June – December 2012
Number 3

Cabaré newsletter

Introduction

The second half of 2012 was marked by many Cabaré project events: signature of partnership agreements, renewal of VSC contracts, statistical analysis of survey data, training on mealybug taxonomy, thesis research of Teresa Martinez, coordination meeting, etc. You will find all of the details of these events in this third issue of the Cabaré newsletter. Enjoy!

Third coordination meeting, Santo Domingo, 4-6 December 2012

The third project coordination meeting was held at Santo Domingo (Dominican Republic) from 4 to 6 December 2012. The working sessions took place at the French Embassy and IDIAF. Ms B. Kreiss, French Ambassador to the Dominican Republic, gave the opening address in which she stressed the importance of the cooperation between France and the Dominican Republic, particularly in higher education and research.
The progress of the Cabaré project was comprehensively reviewed through presentations of the activities of all participants, thus illustrating the dynamics of each partner and the strong relationships between partners.

The meeting was an opportunity for many constructive discussions.

The meeting also provided an opportunity for partners to review the initiatives planned for 2013. It was agreed that the first experimental plots would be set up in the partner countries in the second half of 2013. The administrative and financial aspects were discussed, including the terms of payment of subsidies to partners to enable them to set up local experiments as quickly as possible.

The project partners around Ms B. Kreiss, French Ambassador to the Dominican Republic, and diplomatic attachés of the French Embassy.

All the participants thanked Ms B. Kreiss, French Ambassador to the Dominican Republic, for her cooperation and for providing a meeting room at the Embassy, as well as R. Perez Duvergé, Director of IDIAF, for his reception at the IDIAF headquarters. They also thanked the services of the French Embassy and IDIAF for their help in organizing this meeting.

Thesis research of Clara Landry on modelling black leaf streak diseases on different spatial scales

Clara Landry is conducting thesis research to obtain a PhD at the University of the French West Indies and Guiana within the framework of two projects, including the Cabaré project. Her research involves developing simulation models on black leaf streak diseases on plant, production area and regional scales. These tools are essential to gain insight into how the disease develops and to optimize control strategies.
Two experiments were conducted at Moca (Dominican Republic) on the FHIA21 and Macho X Hembra varieties, from September to December 2012, to collect data for the calibration and validation of an epidemiological model for banana black leaf streak on the plant scale. The first involved monitoring lesions on a susceptible variety, from disease onset until the senescence of each leaf. Lesions were sampled on a bi-weekly basis on 189 leaf squares by E. Salomon and L. Sajousse (IDIAF) for 3 months. The second experiment included two repetitions in September and December 2012 and consisted of removing all leaves on three banana plants and cutting 21 small pieces (25 cm²) of leaves selected randomly on three predefiined leaf sections. Each of these cut leaf pieces (around 1300 fragments overall) was scanned in the field on a scanner obtained for the Cabaré project, and analysed using Visilog image analysis software. Scripts were developed to quantify the number and size of lesions on each scanned leaf fragment. Catherine Abadie,

Aurore Cavalier and Yolande Chilin-Charles helped Clara Landry in this second experiment during two research missions undertaken from 17 to 21/09/2012 and from 5 to 07/12/2012.

Clara Landry explaining the experimental procedures.

Teresa Martinez's stay in Guadeloupe as part of her thesis research

Reina Teresa Martinez, coordinator of the Cabaré project for the Dominican Republic, is also conducting thesis research to obtain a PhD at the University of the French West Indies and Guiana within the framework of the project. This research involves assessment of the risk of the banana streak virus (BSV) spreading through the dissemination of interspecific hybrids of banana and plantain carrying endogenous infectious BSV sequences.

Two parent species, i.e. *Musa acuminata* (A) and *Musa balbisiana* (B), are used in breeding schemes to obtain new improved interspecific triploid (type AAB) or tetraploid (type AAAB) banana hybrids. However, *M. balbisiana* parents bear endogenous banana streak virus (eBSV) sequences in their genome. Some of these sequences are infectious and may be expressed following biotic or abiotic stress and lead to infection of the plants. This thesis research is aimed at assessing, on a plot scale via multilocation trials, the risk of banana streak virus (BSV) dispersal through the dissemination of interspecific banana and plantain hybrids carrying infectious endongenous BSV sequences.

R.-T. Martinez was hosted for 2 months at CIRAD-Guadeloupe, from 15 September to 9 November 2012, as part of her PhD research. During this stay, she analysed samples that had been collected in all banana growing areas of the Dominican Republic so as to evaluate the prevalence of the main BSV species. She also analysed the structure of eBSV alleles present in the genotypes targeted in her PhD research. Initial results revealed a close correlation between the presence of infectious eBSV alleles and that of the virus.

The first meeting of her PhD dissertation committee was held during her stay. The committee members include: Graciela Godoy de Lutz (IDIAF, Dominican Republic), Silvina Gonzalez Rizzo (University of the French West Indies and Guiana), Marie-Line Iskra-Caruana (CIRAD-Montpellier), Damien Meyer (CIRAD-Guadeloupe) and Pierre-Yves Teycheney (CIRAD-Guadeloupe, thesis supervisor).

Aurore Cavalier's research on survey data collected in Cuba and the Dominican Republic

Aurore Cavalier's studies carried out within the framework of the project are aimed at gaining insight into the decline of black Sigatoka disease resistance observed in banana and plantain hybrid varieties that were introduced in Cuba and the Dominican Republic in the 1990s. Epidemiological surveys were thus conducted by A. Cavalier in Cuba from December 2011 to February 2012 and in the Dominican Republic from April to May 2012. Initial results suggest a loss of resistance in the FHIA18 hybrid in Cuba. Further analyses highlighted a number of factors (climate, cropping practices, plant nutrition) that impact the disease severity index. To enhance the statistical approach, A. Cavalier visited CIRAD-Montpellier from 8 to 12 October to collaborate with F. Bonnot, biostatistician and project partner. The findings of this research will be published in scientific journals in 2013.

Rosalba Rodriguez's stay at CIRAD-Montpellier

Rosalba Rodriguez Pena, IDIAF research engineer, spent 4 months at CIRAD-Montpellier (France). During her stay, she characterized *Mycosphaerella fijiensis*, black Sigatoka causal agent, in two ways. This fungus was collected at three locations in the Dominican Republic on FHIA 21 (*M. fijiensis* resistant) and Macho X Hembra (susceptible) varieties. She studied differences in aggressiveness through three successive inoculations of 72 isolates on live banana leaf fragments.

She also participated in describing the genetic diversity of these populations using 11 microsatellite markers. These genetic analyses led to a description of the genetic diversity (HE), allelic richness (Ar) and genetic differentiation (TVF) using Genepop software. The preliminary results suggest that there are now major genetic differences in the pathogen populations.

Mealybug taxonomy training workshop, CIRAD-Guadeloupe, 15- 19 October 2012

The third training workshop of the project was held at CIRAD-Guadeloupe from 15 to 19 October 2012. It concerned the analysis of mealybugs, some species of which are banana streak virus (BSV) vectors and should therefore be taken into account in assessments of BSV risks associated with the dissemination of banana hybrids bearing infectious eBSV alleles.

Six people participated in this workshop (two per active partner country: Cuba, Guadeloupe, Dominican Republic) and

were trained on mealybug morphological and molecular analysis techniques.

Colmar Serra (IDIAF, Dominican Republic) identifying a mealybug under the watchful eye of Elisa Javer-Higginson (INISAV, Cuba).

The workshop was held thanks to funding provided by the Fonds de Coopération Régionale (FCR) and the Prefecture of Guadeloupe.

C. Serra (IDIAF) and Rudy de la Masa (INISAV) capturing a mealybug!

Banana leaf streak disease diagnosis training workshop, Dominica, 25 October 2012

Following a black Sigatoka survey mission, Catherine Abadie, Cabaré project co-coordinator, offered a training workshop on banana leaf streak disease laboratory diagnosis in Dominica. This workshop was focused on theoretical and practical aspects of an approach based on the analysis of sporulating banana leaf streak lesions under a microscope. Seven people, including six from the Ministry of Agriculture and CARDI, attended this training workshop.

Practical training on the diagnosis of banana leaf streak disease in Dominica.

Participants in the banana leaf streak disease training workshop conducted by Catherine Abadie (CIRAD) at the laboratory of the Ministry of Agriculture of Dominica.

Detection of black Sigatoka in Dominica

Aurore Cavalier (CIRAD-Guadeloupe) conducted a support mission in Dominica, from 27 to 28/06/2012, during which she helped a delegation from the Ministry of Agriculture of Dominica carry out a survey at 29 locations in the banana growing area throughout the country. This survey led to the detection of black Sigatoka in the eastern coastal region on the basis of symptom observations and involved the collection of samples to be used for molecular analyses in Martinique.
Catherine Abadie conducted a survey mission in Dominica from 24 to 25/10/2012 which involved the collection, at 5 different locations (eastern, southern and central coastal regions), of leaf samples to be analysed at CIRAD-Montpellier. Genetic analysis of these samples should identify the origin of this disease in Dominica.

Miscellaneous information

Expert appraisal of Luis Perez Vicente (INISAV) on the regional action plan on black Sigatoka control coordinated by FAO

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Luis Perez Vicente (INISAV, Cuba), FAO consultant, went on a 1-month assessment mission (19/08 au 22/09 2012) in the Windward Islands (Dominica, Saint Vincent and Saint Lucia). The consultant also visited Barbados on 21/09/2012. The findings of this assessment should lead to the implementation of a regional action plan for controlling black Sigatoka in the Lesser Antilles in 2013.

Contract renewals for A. Cavalier and O. Simon

Aurore Cavalier, agricultural investigator, and Olivier Simon, project manager, had their respective contracts renewed in September 2012. A. Cavalier will thus continue her statistical analysis of field survey data collected in Cuba and the Dominican Republic until September 2013. O. Simon will remain in charge of financial management and communications for the project until March 2013.

Cabaré project promotional items

Five promotional items (T-shirts, USB keys, caps, bags and pens) were designed as part of the project communication plan. They bear the project and INTERREG programme logos. They will be distributed to Cabaré project partners and stakeholders to promote the project and the INTERREG programme.

Promotional items bearing the project and INTERREG programme logos.

Fourth Cabaré project coordination meeting

The fourth Cabaré project coordination meeting will be held during the last quarter of 2013, either after the Acorbat conference to be held at Fortaleza (Brazil) in September, or after the next INIVIT symposium on roots, tubers, plantains and bananas to be held at Santa Clara (Cuba) in October.

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