

InnOBreed Concept note

Length of project: 48 months/4 years

Project period: 01 July 2022 – 30 June 2026

Project coordinator: Centro Internazionale di Alti Studi Agronomici Mediterranei (CIHEAM)

Consortium: 21 partners from 10 European countries (Austria, Belgium, Czech Republic, Denmark, France, Germany, Greece, Italy, Spain, and Switzerland).

The project

InnOBreed is a collaborative research project funded under Horizon Europe, with the aim to foster organic fruit tree breeding and improve the performance of the fruit sector, by enhancing Innovative Organic fruit Breeding and uses. The project is a joint initiative by 21 organisations, including universities, research institutes, technological centres, and producer associations from nine (9) different EU Member States and Switzerland. Through nine (9) work packages, InnOBreed will evaluate, implement and aggregate innovative solutions (IS) to promote the organic fruit growing sectors by the development and deployment of suitable cultivars.

The main objective of the project is to identify specific fruit cultivars that are better suited for organic production cultivars compared to the ones that are currently used, and that meet organic farming requirements, by:

- Evaluating local genetic resources, (pre-) breeding material and cultivars;
- Breeding for organic traits with optimised approaches (e.g. better robustness, better pest and disease tolerance/resistance, lower input fitness, better adaptation to climate changes, etc.); and
- Introducing these varieties through the organic fruit supply chain.

EU organic fruit production

The vulnerability of the organic fruit production along with a rising market demand for organic products lead to a continuous pursuit of measures to ensure the quality and sustainability of the organic fruit production. The organic fruit sector is highly dependent on inputs, particularly in terms of crop protection. Furthermore, climate change is increasingly generating effects on and risks to the organic fruit production. While the market demand for organic fruits is expanding, the current commercial cultivars, previously selected in a high input paradigm are, for most of them, not adapted to low or no-input farming systems. As a consequence, there is a gap between production and demand. Moreover, the European Green Deal objectives and the Farm to Fork Strategy set the target of at least 25% of EU's agricultural land under organic farming by 2030, which implies a significant increase compared to today.

Scope and activities

In such context, the InnOBreed project will promote and aggregate IS focused on the participative development of fruit varieties specifically tailored to lower inputs organic farming systems. The project's emphasis is given to social innovations, new ideotypes, and new methods for screening resilient cultivars and genitors with larger genetic bases for fostering organic fruit breeding and to their application for the improvement of the whole organic fruit

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chain. The IS will be targeted and developed on participative, multi-actor and multi-trait based approaches and then applied for evaluating underutilised fruit tree genetic resources (FTGR), pre-breeding, and advanced material.

With the aim of supporting the activities of the project, as well as testing and validating the innovative solutions identified, 12 case studies have been selected representing different regions, species and levels of investment in the selection/evaluation process.

InnOBreed is dedicated to fruit perennial species including citrus, grape, pome fruits (apple, pear), and stone fruits (peach, almond, apricot, japanese plum, and european plum). InnOBreed aims to improve the whole fruit chain through the implementation of an organic variety testing network. The following activities and tasks will be conducted during the course of the project:

- (i) identification and definition of current lock-in in organic fruit farming systems (OFS);
- (ii) co-designing new ideotypes fitting with local OFS;
- (iii) identification of performant IS already available;
- (iv) development of new climate change IS but also for fruit quality, pests and diseases tolerance, low input fitness and robustness, and their application by FTGR curators, breeders, variety testers, and nurseries;
- (v) Implementation of protocols, methods and procedures on harmonised bases in the different Regions for accessing on operational bases the robustness of the FTGR evaluation; and
- (vi) checking sustainability and consistency with actual legislations before being disseminated for maximizing IS impacts on the value chain.

Connections with stakeholders and on-going projects

Besides a clear technological and scientific ambition at the organisational/socio-economic level, InnOBreed plans to gather national and EU stakeholders of the fruit chain, including breeders, evaluators and FTGR collection curators, innovation providers, farmers, and consumers in order to ensure the pertinence and durability of the project, and in particular to:

- Capitalise on already available innovative solutions and on a large set of case studies able to be implemented by the innovation providers;
- Identify on participative bases the most suitable accessions/varieties for the fruit organic sector at local and regional levels, also to anticipate the impacts of environmental changes;
- Ensure that the requirements of the fruit sector, consumers and civil society are integrated in the project's approaches; and
- Highlight the practical and technological conditions for implementing the different innovative solutions (technological and social/organisational).

Furthermore, InnOBreed is strongly connected to other running initiatives, projects, programmes and resources involved in OFS, organic fruit participative and classical breeding fostering FTGR uses by fruit-chain, scientists and stakeholders.