

Proposer Details

Title: Mr.

Gender: M

Forename: Rob

ESR: YES

Family Name: Meijer

Resubmission: NO

Year of Birth: 1950

Email: rob.meijer@wur.nl

Institution: Wageningen UR Greenhouse Horticulture

Position: Coordinator Research Organic Greenhouse Horticulture NL

Contact Address : Violierenweg 1

Bleiswijk 2665 MV

Netherlands

Scientific Content

Title

Towards a sustainable organic greenhouse horticulture by integrated research

Abstract:

Organic greenhouse horticulture has to improve their sustainability and profitability. Foot print should be reduced. Production is too low to meet the demand of society. Innovation is needed.

Collaboration in research and with the industry is necessary to meet these challenges and to use efficiently the existing capacity.

The overall objective of this Cost Action is to create knowledge and innovations for an increased sustainability of the EU and occidental organic greenhouse production. Through 6 research topics in 6 Working Groups and by collaboration with the sector these innovations will be realised. The Working groups are: Robust planting material, Sustainable soil and weed management, Nutrient and Water Management, Crop protection, Energy and Climate, Sustainability and Standards.

Endusers are breeders, growers, suppliers and in trade and policy makers.

The WG's meet yearly; every two years an integral workshop. Short term scientific missions are done. A group of endusers comments.

Key Words:

Organic; greenhouse horticulture; sustainability; research; innovation; collaboration in research; EU; Europe; Northern America; robust planting material; soil management; weed management; compost; plant nutrient management; water management; EU Water Framework Directive; crop protection; energy saving; climate neutral; economics; standards; good practice;

Preferred COST Domain:

Food and Agriculture

Text of proposal:

BACKGROUND, PROBLEMS

Organic greenhouse horticulture faces important challenges to increase their social, economic and environmental sustainability. More specifically, 1) occidental demands for reasonable priced organic food are increasing, 2) needs and limiting factors vary according to different pedo-climatic conditions within EU regions, 3) needs to reorient organic greenhouse production practices and strategies within the principles of organic farming instead of the conventional-like approach, 4) needs to reduce the foot print in terms of water and nutrient leaching (EU Water Framework directive), fossil energy use (CO₂ neutral production), natural resilient crop protection and closing cycles, 5) needs to improve organic productivity (40% lower than conventional crops), quality and reduce productivity risks, and 6) needs to increase research collaboration within the EU and occidental countries as conventional research horticulture cooperation.

New knowledge and innovations should be developed to improve sustainability and grower profitability. Collaborative research as well as information and expertise sharing are necessary to meet these challenges and to make an efficient use of the existing research capacity and limited budgets.

BENEFITS

This project will offer sustainable innovations, an increase in efficiency of research capacity and quality. It creates an international infrastructure to contribute to the process towards sustainable organic greenhouse horticulture in the European Area. COST Action on this topic would create an immediate synergy with already existing scientific networks such as ISHS (Int Soc of Hort Sc), MOAN (Mediterr. Organ Agric Network), ISOFAR (Int Soc of Organ Agric Res), and OACC (Org. Agric. Centre Canada). Collaboration in COST will also offer a scientific basis for EU standards, which are presently lacking.

OBJECTIVES, DELIVERABLES AND EXPECTED SCIENTIFIC IMPACT

The overall objective of the project is to create new knowledge and innovations for an increased sustainability of the EU and occidental organic greenhouse production for the sake of producers, trade and society. Through 6 research topics (WGs) and different soil and climate conditions, the project will use an interdisciplinary approach, to fulfil the following specific objectives and deliverables:

1. Robust planting material

WG 1 aims to breed or select robust seeds and plants and to develop practices to reduce risks and improve sustainability and profitability for the grower.

Objectives:

- To develop robust planting material, including rootstocks, by breeding, selection and testing.
- To develop organic practices for viable and healthy seeds and to grow healthy planting material.

Deliverables:

- A common approach for organic breeding;
- Well defined goals for organic breeding for main greenhouse crops in relation to regions;
- EU standards for cultivar testing;
- Open database of cultivar and rootstock test results on production and market potential;
- Organic methods for seed treatment;
- Practices including substrates for organic planting material.

2. Sustainable soil and weed management

WG 2 aims to develop sustainable soil and weed management to promote production and product quality and

to contribute to the definition of criteria for organic substrate production.

Objectives:

- To identify and develop different strategies, including crop rotation, based on a agroecological approach and adapted to local conditions for soil management and weed control;
- To define criteria for organic substrates and for organic pot plants;
- To define criteria for compost quality to improve soil long term fertility;
- To study compost potential in soil-borne disease suppression either in soil and substrates..

Deliverables:

- Guidelines for soil property and weed management;
- New practices and standardised compost characteristics and protocols to enhance plant nutrition and soil suppressiveness;
- Guidelines for organic substrates production or a position paper on characteristics of organic substrates as listed by SCOF (Standing Committee for Organic Farming).

3. Nutrient and Water management within the EU Water Framework Directive

WG 3 aims to develop sustainable nutrient and water management strategies that will minimize or eliminate water and nutrient emission.

Objectives:

- To develop new organic sustainable sources of plant nutrients;
- To better understand N-dynamics of amendments;
- To develop new technologies reducing risks in drain water recycling;
- To develop sustainable organic growing systems for pot production;
- To develop innovative tools for monitoring and controlling water and nutrient emission;
- To develop decision support models.

Deliverables:

- Nutrient and water management strategies to reach zero emission in 2027;
- New sources and kinds of sustainable organic fertilizers;
- New monitoring and control tools for water and nutrient management;
- New technologies to treat and reuse waste effluents

4. Crop protection

WG 4 aims to develop sustainable crop protection strategies based on robustness and resilience of the cropping system.

Objectives:

- To study the role of robust plants;
- To develop resilient systems of crop protection based on robustness of the crop and interaction of pest and disease organisms and their antagonists and control of the environment of the crop;
- To develop and select new organisms, measures, means and techniques for a sustainable pest and disease control;
- To define clear criteria for organic crop protection products.

Deliverables:

- Crop protection strategies and systems based on robustness and resilience for the main crops in different

climatic zones;

- Decision support systems for crop protection;
- New measures, means and techniques for crop protection;
- Set of criteria for suitability of products to be used for crop protection in organic greenhouse horticulture.

5. Energy saving and climate neutral production

WG 5 aims to draft the most feasible concepts, combinations of measures, sources, techniques and regulations to realize a climate neutral greenhouse production in 2030.

Objectives:

- To analyse the energy economy and the use of fossil energy in the present organic greenhouse horticulture in relation to region, growing system and crop schedule;
- To develop options and their feasibility for a climate neutral production in different regions in the EU.
- Via the concept of Trias Energetica:
 - o Reduction of the demand for energy;
 - o Use of renewable sources of energy;
 - o Production and use of energy with the most efficient techniques available;
 - o To develop a climate neutral enrichment with CO₂ of the greenhouse air.

Deliverables:

- Overview of the energy economy in different regions, crops and seasons in the EU and Northern America;
- Strategies to realize energy neutral organic greenhouse horticulture in 2030;
- New feasible concepts, measures, techniques and energy sources for different situations.

6. Sustainability and standards

WG 6 aims to measure sustainability of organic greenhouse production in a wide sense and to develop new concepts by integration of innovations.

Objectives:

- To analyse the degree of sustainability in socio-economic and ecological terms, to analyse the contribution of the findings to sustainability;
- To design new sustainable concepts;
- To contribute to the design of standards and regulations for organic greenhouse production in the EU.

Deliverables:

- A tool suitable to analyse sustainability of organic greenhouse production;
- An overview of the sustainability of organic greenhouse production in the EU;
- New sustainable concepts by integration of innovations of the topics above;
- Scientific background for standards and good practices.

Endusers

Endusers are breeders, producers of seeds and planting material, greenhouse growers, companies in crop protection, composting, substrates, fertilizers and in trade and policy makers.

Scientific impact

Cooperative works done in the 6 previous WGs will reduce the knowledge gap in respect to conventional horticulture. It will support policy makers at SCOF level. Innovations developed in this action will also be of inspiration and importance for conventional greenhouse growing and outdoor horticulture.

SCIENTIFIC PROGRAMME AND INNOVATION

The work plan is composed of the six WGs previously described. They cover the main issues regarding protected organic horticulture facing either technical, environmental and social aspects. Topics are strictly connected with the evolution of European normatives of the sector and are intended to give an answer to farmer and policy makers requests. Moreover, the structure of the proposed COST Action is intended as open and flexible as possible to ensure the participation of researchers from different countries.

ORGANISATION

Following the topic structure described above, the Action will be organised into six Working Groups (WG), coinciding with the six topics. These WG's reflect the research activities in the countries interested. This structure allows other scientists not involved in the preparation to join the Action at a later stage. Scientists participate in the WG's. An overall coordination will be done by a Management Committee (MC). The MC consists of a Chair, a Vice-chair and the Chairs of the WG's. Chairs of the WG's are from all over Europe (Belgium, Italy, Netherlands, Switzerland, UK) and Northern America (Canada). Every WG meets every year to promote cooperation and interaction. The MC meets yearly with each WG. In addition to the WG meetings, small WG meetings will be held for collaboration on specific subjects. Short Term Scientific Missions are done to promote exchange of technologies. Every two years, an integral workshop will be organized to promote integration and an overall view on sustainability. A group out of the endusers will comment on the content, progress and will advise on collaboration for innovation.

Participants interested in network:

- 1-. Rob Meijer, Wageningen UR Greenhouse Horticulture, NL
- 2-. Bettina Billmann, Research Institute of Organic Agriculture FIBL, CH
- 3-. Fabio Tittarelli, Council for Research in Agriculture - Research Centre on Soil-Plant System, IT
- 4-. Justine Dewitte, Provinciaal Proefcentrum voor de Groenteteelt Oost-Vlaanderen vzw, BE
- 5-. Roger Hitchings, The Organic Research Centre - Elm Farm, UK