



COST Action FA1105 – Biogreenhouse
Towards a sustainable and productive EU organic greenhouse horticulture

Training school

**Vegetable diseases diagnostic tools and control methods under
greenhouse organic farming. Practical training.**

Tuesday, 12th to Friday 15th of May 2015 at IFAPA La Mojonera Center

Organizers

MICROGAIA BIOTECH SL
IFAPA La Mojonera, Almería.
CEBAS-CSIC, Murcia.

José Pascual y Cristobal Sánchez
Carmen García y Pedro Gómez
José Pascual y Margarita Ros

Closing date applications: 20th April 2015

Introduction

The diagnosis of plant diseases has evolved over time and practical experience is needed. Traditional techniques have been used to detect plant pathogens and are based on identification of disease symptoms, isolation and culturing of the microorganisms. In the last decades, molecular techniques have been rapidly adopted, and allow a rapid detection and accurate identification of plant pathogens, which is one of the most important strategies for controlling plant diseases as is required for taking appropriate disease management measures.

An early detection of pathogens, even before of the onset of the symptoms, is of special interest in organic farming, where prevention is more important than performing treatments.

The course will offer participants the chance to familiarize with a wide array of diagnostic techniques, which will be applied not only in the laboratory but also on the field. This practical training school will bring tools and knowledge to develop preventive actions against plant diseases caused by common agents such as virus, bacteria and fungi.

Objectives



Co-funded by
the European Union



- To know the physiology and mode of action of the main pathogens affecting vegetables grown in greenhouses;
- To describe the main tools of classical diagnosis of vegetable diseases;
- To describe the main tools of molecular diagnosis of vegetable diseases;
- To teach the main agronomic techniques that improve plant health in organic farming;

Date and Venue

From Tuesday, 12th to Friday 15th of May 2015
IFAPA La Mojonera Center

Contact persons

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Margarita Ros margaros@cebas.csic.es

Rob Meijer rob.meijer@wur.nl

Trainers

Dr. Jose Pascual	Dr. Esteban Baeza	Dra. M Mar Téllez
Dr. Margarita Ros	Dr. Julio Gómez	Dr. Fabio Tittarelli
Mrs.Carmen García	Mr. Amnon Koren	Dra Teresa Urrutia
Dr. Pedro Gómez	Dra Pilar Lorenzo	Mr. JM Torres
	Dr. Dirk Janssen	Dra. Soledad Verdejo-Lucas
	Dra. Leticia Ruíz	

Methods

This is a practical course on field management and laboratory diagnostic tools to detect and identify horticultural plant diseases. Demonstration on how to sample vegetal and soil material in the field and its subsequent use on the laboratory, from microscopic techniques to molecular techniques will be trained. Field trips will be organized to show organic greenhouse production and everyday trainees will be accompanied by experts of pests, virus, fungi or bacteria pathogens to illustrate the visit. Participants will have a pre-lecture before departing to the different farms.

Participants

Up to 15 participants. Master or PhD students or any other qualified people working in the field of organic greenhouse/protected horticulture

Eligibility

In general, applicants must be MSc students, PhD student, or post-docs / early stage researchers or people active in the organic greenhouse/protected farming and being capable and experienced enough to participate. They must be enrolled in or affiliated to an Institution or business located in a country participating in this COST Action: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom. Applicants from approved Near Neighbor country institution are also eligible to apply: Al-Balqaa Applied University/ Faculty of Agricultural Technology in Jordan and Cairo University in Egypt. Except for the above mentioned requirements, the degree wherein the training of the trainee will contribute to the objectives of the Biogreenhouse Action and a reasonable country balance of the participating countries will be taken into account in the selection of the trainees

The interest and/or first-hand experience of applicants should fit the topic of this training school.

Financial support

COST Action FA1105 is offering 15 places at the training school on a competitive basis. The participating trainees will be offered a grant of 250-800€ as a contribution towards the costs of participation, travel, accommodation and meals. The exact grant offered will depend on the need for accommodation and the distance to the venue as the cost of travel differs considerably across eligible countries. Accommodation will be provided by the organizers at a flat rate of 40€/ night included breakfast in a 3 star hotel that it will be in an easy way to pick all of you in the morning before the course and drop you after it. Trainees will not be picked up in any other place than in front of the hotel main entrance. At the arrival, the lunch meals, social lunch and the contribution in the expenses of the field trips of the course must be paid cash on arrival (*185€). Field trips and social lunch are included. Please note that the grant will be paid by bank-to-bank transfer after the course has been completed.

*Consists of 15€ for three days lunch plus 20 for the social lunch (Total 65€) plus the 120€ extra money for covering the local costs for field trips.

Medical insurance

It is the responsibility of each participant to provide adequate insurance coverage (personal, travel and medical) for the whole duration of the training course and travel period.

How to apply

Send a letter of application stating your interest on participating to the training school both to Carmen García (mariac.garcia.g@juntadeandalucia.es) and Jose Pascual (jap@microgaia.es), MICROGAIA BIOTECH /CEBAS-CSIC and to the Chair of COST BIOGREENHOUSE Rob Meijer (rob.meijer@wur.nl) within

Monday the 20TH of April 2015. The letter must be accompanied by the following documents:

- (1) a short CV (maximum 2 pages) containing your personal information, current home and university/institution mailing addresses, e-mail, Skype name (if possible), university qualifications, current enrolment status, training/work experience, publications. Please underline in your CV your previous experiences in a COST action, if any.
- (2) a letter of motivation stating why you would like to participate in this training school.
- (3) for MSc and PhD students only: contact details of your supervisors or any other people who can be contacted for information about your capabilities and/or experience.

Programm

Note: Trainers of the morning will accompany trainees during the field trips of the afternoons.

Tuesday Course Presentation

8.30 - 9.30. Official presentation

- Welcoming to the IFAPA La Mojonera Center

Dr. Salvador Parra, IFAPA Director

- Participant presentation and Trainer presentation from CSIC and IFAPA

Dr. José Antonio Pascual and Dr. Pedro Gómez

Tuesday WP1- Greenhouse organic horticulture. Management of greenhouse conditions to control diseases

Mediterranean protected horticulture is essentially based on the use of low cost greenhouse structures with a very limited climate control that relies mostly on natural ventilation management and simple shading techniques (whitening). Despite of this, different simple strategies can and should be followed by growers to prevent the infestation of the crops by different pests and diseases, especially under organic farming, where prevention is the key to success in crop protection. These strategies will be analyzed and discussed in a field trip to different experimental greenhouses of the IFAPA research Center.

9.30 – 10.30.- Organic horticulture at Europe framework.

Dr. Fabio Tittarelli

10.30 – 11.30.- Greenhouse organic horticulture in Spain. Plant disease implications

Carmen Garcia

11.30 - 12,00.- Coffee Break

12.00 - 14.00.- Field trip to experimental greenhouses of the IFAPA research centre. The important role of greenhouse conditions in the prevention and control of diseases. (Practicum 1. *In situ* pathogen identification, vegetable, soil and soil less growing media sampling to be analysed in the laboratory)

Dr. Pilar Lorenzo / Mr Amnon Koren

14.00 – 15.30.-Lunch and shared discussion

Tuesday afternoon WP2- Plant disease in greenhouse crops

Feasible and practical tools to detect and identify pathogens will be explained and developed. Introduction to the groups of fungal diseases present in horticultural crops.

15,30 – 16,30.- Fungi plant disease taking into account two main conditions: a) greenhouse and, b) Mediterranean conditions

Dr. Julio Gómez

16.30 – 17.00.- Coffee break

17,00 – 18,00.- Bacterial plant disease taking into account two main conditions: a) greenhouse and, b) Mediterranean conditions

Dra. Teresa Urrutia

18,00 – 19,00.- Soil disinfection in biogreenhouse.

Dr. José Antonio Pascual

19,00 – 20,00.- Dinner and shared discussion

Wednesday WP2- Plant diseases greenhouse crops- Bacteria and fungi

Symptoms identification. Microscopic observation and fungal isolations. Phytopathometry and bait techniques. Molecular techniques, use of pathoship

9.00 – 10.00.- Overcoming stress and pathogens through physical and agro techniques methods in greenhouses at mediterranean climate conditions

Mr Amnon Koren

10.00 – 10.30.- Coffee break

10.30 – 11.30 - Rapid methods for plant pathogen diagnosis based on molecular approaches

Dra. Margarita Ros

**11.30.- 14:00 Diagnostic tools for fungal diseases in greenhouse crops.
(Practicum 3. Laboratory identification)**

Dra. M^a Mar Téllez/Dr. José Antonio Pascual

14.00 – 15,30.- Lunch and shared discussion

**15.30 – 18.00.- Diagnostic tools for fungal diseases in greenhouse crops.
(Practicum 4. Laboratory identification)**

Dr. Teresa Urrutia / Dr. Julio Gómez /Mr AmnonKoren

18.00 – 19.00.- Dinner and shared discussion

Thursday WP3- Plant diseases greenhouse crops- Virus

Field observation and identification of symptoms. Infectivity tests in a host range: Insect vector inoculation Sap inoculation. Introduction to control methods of virus diseases affecting horticultural crops.

Presentation of rapid identification techniques: ELISA: principles and applications. Amplified nucleic acid techniques: PCR, Reverse Transcriptase-PCR (RT-PCR), Nested-PCR and Real time PCR. Molecular hybridization with digoxigenin probes: principles and probes design.

9.00 - 10.00.- Virus plant diseases taking into account two main conditions: a) greenhouse, and b) Mediterranean conditions.

Dr. Dirk Janssen

10.00 - 10.30.- Coffee break

10.30 – 12.00.- Laboratory practicum- Practical tools to detect and identify virus: classical techniques. (**Practicum 5. Laboratory identification**)

Dra. Leticia Ruíz

12.00 – 14.00.- Laboratory practicum - Introduction to Molecular and Serological techniques. Diagnostic Techniques for Viral Testing (**Practicum 6. Laboratory identification**)

Dra. Leticia Ruíz

14.00 – 15.30.- Lunch and shared discussion

15.30 – 19.00.- Field trip to organic nursery. Grafting and microbial inoculation with beneficial microorganisms. (**Practicum 7. Field trip to recognize different grafting practices and microbial inoculation in an organic nursery**)

Mr Amnon Koren; Mrs. Carmen García

19.00 – 20.00.- Dinner and shared discussion

Friday WP4 - Plant diseases greenhouse crops- Nematodes

Field observation and identification of disease symptoms. Feasible and practical tools for detection and identification. Symptoms identification. Microscopic observation

9.30 – 11.00.- Basic techniques for nematode extraction and identification. (**Practicum 8. *Visum* identifying of the process to identify nematodes**)

Dra. Soledad Verdejo-Lucas, Mr Amnon Koren

11.00 – 11.30.- Coffee break

11.30 – 14.00.- Field trip to agriculture ecological composting facilities.
(Practicum 9. Visum for identifying the main characteristics of suppressive compost)

Mr JM Torres

14.00 – 16.00.- Social Lunch at the Natural Park Cabo de Gata-Níjar

17.30 – 18.00.- Final remarks and Conclusions
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