



Highlights:

January :

- Teresa Martinez goes to 20th plant virology meeting

February:

- Prospecting BSV in Guadeloupe

March:

- Signing of a framework agreement in Cuba
- Catherine Abadie on assignment in Cuba

April:

- BSV Plantation experiments in Guadeloupe

May:

- Thierry Lescot on assignment in the Dominican Republic

- Clara Landry's PhD thesis

- Organization of a symposium in modeling in the field of health.

- Participation of Jean Carlier at the Conference of the Society of Molecular Biology and Evolution, Montpellier

June:

- Jean Carlier à Toronto
- Return of the final project in Guadeloupe
- Teresa Martinez (IDIAF) and Elisa Javer-Higginson (INISAV) visit CIRAD Guadeloupe

1st half 2015:

In this newsletter, the first of 2015: congresses, a thesis defense, feedback meetings and workshops preparing for the future of the Cabaré network ... Here are the highlights of the first half of 2015. Enjoy!

Signing a framework agreement in Cuba

Michel Eddi, CEO of CIRAD and Maricela Diaz Rodriguez, Director of Science and Innovation at the Ministry of Agriculture of Cuba, signed a framework agreement on March 6, 2015. The signing ceremony was held at the Residence of France in Havana, and was attended by Matthias Fekl, French Secretary of State for Foreign Trade and Jean-Marie Bruno, French Ambassador in Cuba. This agreement strengthens the institutional basis for cooperation between CIRAD and institutes for research and training in agriculture and the environment in Cuba.



Signing the framework agreement between CIRAD and the Cuban Ministry of Agriculture. Left to right: Juan José LEON (MINAGRI, Cuba), Matthias Fekl (French secretary of state), Jean Marie Bruno (French Ambassador in Cuba), Maricela Diaz (MINAGRI, Cuba), Michel Eddi (CIRAD).

In recent years, many regional cooperation projects have already been successfully conducted between CIRAD and its Cuban partners, with funding from the European Interreg program and the French Ministry of Foreign Affairs, including Cabaré. Following the signing of this agreement, Catherine Abadie and Dominique Martinez met CIRAD Cuban partners to present the strategy and CIRAD's proposals for banana systems (INISAV, INIVIT, IBP), food and fruit systems (IIFT, IHLD) and Animal and Plant Health (CENSA, INISAV). Research aims to develop ecologically intensive agriculture. They centre on the management of genetic resources, agro-ecological farming systems and management of health risks (emerging diseases).

Clara Landry's PhD defense

Clara Landry defended her doctoral thesis (specialty: Applied Mathematics) on Monday, May 18, 2015 at the University of the French West Indies and Guiana. She received a

doctorate from the University of Antilles and Guyane with the highest distinction.

Her thesis, partly supported by our project, is on the modeling of the dynamics of black Sigatoka epidemics, a disease caused by fungus *Mycosphaerella fijiensis*.

This is to determine the environmental parameters and host resistance influencing the spatial and temporal dynamics of the disease. Dynamics on the plant scale is described by a model coupling a simplified representation module of the architecture and growth of banana and an epidemiological unit describing the pathogen cycle. The model was calibrated and evaluated with two independent data sets. Numerical experiments and model sensitivity analyzes carried out by Morris and e-FAST methods give a better understanding of epidemics and the three parameters influencing its severity: the lesion extension rate, incubation time and the infection efficiency. The Bayesian inference has helped to refine existing information available on these three parameters.



Clara Landry receiving her results, Monday, May 18, 2015.

This model of spatiotemporal dynamics helped obtain important information for building design tools to control Black Sigatoka of banana.

The jury consisted of the following individuals:

- M. LANGLAIS Michel, Emeritus Professor, Université de Bordeaux (reporter)
- M. MAKOWSKI David, Research Director, INRA AgroParisTech (reporter)
- Mme CALONNEC Agnès, Research Director, INRA Bordeaux (examiner)
- M. SAPORTA Gilbert, Emeritus Professor, CNAM Paris (examiner)
- M. VAILLANT Jean, Professor, Université des Antilles (supervisor)
- Mme ABADIE Catherine, Researcher, CIRAD-Guadeloupe (co-supervisor of thesis)
- M. BONNOT François, CIRAD-Montpellier (co-

François Bonnot's visit to Guadeloupe (co-supervisor of the Clara Landry's thesis), was funded by the Cabaré project

Future PhD defenses

Two other PhD theses are being prepared. Defenses are planned for late 2015 and early 2016.

- Reina Teresa Martinez, IDIAF

Under the Cabaré project, Teresa is preparing a doctoral thesis with the University of the French West Indies and Guiana on "The assessment of the risk of spreading banana streak virus (BSV) by disseminating interspecific banana hybrids and



plantain carriers of infectious endogenous BSV sequences." Her defense is expected in Guadeloupe, December 14, 2015.

➤ Elisa Javier-Higginson, INISAV

Under the Cabaré project, Elisa is preparing a doctoral thesis with the University of Havana on "Molecular diversity of BSV species present in the main banana and plantain producing areas in Cuba." Elisa has already conducted a pre-defense, and the defense is scheduled for early 2016.



Elisa Javier-Higginson (INISAV), at the project's final meeting in June 2015.

Following the Cabaré debriefing, Reina Teresa Martinez and Elisa Javier Higginson spent a week in the laboratory at CIRAD Neufchâteau. This working week, as part of their thesis final year, allowed them to continue their work under the guidance of their supervisor, Pierre-Yves Teycheney.

1st health modeling symposium

CIRAD and the University of the French West Indies and Guiana organized the first modeling symposium in the field of health on 19 and 20 May 2015

Basing the symposium based on the concept of "One Health", CIRAD and the University brought together local and national experts in epidemiology modeling during the two-day symposium.

"Modeling is a powerful tool to understand the risk factors of affecting the spread of disease and to predict disease outbreaks," said Catherine Abadie, vegetable epidemiologist researcher and specialist in black Sigatoka of banana, symposium initiator.



Participants at the first symposium on modeling in the field of health, Université Antilles Guyane, in May 2015.

Four discussion sessions took place over two days:

- Statistical and numerical methods
- Animal Health Risks
- Plant Health Risks
- Human Health Risks

BSV Prospecation in Guadeloupe

More than 1000 leaf samples were collected from Guadeloupe to determine the prevalence of major virus species of banana streak virus (BSV). The team from CIRAD Guadeloupe aims to collect and analyze 2000 samples to assess the BSV status of crops, Creole gardens and wasteland in Guadeloupe. The previous BSV assessment was in 2006.

Cabaré project experimental plots

Banana streak

An experimental plot was set up in Guadeloupe on April 28, 2015 by William Fort in order to study the activation kinetics of infectious eBSV sequences in two varieties of plantain, French Clair and Pelipita, and the influence of the plant material multiplication techniques used.



BSV experimental plot, Neufchâteau in Guadeloupe, 25 June 2015.

In Cuba, a similar plot was set up in order to monitor FHIA-18, Pelipita and FHIA-21 varieties.

Resistance to black Sigatoka

Catherine Abadie went to Cuba in March 2015 to coordinate the activities of Cabaré project. She held a meeting with INISAV and visited the trials set up in a cooperative. This trial uses two CIRAD banana hybrids.

The Cabaré project newsletter



From left to right: Luis Perez, Catherine Abadie, Yanetsy Montero and Elisa Javer in Cuba, March 2015.

Similarly, during his mission to the Dominican Republic, Thierry Lescot visited the Cabaré project hybrid experimental plots. He reported on the completion of two trials conducted by IDIAF. He also worked on guidance for statistical analysis for the project closure meeting in June.



From left to right: Pablo Suarez (IDIAF), Thierry Lescot (CIRAD), Domingo Rengifo (IDIAF) in the Dominican Republic May 2015 visiting the trial plots.

The project is coming to an end ... and preparing for the future!

Invited by CIRAD, more than seventy-five Caribbeans hailing from 15 Caribbean countries and territories met from June 24 to 26 in Guadeloupe to share the results of the Interreg Cabaré project on the prevention and control of emerging sustainable banana diseases. On the agenda were the results of the four-year-long project and discussions on the future of regional scientific and technical cooperation. Researchers, academics, producers, representatives of the Ministries of Agriculture of the Caribbean countries, and Guadeloupe, Martinique and French Guiana came together in Raizet on June 24, for a project debriefing.

The head table for the opening of the meeting was composed of:

- M. Gilles Bajazet, Director of the Joint Technical Secretariat of the Interreg program
- Mme Thérèse Marianne-Pépin, President of the Regional Cooperation Commission of Guadeloupe

- M. Vincent Faucher, Director of Food, Agriculture and Forestry of Guadeloupe
- M. Dominique Martinez, Regional Director of CIRAD Antilles Guyane
- Mme Marlene Rubio Veita, Director of INISAV (Cuba)
- M. Fabio Frias, Responsible for IDIAF international relations (Dominican Republic)
- M. Denis Céleste, Deputy Chief of Economic Development of the Region Guadeloupe



Opening the final Cabaret meeting, June 24th, 2015 at Raizet, Guadeloupe

Participants visited the CIRAD research infrastructures in Neufchâteau, project test plots, as well as the collection of bananas in the Tropical Plant Biological Resource Center, the centre for the selection of new banana varieties and finally innovative banana cropping systems.



Participants in field visits on 25 June 2015 on the experimental CIRAD plots.

Three Interreg V workshops were held on 25 and 26 June. They focused on the following themes: banana and plantain, agroecology diversification in vegetable and fruit production and animal and plant health.



The regional cooperation workshop, June 26 2015, Creole Beach Hotel, Guadeloupe.

Other news

- Reina Teresa Martinez (IDIAF) presented the results of her thesis at the 15th plant virology meeting, which held in Aussois from 18 to 22 January 2015.



- Jean Carlier (CIRAD Montpellier) attended the Annual Conference of the Society for Molecular and Evolutionary Biology from 26 to 29 May 2015 in Montpellier. He presented a poster outlining the project's work, to determine whether resistance of banana hybrids produces a genetic evolution in the pathogen responsible for black Sigatoka.
- Jean Carlier also undertook a mission from 15 to 19 June 2015 in Toronto, Canada. This mission's aim is to perform bioinformatic studies of *Mycosphaerella fijiensis* isolates, responsible for black Sigatoka. They were isolated in Cuba and the Dominican Republic on resistant banana hybrids cultivated for over 5 years (FHIA18, FHIA21). He joined S. Wright's team where he remained for a year as part of the European Pierre and Marie Curie exchange program from August 2013 to August 2014.

Arrivals & Departures:



Kaïssa Pineau Plaisir joined the Guadeloupe CIRAD virology team in March 2015. She replaces Isabelle Acina Mambole who is taking time off. Kaïssa has a University Diploma in Chemistry and a professional degree in Environmental Quality Safety Research. She previously worked at the CIRAD Animal Health Laboratory in Duclos, Guadeloupe). Kaïssa

was in charge of the implementation of procedures of laboratory safety level 3 (P3) and provided technical support to the laboratory for diagnostic tests in serology and molecular biology.

Guillaume Fort, from the CIRAD Guadeloupe virology team, has extended his VSC contract (Civic Service Volunteers) until 30 September 2015. First arriving on May 2, 2014, he will continue his work as part of the project. Guillaume is responsible for drawing up the BSV health status of Guadeloupe banana, as well as the implementation and monitoring of the field experiments assessing the risk of BSV associated with the use of interspecific varieties.



We're in the news !

Following the final project meeting:

- A statement appeared on the Guadeloupe Regional Council's website to announce the final meeting
- An article appeared in *France Antilles* on 06/26/2015: "Three questions for Pierre-Yves Teycheney"
- On 25 and 27 June 2015 Pierre-Yves Teycheney and Catherine Abadie were interviewed on Guadeloupe radio.

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