Dominica

Country Highlights

2010

Improving lives through agricultural research

Caribbean Agricultural Research and Development Institute

Dominica Country Highlights 2010

CARDI's contribution to
agricultural research and development,
food production and the reduction of poverty and hunger

CARDI Office in Dominica

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Acronyms and abbreviations

BELLO	Parry W. Bellot & Co. Ltd.
CARDI	Caribbean Agricultural Research and Development Institute
CFC	Common Fund for Commodities
CPDN	Caribbean Pest Diagnostic Network
DAPEX	Dominica Agricultural Producers and Exporters Limited
DEXIA	Dominica Export Import Agency
DOAM	Dominica Organic Agriculture Movement
DPBL	Dominica Banana Producers Limited
ECCB	Eastern Caribbean Central Bank
EU	European Union
FAO	Food and Agricultural Organisation of the United Nations
FAOSTAT	FAO Statistics
FAVACA	Florida Association for Volunteer Action in the Caribbean and Americas
FMIS	Financial Management Information System
GDP	Gross Domestic Product
GMP	Good Manufacturing Practices
ICM	Integrated Crop Management
IICA	International Institute for Cooperation on Agriculture
ISTRC	International Society of Tropical Root Crops
MOAF	Ministry of Agriculture and Forestry
NAYA	National Association of Youth in Agriculture
NDFD	National Development Foundation
PA	Protected Agriculture
PAS	Protected Agriculture System
TC	Tissue Culture
UF	University of Florida

1.0 Foreword

CARDI welcomed new staff members to the Dominica Unit and as such intensified its activities. The major project activities during the reporting period were the implementation of the Roots and Tubers Project funded by Common Fund for Commodities (CFC) and the European Union (EU) and the Protected Agriculture (PA) project funded by International Institute for Cooperation in Agriculture (IICA).

The highlights were the commencement of activities under the CFC Roots and Tubers Project which included the refurbishing of the propagation facility at Portsmouth Agricultural Station for the weaning and hardening of cassava and sweet potato tissue culture plantlets. Also note worthy was the selection sites and commencement of the establishment of demonstration plots on these sites. Training in Integrated Crop Management (ICM) also commenced under the project.

Also, of great significance was the commencement of the evaluation of growing media and PA coverings and the implementation of the farmer field school approach for training of young farmers in protected agriculture.

The Unit's achievements during 2010 were due to the unwavering support received from the Honourable Minister of Agriculture and Forestry Mr. Walter Mathews, the Permanent Secretary Mr. Samuel Carrette, the acting Directors of Agriculture Mr. Richard Allport and Dr. Reginald Thomas and the MOAF technical staff. The Division of Agriculture's extension staff as well as the station staff of Portsmouth and Hillsborough Agricultural Stations must be given especially mentioned, as without their support the success of the projects implementation would have fallen short.

Other organisations/institutions with which the Unit worked closely with were the IICA, National Association of Youth in Agriculture (NAYA), Bureau of Standards, Dominica Export & Import Agency (DEXIA), National Development Foundation of Dominica (NDFD), Dominica Hucksters Association, Dominica Organic Agriculture Movement (DOAM), Parry Bellot and Company (BELLO) Ltd. and Florida Association in Volunteer Action in the Caribbean and Americas (FAVACA).

Mention must be made of CARDI staff, in particular the Unit's staff, who have worked together under challenging conditions to execute the 2010 work programme.

Sharon Jones
Plant Pathologist/Country Representative (Ag.)

2.0 Executive Summary

As Dominica's agricultural priorities focus on the non-banana sector, the implementation of both the CARDI Dominica Common Fund for Commodities (CFC) Roots and Tubers project funded by the European Union (EU) and the Protected Agriculture IICA funded project; drew great interest and received the full support of the Ministry of Agriculture and Forestry (MOAF), farmers and processors.

The Roots and Tubers project assessed the infrastructure and equipment needs of five cassava micro processors. All processors needed their cassava presses up-graded as well as the introduction of stainless steel utensils to replace plastic and wood utensils used in their manufacturing process.

With the Division of Agriculture and its Extension Unit the training needs for root crop farmers were assessed and key performance gaps that could be bridged through training interventions were identified. The selection of locations for establishing the 19 demonstration plots for training and demonstration were identified.

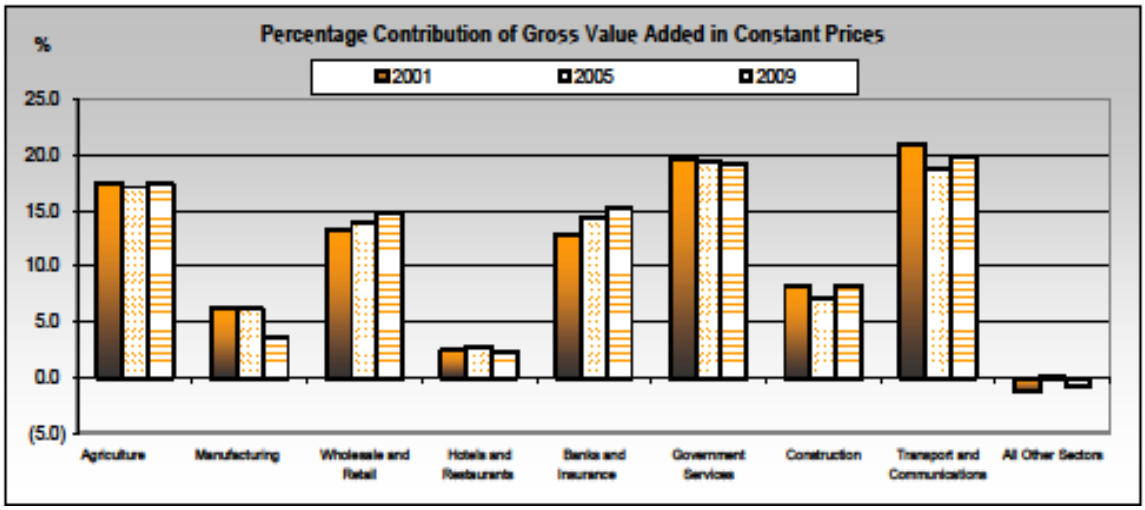
The availability of quality planting material was identified as a constraint to yam production in Dominica and a participatory training programme to demonstrate the mini setting technique as a method of obtaining adequate quantities of quality planting material was conducted. Construction of the weaning and hardening facility to receive tissue culture material has commenced.

The Protected Agriculture (PA) Project is training youth and other PA farmers, in agronomy techniques and general management under PA systems. Training in PA production was addressed through regular weekly training sessions using the farmer field school approach and technical assistance from Florida Association for Volunteer Action in the Caribbean and Americas (FAVACA).

An experiment to evaluate two PA coverings and five media types was established. Preliminary observations look promising.

3.0 Review and update of the agriculture sector

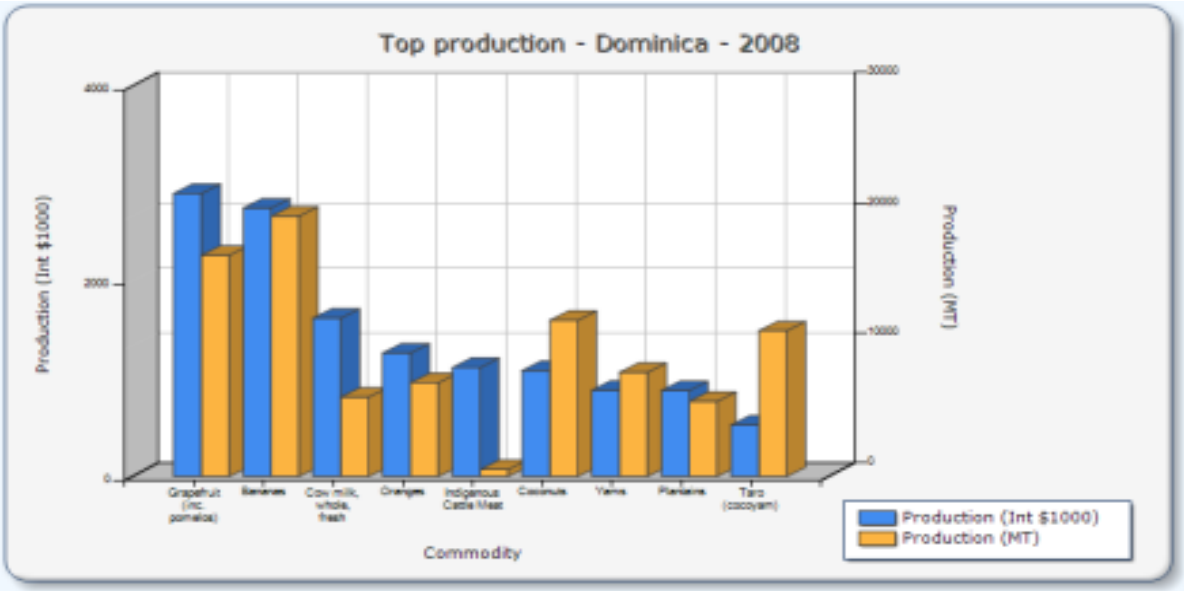
Agriculture remains a major contributor to the Dominican economy, both as a creator of employment and a contributor to GDP. The percentage contribution of gross value added by economic activity of agriculture in constant prices was 17.68 % (crop production contributing 13.35 %). Agriculture's performance was only superseded by transport and communication and government services (Figure 1)



Source: ECCB Statistics, 2009

Figure 1: Percentage contribution of gross value added in constant prices for Dominica in 2001, 2005 and 2009

Figures from National Account Statistics showed the sector grew by 5.2% despite the decline in the banana sub-sector. However FAOSTAT shows that in 2008 banana production was very important to the sector (Figure 2).



Source: FAOSTAT 2008

Figure 2: Crop production in Dominica for 2009

Dominica's agriculture priority activities are focused on the development of diversification crops (non-banana crops) with emphasis on increasing the efficiency of commercial and value added activities. This change in focus was demonstrated; when in September 2010 the Dominica Banana Producers Limited (DPBL) changed its name to the Dominica Agricultural Producers and Exporters Limited (DAPEX).

During January to March 2010, the agriculture sector was hard hit by an extended drought which decreased yields and food production. Over 400 ha of crops were affected, vegetables, bananas, plantain, hot peppers and root crops, in particular dasheen was the worst affected. Banana production dropped by 44%, resulting in a sharp fall in export revenue of 40% i.e. moving from EC$2.7 M to EC& 1.64M. In October, Hurricane Tomas damaged bananas, plantains and protected agriculture systems. Hurricanes and other adverse weather conditions are a constant threat to agriculture. Black Sigatoka, a fungal disease affecting bananas, still remains of great concern to Dominica as it is now present in Martinique.

4.0 Implementation of the Medium Term Plan

Develop Sustainable Industries

Commodity Development – Crops: Roots and Tubers

Introduction

The CARICOM States recognise that the production and marketing of the major root and tuber crops, i.e. cassava, sweet potato and yam, share common themes, trends and prospects. In order to attain the critical production output necessary for sustainable impact within regional markets, CARICOM states have focused on technology transfer and adoption, upgrading of existing processing and product development technologies. Availability of characterised quality planting material, education, training and capacity building of producer groups and associations are essential.

The Common Fund for Commodities Roots and Tubers project seeks to address the key constraints identified along the value chain for yam, cassava and sweet potato, and to explore opportunities for satisfying national and regional markets demands (in the first instance) through an integrated approach.

Value added processors

The catchment of Good Hope and the Kalinago (Carib) Territory are both locations which have a tradition of "value added" component to roots and tubers with particular emphasis to cassava. Both farine (sometimes referred to as cassava flour) and to a lesser extent cassava bread are produced in small facilities which are usually family operated. Farine is usually wholesaled to buyers whereas cassava bread is sold primarily by retail.

Method

Three micro facilities were visited and another two micro processors were interviewed by CARDI technical staff, the Produce Chemist from the Division of Agriculture and the Bureau of Standards in order to assess their equipment needs.

Findings from the survey

There was no food grade equipment used within the facilities. All the containers used were either plastic or wood or a combination of both materials which is unacceptable in Good Manufacturing Practice (GMP).

All five micro processors needed their cassava press up-graded. The cassava press is used to reduce the moisture content of the grated cassava prior to baking it. Currently the type of press used is not food grade and does not allow for ease of cleaning. Also, it is inefficient and severely limits the amount of farine that could be processed. One batch currently takes approximately 6 hours to "press".

Plate 1: Cassava farine press currently in use

Another piece of equipment which was needed by at least two of the micro processors was an electrical grater. The current grater was manual and severely limited the amount of cassava that could be processed. Also, the current grater is not made of food grade material and is also difficult to clean. The Division of Agriculture has two cassava graters but unfortunately they are not made from a food grade material. A local stainless steel fabricator is determining the cost for modifying the existing graters I.e. to include stainless parts where the grater comes in contact with the cassava.

Plate 2: Manual grater in use

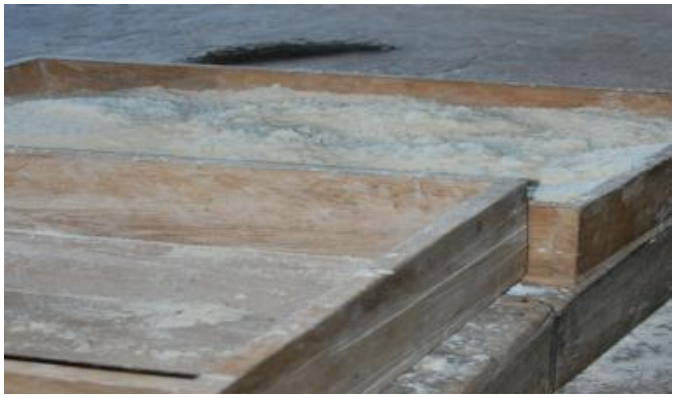


Plate 3: Wooden trays used in cassava farine processing

Recommendations

Only stainless steel utensils are allowed in food production.

Considering budgetary limits, the possible interventions under review are:

- introducing stainless steel utensils
- introducing a stainless steel press into at least one facility
- equipping at least one facility with an electrical grater

Discussions are ensuing with both a local stainless steel manufacturer and a foreign supplier.

Producers

The availability of quality planting material for yam production was identified as a constraint to yam production in Dominica. Mini setting, the technique used to obtain quantities of quality planting material was formally introduced to extension officers in order to ensure that the technology was effectively transferred. Training of trainers in mini setting of yams was also conducted as a means of reviewing the practice and to harmonise the methodology.

The participatory training programme comprised both classroom and practical sessions. Thirty nine participants (extension officers, propagation personnel and agricultural science school teachers and students) attended the training sessions. Of the 19 training evaluation forms returned, all except one thought the training programme was excellent. All participants thought they had increased their knowledge on the science and practice of mini setting.

Plates 4 and 5: Classroom sessions on yam mini setting techniques

Plate 6: Participants preparing yam mini setts

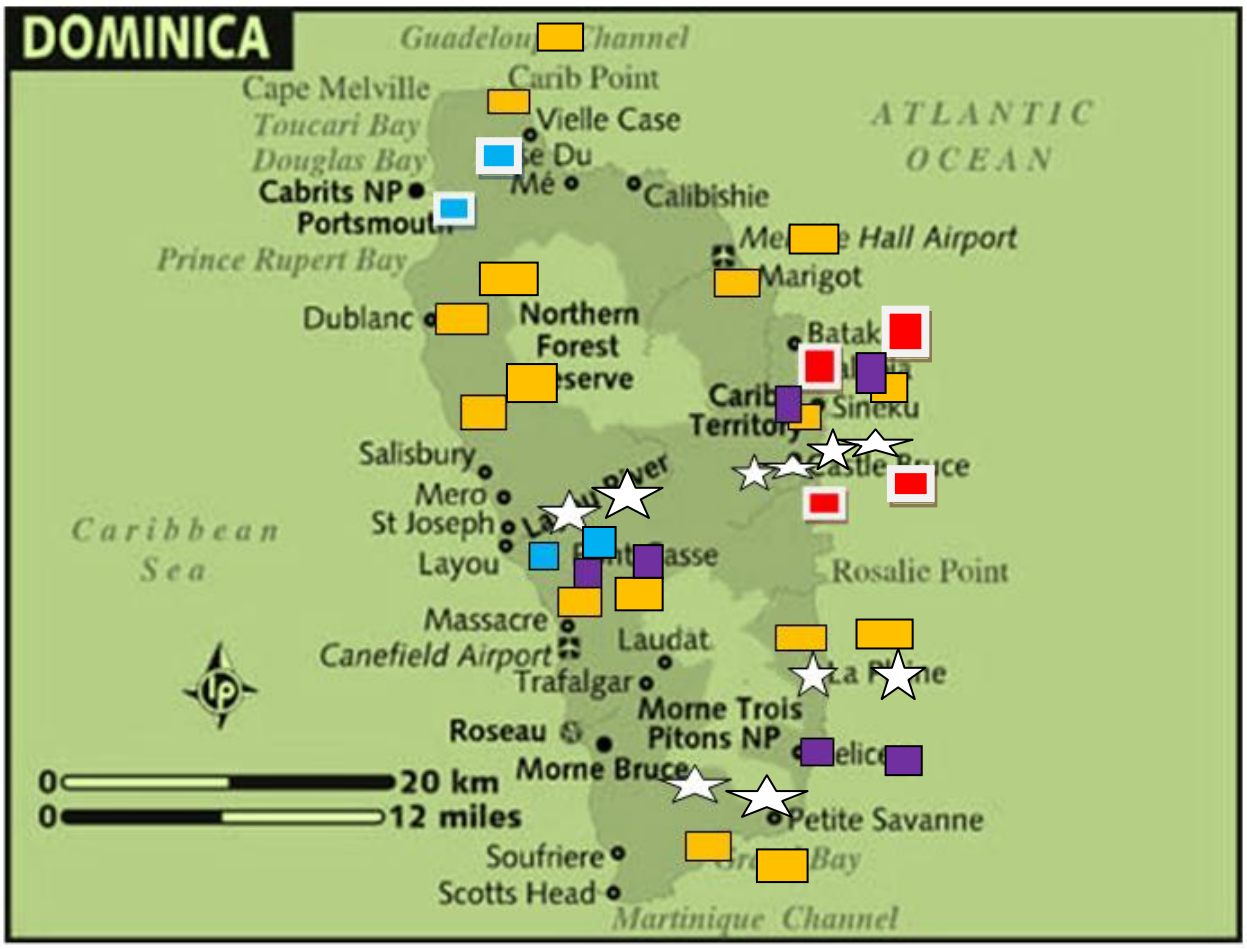
Plate 7: Describing the process of yam mini setting

The farmer, location, crop and acreages of the 19 demonstration plots established for ICM training are shown in Table 1.

Table 1: List of demonstration plots to be established for ICM trainings

	Agricultural Region	**Farmer**	**Location**	**Crop**	**Size of plot** 1 acre = 0.4 ha (approximately)
1	East	Daniel Frederick	Salybia, Kalinago Territory	Cassava	0.5 acre
2	East	Ferdinand Darroux	Ma Prince, Good Hope	Cassava	0.5 acre
3	East	Ruth Prevost	Sineku, Kalinago Territory	Sweet potato	0.25 acre
4	East	Jimmy Tousaint	Good Hope	Yam	0.25 acre
5	East	Raphael Valmond	Sineku, Kalinago Territory	Yam	0.25 acre
6	East	Nathaline Constance	Castle Bruce	Sweet potato	0.25 acre
7	Central	Connie Wayland	Cuba	Yam	0.25 acre
8	Central	Ellis Sorrrant	Cuba	Sweet potato	0.25 acre
9	Central	Mark Henry	Boom Farm, Warner	Sweet potato	0.25 acre
10	Central	Matthew Warner	Belles	Yam	0.25 acre
11	North East	Freda Alfred	Marigot	Yam	0.25 acre
12	North East	Francois	Bense	Yam	0.25 acre
13	North East	Hendrix Williams	Delices	Sweet potato	0.25 acre
14	North East	Mavis Cuffy	New Foundland	Yam	0.25 acre
15	North East	Clinton Hilliare	Bois Bell Vue, Boetica	Yam	0.25 acre
16	South	Allick Athanize	Geneva, Grand Bay	Yam	0.25 acre
17	North	Allan George	Penville	Yam	0.25 acre
18	North	Clement Charles	Syndicate	Yam	0.25 acre
19	West	Philsbert Joseph	Opiton, Calihaut Heights	Yam	0.25 acre

Plate 8, shows the sites where demonstration plots and satellite farms are located in Dominica.



Areas where value added facilities and cassava demonstration plots are going to be established

Areas where yam demonstration plots will be established

Areas where sweet potato demonstration plots will be established

Government station where TC materials will be weaned and hardened

Location of satellite farms

Plate 8: Sites of demonstration plots and satellite farms in Dominica

Discussions were held with the Division of Agriculture regarding the location of the Government owned facility which would be rehabilitated for the purpose of weaning and hardening of planting material for sweet potato, cassava and yam. Proposed locations were visited and assessed for their human and infrastructural capacity.

Plate 9: Rehabilitation of Portsmouth propagation facility

4.0 Implementation of the Medium Term Plan

Emerging Issues

Assessing Undercover Vegetable Production Systems – The use of appropriate technology in Dominica

Despite the widespread adoption of PAS technology in Dominica, the anticipated impact was not always realised, resulting in many structures becoming abandoned and out of production. The new challenges experienced in managing the micro climatic factors, as well as the increased incidence / severity of certain pests and diseases in the created microenvironment, led many farmers to revert to open field production.

Bacterial blight of tomato also became a major production challenge within the greenhouse when soil was the preferred media for production. Juxtaposition on this is a budding industry in Dominica in developing compost and other non-soil media, pot culture has become an attractive alternative.

The research will therefore evaluate the effects of bioclimatic factors, greenhouse design, covering material and media on yield and quality over a 12 month period. Cost of production studies will also be conducted.

The development component will seek to train young farmers in agronomy and general PA management techniques.

Two PAS of similar design, located at the Division of Agriculture Station in Portsmouth were used to conduct the experiments. The ridged arch design is 4.8 m high to the apex and was chosen to allow for dissipation of hot air and to encourage air flow. Each PAS had a different poly film covering, thus varying the amount of light available under the covering. Drip irrigation was installed. All plants received identical management practices for growing the crop.

A temperature and humidity data logger was located in each greenhouse to record temperature and relative humidity.

The factorial experiment investigated the effect of two greenhouse poly film coverings (20% and 80% light transmission) and 5 growing media. A randomized block design was used with three replicates of each treatment. Five media types, Promix, Soil, Bay compost, Gro-bags (coconut coir) and Bellevue Chopin Organic Medium, were evaluated.

Lettuce (variety Eden) seedlings 2 weeks old were transplanted into troughs. Tomato (variety TX54) seedlings 3 weeks old were transplanted into pots.

Evaluation parameters are as follows:

- **Tomato:** Plant height at various stages of development, days to flowering, days to harvest and yield
- **Lettuce:** Number of leaves, diameter of head and weight at harvest

General preliminary observations and discussion

The preliminary observations show a difference in growth and performance of both lettuce and tomato on the different media as indicted by the red line in Plate 10.

Plate 10: Visible effect in tomato growth between treatments 5 and 3

Training of farmers

Training in PA production was addressed by:

- Regular weekly training sessions using the farmer field school approach and
- Using FAVACA volunteer technical assistance

The farmer field school approach used to attract young farmers to training programmes has met variable success and attendance fluctuated.

Plate 11: Young farmer participates in planting lettuce

Plate 12: Young farmer prepares to plant tomatoes

The FAVACA training programme was conducted in two locations in order to broaden the catchment of PA farmers. The workshops were conducted on the 27 & 28 October. A total of 52 participants in Roseau and 31 participants from Portsmouth attended the workshops. The participants included extension offices, greenhouse farmers, educators and college students. All participants concluded the workshop was informative.

Plate 13: Class room session of the PA workshop

Plate 14: Practical session at the PA system workshop

Plate 15: Interactive session at the PA system workshop

4.0 Implementation of the Medium Term Plan

Institutional Strengthening

Technical assistance

Workshops & training programmes organised

- CARDI was requested by the Division of Agriculture to provide training in PA system sanitation procedures for the Citrus Certification Project. A training workshop was conducted and attended by all staff employed at the Citrus Certification Facility
- Training in nutrition and water management and soil solarisation under PA systems (FAVACA facilitator)
- Mini setting technique for yam planting material propagation
- Farmer field school approach in agronomic practices for PA systems

Conferences, trainings, workshops attended

Sharon Jones

- FMIS training, CARDI Headquarters, March 2010
- CFC/ EU Project Launch, Trinidad, March 2010
- Black Sigatoka Regional Meeting: St Lucia, March 26 -27, 2010
- Caribbean Pest Diagnostic Network (CPDN) – Diagnostician Training, June 12-19, 2010 UF Campus, Gainesville, Florida, USA
- Internet conference CPDN

Dorian Etienne

- ISTRC Roots & Tubers Meeting, Kinshasa, Democratic Republic of Congo, 4-8 October 2010

Dionne Augustus

- FMIS training, CARDI Headquarters, March 2010
- Social Security Employee Seminar, Roseau, Dominica

5.0 Staff Members

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