



Screenshot of the BRESOV partners at the HRB Exploitation Strategy Seminar.

Latest news from BRESOV in a nutshell

The last few months have been very productive for the BRESOV project!

During past months, the project has developed the **2nd set of practice abstracts**, **2 press release templates**, held the **2nd sector consultation**, participated in **18 events**, **training and workshops**, and produced **11 scientific publications**.

More details below!

2nd Set of Practice Abstracts

Several project partners worked on the development of the second set of practice abstracts which are now available in a dedicated [section of the BRESOV website](#).

This set of practice abstracts explores the following topics:

- **Soil based seed germination protocol for cauliflower and broccoli** - how to evaluate seed quality by seed germination test:



PRACTICE ABSTRACT 5

Seed germination protocol for small seed lots of cauliflower and broccoli

The high germination percentages of the seed samples and the growth of the derived plantlets are the main criteria to assess the quality of seed batches. The seed quality can be evaluated by seed germination tests. In the Council Directive 2002/55/EC of 13 June 2002 on the marketing of vegetable seed is defined that cauliflower and broccoli seeds being sold must exhibit at least 70 % and 75% germination percentages, respectively. To test the germination percentage of small seed lots, a simple method can be performed to test their quality.

Method

For 150 seed. Seed are divided into three lots of Fifty seed and placed in three aluminium containers containing absorbent paper made wet, without flooding using distilled water.





The seed are covered by absorbent paper and the aluminium containers will be placed at room temperature in the dark (optimal temperature ~20°C). Seedling assessment takes place at the cotyledon disclosure when the first true leaf appears.



Each day after sowing the number of germinated seed are recorded and seedlings will be removed afterwards. After 12 days calculate the percentage germination (seed quality = percentage of seeds providing seedlings in comparison to the total number of seeds) and the germination time (days) of the seed lots.



- **Controlling common blight and black bean aphid in organic bean** - an overview of the diseases on seeds, seedlings and plants and step-by-step guidelines on how to control them in organic bean:



PRACTICE ABSTRACT 4

Controlling Common blight in organic bean

Common bacterial blight caused by *Xanthomonas campestris* pv. *phaseoli* is a very important disease of field bean in many regions of the world and can lead to high losses of production (25 to 60%). The bacterium is primarily transmitted through infected seed. *Xanthomonas* can survive over 15 years in seed before emerging to infect the plant during the vegetative period. The disease occurs on all above-ground tissues from which bacteria can be spread by humans, farm implements, insects, wind, rain or hail.

On seed. If infection occurs when the pods are young, the seed rot or become wrinkled and shrivelled. If the bacteria enter by way of the funiculus, only the hilum may be discoloured. The seeds of pods strongly attacked typically remain small, firm, and yellow.

On seedlings. The first symptoms appear on the cotyledons in the form of circular or irregular, slightly pitted brown spots. Later, on the leaves appear small translucent, wet, greenish spots, with exudates visible in humid weather. As the spots develop, the tissues around them dry and turn brown with a yellow margin 2-5 mm wide.

On plants. Following infection in the field, small, water-soaked areas appear on the leaves, these enlarge and become encircled by a narrow zone of lemon-yellow tissue. These lesions turn brown as the leaf rapidly becomes necrotic, and defoliation may result. The stem surface often splits, releasing a yellow bacterial exudate (in halo blight infections, exudates are light cream or silver coloured). On pods infection occur on any part as small, water-soaked spots which gradually enlarge and may be surrounded by a distinct narrow zoning of reddish-brown tissue. Infections may occur in the vascular elements causing water-soaking of the adjoining tissue. The infected tissue dries out and darkens, and droplets of yellow bacterial exudates may appear which, on drying, form a crust on the surface of older lesions of the pods.



PRACTICE ABSTRACT 6

Black bean aphid control in organic bean

Black bean aphid - *Aphis fabae* Scop. is a polyphagous species, attacking over 200 plant species: ornamental shrubs, represent primary hosts (such as the spindle tree - *Euonymus europaea*, Viburnum shrubs, or the mock-orange *Phyladelphus coronarius*) and herbaceous plants (celery for seed production, spinach, beans, corn, poppy, sugar beet, are secondary hosts). This aphid may have originated in Europe and Asia, but it is now one of the most widely distributed species of aphid.



The black bean aphid is a small insect, 1.6–2.5 mm, black, with a soft-body. Alates are winged forms of aphid and appear in autumn when they lay eggs on woody plant species. The adults then die and the





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Tomato: Seed treatment for organic agriculture



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**Piccoli produttori,
grandi sapori.**



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Con l'obiettivo di selezionare, per tre colture scelte, nuove varietà che possano mitigare stress idrici, termici e nutrizionali, con resistenze ad alcuni parassiti e malattie, e caratteristiche di qualità del prodotto come gusto, aspetto visivo, prestazioni post-raccolta, è nato - nell'ambito della Call FS07-2017 della UE - il progetto BRESOV, promosso dall'Università di Catania quale capofila.





Screenshot of the *Fresh Plaza* website mentioning the latest results of the BRESOV project as well as the release of the 2nd set of practice abstracts.

BRESOV 2nd Sector Consultation

P2-Euroseeds began sector consultation in October 2021. The aim is to get feedback on the detailed Key Exploitable Results (KER) Term sheets defined after the 3rd Annual Progress meeting to specify the needs and expectations of the sector. In preparation for interviews with sector representatives, the BRESOV Steering Committee members and KER leaders were asked to provide their questions and needed input to further shape the exploitation strategy for the 4 selected KERs. The goal of the sector consultation is to define a framework of expectations in terms of valuable feedback regarding exploitation routes and exploitation of the project outcomes.

The first interviews of the consultation took place during the Euroseeds Congress. Two breeding company representatives (Andrew Dominy from Sakata and Erik Vesseur from Takii) provided their input as well as Sandra Goritschnig, who is a scientific advisor of the BRESOV project.



Interview with Andrew Dominy (Sakata) at the Euroseeds 2021 Congress in Prague.

Exploitation Planning

To further shape the **exploitation strategy** within the project, BRESOV partners had the chance to work on selected **key exploitable results** together with experts from the **Horizon Results Booster service (HRB)**, which is an initiative of the European Commission

On 15th and 16th of February 2022, 38 participants from 20 BRESOV partner institutions took the opportunity to receive expert information and guidance on the topic of exploitation within H2020 projects. The HRB experts provided an introduction to the topic of exploitation and tools to structure and define the exploitation roadmap of the BRESOV project. During the second day of the seminar the BRESOV partners actively discussed and further developed the exploitation strategy with the support of the HRB experts.



Poster of the HRB Exploitation Strategy Seminar.

Improved tomato rootstocks for organic agriculture

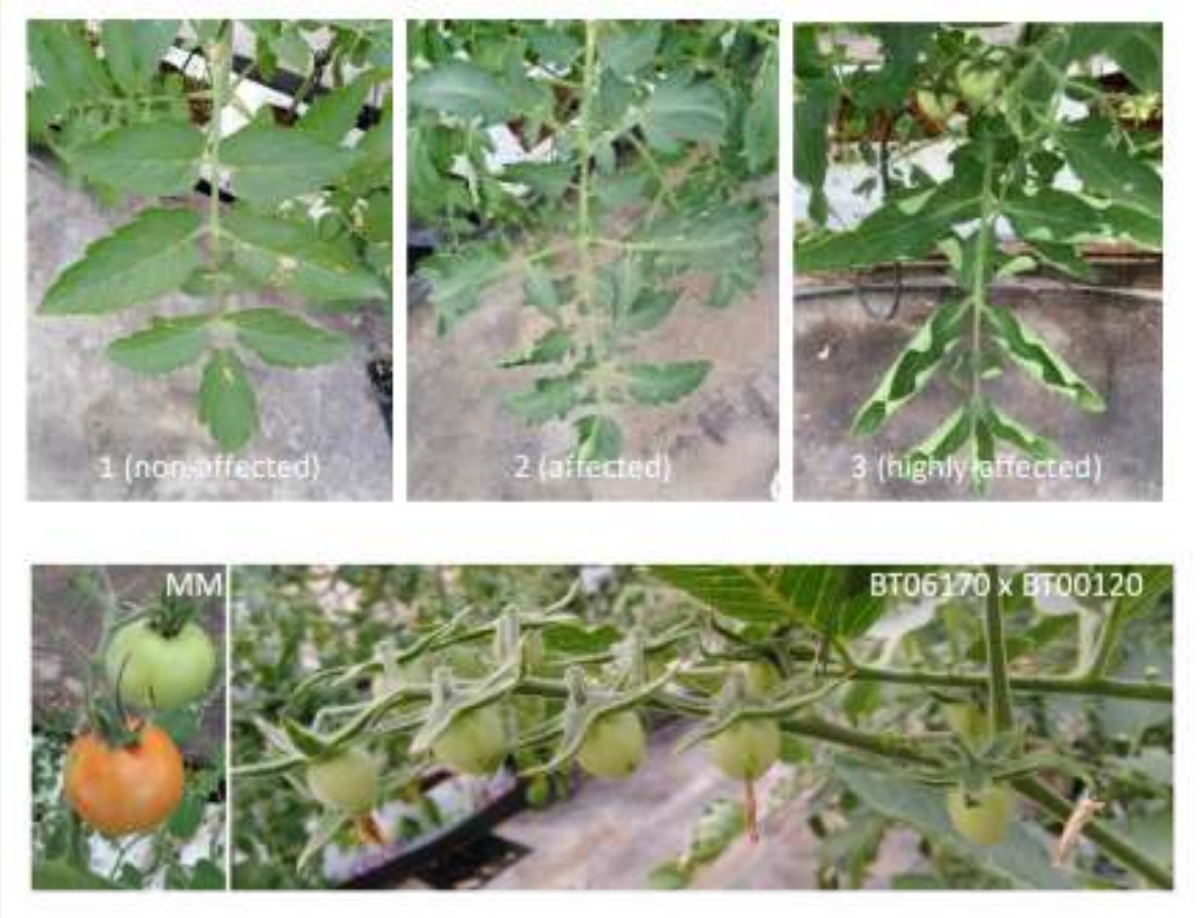
In August 2021, the project Deliverable “**Improved tomato rootstocks for organic agriculture**” was submitted. Several partners contributed to it: UPV, UAL and UNICT.

WP3 aims to develop advanced breeding lines and new populations of high-quality and resilient snap bean, brassicas, and tomato cultivars. With this goal, a set of accessions available from partners and identified in the early stages of the project have been addressed in the project BREEDING SET. In a first step, this pre-selected set of materials was characterized to evaluate their potential for cultivation under organic conditions, and a SELECTED SET of materials was implemented. Finally, the best materials from the BREEDING SET and the SELECTED SET were used for hybridizations among accessions, pre-breeding materials and mutants exhibiting favourable traits. For tomato, new intra- and interspecific hybrids have been developed to be used as potential rootstocks.

This deliverable contains information on the characterization of these hybrids under abiotic stress conditions as well as under organic cultivation conditions. **As a result of this task, a new generation of tomato hybrids with the potential to be used as rootstocks has been developed.** This is an important outcome as it shows that the commercial production of the hybrids selected is feasible. Moreover, the performance under abiotic stress conditions of some of the hybrids proved they carry alleles that allow them to succeed and achieve high productivity under severe climatic conditions (heat and drought stress). Many hybrids also exhibited good performance under organic cultivation conditions when grown in two different sites, which makes them suitable for this production system.



General overview of the greenhouse trial for evaluation of rootstock hybrids under abiotic stress conditions 15 days after transplanting.



Fruit set measured on rootstock hybrids under heat and drought stress conditions.

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



Jaime Prohens (UPV): “Hybrid combinations were designed to exploit heterosis resulting from crossing cultivated tomato with wild and weedy relatives. To be viable for mass production of hybrid seed, three tomato relatives were chosen based on high cross compatibility. *S. habrochaites*, *S. pimpinellifolium* and *S. lycopersicum* var. *cerasiforme*. Different cultivated tomato accessions for obtaining the hybrids were selected based on resistance to diseases, high resilience (da serbo type), and good agronomic properties, including root systems. Most crosses provide abundant quantity of seeds indicating the

feasibility of producing hybrid tomato rootstocks from the parents selected. These hybrids were transferred to UNICT and UAL for checking their performance in comparison with commercial control rootstocks.”



Ferdinando Branca (UNICT): “We obtained good plant performance of the tomato Creativo F1 hybrid with the BRESOV rootstocks provided by partner UPV in comparison with the ordinary ones utilised in Sicilian tomato greenhouses production. Four rootstocks were selected to be used in the future experimental trials by BRESOV stakeholders.”

Rafael Lozano Ruíz (UAL): “The agronomic trials carried out by the UAL team have led to the selection of some rootstock hybrids showing tolerance to abiotic stress conditions (combined heat and drought stress), which undoubtedly means a new challenge in the face of the environmental conditions imposed by climate change. On the other hand, using sources of natural variation to obtain these hybrids, we have verified that, under organic conditions, some of these hybrids have an agronomic potential as rootstocks similar or even higher than commercial varieties commonly used with this aim.”

Latest News

Where has the BRESOV team been?

In the last 6 months, BRESOV was showcased at various events, for example: **scientific conferences, symposia, workshops, congresses, joint meetings with sister projects, events addressing policy makers at EU and national level, training courses.**

Here are the highlights from some of them:

BRESOV at the Organic World Congress 2021

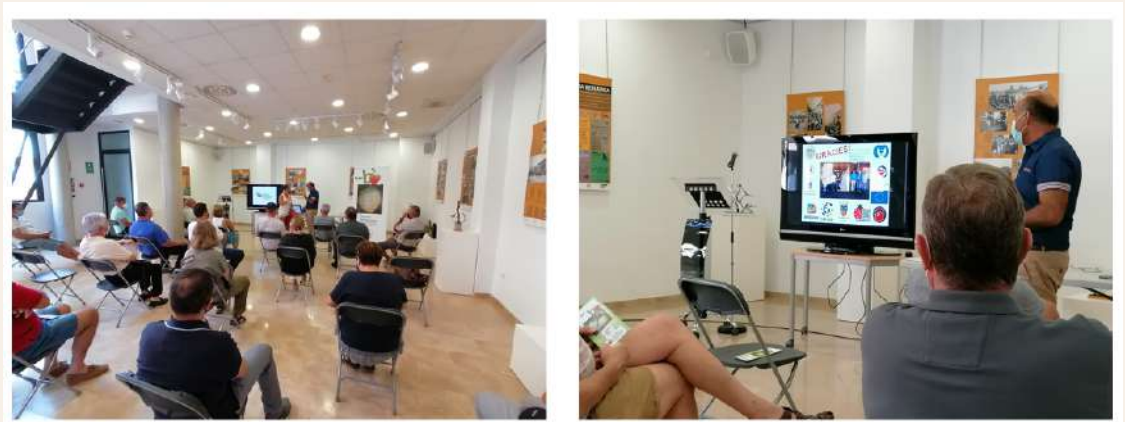
The BRESOV project coordinator Professor Ferdinando Branca (P1-UNICT) and Klervi Crenn (P8-Vegenov) presented the BRESOV project at the **Organic World Congress 2021** that was held online on 6-10 September 2021. The OWC is the world’s largest organic gathering, bringing together 2,500+ farmers, researchers, consumers, and stakeholders.



Screenshot of Professor F. Branca presenting BRESOV project at the Organic World Congress 2021.

BRESOV at XXII Commercial and Agricultural Fair of Meliana

On 18 September, P10-UPV took part in the seminar on Valenciana tomato seed disinfection, selection and breeding in the framework of the XXII Commercial and Agricultural Fair of Meliana (a village close to Valencia city with a long history of vegetable crops cultivation). Target audiences included farmers of the Association of Producers and Marketers of the Valenciana tomato landrace, as well as other farmers and general public.



Pictures of the participants of the seminar on Valenciana tomato seed disinfection at the XXII Commercial and Agricultural Fair.

BRESOV at the European Researcher’s Night 2021

At the end of September 2021, BRESOV was presented at the European Researcher’s Night organized by P1-UNICT.





Pictures from the European Researcher's Night 2021.

BRESOV on Telecolor (Sicilian TV channel)

The BRESOV project coordinator Professor Branca (P1-UNICT) appeared on a television show on organic food and health where he spoke about organic agriculture and the BRESOV project.



Screenshot of the TV show on Telecolor channel.

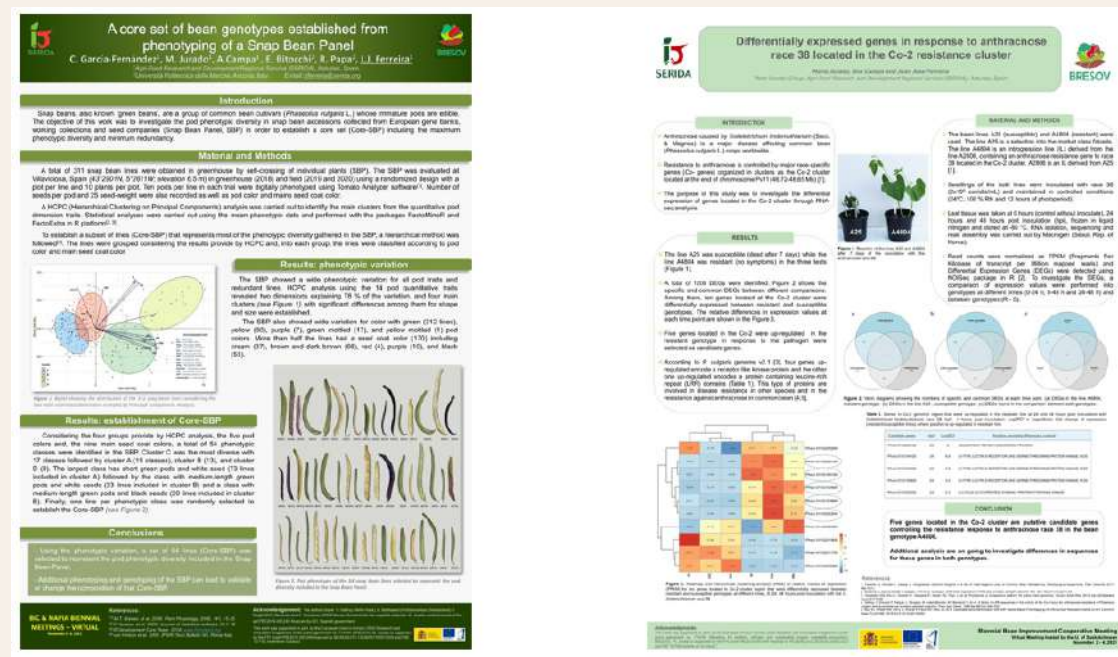
BRESOV at the Euroseeds 2021 Congress in Prague

The BRESOV project was presented at the P2-Euroseeds annual congress to relevant stakeholders in organic breeding and seed business. The project was also presented with a poster, postcards and Task 4.1 factsheet at the Euroseeds booth.



BRESOV at the Bean Improvement Cooperative (BIC) 2021

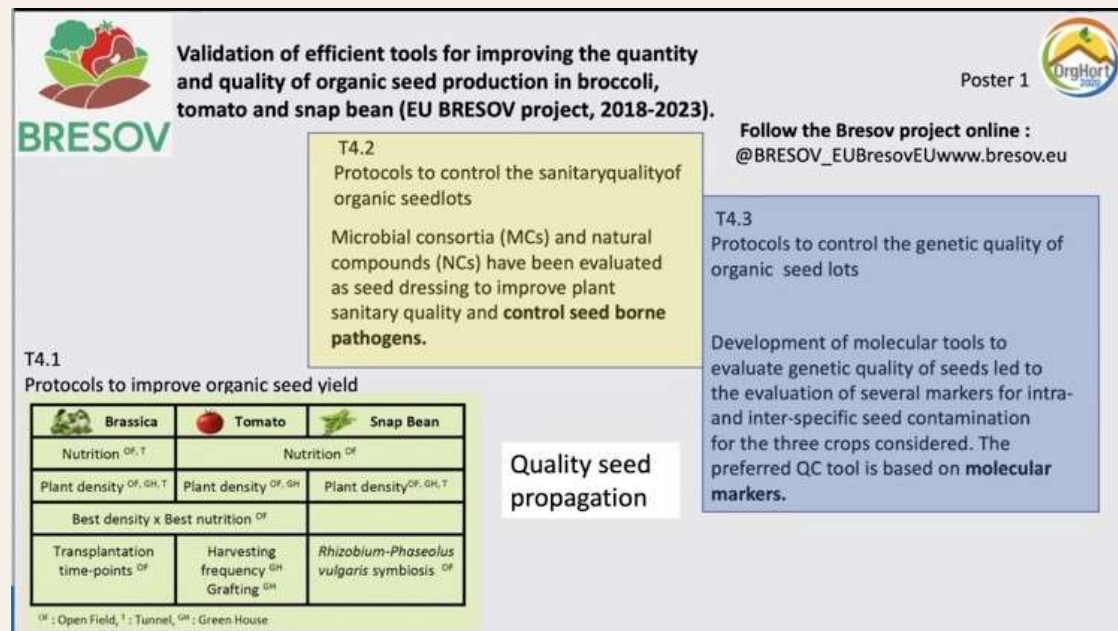
At BIC 2021 on 2-3 November 2021, P16-SERIDA presented BRESOV posters on phenotypic diversity for pod traits in a snap bean panel, and differential expression of genes in response to anthracnose.



BRESOV at the 3rd International Organic Fruit Symposium and 1st Organic Vegetable Symposium

The event was organized by the Di3A at P1-UNICT and was held on 14-16 December 2021.

Several BRESOV posters were presented, including one focusing on the topic of validation of efficient tools for improving the quantity and quality of organic seed production in broccoli, tomato and snap bean.



BRESOV poster on the validation of efficient tools for improving the quantity and quality of organic seed production in broccoli, tomato and snap bean.

BRESOV at ITAKA Open Day

On 13 January 2022, BRESOV took part in the P18-ITAKA Open Day - Interaction Plant-Microbiome In Organic Farming.

During the event, BRESOV trials were presented.





Pictures from the ITAKA Open Day.

BRESOV Brassica Group Meeting

The Brassica crop group had a meeting on 18 January to discuss the recently released genotyping database and its use, as well as the activities carried out by partners.



Screenshot of the participants of the Brassica Group online meeting.

BRESOV at the online webinar by project partner UTAD

On 11 February 2022, P4-UTAD organized an online webinar on the use of biodegradable bioplastic in horticulture.



PROJETO H2020
BRESOV
Melhoramento para uma Produção Hortícola Biológica
Resiliente, Eficiente e Sustentável

WORKSHOP ONLINE
11 de fevereiro 2022, zoom

**Demonstração do uso de plástico biodegradável
Agrobiofilm® em horticultura
em modo de produção biológico**

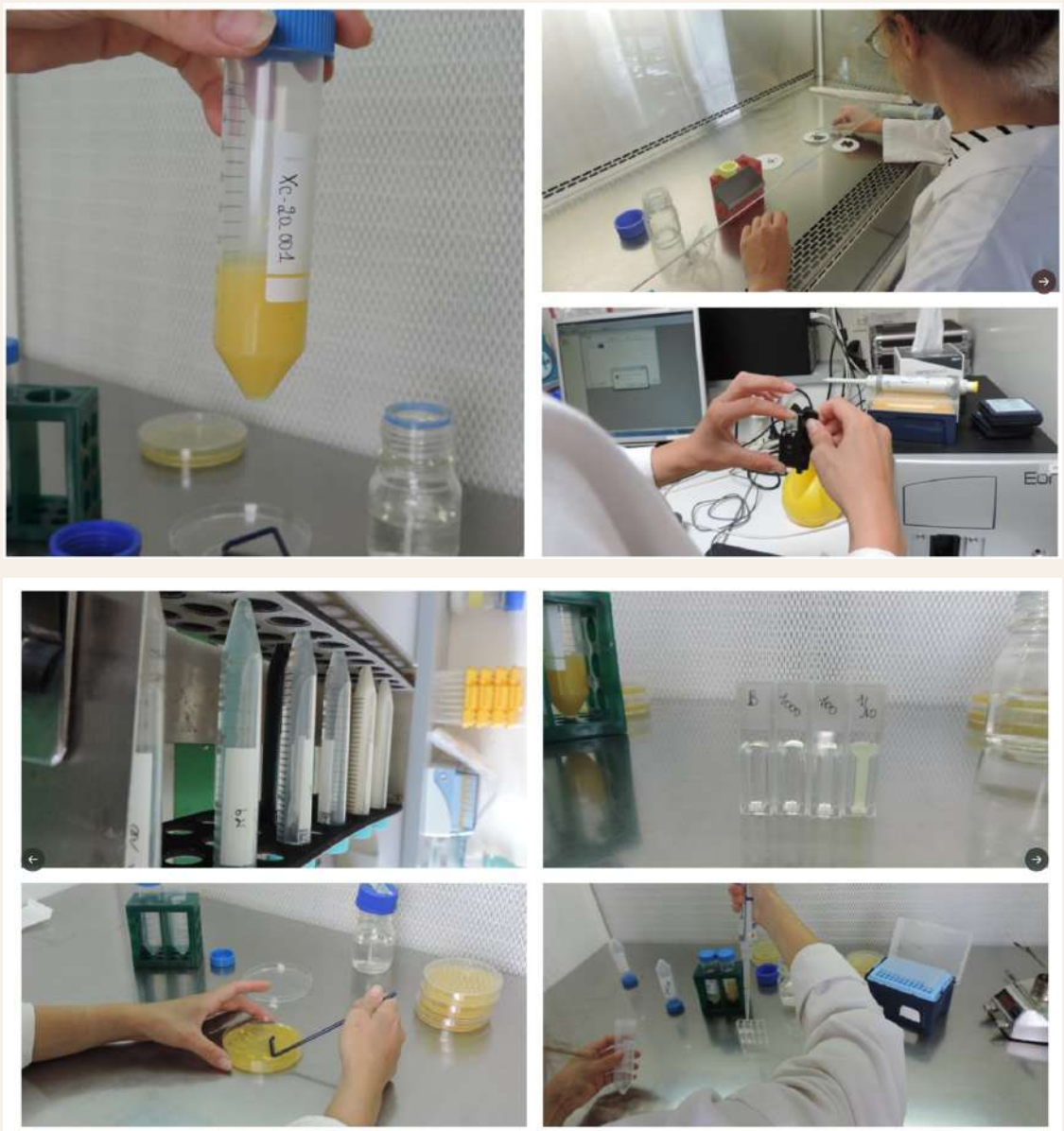
21:00	Sessão de Abertura – Breve apresentação do projeto BRESOV (Eduardo Rosa, Valdemar Carnide, Isaura Castro, Márcia Carvalho - CITAB-UTAD)
21:10	Uso de Agrobiofilm na cultura de brócolo em MPB (Ângela Pereira - BIOBRASSICA)
21:25	Vantagens da aplicação de Agrobiofilm em horticultura (Carlos Rodrigues - SILVEX)
21:45	Discussão e encerramento

Participação gratuita. Inscrição até dia 10 de fevereiro no link:
<https://forms.gle/bQDNMLcPtqK6uvMJ6>



Projeto com financiamento do programa de investigação e inovação da União Europeia Horizonte 2020 (Contrato N.º 774244)
Coordenador na UTAD: Prof. Eduardo Rosa (erosa@utad.pt). Web: www.bresov.eu

Announcement poster with the agenda of the UTAD online webinar on the use of biodegradable bioplastic in horticulture.



The treatment of broccoli seed artificially inoculated with Xanthomonas at P8-Vegenov.



Broccoli harvest at P11-VRDS.



BRESOV collaborator OBS is testing the effect of Rhizobium inoculation on the seed production of eight different snap bean genotypes in France.





Screenshot of the *video*.

As part of the on-farm evaluation for agronomic performances in crop rotation models, P18-ITAKA chose to include beans in the rotation after tomatoes. 3 cultivars have been included and evaluations will be performed until final assessments on marketability.



P9-UNILIV are performing a second Brassica salinity tolerance experiment. This work is designed to explore the stability of observed tolerance in different environments. The image shows the BolAGDH mapping population growing in a controlled environment at University of Liverpool, UK.

BRESOV through the camera lens

In the past 6 months, BRESOV partners have developed a number of video material showcasing their work on the project:

P16-SERIDA created **several videos**:

- A *drone video* showing the field trial with 297 bean lines in organic conditions. This video was recorded at the SERIDA facilities, Villaviciosa, Asturias, Spain in July 2021.



Screenshot of the *SERIDA field trial drone video*.

- A *video* on resistance test to Pythium in common bean in controlled conditions. This video is parts of a set edited to spread the plant breeding job.
- A *gif* showing pod phenotypic variation in the Snap Bean Panel

P18-ITAKA recorded short videos of the tomato and snap bean trials:

Links to Twitter posts:

- https://twitter.com/BRESOV_EU/status/1399261525018284034
- https://twitter.com/BRESOV_EU/status/1410540636592300033
- https://twitter.com/BRESOV_EU/status/1452952211609341958

P8-Vegenov developed a *video* showing the varietal screening of 397 accessions towards tomato late blight resistance. This pathogen is already well known at Vegenov, where tests for the evaluation of varietal resistance and/or the efficiency of bio-protection products are regularly performed under late blight infection conditions throughout the year.

What's next?

- 31 May-3 June 2022: **XX EUCARPIA** Meeting of the Tomato Working Group, Valencia (Spain)
- 29 June-1 July 2022: **ÖGA**, Koppigen (Switzerland)
- 5-7 July 2022: BRESOV annual meeting, Valencia (Spain)
- 3-8 July 2022: **14th International Conference on Plant Pathogenic Bacteria**, Assisi (Italy)
- 26-29 July 2022: **BIOFACH 2022**, Nürnberg (Germany)
- 14-20 August 2022: **31st International Horticultural Congress**, Angers (France)
- 24-26 October 2022: **Euroseeds 2022 Congress**, Berlin (Germany)
- 18-21 October 2022: **International Legume Society Conference**, Granada (Spain)
- postponed to 19-22 September 2023

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