agricultural production systems, and to improve those already existing in the various natural ecosystems of the humid tropical region of Brazil.

Its strategy involves the development of systems of production designed to obtain high and profitable yields of agricultural products and, at the same time satisfactorily maintain the balance of the regional ecosystem.

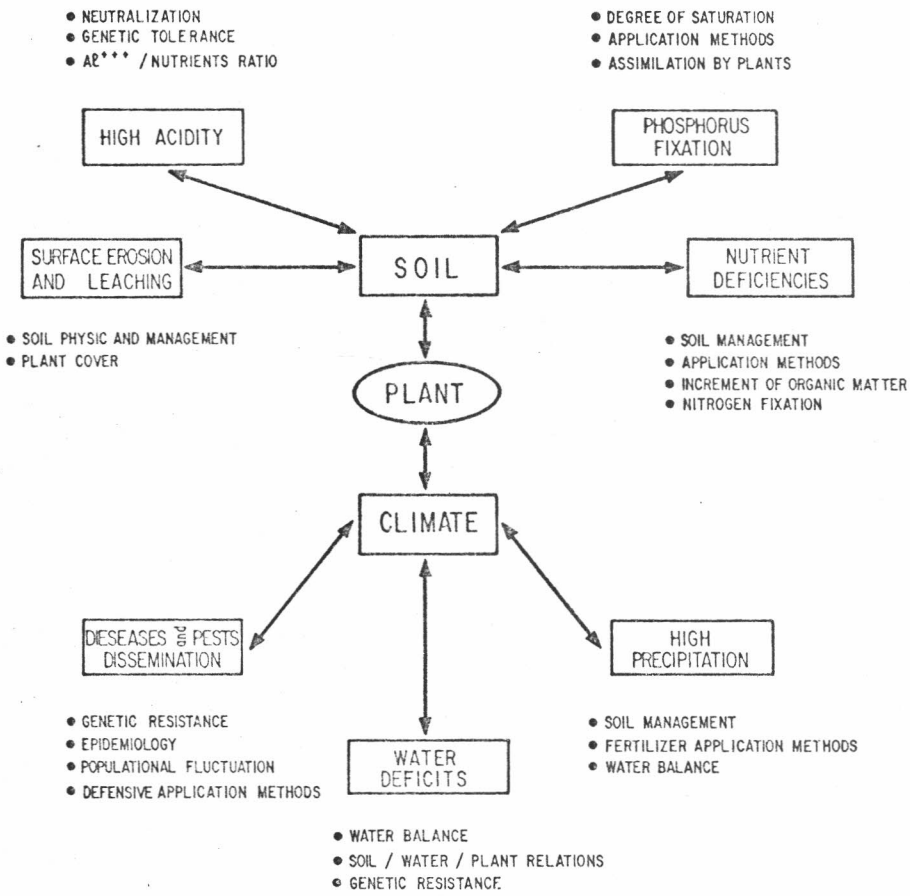
Research carried out in the short run is intended to establish systems of production whose function is to aid in development programs in the humid tropical region (POLAMAZONIA and other special programs). Preliminarily, production systems will be formulated based on technology being used by producers, complemented by available knowledge generated by research. The starting point is an inventory of production systems in use in the region. Familiarization with these systems will help to direct CPATU'S research program in giving greater emphasis to the problems which hinder production and which, at the same time serve as basis for research to develop ideal systems of production.

Component sub-projects are listed in Annex I.

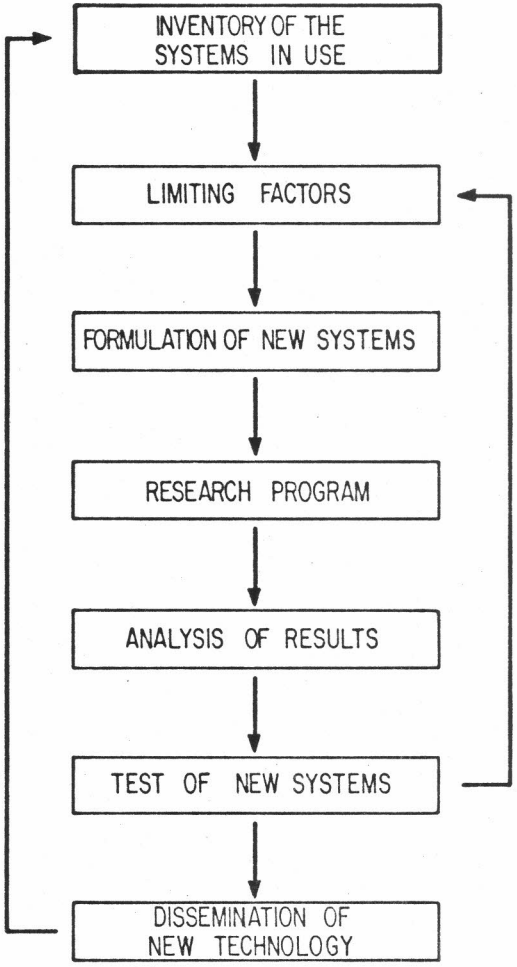
INVENTORY PROJECT
(generalized flow chart)



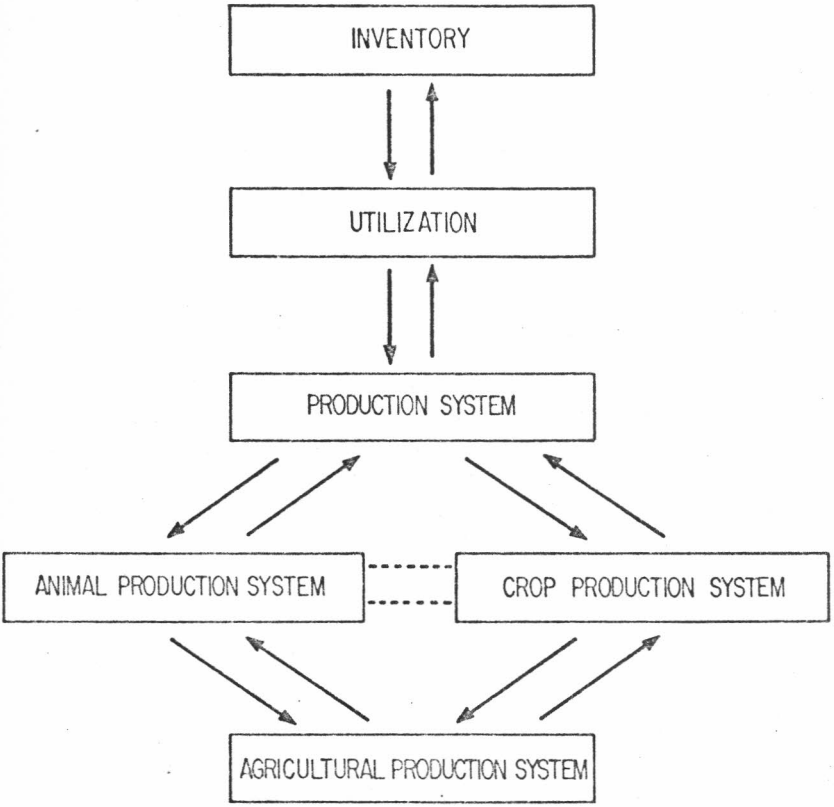
UTILIZATION PROJECT
(action flow chart)



PRODUCTION SYSTEMS PROJECT
(action flow chart)



DYNAMICS OF THE PROJECTS



EXECUTORS

The CPATU research program is carried out by local multidisciplinary research teams in accordance with National Research Centers for agricultural products from other parts of the country, and with organizations of research or technical assistance unrelated to EMBRAPA.

CPATU currently has 56 researchers assigned to teams in the three projects. They are listed in Annex II.

This number will be increased to 60 for the year 1977, in addition to 6 Japanese specialists who will be added to the teams through the agreement on scientific cooperation which EMBRAPA/CPATU maintains with the Japanese government. A cooperative program with the German government and with the Cornell University, U.S.A. is in the planning stages.

COORDINATION AND SUPERVISION

The coordination and supervision of research work is carried out by the Head of the Technical Advisory Committee and by the Project Coordinators.

RESOURCES

To carry out its research programs, CPATU depends on EMBRAPA'S own resources and on special programs such as POLAMAZONIA, BASA*, and SUDAM**.

For the 1977 fiscal year CPATU'S budget is CR$ 39,000,000.00 (thirty-nine million cruzeiros).

* Banco da Amazônia Sociedade Anônima.

** Superintendência de Desenvolvimento da Amazônia.

ANNEX I - LIST OF RESEARCH PROJECTS AND SUB-PROJECTS

1. INVENTORY OF NATURAL AND SOCIO-ECONOMIC RESOURCES

_____ SUB-PROJECTS

_____ Agricultural zoning of the humid tropics of Brazil

_____ Socio-economic research related to products and factors of production in the Amazon Region.

_____ Taxonomic and ecological study of the flora of the Amazon Region.

_____ Studies on anatomy and durability of Amazon timbers.

_____ Survey, identification and population fluctuation of insects pest of rice, corn, beans, cassava, malva and guaraná in areas of the humid tropics.

_____ Survey, identification and pathogenicity of fungi and bacteria affecting jute, malva, African oil palm, and guaraná.

_____ Survey, identification and population fluctuation of jute pests in the Country of Alenquer.

2. UTILIZATION OF NATURAL AND SOCIO-ECONOMIC RESOURCES

_____ SUB-PROJECTS

_____ Agamic propagation of guaraná.

_____ National corn trials.

_____ Prospecting study of native populations of Elaeis melanococca.

_____ African oil palm germplasma bank.

_____ Genetic improvement of malva (Urena lobata L.) in the Amazon Region.

_____ Introduction and selection of paddy rice cultivars.

_____ Selection of black pepper (Piper nigrum L.) cultivars.

_____ Guaraná germplasma bank.

_____ Tests of resistance of forage grasses to "cigarrinha" (spittle bug) (Deois imcompleta) in the Amazon Region.

_____ Study of the decline of cassava yields due to reduction of leaf area index.

_____ Epidemiology and control of anthracnose in guaraná

_____ Physiology and chemical control of Fusarium solani f. piperi, the agent of " drying off " disease of branches of the black pepper plant.

_____ Release of nutrients of various fertilizers under different soil and climate conditions in the Amazon Region.

_____ The behaviour of vigna bean cultivars under climate and soil conditions of the Amazon Region and NPK fertilization.

_____ Response of black pepper to various levels of NPK fertilization.

_____ Bioclimatology of the malva plant.

_____ Bioclimatology of corn.

_____ Survey, pathogenicity and control of nematodes associated with crops of economic interest in the Amazon Region.

_____ Study of factors influencing the quality of guaraná seeds.

_____ Study of germination of Brazil nuts (Bertholletia excelsa H.B.V.).

_____ Productivity of the African oil palm ecosystem and alterations in the properties of the soil.

_____ Study of the ecosystem of the Biological Reserve of Mocambo (CPATU reserve) (soil-vegetation correlation).

_____ Study of the root system of the guaraná plant.

_____ Bromatological study of regional fruit crops and preliminary studies of their industrial utilization.

_____ Utilization of latifoliate species of the humid tropical forest and of jute crop residues as raw material for obtaining cellulose for paper.

_____ Methods of identification of water buffaloes.

_____ Weed control in floodable pasture land.

_____ Introduction and evaluation of forage plants in floodable land areas.

_____ Development of parasitological research on water buffaloes in the State of Pará.

_____ Breeding of mays for different technology levels in the amazon region.

_____ Breeding of jute (C.Capsularis) in the amazon region.

_____ Evaluation of CPATU'S germplasm bank of cassava.

3. PRODUCTION SYSTEMS

_____ SUB-PROJECTS

_____ Behaviour of different production systems of two-crop interplantings of perennial plants.

_____ Productivity of Amazon soils and ecological changes under different management systems.

_____ Evaluation of different multiple production systems with short-cycle crops for the Brazilian Humid Tropics.

_____ Screening of different multiple cropping systems with subsistence crops appropriate to the various ecological conditions of the Amazon Region.

_____ Production systems of Cacao grown under rubber-tree shade in structured red soil.

_____ Evaluation of different rice cropping systems for the flood plains of the Caeté River.

_____ Development of cropping systems of malva at different technological levels.

_____ Experimental cropping systems for cassava.

_____ Intercropping of Brazil nuts with crops of economic importance.

_____ Study of cowpea production (Vigna sinensis L.), interplanted with different crops.

_____ Interplanting of black pepper with crops having nematocide action.

_____ Productive performance of dairy water buffaloes.

_____ Cow-calf productive performance of bovine and water buffalo beef cattle on native grasslands.

_____ Supplementary feeding of water buffalo beef cattle during the flood period of the Amazon River.

_____ Supplementary feeding of yearling beef cattle, in pastures utilizing bone meal and dicalcium phosphate.

_____ Evaluation of methods for utilization of water buffaloes as draft animals.

_____ Productive performance and preservation of water buffaloes of the Carabao breed and of the Baio type.

_____ Fattening of bovines and water buffaloes on pastures.

_____ Production of breeding stock of dairy water buffaloes.

_____ Economic analysis of new techniques of production developed by CPATU.

ANNEX II - LIST OF CPATU RESEARCHERS

P R O J E C T

INVENTORY OF NATURAL RESOURCES

NUMERICAL ORDER	N A M E	FIELD OF SPECIALIZATION	DEGREE
01	Alfredo Kingo Oyama Homma	Economics	M.S.
02	Benedito Nelson Rodrigues da Silva (Coordinator)	Soil-Photointerpretation	M.S.
03	Irenice Alves Rodrigues	Botany-Taxonomy	M.S.
04	Mário Dantas	Ecology	M.S.
05	Cesar Barreira	Sociology	M.S.

ANNEX II (Continued)

P R O J E C T

UTILIZATION OF NATURAL RESOURCES

NUMERICAL ORDER	N A M E	FIELD OF SPECIALIZATION	DEGREE
01	Antonio de Brito Silva	Entomology	Ph.D.
02	Célio Francisco Marques de Melo	Wood Technology	B.S.
03	Emmanuel de Souza Cruz	Soil Fertility	M.S.
04	Francisco das Chagas Oliveira Freire	Plant Pathology	M.S.
05	Gladys Ferreira de Souza	Soil Fertility	M.S.
06	Geraldo Gonçalves dos Reis	Plant Physiology	M.S.
07	Ítalo Cláudio Falesi	Soil - Pedology	B.S.
08	Maria de Lourdes Reis Duarte	Plant Pathology	M.S.
09	Marcio de Assis	Plant Pathology	M.S.
10	Yasuo Kitagawa	Clay Mineralogy	Ph.D.
11	Regina Freire Moller	Soil - Chemistry	B.S.
12	Francisco José Câmara Figueiredo	Seed Technology	M.S.
13	José Maria Gusmão Ferraz	Soil Microbiology	M.S.
14	Raimundo Freire Oliveira	Soil Fertility	M.S.
15	José Ernesto Souto Bezerra	Soil Management and Conservation	M.S.
16	Raimunda Fátima Ribeiro Nazaré	Food Technology	M.S.
17	José Edmar Urano de Carvalho	Seed Technology	M.S.
18	Fernando Carneiro de Albuquerque	Plant Pathology	M.S.
19	Raimundo Evandro B. Mascarenhas	Agricultural Engineering	B.S.

ANNEX II (Continued)

P R O J E C T

PLANT PRODUCTION SYSTEM

NUMERICAL ORDER	N A M E	FIELD OF SPECIALIZATION	DEGREE
01	Dilson Augusto Capucho Frazão	Field Crops	M.S.
02	Eloisa Maria Ramos Cardoso	Field Crops	B.S.
03	Emeleocipio Botelho de Andrade (Coordinator)	Plant Breeding	M.S.
04	Filadelfo Tavares de Sá	Communication (Technology Transfer)	B.S.
05	Luis Alberto Freitas Pereira	Field Crops	B.S.
06	Milton Albuquerque	Field Crops	B.S.
07	Milton Guilherme da Costa Mota	Plant Breeding	M.S.
08	Raimundo Parente de Oliveira	Statistics	M.S.
09	José Francisco de Assis F. da Silva	Field Crops	B.S.
10	Antonio Agostinho Müller	Field Crops	B.S.
11	Nina Rosária Maradei Müller	Field Crops	B.S.
12	Aristóteles Fernando F. de Oliveira	Field Crops	B.S.
13	Areolino Matos	Field Crops	M.S.
14	Antonio Rioyei Higa	Forestry	M.S.
15	Armando Kouzo Kato	Field Crops	M.S.
16	Ingrid Peter	Plant Breeding	M.S.
17	David Michael O'Grady	Irrigation	B.S.
18	Jefferson Felipe da Silva	Field Crops	B.S.

P R O J E C T

ANIMAL PRODUCTION SYSTEM

NUMERICAL ORDER	N A M E	FIELD OF SPECIALIZATION	DEGREE
01	Ari Pinheiro Camarão	Forage Crops and Pastures	B.S.
02	Antonio Roberto Ferreira da Silva	Forage Crops and Pastures	B.S.
03	Cristo Nazaré Barbosa do Nascimento (Coordinator)	Animal Husbandry	M.S.
04	Ermenson Peçanha Salimos	Animal Husbandry	B.S.
05	Ernesto Dias Moreira	Animal Husbandry	B.S.
06	Emanuel Adilson de Souza Serrão	Forage Crops and Pastures	Ph.D.
07	Guilherme Pantoja Calandrini de Azevedo	Forage Crops and Pastures	B.S.
08	Cacilda Borges do Valle	Animal Physiology	Ph.D.
09	Jonas Bastos da Veiga (Coordinator of PROPASTO)	Animal Nutrition	M.S.
10	José Ferreira Teixeira Neto	Forage Crops and Pastures	M.S.
11	Ezequiel Borges do Valle	Animal Management	Ph.D.
12	Luiz Octávio Danin de Moura Carvalho	Animal Husbandry	B.S.
13	Raimundo Nonato Guimarães Teixeira	Forage Crops and Pastures	B.S.
14	José Roberto Lourenço Junior	Animal Management	M.S.