COST ACTION FA1105

Towards a sustainable and productive EU organic greenhouse horticulture

Soil fertility, Suppressiveness & Water management strategies towards sustainable and productive organic greenhouse agriculture

International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM)
Mediterranean Agronomic Institute of Bari (IAMB) - Department of Organic Agriculture
Valenzano, Bari, Italy – 15-19 September 2014

Rationale

Organic greenhouse horticulture should improve its sustainability and reduce its environmental footprint. The scientific challenges are to design sustainable irrigation and fertilization strategies, to enhance the mechanisms of resilience, robustness and suppressiveness for the management of pests and diseases, to integrate crop management, energy saving, renewable energy sources and new techniques to obtain climate neutral production. Soil fertility management in organic horticulture is more complex than in conventional production systems. In organic horticulture, soil fertility management is based on agroecological strategies which need deep knowledge of the pedoclimatic situation and of nutrients flow through the agroecosystem. This is affected and regulated by crop rotations, cover crops, green manuring, and compost application integrated with low input organic fertilizer. In organic greenhouse production, soil fertility management is complicated by the economic constraints of strong structural investments which induce farmers to intensify their systems of production. In this general context, the estimation of mineralization rates and the synchronization of nutrients availability with plants needs are critically important, while the use of simplified nutrient budgets is considered a valid tool to determine the impact of agricultural practices on short and long term soil fertility and on the environment. Water management is strongly connected with both plant physiology and environmental footprint aspects. Mismatching of water and nutrient supply with plant uptake can cause major environmental burdens. Recent research trends are concerning the investigation of agroecological approaches to soil fertility management which include the effect of ecological services providing crops during vegetable rotation in greenhouses and the functional effect of agro-ecological infrastructures inside and outside greenhouses. In OGH, optimal soil conditions reached by wise crop rotation, functional cover crops mixtures, prudent solarisation, suitable organic amendment and well-timed water supply are crucially important in disease suppression and prevention, in drainage and leaching reduction and in yield intensification.

Objectives and participants

To train Master/PhD students and young researchers of COST network (about 30 participants with about 15 students having COST grants) on efficient, sustainable and safe

fertility and water management strategies for organic greenhouse production in different pedoclimatic conditions: Mediterranean and North-European Regions.

Summary

The course will combine classroom lectures and practical training in the field. Trainees will make field surveys of organic system of production in greenhouse in both experimental field and private farms in order to identify the main constraints in soil fertility management in organic greenhouses. In addition, there will be demonstrations of sustainable water management practices to improve crop performances and the environmental footprint of the greenhouse production.

Draft of program

The program foresees 3 days of class activities with daily general discussions on main issues treated by lecturers, 1 day of practical activities and 1 day technical trip. Practical activities will be carried out at IAMB experimental sites (greenhouse, laboratory). Research activities carried out in the framework of BIOSEMED project on organic greenhouse production funded by Italian Ministry of Agriculture, will be described and discussed. Technical trip will show some typical organic greenhouse systems of production in the Mediterranean region.

Contents highlight

<u>Training activities:</u>

- Organic greenhouse horticulture (OGH) system of productions: fertility management principles and standards
- Soil fertility management in OGH: navigation among constraints
- Sustainable water management and deep percolation fluxes in OGH;
- Disease suppression and prevention effects of organic amendment in OGH: functional composts and solarisation;
- Developed peat alternatives as substrates in the organic vegetable seedlings production

<u>Practical activities:</u>

- Irrigation strategies and monitoring technologies to reduce drainage risks and nutrient leaching in OGH;
- Appropriate experimental designs testing growing media mixtures: practical examples

<u>Field Visits:</u>

- Organic greenhouse experimental field at IAMB
- Farm visit: organic producers associations, greenhouses and logistic platform
- Organic Nursery

Preliminary programme

Monday (15/09)

8:30-9:15 - Arrival and accommodation at the Mediterranean Agronomic Institute campus

9:15-9:25 Welcome at IAMB (IAMB *Director*)

9:25:9:45 Training in organic agriculture: the experience of IAMB - Introduction to the Training School programme (L. Al Bitar – IAMB - Italy)

9:45-10:45 *Lecture:* Fertility management in OGH: principles and standards (F. Tittarelli – CRA- RPS- Rome- Italy)

11:00 – 12:45 Lecture: Soil fertility management in OGH: navigation among constraints (W. Voogt – Wageningen UR Greenhouse Horticulture – Bleiswijk - Netherland)

14:30 – 15:30 Lecture: Commercial Organic Fertilizer characteristics and fertilizer management in intensive OGH (K. Moller – KTBL - Germany)

15:45 – 16:45 Lecture: Cover crops functional mixtures in OGH rotation (H. Vedie – GRAB-Avignon - France)

17:00 – 17:30 - Briefing and general discussion with the lecturers

18:00 – 19:00 Visiting IAMB campus

19:00 Social Dinner: 'Agritourism'

Tuesday (16/09)

8:00 – 16:00 Farm visit: organization of organic producers, greenhouses and logistic platform (Packed lunch)
Lectures in the field: Organic greenhouse management for vegetable production (G. Mimiola – IAMB Italy and G. Ranaldo – OP Jonica Bio)

17:30 – 18:00 - Briefing and general discussion with the lecturers

Wednesday (17/09)

9:00 – 11:00 - Lecture: Sustainable water management in organic greenhouse vegetable production (A. Coppola – DICEM - University of Basilicata – Matera – Italy)

11:30 – 13:00 - Lecture: Sustainable strategies for reducing drainage risks and nutrients leaching in OGH & *Practical activity:* measurement of soil water content at different soil depth (G. Dragonetti – IAMB – Italy)

15:00 – 16:45 - Practical activity: Monitoring techniques to evaluate evapotraspiration and drainage in protected environment (G. Dragonetti – IAMB – Italy)

17:00 – 17:30 - Briefing and general discussion with the lecturers

Thursday (18/09)

8:45 – 10: 45 - Lecture: Composting for soil-borne disease suppressiveness in OGH (M. Raviv - Newe Ya'ar Research Center - Israel)

11:00 – 13:00 Lecture: Compost and solarisation for disease prevention in OGH (J. A. Pascual CEBAS-CSIC- Murcia- Spain)

15:00 – 17:00 *–Briefing and general discussion with the lecturers*

Friday (19/09)

9:00-11:00 – Comparison of conventionalization and agroecological approaches of organic production in non-heated Mediterranean greenhouse for vegetable production & *Practical activity:* field measurement of soil nitrates concentration and nitrate leaching evaluation (F. Ceglie – IAMB – Italy)

11:30 – 12:30 Training School conclusions – Take home messages and presentation of further networking opportunities with COST actions

Departure

Date and Venue

15-19 September 2014, Mediterranean Agronomic Institute of Bari (MAIB), Via Ceglie 9, Valenzano (BA), Italy – www.iamb.it

Contact persons

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Eligibility

In general, applicants must be MSc students, PhD student, or post-docs / early stage researchers, and they must be enrolled in or affiliated to an Institution 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 Neighbour country institution are also eligible to apply: Al-Balqaa Applied University/ Faculty of Agricultural Technology in Jordan and Cairo University in Egypt.

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. Successful applicants will be offered a grant of 300-800€ as a contribution towards the costs of travel, accommodation and meals. The exact award offered will depend on the distance to the venue as the cost of travel differs considerably across eligible countries.. Accommodation and meals will be provided on the IAMB campus at a cost of €235 for the whole school period. The whole price must be paid cash on arrival. Field trips are free of charge and social dinner is included. Please note that the grant will be paid by bank-to-bank transfer after the course has been completed.

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.

Travel

The airport of Bari (http://www.aeroportidipuglia.it/mappavoli/bari.html) is located about 20 km from the Institute which can be reached by urban bus (n.16 change to n.4), metro-train (change to bus n.4 at train station) or by taxi (about 38€).

How to apply

Send a letter of application stating your interest on participating to the training school both to Francesco G. Ceglie (ceglie@iamb.it) and Lina Al Bitar (albitar@iamb.it), CIHEAM Mediterranean Agronomic Institute of Bari and to the Chair of COST BIOGREENHOUSE Rob Meijer (rob.meijer@wur.nl) within Monday the 1st of July 2014. 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.