



IMPROVING LIVES THROUGH  
AGRICULTURAL RESEARCH

HQ/002/17

# Agriculture *in the* News



## Issues Affecting Caribbean Agriculture

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**One-stop shop for knowledge on banana and enset bacterial wilt.** *Bioversity International* 18 August 2017

<https://www.bioversityinternational.org/news/detail/one-stop-shop-for-knowledge-on-banana-and-enset-bacterial-wilt/>

Published in *Frontiers in Plant Science*, a review by Bioversity International and partners describes global distribution, symptoms, pathogenic diversity, epidemiology and the state of the art for sustainable management of the major bacterial diseases affecting banana and enset.

... “However, the current situations in Africa (for *Xanthomonas* wilt), Latin America and the Caribbean (for Moko and *Dickeya*) suggest that more efforts are needed at different levels. Growers, technicians and extension workers should be trained on disease recognition, epidemiology and management practices, with the support of plant protection experts,” said [Guy Blomme](#), Bioversity International scientist and lead author. In the current molecular era, an integration of sensitive and specific diagnostic tools together with transgenic approaches, conventional breeding and screening for escape cultivars may offer environmentally friendly and less labour-intensive options to control bacterial diseases. ...

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**Agriculture in the News** is a weekly newsletter which provides a compilation of selected news articles on issues affecting agriculture in the Caribbean region. Articles from Newspapers, Online News Service Agencies, Newsletters and Press Releases are featured.

For copies of documents cited, visit the web address or source of the information provided.



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## CASSAVA

**Boosting cassava production** by Marnus Cherry, Ministry of Agriculture, Government of Saint Lucia website, Thursday, August 17, 2017

<http://www.govt.lc/news/boosting-cassava-production>

### Full article

A root crop development project helps improve the efficiency of cassava processing  
The Minister for Agriculture, Hon Ezechiel Joseph, has voiced continued support for Saint Lucia's cassava industry as part of a wider plan to improve food security in the Caribbean region.

The minister's comments were made earlier this year, at an inception workshop and cassava value chain cluster meeting, that was held to sensitize at least five important stakeholders—the Network of Rural Women Producers (Babonneau and Micoud Cluster), the Fond Assau Agro Processing Plant, the Bureau of Standards, the Development Bank and the Bakery Industry—of developments in the root and tuber crop (cassava) industry.

“This project came to fruition as a result of a request to the FAO for assistance in addressing processing issues in relation to the cassava crop, especially because one of the readily-available infrastructures— the Fond Assau Agro Processing Plant—had been in the retrofitting and refurbishing mode for the past six years,” the minister said. The assistance of the FAO allowed for facility upgrades to food and safety compliance standards, and the ability to accommodate the cluster groups of the Saint Lucia Network of Rural Women Producers on a full-time basis.

Deputy Permanent Secretary in the Ministry of Agriculture, Augustus Cadette, thanked the FAO for the project “Sustainable Approaches to Agribusiness and Value Chain Development of Roots and Tuber Crops in the Caribbean,” valued at US\$500,000. Mr Cadette additionally expressed the ministry's gratitude for the donation of a cassava grinding machine with the capacity to grind 1000 kilograms per hour. The DPS highlighted the benefits of automation in modern agriculture, and its efficiency in the agro processing of root and tuber crops.

Regional Project Coordinator for the FAO, Vermaran Extavour, stressed the importance of cassava as a food security crop, as is the present case at the CARICOM level.

“Cassava is the prioritized commodity for this project, and currently results in a two percent reduction on the food import bill within CARICOM,” she said. “Saint Lucia, as one of these CARICOM countries, must continue to contribute to the import bill's further decline.”

She added that at the culmination of the project, Saint Lucia will be equipped to apply a value chain mindset toward the sustainable functioning of its Root and Tuber Crop Industry.

The Ministry of Agriculture, Fisheries, Natural Resources and Cooperatives collaborated with the Food and Agriculture Organization (FAO) on the project. The project envisions helping the root and tuber crop stakeholders (the local cassava industry) upgrade processing capacity and participate in value chain developmental activities.

Capacity building and technical assistance for the workshop were provided by IICA and CARDI, respectively. CARDI, alongside the Extension Division of the Ministry of Agriculture has been providing and categorizing at least three cultivars needed for niche market development.

## BANANA

**One-stop shop for knowledge on banana and enset bacterial wilt.** Bioversity International 18 August 2017

<https://www.bioversityinternational.org/news/detail/one-stop-shop-for-knowledge-on-banana-and-enset-bacterial-wilt/>

### Full article

*Published in Frontiers in Plant Science, [a review](#) by Bioversity International and partners describes global distribution, symptoms, pathogenic diversity, epidemiology and the state of the art for sustainable management of the major bacterial diseases affecting banana and enset.*

The production of banana and enset (a close relative of banana) is affected by a range of bacterial diseases that cause major losses worldwide. Until recently, bacterial diseases of bananas and enset had not received an equal amount of attention compared to other major threats to banana production such as the fungal diseases [black leaf streak](#) (*Mycosphaerella fijiensis*) or [Fusarium wilt](#) (*Fusarium oxysporum* f. sp. *cubense*). However, as it turns out, **bacteria cause significant impacts on bananas globally and management practices are not always well known or adopted by small-scale farmers.**

Bacterial diseases in bananas and enset can be divided into three groups: (1) Ralstonia-associated diseases (Moko/Bugtok disease caused by *Ralstonia solanacearum* and banana blood disease caused by *R. syzygii* subsp. *celebesensis*); (2) [Xanthomonas wilt](#) of banana and enset, caused by *Xanthomonas campestris* pv. *musacearum* and (3) bacterial head rot or tip-over disease caused by *Pectobacterium carotovorum* (formerly *Erwinia carotovora*) and bacterial rhizome and pseudostem wet rot (caused by *Dickeya paradisiaca* formerly *E. chrysanthemi* pv. *paradisiaca*).

[A new review paper](#) – authored by scientists from Bioversity International, EMBRAPA (Brazil), The Royal Museum for Central Africa (Belgium), The Institute of Plant Health Research (Cuba), The University of Reunion (France) and CIRAD (France) – **describes global distribution, symptoms, pathogenic diversity, epidemiology and the state of the art for sustainable disease management of the major bacterial wilts currently affecting banana and enset. The review paper draws attention to similarities across the bacterial diseases in symptom expression and control/management options.**

“This review will benefit the banana community worldwide as it puts, for the first time, most of the available information on bacterial wilts of banana in a single place. The paper also highlights the geographical distribution and symptoms of these diseases in a clear way, and may help the diagnostic process and even quarantine regulations for those countries where specific diseases are

not yet present, as is the case of *Xanthomonas* wilt in Latin American and the Caribbean,” said Miguel Dita, a scientist at EMBRAPA and co-author of the paper.

**Acceptable management and control of bacterial diseases in banana and enset is achievable by following strict, coordinated and integrated activities.** A first critical step in plant disease management is diagnosis. Disease recognition in banana plants affected by bacteria is achieved by plant-by-plant inspection of the plantation at regular intervals.

In regions, villages or farms where bacterial diseases are not present, the first line of defense is to avoid introducing them. Use of clean planting material and good sanitation procedures need to be always coupled to quarantine methods.

Where a disease is already present, control options should focus on a systematic area-wide approach, with the adoption of a combination of activities such as limitation of access of animals, regular disinfection of farm tools, early removal of male flowers/buds and of diseased plants, to name a few.

These activities, when area-wide performed in a systematic way and based on epidemiological parameters, may guarantee sustainable control.

**“However, the current situations in Africa (for *Xanthomonas* wilt), Latin America and the Caribbean (for Moko and *Dickeya*) suggest that more efforts are needed at different levels. Growers, technicians and extension workers should be trained on disease recognition, epidemiology and management practices, with the support of plant protection experts,”** said [Guy Blomme](#), Bioversity International scientist and lead author. In the current molecular era, an integration of sensitive and specific diagnostic tools together with transgenic approaches, conventional breeding and screening for escape cultivars may offer environmentally friendly and less labour-intensive options to control bacterial diseases.

“This paper will help extension officers and national plant protection organizations to improve quarantine regulations and disease diagnostics in national surveillance programs. The paper also provides information on best biosafety practices for medium and small-scale banana growers to prevent the entry of a disease on farm and prevent subsequent dispersal,” concluded co-author Luis Pérez Vicente from INISAV, Cuba.

**[Read the paper](#)** Blomme G, Dita M, Jacobsen KS, Pérez Vicente L, Molina A, Ocimati W, Poussier S and Prior P (2017) Bacterial Diseases of Bananas and Enset: Current State of Knowledge and Integrated Approaches Toward Sustainable Management. *Front. Plant Sci.* 8:1290. doi: 10.3389/fpls.2017.0129 <https://www.bioversityinternational.org/e-library/publications/detail/bacterial-diseases-of-bananas-and-enset-current-state-of-knowledge-and-integrated-approaches-toward-sustainable-management/>

## COCONUTS

**Coconut industry benefits from CARDI project.** Jamaica Observer, August 15, 2017

[http://www.jamaicaobserver.com/agriculture/coconut-industry-benefits-from-cardi-project\\_107299?profile=1373](http://www.jamaicaobserver.com/agriculture/coconut-industry-benefits-from-cardi-project_107299?profile=1373)

### Full article

Since the implementation of the Caribbean Coconut Industry Development Project two-and-a-half years ago, the Caribbean Agricultural Research and Development Institute (CARDI) has made several strides in improving the local coconut industry through training as well as the establishment of new nurseries among other targeted initiatives.

The four-year project was undertaken through a partnership between CARDI and the International Trade Centre (ITC), with funding provided by the European Union. It was aimed at improving income and employment opportunities, food security, and overall competitiveness of the Caribbean coconut sector

Participating countries in the project include Jamaica, Belize, St Vincent and the Grenadines, St Lucia, and Suriname, among others in the region.

According to CARDI country representative for Jamaica Dr Gregory Robin, Jamaica has the most organised coconut industry board in the region and so a partnership was developed with the local Coconut Industry Board, which had established a national stakeholder platform that addresses all the issues along the value chain, from production to the manufacturing of coconut water, oils and soaps.

He noted that since the project's inception they have done a lot of training and established numerous nurseries across the island, with the newest one slated to be built in the western section of the island. The CARDI country representative added that the training conducted locally also facilitates regional farmers, processors and producers as Jamaica has much more established facilities to cater to the necessary training.

Robin explained that they are also looking at all the various pest and disease issues, including the coconut mite, ambrosia beetle, and the lethal yellowing. In turn, they are working on clean planting materials, which will also be a main focus moving forward for the remaining two years of the project.

He added that training will centre on integrated pest management (IPM), which will be done by conducting experiments in various countries and, in the case of Jamaica, they have selected plots to examine the aforementioned pests and disease.

“Again, we are working closely with the Coconut Industry Board. They were involved with selection of farms,” he said. “We're gonna do more nursery management because the key in expansion is having clean planting materials, so we're gonna ensure the nurseries are in good condition and they have irrigation facilities to ensure we get vibrant seed material and things like that,” Robin said.

In his assessment of the local coconut industry, Robin stated that it has suffered a serious setback from lethal yellowing, but the Coconut Industry Board has made some significant progress with varieties and management of the disease over the years.

“It's very important we do not move diseased planting materials around the island,” he said. “The disease is in a particular area; keep it localised, and I think the Coconut Industry Board is doing a good job on that. What the project is doing is supporting the board to ensure we get the sustainability of those activities,” Robin said.

He explained that they have applied for an extension of the project and the response has been positive so far. Hopefully, he said, this means they will have coconut activities going on for the next four or five years in Jamaica as well as in the rest of the region.

“We have done a lot of training on good manufacturing practices in the small processing water bottling plants and now we want to address the issue of vending around the roadside because that needs addressing and improvement of the sanitation standards. So it's a pretty interesting project and we are getting some good results from it,” Robin told the **Jamaica Observer**.

## **ARROWROOT**

**Arrowroot Revival.** Government of Saint Vincent and the Grenadines Government website, 16 August 2017

<http://www.gov.vc/index.php/news/624-arrowroot-revival>

### **Full article**

The redevelopment of the arrowroot industry in Saint Vincent and the Grenadines, was the main highlight of discussions held on Tuesday 15th August, at a one-day workshop.

Stakeholders at the forum carried out an assessment of the arrowroot industry, in relation to market, technology, food safety and quality compliance.

The local participants are joined by consultants from the International Trade Centre, the joint agency of the World Trade Organisation and the United Nations.

During his remarks at the opening, Mr. Raymond Ryan, Permanent Secretary in the Ministry of Agriculture, Forestry, Fisheries, & Rural Transformation, said that the agricultural sector is vital to the development of the country. He however noted that the sector remains vulnerable, as it is facing a number of challenges.

Mr. Ryan added that the Arrowroot Industry Association has indicated that buyers have expressed an interest in purchasing 100,000 pounds of starch per year, but the potential market is estimated to be even larger, given a growing demand for gluten-free products.

He further stated that although the Government is moving to revitalise the industry, there are a number of underlying issues that need to be addressed.

In presenting his report on the findings of the arrowroot industry in Saint Vincent and the Grenadines, Professor Leonard O'Garro, of the University of the West Indies, said that the industry has a bright future.

Mr. Matias Urru-tigoity of the International Trade Centre in Geneva, said that the objective of the project is to help to provide an income for the farmers in Saint Vincent and the Grenadines.

## COCOA

**Rio Claro Cocoa Beans Among World's Best.** Government Information Service Limited (GISL), Trinidad and Tobago, 18 August 2017

<http://www.news.gov.tt/content/rio-claro-cocoa-beans-among-world%E2%80%99s-best#.WZxTsumQyM8>

### Full article

**August 18, 2017:** Cocoa beans produced by the Rio Claro Demonstration Station, a small agriculture unit in the Nariva / Mayaro county office of the Ministry of Agriculture, Land and Fisheries are among the 50 best bean samples in the world, according to a panel of judges at the Salon du Chocolat, the annual showcase of the industry's leading chocolatiers and chocolate makers.

"It was an experimental six-week project to teach farmers how to do drying," said County Officer Florencia Beckles who heads a 15-person team at the station, which includes Station Manager Sashtri Doon and Quality Officer Roger Poliah.

"About 75 percent of the estates in the county are abandoned," Beckles explained. "We wanted to show the farmers that given the microclimate of this area the quality of the beans was excellent. We wanted to give them a reason to get back into production; show them they could produce quality dried beans themselves and get a good price on the market."

Experimental or not, the achievement stands out on account of the cultivation techniques used by staff of the Rio Claro Demonstration Station as well as the team's reliance on inexpensive, "low-tech" methods—beans were sun-dried, for example—for producing high quality cocoa.

"Cocoa in Trinidad and Tobago is not generic," Minister of Agriculture Clarence Rambharat explained. "It's plant, soil, and geography-specific. Farm practices create the bean. It is not accidental at all. Rio Claro is such a small team; I think that is what makes this a remarkable accomplishment."

In short, it matters how and where the cocoa grows. With almost 30 acres in Ecclesville under cocoa cultivation, the Rio Claro project team harvested pods that were predictably sweet and consistent in quality with other varieties of "trinitario" beans native to Trinidad and Tobago.

In fact, so popular are trinitario beans with the world's chocolate cognoscenti that this year's Salon du Chocolat features "single-origin" cocoa from not one but two Trinidad and Tobago locales: the Rio Claro Demonstration Station and the San Juan Estate in Gran Couva whose samples also earned top 50 recognition.

And just this week, Tobago Cocoa Estate's 'Laura' milk bar, also made from the finest trinitario beans, won gold in the semifinal round of another competition, the International Chocolate Awards.

Held in Paris from Oct. 28 to Nov. 1, the Salon du Chocolat will host 500 participants from more than 60 countries, including 200 world-renowned chefs and pastry chefs.

To qualify for the finals of the International Cocoa Awards, one of the Salon du Chocolat's marquee events, the top 50 bean samples will be processed into chocolate following which they will undergo sensory evaluation through September by a panel of 40 experts.

Some 12-15 finalists are expected to be named by mid-October with the final award ceremony carded for October 30th, 2017.

## **LIVESTOCK**

**Lifetime performance of West African dwarf goats under different feeding systems**, International Livestock Research Institute (ILRI), 16 August 2017  
<https://news.ilri.org/2017/08/16/wagoats-lifetime-performance/>

### **Full article**

A [new paper](#) by scientists at in the International Livestock Research Institute (**ILRI**) and Wageningen University and Research (**WUR**) compared the lifetime performance of West African Dwarf goats (WAD) kept under various feeding systems. They conclude that West African smallholders can best enhance their goat production systems by supplementing the diets of their grazing goats with farm-generated feeds.

Comparisons of the lifetime productivity of individual animals raised by farmers using alternative livestock interventions allowed the research team to assess, reliably and over the long term, the investment opportunities for smallholder farmers.

A dynamic modelling approach was used to explore the effects of different feeding strategies on the lifetime productivity of West African Dwarf goats in southwestern Nigeria. These goats, which are markedly stunted, with typical heights of 30 to 50 cm (12 to 20 in), are more disease resistant than other breeds of domestic goat and are important in the rural village economy of West Africa.

The research team modified the current version of ‘Livestock Simulator’ ([LIVSIM](#)), an individual-based livestock production model that simulates animal production (meat, milk, progeny and manure) and maintenance requirements. Different livestock units can be taken into account, each characterized by production objectives, animal species and breeds. The research team used LIVSIM to test the impacts of changes in inputs such as the quality of feed in West African Dwarf goat raising, which confirmed the sensitivity of the modelled weight development and reproductive performance. The values of simulated model outputs corresponded well with observed values for most of the variables, except for the pre-weaning mortality rate in cut-and-carry feeding systems, where a wide discrepancy between simulated (2.1%) and observed (23%) data was found.

A scenario analysis showed that simulated goats raised in a free-grazing system attained sexual maturity and kidded much later than those raised in grazing plus feed supplementation and in cut-and-carry feed systems. The simulated results indicate that supplementing goat feed with protein and energy sources enhances the lifetime productivity of these goats, as seen in their early sexual maturity and higher birth weights. In terms of economic returns based on feed costs alone, the ‘moderately intense’ feed system produced the greatest profits over the lifetime of the goats.

Read the limited-access article: [Assessment of lifetime performance of small ruminants under different feeding systems](#), by Tunde Amole (ILRI), Mink Zijlstra (Wageningen University and Research), Katrien Descheemaeker (Wageningen University and Research), Augustine Ayantunde (ILRI) and Alan Duncan (ILRI), in *Animal*, 29 Dec 2016.

## CLIMATE-SMART AGRICULTURE

**What does ‘climate-smart agriculture’ really mean? New tool breaks it down** by Desmond Brown, IPS Inter Press Service News Agency, 14 August 2017  
<http://www.ipsnews.net/2017/08/climate-smart-agriculture-really-mean-new-tool-breaks/>

### Full article

PORT OF SPAIN, Trinidad, Aug 14 2017 (IPS) - A Trinidadian scientist has developed a mechanism for determining the degree of climate-smart agriculture (CSA) compliance with respect to projects, processes and products.

This comes as global attention is drawn to climate-smart agriculture as one of the approaches to mitigate or adapt to climate change.

Steve Maximay says his Climate-Smart Agriculture Compliant (C-SAC) tool provides a certification and auditing scheme that can be used to compare projects, processes and products to justify the applicability and quantum of climate change funding.

“C-SAC provides a step-by-step, checklist style guide that a trained person can use to determine how closely the project or process under review satisfies the five areas of compliance,” Maximay told IPS.

“This method literally forces the examiner to consider key aspects or goals of climate-smart agriculture. These aspects (categories) are resource conservation; energy use; safety; biodiversity support; and greenhouse gas reduction.”

He said each category is further subdivided, so resource conservation includes the use of land, water, nutrients and labour. Energy use includes its use in power, lighting, input manufacture and transportation. Safety revolves around production operations, harvesting, storage and utilization.

Biodiversity support examines land clearing, off-site agrochemical impact, limited introduction of invasive species, and ecosystem services impact. Greenhouse gas reduction involves enteric fermentation (gas produced in the stomach of cattle and other animals that chew their cud), soil management, fossil fuel reduction and manure/waste management.

“These subdivisions (four each in the five categories) are the basis of the 20 questions that comprise the C-SAC tool,” Maximay explained.

“The manual provides a means of scoring each aspect on a five-point scale. If the cumulative score for the project is less than 40 it is deemed non-compliant and not a truly climate smart agriculture activity. C-SAC further grades in terms of degree of compliance wherein a score of 40-49 points is level 1, (50-59) level 2, (60 -69) level 3, (70-79) level 4, and (80-100) being the highest degree of compliance at level 5.

“It is structured with due cognizance of concerns about how the global climate change funds will be disbursed,” he added.

The United Nations (UN) Food and Agriculture Organisation (FAO) describes climate-smart agriculture as agriculture that sustainably increases productivity, enhances resilience (adaptation), reduces or removes greenhouse gases (mitigation) where possible, and enhances achievement of national food security and development goals.

The climate-smart agriculture concept reflects an ambition to improve the integration of agriculture development and climate responsiveness. It aims to achieve food security and broader development goals under a changing climate and increasing food demand.

CSA initiatives sustainably increase productivity, enhance resilience, and reduce/remove greenhouse gases, and require planning to address tradeoffs and synergies between these three pillars: productivity, adaptation, and mitigation.

While the concept is still evolving, many of the practices that make up CSA already exist worldwide and are used by farmers to cope with various production risks.

Mainstreaming CSA requires critical stocktaking of ongoing and promising practices for the future, and of institutional and financial enablers for CSA adoption.

Maximay said C-SAC is meant to be a prioritizing tool with a holistic interpretation of the perceived benefits of climate-smart agriculture.

“It can be used as a preliminary filter to sort through the number of ‘green-washing’ projects that may get funded under the rubric of climate-smart agriculture...all in a bid to access the millions of dollars that should go to help small and genuinely progressive farmers,” he said.

“C-SAC will provide bankers and project managers with an easy to use tool to ensure funded projects really comply with a broad interpretation of climate smart agriculture.”

Maximay said C-SAC incorporates major categories of compliance and provides a replicable analysis matrix using scalar approaches to convert qualitative assessments into a numeric compliance scale.

“The rapid qualitative analysis at the core of C-SAC depends on interrelated science-based guidelines honed from peer reviewed, field-tested practices and operations,” Maximay explained.

“Climate-smart agriculture often amalgamates activities geared towards adaptation and mitigation. The proliferation of projects claiming to fit the climate smart agriculture designation has highlighted the need for an auditing and certification scheme. One adaptation or mitigation feature may not be enough to qualify an agricultural operation as being climate-smart. Consequently, a more holistic perspective can lead to a determination of the level of compliance with respect to climate-smart agriculture.

“C-SAC provides that holistic perspective based on a structured qualitative assessment of key components,” Maximay added.

The scientist notes that in the midst of increased opportunities for the use of global climate funds, it behooves policymakers and financiers to ensure projects are not crafted in a unidimensional manner.

He added that small farmers in Small Island Developing States are particularly vulnerable and their needs must be met by projects that are holistic in design and implementation.

Over the years, agriculture organisations in the Caribbean have been providing funding to set up climate-smart farms as demonstrations to show farmers examples of ecological practices that they can use to combat many of the conditions that arise due to the heavy rainfall and drought conditions experienced in the region.

Maximay was among the first agricultural scientists addressing climate change concerns during the Caribbean Planning for Adaptation to Climate Change (CPACC).

A plant pathologist by training, he has been a secondary school teacher, development banker, researcher, World Bank-certified training manager, university lecturer, Caribbean Development Bank consultant and entrepreneur.

Maximay managed the first Business Development Office in a Science Faculty within the University of the West Indies. With more than thirty years' experience in the agricultural, education, health, financial and environmental sectors, he has also worked on development projects for major regional and international agencies.

## ORGANICS

**Saint Lucia to transition to organic farming** by Geraldine Bicette-Joseph, GIS. Government of Saint Lucia website, August 14, 2017

<http://www.govt.lc/news/saint-lucia-to-transition-to-organic-farming>

### Full article

SEVEN FARMS WILL PILOT AN ORGANIC FARMING TRANSITIONARY PROJECT FUNDED BY GEF.

Saint Lucia's agriculture will soon transition from the use of toxic to non-toxic organic chemicals.

Anthony Herman, Project Co-Ordinator of the Belle Vue Farmers Co-Operative, one of the co-operatives chosen to take part in transitionary project, said the process will take some time as educating via demonstration and advocacy is something that cannot be rushed.

"The project is about transitioning, which is a gradual process," he said. "The project is funded by the Global Environment Facility (GEF) and they are working with other strategy partners to help us implement as well as co-fund. This project aims to do a number of things. In the first instance it is about training and organizing seven farms. So in two years we are going to have seven functioning organic farms. Then there are about four schools that would also have transitioned from the use of toxic chemicals to non-toxic at the level of the environment. We plan to expose a number of persons, community leaders, housewives, etc. to the question of harsh toxic chemicals to human health and the environment."

It is hoped that national sensitization will culminate through the hosting of an organic farming symposium.

"At the end of the two year period, a functional booklet will be presented for persons who are interested in starting organic farming and after this we will like to hold a two to three-day symposium which will most probably be the first in the OECS where we will be inviting a whole heap of organic practitioners, and researchers in the organic field to talk about their research and so on and especially where it comes to breaking myths that organic farming is expensive, and throughout this process the plan is that over a period of time we will have a functioning organic farmers network that will champion the cause of organic farming."

One of the major aims of the project is to eliminate the use of toxic chemicals in farming within Saint Lucian schools. Non-toxic organic chemicals include fertilizers and pesticides.

## PROTECTED AGRICULTURE

**Improving crop consistency**, by PO, GIS, Government of Saint Lucia website, August 16, 2017

<http://www.govt.lc/news/improving-crop-consistency>

### Full article

AGRICULTURE MINISTRY SAYS WORKING WITH GREENHOUSES CAN RESULT IN STEADY HARVESTS, YEAR ROUND.

The Ministry of Agriculture is encouraging farmers to adopt farming practices that can result in steady economic gains.

Kemuel Jn Baptiste, Chief Extension Officer in the Extension and Advisory Services Unit, said a cyclical farming approach can help farmers maintain consistency and secure a market for local produce.

“A few things have challenged our consistency in this country. In as much as we have invested heavily as a country in terms of irrigation and infrastructure, agriculture is still very heavily dependent on rain—it is what you call rain fed. Because it is rain fed, and with the added challenges of increased temperatures in the dry season, and increased rainfall intensity in the wet season, it creates a lot of uncertainty for the farmer who is working in the open field. So he may plant a lot of vegetables but there is no guarantee that he will see it all the way to the end,” Mr Jn Baptiste explained.

“This means that although a farmer made a commitment to a buyer to produce a certain amount at a certain time, because there are so many variables, there is no guarantee that he will have it ready. Now because that uncertainty exists, we are bombarded by imports.”

While greenhouses help improve the consistency of produce, the farmers’ lack of upkeep has resulted in some losses. Mr Jn Baptiste said that although greenhouses provide some security against the loss of crops, frequent maintenance is necessary to ensure that crops perform well.

“For many years now, the farmers produce the first few crop cycles using greenhouses, and then they stop because the plastic gets damaged and there’s no commitment or no resources set aside to replace it. The other thing that farmers do not pay attention to is the condition of the soil in greenhouses. In the soil there is a buildup of pathogens, and little effort is expended in trying to deal with it, so farmers start having crop failures, become frustrated, and leave the facility.”

Mr Jn Baptiste said working cyclically with greenhouses in the proper manner will help counteract such losses.

“What we are saying as ministry is these facilities exist and you can work with them cyclically. During the dry season you can allow them to sit idle because then you don’t need an umbrella to produce your crops. Instead you expose them to the sun, what we call solarization, and when the rainy season begins you cover over and you begin to produce. I’m saying all this to say that if we do not maintain consistency in the market, the person who is buying from you, whether it is

hotelier or a supplier, if you can't deliver they will find another source, and that source very often represents a foreign source.”

The Ministry of Agriculture stresses that with proper greenhouse farming practices, farmers can ensure consistent production, and as a result, benefit from a predictable income, year round.

## **NATIONAL BUDGET - AGRICULTURE: Dominica**

### **Government of the Commonwealth of Dominica Budget Address 2017 - 2018: Realising a Modern, Prosperous Dominica by Honourable Roosevelt Skerrit - July 27, 2017**

<http://finance.gov.dm/index.php/budget/budget-addresses/file/25-budget-address-2017-2018-realising-a-modern-prosperous-dominica-by-honourable-roosevelt-skerrit-july-27-2017>

#### ***EXCERPTS***

##### ***pp. 7 Economic Context and Review***

Madam Speaker, in Dominica, economic activity expanded during 2016, with preliminary GDP estimates indicating real growth of 2.8 percent. This performance was driven by increased activity in some of the main productive sectors, namely Agriculture, Livestock & Forestry, Fishing, Mining and Quarrying, Electricity & Water, Construction, Financial Intermediation, Education & Other Community, Social & Personal Services sectors. The Agriculture, Livestock & Forestry sector grew by 9.9 percent. The banana subsector is estimated to have grown by approximately 14.0 percent in 2016 while the Other Crops subgroup also is estimated to have grown by 10.5 percent.

***pp.13*** Madam Speaker, Government utilises the AID Bank as the main financial institution through which special lines of credit are made available to various sectors of the economy. In the budget for fiscal year 2016/17, special lines of credit were established to facilitate expansion in the agriculture and tourism sectors. In addition, funds were made available for Music and Artists in the Creative Industry.

The AID Bank reports that the funds provided have been on-lent as follows:

- One hundred and twenty-four (124) loans totalling \$2.1 million have been granted under the special facility for agriculture.
- Three loans (3) totalling \$2.6 million have been granted under the special tourism facility.

##### ***pp.17-18***

##### ***Agriculture***

Madam Speaker, we now move to another major pillar of our economy, the agricultural sector.

Over the years, we have witnessed a transformation in the structure of the agricultural sector as the efforts of the Government to diversify have borne fruit. Indeed the picture now developing is one that shows that agricultural diversification is beginning to take root on a scale never seen before. A mix of crops comprising mainly banana, plantain, dasheen, yam, tannia, sweet potato and ginger now profile the agricultural export sector.

This has been due largely to gains made in the Support to Horticulture Programme and the success of DEXIA's continued efforts in seeking new export markets. This has been supported by the operationalisation of the pack houses in Portsmouth and Roseau.

Recent market led developments have helped push this new thrust in agricultural diversification. Madam Speaker some of these successes include:

- supply of one twenty foot container of dasheen per week to a distributor in Florida;
- supply of one twenty foot container of dasheen and other root crops per fortnight to a wholesaler in England;
- the increased supply of mixed produce to the regional market;
- Re-entry into the U.K banana market with the support of WINFRESH;
- Increase in the number of micro, small and medium agro processors particularly in the areas of passion fruit juice, pepper sauce, cassava, cocoa, coconut oil, herbs and spices.

In order to take advantage of these initiatives and opportunities, DEXIA in collaboration with the Ministry of Agriculture, has identified a core group of farmers committed to producing the required five hundred (500) tonnes of dasheen to fulfil the current and growing export demand. The farmers, selected from the seven agricultural districts are being supported to ensure a steady supply throughout the year.

The specific strategy being adopted by the Ministry of Agriculture and DEXIA targets three hundred and thirty-six (336) acres spread among one hundred and twelve (112) farmers with a minimum of three (3) acres per farmer annually. Production will be staggered by scheduling the planting of half an acre per farmer every other month.

Working collaboratively, the Ministry of Trade, the Division of Agriculture, DEXIA and the Bureau of Standards are delivering support services to the farmers which include:

- Production support.
- Quality Assurance Certification.
- Processing, market support and value added

The farmers will be expected to supply labour for land clearing, planting and harvesting. Those who require working capital will be recommended to the AID Bank for loans at an interest rate of 3.0 percent, commensurate with the time of harvesting of the crop.

Madam Speaker, I have elaborated on the strategy for developing and expanding dasheen production to highlight the approach being taken by the Ministry of Agriculture for increasing production of all the crops, including plantain, yams, tannia, sweet potato, hot peppers and passion fruit.

In an effort to revive the banana industry and resume exports to the United Kingdom, Government has embarked on a series of interventions. Building materials valued at \$330,478 were provided as a grant to fifty-four (54) core farmers to upgrade pack shed structures. This will allow them to meet the Global Good Agricultural Practices standards.

The Ministry of Agriculture has ordered an additional sixty thousand (60,000) tissue culture banana plantlets at a cost of eighty-eight thousand dollars (\$88,000). Fifteen thousand (15,000) of

these plantlets have already been distributed. The second batch of fifteen thousand (15,000) has been weaned and hardened and will be distributed in August.

The third batch of thirty thousand (30,000) plantlets will be received in August. Fertilizer has been provided to all farmers who received tissue culture plants. Madam Speaker, it must be noted that all of these plants are being weaned and hardened at the Chinese Smart Green House at the Portsmouth Agricultural Station.

Government has established a revolving fund from the proceeds of sale of fertilizers and agricultural spray oil received from the European Union funded Banana Accompanying Measures (BAM) programme. This is to allow for sustainability and to ensure that farmers can obtain fertilizers and spray oil at subsidized prices on a continuous basis. The Ministry has also distributed free of charge, two thousand, five hundred (2500), twenty-five kilogram (25 Kg) bags of fertilizers to farmers producing banana, plantain, vegetables, root and other crops, to boost production. Spray oil is also being sold at all agricultural stations at subsidised prices

***pp. 26-27 Agriculture***

Many of the identified growth-enhancing public investment projects cover the strategic areas for Agriculture within the GSPS namely:

- Development of the Banana and Plantain Subsector, Support to Horticulture Sector and Vegetable Expansion are in support of the strategy to promote and encourage investment in agriculture;
- Cocoa Rehabilitation and Expansion and Coffee Rehabilitation & Expansion projects encourage priority investment in downstream high value added production and processing of products;
- Enhancement of Phytosanitary Capacity of the Plant Protection & Quarantine Unit; and Operationalization and Commercialization of National Abattoir addressed the strategy to strengthen the policy, strategic planning and management capability to support sustainable agriculture development;
- Rehabilitation of Trails and Facilities within National Parks and Ecotourism Sites and Construction and Repair of Bridges- Segments 1,3,5 of the Waitukubuli national Trail, re-enforce linkages with other growth-enhancing sectors particularly tourism.

The Cocoa Rehabilitation and Expansion will mainly concentrate on the drying facility and entail the increase of teams and collaboration of cooperatives.

In respect of the 3.8 percent sectoral growth estimated for 2017/18, \$22.7 million is proposed for investment in the agriculture sector.

## MARKETING

**Agriculture Dept. advocates market led production** by PO, GIS, Government of Saint Lucia website, August 15, 2017

<http://www.govt.lc/news/agriculture-dept-advocates-market-led-production>

### Full article

THE DEPARTMENT OF AGRICULTURE ADVISES FARMERS ON HOW TO GAIN MAXIMUM RETURNS FROM THEIR CROP INVESTMENTS.

The Department of Agriculture is advocating a market-led approach to production for farmers, that will result in maximum returns.

Chief Extension Officer in the Extension and Advisory Services Unit, Kemuel Jn Baptiste, said such an approach will improve farmers' chances of success in the production, marketing, and sale of fresh agricultural produce.

“We come out of a history where our agriculture was plantation oriented and those plantations had very specific markets—coffee, cocoa, sugarcane—whatever was produced had organized arrangements with the estate owners,” he explained. “We moved into bananas and we got preferential treatment so everything produced with bananas was sold. But over time that dynamic has changed. So while there were organized and established trading pathways for the plantation type crops, that did not obtain for the new crops that we diversified into.”

Today, a free market prevails, which results in an influx of imports in order to cater to market demand.

“Over time, with the opening up of trade, we have new entrants like supermarkets, hawkers, hoteliers, and persons who operate on behalf of the hoteliers, so now there are a whole set of new players operating in the marketing environment,” Mr Jn Baptiste said. He advised farmers to now reach out to buyers in an effort to cater to specific demands.

“We have been talking about this for a while but I’m hoping the audience will hear it a bit better this time, because frustrations are beginning to settle in. Farmers are producing and when they’re ready for harvest then they begin to seek where to dispose of their produce. What we are advocating in today’s environment is what is called market-led. If you decide to grow anything, whether vegetables, herbs, fruits, roots, there must be consideration first of all given to what you will do with it.”

Mr Jn Baptiste stressed that establishing relationships with buyers will help farmers determine what and how much should be planted, so that farmers get maximum returns from their investments.

## SATELLITE DATA TO ESTIMATE CROP YIELD

**Harnessing rich satellite data to estimate crop yield.** College of Agricultural, Consumer and Environmental Sciences, [University of Illinois at Urbana-Champaign](http://aces.illinois.edu/news/harnessing-rich-satellite-data-estimate-crop-yield), August 16, 2017  
<http://aces.illinois.edu/news/harnessing-rich-satellite-data-estimate-crop-yield>

### Full article

URBANA, Ill. – Without advanced sensing technology, humans see only a small portion of the entire electromagnetic spectrum. Satellites see the full range—from high-energy gamma rays, to visible, infrared, and low-energy microwaves. The images and data they collect can be used to solve complex problems. For example, satellite data is being harnessed by researchers at the University of Illinois for a more complete picture of cropland and to estimate crop yield in the U.S. Corn Belt.

“In places where we may see just the color green in crops, electromagnetic imaging from satellites reveals much more information about what’s actually happening in the leaves of plants and even inside the canopy. How to leverage this information is the challenge,” says [Kaiyu Guan](#), an environmental scientist at the U of I and the lead author on the research. “Using various spectral bands and looking at them in an integrated way, reveals rich information for improving crop yield.”

Guan says this work is the first time that so many spectral bands, including visible, infrared, thermal, and passive and active microwave, and canopy fluorescence measurements have been brought together to look at crops.

“We used an integrated framework called Partial Least-Square Regression to analyze all of the data together. This specific approach can identify commonly shared information across the different data sets. When we pull the shared information out from each data set, what’s left is the unique information relevant to vegetation conditions and crop yield.”

The study uncovers that the many satellite data sets share common information related to crop biomass grown aboveground. However, the researchers also discover that different satellite data can reveal environmental stresses that crops experience related to drought and heat. Guan says the challenging aspect of crop observation is that the grain, which is what crop yield is all about, grows inside the canopy, where it isn’t visible from above. “Visible or near-infrared bands typically used for crop monitoring are mainly sensitive to the upper canopy, but provide little information about deeper vegetation and soil conditions affecting crop water status and yield,” says John Kimball from University of Montana, a long-term collaborator with Guan and a coauthor of the paper.

“Our study suggests that the microwave radar data at the Ku-band contains uniquely useful information on crop growth,” Guan says. “Besides the biomass information, it also contains additional information associated with crop water stress because of the higher microwave sensitivity to canopy water content, and microwave can also penetrate the canopy and see through part or all the canopy. We also find that thermal bands provide water and heat stress information,”

Guan says. “This information tells us when leaves open or close their pores to breathe and absorb carbon for growth.”

Coauthor David Lobell from Stanford University, who crafted the idea with Guan, says leveraging all of this satellite data together greatly increases the capacity to monitor crops and crop yield.

“This is an age of big data. How to make sense of all of the data available, to generate useful information for farmers, economists, and others who need to know the crop yield, is an important challenge,” Guan says. “This will be an important tool. And, although we started with the U.S. Corn Belt, this framework can be used to analyze cropland anywhere on the planet.”

The study, “The shared and unique values of optical, fluorescence, thermal and microwave satellite data for estimating large-scale crop yields,” is published in *Remote Sensing of Environment*. The work was initiated and designed by Kaiyu Guan from U of I and David Lobell from Stanford University. It is coauthored by a multi-institute team of Jin Wu (Brookhaven National Lab), John S. Kimball (University of Montana), Martha C. Anderson (USDA ARS), Steve Frolking (University of New Hampshire), Bo Li (University of Illinois), and Christopher R. Hain (NOAA).

Funding was provided by the NASA New Investigator Award (NNX16AI56G), U.S. National Science Foundation (NSF-SES-1048946), a Terman Fellowship from Stanford University, the University of Illinois, NSF grant NSF-EF1065074, and NASA (NNX14AI50G).

All the data used in this study are available by request ([kaiyug@illinois.edu](mailto:kaiyug@illinois.edu)).

In addition to being an assistant professor in ecohydrology and geoinformatics in the Department of Natural Resources and Environmental Sciences in the College of Agricultural, Consumer and Environmental Sciences at U of I, Guan has a joint appointment as a Blue Waters professor affiliated with the National Center for Supercomputing Applications (NCSA).

## INFORMATION - OPEN ACCESS

**New era in Open Access marked in IITA.** International Institute of Tropical Agriculture (IITA), 16 August 2017  
<http://www.iita.org/news-item/new-era-open-access-marked-iita/>

### Full article

IITA moves closer to being Open Access (OA) compliant with the launching of a data repository called CKAN or Comprehensive Knowledge Archive Network.

CKAN is an open access management system for storing and distributing open data and is IITA’s repository for numeric data. It was launched on 21 July at IITA, Ibadan, with researchers, students, and trainees from various research areas and units in attendance.

CGIAR Open Access policy mandates its members to make research data accessible, discoverable, and free to the public, with comprehensive implementation by the end of 2018. IITA, therefore, has an obligation to come up with OA repositories for various information products. While IITA already uses OA repositories for text, multimedia, and special files, the repository for tabular (mostly numeric) data was lacking.

With the launch of CKAN, IITA researchers can now easily drop their data in the repository in compliance with the Open Access Policy. CKAN displays the metadata immediately, and after an embargo period (usually 12 months), makes the data sheet itself available. These repositories make the work of IITA's scientists easily accessible and enable other researchers to use the data in the repository.

The Data and Information Management Unit (DIMU) implemented and deployed the open access data repository for public access.

Martin Mueller, IITA's E-Research Coordinator, DIMU, reminded staff that under the Open Access Policy of the Institute, everyone should ensure that their work is easily accessible and available. "The CKAN platform provides researchers a medium for saving and sharing research findings, and linking to other online OA repositories," he said.

This means that OA repositories can (theoretically) link various data storage archives. Through this network, metadata in the content of other repositories can be accessed via CKAN. Also, other repositories can display CKAN content.

Olalekan Anifowoshe, Data Programmer, DIMU, said, "The Institute supports its researchers to become OA compliant. Staff members should assist the Institute's mission of providing free online Open Access to its research by publishing their research outputs, data, publications, and information products under OA licenses." Staff should fill in the metadata capture sheet in the site on SharePoint and send it together with the data immediately after data collection to [iita-ckan@cgiar.org](mailto:iita-ckan@cgiar.org). During the launch, the use of the capture sheet was also explained in detail.

The launch marks the official start of the use of the CKAN platform to help Unit and Project Managers familiarize themselves with the changes brought about by the introduction of Open Access policies. Also with this launch, it is now mandatory for every researcher to use CKAN for all research data under the OA policy.

Established OA and data management implementation guidelines and policies have been developed by CGIAR as part of its commitment to enhancing the visibility, accessibility, and impact of its research and improvement activities.

## AGRICULTURAL RESEARCH- Assessing Impact

**On what (and how and when) to measure when measuring impacts of agricultural research for development**, International Livestock Research Institute (ILRI), 2 August 2017

<https://news.ilri.org/2017/08/02/on-what-and-how-and-when-to-measure-when-measuring-impacts-of-agricultural-research-for-development/>

### EXCERPTS

*The following article is written by Iain Wright, deputy director general for research at ILRI.*

*On 6–8 Jul 2017, I attended a conference at the World Agroforestry Centre (ICRAF) on [Impacts of International Agricultural Research: Rigorous Evidence for Policy](#) organized jointly by the CGIAR Independent Science and Partnership Council (ISPC) Standing Panel on Impact Assessment (SPIA) and the CGIAR Research Program on Policies, Institutions, and Markets (PIM). I welcomed the delegates at this meeting in Nairobi, Kenya, on behalf of ICRAF and the International Livestock Research Institute (ILRI), the two CGIAR centres headquartered in Nairobi. A modified version of my address and personal reflections on impact assessment in CGIAR follows.*

We in CGIAR have committed ourselves to tackling some of the greatest challenges that the human population has ever faced.

How do we feed a growing population not only with calories but also with nutrients essential for good health, and do so in the face of climate change? We know that proteins, vitamins and minerals are essential not only for growth in children but also for children's intellectual development, their cognitive and learning ability. We know that malnutrition can not only stunt children permanently but also damage a nation's long-term economic development.

Agriculture forms, and will continue to form, the basis of economic development in many part of Africa. Agriculture is the route by which millions of people will escape poverty, not just through improvements to the livelihoods of individual farmers but also through commercialization of smallholder agriculture, which generates employment in farm input services and in the production of value-added products along agricultural value chains.

Although agriculture is often viewed in industrialized countries as harmful to the environment, farming holds the key to effective natural resource management and the provision of essential environmental services, such as reduced intensities of greenhouse gas emissions achieved via well-managed rangelands and trees that store significant amounts of carbon, or absolute reductions in greenhouse gas emission levels achieved through increased agricultural productivity and more efficient use of farm inputs.

While those of us who work in agricultural research recognize its importance, we must persuade the rest of the world of the case because agricultural research can deliver benefits such as these only if there is sufficient investment in this research. A few decades ago, agriculture received about 15% of official development assistance (ODA). Today, agriculture receives just 4% of total ODA (and of that 4%, agriculture's livestock subsector receives just 4%, despite the fact that the

livestock subsector contributes an average of 40% of the agricultural gross domestic product of developing countries).

Many studies show high rates of return to agricultural research but we need more specific evidence on what investment in agricultural research actually delivers. As donor organizations are under increasing political pressure to change their investment priorities, to better address, for example, domestic issues or the refugee crisis, it is timely to consider the role of impact assessment in CGIAR.

Agricultural research for development deals with complex agro-socio-ecological systems generating complex problems as well as benefits. We use complex research methodologies to solve the complex problems.

A major challenge in assessing the impacts of our research is having sufficiently robust methods to generate robust evidence. While we have methods to assess rates of uptake of a given technology or the welfare benefits of adoption of that technology, not all research is focused on a single technology. How do we assess the impact of research that delivers a mix of new technologies that are likely to be adopted and adapted in different ways by different farmers? In the livestock sector, for example, improved livestock genetics will have little impact if not accompanied by better livestock feeding strategies and health services, which themselves will require new institutional and marketing arrangements, which in turn will be effective only where there are policy environments conducive to such novel arrangements. In such cases, how do we discern what impacts our research is having?

Where CGIAR research focuses on influencing decision-making, the effects of such research on the complex political processes involved are often difficult to assess. Twelve years ago, I was at a workshop on the interface between research and policy organized by the chief scientist at the Scottish Government Rural Affairs Department, who at that time was Maggie Gill, now chair of the CGIAR ISPC. One participant presented a list of things a minister has to consider when devising a new policy. Technical or scientific evidence was only 1 of 23 things on that list. How do we know what impact our research is having on the other 22 factors being taken into account?

As we consider here impact assessment work in CGIAR, let us also continually ask ourselves how we can best deal with complex questions about impact. This will help us avoid focusing only on things easy to measure.

To meet the global challenges that CGIAR is researching, we will need not incremental but rather transformational change in smallholder agriculture.

**If we focus on things that are easily measured, we will fail to provoke those transformational changes.**

Do we have the tools and methods needed to measure the impacts of complex solutions to complex problems? I believe we need more methodological development of quantitative and qualitative impact assessments. I believe we have much to learn from other sectors, including public health and education.

So as we delve into impact assessment work this week, let us look not only at what we have achieved in the past but also at how we will demonstrate our achievements in the future.

Below are excerpts from selected conference presentations at the three-day Jul 2017 conference on [Impacts of International Agricultural Research: Rigorous Evidence for Policy](#)  
[The rigour revolution in impact assessment](#) written by **Doug Gollin**

[Recalibrating and reassessing the global returns to agricultural R&D evidence](#) written by **Phil Pardey,**

[Comments on Papers on 'From productivity increases to aggregate, long-run impacts'](#) written by **Chris Barrett,**

[Measuring gendered impacts](#) written by **Cheryl Doss**

conclusion to an invited paper titled [The adoption puzzle—what can the CGIAR learn from field experiments of new agricultural technologies?](#) written by **Alain de Janvry,**

## UPCOMING EVENTS

September

### **Caribbean Wellness Day**

**Date:** 9 September 2017

**Description:** Theme: "A Brighter Future for our Youth". Focus is on youth ages 15-29

**Website:** <http://carpha.org/>

### **Agribusiness Expo 2017**

**Date:** 28 September- 1 October 2017

**Location:** Grenada

**Description:** Hosted by Ministry of Agriculture, Grenada. Theme: "Agribusiness generating wealth, wellness and employment"

**Website:** <http://www.gov.gd/>

October

### **World Food Day**

**Date:** 16 October 2017

**Description:** Theme is "Change the future of migration. Invest in food security and rural development".

**Website:** <http://www.fao.org/world-food-day/2017/home/en/>

November

### **Third Conference of the World Banana Forum**

**Date:** 8 - 9 November 2017

**Location:** Geneva, Switzerland

**Description:** Will focus on global collaboration, gender, business and technical issues in banana production and trade. The conference will benefit everyone who has an interest in the banana sector - from producer and consumer organizations to governments, retailers, traders, NGOs and research institutions.

**Website:** <http://www.fao.org/world-banana-forum/wbf3/wbf3/en/>

### **TropAg2017**

**Date:** 20-22 November, 2017

**Location:** Brisbane, Australia

**Description:** Theme is “high impact science to nourish the world”, reflecting the critical role of science, technology and innovation to the many challenges facing tropical and sub-tropical agriculture and food production globally.

**Website:** <http://tropagconference.org/>

December

**CARDI Day**

**Date:** 5 December 2017

### **2018**

October 2018

**18th International Triennial Symposium of the ISTRC (International Society for Tropical Root Crops)** will be in Cali, Colombia from 22nd to 26th October 2018.

<http://www.istrc.org/194-18th-international-triennial-symposium-of-the-international-society-for-tropical-root-crops-istrc-cali-colombia-from-22nd-to-26th-october-2018>