

EXECUTIVE SUMMARY

INTRODUCTION

The mission of the National Agricultural Research Institute (NARI), is to advise on and develop technologies for sustained agricultural development. Essentially, the goal of NARI is to increase productivity and improve the quality of crops and livestock for national use and for export. The Institute has direct responsibility for the improvement of technology of the non-traditional crops sector and livestock production.

During 2001, the Institute operated and maintained several locations. These were the Headquarters, Mon Repos, Livestock Farm, Mon Repos, Intermediate Savannahs Field Research Unit, Ebini, Horticultural Station, Timehri, Kairuni Crops Station and Plant Nurseries at Benab, Fort Wellington, Mon Repos, Pouderoyen, Charity, Bartica and Hosororo. The establishment of another plant nursery at St. Ignatius in Region 9 was initiated.

In order to fulfill its mandate, NARI's work programme was concentrated in six programme areas. Five of these programmes addressed research and development of fruit and Perennial Crops, Root, Tuber and Other Food Crops, Vegetable Crops, Livestock and Soils and the Environment. The other programme Agricultural Services, provided services to farmers, agencies in the agricultural sector and to NARI's research effort. A seventh programme, Organic Agriculture was initiated in 2001.

*In the areas of technology transfer, a number of training courses were conducted. A series of booklets/pamphlets depicting various aspects of crops and livestock production systems were introduced. The weekly radio programme **'NARI IN FOCUS'** was also used for information dissemination. Additionally, training was provided for secondary school children countrywide.*

An Information Technology (IT) Unit was initiated in 2001. This is in keeping with the provisions of the National Development Strategy that a

modern computerized information center to facilitate the collection, storage and retrieval of agricultural information be established at NARI.

*The Caribbean Vegetable Network (CARIVEG) was launched in Guyana under the auspices of NARI and PROCICARIBE. NARI in conjunction with the ACP-EU Technical Centre for Agriculture and Rural Cooperation (CTA) hosted a two-week course on **“Web Page Design and the use of Electronic Networks”** in December, 2001.*

Staff members benefited from training both locally and overseas. Staff at all levels participated in these activities.

Capital projects were completed at the cost of G\$18M. Cash inflows for the year 2001 were \$232,525.996 and cash outflows were \$239,163.835.

This report presents the main activities of the Institute and the major results for the year 2001.

FRUIT AND PERENNIAL CROPS PROGRAMME

Projects in this programme encompassed genebank management and propagation, ornamentals, mushroom, post-harvest studies and plant nurseries.

Satisfactory progress was made in the establishment of germplasm collection blocks and pilot orchards of fruit cultivars. These included avocado, cherry, citrus, coconut, mango and pineapple at the various plant nurseries. Additionally, the evaluation of foreign fruit cultivars for local adaptation was an on-going activity. These evaluation studies were on avocado, cashew, citrus, mango, passion-fruit and sour-sop. These evaluations are being conducted on both NARI's locations and farmers' fields.

In the areas of selection and propagation of CTV free planting material using tissue culture, two important breakthroughs were made. Firstly, a plant growth medium was developed that can be used to quickly multiply important varieties of citrus rootstock. Secondly, a rooting medium was successfully developed to induce root production.

Ornamental production was an on-going activity. Training in ornamental plant propagation as well as the actual establishment of plots of mother plants were accomplished at Benab, Charity, Mon Repos, Pouderoyen and Timehri plant nurseries. An orchid medium was also developed to successfully multiply and grow the Epidendrum orchid species.

In mushroom research, evaluation studies were conducted on four species of mushroom obtained from China. Two species, Agaricus and Pleurotus showed good performance under local conditions. These species are to be utilized in commercial production in 2002.

Post-harvest studies were conducted on the effects of storage treatments in the quality and shelf life of Spice mango. Initial results indicated that waxing increased the shelf life of Spice mango but at the expense of fruit attractiveness. Further investigations would be done in 2002.

Plant nurseries at Charity and Pouderoyen were further rehabilitated and expanded under the Poor Rural Community Support Services Project (PRCSSP). The nursery at Hosororo concentrated mainly on organic cocoa seedling production. An additional nursery facility was established at St. Ignatius in Region 9. Total production at all the nurseries in 2001 was 111,268, compared to 97,993 in 2000.

ROOT, TUBER AND OTHER FOOD CROPS PROGRAMME

Research projects were done in the areas of genetic improvement, crop management and management of pests and diseases.

One of the main achievements for 2001 was the collection of plantain and banana germplasm. Fourteen plantain and forty-one banana accessions were collected. Seven aroid and one-yam accessions were also collected. The cassava collection containing forty-eight entries, was maintained at Mon Repos. The sweet potato collection which comprised of thirty-eight accessions was maintained at Mon Repos and Fort Wellington. A first draft of a manual was done of descriptions of the sweet potato accessions

The Plant Tissue Culture laboratory (PTCL) continued to store, monitor and evaluate germplasm of cassava, sweet potato and yam, held in the in vitro genebank. During 2001, the PTCL extracted DNA of 12 sweet potato cultivars in the field germplasm collection. The DNA is presently in storage in the DNA bank in the PTCL.

There are trials in progress to determine the optimal time of harvest of two cassava cultivars and to develop a strategy for the management of the sweet potato weevil (Cylas formicaries).

VEGETABLE CROPS PROGRAMME

In this programme, emphasis was placed on improving the productivity, promoting and enhancing the quality of vegetables, as well as promoting sustainable systems of seed production, to ensure that quality seed of locally adapted varieties reach farmers.

On-farm evaluations of new varieties of ochro, tomato and sweet pepper were conducted. Investigations were also initiated on new crop types. These included cauliflower, broccoli, onion and carrot.

The technique of using sheltered-culture for year-round vegetable production was initiated. The technology being developed would be transferred to the farming community.

Seed was produced and distributed for poi, boulanger, bora, tomato, cowpea (minica) and ochro. Genetically, improved seed of new tomato lines were obtained from AVRDC. These would be multiplied in 2002.

LIVESTOCK PROGRAMME

The activities in this programme included duck breeding and duckling production, sheep breeding and forage production. These projects were designed mainly to provide services, among which are quality-breeding animals and improved production systems, to the farming community.

In 2001, 77,772 ducklings and 68 breeding rams were sold to the farming community. Total revenue generated by the farm was G\$9.5M.

The forage production project provided quality forage for the sheep by utilizing the protein bank concept. Leucaena was the main protein species used along with the trailing and climbing types such as kudzu and centrosema.

SOILS AND THE ENVIRONMENT PROGRAMME

Soil sampling and analysis of the mangrove area on the West Coast of Demerara was completed and a report submitted to the Environmental Protection Agency (EPA). A draft report on a semi-detailed soil and land use survey of Canal # 1, West Bank Demerara was completed. Another project on salinity determination in land and water-ways in areas of influence of sea defence repairs was also completed.

In soil management, emphasis was on evaluation of the efficiency of different strains of Rhizobia on nodulation and nitrogen use by cowpea on a clay soil. The effect of organic waste products on the physical/chemical properties of a clay soil in the yield of vegetables and on weed growth and development was also investigated.

AGRICULTURAL SERVICES PROGRAMME

This programme provided support to farmers and to agencies in the agricultural sector.

Activities included routine soil analysis, fertilizer and soil management recommendations, diagnoses and recommendations for the management of plant diseases, insect pests and weeds. Additionally, bait for the control of leaf-cutting Acoushi ants, as well as Rhizobium innoculum for legume production were produced.

The Library and Information Centre received 786 books, journals and abstracting journals. The WINISIS programme was installed to be used as the database for all the library's holdings. The database having all records of journals and institutional publications up to March 199 was transferred into this system and can now be accessed by users.

The Communications Unit was involved in exhibitions, video recordings, printing, digital and still photography, press briefs and releases of information via the print and electronic media.

In keeping with one of the provisions of the NDS, that a modern computerized information center to facilitate the collection, storage and retrieval of agricultural information be established at NARI, an IT Unit was established in 2001. An initial design of NARI's website was completed.

ORGANIC AGRICULTURE

An Organic Agriculture Programme was developed in October, 2001. This programme encompassed the production of selected vegetable and tropical fruit crops using organic principles and practices. The general objective of the programme is to utilize the principles and practices of organic agriculture to produce selected agricultural commodities and promote organic agriculture as a viable alternative to high external input based conventional agriculture.

The main focus of the programme in 2001 was on organic cocoa production in Region 1. Inspection for organic certification was carried out by the Dutch Certifying Agency SKAL. In June 2001, 1 metric ton of dried cocoa beans was exported to the Netherlands.

For germplasm characterization and evaluation, a comparison of 65 cocoa accessions using 22 traits revealed 12 distinct cocoa 'varietal' groups in the area. Research also focused on the screening of the 12 cocoa varietal groups for resistance to fungal Witches Broom and Black Pod diseases.

INTERMEDIATE SAVANNAHS UNIT

Work continued on germplasm conservation and evaluation. Among the accessions were mung, peanut, pigeon pea, soybean, sorghum, maize and cowpea. Seed production and multiplication was an on-going activity to ensure the availability of seed of cowpea and maize to the farming community in the Berbice river area. Sheep production was also an on-going activity at Ebini.

POOR RURAL COMMUNITY SUPPORT SERVICES PROJECT

Research activities were conducted in Regions 2 and 3 as a component of the PRCSSP in these two regions. The major component of the research activities concentrated on the introduction of new crop types, improved varieties of existing crops, using livestock in integrated farming systems and utilizing IPM strategies for the reduction of pesticide use.

The following projects were conducted:

- 1. Evaluation trials on black-eye, red kidney beans, field corn, passion-fruit, tomato, ochro and sweet corn.*
- 2. Duck rearing is an integrated farming system.*
- 3. Evaluation of bio-pesticides for the control of Diamond Black Moth*
- 4. Reduction of post-harvest losses of papaw through the use of IDM strategies.*