



CABI in the Americas and Caribbean

Strengthening partnerships for Food Security and Biodiversity Conservation

Yelitza Colmenarez, Naitram Ramnanan, Ulrich Kuhlmann

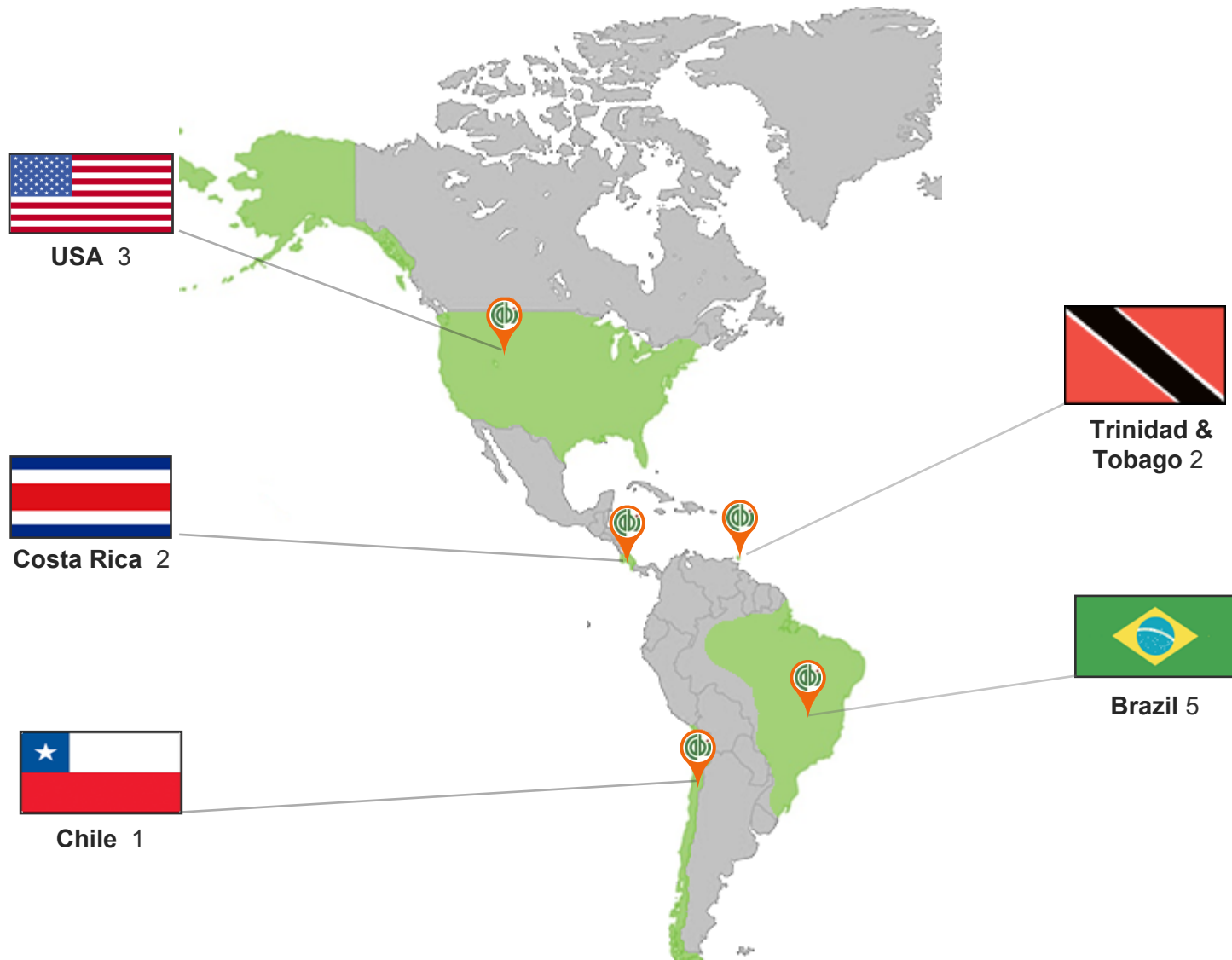
Member Countries Regional Consultation: Americas and Caribbean
12-14 September 2018, Ottawa, Canada



Outline of the Presentation

- CABI in the Americas and the Caribbean
 - Presence
 - Key partners
 - Working environment
- Member country priorities identified in 2016
- Responding to member country priorities in the Americas and the Caribbean
 - Plant health
 - Invasive species and biodiversity
 - Food and nutrition security
 - Trade and market access
 - Knowledge management, communication and use

CABI presence in the region



Key Partners in the region



Latin America & Caribbean

- High Biodiversity
- Intense movement of people and products



Introduction of new pests and diseases



European canker of Apple



Zebra Chip
Liberibacter solanacearum



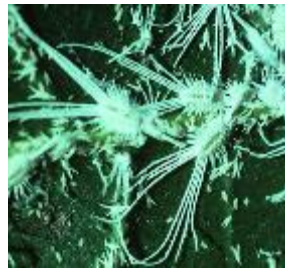
Plum pox virus



Lethal Yellowing



Tomato spotted ringspot virus



Rastrococcus
invadens



Frosty pod rot
Moniliophthora roreri



Colletotrichum kahawae - Café



Helicoverpa armigera



Diaphorina citri



Sago Palm Scale

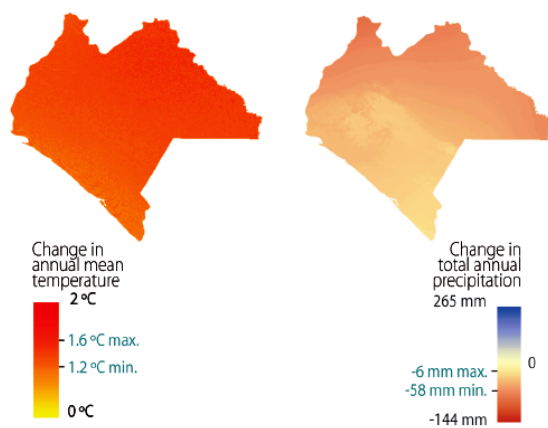


Erwinia amylovora

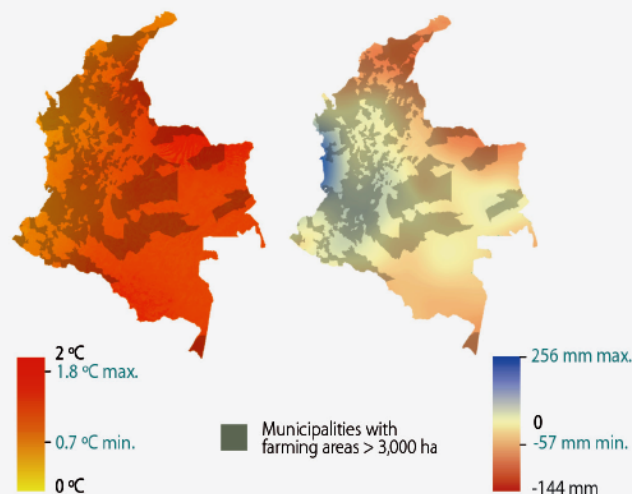
Climate Change

How Latin American countries look in the modeling and projections

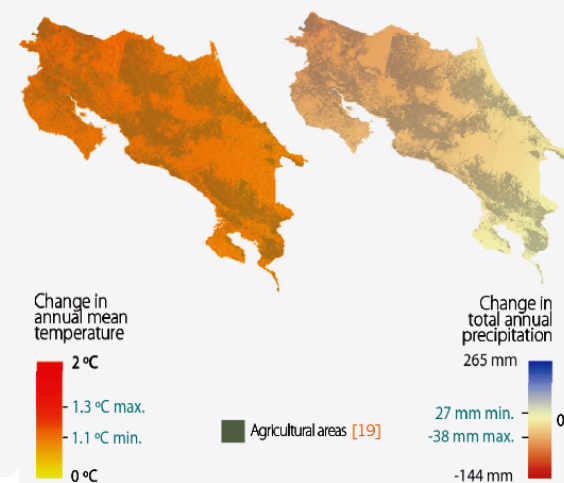
Projected Changes in Temperature and Precipitation in Chiapas by 2030⁴



Projected Change in Temperature and Precipitation in Colombia by 2030⁶



Projected Change in Precipitation and Temperature in Costa Rica by 2030⁴



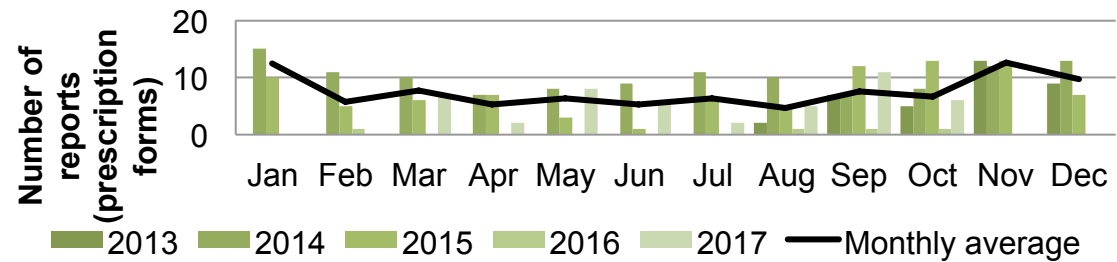
- Increasing Temperatures
- Extreme
 - Drought
 - Flooding

Source: <http://sdwebx.worldbank.org/climateportal/doc/agricultureProfiles/CSA-in-Colombia.pdf>
<http://sdwebx.worldbank.org/climateportal/doc/agricultureProfiles/CSA-in-Costa-Rica.pdf>
<http://sdwebx.worldbank.org/climateportal/doc/agricultureProfiles/CSA-in-Chiapas-Mexico.pdf>

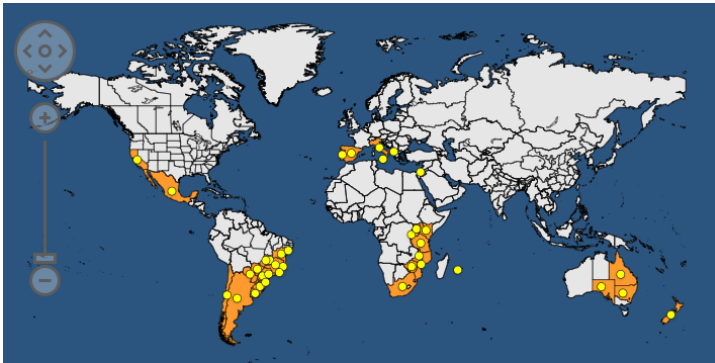
Climate change effects



Crop Distribution



Pest incidence



Introduction new pests



Biological control agents

Climate Smart Agriculture

Regional efforts linked to global platforms



Climate-Smart Agriculture

Overview | On the ground | Policies and planning | Knowledge | International fora | Resources | News

Climate-smart agriculture (CSA) is an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development, ensure food security in a changing climate. CSA aims to tackle three main objectives: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions, where possible.

CSA is an approach for developing agricultural strategies to secure sustainable food security under climate change. CSA provides the means to help stakeholders from local to national and international levels identify agricultural strategies suitable to their local conditions. CSA is one of the 11 Corporate Areas for Resource Mobilization under the FAO's Strategic Objectives. It is in line with FAO's vision for Sustainable Food and Agriculture and supports FAO's goal to make agriculture, forestry and fisheries more productive and more sustainable.



News



How a climate-smart and sustainable approach to agriculture has helped transform lives in Nepal
25 January 2018



FAO launches new Climate-Smart Agriculture web platform
10 November 2017

Highlights

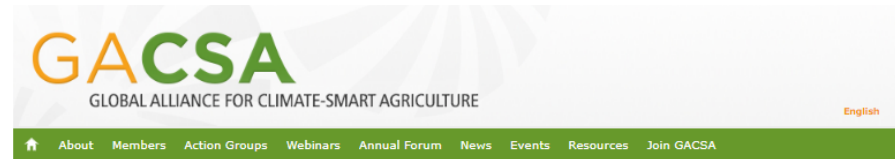


FAO links

- Climate Change
- NEW 2nd Edition CSA sourcebook
- Towards Sustainable Food and Agriculture (SFA)

External links

- Agriculture Action Day at



As part of the third Annual Forum of GACSA to be held on 12-14 December 2017

Regional Side-Event for Africa - GACSA Annual Forum

Side-event to present and foster consultation on a new AfDB programme on Climate-Smart Agriculture: The Africa Climate-Smart Agriculture (ACSA) Programme for Food Security, Adaptation and Mitigation in Africa (2018-2025).

GACSA is an inclusive, voluntary and action-oriented **multi-stakeholder platform on Climate-Smart Agriculture (CSA)**.

Its vision is to improve food security, nutrition and resilience in the face of climate change. GACSA aims to catalyse and help create transformational partnerships to encourage actions that reflect an integrated approach to the three pillars of CSA...

Member Spotlight: Emilia-Romagna Region



Climate-Smart Agriculture in Colombia

- Climate-smart agriculture (CSA) considerations**
- CSA is already being practiced in Colombia, but these practices are often implemented unsystematically or have generally low adoption rates. There are a variety of practices that could increase the climate resilience of landscapes and the agricultural sector if taken to scale.
 - Scaling up investments in agricultural research and development (R&D), which is currently only 0.2% of the gross domestic product (GDP), would have innovation. This includes investment in science and technology research and extension, and education and training, as well as support for farmer organizations and associated local institutions.
 - Planning processes with a focus on sub-national and local levels are needed to analyze the agro-climate risks, to identify the most promising CSA practices, and to implement adaptation and mitigation measures. Assistance from public institutions is needed to help producers overcoming barriers to adoption.
 - Agroforestry practices are already implemented in more than 25% of coffee systems but could be expanded to include more farmers and to other crops, including citrus, oilseeds, and fruit orchards. Opportunities exist to scale out similar emerging CSA activities in other production systems.
 - International funds and connections with the international finance community created through collaborations on low-emissions development policies (National Strategy for REDD+), National Adaptation Plan (NAP), and the Colombian Low-Carbon Development Strategy (ELCD) could be linked to support integrated agriculture, conservation, adaptation to climate change, and mitigation opportunities and to scale-out CSA adoption.
 - Strengthening agro-ecological resilience provides opportunities to move agriculture initiatives beyond immediate food and livelihoods towards broader climate resilience.

Climate-Smart Agriculture in Costa Rica

- Climate-smart agriculture (CSA) considerations**
- Efficient irrigation and drainage systems are essential responses to increasingly regular rainfall patterns over large parts of the country.
 - The provision of improved weather information services will facilitate informed decision making by producers.
 - A growing public concern is the high rates of agricultural usage by Costa Rican farmers. Efficient use of agrochemicals can reduce costs, improve farmers' responses to unpredictable weather patterns, and contribute to mitigation efforts by reducing nitrogen emissions.
 - Rotational grazing and forage banks increase the
 - The established PES program provides an incentive

Climate-Smart Agriculture in Chiapas, Mexico

- Climate-smart agriculture (CSA) considerations**
- The high biodiversity and environmental services in Chiapas can be maintained through diversified activities, such as agroforestry and agroecology, as means for securing livelihoods and bolstering climate mitigation potential, diversifying trade-offs between development and conservation.
 - Climate risk management strategies, such as early weather notifications, warning systems, and agricultural insurance, can help farmers cope with the floods, pest infestations, and other climate extremes that are common in Chiapas.
 - Payments for Ecosystem Services in Chiapas may help increase carbon capture in soil while boosting
 - The identification of suitable adaptation and mitigation options can be enhanced by development and access to Integrated Decision Support Systems that compile and analyze weather, agronomic, and market information, and deliver results to a range of stakeholders and decision makers.
 - Strengthening governance and democratic landscape management of farmers' associations, guilds, and cooperatives can help increase productivity by creating economies of scale that bring connectivity to the fragmented landscape of numerous small land holdings in Chiapas.
 - Chiapas receives considerable support from external

Climate-Smart Agriculture in Peru

- Climate-smart agriculture (CSA) considerations**
- Investing in irrigation infrastructure, conservation of water recharge areas, water-efficient crop varieties, and site-specific land-use planning can improve water-use efficiency and resilience of agriculture systems.
 - Efficient use of chemical fertilizers, especially in rice and sugarcane systems, can facilitate reductions in agricultural emissions.
 - Livestock systems offer the potential for dual adaptation and mitigation benefits through the adoption of natural pasture recovery methods, silvopastoral systems, and improved fodder and livestock breeds.
 - The preservation and transference of ancestral adaptation practices for soil conservation (e.g., platforms, terraces) and water retention (e.g., canals, ponds) are important for mainstreaming CSA.
 - Peru's vast forest cover (roughly 60%) and relationships with the low carbon and forestry-related international finance community (UN-REDD+, CIF, NARS, LEEDS) provide promising opportunities to scale out CSA practices that address carbon sequestration and ecosystem service provisioning.
 - Investment in climate insurance, research and development (R&D), agricultural extension services, domestic markets and value chains, and infrastructure can increase competitiveness of small-scale farmers

Member country priorities – 2016

- Plant health systems
- Invasives species and biodiversity
- Food and nutrition security
- Trade and market access
- Knowledge management, communication and use
- Cross cutting issues
 - Capacity building and governance
 - Public-private partnerships
 - Enable, empower and employ women and youth
 - Embed monitoring, evaluation and impact analysis

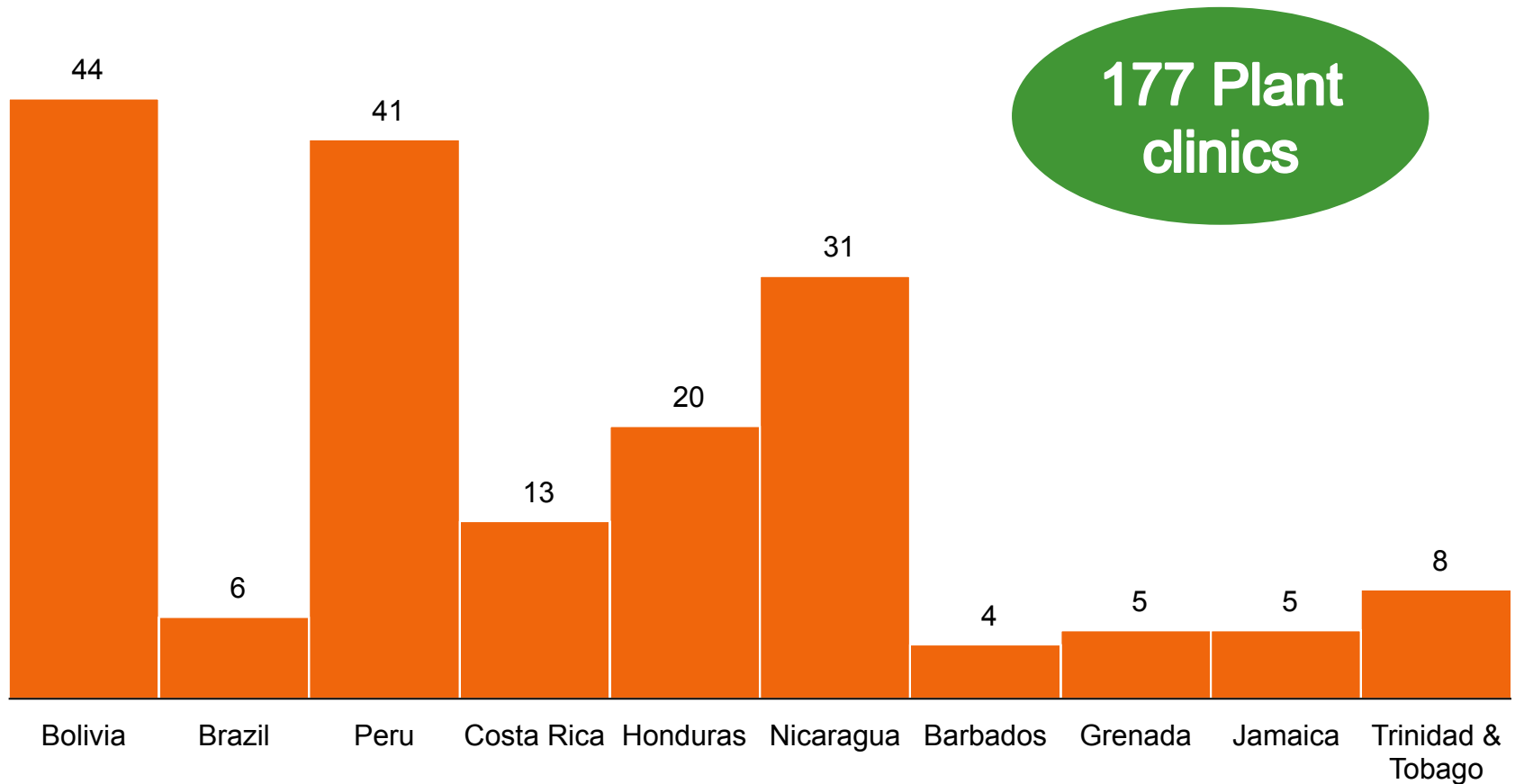


Responding to Member Country Priorities in the Americas and the Caribbean

- Plant health
- Invasive species and biodiversity
- Food and nutrition security
- Trade and market access
- Knowledge management, communication and use

Plant Health

Plantwise in Latin America and the Caribbean



Plant Health

Plantwise in Latin America and the Caribbean

27,603

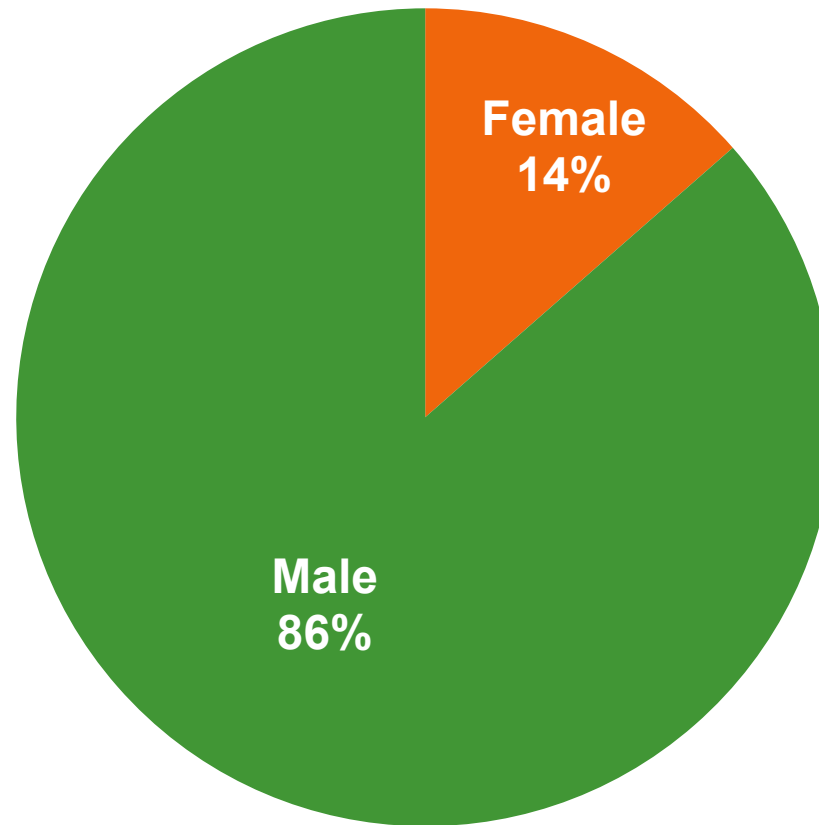
Farmer's queries recorded

Costa Rica	578	Jamaica	586
Honduras	883	Trinidad & Tobago	1,601
Nicaragua	1,781	Bolivia	15,687
Barbados	726	Peru	5,258
Grenada	349		

Plant Health Plantwise in Latin America and the Caribbean

1,230

Plant doctors
trained



Gender of farmers reached



Biodiversity and invasive species management – prevention and early detection

Preventing the COSTS of Invasive Alien Species (IAS) in Barbados and the OECS Countries:

- The objective of this project is “Prevention, early detection, control and management frameworks for IAS that emphasise a risk management approach by focusing on the highest risk invasion pathways of Barbados and OECS countries”
- **Component 1 and 2** addresses needs of Antigua and Barbuda, Barbados and St. Kitts and Nevis in relation to national frameworks for IAS prevention, early detection, management and control. Pilot projects will lead to improved local capacity to deal with particular IAS impacting biodiversity
- **Component 3** is regional, and as such will be oriented towards addressing common needs of the OECS countries in relation to IAS

Invasive species early detection system established for key species – CABI Central Diagnostic Lab



New Disease Reports



ISSN 2044-0588

NDRs

Scope

Submission

Volumes

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BSPP

New Disease Reports (2017) 36, 2. [<http://dx.doi.org/10.5197/j.2044-0588.2017.036.002>]

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First report of *Moniliophthora roreri* causing frosty pod rot on *Theobroma cacao* in Jamaica

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Keywords: Caribbean, cocoa, fungal disease

Frosty pod rot (FPR), caused by the basidiomycete *Moniliophthora roreri*, is a devastating disease of cacao. First discovered in Ecuador in 1917, FPR is present in the main cacao producing countries of Southern and Central America, except Brazil (López & Enríquez, 1980; Evans, 2016) but it has not been previously reported in the Caribbean. In August 2016, unusual symptoms were observed on cacao pods on farms in Crooked River located in the parish of Clarendon in Jamaica. Examination of affected pods and fungal spores by officers of the Research and Development Division (Ministry of Industry, Commerce, Agriculture and Fisheries) led to a tentative diagnosis of FPR.

Following this discovery, infected pods were dispatched to the CABI Diagnostic and Advisory Service, Egham, United Kingdom for examination and analysis. Symptoms typical of FPR (Evans, 1981) were observed, namely necrotic lesions, white fungal mycelium and cream/beige sporulation on the pod surface (Fig. 1) along with extensive brown necrosis of the internal pod tissues (Fig. 2). Spore samples were removed from the surface of pods with a sterile needle and tissue samples aseptically excised from both the surface tissues and internal pod tissues. Samples were plated on tap water agar, potato dextrose agar (PDA) and 2% malt extract agar (MEA) and incubated at 25°C. Emergent fungal colonies were purified by sub-culturing. Morphological characteristics of sporulating fungal colonies on MEA and PDA after 5 to 7 days growth were indicative of those of *M. roreri* as described previously (Evans, 1981).



Biodiversity and invasive species management – Management and Control

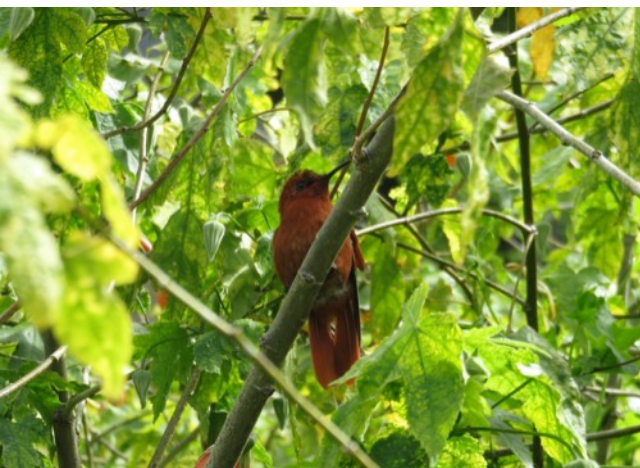
- Biological Control of “Rubber vine” *Cryptostegia madagascariensis* in Brazil. This collaborative work is funded by Johnson and SC Johnson
- Following a successful biocontrol project against another invasive rubbervine (*Cryptostegia grandiflora*) in Australia, new project development activities were focussed on the Caatinga habitat of Ceara state in northern Brazil where the sister species *C. madagascariensis*, common name devil’s claw, is threatening the fragile ecosystem as well as the endemic Carnauba Palm
- **Invasive Species:** Early detection system established for member countries targeting key species in the Caribbean and Latin American countries – CABI Central Diagnostic Lab



Biodiversity and invasive species management – Ecosystem Restoration

Darwin Initiative – Chile

- Rescue and restoration of the native flora of Robinson Crusoe Island in the Juan Fernández Archipelago National Park
- Area: Isla Robinson Crusoe, Chile
- Why Juan Fernández? High Biodiversity – Endemic species
- Evaluation of the microorganisms – Dr. Andrés Frances, INIA
- Excellent results obtained



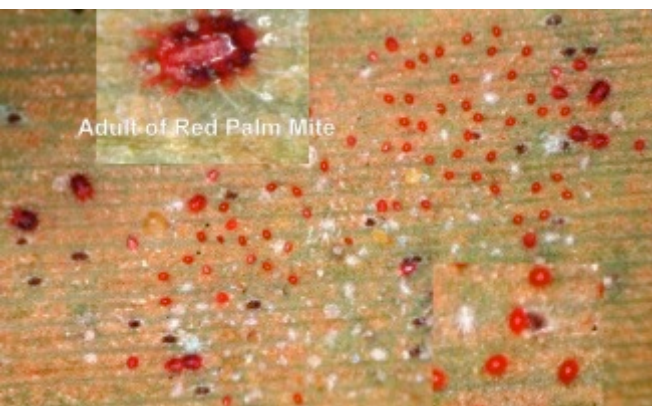


Food and Nutrition Security

Several Regional initiatives contribute to food and nutrition security

Quarantine pest platform

- Strengthening the collaboration among key institutions in the region. Coordinated by EMBRAPA with CORPOICA-INIA-CABI



Caribbean Plant Health Directors Forum

- Collaborative efforts and unified strategies to strengthen plant health safeguarding throughout the Greater Caribbean Region. Coordinated by USDA-APHIS, CARICOM, IICA



South American Biological Resource Centre Network

- Establish a South American regional Biological Resource Centre Network. Coordinated by INIA Chile and CABI



Trade and market access: improving market access – heavy metals in cocoa from Peru and Venezuela



- New food safety legislation in the EU
- For cocoa, concerns include levels of pesticide residues and heavy metal contamination
- With partners in South America, CABI examined heavy metal contamination from cocoa farms (soil and beans)
- General recommendations included:
 - increase soil pH to reduce availability
 - avoid use of phosphate fertilisers
 - avoid irrigation with contaminated water
 - remove cocoa waste materials (pod husks, pruned material)
- EU continues to discuss issue resolution with producing countries
- Ongoing work with ICCO and regional partners to mitigate and remediate contaminated cocoa soils



Knowledge management and Capacity Building

Rational Pesticide Use

- Collaborative work with the government and private companies to train extension officers and farmers in Colombia, Trinidad and Tobago and Barbados

Invasive species

- Establish technical capacity and early detection systems for key species in the Caribbean and Latin American countries

Diagnostic and pest management

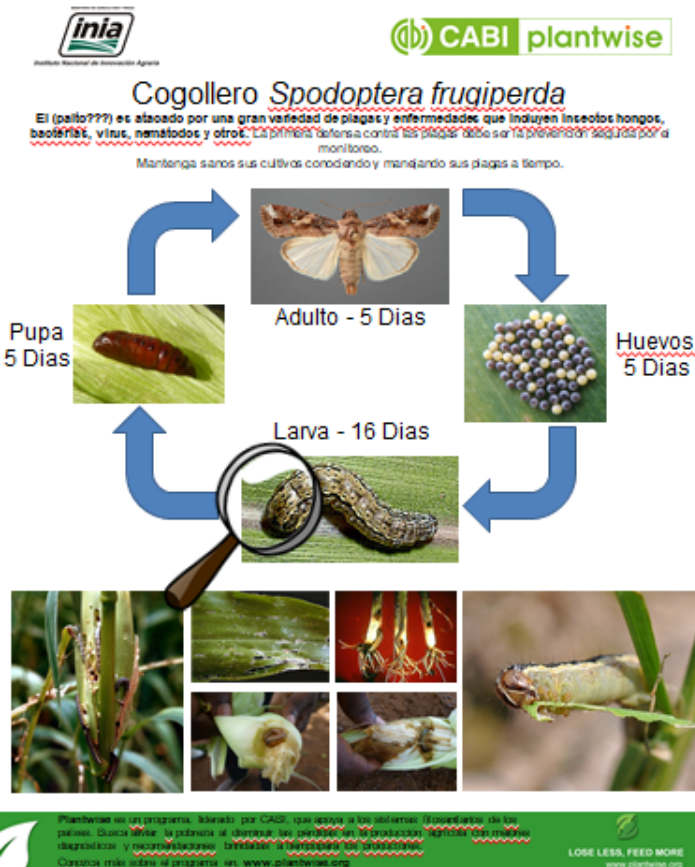
- Around 1,500 extension officers and technicians trained in Latin America and Caribbean as part of the Plantwise programme



Invasive Species and Knowledge Management

Classical Biological Control

Spodoptera frugiperda and *S. eridania*



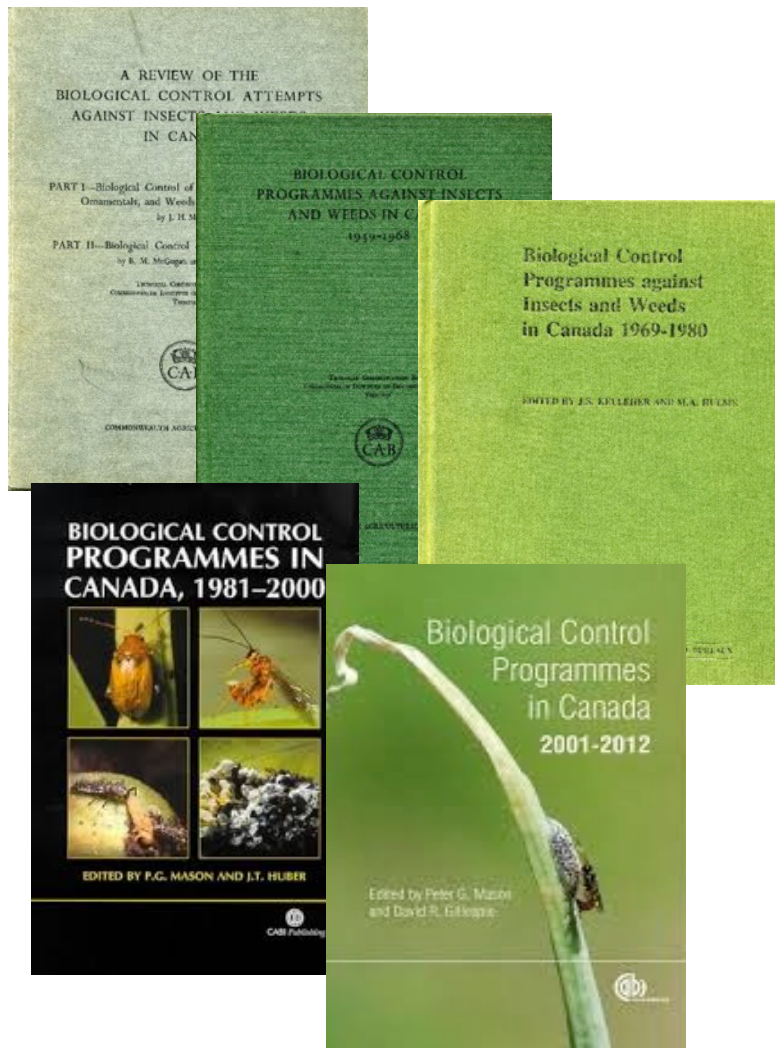
- Both species (*S. frugiperda* and *S. eridania*) are originally from the region, causing losses in key crops
- Evaluation of the natural enemies in Colombia, Brazil, Bolivia and Costa Rica, to establish an Integrated Pest Management package which can also be transferred to other regions around the world where these species were introduced and are causing problems
- Experience on the management of these species from Latin America and Caribbean – South to South Cooperation

Review Article

REVISÃO DA BIOLOGIA, OCORRÊNCIA E CONTROLE DE *Spodoptera frugiperda* (LEPIDOPTERA, NOCTUIDAE) EM MILHO NO BRASIL

BIOLOGY REVIEW, OCCURRENCE AND CONTROL OF *Spodoptera frugiperda* (LEPIDOPTERA, NOCTUIDAE) IN CORN IN BRAZIL

70 years of research collaboration between Canada and CABI



- Strong research collaboration in the field of biological control of arthropod pests and weeds has been established
- Strong scientific output and a large number of Canadian internships at CABI (over 105 from 21 different universities)
- Joint publishing initiatives are also a feature of this special relationship. Co-authored by CABI scientists and their Canadian counterparts, CABI published five volumes of “Biological Control Programmes in Canada (1910 to 2012)”

A strong collaboration network

**BC Ministry of Forests,
Lands and Natural
Resource Operation:**
Susan Turner

AAFC Summerland:
Chandra Moffat

Simon Fraser University:
Paul DeGrace
(Coop program)

University of Victoria
Rachel Richmond
(Coop program)

AAFC Agassiz:
Paul Abram

AAFC Lethbridge:
Hector Carcamo
Rosemarie DeClerck-Floate
Robert Bouchier
Kevin Floate
Haley Catton

University of Alberta:
Felix Sperling

Ecoscience
Alec McClay

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Alejandro Costamagna

University of Guelph:
Rebecca Hallett

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AAFC Ottawa:
Peter Mason
John Huber
Gary Gibson
Andy Bennett
Hume Douglas
Jose Fernandez
Patrice Bouchard

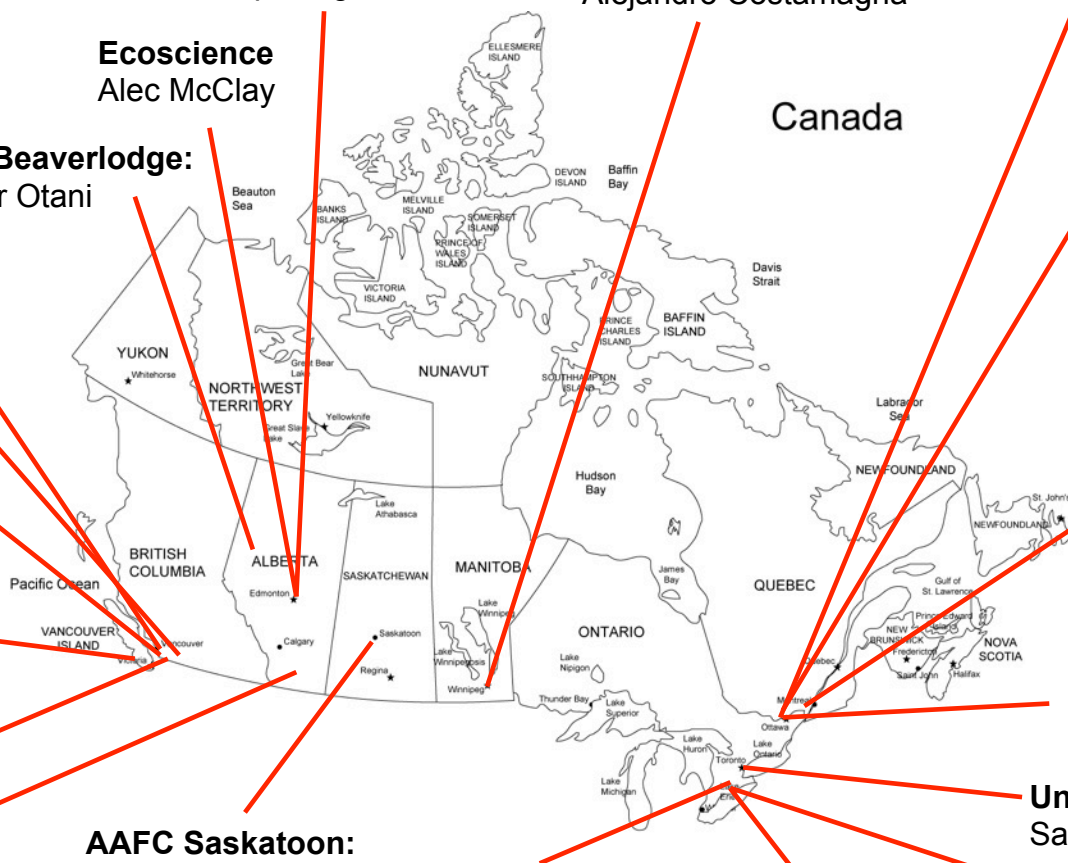
**Pest Management
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Kathy Makela

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Jean-sur-
Richelieu:**
Charles Vincent

Carleton University:
Naomi Cappuccino

University of Toronto:
Sandy Smith

OMAFRA:
Hanna Fraser





Development of invasive species management approaches

Current targets

- Apple leaf curling midge, *Dasineura mali*
- Diamond back moth, *Plutella xylostella*
- Brown marmorated stinkbug, *Halyomorpha halys*



Future targets

- Spotted lanternfly, *Lycorma delicatula*
- Allium leaf miner, *Phytomyza gymnostoma*
- Oriental fruit moth, *Grapholita molesta*
- European grapevine moth, *Lobesia botrana*





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Ministry of Agriculture and
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People's Republic of China



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Ministry of Foreign Affairs of the Netherlands



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development
and Cooperation SDC