

# Long-term experiments as a platform for monitoring bread wheat quality

*I.K. Thomsen*

*University of Aarhus, Faculty of Agricultural Sciences, Department of Agroecology and Environment, Denmark. [ingrid.thomsen@agrsci.dk](mailto:ingrid.thomsen@agrsci.dk)*

## Abstract

Both winter wheat and spring wheat have the potential for producing grain of bread wheat quality under North European conditions. The two crops may due to their different growth length respond differently to previous use of green manure and to the soil organic matter content. To compare winter wheat and spring wheat for their ability to produce quality grain for bread production, both crops are included in a long-term experiment (LTE) at Askov Experimental Station. The LTE provides a unique platform for such comparison, as the two crops can be grown under identical conditions regarding previous management, soil and climate. The bread wheat experiment is part of the project AGronomical and TEchnological methods to improve ORGanic wheat quality (AGTEC-Org) funded by CORE Organic ([www.coreorganic.org](http://www.coreorganic.org)).

## Background

It is a challenge to organic farmers, millers and bakeries to fulfil consumer expectations of 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. Food processing technologies such as the post-harvest handling of the grain and flour processing are also key factors in producing bread of high nutritional value without contaminants. AGTEC-Org focuses on the optimization of agronomic practices and grain fractionation processes in order to obtain wheat and flour with improved nutritional value, health and sensory characteristics. The project is a transnational research project with partners from ISARA, ESA, INRA in France; FiBL and ART in Switzerland; BOKU in Austria and INRAN in Italy. Further information at: <http://agtec.coreportal.org>

## Objective

The overall objective of the AGTEC-Org project is to identify agronomic and food processing technologies that enhance the baking quality and the nutritional value of organic wheat and reduce mycotoxin contamination. Specific objectives are to:

- Evaluate the current practices for organic grain wheat production and flour-processing in Europe,
- Improve crop management strategies to enable bread-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 diverse climates and soil types.

The aim is to enhance the quality, relevance and utilisation of resources in European research in organic food and farming through coordination and collaboration.

## **Materials and methods**

Interactions between type of green manure and time of incorporation will be investigated at Askov Experimental Station in Denmark in the DK-5 experiment in the catalogue on Nordic LTEs (Petersen et al., 2008). In this LTE initiated on a sandy loam in 1981, three green manure treatments were included in 2003: ryegrass, grass-clover and none. Half of each plot is ploughed in late autumn; the other half is ploughed in spring. The standard crop in the LTE is spring barley. In the 2007/2008 growing season, winter wheat will be sown after the autumn ploughing and spring wheat after the spring ploughing. Grain of winter wheat and spring wheat will be sampled in 2008. The two wheat types will be tested for protein content, baking quality and *Fusarium* contamination.

## **References**

Petersen, J., Mattsson, L., Riley, H., Salo, T., Thorvaldsson, G. & Christensen, B.T. (2008). Long Continued Agricultural Soil Experiments: A Nordic Research Platform – An overview. Aarhus University, Faculty of Agricultural Sciences, DJF-report Plant Science no. 136, 20 pp.