

## Valorising European Research for Innovation in Agriculture and Forestry



### VALERIE Stakeholder Trials:

## Fusarium Head Blight Sensitivity of bread wheat variety in Alessandria, Italy

#### The problem

Choosing the best varieties for a value-chain requires a lot of testing and must include the key factors, such as productivity, adaptability and pathogen sensitivity, especially to Fusarium Head Blight (FHB). While the two former parameters are already assessed by local trialling activity sponsored by seed companies, the latter is not assessed by a specific experiment. Unlike other countries, there are no national research organisations performing this activity. At the same time, seed companies launch new wheat varieties every September, with new characteristics that are different from other vegetal materials. Therefore, trials need to be repeated almost every two or three years and references need to be updated very quickly. It is important for farmers to know the FHB sensitivity of the varieties of the Harmony value-chain<sup>1</sup> to know which to select, based on previous crop and climate conditions.

#### The proposed solution

The solution proposed in the trial consists of a field test in the Cadir Lab experimental fields, in order to compare the FHB sensitivity of the seven varieties allowed in the Harmony value-chain contract. In the trial we used untreated seeds to also identify the sensitivity of other fungal pathogens (leaf blotch and yellow rust). We also focused on the mycotoxin content (Deoxinivalenol) of the grain following the EU standards for food contaminants for human health.

#### Stakeholders

The stakeholders involved in this trial belong to the whole Harmony supply chain, starting from farmers to the miller. Farmers are interested in this trial since they can obtain some information on pathogen sensitivity of the variety they are growing and with this they can decide whether to avoid one pesticide application (during early spring). Storage cooperatives are interested as they are selling certified seeds, plant protection products and they store and mix the grain lots, which must be mycotoxin free.

<sup>1</sup> The Sustainable wheat Harmony value-chain, trademarked from Mondelez International, that has been developing in Alessandria county since 2014.

### Aims and Method

The trial follows a comparative test set up. It comprised 7 bread wheat varieties (Altamira, Solehio, Graindor, Calabro, Moisson, Oregrain and Rubisko) in plots measuring 1.5m of width and 30m of length, replicated 3 times in sequence, one next to the other. Each plot was divided into 4 subplots, 6 metres long, to apply 4 different treatments with the experimental sprayer:

- Untreated or Blank, with no fungicide application
- One yearly treatment fungicide application with Strobilurine molecules (Azoxystrobin)
- One late treatment fungicide with triazole molecules (Tebuconazolo)
- Complete fungicide strategy combining the early and late treatment



*Drone picture of the trial*

The trial consisted a total of 84 subplots, in which we performed two types of assessments:

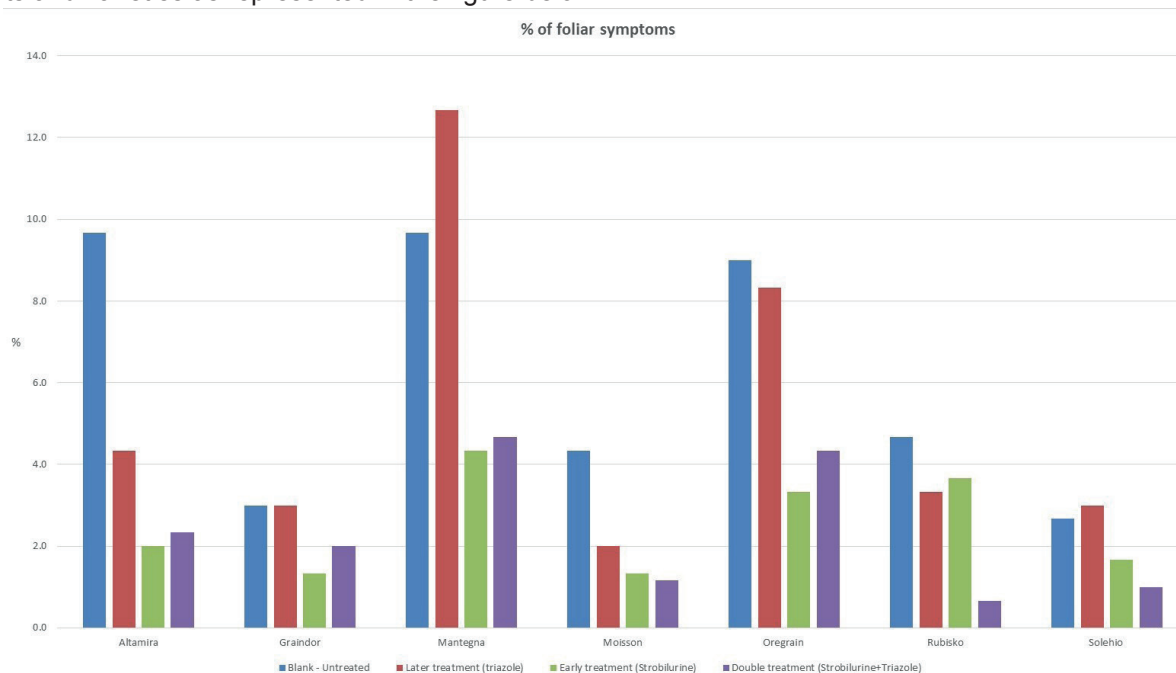
- Visual evaluation of pathogen symptoms;
- Test ELISA quantification of Deoxinivalenol content in grains performed by the Laboratory of the University of Turin.

We did not assess the yield and other qualitative parameters of the trial.



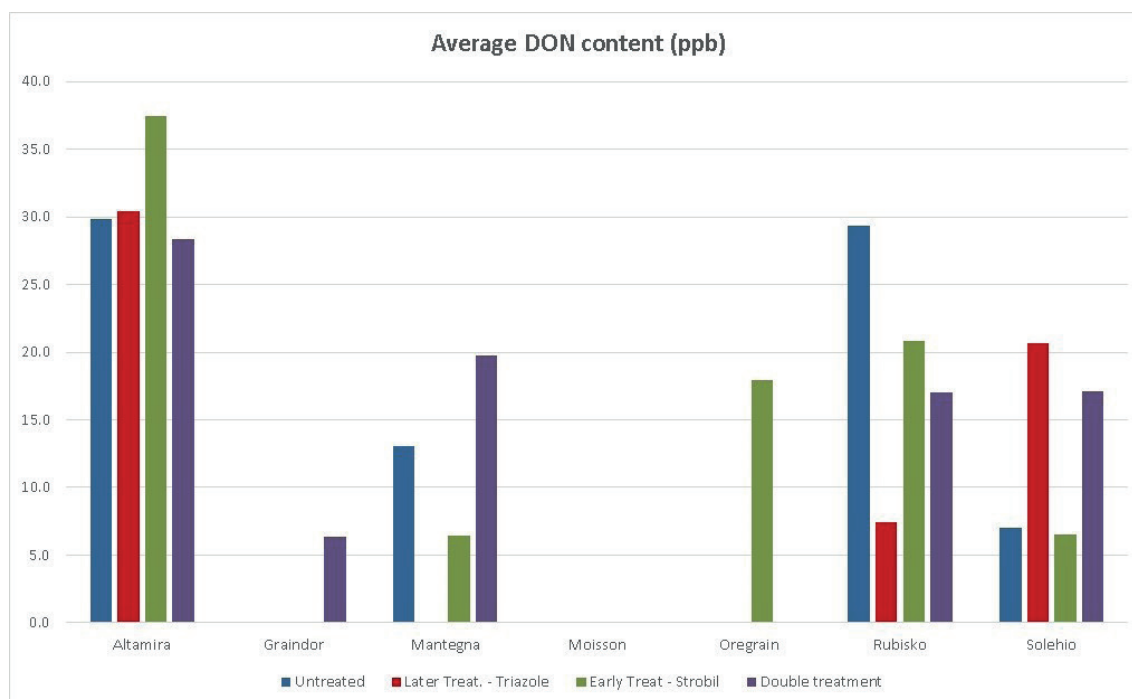
## Results

Due to very dry conditions, pathogen symptoms were very rare and we could see only a slight difference between the treatments and varieties as represented in the figure below:



As visible in the figure, values (% foliar symptoms) are very low, compared to an average situation. Nevertheless, the sensitivity of varieties for foliar pathogens is quite clear.

The situation of mycotoxin content is shown in the figure below.



From the assessed data, we can see that the variety Altamira has higher than average DON content values, as well as Rubisko. Nevertheless, assessed values are very low and do not have any influence on the sanitary quality of the grains where the legal threshold of DON in soft wheat is below 1,250 ppb (ug/kg).

In this trial, the average assessed value in the grain is about 21 ppb, which is an excellent result, 50 times lower than the threshold.



## Overall stakeholder involvement and feedback

Stakeholders visited the trial during May 2017 and saw the low differences in sensitivity between each variety. In order to communicate the trial set-up and the first results, a poster was prepared and presented during the demo-day. The assessed data are useful for the supply-chain because they help farmers to have a good reference of the FHB of the varieties and give a clear picture of the DON accumulation in the area.

## Key findings

The main findings of this trial are:

- Our regional climate is not favourable for FHB linked mycotoxins (such as DON) for the most common varieties of Harmony value-chain;
- The selected varieties for the trial can accumulate very low concentrations of mycotoxins thanks to their low genetic sensitivity to FHB infection;
- A good fungicide strategy helps grow a healthier wheat crop and without mycotoxin infection



## Further reading

VALERIE trial leaflet: Sampling for quality assessment and improvement for a wheat supply chain in Alessandria, Italy

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

## Acknowledgements

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