



Annual Abstract

Project title and Acronym:	AGronomical and TEChnological methods to improve Organic wheat quality (AGTEC-Org)
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Period Covered:	August 1, 2008- December 31, 2009

Popular Description of project progress and summary of results (1-2 pages).

Project progress and events

The general aim of the AGTEC-Org project is to identify and develop agronomical and food processing technologies that enhance the baking quality and the nutritional value of organic wheat and reduce mycotoxin contamination.

The second project meeting took place in Zürich (Switzerland) on October 2 and 3, 2008. This meeting was mainly dedicated to assess the impact of agronomical techniques on grain production and quality value. The objectives of the meeting were to list the different ways to reinforce (i) the link between agronomists responsible for the field trials (WP2) and food technologist leading the assessment of grain quality and technological properties (WP4), (ii) the cooperation within each sub tasks inside WP2 and WP4, (iii) understanding and communication on the results from year 1. Results from the experiments on agronomical techniques (95 treatments from 2005-2007) were presented and discussed by the partners. The discussion was essentially centred on the combination of results from yield performance and agronomic conditions with results on grain quality, mycotoxin contamination and rheological properties.

A first synthesis of the results coming from the first year interviews on the organic wheat and flour production in the different countries was presented. A proposal for a collective scientific publication was suggested by the coordinator. The second day was dedicated on administrative questions (reporting, communication), publications and cooperation. Various ways of collaboration were considered (combination of partners implied in common sub-tasks, linking agronomical and technological aspects, etc.). Two scientific publications were planned for year 2: one coordinated by C David on *the organic wheat and flour survey* and one coordinated by G Hellou on *the ways of mixing legumes and wheat*.

During this second meeting, a common framework to describe experimental sites involved in the project was defined. It allows describing the field experiments for future communication (web site and leaflets). For all experimental sites, objectives, experimental factors, environmental conditions and field monitoring had been described. A new database was also set up during year 2 to combine each data provided by WP 2 in order to assess the impact of environmental conditions and experimental factors on the wheat performances and grain quality.

The second year was dedicated to replicate agronomic experiments. Different ways to insert legumes in the crop rotation were tested with green manure, undersowing systems with forage legumes and pea-wheat intercropping system. Therefore, various N management combining N fertilization and the insertion of legumes had been compared with long-term experimental trials in Switzerland, Austria and Denmark. Finally, the influence of soil management was considered, by comparing no-till, minimum tillage and traditional ploughing in different experiments in France and Switzerland. Yield performance, grain nutritional and technological properties and DON contamination had been assessed in the different experiments representing 167 treatments for year 2008-2009. Moreover, 60 standardised baking tests were also done to evaluate the incidence of the agronomical treatments.



New experiments lead by INRA Montpellier have been done to assess the incidence of post harvest treatments on flour properties. The incidence of milling techniques (stone or roller milling) and the milling yield (3 extractions rates between 75% to 85%) on flour characteristics was tested on two control treatments from the same cultivar (Orpic) differentiated by the protein level and the DON contamination (Table 1)

Table 1 : Grain Characteristics of the control treatments

Characteristics	Control	Control + 60 NU
1000 ktw (g. db.)	37.1	40.8
Hl mass (kg/hl)	72.3	75.3
Vitreousness (%)	4	10
Ash (% d.b.)	1.71	1.58
Protein (% db)	9.6	12.6
DON (ppb)	110	586

The technological properties of the flours were evaluated by means of rheological tests such as farinograph and alveograph analyses and Gluten Index. Moreover, a standardised baking test was also realised on all flours.

The data analysis from agronomical and post-harvest treatments is still on-process for future scientific publications and dissemination.

The progress of the AGTEC-Org was presented to the funding and management board of CORE Organic at the Roma conference organised June 2009.

The coordinator was also invited to present the project at the EU thematic platform *Plant for the future* Conference held October 2009 at Lisbon.

The third project meeting has been held in Montpellier (France) on October 1 and 2 2009. The general aim was to present and discuss results from WP1, WP2, WP3 but also WP4 and to organize the work on modelling for the WP5. The objectives of the meeting were mainly to improve the dissemination process including the revision of the website and the planning of scientific articles. The partners highlighted the need to develop different types of communication for AGTEC Org projects (leaflets, website, publications, etc.). Results from WP2 and WP4 were discussed in order to underline originality and relevance of the knowledge provided by the different experiments. A list of provisional scientific papers was defined, time schedule and leaders were also defined.

The WP5 is devoted to modelling work seeking to generalise results from experiments to enhance farm management strategies in other climates and soil types represented in Europe. First, 4 experimental sites from Denmark, France, Switzerland and Austria were selected to evaluate the AZODYN and FASSET models. Experimental data coming from these experiments were collected and formatted to be calibrated for the two models. First simulations will be realised in the next few months. A second step will be to use the model to draw some scenarios and simulate the incidence of N management on wheat performances in various weathers and soil conditions.

Project communication and administration

- The period covered by this report was characterised by regular communication between the group through e-mailing sent to the group where methodology was discussed and common documents were produced. The deputy coordinator engaged by ISARA had permanent contact with partners to follow deliverables.

- We have agreed on a common framework to describe the technical management of each experiment. Since then, all partners responsible of the different experimental sites produced each year the field description (objectives, material & methods, main results).



- At the end of year 2009, the project website <http://agtec.coreportal.org> was updated to communicate about the project and events. Website structure was slightly modified in order to be best fitted to the needs of the partners involved into the AGTEC-Org project.

Project publications and deliverables

A scientific paper coordinated by C David on the current practices for organic grain wheat production and flour-processing in the different countries, obtained by interviews and peer review was produced during 2009. This collective paper, discussed by the different contributors involved in the data collection, will be submitted primo 2010.

<p>References and links to papers/reports which have been published in the period:</p>	<p><i>Peer-review articles</i> David, C. and S. Joud (2008). Etat des lieux de la collecte du blé biologique panifiable en France. Industries des céréales. N°159 p.21-25. available in Organic E-prints.</p> <p><i>Communications</i> David, C. (2009). Agronomical and technological methods to improve organic wheat quality. Oral presentation to the Thematic platform Plant for the future Conference, Lisbon, October 5,6</p> <p><i>Thesis:</i></p> <p>Boissinot, F (2009). How to optimise the insertion of undersown forage legumes in organic wheat crop? (full version in French, Abstract available in English). ESA Angers. Thesis submitted on September 18, 2009 for the degree of Master in agronomy.</p> <p>Lefèvre, V (2009). Consequences of soil management on soil fertility (full version in French, Abstract available in English). ENITA Clermont. Thesis submitted on September 23, 2009 for the degree of Master in agronomy.</p> <p>Poitral, C (2009). Nitrogen management of organic wheat and consequences on grain yield and protein content. Crossed contribution of undersown forage legumes and spring organic fertilization. (full version in French, Abstract available in English). ENITA Bordeaux. Thesis submitted on September 28, 2009 for the degree of Master in agronomy.</p>
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