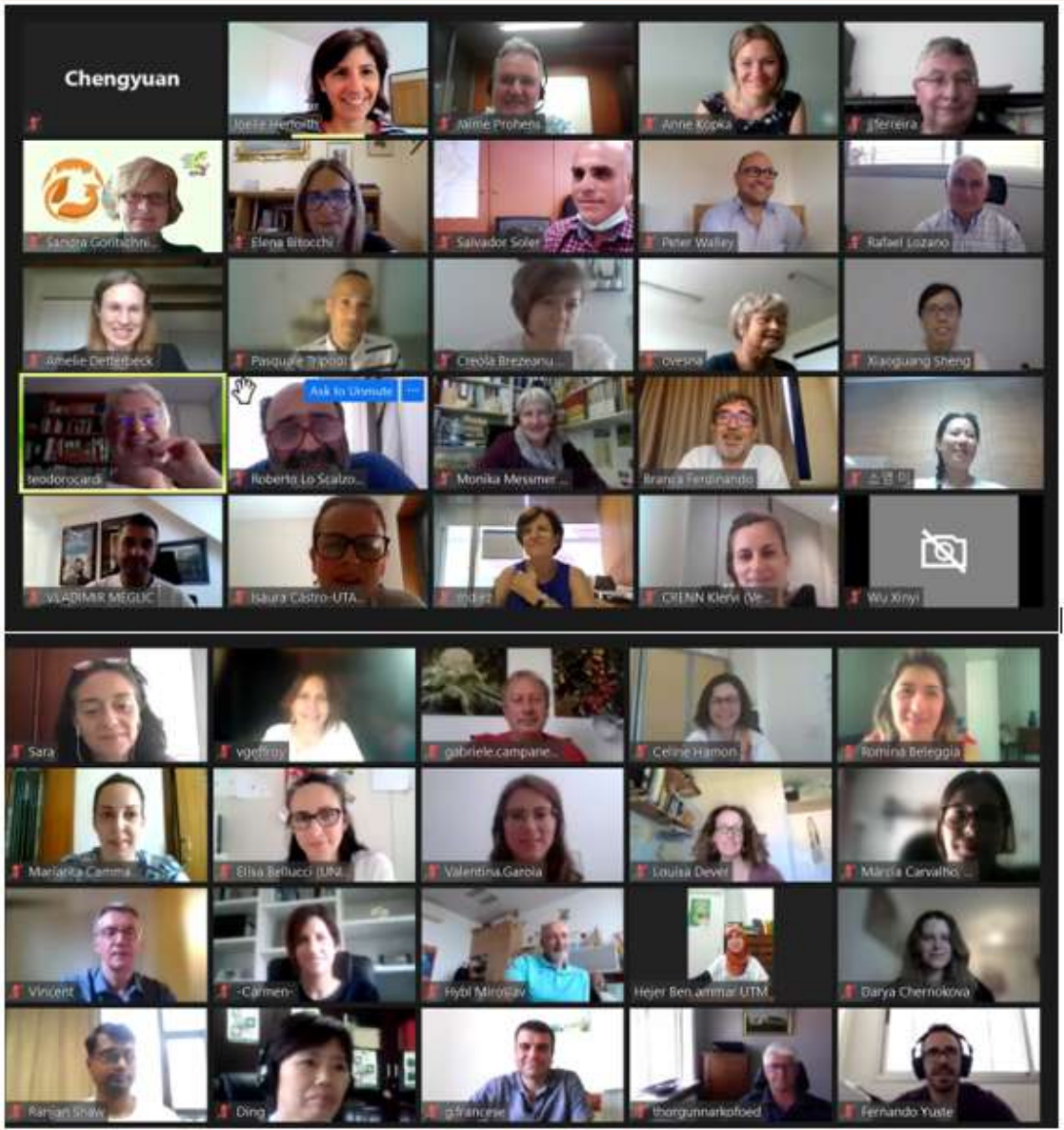




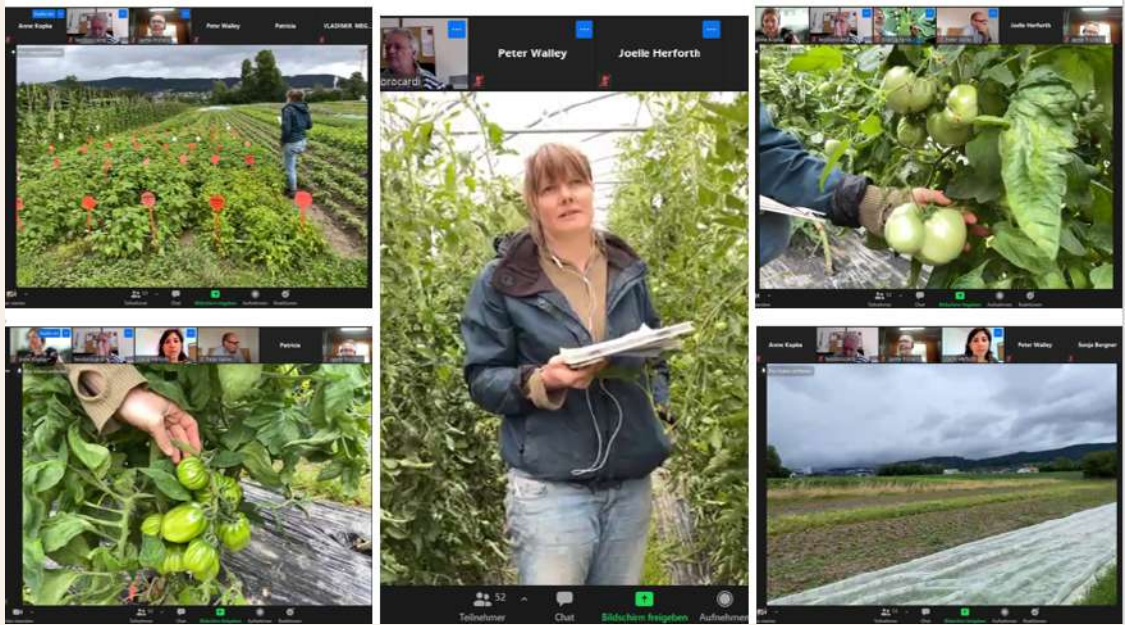
4th DIGITAL NEWSLETTER



Screenshots from 3rd BRESOV Online Progress Meeting 14-15 July 2021

Latest news from BRESOV in a nutshell

What a month for the BRESOV project! On 13th July, the 2nd Review meeting for the BRESOV project took place with representatives from the European Commission (DG Agri and REA) along with the monitors of the project. On 14th and 15th July, the consortium gathered online for the 3rd Annual Progress meeting. Again, for the second year in a row, the progress meeting couldn't take place in person – it was supposed to be held in Switzerland – and two full days of online meetings were organised. Progress achieved in the different work packages of the project were presented and outlines for the next steps discussed. The meeting also hosted a specific stakeholder's session to discuss exploitation of project results, including a virtual visit to an organic farm in Switzerland where different variety trials were discussed.



NEW! Media area



The BRESOV website now features a **media area** which shows all the videos produced by BRESOV: project video showcasing the main project results, with interview from partners and also other short clips:

- FiBL “Project video”
- FiBL “Bush bean variety trial”
- Vegenov “Varietal screening regarding tomato late blight”
- SERIDA “Looking for the perfect snap bean cultivar for organic production: Field evaluation”
- SERIDA “Resistance test to powdery mildew in common bean: Identifying sources of resistance in a snap bean panel”

Spotlight

Evaluation of materials for water stress and nitrogen deficit performance

In April 2021, the deliverable “Evaluation of materials for water stress and nitrogen deficit performance” was submitted. Several partners contributed to it: UPV, UNICT, UNILIV and CREA.

For two of the crops of BRESOV (brassicas and tomato), **the choice of materials with better performance under water stress conditions** is of great relevance for selection and breeding of brassicas and tomato. In this way, for **brassicas** soil flooding is a common stress in northern Europe environments, while in the south of Europe lack of water availability is a common stress. In **tomato**, reduction of irrigation water is a major objective for achieving a higher sustainability, in particular for regions with low water availability. In addition to water stress, reduction of N fertilization and selection for good performance under low N conditions is a major objective for tomato cultivation under organic conditions. This deliverable contains **information on the evaluation of selected materials of brassicas under flooding water stress and under conditions mimicking drought**, as well as the evaluation of a set of **highly resilient long shelf-life ,de penjar‘ tomatoes under low N fertilization**, and of a **selected set of tomato materials under reduced irrigation and no nitrogen fertilization** both in Italy and Spain.

BRASSICA

The **major environmental factors** that limit **plant productivity in agricultural systems** include **drought, waterlogging, salinity, and temperature stresses**. All of which will be exacerbated with increased frequency of extreme weather events predicted with climate change. Water stress and waterlogging are two of the most common stresses affecting leafy vegetable production. **The BRESOV core collection has facilitated the discovery of useful phenotypic variation for both water stress extremes**. Indeed, there **are old landrace accessions and crop wild relatives that perform better under stress compared to the control**. These findings enable the Brassica crop group to select diverse accessions from the different morphotype groups and advance these for selection and breeding, thus contributing to the development of improved lines for organic agriculture.

TOMATO

The experiment made with the highly resilient “de penjar” tomato under two conditions of N fertilization revealed a **wide diversity in our collection for agronomical, morphological and fruit organoleptic and nutritional quality traits**. The results obtained support the evidence of a current over-fertilization in ‘de penjar’ tomato cultivation.

Overall, the **results indicate that under organic conditions, reduction of N fertilization and irrigation can be achieved, and tomato materials with good performance under low N and/or low irrigation, and therefore high N use efficiency (NUE) and/or water use efficiency (WUE) can be selected**. In this respect, we have identified some materials with good yields and high NUE and WUE.



BoITBDH lines arranged in a randomised block design in a glasshouse at University of Liverpool, UK.



BRESOV diversity collection waterlogging experiment at Wood Park Farm, UK. In the image the bagged pots can be seen (yellow arrow).



Field of the NUE trial in “de penjar” tomato in Spain (2019)



Randomized field for the tomato selected set with blocks for Control, WUE and NUE conditions (Italy, 2020).

The authors of the report shared their personal take on the experiments:



Jaime Prohens (UPV): “The experiments that were performed with reduced N fertilization in the highly resilient tomato ‘de penjar’ set of landraces (typical of the Mediterranean area and that can be grown without irrigation) showed that current levels of N fertilization under organic cultivation, which are lower than those of conventional agriculture, can be dramatically reduced without impacts on yield or major quality traits. This may have a strong impact on the production costs and the environmental impact of their cultivation. Also, evaluation of a selected set of tomato accessions of different types under reduced irrigation or N fertilization revealed that materials with improved water and nitrogen use efficiencies can be selected, which will contribute to more efficient and resilient tomato plants.”



Peter Walley (UNILIV): “Our agricultural systems are experiencing reductions in yield brought about by an increased frequency in extreme weather events. As part of BRESOV D3.4, the Brassica team have been exploring resilience to water stress. We have now identified accessions that are tolerant to water deficit, with plants performing as well under reduced irrigation compared to when grown using a conventional irrigation scheme. By contrast, crop waterlogging causes major losses to leafy vegetable crops, particularly early in the season during establishment. The Brassica team have identified accessions that can withstand waterlogging, with some accessions readily producing aerial roots to compensate for the loss of the main root ball. Resilient accessions have been crossed and incorporated in our breeding programme.”



Pasquale Tripodi (CREA): “With the broad genotyping and phenotyping activities in the first two years of the project, we have selected a core germplasm set of long shelf-life landraces tomato highly adapted to drought stress. From the multi-site trials under reduced availability of nitrogen and water, we validated the potentialities of this



material for cultivation in organic farming, highlighting those better performing with reduced inputs. This selected material encloses suitable cultivars to be adopted in organic farming and to exploit in further breeding programs.”

Latest News

Where has the BRESOV team been?

In the last 18 months, BRESOV was showcased at various events: scientific conferences, symposia, workshops, joint meetings with sister projects, events addressing policy makers at EU and national level, training courses, etc. Here are the highlights from some of them:

BRESOV at Giornate Scientifiche SOI

On 22-23 June 2021, BRESOV results were presented at the XIII Giornate Scientifiche SOI - scientific days of the Italian Society for Horticulture organized by University of Catania (UNICT). During the event, Maurizio Martina, Deputy Director of FAO highlighted the great role of horticultural production for increasing the availability of healthy foods for human communities.



LIVESEED and BRESOV Joint meeting on tomato breeding

BRESOV partners University of Catania (UNICT), University of Almeria (UAL), Universitat Politècnica de València (UPV) and CREA organised a joint meeting between LIVESEED and BRESOV on tomato breeding to address common challenges and foster synergies between the two projects on 24 February 2021.



BIOFACH 2021 e-special edition

The H2020 projects LIVESEED, BRESOV and ECOBREED presented their strategies on boosting organic seed and plant breeding across Europe at BIOFACH online 2021 edition on 19 February 2021. The title of the presentation was: Innovations on organic seed and plant breeding and presentation of new European organic seed router database.



BRESOV Tomato Crop Group Meeting

The BRESOV Tomato Crop Group met online on December 11, 2020. The previous meeting was held in Almeria one year ago (November 27, 2019). Twenty-four people from eight BRESOV partner institutions participated in the meeting. For Work Packages 2 and 3, all involved partners delivered a presentation concerning ongoing activities, results obtained so far and plans for 2021. In the afternoon, Work Package Leaders for Work Packages 4 and 5 summarized current activities. Read [more](#).



Training Network Course on Genomics-assisted breeding of vegetable crops

In the framework of the Agrifood Campus of International Excellence (ceiA3), which is a joint initiative between several Spanish Universities, University of Almeria (UAL) organized a Training Network Course on Genomics-assisted breeding of vegetable crops – 2019 Edition (13-28 November 2019) and 2020 Virtual Edition 2020 (11-27 November 2020). This Course is aimed at breeders, technical staff of agricultural cooperatives and graduate and master students with interest in the genomic tools used for genotyping selection and plant breeding.



Biocontrol agents and natural compounds

University of Catania (UNICT) and ITAKA organised a Workshop on “Biocontrol agents and natural compounds: important tools for organic vegetable food supply chains” on 13 November 2020. Read [more](#).



Figure 6.7. P1-UNICT and P18-ITAKA Online Workshop on Biocontrol Agents and Natural Compounds.

BRESOV results were published in 13 scientific peer reviewed articles in the last 18 months which you can find on the dedicated page of the [BRESOV website](#).

News from the field



Both pictures: bean experimental field at Romanian farmer, Vegetable Research and Development Station Bacau (VRDS)



Bean trial, Vegetable Research and Development Station Bacau (VRDS)



Both pictures: bean investigations WP 2 and WP 3 on the experimental field, Vegetable Research and Development Station Bacau (VRDS)





Tomatoes, Vegetable Research and Development Station Bacau (VRDS)



Experimental tomato field at Romanian farmer, Vegetable Research and Development Station Bacau (VRDS)



Inoculation of *P. infestans* on tomato, Vegenov



Inoculation of tomato seeds with ToMV for pathogen detection, Vegenov



Scoring of *P. infestans* symptoms on tomato leaves, Vegenov





Tomato plants grown in greenhouse before *P. infestans* inoculation, Vegenov



Young tomato plants for Task4.1 and Task 5.2., SECL - Terre d'Essais (SECL)

Some plants are grafted on different rootstocks. Rootstock material was generated in BRESOV breeding approach.



Broccoli seedlings, Vegetable Research and Development Station Bacau (VRDS)





WP5 broccoli harvest 2020, University of Liverpool (UNILIV) and Molyneux Kale Company

What's next?

- 22-27 August 2021 : XXI Eucarpia General Congress, online from Rotterdam (the Netherlands)
- 7-9 September 2021 XIII Convegno Nazionale sulla Biodiversità “Biodiversità 2021”, online
- 8-10 September 2021: Organic World Congress, Rennes (France)
- 15 October-15 November 2021: Bean improvement cooperative meeting (BIC), Canada
- 15 October 2021: Crops, Seeds & Soil (CSS) 4.0 2021, online
- 17-22 October: XVI Congreso Nacional de la Sociedad Española de Ciencias Hortícolas, Córdoba (Spain)
- 2-4 November 2021: New technologies in plant protection: outlook conference, Dum techniky Pardubice, Czech Republic
- 14-17 December 2021: III International Organic Fruit Symposium and I International Organic Vegetable Symposium, online
- End of 2021: ERFA Days: presentation, discussions and workshop for the exchange of know-how between practice and research, Switzerland
- End of 2021: 13th edition of the EPE symposium, Ecology and Ecosystem Protection, Bacau Romania

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The BRESOV project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774244.

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