

CAMI PROJECT

Caribbean Agrometeorological Initiative

REPORT OF CONTRACT FOR CONSULTANTS' SERVICES

Prof. Simone Orlandini

Department of Plant, Soil and Environmental Science - University of Florence

Piazzale delle Cascine 18.

50144, Firenze. Italia

Tel: +39 0553288257, 0553288446

E-mail: simone.orlandini@unifi.it

Caribbean Agrometeorological Initiative (CAMI) has the aim to increase and sustain agricultural productivity at the farm level in the Caribbean region through improved dissemination and application of weather and climate information using an integrated and coordinated approach. The results are expected to benefit the farming community in the Caribbean Region. The project is expected to assist the farming on decision making developing pest and disease forecasting systems for improved on-farm management decisions. Other aims are preparation and wide diffusion of a user-friendly weather and climate information newsletter and organization of forums with the farming community and agricultural extension agencies to promote a better understanding of the applications of weather and climate information and to obtain feedback to provide better products from the meteorological services for use by the farming community.

The project is funded with a grant received from the European Union through the African Caribbean and Pacific Group of States (ACP) Science and Technology (S&T) Programme. The coordinator is the Caribbean Institute for Meteorology and Hydrology (CIMH) in partnership with the Caribbean Agricultural Research and Development Institute (CARDI), World Meteorological Organization (WMO) and National Meteorological and Hydrological Services (NMHSs) of ten Caribbean member States.

Based on the planned activity and the specific experience in the field of operational application of agrometeorology, Prof. Simone Orlandini was selected as the consultant for pest and disease agrometeorological modeling. Particularly, the consultant shall:

- Meet with local stakeholders (pathologists, entomologists, agronomists and extension service personnel from ministries of agriculture) in partner countries, CARDI and farmers to determine needs with respect to weather and climate information in pest and disease development.
- Develop needs assessment and recommendations report with respect to weather and climate related pest and disease modeling.
- Conduct a training workshop for meteorologists and CARDI pathologists that would include the presentation of the abovementioned needs assessment and recommendations and training in relevant model development.

The activity will allow the participants to:

1. Understand of the major pest and disease influences of cropping in the Caribbean.
2. Understand influences of weather and climate on pest and disease development.
3. Have hands on use and application of basic models and approaches used in pest and disease modelling.

During the period December 2010 / April 2011 the expert attended the following meetings with local stakeholders:

BELIZE December 8th

JAMAICA December 10th

TRINIDAD January 24th

GUYANA January 25th
GRENADA January 26th
ST LUCIA January 27th
DOMINICA January 28th
BARBADOS April 6th

During the first trip in Caribbean area, including Belize and Jamaica, the following elements were presented (annex 1):

effect of weather conditions on pest and disease

main element of modeling approach

implementation and application of modeling for pest and disease control

During the second trip organized in January, the presentation was revised to give more details about the biological element of pest and disease development, to satisfy the needs of the participants, mainly having a physical background (annex 2).

A consistent participation was observed during each meeting, and minutes were prepared to summarize the main points of the discussion (annex 3).

During each meeting the importance of collecting real data for the development of models was strongly emphasized (annex 4). Both biological (crop, pest and disease) and meteorological (temperature, relative humidity, rainfall, leaf wetness) data are the basis for model development, calibration and validation. To support country activity and the following project phases oriented to the selection of a limited number of case studies to demonstrate the importance of models for crop protection management, a form was prepared. The form (annex 5) includes all the main information required for the evaluation of the importance of diseases in the Caribbean area. One month was the time available for each country to provide us with all the information. Results were collected from the majority of the country (annex 6).

The training workshop was held from 4th to 5th April. The following topics were addressed with oral presentation and practical exercises:

- Monitoring of epidemics: disease, pathogen, insect, host
- Basic elements of modelling for pest and disease applications
- Generic models for pests and diseases.
- Application of generic models: infection and degree-days model exercise
- Analysis of possible role of agrometeorological models
- Definition of modeling aims
- Leaf wetness estimation: exercise
- Preliminary modeling approaches using pathogen and pest model: black sigatoka example
- Preliminary modeling approaches using pathogen and pest model

For each topic power point presentations were provided to the participants, together with data and tools for exercises, documents, papers and the main references describing the state of the art. All the documents are available from the project web site.

At the end of the meeting the discussion was oriented to the final selection of the case studies. On the basis of the received answers (annex 7), the following elements were chosen:

Common name pathogen: Black sigatoka
Kingdom: Fungi
Division: Ascomycota
Class: Dothideomycetes
Order: Mycosphaerellales
Scientific names: *Mycosphaerella fijiensis*
Host Banana (*Musa sapientum*)

Common name: Citrus Psyllids
Class: Insecta
Order: Hemiptera
Suborder: Sternorrhyncha
Superfamily: Psylloidea
Family: Psyllidae
Scientific names: *Diaphorina citri*
Host Gen: Citrus

Common name: Silverleaf whitefly
Class: Insecta
Order: Hemiptera
Superfamily: Aleyrodoidea
Family: Aleyrodoidea
Scientific names: *Bemisia tabaci*, Biotype B (= *B. argentifolii*)
Host Vegetables (specially tomatoes and peppers)

During the period before the attachment in Florence, Department of Plant, Soil and Environmental Science – University of Florence, planned for September 2011, these pests and diseases will be studied, analysis the state of the art and the main biological and epidemiological properties. A proposal for specific models will be prepared, giving the Caribbean countries the main elements for develop a specific support systems for farmers and local stakeholders.

Florence, September 2011

The consultant

(Prof. Simone Orlandini)

