



*Competitiveness increase of high hill and mountain farms through cereal biodiversity valorization under organic farming: **the BIO2 project***

Make innovation in agriculture.

The experiences of the EIP Operational Groups in Emilia-Romagna

Brussels, 11/04/2018

Silvia Folloni, Open Fields srl



# The project

- **TITLE:** *Competitiveness increase of high hill and mountain farms through cereal biodiversity valorization under organic farming*
- **LIFE CICLE:** 01/10/2016 – 31/09/2018
- **PROGRAM:** Operation Type 16.1.01 - Operational Groups of the European Innovation Partnership: "Productivity and Sustainability of Agriculture" - Rural Development Program 2014-2020 of the Emilia Romagna Region. 2016 call. Focus Area 2A – Improving economic performance of all farms, farm restructuring and modernization
- **KEYWORDS:** competitiveness, biodiversity, heritage wheat, evolutionary populations, varietal mixtures











# Introducing BIO2

TRAILER ENGL

<https://vimeo.com/254308330/73197e9d90>

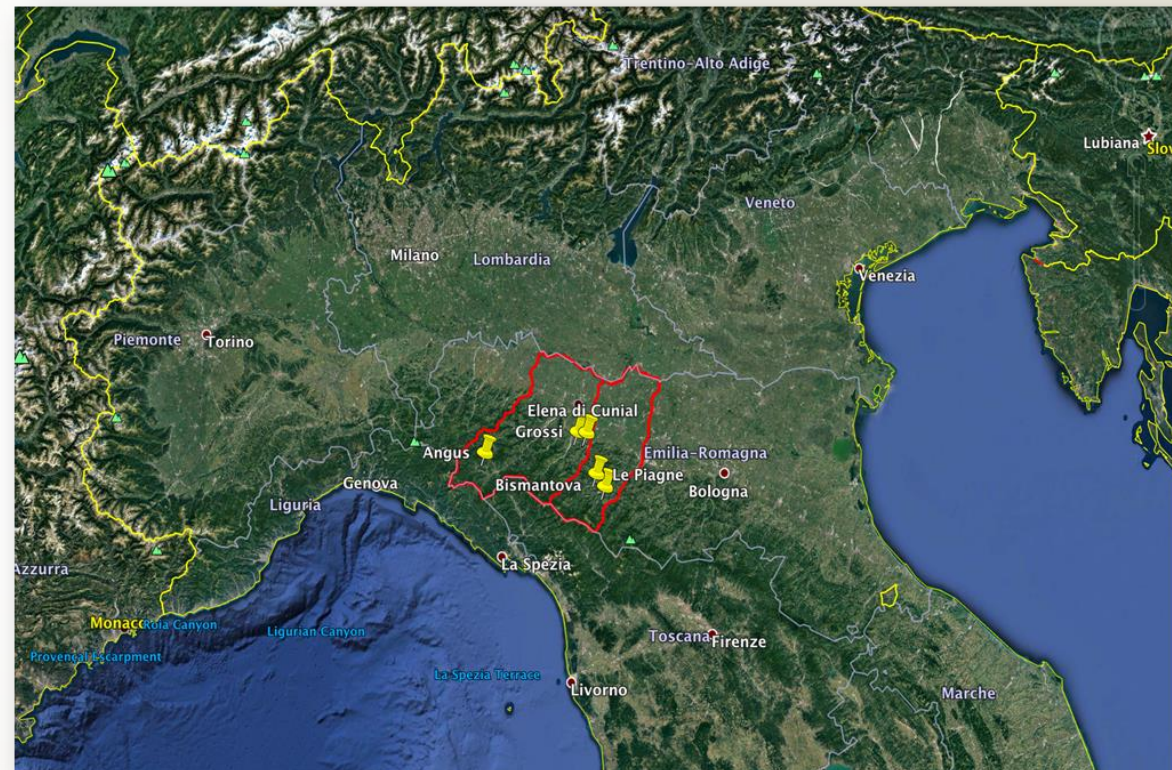


# The Operational Group (OG)

Open Fields (coordinator)	
Bismantova Az. Agricola	
Le Piagne Soc. Agricola	
Az. Agricola Grossi	
Angus Az. Agricola	
Azienda Elena di Cunial	
Stuard experimental farm	
Molino Grassi	
Agriform	
University of Parma (UNIPR)	

CONSULTANT: Dott. Salvatore Ceccarelli,  
Prof. of Agricultural Genetics

WITH THE PARTICIPATION OF: Ezio Rocchi, master baker



# The concept

- Marginal areas, such as mountains, are best to produce quality, organic products;
- Heritage/local varieties and ancient wheat are experiencing a time of rediscovery, characterized by strong consumer interest;
- Evolutionary populations are highly heterogeneous material having higher buffering capacity to adapt to various stress factors and a changing climate. They can improve performance and yield stability, especially under organic and low-input agricultural conditions, or in marginal areas. Moreover they contribute to broadening the existing genetic diversity.

## Objectives



- **To increase competitiveness of mountains and high hills farms**
  - To favour the **cultivation of local underexploited wheat varieties and evolutionary populations under organic farming**;
  - To promote *in situ* conservation of **agro-biodiversity**;
  - To **broaden the range of cereal products** available to consumers.

# Heritage and local wheat

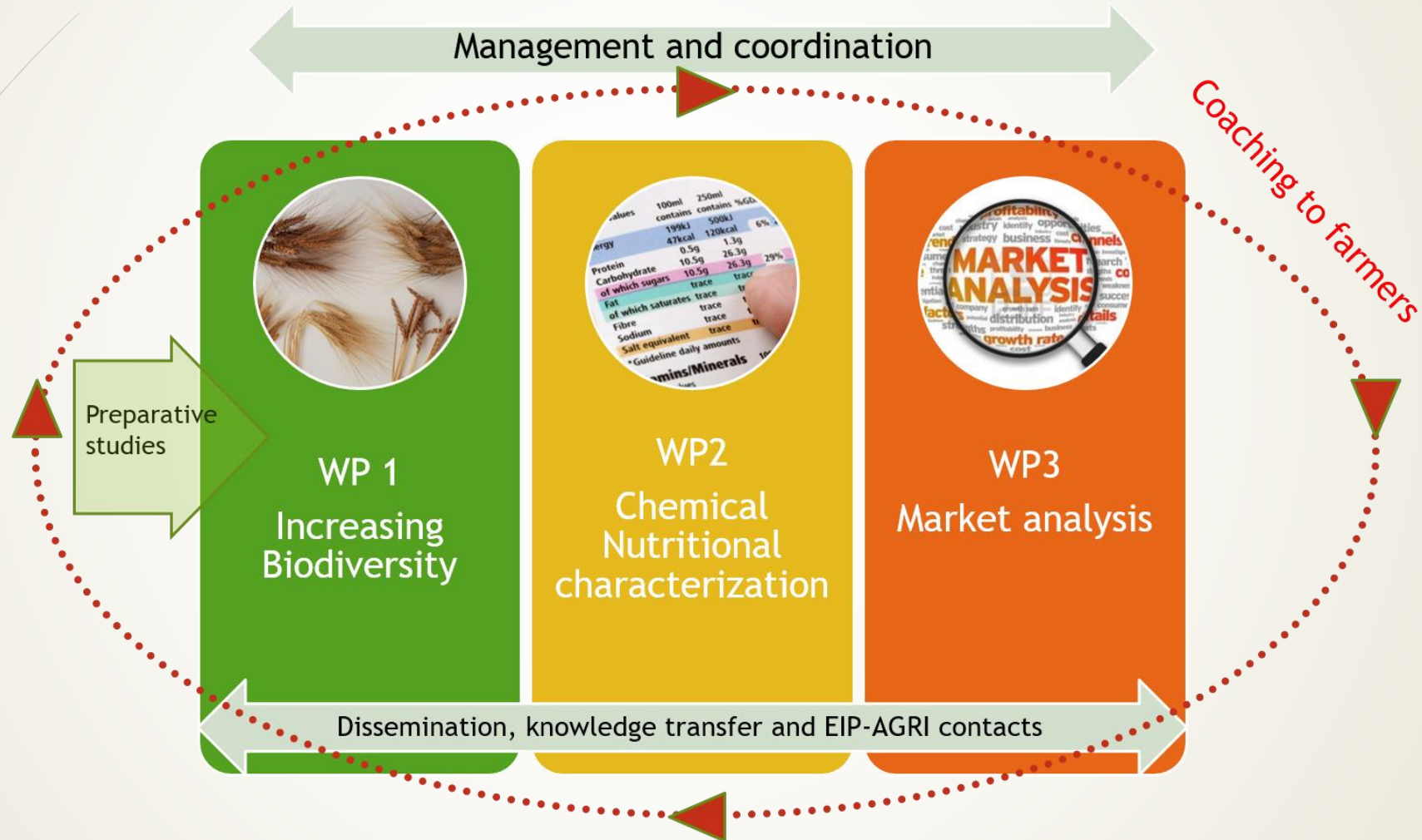
Also defined ancient wheat (commercial term)

Local varieties or populations of species belonging to the *Triticum* genus:

- Einkorn (*T. monococcum* subs. *monococcum*);
- Emmer (*T. turgidum* subs. *dicoccum*);
- Spelt (*T. aestivum* subs. *spelta*);
- Turanicum (*T. turgidum* subs. *turanicum*);
- Wonder wheat (*T. turgidum* subs. *turgidum*);
- Saragolle (population of turanicum and durum wheat);
- Durum wheat (*T. turgidum* subs. *durum*);
- Soft wheat (*T. aestivum* L.).



# The project structure



# WP1: Biodiversity improvement

- To test and cultivate under organic farming Evolutionary Populations (Eps: 3 mixtures of heritage varieties of wheat and one CCP by ICARDA), in order to obtain farm adapted – and therefore specific – evolutionary populations.
- To compare the EPs and the heritage varieties sown in purity with modern varieties of wheat.

30 small plots of 10,2 m<sup>2</sup> with heritage varieties and ancient species of the *Triticum* genus sown in purity and mixes.



Big plots of 1000-2000 m<sup>2</sup> sown with mixes:  
 - ICARDA CCP,  
 - Mix BIO2 durum wheat,  
 - Mix BIO2 bread wheat,  
 - Mix GROSSI

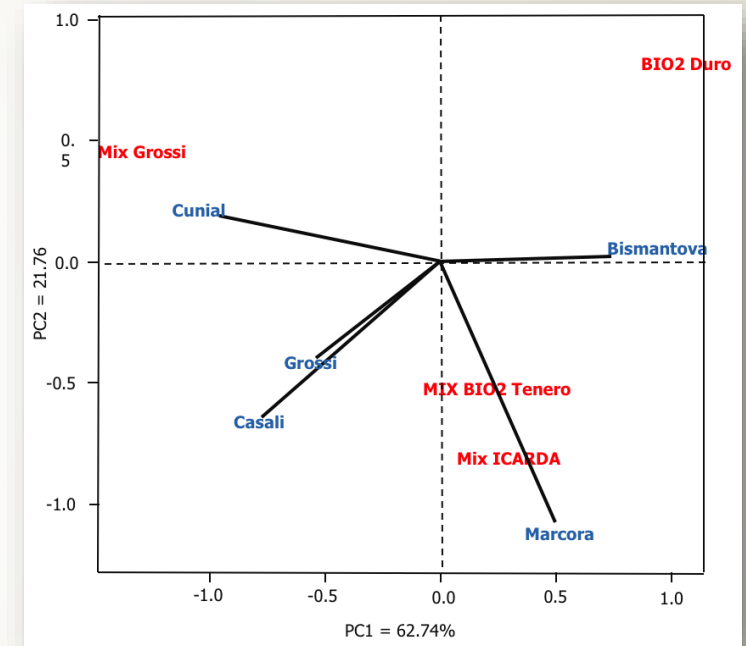


# WP1: first results

Farm	Yield (t/ha)	Plant Height (cm)	Spikelet length (cm)	test weight
Bismantova	4.163 a	136.5 a	7.9 bc	77.12 a
Casali	2.690 c	125.4 b	8.0 b	77.33 a
Cunial	1.569 d	86.7 c	7.4 c	71.12 b
Marcora	3.256 bc	120.3 b	7.7 bc	77.96 a
Grossi	3.767 ab	128.4 ab	9.5 a	72.81 b
<b>Lsd 0.05</b>	0.6186	9.08	0.6330	1.166

The values followed by the same letter are not significantly different

- For all the parameters, significant differences have been detected between the farms.
- Production yields of the different EPs vary from farm to farm due to their different adaptation to soil properties and microclimate.



## WP2: Chemical and nutritional characterisation



- ▶ To measure the content of proteins, fiber, starch, fatty acid profile and microelements such as minerals, B-vitamins, phenolic acids (on wholegrain flours);
- ▶ To determine the asparagine content (amino acid involved in the acrylamide formation during bread-making process);
- ▶ Bread making with flour from evolving populations/mixtures;
- ▶ To evaluate the acceptability and appreciation of breads (panel test);
- ▶ In vitro bio-accessibility of micronutrients and phytochemicals;
- ▶ To measure the Glycemic responses and post-prandial plasma insulin levels in healthy subjects.

## WP2: first results



- No micotoxins have been detected;
- Other chemical, rheological and nutritional analysis are ongoing;
- The breads for the in-vivo glycemc responses have been produced and the analysis are ongoing.



# WP3: Economic analysis and new selling channels for agricultural products

- To assess the marketing potential of raw and processed outputs;
- To analyse possible marketing channels;
- Profit and loss analysis;
- To develop a simple model evaluating alternative scenarios;
- Tastings with consumers (public engagement).

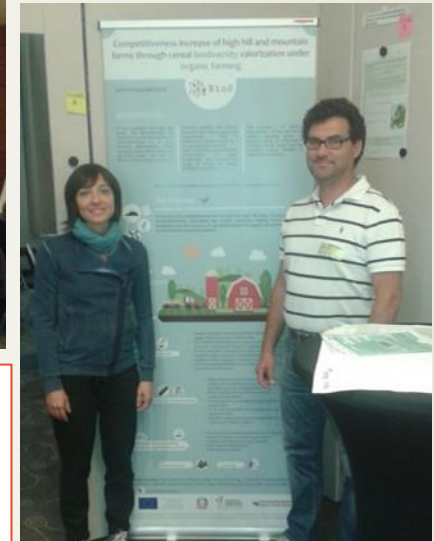


# Dissemination and transfer of results Implementation of the EIP-AGRI network



EIP-AGRI Workshop on Innovation in supply chain: creating value together

6-7 FEBRUARY 2018 – LYON, FRANCE



Launch of a dedicated website; production of a short documentary and a trailer; organisation of visits to the experimental fields; preparation of leaflets, posters etc.; networking and cooperation activities with European, national projects and other OGs; technical and scientific publications; participation to conferences and workshops; final project workshop.



# Make innovation in agriculture: *our experience*

- ▶ Working together in a Multi-Actor project is **not easy**; different actors have different priorities, expectations, as well as different timing and organization of work
- ▶ Important to keep the **OG motivated and focused** (dedicated project manager)
- ▶ **The BIO2 OG**, is «evolving» and **adapting in a co-creation process**: both the *practical knowledge of farmers & industry* and the *academic knowledge* feed the innovation process and design alternative business models
- ▶ It is very enriching and it is the best way to achieve **results that are adopted by farmers**
- ▶ **Institutions could further facilitate this process** by reducing the rigidity of certain administrative procedures and schemes, to favor the participation of **small family farms**

# THANK YOU FOR YOUR ATTENTION

[www.bioalquadrato.it](http://www.bioalquadrato.it)

[s.folloni@openfields.it](mailto:s.folloni@openfields.it)



Initiative under the framework of the Rural Development Program 2014-2020 of Emilia Romagna Region - Operation Type 16.1.01 - Operational Groups of the European Innovation Partnership: "Productivity and Sustainability of Agriculture" - Focus Area 2A - Project No. 5005321

European Agricultural Fund for Rural Development: Europe Investing in Rural Areas

