I. PROJECT TITLE

FOOD CROP PRODUCTION
Research and Development of Food Cropping Systems for Small Farmers in the CARICOM Commonwealth Caribbean Region

3. RECIPIENT (Project Title)

Caribbean Agricultural Research Development Institute (CARDI)

II. FUNDING ($000) AND MAN MONTHS (MM) REQUIREMENTS

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IV. PROJECT AUTHORIZATION

1. CONDITIONS OF APPROVAL

That prior to the disbursement of A.I.D. grant funds:

a) CARDI agrees to assume 100% of project capital acquisition and operating costs of the Documentation and Technical Information Center.

b) An agreement will be executed between CARDI and the University of the West Indies (UWI) formalizing the cooperative working arrangements between CARDI and UWI Faculty of Agriculture.

c) Working agreements will be executed between CARDI and cooperating host governments.

2. CLEARANCE

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3. APPROVAL

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4. APPROVAL AID (See M.O. 2021.1 V)
A. INTRODUCTION/BACKGROUND

High and rising unemployment is perhaps the most serious socio-economic problem facing the CARICOM States of the Commonwealth Caribbean region. Closely inter-related with the alienation of the younger generation from an agricultural system based on historical colonial patterns and the migration of these youths to overcrowded urban areas, the high level of unemployment is the major factor contributing to poverty and skewed income distribution resulting in rising crime rates and urban unrest.

Also, the industrial and tourism sectors and the wage structure associated therewith have tended to lure the younger generation away from agriculture pursuits. Consistent with these trends, there has been steady decline in agricultural productivity and production and in recent years the CARICOM region has switched from an agricultural surplus to a deficit area currently importing over $500 million of food products per year.

More recently, the leaders of the Region have increasingly become aware that the agricultural sector and rural development must be given priority if unemployment rates are not to grow to even higher levels and the strains on the society to become intolerable. In several of the states of the Region, the ultimate viability of the economies could well depend on the revitalization of their agricultural sectors. In spite of efforts to stimulate and diversify agricultural production, the sector has not shown any significant response. While the demand for foodstuffs increases with the steady rise in population, food crop production for local consumption has declined and the food deficit continues to grow.

Largely because of the emphasis that historically has been given to the traditional export crops, the agricultural sectors within the CARICOM territories have not been able to provide for their own national food needs. Those that might be expected to provide for the local or regional markets lack the necessary expertise and incentives for the successful cultivation of selected food crops that can be grown well within the Region. A major portion of the Region's food import costs could be avoided if policies, financial resources, technology, manpower, and motivation regarding agriculture were modified to promote more effective utilization of existing resources. All food requirements, with the exception of wheat, could be produced in the Region.
The small peasant farmers that produce the bulk of foodstuffs for local consumption in the Region can be generally characterized by the following major constraints:

a) lack of adequate farm technology or scientific know-how;

b) low productivity levels;

c) inadequate extension and other supporting services;

d) poor pricing structure and marketing mechanisms.

There is an urgent need to address small farming enterprise problems and to find means to increase the incomes of the small farmer.

Individually most of the CARICOM states, particularly the LDCs, do not have the trained manpower, resources, or institutions to meaningfully address their fundamental agricultural development problems, including those of the small farmer food producers. This project will attempt to provide a regional "common service," with particular emphasis initially on the LDC's, for research and extension, demonstration and training.

B. RATIONALE

Agricultural research for the Region has been carried out primarily at St. Augustine, Trinidad, since the Imperial College of Tropical Agriculture was inaugurated in 1922. In 1962, the Regional Research Center (RRC) was established on the St. Augustine campus of the University of the West Indies (UWI) as an integral part of the UWI Faculty of Agriculture. The institutional growth and evolution that has taken place to date resulted in the RRC/UWI complex and facility which represents perhaps the world's best concentration of professional talent, experience, skill, knowledge and printed information on the general subject of tropical agriculture.

In spite of this resource, agricultural research in the Region and in each of the countries has fallen far short of meeting urgent agricultural development and production needs. The applied research necessary to fully utilize technology that is well known in the developed countries, has either not been accomplished or applied.

In July, 1972, the Heads of Government of the Caribbean Community reached a decision to have an examination of the entire question of regional agricultural research with special reference to the role and operations of the Regional Research Center (RRC).
Mission under the Chairmanship of Dr. Louis Campbell, Chief of the Agricultural Division of the Caribbean Development Bank, and including Chief Technical Officers for Agriculture from six Commonwealth Caribbean countries undertook this study. This Mission concluded that the region was failing to make the technological advances necessary to keep its agriculture in business. It was convinced that this failure was the result of inadequacies of the service sectors to agriculture, high among the list being research and technology developments in production, processing, and marketing. The geographical, physical, social, and economic facts of the region make it practically impossible for the territories independently to economically meet their research and technology needs in agriculture. The problems could be solved only if attacked by a regional approach. The Mission recommended a substantially restructured regional organization which would conduct research on the more urgent economic problems and carry results to the practical application stage. The proposed restructured Institute should be separated financially and administratively from the University of the West Indies and become an affiliate institute of the University, continuing to use facilities at the University of the West Indies and continuing close collaboration with the UWI Faculty of Agriculture. The Mission also recommended the establishment of an extension service connected with the restructured Center to assure that the results of the research was carried forward to the recipient countries.

In 1973, an AID contract consultant participated with an IBRD team which was undertaking a regional study of the Commonwealth Caribbean. The consultant's report for the IBRD endorsed the recommendations of the Mission headed by Dr. Campbell that the Research Institute should be separated from the University of the West Indies Faculty of Agriculture in order to make the research more relevant to the needs of the area and less academic in nature. Recommendations were also made for strengthening liaison with the international agricultural research institutes operating in the tropics and sub-tropics, for maintaining a corps of field trial officers and for strengthening the extension capability in the area.

In July, 1974, the Heads of Government of the Caribbean Community approved the establishment of the Caribbean Agricultural Research and Development Institute (CARDI) which would be open to the states and territories of the region and be governed by a Committee of Ministers of Agriculture. The Institute would have a Board of Directors drawn from persons having extensive agricultural experience and representing all the countries of the area, the CARICOM Secretariat, the University of the West Indies, and the Caribbean Development Bank. The Institute is to be formally established in June, 1975, at which time an
Executive Director will have been nominated. CARDI's creation is a result of an awareness on the part of member states of the need for increased emphasis on agricultural production problems and their resolution. The focus of CARDI as a new institution will be on problem-solving and development, involving inter-disciplinary approaches to deal with all constraints. Research programs will be administered so as to attack primary production and marketing problems by means of inter-disciplinary teams of specialists. Efforts will also be made in coordinating research which is applicable to problem-solving in agriculture (soil classification and mapping, pest control, etc.) to provide the comprehensive attack needed to make appreciable progress. CARDI will be administratively and financially separated from the UWI; close affiliation will continue, with CARDI occupying facilities and using technical staff of UWI on a cooperative cost sharing basis, thus effecting considerable economies by avoiding duplication.

As a new institution, CARDI needs additional financial support to conduct specific research and outreach development activities in the food crop sector. The MDC (Trinidad, Barbados, Jamaica, and Guyana) member countries carry the major financial burden of CARDI (about 75 percent). The LDC members or affiliated states are not able to do more because of severe national budget limitations. CARDI will therefore have to draw heavily on external assistance for development-oriented research and outreach activities if it is to carry out its new mandate. It is anticipated that the British and the Canadians, as well as some of the international foundations, will consider support for specific research projects. AID's project assistance grant will focus on addressing constraints regarding the lack of technical information on food crops and the delivery of this information through Ministries of Agriculture to the small farmer in a form to motivate its use for increasing food crops production in the region.

The project complies with AID policy in attempting to assist small farmers in improving production, productivity, income and income distribution, nutrition, and standard of living. Such assistance is consistent with AID's policy of providing support through regional development institutions in the Caribbean and would enable a "common service" approach for research/extension activities that cannot be economically undertaken on an individual country basis. CARDI will service some fourteen countries and territories of the Commonwealth Caribbean.
C. **SECTOR GOAL**

The overall sector goal is to increase the incomes of small farmers and decrease food imports into the CARICOM Commonwealth Region. A sub-goal is to increase small farmer production and productivity, especially of basic food crops.

D. **PURPOSE AND RELATION TO SECTOR GOAL**

The specific purpose of this project is to assist the Caribbean Agricultural Research and Development Institute (CARDI) in establishing an outreach program of applied research, demonstration/extension, and training in order to develop and promote a selected number of small farmer food cropping systems. Initially, three of the LDC CARICOM countries will be selected to participate fully as pilot demonstration sites for the project. The project will strengthen CARDI's capability to address problems of the small farmers' food crop production systems through:

1) The identification of problems and design, implementation and evaluation of research projects, and development of applied agronomic technology.

2) The transmission of research information to technicians and small farmer producers of food crops.

3) The development and conduct of programs to train technicians and lay persons in improved technology.

4) The design and implementation of crop production programs, initially in three pilot LDC CARICOM member states.

5) The functioning as an outreach mechanism of the UWI Faculty of Agriculture serving Ministries of Agriculture and other entities of the CARICOM region in agricultural research, extension, and training.

E. **COURSE OF ACTION**

**Identification of CARDI Programs**

Research, extension, and promotional programs should be selected on the basis of prefeasibility studies on proposals.
prepared by CARDI staff or the participating Ministries of Agriculture or other entities describing:

1) Identification of problems to be addressed.

2) Description of current status.

3) Approach and methodology to be used in carrying out programs.

4) Resource requirements and availabilities necessary to carry out the program; i.e., personnel, commodities, and other costs.

5) Implementation schedule anticipated.

6) Benefits and beneficiaries.

AID grant funding provided to CARDI will be used for the establishment of three operational/demonstration centers in three pilot territories. (Belize, St. Kitts, and St. Lucia have been selected for the first three pilot sites. CARDI expects to eventually establish additional centers in other CARICOM territories.) for conducting adaptive research and related promotional/extension/training activities in selected food crops. Funds will be used for commodities, staff salaries, and operation costs, of these centers. CARDI funds will be used to support all costs of a Documentation/Information Center on the St. Augustine campus of the UWI.

The CARDI Board of Directors will determine the specific food crop production problems to be addressed by the Operation Centers based on proposals submitted by the Ministries of Agriculture or other cooperating entities and pre-feasibility studies to be carried out by or with the assistance of the CARDI staff. The pre-feasibility studies and/or proposals will be examined against the following criteria:

1) The proposed activities address constraints relating to small farmer food crop production systems.

2) A reasonable prospect exists that the increased food crop production by the small farmer will be profitable, taking into account effective demand and projected price and production levels.
3) A reasonable prospect exists that necessary inputs and supplies will be available to permit utilization of improved technology by the small farmer.

4) Adequate marketing infrastructure will exist.

5) Proposals are otherwise technically, economically, and socially sound.

The principal activity of the Operation/Demonstration Centers will be research for development of technical recommendations for production and marketing of important food commodities including tomatoes, carrots, peanuts, potatoes, onions, pigeon peas, and others as appropriate. Research also will include work in handling, packaging, storage, seed multiplication, and plant material propagation. Variety testing will be conducted throughout the wet and dry seasons to observe seasonal effects upon varietal response to yield, quality, incidence of diseases, and insects. The agronomic aspects, such as time of planting, spacing, plant population density, fertilizer response, water management, weed control, disease control, and insect control will be developed.

Economic analysis and feasibility of the technical production and marketing practices will be made to assure that recommendations resulting from the research are adequately dramatic or clearly profitable to the farmer.

Upon development or perfection of technical recommendations, educational, and promotional activities of many types will be conducted and technical assistance will be provided to farmers. Farmers will be called together for meetings, training courses, and field days to make them aware of the potential for utilization of improved technology. Farmers will be organized into formal and informal groups for determining their needs for technical assistance, inputs, and willingness to participate in special efforts to increase food crop production. Commodity production programs of a limited number of crops most appropriate to production and marketing needs will be promoted in coordination with local and regional production goals to be established by the Agricultural Marketing Protocol (AMP) and the Guaranteed Marketing Scheme operated by CARICOM.
A Documentation/Information Center will be established at the St. Augustine campus of the University of the West Indies to serve as the epicenter for extension activities of many types to serve Ministries of Agriculture and the rural sectors in the Region. The various functions to be performed by the Documentation/Information Center are to:

1. Compile known information on improved technology, economics, resource base, and other factors affecting development of the CARICOM countries.

2. Make known this information to Ministries of Agriculture through newsletters, commodity reports, and other media.

3. Prepare technical information resulting from past and current research in a form usable by farmers, consumers, and agricultural technicians (including posters, bulletins, leaflets, pamphlets, radio and press releases, video tape documentaries, etc.).

4. Duplicate this information in adequate quantities to serve the entire CARICOM Region.

5. Distribute this information to Ministries of Agriculture for use by farmers, marketing boards, technicians, consumers, agro-industry, etc.

6. Serve as a clearing house for new research information resulting from programs of the Operation Centers and other sources.

7. Conduct public relations campaigns to gain public and private support of CARDI/Ministry of Agriculture/UWI cooperative programs in agriculture and rural development.

8. As capabilities and resources allow, engage in other development activities such as gathering, analyzing, preparing, and distributing general information relating to agricultural and rural development, initiating radio news services on prices and availabilities of food crop commodities, compilation and analysis of statistical data on agricultural production, farmer characteristics, etc., by country and other activities to be determined.
Rationale for Project Site Selection

Three LDC CARICOM states have been tentatively identified as the most appropriate sites for the initial project Operation/Demonstration Centers. While final selection of pilot site countries is contingent upon approval by the CARDI Board of Directors (meeting anticipated in June 1975), the CARDI Executive Director-designate, Dr. R. Pierre, is of the opinion that the selection of St. Lucia, Belize, and St. Kitts will be approved and that the governments of these states will be fully committed to cooperating with the program. Dr. Pierre also expects to obtain Board approval and agreement/commitments from the three participating governments prior to any disbursement of AID funds.

St. Kitts: Major changes have occurred in recent months through the government's actions in taking over all large sugar estates and forming a government sugar corporation. The Government of St. Kitts plans to diversify its activities in agriculture to include other crops such as vegetables, involving small farmer operations. The time appears appropriate to provide research and other development assistance through CARDI to guide such modifications in the agriculture sector.

Prior to the takeover by Government only 20% of the total 50,000 acres in farms in St. Kitts was held by farmers whose holdings were less than 25 acres. This percentage is expected to increase significantly as diversification plans become effective. The physical potential for agricultural development in St. Kitts is high. Soils are fertile, the rainfall pattern is good, and extensive resources of ground water are evident. The Ministry of Agriculture in St. Kitts is becoming aware of the need for more emphasis in agricultural development and has a limited, but good, staff of extension personnel and agricultural officers. There is a need to strengthen the technical capabilities of this staff and to begin a program of research and development in diversified crops. The assistance to be provided by the CARDI project would be welcomed by the Government.

Belize: Statistics on the land holdings of farmers in Belize are not available, except data of a very general nature. Belize has the next highest land/population ratio in the CARICOM Region after Guyana. Belize has a total land area of 5,258,000 acres and a population of 119,600 (1970 data) giving approximately an average availability of
43.9 acres per family. Much of the agriculture in Belize is of the shifting slash and burn type with farmers continually opening up new land for cultivation of corn and red beans, principally. There is no existing population pressure on the land. The agricultural pattern that has developed requires modification to avoid long-range problems of destruction of renewable natural resources such as forests, soils, water, and fisheries.

There is a high potential for increasing agriculture in Belize. The level of migration from Jamaica and other Caribbean states is increasing. The need for employing more advanced technology in food production is evident. The potential exists for both intensive and extensive types of agricultural development.

The current export crops are citrus and sugar. There are approximately 630,000 acres of sugar cane and some 40,000 acres in other crops. Estimates indicate that there are approximately 1,000 small cane growers. There are also approximately 3,000 small leasehold farmers who occupy their land under contract for which they pay an annual token fee to the Government. In addition, the Government has initiated a land scale program for small farmers that provide land at low prices ($15-$30/acre) with an extended payment period. These farmers will most likely convert to more intensive and permanent type operations involving bananas, vegetables, rice, livestock, and fruits.

The initiation of a CARDI research and agricultural development program in Belize is needed and desired by the Government. It currently has an agricultural staff of 15 adequately trained people (vocational or college level), some of whom would be involved in the CARDI program. The CARDI program could do much to help Belize to meet some of the food requirements of the CARICOM Region.

St. Lucia: Agriculture in St. Lucia is characterized by numerous small holdings, each under a multi-ownership land tenure pattern. Of the total of 87,375 acres of agricultural land, approximately 40% of the holdings are less than 25 acres in size. Of the total, approximately 16% of them are from one to five acres in size. Most of the small farmers are of the subsistence group who market only a
limited quantity of produce in the principal urban center, Castries. Bananas, mangos, root crops, fruits, and vegetables comprise the principal food commodities. However, the level of technology is very low resulting in low production, low incomes, and low standards of living for the rural poor.

There is a definite need to initiate improved food production and marketing technology in the island to meet internal consumption requirements. The Ministry of Agriculture is staffed with a limited number of agricultural officers (four or five) trained at the vocational or college degree level who need assistance in serving the needs of the small farmer. The Government of St. Lucia would welcome assistance from CARDI to initiate a program in applied research and development of food crops production.

APPENDIX II contains general background information on St. Kitts, Belize, and St. Lucia.

F. IMPLEMENTATION SCHEDULE

The life of the project will be for a three-year period. It is proposed to implement the project beginning on or about July 1, 1975. During the first year of the project a detailed plan of work for each of the three Operation Centers will be developed, commodities will be procured, the Operation Centers will be established, activities of the Documentation/Information Center in St. Augustine will begin in existing facilities, and new personnel will be appointed to assume project responsibilities. Operating agreement with the project site governments and working procedures of CARDI and UWI will be developed prior to disbursement of AID Grant funds and prior to implementation of the project. (Copies to be provided to A.I.D.). Research and development activities of the project (in Operation Centers) will begin in the second year and continue through the third year to the end of the project (June 30, 1978). APPENDIX III shows the relationships and sequence of major actions in implementing the project. APPENDIX IV indicates details of a proposed work plan for first through third year of establishment and operation of activities at the pilot Operation/Demonstration Centers.

G. CONTRIBUTIONS/FINANCIAL PLAN

1. CARDI - Cash counterpart contributions of CARDI for the specific activities described in this project paper are summarized in APPENDIX V. A total of U.S. $214,400 will be provided over a three-year period to cover all costs of the
Additional contributions of CARDI and the UWI Faculty of Agriculture will be services of 26 CARDI professional staff (See APPENDIX VI) and 32 Faculty of Agriculture staff who will participate as members of the multi-disciplinary teams to guide and assist in research, extension, and training activities of the project. The costs corresponding to these services have not been specifically identified, but are included in the annual budget of CARDI (to be approved in June 1975) and the recurrent budget of the Faculty of Agriculture of the UWI for the 1976/1978 triennium which is expected to be approved in 1975.

2. A.I.D. - Grant funds will be provided to cover the costs of establishment and operation of the three pilot Operation/Demonstration Centers in Belize, St. Kitts, and St. Lucia. APPENDIX V identifies specific expenditures by functional categories. A total of $432,720 has been identified as AID's contribution over the three-year life of the project. Additionally, AID will provide the "no cost" services of an AID/Washington technical project adviser to assist in program design and evaluation, as appropriate and requested. Other AID technical expertise may be available to provide ad hoc guidance when requested. AID will also assist, to the extent possible and when requested, in strengthening CARDI linkages with other major regional and international research institutions.

3. Cooperating Host Governments - Contributions of project cooperating governments (Belize, St. Kitts, and St. Lucia) will be both in-kind contributions of land for Operation Centers, irrigation water, utilities, etc., and cash represented in the form of personnel assigned to project activities. These specific contributions will be identified in CARDI/Cooperating Government Working Agreements.

H. SPECIAL CONDITIONS, COVENANTS, AND PROVISIONS

Approval of this project will be provided in accordance with the following guidelines and preconditions:

1. Work Plan

Prior to disbursement of A.I.D. funds CARDI will provide for A.I.D. concurrence a detailed Work Plan for project operations. The Work Plan should demonstrate that it was developed and applied against the criteria outlined
in Section E, COURSE OF ACTION.

2. Project Management/Monitoring

Administrative, financial, and technical management of the project will be the responsibility of several entities. The Board of Directors of CARDI is responsible for administering all CARDI project activities and redelegates this authority to the Executive Director. Internal administrative, financial, and technical management will be conducted by the Executive Director. CARDI will be responsible for financial management of AID grant funds after disbursement, as well as its own overall budget totalling approximately $1.5 million. The CARDI "Protocol Agreement" and regulations require that the Executive Director submit annual financial reports to the Board of Directors on budgetary expenditures which will be reviewed by outside certified accountants.

Internal administrative and technical management of the project will be performed by the Executive Director of CARDI and other CARDI officials to whom authority may be delegated. The AID Project Monitor of LA/DR/RD, AID/Washington, will be responsible for monitoring the administrative and technical aspects of the project on AID's behalf. The Caribbean Regional Controller, stationed in Haiti, will have responsibility for developing mechanisms for disbursements of AID grant funds to CARDI. These disbursements will be made in a timely fashion by AID on the evidence of monthly financial reports by CARDI indicating prior monthly and planned monthly expenditures of the Operation Centers.

There will be joint AID/CARDI annual reviews in which the AID/Washington Project Monitor and other AID/Washington officers of LA/DR and LA/DP will actively participate. These review will be conducted to determine the effectiveness of the grant project in reaching the small farmer. The findings of these reviews will also serve as the basis for measuring the effectiveness of the multi-disciplinary team approach and for determining any necessary modifications in future project work plans to assure maximum outreach. Annual reports of the CARDI Executive Director to the Board of Directors will be made available to AID upon request.

3. CARDI/Cooperating CARICOM Government Working Agreements

The Executive Director of CARDI will obtain written agreements between CARDI and the cooperating governments of
Belize, St. Kitts, and St. Lucia with respect to the Operation/Demonstration Centers to be located in these countries. The agreements will describe the services and resources to be provided by CARDA and the contributions and commitments to be made by the cooperating governments. Such contributions and commitments will include (1) provision of land, existing buildings, irrigation facilities, utilities, or other in-kind contributions, (2) counterpart project personnel of Ministries of Agriculture or Marketing Boards (representing budgetary cash contributions), (3) commitments of cooperation by Marketing Boards in CARDA project territories and the establishment of fair floor prices for specific commodities that would serve as incentives to farmers, (4) commitment of Ministries of Agriculture to assume financial and operational responsibilities of the Operation Centers at the end of the three-year project life (after June 30, 1978), and (5) commitment by CARDA to provide guidance and support to pilot site governments, as required, after the three-year project life.

Disbursement of any AID grant funds would be contingent upon development of appropriate agreements as described above.

4. CARDA/UWI Working Arrangements

An additional condition to disbursement of AID grant funds will be the development and execution of documentation between CARDA and the Faculty of Agriculture of the UWI describing the cooperative working arrangements of CARDA and UWI. Such documentation is expected to be a part of the formal CARDA and UWI regulations.

Relationship Between CARDA and UWI Faculty of Agriculture

The working relationship between CARDA and the UWI Faculty of Agriculture is excellent. Formal arrangements for the sharing of human resources, physical facilities, research stations, laboratories, and farming equipment in conducting activities of each institution will be established in a UWI/CARDA Memorandum of Understanding which will become a part of the official UWI Regulations. (The Memorandum of Understanding is expected to be incorporated into the UWI Regulations by June 30, 1975.)

AID/Washington technicians have confirmed that close collaboration and integration of programs of the UWI and CRRC (now CARDA) has existed in the past and will continue in the future. The pooling of human and physical resources and close collaboration in planning and implementing training, research, and development activities provides shared benefits and savings to both CARDA and the UWI in achieving mutual objectives.
Depending upon the availability of expertise, CARDI staff will assist the UWI Faculty of Agriculture in guiding research activities of post-graduate students. In return, the UWI Faculty of Agriculture and post-graduate students will assist CARDI in agricultural research problems and development activities where appropriate. CARDI staff will occupy existing and new quarters of the Faculty of Agriculture on the UWI St. Augustine campus. CARDI will also operate its Documentation/Information Center in the Faculty of Agriculture facilities on a cooperative basis with the Department of Agricultural Extension. The Department will use these shared facilities largely for extension teaching purposes while CARDI will use them for development outreach activities.

UWI research is expected to cover a broad spectrum of technical disciplines for the resolution of generic problems. CARDI research will largely be multi-disciplinary in nature to resolve problems of the food crop production systems. Research efforts of CARDI and UWI are thus expected to be coordinated and complementary.

CARDI will serve as the outreach arm of the UWI's program in agricultural development to assure that research conducted serves practical purposes and that results of such research reaches recipients in a useful form. In summary, the cooperative program of CARDI and the UWI are complementary in nature, completely integrated and non-duplicative. This working relationship is considered to be an ideal and highly functional model.

I. ROLE OF WOMEN IN THE PROJECT

In order to fulfill the hopes and aspirations of the peoples of the Caribbean, efforts should be directed towards the optimum utilization of all available human resources. In this context, the importance of ensuring that women are afforded the opportunity to contribute fully to the economic and social development of the region has been duly recognized in developing the project with CARDI. Currently, there are three women professionals on the CARDI staff who will be involved in the project activities. Conditions of service in CARDI, as with the University of the West Indies, are non-discriminatory and women receive salaries on an equal basis with men in the same positions.
**Project Title & Number**

**Research and Development of Cropping Systems for Small Farmers in the CARICOM Region**

**Narrative Summary**

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<td>Assumptions for achieving goal targets: (A-4)</td>
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</tr>
</tbody>
</table>

**Goal:** To increase income of small farmers and to decrease food imports.

**Subgoal:** To increase small farmer production and productivity.

1. Increase number of food crops being produced in commercial quantities.
2. Decrease in volume of imports of researched crops or their substitutes.
3. Increase in number of small farmers engaged in commercial food crop production.

1. Data on sales of inputs such as seeds, fertilizer, etc.
2. Studies and statistical reports on performance of agricultural sector prepared by IBRD, CDB, UNDP, FAO, CARICOM, CARDI, and UWI.

1. That national governments will foster policies regarding prices, taxes, land tenure, agricultural credit, etc., and provide adequate budgetary resources to maximize available production capacity and utilization of technical personnel to encourage development of the rural sector.
2. That agricultural/marketing agreements under CARICOM will continue in effect as incentives (especially for the LDC CARICOM member countries) for local food crops production.
To establish a CARDI outreach program of applied research, extension and promotional activities in a selected number of food crops, that fit the small farmer production systems. These activities will be conducted in three pilot territories (LDC's) of the CARICOM Commonwealth Region through the establishment of three pilot Operation / Demonstration Centers.

<table>
<thead>
<tr>
<th>Research Indicators</th>
<th>Extension Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Each Center conducting research on no less than three food crops not previously produced in commercial amounts.</td>
<td>(a) Technical recommendations being produced by CARDI in a</td>
</tr>
<tr>
<td>(b) Based on above research, technical recommendations will be developed by CARDI, appropriate for use by small farmers.</td>
<td></td>
</tr>
<tr>
<td>(c) Research studies/recommendations will address technical, economic, and social constraints affecting small farmers.</td>
<td></td>
</tr>
</tbody>
</table>

1. Research Indicators
(a) Each Center conducting research on no less than three food crops not previously produced in commercial amounts.
(b) Based on above research, technical recommendations will be developed by CARDI, appropriate for use by small farmers.
(c) Research studies/recommendations will address technical, economic, and social constraints affecting small farmers.

1. Annual evaluations (joint CARDI/AID).
2. On-site visits.
3. Special studies and reviews.
4. Visits to review information gathered at Documentation/Information Center.
5. Statistics on sales of inputs from reports and studies of IBRD, CDB, UNDP, FAO, CARICOM, CARDI, and UWI.
6. End-of-project review.

1. That CARDI will continue to receive financial support of member governments.
2. That pilot site governments will assume costs of continuing operations of Demonstration Centers, thereby permitting CARDI to initiate additional Centers in other CARICOM countries.
3. That a "Protocol Agreement" will become effective between CARDI and UWI and that such an agreement will provide a formal mechanism for collaboration in the implementation of CARDI development programs and conduct of basic or applied research utilizing UWI staff.
# APPENDIX I

## Page 2a of 4

### PROJECT DESIGN SUMMARY

#### LOGICAL FRAMEWORK

**Research and Development of Food Cropping Systems for Small Farmers in the CARICOM Region**

<table>
<thead>
<tr>
<th>PROJECTIONS</th>
<th>VERAIBLE INDICATORS</th>
<th>MEANS OF VERIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Purpose: (B-1)</td>
<td>Conditions that will indicate purpose has been achieved: End-of-Year status (B-2)</td>
<td>format suitable for dissemination to small farmers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(b) CARDI producing informational materials in quantities sufficient to cover service area.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(c) CARDI conducting demonstrations and training in use of improved technology as per annual work plan.</td>
</tr>
</tbody>
</table>

#### IMPORTANT ASSUMPTIONS

4. Annual Project Work Plans will be implemented according to schedule.

5. No unforeseen natural disasters will destroy or interfere with expected research results.

3. Promotional Indicators

   (a) Using research results, CARDI will implement production/marketing programs in at least three food crops in each LDC served by a pilot Center.
### Research and Development of Food Cropping Systems for Small Farmers in the CARICOM Region

#### Project Design Summary

<table>
<thead>
<tr>
<th>NARRATIVE SUMMARY</th>
<th>OBJECTIVELY VERIFIABLE INDICATORS</th>
<th>MEANS OF VERIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Purpose: (B.1)</td>
<td>Conditions that will indicate purpose has been achieved: End-of-Project status, (B.2)</td>
<td></td>
</tr>
</tbody>
</table>

#### 4. Other Indicators

(a) Three Operation Centers will be funded upon completion of project in accordance with LDC/CARDI agreements.

(b) Measurable increase in purchases by small farmer of technological inputs emanating from CARDI information/dissemination activities.

#### IMPORTANT ASSUMPTIONS

Assumptions for achieving purpose: (B.4)
## Appendix I

### Project Design Summary

<table>
<thead>
<tr>
<th>I. Operation Centers</th>
<th>J. Routine Project Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Three centers, staffed as per Appendix V.</td>
<td>1. That participating governments will cooperate with CARDI research and outreach programs.</td>
</tr>
<tr>
<td>2. CARDI national reports</td>
<td>3. Important Assumptions</td>
</tr>
<tr>
<td>4. Operation Plan for each center soon after project initiation and annually thereafter.</td>
<td>4. That CARDI UWI working agreements will provide personnel to serve on multi-disciplinary teams.</td>
</tr>
<tr>
<td>5. Model centers in the field work.</td>
<td>5. Multidisciplinary teams (consisting of 5-6 CARDI and UWI personnel each) in field work.</td>
</tr>
</tbody>
</table>

### Important Assumptions

1. Operation Center personnel (including assigned Ministry staff) trained in research, extension, and promotion activities.
2. Documentation/Information Center staffed as per Appendix V.
4. One Information Center staffed as per Appendix V.
5. Two personnel trained 12 months after project initiation and 3 Mi. Ag. Personnel 18 months after project initiation.

### Objectives

1. Life of Project: 1976-1978
2. Total U.S. Funding: $432,720
3. Research and Development of Food Technologies Prepared: 9/30/77

### Schedule

2. Documentation/Information Center.
3. One Information Center.
4. That participating governments will cooperate with CARDI research and outreach programs.
5. Multidisciplinary teams (consisting of 5-6 CARDI and UWI personnel each) in field work.
### NARRATIVE SUMMARY

<table>
<thead>
<tr>
<th>Project Outputs (C-1)</th>
<th>Magnitude of Outputs: (C-2)</th>
<th>MEANS OF VERIFICATION</th>
<th>IMPORTANT ASSUMPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Assumptions for achieving outputs: (C-4)</td>
</tr>
</tbody>
</table>

5. One team per Operation Center annually for minimum of three weeks each per year.
Research and Development of Food Crops for Small Farmers in the CARICOM Region

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Life of Project:
From FY 1976 to FY 1978
Total U.S. Funding $432,720
Date Prepared: June 1976

Project Title & Number
Logistical Framework

NARRATIVE SUMMARY

<table>
<thead>
<tr>
<th>OBJECTIVELY VERIFIABLE INDICATORS</th>
<th>MEANS OF VERIFICATION</th>
<th>IMPORTANT ASSUMPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation Target (Type and Quantity) (D-2)</td>
<td>1. $432,720 in A.I.D. grant funds over three-year life of project.</td>
<td>1. Continuing availability of A.I.D. resources beyond first FY funding.</td>
</tr>
<tr>
<td>1. Progress reports.</td>
<td>2. A.I.D. program documentation; i.e., Project Agreements, PIOs, PARs, etc.</td>
<td>2. Adequate budget allocations for CARDI, UWI, and cooperating host governments.</td>
</tr>
<tr>
<td>2. $214,400 funding from CARDI.</td>
<td>3. On-site visits.</td>
<td></td>
</tr>
<tr>
<td>3. A.I.D./Washington project monitor and technical consultants, as appropriate and requested.</td>
<td>4. Annual and special project reviews.</td>
<td></td>
</tr>
<tr>
<td>4. Thirty-six staff members of the UWI Faculty of Agriculture, including specialists in numerous areas, who will be available, as needed, to serve on the multidisciplinary teams.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. The three host governments will provide approximately ten acres</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assumptions for providing inputs: (D-4)

1. Continuing availability of A.I.D. resources beyond first FY funding.
2. Adequate budget allocations for CARDI, UWI, and cooperating host governments.
## Project Design Summary

**Logical Framework**

**Research and Development of Food Cropping Systems for Small Farmers in the CARICOM Region**

<table>
<thead>
<tr>
<th>NARRATIVE SUMMARY</th>
<th>OBJECTIVELY VERIFIABLE INDICATORS</th>
<th>MEANS OF VERIFICATION</th>
<th>IMPORTANT ASSUMPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Inputs: ID-1, ID-2</td>
<td>Implementation Target (Type and Quantity): ID-2</td>
<td>([ID-2] for location of each pilot Operation / Demonstration Center site, as well as irrigation water and other in-kind technical and logistical support.</td>
<td>Assumptions for providing inputs: ID-2</td>
</tr>
</tbody>
</table>
Belize

Location: On the east coast of Central America facing the
Caribbean Sea, bounded on the north and west by Mexico and
on the west by Guatemala. Area: 8,866 square miles (includ­ing
cluding a number of islets lying off the coast).
rate is 3%. Capital: Belmopan (population, 3,000).

Belize has the lowest population density in Central America
(about 14 persons per square mile). From 70-80% of the
people are functionally literate.

Economy: In 1970 the gross national product (GNP) of Belize
was estimated at U.S. $65.6 million or about $540 per capita­
higher than that of most of its Central American neighbors.

The exploitation of its rich forests was the only economic
activity of any consequence in Belize until well into the
20th Century, but this situation has changed as the supplies
of accessible timber have become more limited. Sugar and
citrus have replaced forest products as the principal exports,
and interest has been shown in developing fishing and cattle
farming, and in growing bananas, cocoa, and vegetables.
Belize's principal natural resources are some 2 million acres of
good agricultural land, only a fraction of which are under
cultivation.

Except for sugarcane processing, industry is on a small scale
in size and variety of products. The ability to expand this
sector is restricted by the small domestic market as well as
by poor internal transportation facilities. The good pros­
pects for cattle farming encouraged the Government to build
a modern meat packing plant.

Belize's foreign trade has consistently shown a substantial
deficit which has been financed through foreign aid (primarily
from the United Kingdom), tourism, and foreign investment.
In 1970 imports totaled $35 million and consisted mainly of
foodstuffs, machinery, transportation equipment, and manufactured
goods. During this same year exports amounted to only $19
million. The United States and the United Kingdom are Belize's
most important trading partners; trade with each represents
one-third of imports and exports.

Belize receives considerable financial aid from the United
Kingdom. Most of this assistance was spent on building the new
capital, Belmopan. Other funds have been used to construct a
new sugar factor. Private investment from abroad has made
possible the rapid growth of the sugar and citrus industries.
Belize is a recipient of concessional lending from the
Caribbean Development Bank.
St. Lucia


Principal Government Officials:

The Governor - His Excellency Sir Fra Simmons
Premier and Minister of Finance, Planning and Development - Hon. John Compton
Minister of Trade and Industry - Hon. George Mallet
Minister of Housing, Community Development, Social Affairs and Labor - Hon. Mrs. Heralidine Rock
Minister of Communications and Works - Hon. Clendon Mason

Economy: Gross domestic product per capita - US $400 (est.)

The basis of the island's economy is agriculture and agricultural processing. The principal crop is bananas, which account for roughly 60% of St. Lucia's foreign exchange earnings. Other crops include cocoa, coconut oil and copra. St. Lucia imports about US $7 million in foodstuffs annually, and current government efforts are directed toward increasing local food production. Over the past several years tourism has expanded rapidly, from 33,000 visitors in 1967 to an estimated 100,000 in 1973. St. Lucia has also enjoyed considerable success in its efforts to attract light industries as part of the government's policy to diversify the island's economic base.

Premier John Compton and the United Workers' Party came to power in 1964 following the collapse of the George Charles Government, which had dominated St. Lucia's post-war politics. With his solid legal background, understanding of economics and administrative competence, Compton has given strong direction to St. Lucia's economic development. He was able to stand on his record during the 1969 general election, and the UWP was re-elected with a 6-to-4 parliamentary majority. In the May, 1974 elections, however, the UWP faced a strong challenge from a reinvigorated opposition, the St. Lucia Labor Party, but was returned to power with a ten-to-seven majority in the enlarged House of Assembly. The campaign precipitated vigorous debate on St. Lucia's development priorities, which is likely to produce some modifications in development plans to encourage more balanced economic growth.
St. Kitts (Correctly St. Christopher)

Location: St. Kitts is situated centrally in the Leeward group of islands.

Population: 64,000.

Area: 68 square miles

Capital: Basseterre (population - 16,000)

GDP per capita: U.S. $300 (estimated).

Economy: Agriculture, largely sugar for export.
Determination of Initial Operation Center Activities (1st Year)

Procurement of Operation Center Commodities (1st Year)

Selection/Location of Operation Centers (1st Year)

Recruitment/Assignment of Personnel (1st Year)

Procurement of Commodities for Documentation Information Center (1st Year)

Construction of Operation Centers (1st Year)

Training of Personnel (1st-2nd Years)

Operation of Documentation/Information Center (CARDI) (1st-3rd Years)

Conduct Research, Trials, Studies (1st, 2nd, & 3rd Years)

Commodity Production Programs (2nd-3rd Year)

Increased Production of Commodities (3rd Year - Continuing)

CARDI/UKI Scientists

CDB

Agri-Business

AMP

CMS

CARICOM

FAO/UNDP

Technical Assistance (CARDATS)
Proposed Model Work Plan for First, Second and Third Year Operations of Operational/Demonstration Centers

1. **Procure Commodities** - (such as tractors, farm equipment, tools, etc.); establish an inventory system; establish training program for key operators for assembly, operation and maintenance of equipment.

2. **Construct Facilities of Operational/Demonstration Centers** - Prepare plans for land layout, perform land leveling operations, construct fences, ditches, irrigation canals, roads and other minor farm infrastructures; construct offices, packing sheds, workrooms for research, demonstration and training; layout research and demonstration plots in fields.

3. **Conduct Research Programs** - Determine market potential for specific crops; prepare research and development plans; select crops for research and promotion; design experiments according to needs; conduct research in variety trials, fertilizer trials, pest control techniques, cultural practice variables; investigate means and methods for establishing realistic uniform grades and standards for commodities being studied/promoted; investigate appropriate storage/handling techniques; collect and analyze data obtained from research; prepare reports and make technical recommendations on appropriate procedures for farmers to adopt; provide information to Documentation and Technical Information Center for wider use in other territories of the CARICOM Region.

4. **Conduct Training Programs** - for Ministry of Agriculture personnel; provide on-the-job practical training in research techniques and extension methodology; provide for continuous supervision of field/laboratory work; assign more responsibilities of the program to Ministry of Agriculture personnel as capabilities are acquired.

5. **Conduct Training Programs** - Provide for Farmer Field Days in Operational/Demonstration Centers; provide short courses in specific technological fields; disseminate information (through leaflets, pamphlets, etc.) to farmers; provide seed or plant materials to farmers; organize farmers into formal or informal groups to increase efficiency of providing them services of various types.

6. **Conduct Production Campaigns** - Identify target areas and target farmer groups; organize commodity production programs with Ministries of Agriculture, farmer groups, marketing boards and other entities involved; locate sources of inputs (such as plowing services, seed, fertilizer, insecticides, packing materials, etc.); coordinate financing for inputs with farmers, marketing boards, national banks, agri-business or other sources; coordinate and plan with marketing boards to provide markets for production; assist in establishment of appropriate grades and
standards and minimum floor prices for commodities based on these standards; initiate promotional activities (radio, press, etc.) to encourage participation by farmers; provide assistance to farmer groups on improved technology of production and marketing; initiate seed production programs for specific crops; repeat the process with other commodities and with different farmers in different areas, as appropriate.

7. Evaluation - Establish a system of reporting on project activities; establish a system of evaluation of all project activities which will include a feedback mechanism to identify problems that will arise; assist in making appropriate modifications and corrections in programs; identify priority areas or activities for future project emphasis.
APPENDIX V

A.I.D.

3 FOOD CROP DEVELOPMENT CENTRES

Operating Costs:

<table>
<thead>
<tr>
<th></th>
<th>FY 1976 Funds</th>
<th>FY 1977 Funds</th>
<th>FY 1978 Funds</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Officer</td>
<td>37,500</td>
<td>40,500</td>
<td>78,000</td>
<td></td>
</tr>
<tr>
<td>Field Assistant</td>
<td>17,000</td>
<td>12,000</td>
<td>29,000</td>
<td></td>
</tr>
<tr>
<td>Tractor Driver/Mach. operator</td>
<td>12,000</td>
<td>13,000</td>
<td>25,000</td>
<td></td>
</tr>
<tr>
<td>Cultural operations</td>
<td>45,000</td>
<td>40,000</td>
<td>85,000</td>
<td></td>
</tr>
<tr>
<td>Maintenance of Equipment</td>
<td>1,000</td>
<td>3,000</td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td>Travel (Local &amp; Regional)</td>
<td>22,500</td>
<td>15,000</td>
<td>37,500</td>
<td></td>
</tr>
<tr>
<td>Materials (fert., seeds etc.)</td>
<td>12,000</td>
<td>13,500</td>
<td>25,500</td>
<td></td>
</tr>
</tbody>
</table>

Capital

<table>
<thead>
<tr>
<th></th>
<th>FY 1976 Funds</th>
<th>FY 1977 Funds</th>
<th>FY 1978 Funds</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm Machinery (tractor etc.)</td>
<td>30,000</td>
<td>36,000</td>
<td>66,000</td>
<td></td>
</tr>
<tr>
<td>Farm Equipment (Sprayers, irrigation etc.)</td>
<td>15,000</td>
<td>15,000</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Fencing</td>
<td>15,000</td>
<td>15,000</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Building - office, storage, packing and grading shed</td>
<td>12,000</td>
<td>14,000</td>
<td>26,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>144,000</td>
<td>147,720</td>
<td>391,720</td>
<td></td>
</tr>
</tbody>
</table>

DOCUMENTATION AND TECH. INFORMATION SERVICE

Operating Costs:

<table>
<thead>
<tr>
<th></th>
<th>FY 1976 Funds</th>
<th>FY 1977 Funds</th>
<th>FY 1978 Funds</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common. Specialists</td>
<td>12,000</td>
<td>12,000</td>
<td>12,500</td>
<td>36,500</td>
</tr>
<tr>
<td>Documentalist.Librarian</td>
<td>10,000</td>
<td>13,000</td>
<td>23,000</td>
<td></td>
</tr>
<tr>
<td>Clerk/Typist</td>
<td>12,000</td>
<td>13,000</td>
<td>25,000</td>
<td></td>
</tr>
<tr>
<td>Technicians (3)</td>
<td>12,000</td>
<td>12,000</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td>Maint. of Equip.</td>
<td>12,000</td>
<td>12,000</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>1,800</td>
<td>2,000</td>
<td>3,000</td>
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<tr>
<td>Com. Serv. Charge</td>
<td>9,000</td>
<td>9,200</td>
<td>18,200</td>
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</tr>
<tr>
<td></td>
<td>25,800</td>
<td>25,200</td>
<td>51,000</td>
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Capital

<table>
<thead>
<tr>
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<th>FY 1976 Funds</th>
<th>FY 1977 Funds</th>
<th>FY 1978 Funds</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Composer</td>
<td>25,000</td>
<td>25,000</td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>Photocopying Mach.</td>
<td>2,000</td>
<td>2,000</td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td>A B Dick. Machine</td>
<td>10,000</td>
<td>10,000</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td>Projection &amp; Photo. Equip. etc.</td>
<td>5,000</td>
<td>5,000</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>Furniture</td>
<td>5,000</td>
<td>5,000</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>56,000</td>
<td>56,000</td>
<td>112,000</td>
<td></td>
</tr>
</tbody>
</table>

Three Food Crop Development Centres and Documentation and Technical Information Service
Financial aid
(In U.S. $)
CARIBBEAN AGRICULTURAL RESEARCH and DEVELOPMENT INSTITUTE (CARDI)

THE UNIVERSITY OF THE WEST INDIES

STAFF LIST

(Academic Year 1974/75)

** Lloyd Rankine, B.Sc. (N. Carolina), M. Sc., Ph.D. (Hawaii) - Agrl. Economist

Everold Hosein, B.Sc. (Kansas), M.A., Ph.D. (Mich.) - Ext. Specialist


Chelston W.D. Brathwaite, B.Sc. (UWI), M.Sc. Ph.D. (Cornell) - Nematologist

Winston Benson Charles, MSA (UBC), D.I.C.T.A. - Plant Breeder

** John L. Hammerton, B.Sc., (Reading), Ph.D. (Wales) - Agronomist

Syed Qayamul Haque, B.Sc., M.Sc. (Bihar), Ph.D. (IARI) - Virologist

Sinclair Hugh Mantell, B.Sc. (Brist.), M.Sc., Dic. (Lond.) - Plant Pathologist

D.T.A. (UWI)

Nizar Mohamed, D.Sc. (Notts.), Ph.D. (Adelaide) - Virologist

** Samsundar Parasram, B.Sc., M.Sc. (Delhi) - Entomologist

Ralph H. Phelps, B.S.A., M.S.A. (UBC), Ph.D. (Wis.) - Plant Pathologist


Nalin D. Singh, B.Sc. (Allahabad), M.Sc., Ph.D. (Iowa) - Hematologist

*** Darvin D. Williams, M.Sc. (Iowa), Ph.D. (Calif.), D.I.C.T.A. - Plant Breeder

+++ Kenneth Buckmire, B.Sc., M.Sc. (U.K.) - Entomologist


Lalit H. Ayra, B.Sc., M.Sc. (UP.), MSc., Ph.D. (Minn.) - Soil Physicist

Ram C. Dalal, F.Sc., B.Sc. (Punjab), MSc., Ph.D. (IARI) - Soil Chemist

* Theodore U. Fertuson, B.Sc., Ph.D. (UWI) - Agronomist

+++ John Keogh, N.Agric.Sc., M. Agric. Sc. (New Zealand), Ph.D. (Guelph) - Pasture Agronomist

** Horace W. Payne, B.S.A. (UBC), M.Sc. (Cornell) - Agronomist
Peter Quilt, D.Sc., Ph.D. (Bath.) - Microbiologist

James Stark, B.Sc. (Glas.) - Soil Surveyor

Donald Walmsley, M.Sc., Ph.D. (Lond.), A.K.C. - Soil Chemist

++ Basil G.F. Springer, B.Sc. (Lond. - UCWI), M.Sc. (Wales) DIC, Ph.D. (Lond.) - Biometrician

Allan C. Brewer, B.Sc. (Edin.) M.Sc. (Reading) - Biometrician

Myrtle Hall (Mrs.), D.Sc. (UWI) Graduate Assistant in Computer Programming

Hemragie Jogie (Miss), B.Sc. (UWI) Graduate Assistant in Biometrics

Frank B. Lauckner, B.Sc. (Leeds), A.I.S., F.S.S. - Biometrician

Joan Sanchez (Mrs.), R.Sc. (UWI) (Junior Biometrician) -

Graham Taylor, B.Sc. (Hons.) (Surrey) - Biometrician

+++ Laurence H. Back, B.Sc. (Reading) B. Sc. Spl. (Lond.) - Biometrician

St. Clair M. Fordc, B.Sc., M.S.A. (UBC), Ph.D. (Ibadan) - Analytical Chemist

James Morris, B.Sc. (UWI) - Analytical Chemist

Projected Staff List (Associated with project on the research and development of food croping systems for small farmers)

Aeronomists - 3

Communications Specialist - 1

Documentalist - 1

* Resident in Barbados

** Resident in Jamaica

*** Resident in Antigua

++ on Secondment

+++ Temporary