BRESOV

Breeding for Resilient, Efficient and Sustainable Organic Vegetable production

BREEDING FOR RESILIENT, EFFICIENT AND SUSTAINABLE ORGANIC VEGETABLE PRODUCTION: THE H2020 BRESOV PROJECT

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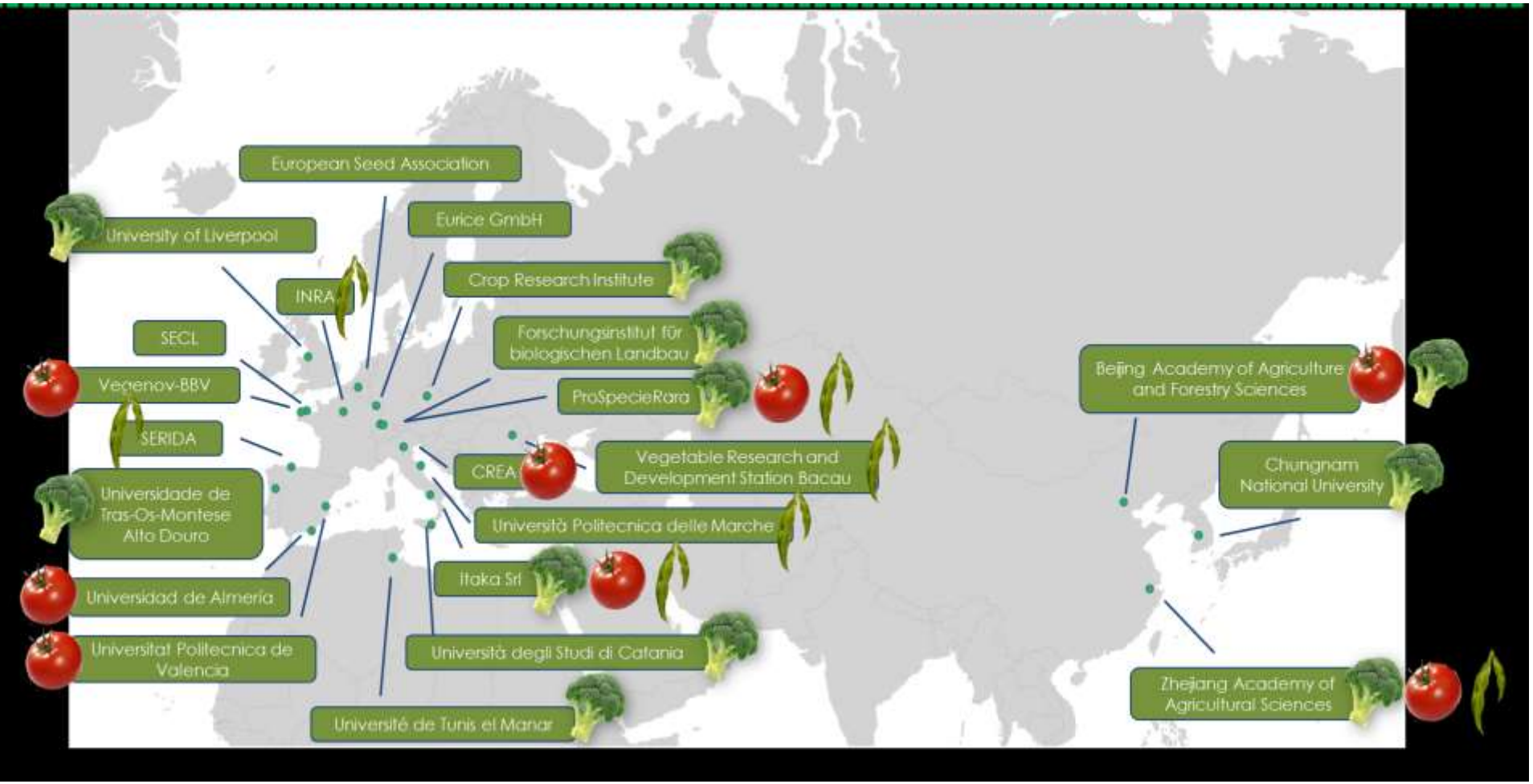
Overview

Exploitation of **genetic resources**, in terms of formulating **climate-resilient** cultivars addressed to **vegetable organic production** systems under current and future scenarios of climate change

Three crops: brassicas, beans and tomatoes

- **4** years
- **22** partners
- **9** EU28 countries *(IT, BE, ES, PT, CZ, FR, UK, RO, GER)*
- **2** Associated countries *(Switzerland, Tunisia)*
- **2** Third countries *(China, South Korea)*

BRESOV Partners at a Glance



Objectives

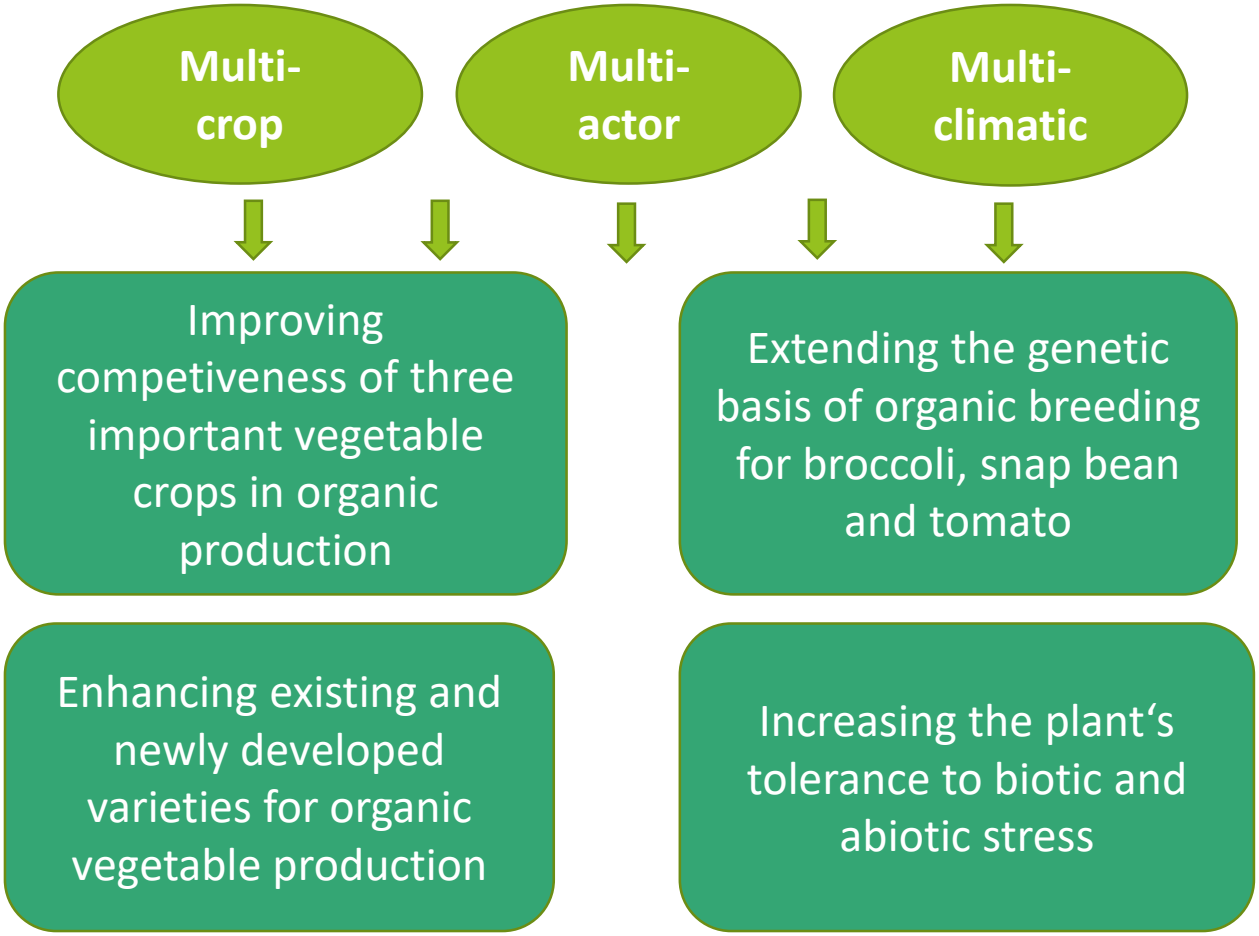
The **overall aim** of BRESOV is to improve the **competitiveness** of the three crops (brassica, bean, tomato) when grown in an **organic production system**:

- a) Establishing **core collections** of non-redundant genotypes for each species.
- b) Exploring the **genetic basis of main traits for organic cultivation** and **develop molecular markers** for assisted breeding of new cultivars (OP cultivars, inbred lines and hybrids) adapted to organic farming agro-systems for **biotic and abiotic stresses** on several organic vegetable farming systems in different European and non-European locations.

Objectives

- c) Increasing quality and quantity of **organic vegetable seed availability** for the growers of **different European geographic/climatic conditions** by developing methodologies that ensure the availability of organic seed of high quality.
- d) Improving the **adaptability** of the target crops in organic vegetable farming systems and the **interaction between the new cultivars and the soil microbiome**.
- e) Demonstration/testing/training activities to **disseminate the outcomes of the project** in view to innovate vegetable organic farming to the BRESOV stakeholders: one of our primary goals is to make **organic agriculture accessible** to more growers.

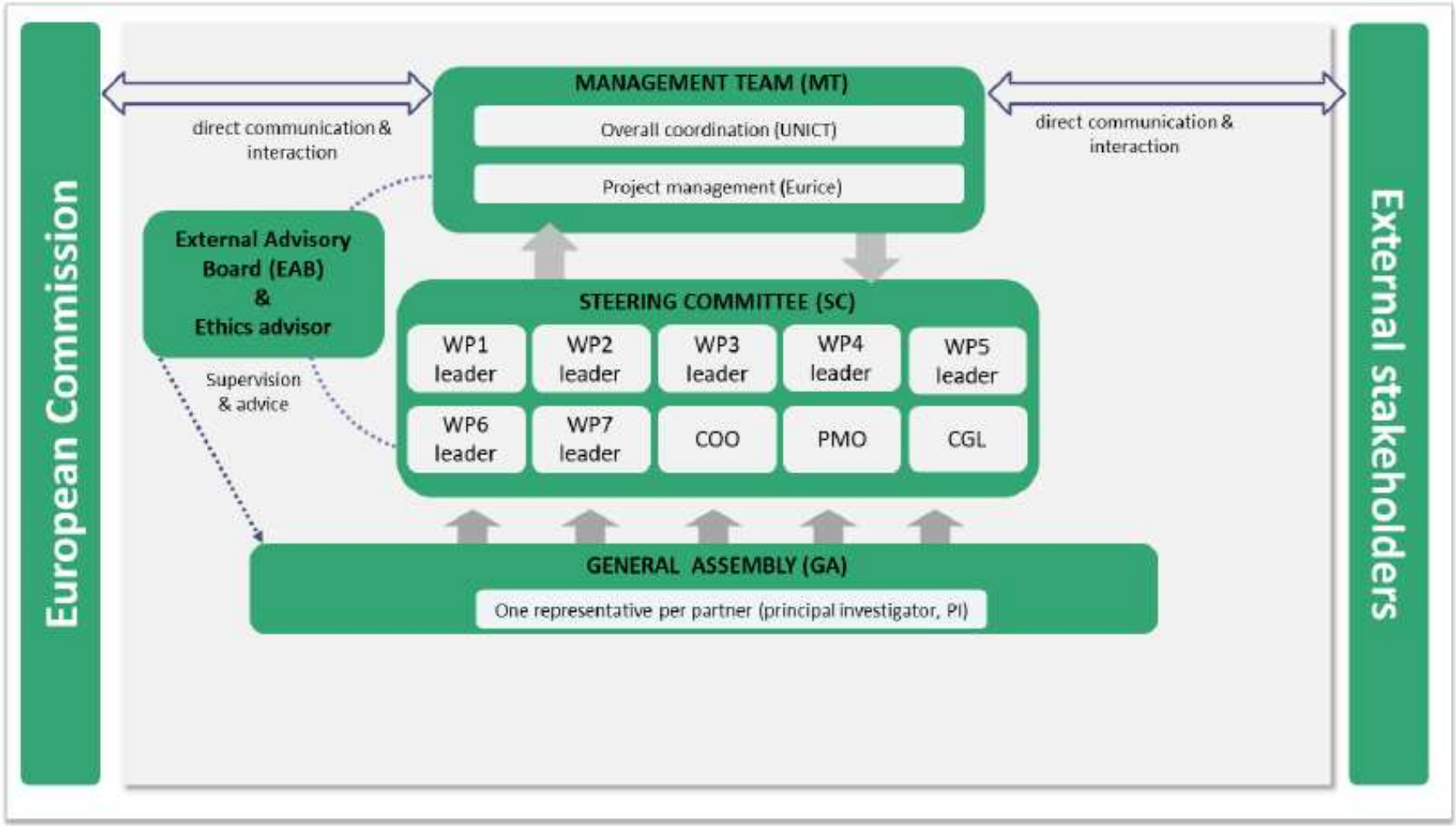
Approach and expected results



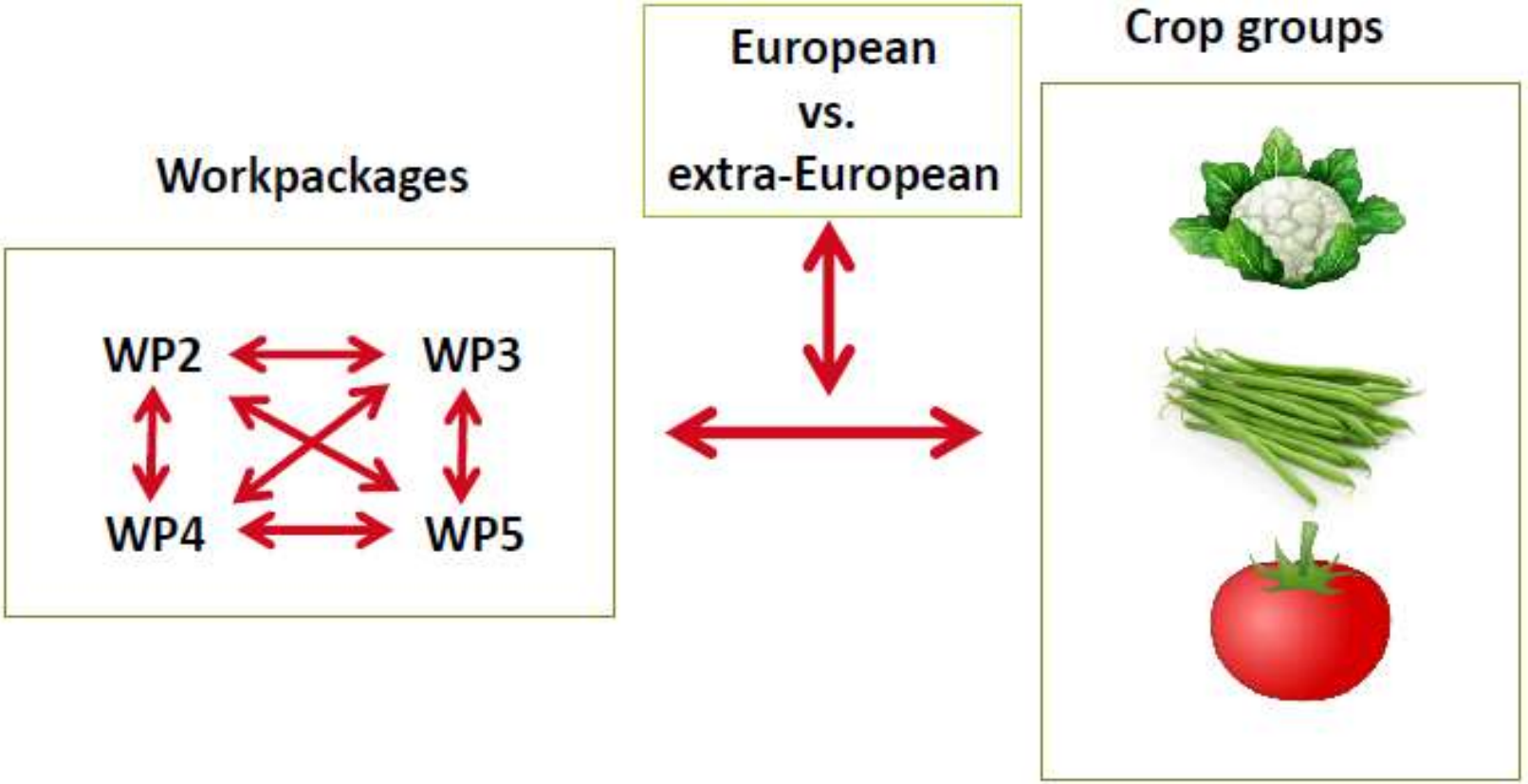
Consortium overview

- BRESOV follows a **multi-actor approach** involving academia, industry and farmers
- **External stakeholders** (seed and breeding companies, growers) support BRESOV through strategic advise, field testing
  - e.g. Gautier Semences (FR), OBS Innovation (FR), Semiorto Sementi (IT), Sativa Rheingau AG (CH) etc.
- **Important dates**:
  - 01/05/2018: Project start
  - 14-15/06/2018: Presentation of BRESOV at FOOD 2030 Conference in Plovdiv (Bulgaria)
  - 25-27/06/2018: Kick-off Meeting (Catania)
  - Yearly project progress meetings

BRESOV organisational structure



Crop groups with internal coordination



WP1 Objectives

N°	Description
O1.1	Provide optimal guidance and support to all partners through a quick set-up of effective management & communication structures.
O1.2	Transparency for consortium partners through proper project documentation.
O1.3	Maximize effectiveness of project activities: ensure the timely and qualitative achievement of project results through scientific and administrative coordination.
O1.4	Ensure efficiency: use resources wisely, avoid duplication of efforts, reduce waste of time and energy to a minimum to prevent unnecessary spending of funds.

Why do we need WP1?

Work package 1 will provide a clear organisational framework and all necessary support mechanisms to enable a smooth project workflow in BRESOV ensuring successful implementation of the project.

What the work package is about

- **Inform**
  the consortium about upcoming deliverables and deadlines, contractual obligations, financial rules etc.
- **Monitor**
  implementation of project work plan, timely submission of deliverables, achievement of milestones, and financial issues (cash flow and budget overviews)
- **Coordinate**
  activities on consortium level, e.g. reporting, meetings, etc.
- **Guide**
  decision making and - if necessary - contingency planning
- **Communicate**
  about the project and its results; support outreach activities (together with WP6)

WP2 Objectives

Objectives of WP2 as described in the DoA

Number	Description
O2.1	Characterize genetically and phenotypically genetic resources (CWRs, LRs and improved varieties) and use this information by specific core collections, association panels and mapping populations.
O2.2	Provide high-throughput genomic data of associations panels and mapping populations, which *will include also genetic information already available*, along with phenotypic data related to organic farming-related traits.
O2.3	Identify genes and/ or QTLs controlling organic farming related traits by using GWAS, linkage mapping and population genomics, and exploit this information to identify interesting lines/ genotypes and to develop molecular markers to be used in future breeding for organic farming environments.
O2.4	Integrate all data (genotypic and phenotypic information) from WP2 and WP3 in a common database for each crop, promoting comparison of different results and analyses; the database will be accessible for the consortium during the project and will be available for the scientific community at the end of the project.

Identification of genes/ QTLs for traits of interest

↓

Key tools to help breeders to introgress the useful genetic diversity in a target background more efficiently

Development of mapping populations and association panel

High-throughput genotyping

High-throughput phenotyping

(field & controlled conditions)

↓

Organic farming related traits

(i.e. resistance/tolerance to biotic and abiotic stresses and nutritional and organoleptic traits);

Acquisition of new information

↓

Identification of new genetic materials

↓

Transfer useful genetic diversity from exotic materials into elite germplasm

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*their role was indicated by crop leader in planned activities present in WP2 description of grant agrrement, but their, but not present in WP2 description of the Grant Agreement

**present in WP2 description of the Grant Agreement, but their role was not indicated by crop leader in planned activities sent to UNIVPM at the beginning of June

	Task 2.1 Sets of materials	Task 2.2 Genotyping and phenotyping	Task 2.3 Data analysis	Task 2.4 Validation	Task 2.5 Data integration and sharing
1 - UNICT			**		
3 - UAL					*
4 - UTAD	**				
5 - VURV					
7 - UNIVPM					
8 - VEG					*
9 - UNILIV					
10 - UPV					*
11 - VRDS					
12 - CREA					
14 - ZAAS	**		**	**	
15 - UTM	**		**	**	
16 - SERIDA					
19 - INRA					
20 - UNICHU			**	**	

WP3 Objectives

Objectives of WP3 as described in the DoA

Number	Description
O3.1	Select germplasm in the BRESOV repository that are resilient, and adapted to organic agriculture
O3.2	Identify sources of tolerance or resistance to prevalent pests and diseases under organic conditions
O3.3	Breed new elite materials for organic agriculture
O3.4	Evaluate quality traits for selecting high-added value cultivars and materials for organic agriculture

What is our Research Question and why are we doing this?

Can we select and breed materials with improved performance under organic conditions? Organic conditions are different both in management, use of agrochemicals and ecological conditions to "conventional" cultivation.
Local varieties, already existing breeding and newly developed materials with tolerance to abiotic and biotic stresses and with good productivity and enhanced fruit quality, will make European Organic Agriculture more competitive.

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WP3 Partners

- Partners and their activities in WP3

<u>Distribution of specific tasks per partner:</u>
Largely based on a crop basis

<u>Specific partner responsabilities within tasks:</u>
Defined in the crop groups meetings

Partner	Task 3.1 Screening	Task 3.2 Pest/disease	Task 3.3 Selection	Task 3.4 Breeding	Task 3.5 Added value
P1-UNICT		×			
P3-UAL		×			
P4-UTAD					
P5-VURV					
P6-FiBL	×	×			
P7-UNIVPM		×			×
P8-VEG					
P9-UNILIV		×			
P10-UPV					
P11-VRDS		×			×
P12-CREA		×			
P13-BAAFS					
P14-ZAAS					
P15-UTM					
P16-SERIDA					
17-PSR					
P19-INRA					
P20-UNICHU	×		×	×	×

WP4 Objectives

Objectives of WP4 as described in the DoA

Number	Description
O4.1	Develop protocols adapted to the specific conditions of organic farming to improve organic seed yield
O4.2	Determine products and tools to control the sanitary and genetic quality of organic seed lots.

What is our Research Question and why are we doing this?

Two main factors that affect the development of organic farming in Europe are the **limited quantity and the poor quality of organic seeds available** on markets.
The general objective of this WP4 is to develop the protocols and tools which suit to the specific conditions of organic farming to **maximize yield** (task 4.1) and **ensure high quality** (tasks 4.2 and 4.3) of organic seeds in tomato, snap bean and brassicas.

What is our Research Question and why are we doing this?

Pre-breeding lines are selected for their interesting cluster of traits for organic agriculture. In practice and compared to the organic standards in each region:

are they easily cultivated?

how do they perform alongside the standard cultivars and the requirements of the market? T5.1&5.2

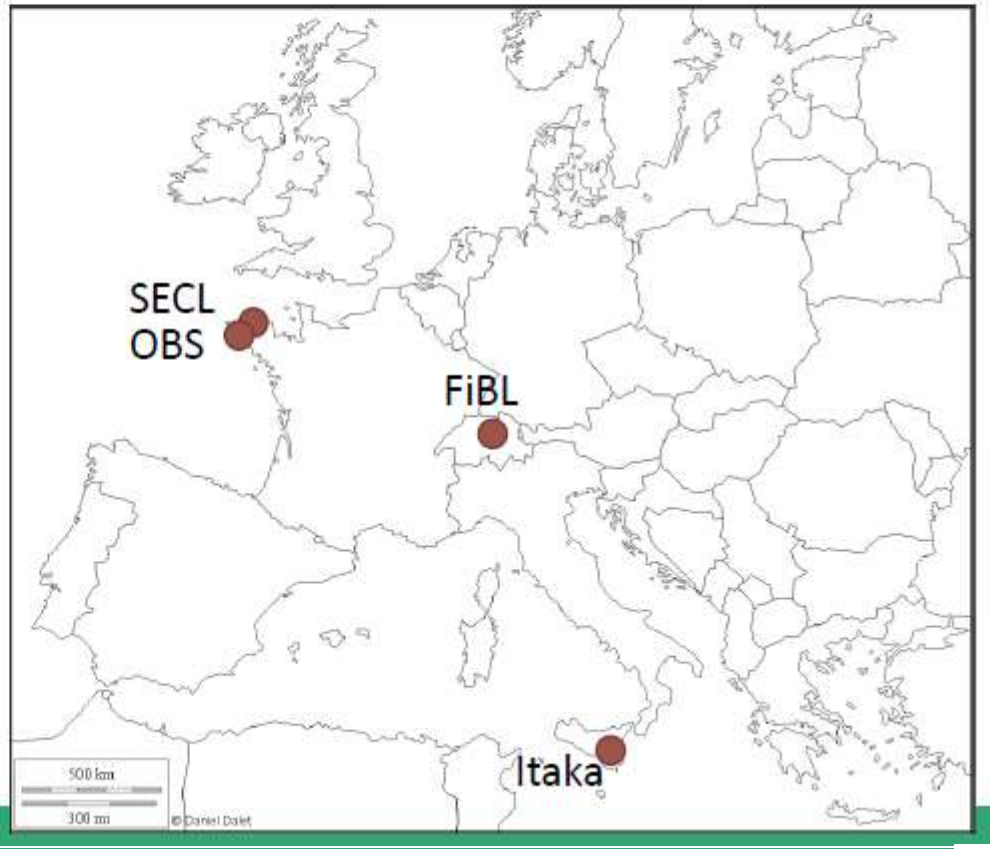
Can crop performance be naturally enhanced (bioactive products, crop rotation) T5.3 & 5.4?

WP4 organization

- T4.1 - Determination of the optimal agronomic conditions for organic seed production

Sites for the growing trials :

- Sicily (ITAKA) => **tomato** – greenhouse/tunnel / **brassica** / **snap bean**
- Switzerland (FiBL) => **tomato** – greenhouse
- France (SECL22/OBS) => **tomato** – greenhouse / **brassica** / **snap bean** ?



WP4 Partners

Partners and their expertise / responsibilities in WP4

Partner	Partner's responsibilities in reaching the WP's Objectives
ESA (Kate WILSON/Christophe ROUILLARD)	T4.1 leader In task 4.1 ESA will define the varieties to use, the traits to evaluate, and the parameters to study for the three crops. ESA will also set up a trialling plan and provide a harmonised trialling protocol and recommendations for the task partners; it will then supervise the trials and will use all the collected data and statistical results to define the thresholds and optimal conditions to maximize the quantity and the quality of organic seeds in tomato, brocoli and bean.
FiBL (Joelle HERFORTH)	FiBL will participate in : - Organize trials in T4.1 - Test alternative products for seed disinfection in T4.2.
Itaka (Vincent LEFEBVRE DUPREY)	Itaka will participate in : - Organize trials in T4.1 - Provide alternative treatments for sedd disinfection (T4.2) - Evaluate Alternative in controlled conditions (T4.2)
SECL (Guillaume ROSTOLL)	SECL will conduct trials in T4.1

WP5 Objectives

Number	Description
O5.1	Evaluate a shortlist of breeding lines compatible with organic farming for the production of crops of enhanced quality and marketing value.
O5.2	Provide farmers with new materials to be tested alongside commercial organic varieties on-farm.
O5.3	Enhance crop performance (i.e. stress tolerance and nutrition) using bioactive products.
O5.4	Promote crop rotations for improved performance of brassicas, snap bean and tomato crops.

What is our Research Question and why are we doing this?

Pre-breeding lines are selected for their interesting cluster of traits for organic agriculture. In practice and compared to the organic standards in each region:

are they easily cultivated?

how do they perform alongside the standard cultivars and the requirements of the market? T5.1&5.2

Can crop performance be naturally enhanced (bioactive products, crop rotation) T5.3 & 5.4?

WP5 Partners

- Partners and their expertise / responsibilities in WP5

Partner	Country	Tomato	Broccoli	Bean
VRDS	Romania	x	x	x
ITAKA	Sicily	x	x	x
FiBL	Switzerland	x	x	x
ZAAS	China	x	x	x
SECL	France	x	x	x
BAAFS	China	x	x	
SERIDA	Spain			x
CREA	Italy	x		
VURV	Czech republic		x	
UTAD	Portugal		x	
UniLIV	United Kingdom		x	

+ T5.3 & 5.4
+ T5.3 & 5.4

- All partners to conduct tials and collect data following protocols provided by FiBL and organise local tasting of the crop products.

WP6 Objectives

N°	Description
O6.1	Communication, create visibility and encourage project outreach
O6.2	Disseminate results to targeted stakeholders and the scientific community
O6.3	Training of relevant stakeholders
O6.4	Foster innovation management by maximising the exploitations of results

Why is WP6 important?

Make BRESOV known by a huge range of stakeholders (incl. the wider interested public and the media).
Transfer knowledge & results to academia, seed/breeding companies and farmers.
Ensure the use of BRESOV results and maximize the impact of the project.

Communication

Objective:

- **Reach out to society and show the impact and benefits** of EU-funded R&I activities, e.g. by addressing and providing possible solutions to fundamental societal challenges and creating visibility

Focus:

- **Inform** about and **promote** the project AND its results/success.

Target audiences:

- Multiple audiences beyond the project's own community incl. media and the broad public.

Formal obligations:

- Article 38.1 of the Grant Agreement

Dissemination

Objective:

- **Transfer knowledge & results** with the aim to enable others to use and take up results, thus maximising the impact of EU-funded research.

Focus:

- **Describe** and **ensure results available** for others to **USE** → focus on results only!

Target audiences:

- Audiences that may take an interest in the potential USE of the results (e.g. scientific community, industrial partner, policymakers).

Formal obligations:

- Article 29 of the Grant Agreement

Exploitation

Objective:

- **Effectively use project results** through scientific, economic, political or societal exploitation routes aiming to turn R&I actions into concrete value and impact for society.

Focus:

- **Make concrete use** of research results (not restricted to commercial use).

Target audiences:

- People/organisations including project partners themselves that make concrete use of the project results, as well as user groups outside the project.

Formal obligations:

- Article 28 of the Grant Agreement

Communication Committee (CC)

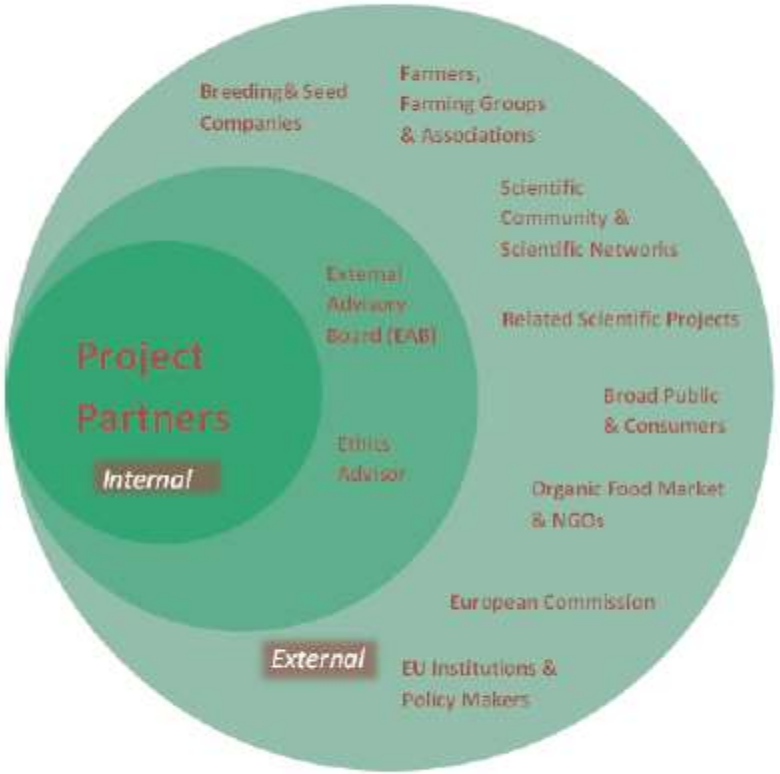
- comprised of ESA, Eurice, the coordinator and key representatives of the different BRESOV core activities
- to be nominated at the kick-off meeting

Role/tasks:

- in charge of guiding external project communication
- content production
- quality assurance for all communication measures

Communication Concept

- developed by Eurice in cooperation with the coordinator and WP leaders
- internal document as basis for all communication measures
- defines BRESOV's aims, key messages and communication channels to address relevant stakeholders
- available in your meeting folders



BRESOV Stakeholder mapping

Communication and dissemination strategy

Target audience:

- Scientific Community & Scientific Networks
- Breeding, Seed & Farming Companies & Associations
- European Commission, EU Institutions & Policy Makers
- Organic Food Market, NGOs, Broad Public & Consumers

Communication channels:

- Project website: www.bresov.eu
- Social media channels:
  - **Twitter: @BRESOV_EU** https://twitter.com/BRESOV_EU
  - **Facebook:** www.facebook.com/BresovEU/

Social media

BRESOV

Networking

ESA Stand at
Flagship Conference
2nd FOOD 2030 High
Level Event
14-15 June, Plovdiv

BRESOV_eu
Published by Alexandra Sabou [?] · June 15 at 3:19pm ·

We are slowly reaching the end of the second day of the #Food2030EU conference here in Plovdiv, Bulgaria! Two full days of full of promising discussions, fruitful encounters & insightful debates about the common food security challenges that Europe is facing nowadays. Together with other #H2020 projects, we are proud to mention that BRESOV_eu has been showcased during the conference! Thank you to all those who have visited us at the #Food2030EU Food Village! #EmbracingNature #Food2030EU

Communication and dissemination strategy

Communication channels (*continued*):

- Communication material (*Postcard, poster, factsheet etc.)*
- Position paper
- E-Newsletter
- Audiovisual material (*short video with methods and main results*)
- Practice abstracts (e.g. EIP-AGRI)
- Public events / BRESOV outreach event
- Scientific events, conferences and workshops
- Scientific publications / peer-reviewed journals

Field_beans_VRDS

Field_beans_VRDS

Field_tomato_SECL





Field_brassica_UNICT

Field_Brassicas_UNICT





Links with other EU projects

LIVESEED will help to establish a level playing field in the organic seed market across Europe, improve the competitiveness of the organic seed and breeding sector, and encourage greater use of organic seeds by farmers.

ECOBREED will improve the availability of seed and varieties suitable for organic and low- input production, focusing on four crop species, i.e. common wheat, potato, soybean and common buckwheat.

TRADITOM has phenotyped and genotyped 1200 local varieties of tomato from the Mediterranean region and established a core collection.

G2P-SOL is genotyping the European Solanaceae genetic resources.

TomGEM is dealing with the mining of a vast range of genetic resources to identify cultivars/genotypes displaying yield stability under heat stress conditions and to uncover loci/genes controlling flower initiation, pollen fertility and fruit set.

DIVERSIFOOD evaluates and enriches the diversity of cultivated plants within diverse agroecosystems to increase performance, resilience, quality and use through a multi-actor approach

In these EU funded projects some BRESOV's partner are involved / some results will be used by the BRESOV project

New EU H2020 proposal projects
SFS28 2019 - *Research and Innovation actions*

BRASSICA GENETIC RESOURCES FOR THEIR RESILIENT, EFFICIENCY AND SUSTAINABLE CONSERVATION AND EXPLOITATION (BRACE)

III International Organic Fruit Symposium
and
I International Organic Vegetable Symposium
Catania 5-8 October 2020

Thank you for your attention….