

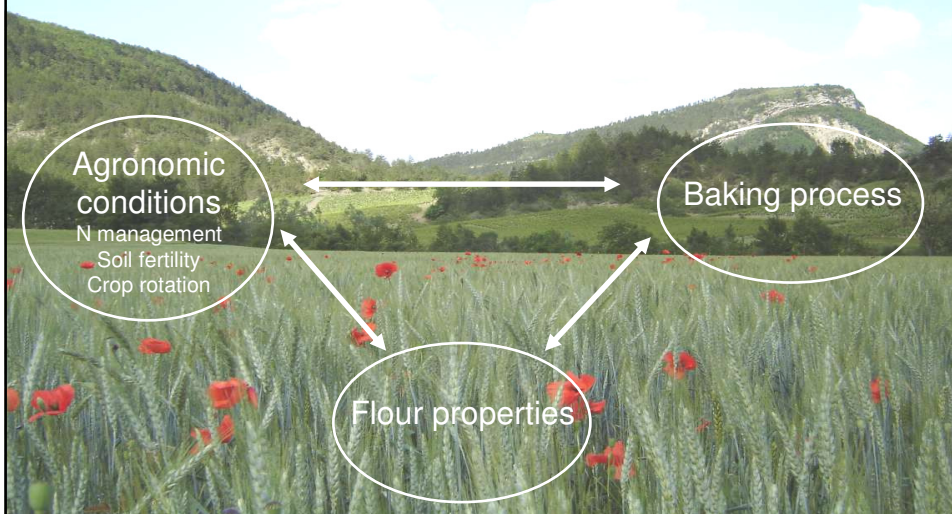
## AGronomical and TEChnological methods to improve ORGanic wheat quality

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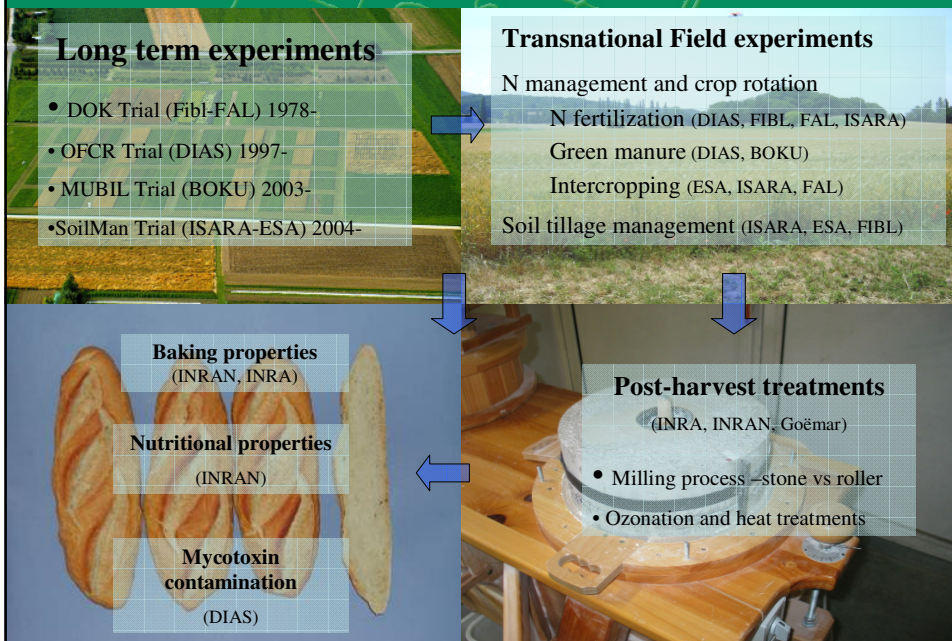


### Enhancing baking quality and nutritional values of organic wheat without contaminants



## Objectives

- Evaluate the current practices for organic grain wheat production and flour-processing in Europe.
- Improve crop management strategies to enable bread-making quality wheat to be produced on organic farms with and without livestock.
- Develop optimal post-harvest treatment to prevent mycotoxin contamination and enhance bread making quality and nutritional value.
- To generalise results from experiments in order to enhance farm management strategies in various climates and soil types observed in Europe.



**CORE organic** Exchange scientific expertises

**FIBL Trial**

3 experimental factors – 8 treatments  
1 site

Mouldboard ploughing vs Reduced tillage

Slurry vs Slurry+manure compost

Biodynamic preparations vs no preparations

**SoilManTrials**

1 experimental factor 4 treatments – 2 sites

**Mouldboard ploughing** - 30 cm - soil inversion

**Shallow mouldboard ploughing** - 15 -20 cm - soil inversion

**Reduced tillage with tine tool** 10 - 15 cm – no soil inversion

**No tillage** - 0 - 5 cm – no soil inversion

**Mouldboard ploughing**

**Reduced tillage without soil inversion**

**CORE organic** Combine & compare agronomic solutions

**Intercropping or undersowing system**  
wheat-pea / wheat-clover mixtures

3 experimental factors – 24 treatments  
1 site

Wheat / Pea ratio : 50/50 - 70/30 – 100/0 – 0/100

N fertilization strategies  
Time of N application (3 dates)  
N amount (2 levels)

**N fertilization**

3 experimental factors 4 sites

Crop rotation with high vs low proportion of N-fixing crops

N fertilization with vs without supply of animal slurry or manure

Biodynamic vs Organic systems

3 experimental factors – 5 sites

Seed rate of clovers grass (3 levels)

**Green manure**

2 experimental factors 4 treatments – 3 sites

Type of green manure

Time of incorporation

# CORE organic

Innovative agronomical and technological methods



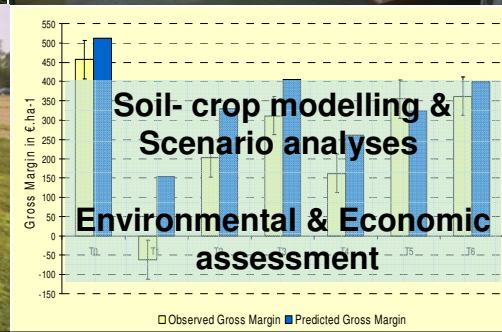
Intercropping and undersowing system on organic wheat



Ozonation and heat treatment

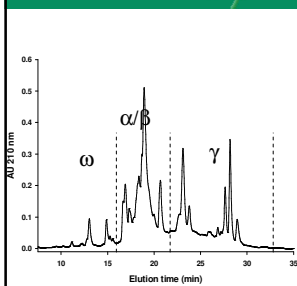


Superficial tillage on organic grain systems



# CORE organic

Multifactorial analysis



## Bread making properties

- Dough rheological analysis
- Redox status
- Zeleny sedimentation index
- Gluten index
- Flour rheological properties



## Mycotoxin contamination

- Fusarium sp. Detection
- DON concentration

## Nutritional values

- Dietary fibre
- Bound Hydrophilic antioxidants
- Hardness
- Ash
- Total protein

## Added value of the collaboration

- The use of long term experiments, surveys and analytical trials
- The assessment of innovative crop management and milling processes
- The combination of agronomical and technological methods
- A multidisciplinary consortium
- A permanent link with farmers and millers through participatory research

## Context

- It is a challenge to organic farmers, millers and bakeries to fulfil consumer expectations of providing healthy and safe products without impairing yield performance.
- The quality of organic grain can be modified by agronomic conditions such as crop management, crop rotation, and soil fertility. Therefore, food processing technologies such as the post-harvest handling of the grain and the flour processing are also key factors in producing bread of high nutritional value without contaminants.

