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A PROGRAM FOR THE RESUSCITATION OF THE WINDWARD ISLANDS BANANA INDUSTRY AND RECOMMENDATIONS TO CONTRIBUTE TO ITS SUSTAINABILITY IN WORLD TRADE

By
Joseph E. Edmunds* and Clayton Shillingford**

Monday May 18, 2005

Hon. Roosevelt Skerrit
Prime Minister
Government Headquarters
Kennedy Ave.
Roseau, Commonwealth of Dominica, W.I

Hon. Kenny Anthony
Prime Minister
The Graham Louisy Administration Building
Waterfront
Castries, St Lucia, W.I

Hon. Keith Mitchell
Prime Minister
Ministerial Complex, 6th Floor
St Georges, Grenada, W.I

Hon. Ralph Gonsalves
Prime Minister
Government Administrative Buildings
Kingstown, St Vincent & the Grenadines, W.I

Dear Prime Ministers,

As former Executive Officers and Technical Directors of the banana industries of the Windward Islands and Jamaica, with extensive experience in banana research, development, production and marketing worldwide, we are pleased to submit to you the attached proposal directed at the resuscitation of the Windward Islands banana industry.

We were motivated to make this presentation after extensive analysis of the present predicament of our industry and reports from some quarters that our banana industry "now faces extinction."

This paper is meant to supplement initiatives by WIBDECO, the island banana companies, and you, our leaders, in the interest of our banana industry and our many citizens whose livelihoods still depend on it.

We sincerely hope that our preliminary suggestions will be given due consideration as part of an integrated program for the resuscitation of our industry.

We remain available to assist in this process with emphasis on what can be done in the islands to sustain our industry through improved labour productivity and quality and decrease in cost of production.

Yours sincerely,

Dr.Joseph E. Edmunds

Dr. Clayton A. Shillingford

c.c.

Hon. Colin McIntyre
Minister of Agriculture
Government Headquarters
Kennedy Ave.
Roseau, Commonwealth of Dominica, W.I

Hon. Ignatius Jean
Minister of Agriculture
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Waterfront, Castries, St Lucia, W.I

Hon. Gregory Bowen
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Ministerial Complex, 2nd & 3rd Floor
St Georges, Grenada, W.I

Hon. Girlyn Miguel
Minister of Agriculture
Richmond Hill
St Vincent & the Grenadines, W.I

INTRODUCTION

This presentation to the Heads of Government of the Windward Islands (Windward Is) is put forward by the authors in a genuine desire to assist in the resuscitation of the industry and to contribute to its sustainability in world trade. Growth in the island economies and relief of poverty in the rural sector is largely dependent on developments in agriculture and more particularly bananas. As can be seen from the attached qualifications and experience of the authors, they have in the past played a pivotal role in the industry of the Caribbean and have considerable experience in advising other banana industries worldwide.

BACKGROUND

Production and Market Perspectives

The banana industry of the Windward Is. was once the economic backbone of the islands, when they enjoyed specific quotas and duty free import into the UK. With the introduction of the tariff-only EC Common Organization of the Market in Bananas (COMB) in 1993 there began a steady decline in export value from the peak levels of the 80's and the early 90's. Since then the erosion of preferences has had a devastating effect on the island economies. In 1991, bananas contributed US$130 million to export earnings, US$32 million in Dominica, US$60 million in St.Lucia, US$34 million in St.Vincent, and US$4 million in Grenada. The trend since then has been progressively downward (**Table1**). The share of bananas in export revenue from the Windward Is was estimated as a third in 1993 but was much higher in earlier years.

Table 1: FOB Export Values in US$ million, 1994-2004,

Island	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Dominica	24	18	18	18	15	15	12	8	7	5	6
St Lucia	49	52	52	37	37	34	28	16	22	16	20
St Vincent	17	25	22	16	22	20	19	13	14	11	11
Grenada	2	2	1	-	-	-	-	-	-	-	-
Total	92	97	93	71	74	69	59	36	43	32	37

Source: WIBDECO [See Footnote 1]; quoted in National Economic Research Associates (NERA) Report, 2003 and other WIBDECO sources. For Grenada (-) signifies less than 1.0 million tonnes.

The banana industry was the principal employer of the populations of the islands. The Oxford Policy Management Report asserts that in 1993-2001 banana sector employment (transportation, operations etc) was as high as 67,000 or 18% of the working population (age 15 to 60 years). From 1994 to the present there has been a steady decline in sector employment as well as the number of growers who deliver bananas for export, falling from 23,000 in 1994 to less than 5000 in 2003 (**Table 2**). The result has been, in general, a significant decline in the island economies, increased migration and in particular, increased rural poverty.

Table 2: Number of Active Growers in the Windward Islands in '000, 1994-2003

Island	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Dominica	6.8	6.2	5.5	4.8	2.9	2.9	2.4	1.3	1.0	1.0	NA
St Lucia	8.0	7.4	6.7	4.8	4.5	5.2	4.8	3.8	2.0	2.0	NA
St Vincent	7.4	6.1	5.7	6.7	4.2	4.4	3.8	2.2	2.5	2.3	NA
Grenada	0.9	0.5	0.2	-	0.1	0.1	0.1	0.1	-	-	NA
Total	23.0	20.2	18.0	16.3	11.7	12.6	11.1	7.3	5.5	4.3	

Source: WIBDECO, as quoted in the NERA Report, 2003 and other WIBDECO sources

NA, Not available

The decline in number of growers, which is estimated at more than 60% compared with pre-1994 levels, has been matched by a significant fall in area under banana cultivation. Among the three largest exporters, the biggest proportionate fall occurred in Dominica. Grenada was down to only 10% of its previous area but the recent hurricane Ivan has now completely decimated the production in that island. With these trends the income level per farmer is estimated at an average of US$5000-6000 per year, barely enough to sustain a family.

Export production of Windward Is bananas almost doubled to 260,000 tonnes in the period 1981 to 1990/2 but thereafter began a very steep decline. By 1994, export production was down to 157,000 tonnes and now stands at 84,000 tonnes in 2004, a drop of 46% (**Table 3**).

Table 3.Production of Bananas in the Windward Islands in '000 tonnes, 1994 to 2004,

Island	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Dominica	43	33	40	35	29	28	28	18	17	10	13
St Lucia	91	106	106	71	73	65	70	34	49	34	42
St Vincent	31	50	44	31	40	37	42	32	33	23	29
Grenada	5	5	2	-	-	1	1	1	1	-	-
Total	157	184	192	137	132	131	141	85	100	67	84

Source: WIBDECO; quoted in IMF Country Report 03/29 *ibid*, NERA Report and other WIBDECO sources

In 1993 a total of 470,000 tonnes of bananas were imported into the UK from all sources rising to 833,000 tonnes in 2002. By that time, Windward Is producers had lost significant market share to other ACP and dollar sources even while there was significant growth in the UK market.

Evaluating the Viability of the Industry

We should examine carefully the two main factors, low productivity and high cost of production, in the reduced viability of the Windward Is industries. Comparison with other African, Caribbean and Pacific States (ACP) and Dollar sources is instructive. Some estimate of the comparative costs of production can be gained from the FOB unit values of their exports (**Table 4**)

Table 4: Comparison of FOB Unit Values of Banana Exports in 1999

Country	**US$ per tonne**
Dominica	552
St Lucia	520
St Vincent	535
Jamaica	558
Surinam	562
Belize	568
Ecuador	235
Costa Rica	221
Cameroon	261

Ivory Coast	388

Source: WIBDECO, other ACP sources, FAO Yearbook as quoted in the NERA Report

These data are only indicative because actual production costs are not readily available since Windward Is. farmers hardly keep records until recently following EUREP-GAP, a system of UK supermarket traceable requirements on pesticide use, waste disposal and labour standards.

Receiving and loading costs are also high as indicated by **Table 5**

Table 5. Receiving and Loading Costs in US$/tonne, 1994-1997

Island	**1994**	**1995**	**1996**	**1997**	
Dominica	86.9	101.2	120.5	65.1	
St Lucia	88.4	104.3	110.2	79.9	
St Vincent	77.7	78.7	78.5	45.4	
Grenada	132.8	144.7	196.9	247.9	
Ave. Windwards	87.3	98.8	104.2	68.2	

The contrast of conditions of production is often cited for the large gap in productivity between the Windward Is. and competitive producers. (**Table 6**)

Table 6: Comparative Production Conditions

Windward Islands	**Competitive Producers**
Land hilly, and limited availability	Large, flat and wide availability

Lower soil fertility	Rich soils
Many independent small farmers. Ave. farm size, 2.5 acres	Plantation agriculture and vertically integrated into the market
Higher wages	Lower wage rates
Higher input costs due to smaller volumes and variability in growing conditions	Lower input costs due to volume and economies of scale
High shipping costs due to smaller volumes and more ports of call	Lower shipping cost due to larger volumes.
Inadequate pest & disease control systems	More integrated and effective pest & disease control
Lower yields at less than 5 tonnes per acre	Yields at 20-24 tonnes per acre
Limited land ownership	Lands owned or leased

Source: Modified from UNCTAD website (from NERA Report)

To the Windward Is. constraints we can add shortage of capital, low labour productivity, an aging work force, higher natural risks such as hurricanes, lack of access to efficient distribution channels, poor quality controls, and less effective management and marketing strategies. The banana business has very special characteristics. It is a highly perishable crop, requires careful growing conditions, packaging, transport, handling, ripening and distribution into the market place**.** To these challenges we must now add the increasing role and demands of the UK supermarkets.

On the positive side, banana growing is labour intensive, delivers a relatively quick return on effort and investment, provides a weekly income year round, and the crop recovers quickly from hurricanes and other natural disasters. Besides there is the economic benefit of the banana boats on the return voyage carrying freight of foodstuffs, raw materials and other general cargo at lower cost than would otherwise apply.

The EU has provided the traditional ACP countries with funds to improve quality and productivity through irrigation and some other appropriate technologies but the implementation has not been sufficient to offset the fall in export production.

The key indicators to evaluate viability are increased labour and land productivity, improved quality, maintenance of share in the UK market, export volumes to meet market demand and export revenue. In each case, the prospects for improved viability are based on the issues and recommendations enumerated in the proposed resuscitation program which is necessary to restore confidence of the growers and Government in the future of the industry. Continued decline in prices and export volumes against more destabilizing changes, and anticipated greater competition next year in the marketplace will spell reduced viability probably to be accompanied by grave economic and social consequences for the Windward Islands. The extent and pace of the downward spiral will continue unabated and only a well thought out plan and rapid response could help at this late date.

Management and Technological Perspectives

The industry of the Windward Is. was once centrally managed and took advantage of economies of scale by bulk purchasing of materials in a timely manner, resulting in lower administrative costs, and in general lower costs of materials needed for production.

The industry received its technical direction from the Windward Islands Banana Research and Development Center in St. Lucia. This Center and the sister organization, the Jamaica Banana Board Research and Development Department were the major institutions for banana R&D in the Western Hemisphere. These centers were staffed by the most experienced banana scientists in all aspects, breeding, agronomy, engineering, pest and disease control, and quality improvement. This is demonstrated by the role they played in the development of banana industries in Latin America serving the small banana growers who did not have access to the R&D of the banana companies such as Chiquita. Scientific personnel from the Caribbean Centers also served as advisers to international agencies in the Pacific Islands and Africa and were founding members of the Association for Cooperation in Banana Research in the Caribbean and American Tropics (ACORBAT).

In addition, Caribbean scientific personnel from these Centers presented major papers in banana research and development at international meetings and produced important advisory publications in research annual reports and other international journals which served as the foundation for continuous improvement of the banana industries in the Caribbean and worldwide.

It is now evident that the Caribbean banana industry has lost its leading position as the most important revenue earner of the islands and it has ceased to generate new or modified technologies which are so important for the survival of the industry in a global economy. The R&D arm of the industry has been considerably reduced and the technological base of the industry needs to be reviewed. The industry has lost its international technological leadership and is rapidly losing ground as a producer of bananas for the international marketplace.

AREAS FOR CONSIDERATION

The survival and sustainability of businesses, industries, and enterprises in the developing world will depend upon the introduction of appropriate management and technological systems which could give them an edge in the global market place. It is clear that the Windward Is. banana industry is losing its place in its traditional market. Policy direction, modern management

systems, research and development and the application of appropriate technologies are needed as the roadmap for sustainability of the industry.

Further, it is evident that there has been a regression in many of these areas over the years. The future of the industry will depend upon the resolve of our leaders to address the present situation with initiatives to avert a complete collapse of an industry which is so important for the social and economic development of the islands.

The following areas are recommended for consideration:

1. **Organization, Management, and Administration**
2. **Improvements in technological areas and support services**

    A. Pest and disease control

    B. Agronomic practices

    C. Fruit quality

    D. Diversification of other crops with bananas

    E. Irrigation

    F. Organic farming

    G. Scientific support staff and extension services

Organization, Management, and Administration

In order to narrow the gap in some of the differences elucidated in **Table 6** above under the heading Comparative Production Conditions, it is necessary to introduce management, administrative and organizational structures which would redound to the benefit of banana farmers and the industry as a whole.

The industry must be looked upon as a production system with component small parts operating in synchrony towards a common objective – increasing productivity, improving quality and reducing cost of production.

In order to achieve this, future banana farmers must be identified within a workable demographic positioning as partners in a competitive global market**.**

The substantial reduction in number of growers and acreages under cultivation requires immediate analysis. There is a need for a review of grower registration and an analysis of the reasons for their abandonment of farming with a view to assisting a reduced core of workers in achieving higher labour productivity and production and improved quality for the sustenance of the industry. The issue of the administration of the industry is crucial and forward planning is urgent at this point. The apparent absence of a comprehensive plan for the resuscitation of the industries is not a positive sign from the vantage point of industry administration. Additionally, growers must become stronger partners in the resuscitation plan through appropriate training in banana technology and good business practices as we enter an even more competitive global environment.

The various reports that were examined all point to the dismal state of the industry. The Windward Is. industries were expected to benefit from the protections afforded by the Lome Convention and its successor the Cotonou Agreement. These agreements were set up to ensure continued viability of ACP banana industries by stating as in the Cotonou Agreement that "*The Community agrees to examine and where necessary take measures aimed at ensuring the continued viability of their banana export industries and the continuing outlet for their bananas on the Community market*". Current evidence suggests that these arrangements have offered progressively less protection to the most vulnerable and higher cost Windward Is. producers. The remaining option therefore is to beef up the administration and management structures and where appropriate introduce technologies and practices which would lead to the achievement of improved labour productivity, production and quality.

There is therefore a need to reexamine the structure, organization, administration and management of the industry as a matter of urgency. This would include attention to infrastructure, methods of lowering cost of material inputs for production, their storage and availability in times of need and their distribution.

Possible Improvements in Technical Areas and Support Services (Needs Assessment)

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Pest and Disease Control

Adequate pest and disease control is vital for optimum crop production. The major disease plaguing the industry today is leaf spot (Yellow Sigatoka). Although the epidemiology of the disease is well known, the basic elements of management of control are not followed resulting in sporadic outbreaks of the disease resulting in loss of production and poor fruit quality. Quality improvement is critical to adding value to bananas. It is well known that the disease is caused by a fungus whose spores are carried by the wind. When the spores alight on a banana leaf, if the weather conditions are favorable, the spores germinate and the plant becomes infected. Therefore if control is to be effective it must be based largely on preventive sprays. The eventual introduction of the more virulent Black Sigatoka will make control even more difficult.

It is therefore imperative that the control of the disease must not be left to the individual farmers but must be coordinated to minimize spread of the spores from one field to another. Leaf spot control programs must therefore be managed and implemented to take into account groups of contiguous banana farmers, abandoned farms as sources of infection and poor control practices by some farmers.

Unfortunately the industry has lost thousands of tonnes of production over the last two years as a result of poor leaf spot control, either through the rejection of leaf spot fruit or poor yields and quality resulting from disease. This can be averted through a managed system of control and the use of known and practiced technology.

There is need for a review of existing operational systems and the demographics of banana holdings in each of the islands, so that control programs can be recommended together with management systems to minimize leaf spot outbreaks.

Borer and nematode control are critical for the optimum uptake of nutrients from the soil. The banana plant, because of its rapid growth requires vast amounts of water and nutrients. Borers damage the plant by larvae boring tunnels through the underground rhizome. Nematodes feed on the root system, and cause severe lesions. These tunnels and lesions are then invaded by soil bacteria and fungi. The resulting decay of the rhizome and roots weaken the uptake capacity and anchorage of the plant, causing reduced nutrition and severe toppling. In many instances toppling has been recorded as high as 50% loss of production due to borer and nematode damage. The unfortunate practice of replanting is often the result of damage by these pests. Our competitors in Latin America and elsewhere consider banana as a permanent crop. Plantations can be 20 to 30 years old. Replanting is not practiced unless plantations are damaged by flooding, hurricane or windstorms or there is need for introduction of new varieties.

A review of present practices needs to be undertaken. Timely application of effective control measures as well as the number and quality of the applications recommended are

essential for success in the control of these pests. These measures cannot be left to the discretion of farmers especially the smaller ones. As a matter of urgency, technological advances and their introduction and management in these areas need to be applied to the industry.

Agronomic Practices

There is need for a review of agronomic practices under different growing conditions. This is very important for improved productivity. Agronomic practices must be related to topography, soil type and ecological considerations. One must not apply the same agronomic recommendations for all conditions. Fertilizer formulations, frequency of application and placement must be related to soil type and topography as much as possible. The loss of fertilizer through run-off water with rains, particularly on sloping land, must be minimized.

Monitoring of soil and leaf mineral status must be done to determine the most appropriate fertilizer formulation to be used. Such was the practice in the past. Modern concepts of fertilizer application as practiced in cropping systems in more developed countries should be applied to save on fertilizer costs and wastage. For instance, follower setting and fertilizer use application can lead to increased productivity when synchronized as part of a discipline of crop husbandry and management.

Present agronomic practices need to be reviewed and an integrated package of recommendations presented which would save in the cost of production and improve yields.

Fruit Quality

The market demands a consistent premium quality fruit. Our industry suffers from fluctuations in quality resulting in unfavorable supermarket and consumer reaction, poor market prices and loss of revenue. Poor quality is partly related to inadequate pre-harvest agronomic practices and pest and disease control (particularly leaf spot control) and secondly to a sequence of post-harvest factors including field transport, handling, processing, packaging, storage, transatlantic ship transport and ripening.

A review needs to be made of practices which militate against the production of high quality fruit for the market and recommendations put in place.

Diversification of Other Crops with Bananas

A considerable amount of work has been done in this field in the Windward Islands and many recommendations have been made to the industry. Diversification with bananas is one way of developing a sound agricultural diversification program for the islands. It has been demonstrated that in the first three to four months of a new banana field there is an open canopy which could be planted to a variety of short term crops (e.g. peanuts, potatoes and other root crops, and corn.) Interplanting bananas with peanuts improves the nitrogen status of the soil and concomitant banana production. Diversification of the crop species can help in reducing leaf spot. There are known marketable bananas which are resistant to leaf spot which need to be tested commercially.

There is need for a diversification policy based upon local, regional and global markets for the intercrops. Further, recommendations need to be put in place on the use of bananas as a nurse crop in the reestablishment of permanent crops after a hurricane or in a tree crop diversification program. These practices could be developed as an agricultural policy on land use versus land capability programs. Where applicable, the marketing of intercrops as part of export cargo to Europe could help reduce shipping costs. The contribution of a diversified crop program to growth in tourism and food security is also of paramount importance. Further, banana production should not be considered in isolation, but rather as part of a system of agricultural production and management.

Irrigation

Much emphasis and finance have been put in irrigation in an attempt to increase productivity in areas where natural rainfall is inadequate. This innovation must be examined in the context of a holistic production package in terms of the various agronomic practices and other areas mentioned in earlier sections. For example, fertilizer and nematicides can be delivered through the irrigation system in a measured way. Also leaf spot can be exacerbated if irrigation is applied unto foliage which unduly increases field humidity and leaf wetness. The other key aspect of water management is to ensure the correct amount of irrigation at the right time and that drainage is adequate to prevent drowning of the root system.

An integrated program needs to be established in areas with irrigation, which takes into account the relatedness of other necessary practices and the maximization of yields.

Organic Farming

Organic farming which minimizes or eliminates the use of chemicals is receiving popular appeal in the market place. This is an effort at value adding by attempting to differentiate the product, but investment and certification requirements may be difficult to attain. As laudable as this practice may be, it must be accompanied by sound scientific data through the monitoring of the mineral status of soils and leaves for optimum production and to determine the need for changes in the organic content of minerals as necessary. As in "fair-trade" and special packs, there appears to be an opportunity to exploit the organic niche market.

A bulk system for the production of organic material needs to be introduced as well as a monitoring mechanism of the necessary soil nutrient levels for optimum crop production.

Scientific Support Staff and Extension Services

In order to implement improvements in the technological base of the banana industry of the Windward Islands, it is necessary that there be in place, a minimum of support technical staff with basic laboratory equipment and back-up extension services in the field.

An assessment needs to be made of the present capability of the industry to meet the present and future technological demands in a global perspective and recommendations made to meet those demands. In this regard the industry will need to put in place a program with adequate staffing for the training of farmers in areas related to food safety, environmental protection, occupational and health safety.

CONCLUSION

The banana industry of the Windward Is. can be resuscitated, and sustained in the world market if there is an in-depth review of the administration, management and technological base of the industry to guide policy and implementation of appropriate management practices.

Donor assistance needs to be properly channeled to produce optimal impact in the shortest possible time. The tariff scenarios being considered suggest that the Windward Is exports would suffer even more drastically if action is delayed. In the short run efficient input availability and distribution and technical aid and innovations as proposed will be critical.

The authors are of the view that there is need to give due consideration to the above areas for the sustainability of the industry. In so doing, the industry could stand a chance for significant improvement as a major revenue earner, and regain some of its losses in the market place. To that end productivity gains and quality improvement consequent on these recommendations could make a significant difference to continued industry viability.

Given the unique structure of the banana industry of the Windward Is., consisting of a large number of small holdings scattered over non-contiguous acreages in four islands, there is scope for intensive banana farming under sound management and technological inputs with the necessary support staff. This would require the identification of a core of growers who would be registered as qualified for the production of export bananas, producing 10 tonnes or more per acre. It is our expectation that with improved agricultural practices the industry can be more competitive than at present and be in a better position to weather future erosion in preferential treatment in its traditional market

The authors are of the view that in this world of global competitiveness, no industry can survive without the underpinning of appropriate quality management systems, and sound science and technology. This is true for our banana industry as it is and has been for agricultural industries in more developed countries. The authors believe there is much scope for improvement in productivity and quality at reduced costs if due consideration is given to the above considerations.

The authors have attempted to summarize a set of key issues, which, if addressed now can lead to more viable banana enterprises in the islands. We are fully aware of the concerns of our Governments, industry management, growers and the general public as the industry slide continues. We are also aware of the efforts being put in place by all concerned. For the present, in spite of serious hardship for the people, rural as well as urban communities have been able to survive, at least for the time being, through a combination of employment in the service sector, emigration and remittances from overseas. At the same time we are aware of the significant decreased income to farm families, decreased revenue to countries and the concomitant family strife and economic dislocation.

We remain available for further focused discussion on possible options that would lead to rapid implementation of the above recommendations.

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Professional Experience/Agriculture and Related Fields

Research Fellow in Nematology at the University of the West Indies, St. Augustine Campus, 1966-1971 and Director of Research and Development of the Windward Islands Banana Growers Association (WINBAN Research and Development) 1971-1984, before appointment as Ambassador of St. Lucia to the United Nations, the Organization of American States and the United States, 1984-1997.

Published extensively in the fields of Nematology, Plant Pathology, and Banana Technology; played a leadership role in those fields internationally; and acted from time to time as Managing Director of the Windward Islands Banana Industry.

Technical advice to the Windward Islands banana industry emanated from WINBAN R&D Center in St. Lucia with experiments and field officers in each of the islands.

As Ambassador of St. Lucia in the United States, championed the case for the banana industry to the US Congress, US State Department, and the OAS. As Director of the OAS office in Suriname gave advice to small banana growers in that country at the request of the Inter-American Institute for Cooperation in Agriculture (IICA)

International Consultant/Advisor

1966-1984

The Commonwealth Fund for Technical Cooperation (CFTC) and the South Pacific Bureau for Technical Cooperation (SPEC) – Training Program in banana technology held in Rarotonga, Cook Islands, for technical and extension staff from countries of the South Pacific.

Union of Banana Exporting Countries of Latin America (UPEB) – Identification of banana research priorities and the establishment of research networking.

Canadian International Development Agency (CIDA) – Determination of the training needs in agriculture for the Windward and Leeward Islands.

International Development and Research Agency of Canada (IDRC) – Review of funded programs in cropping systems in Cameroon and Nigeria.

National Institute of Agriculture in Ecuador (INIAP) – Advice on banana nematode control in Guayaquil.

Membership of Banana Organizations

Organization of Tropical American Nematologists (OTAN) – Past President and Founding Member. Serving Nematologists in Latin America, the Caribbean, and Tropical North America.

Presented several papers on banana research and development.

The Association for Cooperation in Banana Research in the Caribbean and American Tropics (ACORBAT) – Past President and Founding member. Serving banana research institutions and banana growers in the Western Hemisphere. Presented several papers on banana research and development.

Science and Technology, Conservation, Integrated development

Recently included in a list of Caribbean Icons in Science, Technology and Innovation. A founding member of the National Trust, The National Research and Development Foundation, and the Naturalist Society of St. Lucia. Cited as a "Pioneer in the Conservation Movement in St. Lucia." Has given many lectures on the concept of integrated development with emphasis on

land capability versus land use and the mobilization of national and human resources and institutional development within the realities of local, regional, and global parameters.

Honors and Awards, Lectures and Publications

Received many distinguished awards for contributions to science, and published over 50 papers in areas related to agriculture, science, technology, education, democracy, and governance. Has lectured extensively at various local, regional, and international institutions.

Education

PhD – Nematology (Cornell University)

MSc - Plant Pathology (Cornell University)

BSA - Agronomy (University of Puerto Rico)

Language Proficiency

English – Native Language

Spanish –Working Knowledge

French - Some understanding

French Creole – Working Knowledge

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Accomplishments and Abilities

Highly organized, results-oriented leader with extensive expertise in corporate, university and privately owned enterprises. Skilled in team building, professional recruitment, staffing and employer/labour relations, diversity awareness, and performance measurement

President of the Association for Cooperation in Banana Research in the Caribbean and American Tropics, (ACORBAT), 1975-1981, receiving several awards for leadership of ACORBAT. Recognized by numerous DuPont corporate awards for contributions to product development, quality assurance, marketing, diversity, and people development. President of the DuPont Black Employees Network, (1994 -1996).

Organized, led, and participated in several international conferences including the International Congress of Plant Pathology, the American Phytopathological Society, the Organization of Tropical American Nematologists, the International Network for Improvement of Banana and Plantain, and the International Society of African Scientists. Published numerous papers and reviews on banana diseases and agricultural products for several publications and conference proceedings.

Demonstrated ability in planning, designing, and implementing programs in research, business and marketing. Proven verbal and written communication skills. Possesses a strong commitment to environmental protection, broad botanical knowledge and extensive, diverse experience in agricultural research, development, marketing, and sound business practices.

Retiring in 1998 from DuPont, time is now devoted to doing consulting work in agriculture and environmental protection and leading the Dominica Academy of Arts & Sciences (http://www.da-academy.org/) which is registered with the IRS as a non-profit organization devoted to assisting in Dominica's development by engaging nationals in the Diaspora and on the island.

Professional Experience

Consultancies

International Consultant, UNDP Supported "Dominica's Biodiversity Strategy and Action Plan" 2002-2004

Consultant, DuPont Agricultural Products 1999-2003

Dominica Academy of Arts & Sciences (DAAS)

President 2002-2005

DuPont Agricultural Products, Stine Lab, Wilmington, DE Research Associate, Product Support and Renewal 1993 – 1998

Product Development Manager, Worldwide Banana Markets 1988 - 1992

Product Development Manager, Latin America and the Caribbean 1980 - 1987

University of Illinois, Urbana, IL, Visiting Professor 1979

Jamaica Banana Board, Kingston, Jamaica

Technical Director, R & D Dept 1977 - 1979

Manager, Crop Productivity 1977

University of Illinois, Urbana, IL, Research Assistant 1975 - 1977

Jamaica Banana Board, Kingston, Jamaica

Manager, Quality Control 1972 - 1975

Senior Plant Pathologist, R&D 1970 - 1972

Pathologist, R & D Department 1967 - 1969

Professional Affiliations

- Diploma of Membership of the Imperial College of Science and Technology
- Sigma Xi, The Scientific Research Society of North America
- American Phytopathological Society, (APS), Caribbean Division
- Association for Cooperation in Banana Research in the Caribbean and American Tropics, (ACORBAT)
- Organization of Tropical American Nematologists, (OTAN)
- International Network for the Improvement of Banana and Plantain, (INIBAP)
- International Society of African Scientists, (ISAS)
- President, Dominica Academy of Arts & Sciences (DAAS)

Education

University of Illinois PhD, Plant Pathology 1977

University of the West Indies Diploma in Management 1973

University of London MSc. Mycology and Plant Pathology 1968

University of the West Indies MSc. Botany/Dominica Forest Ecology 1967

University of the West Indies BSc. Botany, Chemistry, and Mathematics 1962

[1]WIBDECO, the Windward Islands Banana Development and Exporting Company is a 50:50 joint venture between the Governments and the Growers Organizations and Fyffes, which acquired the Geest banana business in 1996. Geest is now essentially a shipping company with licenses to import ACP fruit, which it trades to WIBDECO. The assets of the joint venture include a European dollar banana marketing business.

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