

Valorising European Research for Innovation in Agriculture and Forestry



VALERIE Stakeholder Trials:

Sampling for quality assessment and improvement for a wheat supply chain in Alessandria, Italy.

The problem

Developing local value-chains can offer a good solution for product valorisation and a safer way to manage the wheat trade. Nevertheless, local value chains need to pay close attention to product quality and the homogenous specification of the product, among all farmers. This is the case for the Sustainable wheat **Harmony** value-chain, trademarked from Mondelez International, that has been developing in Alessandria county since 2014. **Local farmers do not usually take part in an organised value-chain and the quality of their production is very variable.** Storage cooperatives collect different grain lots from farmers and must ensure good sorting based on a quality assessment. Knowing the quality before storage can be useful for them.

The proposed solution

Tools and networks to assess the grain quality before the harvest could help to identify in advance what type of grains the farmers will deliver and if they respected the guidelines of the supply chain. We aimed to set-up a pilot experience to test a methodology of sampling grains in the field **before the harvest** to inform both farmers and cooperatives about the batch quality.

Stakeholders

Stakeholders were asked to identify the main issues and knowledge gaps regarding wheat production during the first discussions of the project. This issue emerged as one of the most important for all members of the meeting: farmers, technicians, storage cooperatives and millers. Even if it does not deal with a specific technical issue or a knowledge gap, the trial topic comprises different aspects of logistics and organisation.



Aims and Method

This experimental activity should be considered a pilot experience (or farm demonstration) aiming to:

- Use a manual harvester to collect samples in the field before the harvest and the use of a portable grain tester to measure humidity and specific weight directly in the field.
- Validate the methodology of representative sampling in the field through the definition of the minimum significant numbers of subsamples.
- Validate the reliability of data collected before harvest and in post-harvest for different varieties.
- Analyse the data and understand what parameters can influence the quality of the grains.

Results



After two years of activity, we found that:

- The best time for assessment is a few days before the harvest, if no rainfall has occurred.
- At least 30 subsamples have to be taken to achieve a representative sample.
- The result obtained in pre-harvest is reliable and can be used to confirm the quality of the grain to farmers.

We also learned that:

- It is not possible to use this method in all fields of the supply chain especially if their dimensions are very big.
- Time during the harvest is very short and time between sampling and analysis needs to be as short as possible. It is best if the analysis can be performed in the field.
- In order to save time and improve logistics, this method can be used in some pilot-fields on the farm.
- Once the sample is taken, mycotoxin can be measured, if climate conditions highlight the risk of fungal disease.
- A sampling plan in the field can be defined by the cooperative in order to screen the quality of the grain (technological parameters and presence of mycotoxins). This can comprise pre-harvest and post-harvest sample collecting.





Overall stakeholder involvement and feedback

Stakeholders have been directly involved in the trial which took place in their fields. They were informed about the grain quality in their fields under contracts. In addition, we also sampled grain after the harvest and a large number of samples were analysed by the laboratory of the miller. Thanks to this activity and the requirements of the supply chain we have information about the fertilization, pesticide application, yield and grain quality. We studied the correlation of the field data with the quality of the product and we were able to provide personalised advice to every farmer in the supply chain.



Key findings

The key findings relate to the overall activity of quality assessment over the supply chain.

- Grain quality for bread quality is strongly influenced by crop techniques, such as fertilization and pesticide applications.
- We recommend fertilizing above a given threshold (130kg/ha of Nitrogen) and we set the requirement to treat the crop with fungicide and pesticide during earing stage.
- Grain with insufficient fertilization and treatments must be discarded.



Further reading

VALERIE trial leaflet: Evaluation of biostimulants in the bread wheat value-chain, Alessandria, Italy.

VALERIE trial leaflet: Fusarium Head Blight Sensitivity of bread wheat variety in Alessandria, Italy.

Acknowledgements

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