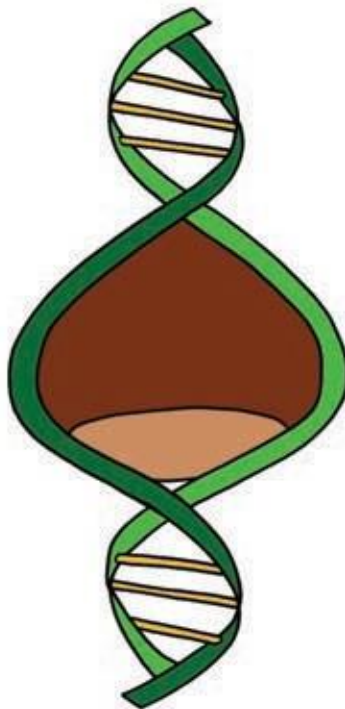


# THE BIODIVERSITY OF TRADITIONAL CHESTNUT ORCHARDS IN EMILIA-ROMAGNA



**BIODIVERSAMENTE  
CASTAGNO**

EXTRACT FROM THE PAMPHLET "THE BIODIVERSITY  
OF TRADITIONAL CHESTNUT ORCHARDS IN EMILIA-ROMAGNA"

The complete version in Italian can be found at the link:  
<https://www.pedologia.net/it/BIODIVERSAMENTECASTAGNO/cms/Pagina.action?pageAction=&page=InfoSuolo.47@localeSite=it>

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**PHOTOS**

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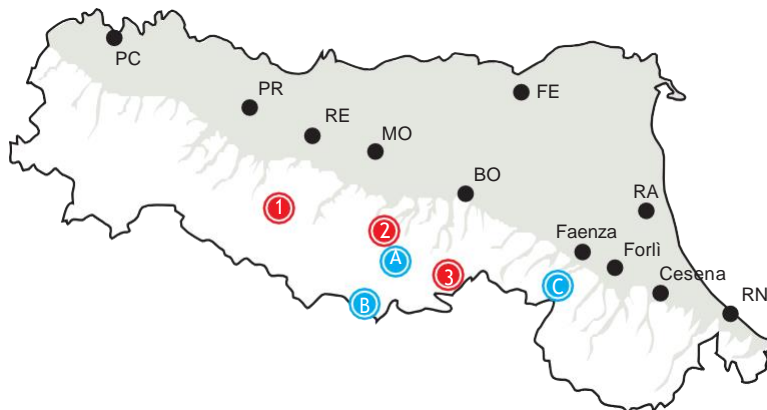
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# The Project BIODIVERSLY CHESTNUT



Traditional chestnut orchards are characterised by trees which are often hundreds of years old, mainly grafted with marrons and native varieties of chestnuts, and by soil which has never been tilled. They represent a real stronghold of tradition, culture and food. In fact, they play a fundamental role in the management and conservation of the territory, and the hilly and mountainous landscape of Emilia-Romagna as well as in the production of a fruit rich in nutritional qualities and properties. The traditional chestnut orchard ecosystem is characterised by a wide environmental and genetic biodiversity based on the soil, the animals and the plants present. The Operational Group BIODIVERSLY CHESTNUT was set up with the aim of deepening the understanding of the biodiversity present in the chestnut orchards in Emilia-Romagna and to give value and promote the role of the chestnut grower as “custodians” to protect biodiversity and the territory. The cooperation between researchers, chestnut-producing farms, chestnut-growing consortiums and associations, which together created the official constitution of the operational group, is an important step towards better integration of the academic and research system and the chestnut sector. The working plan envisaged a collective study shared by the scientific community and chestnut producers to understand the genetic variability of the chestnut germplasm and the main characteristics of the soil and its biodiversity through indices such as Soil Biological Quality

KEY	PARTNER FARMS	BOROUGH
1	Daniele Canovi’s Antico Bosco Farm	MAROLA
2	Stefano Fogacci’s Tizzano Farm	ZOCCA
3	Andrea Degli Esposti’s La Martina Farm	MONGHIDORO
A	Zocca “Field Collection” Farm	ZOCCA
	Zocca “Scion Field” Farm	ZOCCA
B	Granaglione Experimental Educational Chestnut Park	GRANAGLIONE
C	“Experimental Plot of Chestnut Germplasm” Field Collection called “Faggeto”	BRISIGHELLA

(SBQ) and Biological Fertility Index (BFI). The study of the genetic fingerprint considered not only the territories of the partner farms but also a specific study within the Field Collections available in Emilia-Romagna: “Scion Field” in Zocca (MO), Field Collection in Zocca (MO), the Experimental Educational Chestnut Park in Granaglione (BO), Field Collection “Experimental Plot of Chestnut Germplasm” called “Faggeto”(RA). Furthermore, the variety of regional native chestnuts at risk of extinction, recognised in the field collections, were grafted at the partner farms which have effectively become their custodians.

The participatory approach, which characterised the work of the Operational Group, allowed the entire work process to be tested, identified and shared in order to define the “guidelines” to study, preserve and give value to the biodiversity of Chestnuts.

To summarise, the specific objectives of the Project BIODIVERSLY CHESTNUT were to:

- **understand the genetic variability of the chestnut germplasm;** this was determined by the fact that the characterization of chestnut biodiversity in Emilia-Romagna is based on biometric (pomological) and morphological analyses, as can be seen from the regional collection records of the regional varieties at risk of genetic erosion.
- **understand the characteristics of chestnut orchard soils** describing the pedological observations carried out with a Dutch auger and specific soil profiles opened in the traditional chestnut orchards on the partner farms situated in different geo-pedological situations.
- **understand the biodiversity present in the chestnut orchard soil** through specific surveys and processing to determine the soil Biological Quality index (SBQ) and the soil Biological Fertility index (BFI).
- **Create scion fields on partner farms for varieties of chestnuts at risk of extinction;** genetically recognised scions were collected from the field collections available in Emilia-Romagna and grafted at two partner farms in order to safeguard the trees and protect biodiversity in the chestnut sector.
- **Set up, define and share “guidelines to study, preserve and give value to Chestnut biodiversity”** which also permit giving value to and promoting the role of chestnut growers as “custodians” to protect biodiversity and the territory.

# Guidelines to study, preserve and promote the biodiversity of the traditional chestnut orchard ecosystem

The definition of the “Guidelines to study, preserve and promote Chestnut biodiversity” is connected with the activity carried out by the Operational Group BIODIVERSLY CHESTNUT.

First of all, the guidelines, shared by the farms and research institutions in the operational group, aim to give value and promote the role of the chestnut-grower as “custodian” of the protection of biodiversity and the regional chestnut territory.

A fundamental reference was the publication by the Italian Ministry of Agricultural, Food and Forestry Policies (MIPAAF) 2012 “Guidelines for the conservation and characterisation of plant, animal and microbial biodiversity concerning agriculture” written for the National Plan of Biodiversity concerning Agriculture.

Furthermore, it is necessary to remember that in 1992 “The convention on biological diversity” (CBD) - an international treaty aimed at the protection, the durable and informed use of its elements and the fair distribution of the benefits deriving from the use of

genetic resources - was adopted. This convention is based on three fundamental points:

1. Genetic resources cease to be a freely accessible resource (Common Patrimony of Humanity), State Governments have sovereign rights over the resources originating in and found on their land;
2. Conservation is closely linked to the sustainable use of Resources;
3. Access to Resources (not only material, but also immaterial, such as traditional know-how) must be regulated by Prior Informed Consent (PIC) from the owner communities and by an agreement of equal distribution of potential benefits deriving from the use of the resources (benefit sharing) which entered into force in 1994 and the International Treaty on Plant Genetics Resources for Food and Agriculture (ITPGRFA), operating since 2004.

## Definitions published by MIPAAF, 2012 "Guidelines for the conservation and characterisation of plant, animal and microbial biodiversity concerning agriculture"

**Local variety:** "A local variety of a crop which reproduces by seed or vegetative propagation is a variable population, which is identifiable and usually has a local name. It has not been part of an organized programme for genetic improvement, it is characterized by specific adaptations to the environmental and cultivation conditions of a designated area and is closely associated with the customs, knowledge, habits, dialects and traditions of the human population which developed it and continues to cultivate it". Definition proposed by the meeting of On-Farm Conservation and Management Taskforce of the European Cooperative Programme on Plant Genetic Resources (ECPGR), held at Stegelitz (Germany) in 2006.

**Conservation ex situ:** is conservation in specific structures with different means depending on the species. Apart from field collections, it is practically a static system, at least during the conservation phase, even if it is possible that variations arise or genetic diversity is lost during the regeneration phase in the field, when standards are not respected. All the material conserved ex situ must be managed in a way to minimise risk in the event of natural disasters, technical problems, biological damage, socio-economic problems, etc. The protection procedures, therefore, must involve continuous monitoring of the material and, in particular, the conservation of germplasm duplicates in different sites. Management of ex situ populations, must also avoid any intervention which could weaken the genetic integrity and the vitality of the material (reduction of genetic diversity, artificial selection, transmission of pathogenic agents, uncontrolled hybridization, etc.).

**Conservation in situ/on farm:** is conservation of the ecosystems and the natural habitats and maintenance of the populations and both the wild and cultivated species within them, or rather within the environments where, in accordance with the what is laid down in the CBD, they have evolved their distinctive characteristics. This is a dynamic conservation system: the diverse populations continuously adapt to selective biotic and abiotic pressures (including anthropic pressure). Conservation in situ of cultivated forms is generally defined on farm. In this perspective, conservation in situ/on farm appears to have a holistic approach to safeguard the biodiversity of the agro-ecosystem, it tends to safeguard all living forms present in this situation, whether they are cultivated or spontaneous, but above all it does not neglect maintaining, if not the strengthening, the complex relationships that develop between them. This context is a good way to conserve local varieties, which have been cultivated in a certain location for a long time by a certain human community, so that they may be called "native", or have "always" been cultivated there.

## Guideline for the Protection of Plant Genetic Resources

The process of securing the genetic diversity of species requires the development of a strategy in which ex-situ and in situ conservation become synergic to guarantee the presence of an adequate number of individuals of the different accessions in the territory, located in different structures and therefore protected, so that it is possible to retrieve material for propagation and grafting when necessary.

The necessity of describing and cataloguing the genetic diversity from which it is possible to retrieve information about the genetic resources conserved should not be underestimated.

Fortunately, pomological records are available for many varieties conserved in the Region on the site of the Regional Voluntary Catalogue of Agricultural Genetic Resources in the Emilia-Romagna Region and some are mentioned in the Italian Native Fruit Tree Atlas recently edited by the Italian Ministry of Agricultural, Food and Forestry Policies.

However, some accessions are present in a very limited number of plants and the support of Partner Farms from the Project Biodiversity Chestnut has become fundamental for their conservation on farm.

The guidelines defined by the Operational Group, following the outline of the National Guidelines contain the following points:

Promotion of **Conservation ex situ**: through the following Field Collections available in the Emilia-Romagna Region, where the Bologna University has prepared a true inventory of the material conserved by using molecular markers:

- Scion Field in Zocca (MO) set up by the then East Modena Apennine Mountain Community which became the Union of the Terre di Castelli Boroughs; currently managed by the recently established voluntary Agro Forestry Chestnut Consortium of the Apennines of Modena;
- Field Collection in Zocca (MO) run by the Union of the Terre di Castelli Boroughs on land which is the property of Zocca Council;
- Field Collection of Granaglione (BO) run by the National Agricultural Academy with the support of the social cooperative of Campeggio Monghidoro;
- Field Collection “Experimental Plot of Chestnut Germplasm” called “Faggeto”, situated in the forestry district “Alto Lamone” of Brisighella (RA); the Union of Romagna Faentina has granted free access to the Chestnut Study and Documentation Centre at Marradi.

**Promotion of Conservation in situ/on farm**: creating two safeguard fields for the varieties of chestnut at risk of extinction on Stefano Fogacci’s Tizzano Farm and Andrea Degli Esposti’s La Martina Farm, emphasizing their role as

“custodians of the regional chestnut genetic resources facing extinction”.

**Broadcast the importance of chestnut biodiversity to consumers:** in this context the Consortiums of chestnut-growers definitely assume an important role as for years they have organized informative activities, promoting the typical characteristics and knowledge of the local varieties.

**Encourage good soil management in traditional chestnut orchards:** the soil of traditional chestnut orchards has never been tilled or worked and in fact the traditional chestnut orchard is a clear example of conservative soil management. However, some practices are necessary as the orchards are situated on moderately-steep to steep slopes. Therefore, in reference to the “Voluntary guidelines for sustainable soil management” (FAO 2015) which clarify the important role sustainable soil management plays in contributing to the collective efforts to mitigate and

adapt to climate change, fight desertification and protect biodiversity, it is clear that good management of traditional chestnut orchards must set the following objectives:

- Reduce water and wind erosion of soil to a minimum by maintaining good grass coverage;
- Maintain good soil structure to avoid compaction which can be caused by the passage of machinery in flatter orchards where driving is possible;
- Maintain or improve the organic matter content, for example also by adding organic material and not burning debris from pruning;
- Apply good water management techniques to encourage the infiltration of water from precipitation and guaranteeing drainage of excess water;
- Preserve the biodiversity of the soil to support all biological functions.





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