



COST Action no. FA1204

Vegetable grafting to improve yield and fruit quality under biotic and abiotic stress conditions

2012 | 2016

Due to limited availability of arable land, and water resources, the large use of fertilizers, and the high market demand for vegetables, cucurbits and solanaceous crops are frequently cultivated under unfavourable soil and environmental conditions. These include soilborne pathogens, salinity, thermal stress, drought, and heavy metals. These harmful conditions are magnified by the changing environmental conditions and the restrictive policies of agrochemical use. One way to avoid or reduce losses in production caused by adverse conditions in vegetables would be to graft them onto rootstocks capable of alleviating the effect of external stresses on the shoot.

This Action aims to stimulate cutting-edge multidisciplinary collaborative research towards identifying and understanding how rootstock-mediated traits can improve vegetable crop yield and quality under biotic and abiotic adverse conditions. Sharing knowledge and enhancing scientific and technical collaboration will surely fill knowledge gaps in the area of vegetable grafting.

This Action can also stimulate the wider commercial development and exploitation of this technique in Europe. The knowledge gained will be summarized in a book as a final output of this Action



How networking within the Action will yield the objectives?

The achievement of the objectives is guaranteed by the expertise of the participants in the network (more than 200 WG Members). This assures the complete integration between the knowledge in vegetable grafting research and the application of this knowledge to develop new rootstocks and to facilitate the integration of grafted plants as a significant tool in vegetable crop production.



To pursue and fulfil the objectives the Action organises:

- Working Groups Meetings to develop the scientific part and dissemination activities;
- Short-Term Scientific Missions (STSMs) and Training Schools;
- Workshops at the national/international level;
- Annual conferences presenting the COST activities/results;
- Website and dissemination activities;
- Publication in international peer-reviewed journals;
- Publication of a scientific book.

The scientific and dissemination activities can be easily monitored by the deliverables and milestones of the project. Management structures (i.e. Steering Committee, STSM Committee, Editorial Board Committee) support the Management Committee for internal monitoring and to cope promptly with any issue arising during the project, and to assure the achievement of the objectives.

Participating Countries:

COST Member Countries: Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, France, Germany, Greece, Hungary, Israel, Italy, Latvia, Netherlands, Norway, Portugal, Romania, Slovenia, Spain, Switzerland, Turkey, United Kingdom.

COST Near Neighbour Countries: Albania, Lebanon.

COST International Partner Countries: United States of America, China.

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FA 1204 Grant Holder



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COST Action FA 1204 (2012 – 2016)

Vegetable grafting is becoming a serious and attractive means to improve crop production which has stimulated public and private research in this field. For this reason, the COST Action FA1204 (www.vegetablegrafting.unitus.it) started in October 2012 with the major aims of understanding the biological basis and improving the rootstock-mediated effects on vegetable crops (especially in *Solanaceae* and *Cucurbitaceae* species).

Scientific work plan methods and Working Groups

To achieve the objectives of the Action the work plan is subdivided into four WGs each producing its deliverables for monitoring the progress of the Action.

The Action will compile and integrate the scientific information and related research activities in European and non-European countries as basis for development and exploitation of new rootstocks through 4 Working Groups.

WG1 - Genetic resources and rootstock breeding

WG2 - Rootstock-scion interactions and graft compatibility

WG3 – Rootstock-mediated resistance to (a)biotic stresses

WG4 - Rootstock-mediated improvement of fruit quality

Working Group 1

Genetic resources and rootstock breeding

Leader: Andrew J. Thompson, Cranfield University, UK
Co-Leader: Halit Yetisir, University of Erciyes Melikgazi, Turkey

- Defining the current genetic variability existing in each vegetable species, as well as the existing breeding programs.
- Collecting the information on germplasm available for each vegetable crop, on commercial rootstocks, and on rootstock breeding programs.

Working Group 2

Rootstock-scion interactions and graft compatibility

Leader: Jan Henk Venema, University of Groningen, The Netherlands
Co-Leader: Ian C. Dodd, Lancaster University, UK

- Defining the major physiological and genetic determinants of root and shoot development and grafting compatibility for each vegetable species.
- Collecting information on the molecular, biochemical and physiological studies related to root-shoot communication, and on the factors affecting grafting compatibility.

Working Group 3

Rootstock-mediated resistance to stresses

Leader: Dietmar Schwarz, Institute of Vegetable and Ornamental Crops, Germany
Co-Leader: Roni Cohen, ARO, Neve Ya'ar Research Center, Israel

- Defining the current status of knowledge about rootstock-mediated crop improvement to attenuate the impacts of biotic, abiotic and combined stresses, and on the improvement of resource use efficiency.
- Collecting information on the main biotic and abiotic stresses for each vegetable crops, and on rootstock effects on mitigation of stresses and resource use efficiency improvement.

Working Group 4

Rootstock-mediated improvement of fruit quality

Leader: Cherubino Leonardi, University of Catania, Italy
Co-Leader: Carmina Gisbert, COMAV, Valencia, Spain

- Defining rootstock effects on fruit quality, and strategies for a better understanding and exploitation of the processes involved.
- Collecting information on the most important commercial and nutritional quality traits of vegetable crops, and on research activities aimed to study the rootstock influence on fruit quality.

