



BRESOV has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 774244.

# Final Conference of the EU Horizon 2020 project BRESOV 28th-30th March 2023, Agrigento, Italy



Università  
di Catania



Breeding for Resilient, Efficient and Sustainable Organic Vegetable production

## KER3: Agronomic practices to increase the production of high-quality organic seed and advanced tools to control the sanitary quality of organic broccoli, snap bean and tomato seed lots.

KER Presentation

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- 🌱 30/03/2023



# KER characterisation

## Agronomic practices to increase the production of high-quality organic seed

### Problem

- Lack of organic seeds
- The EC envisions the end of derogations by 2035
- Quality of organic seed is often heterogeneous (medium/low germination rate)

### Solution

- Adjust or combine several agronomic factors that are compliant with organic production rules to increase seed yield and ensure good seed germination rate

# KER characterisation

## Agronomic practices to increase the production of high-quality organic seed

### What we did

- Evaluation of the effect of several agronomic parameters on seed production under organic growing conditions in different European locations
- Seed germination tests after every trial

### BRESOV innovation

- Guidelines for the production of high quality organic seeds :
  - List of agronomic factors easy to put in place and compliant with organics rules to increase seed production and seed quality (germination)
  - Provides directions on which factor to use in priority depending on the crop and the regional pedo-climatic conditions

# KER characterisation

## Agronomic practices to increase the production of high-quality organic seed

Who will benefit from our results?

- Seed producers
- Breeding companies (small/medium scale)
- Organic farmers

What do we plan for the future?

- Easy-to-read and accessible document presenting main results from trials with guidelines about agronomic practices per crop and geographical region)
- Video highlighting key agronomic factors
- Practice abstracts about seed germination methods, seed treatment with Rhizobium, grafting of tomato, ...
- Communication at local/national events, demonstration in the field

# Impact of the KER in 3-year time

## Agronomic practices to increase the production of high-quality organic seed

- For organic farmers, small/medium-scale breeding companies and seed producers
  - to produce more seeds of good quality in tomato, snap bean and broccoli (and possibly more crops),
  - improve revenues and help them to expand their activity, thus probably creating new working positions
- Environmentally friendly practices
  - contributes to the adoption of lower-impact agricultural systems : less exposure to chemicals for workers, lower impact on environment



# KER characterisation

## Tools and products to control the sanitary quality of organic seed lots

### Problem

- Important issues related to pathogen-contaminated seed lots because of a lack of accurate pathogen detection tools and lack of efficient seed treatments that are compliant with organic production rules

### Solution

- Seed-borne pathogen detection at early stage in seed lots
- Use of biocontrol products and steamed water as organic-compliant seed treatments towards key seed-borne pathogens

# KER characterisation

## Tools and products to control the sanitary quality of organic seed lots

### What we did

- Development of molecular-based protocols to detect major seed-borne pathogens in seed lots
- Application of a method to assess seed treatment products
- Evaluation of the efficiency of 6 natural seed treatments (4 microbial-based products and 2 natural compounds), acetic acid and hot water towards major seed-borne pathogens

### BRESOV innovation

- Molecular tools (PCR-based) to detect seed-borne pathogens directly in seed lots
- Evaluation of new products (not yet commercialized) that are compliant with organic production rules
- Recommendations for application/use of the best products

# KER characterisation

## Tools and products to control the sanitary quality of organic seed lots

Who will benefit from our results?

- Breeding companies
- Seed producers
- Seed resellers
- Vegetable producers
- Organic farmers and farmer organizations

What do we plan for the future?

- Service offering to companies (evaluation of products, pathogen detection in seeds)
- Marker accreditation for pathogen detection
- Further development / validation of seed treatment products
- Follow-up research projects (e.g. LIVESEEDING)
- Practice abstracts and other communication documents
- Conferences / workshops / events with seed companies and farmers (local/ national)



# Impact of the KER in 3-year time

## Tools and products to control the sanitary quality of organic seed lots

- Expand possibilities to detect major seed-borne pathogens in seed lots upon seed reception and before sowing
  - limits the use of pest control solutions in the field and/or yield loss = more cost-efficient control of the sanitary quality of the vegetable production
- Potential new organic-certified seed treatments towards major seed-borne pathogens, which contributes to enlarge the number of environmentally friendly pest control solutions available to farmers
  - less exposure to chemicals for workers, lower impact on environment, supporting green deal policy



# Thank you for your attention!

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of interest?

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