



## **COST ACTION FA1204**

**Vegetable Grafting to Improve Yield and Fruit Quality Under Biotic  
and Abiotic Stress Conditions**

**1<sup>ST</sup> COST ANNUAL CONFERENCE**

**1<sup>ST</sup> ROOTPOWER WORKSHOP**

**12-14 November 2013**

**Murcia, SPAIN**

***“EXPLOITING ROOT-TO-SHOOT COMMUNICATION FOR IMPROVING  
YIELD STABILITY AND FRUIT QUALITY IN VEGETABLE CROPS”***



**SCIENTIFIC PROGRAMME**

## LOCAL ORGANIZING COMMITTEE

**Francisco Pérez-Alfocea**, CEBAS-CSIC, Spain  
**Cristina Soriano-Carpena**, CEBAS-CSIC, Spain  
**Alfonso Albacete-Moreno**, CEBAS-CSIC, Spain  
**Cristina Martínez-Andújar**, CEBAS-CSIC, Spain  
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**María del Puerto Sánchez-Iglesias**, CEBAS-CSIC, Spain  
**Elena Cantero-Navarro**, CEBAS-CSIC, Spain  
**Michael Bitterlich**, Institute of Vegetable and Ornamental Crops, Berlin, Germany

## SCIENTIFIC COMMITTEE

**Giuseppe Colla**, *Chair*, University of Tuscia, Italy  
**Francisco Pérez-Alfocea**, *Vice-chair*, CEBAS-CSIC, Spain  
**Andrew J. Thompson**, University of Cranfield, UK  
**Halit Yetisir**, University of Erciyes Melikgazi, Turkey  
**Jan Henk Venema**, University of Groningen, The Netherlands  
**Ian C. Dodd**, Lancaster University, UK  
**Dietmar Schwarz**, Institute of Vegetable and Ornamental Crops, Germany  
**Roni Cohen**, ARO, NeweYa'ar Research Center, Israel  
**Menahem Edelstein**, ARO, NeweYa'ar Research Center, Israel  
**Cherubino Leonardi**, University of Catania, Italy  
**Carmina Gisbert**, Polytechnic University of Valencia-COMAV, Spain  
**Dimitrios Savvas**, University of Athens, Greece  
**Zhilong Bie**, Huazhong Agricultural University, China  
**Frank Louws**, North Carolina State University, USA

## KEY DATES

**Abstract submission:** 15<sup>th</sup> October  
**Registration and Hotel Booking:** 30<sup>th</sup> October

## VENUE

Hotel Silken 7 Coronas, Avda. Ronda de Garay, 5, 30003-Murcia.  
[www.hotelsietecoronas.com](http://www.hotelsietecoronas.com)

### Further information at:

[http://www.cost.eu/domains\\_actions/fa/Actions/FA1204](http://www.cost.eu/domains_actions/fa/Actions/FA1204)

### COST Action FA1204 webpage:

<http://www.vegetablegrafting.unitus.it/index.php/meetingsand-conferences/murcia.html>

## WELCOME NOTE

Dear colleagues and friends,

On behalf of the MC of the COST ACTION FA1204, the local organizing committee of CEBAS-CSIC welcomes all interested stakeholders (horticulturalists, plant pathologists, plant breeders, physiologists, biotechnologists and policy makers) to attend the 1<sup>st</sup> COST ANNUAL CONFERENCE of the action, jointly organized with the 1<sup>st</sup> ROOTOPOWER WORKSHOP.

After more than fifty years of crop improvement principally selecting for above ground traits, scientists now perceive root system engineering as an opportunity to integrate new approaches to maintain sustainable crop production under changing environmental conditions while minimizing the demand for new resources. Root-specific traits such as root system architecture, sensing of edaphic stress and root-to-shoot communication can be exploited to improve not only resource capture and plant development under adverse conditions, but also fruit quality. The potential of grafting is as broad as the genetic variability available, and may allow horticulture to cross species barriers between rootstocks and scions, allowing a more direct and efficient exploitation of wild germplasm.

The COST action FA1204 aims at stimulating cutting-edge multidisciplinary transnational collaborations towards identifying and understanding how rootstock-mediated traits can improve vegetable crop yield and quality under adverse biotic and abiotic conditions. Central to both international initiatives is the use of grafting in vegetable species, allowing precise assessment of the effect of altering root traits on crop performance and fruit quality independently of shoot traits, by using wild germplasm, mapping populations and functional lines as rootstocks.

The strategic aim is to help crop producers and breeders to improve yield stability and fruit quality under a changing and challenging environment and to overcome the consequences of unsustainable agricultural practices that are causing soil degradation and depleting natural resources.

The workshop will present recent results in phenotyping, genetics and physiology of rootstock-mediated tomato crop improvement under individual and combined abiotic stresses. This meeting will promote discussion on improving crop stress resistance and quality through more resource efficient rootstocks, allowing a more efficient use of soil, dwindling water and phosphorus resources, and a reduction of the excessive use of nitrogen and potassium fertilizers (which have a high carbon footprint), as well as how this research could be extended to other abiotic and biotic constraints and vegetable crops. Without this research there will be a trend for below-ground biotic and abiotic stresses to decrease plant growth and development throughout the world leading to serious crop yield losses, and hence endangering food security.

The Southeast region of Spain (Murcia and Almeria provinces) is the perfect location to hold this meeting since it is one of the major horticultural areas in the world and produces around 100 million grafted plants per year. Our programme includes around

75 oral and poster presentations, with 110 participants from public and private sectors coming from 25 countries. We wish you a successful conference and a very pleasant stay in Murcia, a city where you will find a wonderful weather, excellent gastronomy, historical and cultural sites and charming people.

With kind regards,

The Conference Chair,  
*Dr. Francisco Pérez Alfocea*  
CEBAS-CSIC  
On behalf of the Organizing Committee



**1. MONDAY 11<sup>TH</sup> NOVEMBER**

Venue: Hotel Silken 7 Coronas

**20:00-21:00** Early registration

**21:00-22:00** Welcome reception

**2. TUESDAY 12<sup>TH</sup> NOVEMBER**

Conference room: *Salón Lorca*

**8:00-9:00** Registration. Mounting of Posters (*Salón Gaya*).

Loading presentations. Contact Dr Alfonso Albacete at Conference room

**9:00-9:30** Official Opening

Local organizer/Vice-Chair: Dr Francisco Pérez-Alfocea

Chair: Dr Giuseppe Colla

**SESSION I:**

**WG 1 - GENETIC RESOURCES AND ROOTSTOCK BREEDING**

*Chair: Dr. Andrew Thompson. Cranfield University, UK.*

*Rapporteur: Dr. Halit Yetisir. University of Erciyes Melikgazi, Turkey.*

**9:30-11:00** Oral presentations

9:30-9:45 'Understanding the genetic basis of root trait variation in tomato'

*Andrew J. Thompson*

9:45-10:00 'Horticultural and phytopathological evaluation of exotic watermelon germplasm as a source for rootstock breeding'

*Edelstein, M. Cohen, R. Tyutyunik, J. Tadmor, K. Falik, E.*

10:00-10:15 'Biotechnology for rootstocks micropropagation and breeding'

*C. Gisbert, J.M. Mulet, J. Prohens, R. Serrano, B. Picó*

10:15-10:30 'Potential new Cucurbita spp rootstocks with viral and fungal resistance'

*G.H.S. Nunes, E.W.L.P. Nunes, M. Ferriol, A. Alfaro-Fernández, I. Font, C. Gisbert, B. Picó*

10:30-10:45 'Comparison of the physiological parameters of drought between early stage in pot and mature stage in field for tomatoes I'

*Yildiz Dasgan*

10:45-11:00 'Current situation of gourd germplasm against virus diseases in Turkey'

*Hakan Fidan, Nihal Denli, Pelin K. Ozturk, Çetin Nacar, Halit Yetisir*

**11:00-11:30 Coffee Break/Poster viewing>Loading presentations**

**SESSION II:**

**WG 2 - ROOTSTOCK-SCION INTERACTIONS AND GRAFT  
COMPATIBILITY**

**Chair:** *Dr. Jan Henk Venema. University of Groningen, The Netherlands.*

**Rapporteur:** *Dr. Ian C. Dodd. University of Lancaster, UK.*

**11:30-13:00 Oral presentations**

11:30-11:45 'Abscisic acid and cytokinin interaction in root-to-shoot communication to improve salt-tolerance in tomato'

*G.B. Öztekin, A. Martínez-Pérez, A. Albacete-Moreno, F. Pérez-Alfocea and C. Martínez-Andújar*

11:45-12:00 'Rootstock xylem and scion leaf hormone concentrations are positively correlated'

*Alfonso Albacete, Ian C. Dodd and Francisco Pérez-Alfocea*

12:00-12:15 'Identifying salt-, drought- and ABA-responsive genes in tomato roots'

*Ferrández-Ayela, A., Dodd, I.C., Martínez-Andújar, C., Pérez-Alfocea, F., Pérez-Pérez, J.M.*

12:15-12:30 'Oxidative stress associated with rootstock-scion interactions'

*P. Irisarri, H.J. Martens, P. Errea and A. Pina*

12:30-12:45 'Assessment of grafting compatibility between globe artichoke and cardoon by SEM analyses'

*Trinchera A., Pandozy G., Crinò P., Rea E.*

12:45-13:00 'Detection of the graft union with electric impedance measurements'

*László Gáspár, Eszter Vozáry, Viktor Teráz, Viktória Böhm, Noémi Kappel, Noémi Lukács*

**13:00-14:30 Lunch (Hotel Silken 7 Coronas)**

**SESSION III:**

**WG 3 - ROOTSTOCK-MEDIATED RESISTANCE TO BIOTIC AND ABIOTIC  
STRESSES**

**Chair:** *Dr. Dietmar Schwarz. Institute of Vegetable and Ornamental Crops, Germany.*

**Rapporteur:** *Dr. Roni Cohen. ARO, NeweYa'ar Research Center, Israel.*

**14:15-14:30 Loading presentations**

**14:30-16:00 Oral presentations**

- 14:30-14:45 'The need for tailor-made cucurbita rootstocks: what can we learn from growing grafted melons in desert agriculture?'  
*R. Cohen, I. Gal, A. Koren, Pivonia, S., Edelstein, M.*
- 14:45-15:00 'Reducing susceptibility of trellised cucumber and melon plants to cucumber green mottle mosaic virus by agro-technique means and grafting'  
*Amnon Koren, Victoria Reingold, Aviv Dombrovsky*
- 15:00-15:15 'Unraveling the molecular basis of the resistance to plum pox virus induced by grafting from almond to peach'  
*Manuel Rubio, Luis Rodríguez-Moreno, Manuel Castro de Moura, Albert Mascarell-Creus, Claudio Bonghi, Federico Dicenta, Pedro Martínez-Gómez*
- 15:15-15:30 'Effects of grafting and rootstock genotype on nutrient uptake by tomato'  
*D. Savvas, G.B. Oztekin, M. Tepecik, A. Papanikolaou, V. Katsiki, A. Ropokis, G. Ntatsi*
- 15:30-15:45 'Influence of grafting and nitrogen on yield and aerial pests population in hydroponics tomato crop'  
*Katja Zanic, Gvozden Dumcic, Branimir Urlic, Smiljana Goreta Ban*
- 15:45-16:00 'Grafting reduces the cadmium translocation from roots to shoots and fruits in tomato'  
*Pradeep Kumar, Menahem Edelstein, Mariateresa Cardarelli, Elvira Rea, Giuseppe Colla*

**16:00-16:30 Coffee Break**

**16:00 – 18:30 Poster viewing (Salón Gaya)**

**16:30 – 18:30 MC meeting** (see agenda)

**19:00: Social event: Tour around the city of Murcia**

**Meeting point: Hotel Hall**

### **3. WEDNESDAY 13<sup>TH</sup> NOVEMBER**

#### **SESSION IV:**

#### **WG 4 - ROOTSTOCK-MEDIATED IMPROVEMENT OF FRUIT QUALITY**

**Chair:** *Dr. Cherubino Leonardi. University of Catania. Italy.*

**Rapporteur:** *Dr. Carmina Gisbert. UPV-COMAV, Valencia. Spain.*

**8:45-9:00 Loading presentations**

**9:00-10:30 Oral presentations**

- 9:00-9:15 'Effect of pruning system on yield and quality of greenhouse grafted tomato'  
*Isabel Mourão, Joana Teixeira, Luis Miguel Brito, Maria Elvira Ferreira, Maria Luisa Moura*
- 9:15-9:30 'The contents of certain primary and secondary metabolites of grafted tomato fruits regarding to salinity stress and growing period'  
*Nina Kacjan Maršič, Bernarda Brajović, Dominik Vodnik*
- 9:30-9:45 'Sensory analysis of grafted watermelon grown in different Hungarian regions'  
*David Fekete, Evelin Várvölgyi, József Felföldi, Attila Gere, Zoltán Kókai, Viktória Böhm, Gábor Balázs, Noémi Kappel*
- 9:45-10:00 'Differential evolution of physicochemical and phytochemical fruit composition during ripening in grafted and non-grafted watermelon'  
*Marios C. Kyriacou and Georgios A. Soteriou*
- 10:00-10:15 'Effects of grafting and modified atmosphere packaging (MAP) on melon and aubergine quality parameters during storage'  
*E. M. Khah, S. Petropoulos, I. S. Arvanitoyannis, F. Bletsos*
- 10:15-10:30 'Quantitative and qualitative response of Sicilian eggplant ecotypes to grafting onto *Solanum torvum*'  
*L. Sabatino, G. Iapichino, F. D'Anna*

**10:30-11:30 Working Groups parallel meetings**

**11:30-12:00 Coffee Break/Poster viewing>Loading presentations**

**SESSION V:**

**VEGETABLE GRAFTING: ONGOING PROJECTS AND STATE OF THE ART  
FROM A COMMERCIAL POINT OF VIEW**

*Chair: Dr. Giuseppe Colla, University of Tuscia, Italy.*

*Rapporteur: Dr. Dimitrios Savvas, University of Athens, Greece.*

**12:00-12:45 Ongoing Projects**

- 12:00-12:15 'Grafting in organic horticulture'  
*Martin Koller (from BioGreenhouse COST Action)*
- 12:15-12:30 'Overview of USDA-funded project to advance grafting technologies in the U.S. fruiting vegetable industry'  
*Frank J. Louws*
- 12:30-12:45 'The History, Current Status and Future of the Cucurbit Grafting in China'  
*Zhilong Bie*
- 12:45-14:30 **Round Table.** 'State of the art from a commercial point of view'



**Moderators:** *Dr. Jan Henk Venema and Dr. Andrew Thompson*  
*Syngenta, Monsanto, Centro SEIA, Ramiro Arnedo, Rijk Zwaan, Nunhems.*  
*(10 min each followed by discussion).*

**14:30-16:00 Lunch (Hotel Silken 7 Coronas).**

**SESSION VI:  
WORKSHOP ON PHENOTYPING, PHYSIOLOGY AND GENETICS OF  
ROOTSTOCK-MEDIATED TOLERANCE TO SOIL ABIOTIC STRESSES IN  
TOMATO**

**Chair:** *Dr. Francisco Pérez Alfocea. CEBAS-CSIC, Spain.*

**Rapporteur:** *Dr. Ian C. Dodd. University of Lancaster, UK.*

**15:45-16:00 Loading presentations**

16:00-16:15 'Introduction to the EU-ROOTOPOWER project'  
*F. Pérez-Alfocea, Project Coordinator*

16:15-16:30 'Screening a tomato mapping population for root resistance to soil impedance plus polymorphism discovery in parental genomes'  
*Andrew Thompson, on behalf of the EU-ROOTOPOWER Consortium*

16:30-16:45 'Rootstock-mediated variation in tomato vegetative growth under moderate salinity'  
*Alfonso Albacete, on behalf of the EU-ROOTOPOWER Consortium*

16:45-17:00 'Phenotyping and physiology of rootstock-mediated tolerance to drought in tomato'  
*Sevilay Topcu, on behalf of the EU-ROOTOPOWER Consortium*

17:00-17:15 'Effects of nitrogen stress on a population of *Solanum* rootstocks'  
*F. Pérez-Alfocea, on behalf of the EU-ROOTOPOWER Consortium*

**17:15-17:45 Coffee Break/Poster viewing (Salón Gaya)**

17:45-18:00 'Phenotyping and physiology of rootstock-mediated tolerance to soil low phosphorus stresses in tomato'  
*Juan M. Ruiz-Lozano, on behalf of the EU-ROOTOPOWER Consortium*

18:00-18:15 'Phenotyping of tomato rootstocks under low potassium supply'  
*Cristina Martínez-Andújar, on behalf of the EU-ROOTOPOWER Consortium*

18:15-18:30 'Root-to-shoot signalling of soil abiotic stresses'  
*Ian C. Dodd, on behalf of the EU-ROOTOPOWER Consortium*

18:30-18:45 'Improving tomato for tolerance to multiple abiotic stress factors'  
*María José Asins, on behalf of the EU-ROOTOPOWER Consortium*

18:45-19:00 Discussion

**19:00-19:30 Main conclusions. Closing of the Meeting**

*Chair: Dr Giuseppe Colla*

*Vice-Chair: Dr Francisco Pérez-Alfocea*

**21:00 Conference dinner (Restaurante HISPANO, Calle Radio Murcia, 4)**

**4. THURSDAY 14<sup>TH</sup> NOVEMBER**

**SESSION VII:  
TECHNICAL VISIT**

**7:30 Journey to Motril, Granada (about 4 hours)**

**11:30-14:00 Visit to *Cooperativa La Palma***

La Palma is the largest producer in the world of cherry tomatoes (30 million Kg) and other tomato specialties using grafted plants. Its main markets are those in UK, France, Germany and Spain. The visit includes a tour around its greenhouses, where grafting experiments facing local constraints will be shown, as well as one of the most modern processing and packaging plants.

**14:00-15:30 Lunch**

**15:30 Journey to *El Ejido (Almeria)***

**17:00-18:30 Visit to the seed company *Ramiro Arnedo Research Station***

Back to Murcia