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CARIBBEAN FOOD CROPS SOCIETY

37

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Annual Meeting 2001**

Trinidad and Tobago

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OF THE
37th ANNUAL MEETING

15-20 July 2001

Hilton Trinidad and Conference Centre
Port of Spain, Trinidad & Tobago

Science, Technology, and Education – Empowering Caribbean Agriculture”

**Proceedings Edited
by
Wilfredo Colón**

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**Caribbean Food Crops Society Meeting
37th Annual Meeting
15-20 July 2001**

Port of Spain, Trinidad & Tobago

“Science, Technology, and Education – Empowering Caribbean Agriculture”

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Opening Remarks

**Chairperson: Mr. Winston Gibson, CFCS President, 2001
Chief Technical Officer, Ministry of Food Production and Marine Resources**

Honourable Tevor Sudama, Minister of Food Production and Marine Resources; Honourable Dr. Jennifer Jones-Kernahan, Minister in the Ministry of Food Production and Marine Resources; His Excellency Ambassador for France; His Excellency Dr. Jorge Luis Pérez Alvarado, Ambassador of the Dominican Republic; Mrs. Wendy Lee Yuen, President of the Agricultural Society of Trinidad and Tobago and Chairperson of the National Agricultural Marketing and Development Corporation; Mrs. Maureen Manchouk, President, National Institute of Higher Education (Research and Technology); Mr. Swallay Mohammed, Permanent Secretary, Ministry of Food Production and Marine Resources; Dr. Alberto Beale, Chairman, Board of Directors of the Caribbean Food Crop Society (CFCS), and other Directors of the Society; Professor Charles R. McDavid, Dean Faculty of Agriculture and Natural Sciences, of the University of the West Indies; Dr. Compton Paul, Executive Director, Caribbean Agricultural Research and Development Institute; Dr. Arlington Chesney, Inter-American Institute for Cooperation on Agriculture, Regional Director and country representative for Trinidad and Tobago; members of the diplomatic corps, distinguished guests, ladies and gentlemen.

It is with a sense of honour and a feeling of great humility, that I have the responsibility and the pleasure of warmly welcoming each and every one of you to the opening ceremony of this the 37th Annual Conference of the Caribbean Food Crop Society. I have not often had the honour of addressing such a distinguished gathering of luminaries as are assembled here this morning.

To the several visitors in our midst, I trust that your travel arrangements went smoothly; that transport from the airport was satisfactory and timely; and that you find your accommodation comfortable.

Ladies and gentlemen, I stand here before you in the capacity of President of the CFCS, 2001, and in that capacity, my primary responsibilities are for the organizing and management of all activities related to the successful mounting of this event.

This conference brings together farmers, scholars, researchers, policy makers, extensionists, growers, processors and several other stakeholders involved in or concerned about food production, distribution and policy, and aims to embrace members from the four main language groups of the Caribbean basin.

You would recall that the hugely successful 36th annual meeting and conference was held in Boca Chica, Dominican Republic in August last year. Now it is Trinidad and Tobago's turn, and we intend to do everything possible to make this year's meeting a successful and productive event.

As you know the theme of this year's conference is "*Science, Technology, and Education – Empowering Caribbean Agriculture*". While this theme may appear to some to be broad, there is no gainsaying the fact that if Caribbean agriculture is to become competitive and sustainable, science, technology and education must be adopted and applied as strategic instruments to achieve that goal.

Consistent with the main theme, the conference will therefore focus on six sub-themes. These are:

- ~ Crop and Livestock Improvements – alternative production systems, biotechnology, non-traditional commodities, HACCP, etc.
- ~ Integrated Pest Management and Food Safety – pesticides and residue levels, contaminants, biocides, regulatory, and cultural practices
- ~ Post Harvest Technology – maturity and quality indices, packaging and storage of produce, processing, and preservation.
- ~ Land and Water Resources – remediation techniques, soil amendments, application of GIS techniques, soils and environmental pollution.

- ~ Marketing, Economics and Policy issues – quality assurance, marketing intelligence, and international standards.
- ~ Agricultural Education and Extension – participatory research and development (the primary focus of the Farmers Forum on Tuesday), Farmer Field Schools, methodologies for technology transfer.

Distinguished ladies and gentlemen, the conference call for scientific papers related to the main theme, and to the six sub-themes just mentioned, yielded some sixty-odd submissions. Over the next week, these scientific papers will be the subject of intense scrutiny and discussions during the technical sessions.

On behalf of the Society, and the conference organizing Committee, I wish to express our profound appreciation to the scholars, researchers and other professionals who so resoundingly responded to the call for papers.

During the course of the conference, six technical sessions will be held to examine the scientific papers received and related to the six sub themes. A moderator and rapporteur have been selected for each technical session.

A poster display has been mounted, and you are invited to view the display during the breaks today and tomorrow.

As already stated the Farmers Forum tomorrow will address the issue of participatory research and development as a facet of our agriculture. The theme of the forum is Farmer Participation in Research and Development.

Wednesday has been reserved for field trips, and delegates are encouraged to indicate early which one of the two trips they prefer to attend. On the trip to north Trinidad, participants will visit a commercial horticulture enterprise, broiler production facility, the entomology section of the Research Division of the Ministry of Food Production and Marine Resources, a mixed vegetable – producing farm, and selected areas of the University of the West Indies.

The south trip will also visit the University of the West Indies, then move on to a commercial vegetable farm, the entomology section of the Research Division, Ministry of Food Production and Marine Resources, a large horticultural enterprise and Caroni (1975) Ltd, our largest single agricultural entity in the country.

A dinner and cultural evening is planned for tonight at the Hilton Poolside. On Wednesday night, the Awards Banquet will be held at the Savannah Terrace, Trinidad Hilton Hotel.

Distinguished ladies and gentlemen, this year's event is being sponsored by CARDI, IICA, UWI and the Ministry of Food Production and Marine Resources and each of these agencies is represented on the hard-working organizing committee. I wish to thank the organizing committee for the very professional and dedicated manner with which it approached its tasks.

Special thank you to Aurora Noguera-Devers, Joy Persad-Myers, Judith Ann Francis, Kathleen Gittens, Michelle Evelyn, and staff.

To NIHERST, a special thank you for its role in sourcing the human and other resources for interpretation at the conference.

To those corporate bodies which have agreed to sponsor some of the conference activities, another special thank you.

Greetings

**Dr. Alberto Beale, Acting Chairman
Board of Directors, CFCS**

Good Morning!

The Honorable Trevor Sudama, Minister of Food Production and Marine Resources of Trinidad and Tobago. Mr. Winston Gibson, Chief Technical Officer of the Ministry and President of the Caribbean Food Crops Society (CFCS) for the year 2000-2001. Dr. Guy Anais, Vice Chairman of the Board of Directors of the Society. Dr. Compton Paul, Executive Director of the Caribbean Agricultural Research and Development Institute (CARDI), Executive Secretary of PROCICARIBE, and President of the Organizing Committee of this meeting. Dr. Richard Brathwaite, Chairman of the Food Production Department of the St. Augustine Campus of the University of the West Indies (UWI) in representation of Dr. Charles McDavid, Dean of the Faculty of Agriculture and Natural Sciences, and co-host of this meeting. Dr. Arlington Chestney, Regional Director for the Caribbean of the Inter-American Institute for Cooperation on Agriculture (IICA). The Honorable Jorge Luis Pérez Alvarado, Ambassador Extraordinaire in representation of the Honorable Hipólito Mejía, President of the Dominican Republic. Dr. Rafael Ortiz Quezada, Under Secretary of Agriculture for Research in representation of the Honorable Eligio Jáquez, Secretary of Agriculture of the Dominican Republic. Distinguished Dr. Miguel A. Lugo López, Special Advisor to the Society's Chairman and the scientist to whom this meeting is dedicated. Ladies and Gentlemen.

We are truly delighted that after an absence of 16 years, the Caribbean Food Crops Society will hold its 37th Annual Meeting in Trinidad and Tobago. It gives me great pleasure to declare open this meeting. I wish to greet you all with a great sense of friendship and respect.

I would now like to initiate the meeting presenting the members of the Board of Directors. These are:

- Dr. Guy Anais, Vice Chairman of the Board, and Research Scientist at I.N.R.A. in Guadeloupe.
- Mr. Kofi Boateng, Secretary of the Board and Assistant Director of the University of the Virgin Island's Cooperative Extension Service.
- Mrs. Aurora Lugo López, Treasurer of the Board from Puerto Rico.
- Mr. Winston Gibson, CFCS President for the year 2000-2001 who serves as the Chief Technical Officer of the Ministry of Food Production and Marine Resources of Trinidad and Tobago.

The Board members from the French Speaking countries are:

- Dr. Guy Anais, from I.N.R.A in Guadeloupe.
- Mr. Xavier Merlini, President of AMADEPA, from Martinique.
- Mr. Marceau Farrant, Research Scientist from INRA in Guadeloupe.

The Board Representatives from the English Speaking countries are:

- Mr. Kwame García, Director of the Cooperative Extension Service of the University of the Virgin Islands.
- Dr. Richard Harrison, Director of the Rural Development Authority of the Ministry of Agriculture of Jamaica.
- Dr. Compton Paul, Executive Director of CARDI, Trinidad & Tobago.

The Board Representatives from the Spanish Speaking countries are:

- Dr. Wilfredo Colón, Agribusiness Project Director from Ana G. Méndez University System, Universidad del Este in Puerto Rico.
- Mr. Jerry Dupuy, Barceló Enterprises, Dominican Republic

- Dr. Alberto J. Beale, Agricultural Experiment Station of the University of Puerto Rico.

The position of Board Representative from the Dutch Speaking countries is currently vacant.

The members of the Advisory Board of the CFCS are:

- The Honorable Hipólito Mejía, President of the Dominican Republic.
- Dr. Altagracia Rivera de Castillo, Executive Director of the Centro para el Desarrollo Agropecuario y Forestal (CEDAF) of the Dominican Republic.
- Dr. Lawrence Lewis, Deputy Commissioner of Agriculture of the U.S. Virgin Islands.
- Dr. Charles McDavid, Dean of Agriculture and Natural Sciences at the St. Augustine Campus of the University of West Indies.
- Dr. Antonio Pinchinat recently retired from IICA, St Lucia.
- Dr. Fernando Gallardo, former Associate Dean and Deputy Director of the Agricultural Experiment Station of the University of Puerto Rico.

The two Special Advisors to the Chairman of the Board are:

- Dr. Darshan Padda, former Chairman of the Board of Directors of the CFCS and former Vice President of the University of the Virgin Islands.
- Dr. Miguel A. Lugo López, Emeritus Professor of the University of Puerto Rico and to whom we dedicate this 37th Annual CFCS Meeting.

The Caribbean Food Crops Society wishes to express its gratitude to the Ministry of Food Production and Marine Resources of Trinidad and Tobago, to the Caribbean Agricultural Research and Development Institute (CARDI), to the Faculty of Agriculture and Natural Sciences of the St Augustine Campus of the University of the West Indies (UWI) and to the Regional Office for the Caribbean of the Inter-American Institute for Cooperation of Agriculture (IICA) for inviting us to hold this 37th Annual Meeting in Port of Spain, Trinidad, and for agreeing to co-host the activity. We were eager to return to Trinidad, since the last time we met in this beautiful country was in 1985. This year marks the fourth time that the CFCS has held its annual meeting here.

The success of a Meeting depends on several factors. Two of these are the quality of the presentations and posters and 2) the diversity of its participants. This Society serves as the most effective mechanism for providing direct outreach from researchers, extensionists, Ministry of Agriculture personnel and members of the private sector to all the people of the islands and territories of the Caribbean. The greater the diversity and the number of persons attending the Meeting, the more widespread the results of last year's scientific breakthroughs and innovative projects will be.

Our Society promotes the integration of members of the agricultural sector of the Caribbean. We have also reached out to the environmental and natural resources sectors of our Region. The CFCS is the oldest and most effective regional agricultural society in the Caribbean. As I look around the audience, I am able to identify Society members from a great number of institutions.

The Society members that actively participate every year in our meetings come from: INRA from Guadeloupe and Martinique; AMADEPA or Association Martiniquaise pour le Développement Productions Agricoles of Martinique; the General and Regional Councils of Martinique; the University of the West Indies; the Caribbean Agricultural Research and Development Institute (CARDI); the Inter-American Institute for Cooperation on Agriculture (IICA); the Cooperative Extension Service and Agricultural Experiment Station of the University of the Virgin Islands, and their Department of Agriculture; the United States Department of Agriculture; the Ministry of Agriculture of Jamaica; the Centro para el Desarrollo Agropecuario y Forestal (CEDAF), as well as from the State Department of Agriculture, from the private sector and from universities from the Dominican Republic such as the Universidad Nacional Pedro Henríquez Ureña (UNPHU).

Participants include members of the faculty of the University of Florida, The Ohio State University, Tuskegee University, Prairie View A & M University, Ana G. Méndez University System and other North American institutions. Members from the Agricultural Experiment Station and the Faculty of Agriculture of the University of Puerto Rico are also regular participants.

In the past, the summer meeting of the Caribbean Basin Administrative Group was held in conjunction with the annual CFCS meeting. We are hopeful that next year we will be able to double or triple presentations from scientists working on CBAG research projects.

We are delighted that this year we have a large participation from the Ministry of Food Production and Marine Resources of Trinidad and Tobago, from the University of the West Indies, from CARDI and from PROCICARIBE. We look forward to holding future CFCS Meetings jointly with PROCICARIBE. We hope that a large delegation from Trinidad is able to attend the 38th Annual CFCS Meeting, which will be held in Martinique in July 2002.

Although we do not have all of the data from the registration table yet, I believe that the largest delegation from outside of the host country is from Martinique. I wish to congratulate the CFCS members from Martinique for being so active every year in CFCS activities.

Our Society must strive to attract new members from other islands in the Region. Over the years, we have held our annual meetings in 14 different locations in the Caribbean. However, in some countries we have not met for over 30 years, and in others, we have not met at all. We would like to explore new possibilities for venue in the year 2003. Countries that come into mind are Grenada, Belize, Guyana and the Bahamas. We request your support to the Board of Directors in identifying venues for CFCS Meetings.

Our Society must strive to establish linkages with other national and international entities within the Region. The Association of Caribbean Universities and Research Institutes (UNICA) have a membership from over 35 universities and research institutes from the Caribbean Region. The Caribbean Council of Higher Education in Agriculture (CACHE) has as its member's approximately twenty universities that include agricultural programs in their curricula. I have invited the Secretary General of UNICA, Prof. Mervyn Alleyne, and a representative of CACHE to make presentations today on what their organizations are, as well as their priorities and projects.

The CFCS should also serve to promote a closer collaboration between the Ministries of Agriculture of the Caribbean. All our countries produce more or less the same crops and animal products, and all face similar production constraints. By working together, we shall be able to reduce duplicity and make a more effective use of our limited resources.

Today, as we initiate our Annual Meeting, I would like to recognize one of most faithful members of our Society. He is a scientist, a gentleman, a diplomat, a Caribbeanist and a true patriarch of this Society. To him we dedicate this 37th Annual Meeting of this Society. Dr. Miguel Lugo-López please stand up and be recognized.

Thank you!

Keynote Address

Mrs. Wendy Lee Yuen, President, Agricultural Society of Trinidad & Tobago; Chairperson, National Agricultural Management and Development Corporation (NAMDEVCO)

Mr. President; Honourable Trevor Sudama, Minister of Food Production and Marine Resources of Trinidad and Tobago; Excellency, Dr. Jarge Lius Perez Alvarado, Chairman and Board of Directors of the Caribbean Food Crops Society, other distinguished members of the head table; especially guests, presenters, ladies and gentlemen: Welcome to Trinidad and Tobago on this auspicious occasion – the 37th Annual Meeting of the Caribbean Food Crops Society.

It is indeed a great honor and a pleasure for me to address you this morning at the start of this conference and having reviewed the diverse list of papers to be presented by our researchers and technologists and educators throw out the challenge to you all to carry out the mandate of your conference theme “Science, Technology and Education – Empowering Caribbean Agriculture”. Now more than ever before we, farmers of the region need your assistance as globalisation forces us to become efficient producers in a fiercely competitive market place where the playing field is far from level.

Mr. President, Caribbean Agriculture needs to take a quantum leap forward in the application of science and technology to current production methods in food crop farming. The time has come for research to be carried out on the farm by both farmers and researchers. In this way, meaningful solutions can be found for current problems. We must empower farmers with the tools necessary to identify problems and seek solutions. Systems must be developed to effectively and efficiently deliver information. Given our lack of infrastructure and a food production sector characterized by smallholdings we need to review our current systems for transfer of technology.

Perhaps the time has come for our researchers and extensionists to re-tool and find new methodologies for the delivery of technology. How can we involve the farmer in this process? How can we make the best use of our limited resources to reach the widest possible audience? Can we adopt the participatory approach and use former field schools to affect a more rapid delivery of technology? These questions are just some food for thought as you discuss these and other issues over the coming week.

While our ability to compete internationally and I dare say our very ability to survive, depends to a great extent on our ability to apply science and technology to our production processes, this research and technology transfer is not without considerable financial constraints. Recognizing the disadvantage that this imposes on Caribbean farmers, there are numerous international agencies seemingly bent on correcting the imbalance that exists between farmers of the developed world and farmers of the developing world in terms of their ability to access technology and education.

Sadly, in spite of the large sums of money identified for this purpose, the difficulties in meeting loan conditionalities, the exorbitant consulting fees attendant on the loan package and other administrative nightmares, very little of this aid ever finds its way to the small farmer. Perhaps there is a greater role to be played by agricultural societies and co-operations directing Ministries and the most deserving beneficiaries.

Despite all of our apparent disadvantages in utilizing science and technology, I am happy to tell you that all is not “doom and gloom”. Here in Trinidad and Tobago our food crop farmers have risen to the global challenge and are price competitive in number of fresh vegetables and fruits. Even as we face total declining acreages under food production levels of key food crops, alluding to greater efficiencies possibly due to greater adoption of suitable technologies. This has enabled our farmers to supply a wide range of high quality fresh fruit and vegetables to both the domestic and export markets even in the face of competing imported products which have enjoyed a 0% CET for CARICOM region and 40% from outside of CARICOM. Another result of this increased productivity has been the marked upsurge of our intra-regional trade since 1988 and the significant increase in our extra-regional exports particularly in crops such as hot peppers.

Mr. President, while we recognize the benefits of science and its role in improving both quantity and quality of food crops produced, we must be ever vigilant not to compromise our consumers and our

environment in terms of safety. Food safety implies the judicious application of pesticides in conformity with the manufacturer's specifications. Ladies and gentlemen it is no longer acceptable to leave the responsibility of food safety solely to the discretion of the farmer. We are all consumers of fresh produce, and as such deserve to be protected. We must call on all Governments of the region to not only enact safe food legislation but also to implement suitable systems which will enforce the minimum standards for food safety. WTO conditionalities demand traceability and accountability for safe food systems and these must be fully functional to facilitate the export of fresh produce.

Ministries of Agriculture and Food Production need to take the lead in this initiative to ensure good food quality. While the analytical capabilities of many small Caribbean countries may not be adequate, here is another opportunity for inter-regional co-operation by having member states contribute to the establishment of one central lab facility where appropriate testing for pesticide residues and other contaminants can be carried out. If we fail to provide our domestic consumers with assurances of good quality, safe produce, then we run the risk of driving our customers preferences to "so-called safer imports". Our deficiencies in pesticide residue analysis have caused us to accept the stated quality of imports without question but this may very well be an area for some concern.

Arising out of our concerns for safe food, as well as a concern for the safety of the environment and not least, the farmer and his workers, we need to explore more fully the practices of integrated pest management and encourage greater usage of botanicals and biologicals in preference to harsh chemical pesticides. Where possible farmers should be instructed in techniques to locate and identify beneficial insects rather than adopting the old approach of "if it moves – kill it". Cultural and biological rather than chemical solutions should be encouraged.

To translate this IPM strategy to a national perspective would require a great deal of support from policy makers, pesticide control boards and indeed from Ministers and governments. Mr. President, it is my personal view that we need to severely restrict the availability and usage of certain classes of pesticides which are hazardous to the environment the farmer and the consumer. This is one area deserving of further research as we all seek safer alternatives in the production of food crops.

Utilizing IPM as a production strategy can facilitate the attainment of international standards as specified in the Codex Alimentarius. Together with good agricultural practices, IPM can be significantly reduce the number of critical points in a HACCP production system and the resulting crops will be more wholesome and consumer friendly.

Mr. President, the food crop sector has an important role to play in the Caribbean region due to its direct impact on a number of key issues. The region has to look beyond the stated declining contributions of agriculture to the ADP. These figures are relative to growth in other sectors such as tourism or in the case of Trinidad and Tobago petroleum and should not be used as the sole indicator of agricultural performance. Indeed in absolute terms there has been significant growth in the sector. However statisticians/economists have found it convenient to attribute revenue from agro processing to the manufacturing sector to the detriment of the agricultural sector. For e.g. various reports would have your believe that the coconut industry is dead and waiting to be buried yet it supports a \$100M a year soaps and fats and oil industry with linkages to transport, packaging, advertising, employment generation and foreign exchange earnings.

Notwithstanding its seemingly small contributions to GDP, the food crop sector has a serious responsibility in terms of the provision of food security and contribution to the adequate nutrition of the population of the region. Mr. President, several benefits accrue from the fulfillment of this role.

By continuing to produce our food crops we enhance our self-sufficiency and reduce the dependency on risky international suppliers who are facing threats from all manner of exotic pests and diseases from Foot and Mouth disease to Asian bird flu. We generate employment for our citizens particularly in the rural areas and this contributes significantly to overall social stability.

The FAO in its paper on "Issues at stake relating to Agricultural Developments, Trade and Food Security" has concluded "significant progress in promoting economic growth, reducing poverty and enhancing food security cannot be achieved in most countries without developing more fully the potential capacity of the agriculture sector and its contribution to overall economic development".

Participants your interventions this week aimed at increasing agricultural production and productivity are indeed welcome and timely. Against a background of continuing export subsidies in developed countries which discourages domestic production in food importing countries the challenge for you this week is to guide us to the appropriate science and technology that will truly empower Caribbean Agriculture. Mr. President, Ladies and Gentleman, I wish you a fruitful conference.

Feature Address

Hon. Minister Trevor Sudama **Ministry of Food Production and Marine Resources**

Mr. President; Ms. Wendy Lee Yuen, President of the Agricultural Society of Trinidad and Tobago; members of the Board of Directors of the Caribbean Food Crops Society; other distinguished members at the head table; participants, ladies and gentlemen, may I add my own welcome to each of you here this morning. A special welcome to the several visitors to Trinidad who come from other countries in the Caribbean and Latin America.

Mr. President, it is with interest that I took note of the theme of this the 37th Annual Caribbean Food Crops Society (CFCS) Conference, which is *Science, Technology and Education – Empowering Caribbean Agriculture*.

Considering the present state of Caribbean agriculture, the unfolding demands in the area of international trade in agricultural and food products and the challenges our countries face in closing the gap on producers from developed countries, I applaud the Society for its choice of this theme at this particular time.

I do so because I concur fully with the Society that fostering the application of science, the use of technology and the educating and training of stakeholders are indispensable to sustainably empowering Caribbean agriculture.

The status of agricultural development in Caribbean states is such that despite the continued reliance of these countries on agriculture for foreign exchange, food supply and employment, the contribution of the sector has declined in relative terms in varying degrees from country to country.

For example, in the case of Trinidad and Tobago, the relative contribution of agriculture to GDP had declined from 5.0 percent in 1985 to 2.2 percent in 2000, while the sector's labour force fell from 10.8 percent of the national labour force to 9.0 percent over the same period.

The decline in relative contribution of the agricultural sector to the economy of our states has been attributed to several factors including low productivity of the traditional export commodities, coupled with the failure of the non-traditional commodities to make-up the deficit. The technologies in use are neither the most productive nor the latest, and unit production costs are higher than those of competitors in developed and some developing countries.

Mindful of the potential role and contribution which agriculture can still play in the development of Caribbean states, and in attempting to address the reduction in market share of traditional export commodities, the governments of these states must adopt policies and strategies to diversify production and marketing, and to increase production, productivity and competitiveness.

Improvements in the development and use of technology will determine to a large measure, the success of these states in diversifying agricultural production, increasing productivity and meeting the challenges and demands of the export market.

Already science and technology are affecting access to export markets. The Codex Alimentarius (or food code) is fast becoming the seminal global reference point for consumers, food producers, national food control agencies and the international food trade.

In that context, giving effect to the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) and the Agreement on Technical Barriers to Trade (TBT) pose daunting challenges to countries such as ours.

Indeed, a number of developing countries consider SPS requirements to be one of the greatest impediments to trade in agricultural and food products, particularly in the case of the European Union (E.U.).

The problems developing countries have in complying with SPS requirements reflect their wider resource and infrastructure constraints that limit their ability to comply with SPS standards.

A particularly acute problem is access to appropriate scientific and technical expertise and infrastructure.

Furthermore, in many circumstances SPS requirements are incompatible with existing systems of production and marketing in developing countries. In the case of Trinidad and Tobago, increased food safety standards in export markets have already affected some fish and fish products, and are a potential threat to other commodities such as milk, vegetables, fruits and poultry.

And then, we are faced with yet another scientific and technological challenge-genetically engineered foods. The Codex Alimentarius is coming under increasing pressure to publish draft standards for genetically modified organisms (GMOs), and we can be sure that scientific and technological requirements will dominate those standards when formulated.

We have taken note of the 1999 Codex Alimentarius guidelines for the production, processing, labelling and marketing of organically produced foods. In each case, we are alerted to the need for our countries and region to develop scientific, technological and educational capabilities to deal with the guidelines, which are soon to become standards.

And so the imperatives of accessing, developing and promoting the adoption of appropriate technology and scientific methodologies become obvious.

In that respect, Caribbean states must consider the benefits to be gained by adopting a regional approach to satisfying the ever-increasing demands of the markets in international trade for agricultural products.

It is equally obvious that if our states are to confront the challenges of increasing productivity and improving competitiveness, science and technology must be applied in the areas of research, extension, agro-processing and marketing.

In the case of research, a priority area of attention and effort must be on increasing the effectiveness, efficiency and responsiveness of the existing research and extension institutions in our countries and region.

Research and development should lead to technology transfer to farmers or to technology adaptation or innovation in biotechnology or agri-based industry.

Regional agriculture teaching and research institutions must ensure that syllabuses are appropriately modified to remain current and aligned to vital issues demanding response from our agricultural sectors.

On a related note, we should all be concerned with the dwindling enrolment in the agriculture disciplines at the University of the West Indies (UWI) and at the Eastern Caribbean Institute of Agriculture and Forestry (ECIAF).

In the case of the government of Trinidad and Tobago, we are considering a mechanism to stimulate increased competition among researchers and research organizations through the establishment and operation of a competitive research fund to finance projects that meet strategic national agricultural development objectives.

In addition, we are now undertaking a review of the operations and organisation of state-funded research and extension institutions and systems with the intent of making required adjustments.

In the areas of agro-processing and marketing, Trinidad and Tobago are considering the application of incentives as targeted and transitional instruments to help achieve the specific developmental objective of technology transfer.

Mr. President, in many places information and information technology are being viewed as factors of production. The availability, accessibility and flow of information to and among sector participants are fundamental requirements for encouraging the application of science and technology in our agricultural sectors, and for increasing the level of entrepreneurship.

Caribbean countries must enhance the information technology infrastructure servicing the agricultural sector to allow ready access of databases to stakeholders, particularly producers and marketers.

In that regard, we are encouraged by the progress made in the region with the development and installation of the Caribbean Agricultural Information Service (CAIS); the Caribbean Agricultural Marketing Intelligence and Development network (CAMID), and the several networks within the Agricultural Science and Technology Networking System of the Caribbean (PROCICARIBE).

In the case of PROCICARIBE, the objectives include:

- ~ assisting and facilitating the establishment of commodity-based and thematic networks, and
- ~ assisting in the design and establishment of a science and technology system for the development of sustainable agriculture in the Caribbean.

Mr. President, these efforts are critical if our states are to

- ~ provide access to information products and services in priority areas for development, and
- ~ build capacities in member's states to manage information, and for the collection, organization, dissemination and analysis in support of the needs of the sector.

Mr. President, while we note these advances, stalled initiatives such as the efforts of CEDAF (Centro Para Desarrollo Agropecuario y Forestal) and CCST (Caribbean Council for Science and Technology) to establish a Biotechnology Network must be reactivated and brought to fruition.

Mr. President, there is also a role for science, technology, education and training in our efforts to foster rural development. Our past attempts to realise acceptable levels of development in our rural communities have been disappointing and have led to a redefinition or repositioning of the concept of rural development. At the international level, the issue of the multi-functionality of agriculture has been raised and is receiving the attention of stakeholders.

In the revised dispensation, science and technology are being viewed as essential inputs for environmentally sustainable rural development and employment generation.

In our region, we must also address the development and provision of information and information services within the context of rural development. The analysis shows that in general, rural communities in our countries have not as yet benefited from the unfolding revolution in information technology.

We must therefore deal with the issue of providing information infrastructure and services for rural development, including the strengthening of information and communication capacities in our rural areas.

In so doing, quite apart from the provision of hardware, software, databases and Internet access, the matter of information literacy of the intended beneficiaries must be approached in the context of knowledge management.

Mr. President, most of the Caribbean countries have already completed their needs assessment over the short to medium term, of their agricultural sectors, and are aware of the deficiencies in education and training among their stakeholders.

I had previously mentioned deficiencies in our capacities to meet Codex Alimentarius standards, which are related to a shortage of scientific and technological know-how. These deficiencies are also evident when we attempt to deal with issues of genetically modified foods, biotechnology, informatics, biodiversity and sustainable resource management.

Comprehensive plans to satisfy those education and training needs among our farmers, researchers, marketers, rural communities, extensionists, policy makers, scientists, quarantine officers, and processors, among others, must now be drawn up, and resources secured to execute those plans over the next several years.

While some assistance in funding for education and training can be expected from international agencies, Caribbean states must themselves be prepared to adjust developmental priorities to provide resources to cater to those needs.

Mr. President, distinguished participants, I have attempted in a concise manner, to share with you my vision of the role of science, technology and education in Caribbean agriculture if it is to be empowered, competitive and sustainable over the medium to long term.

We are aware that considerable resources will be required to provide physical and other infrastructure; to adopt or change existing production processes; to establish new institutions; to change laws and regulations and to educate and train a range of sector stakeholders.

Given the limited availability of financial resources common to each of our economies, and the fierce intersectoral competition for those resources, you will agree that the challenge ahead is a formidable one.

Yet the stakes are high, and our failure to respond to the imperatives for making our agriculture competitive and sustainable will impact negatively and perhaps disastrously on our economies, and on the well being of our peoples.

Where feasible, we will need to plan and act as a region, but in many instances, the response must be at a national level.

We have configured and shared a vision for the future of Caribbean agriculture. The challenge now is to do everything possible to realize that vision.

Mr. President, distinguished participants, I wish you all success with your Conference, and thank you for your attention.