



TRAINING SESSION: PRACTICES AND TECHNIQUES
TO MANAGE THE LETHAL YELLOWING DISEASE IN COCONUT PALMS

Objectives and Program



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727459

OBJECTIVES

- Provide information for the identification of LY symptoms in coconut palms, alternative host plants, and how to collect insect vectors.
- Provide an opportunity to visit a site where LY resistant coconut palms are being cultivated under organic conditions.
- Acquire the capacities: (a) for collecting samples of insects and plants and (b) for the fast molecular detection of phytoplasmas associated with the LY disease.
- Improve the knowledge on management strategies to reduce LY economic impact.

DAY 1: THE TROPICSAFE PROJECT AND THE LETHAL YELLOWING DISEASE

TECHNIQUES FOR DETECTION OF LETHAL YELLOWING ASSOCIATED PHYTOPLASMAS

08:30-08:45 Welcome. Carlos Oropeza

08:45-09:15 Presentation of the TROPICSAFE project. Assunta Bertaccini

09:15-10:30 An overview of the Lethal Yellowing (LY) disease. Carlos F. Ortiz and Carlos Oropeza

- » Symptomatology of LY in coconut palms and other host plants
- » Time-space dispersal of LY
- » Phytoplasmas associated with LY
- » Screening for LY resistance and management

10:30-10:45 Coffee break

10:45-11:45 LY in TROPICSAFE countries in the Americas (Jamaica, Cuba, Mexico) and Africa (Ghana). Wayne Myrie, Carlos Oropeza and Matthew Dickinson

11:45-13:00 Techniques for the detection of LY phytoplasmas:

- » Polymerase Chain Reaction (PCR) analysis and its applications. Luis Sáenz
- » Loop-mediated isothermal amplification (LAMP) analysis and its applications. Matthew Dickinson

13:00-15:00 Lunch

15:00-16:30 Explanation of the field visit. Carlos Oropeza

- » Sites to visit and what to find and do in each site
- » Sampling of plant tissues, description of methodology
- » Collection of insects, description of methodology

16:30-17:30 Visit to laboratories in CICY facilities and equipment. Luis Sáenz

DAY 2. VISIT TO SITES WITH COCONUT PALMS OR OTHER PALMS AFFECTED BY LY FOR SYMPTOM OBSERVATION, SAMPLING AND CAPTURE OF INSECTS

Wayne Myrie, Carlos Oropeza and Matthew Dickinson

07:45-08:15 Transfer from hotel to MAPSA site

08:15-10:00 Visit to MAPSA near Merida:

- » Visit to LY resistant coconut palms cultivated under organic conditions

10:00-11:30 Transfer from MAPSA site to San Crisanto

11:30-12:30 Visit of two sites in San Crisanto:

- » **Guadalupe site.** Visit to the collection of germplasm that was a previous resistance screening trial
- » **Caridad del Cobre site*.** Watching and collecting of insects in a site with a recent LY outbreak

12:30-13:00 Transfer from San Crisanto to Telchac

13:00-14:00 Visit to Telchac Town:

- » Observation of LY symptoms in palms, sampling of plant tissue and demonstration of rapid DNA extraction and setting up of Loop-mediated isothermal amplification (LAMP) diagnostics in the field; observation and collection of insects

14:00-15:30 Lunch in Telchac

15:30-17:00 Transfer from Telchac to the hotel

DAY 3. LABORATORY SESSIONS

08:30-13:30 Analyses of samples using qPCR and LAMP. Luis Sáenz and Matthew Dickinson

- » Distribution to trainees of documents detailing the qPCR and LAMP protocols
- » Demonstration of the process for the extraction of DNA from samples
- » qPCR assay of DNA extracts from palm and insect tissue samples
- » LAMP assay of DNA extracts from palm tissue and insect tissue samples

13:30-15:00 Lunch

15:00-16:00 Results session. Carlos Oropeza with Matthew Dickinson and Luis Sáenz

- » Observation of the results obtained with both techniques, discussion and conclusions