

Final Project Summary

Project title	Fusarium mycotoxins in UK oat varieties – monitoring in preparation for legislation		
Project number	RD-2008-3574	Final Project Report	PR547
Start date	September 2012	End date	March 2015
AHDB Cereals & Oilseeds funding	£17,805	Total cost	£17,805

What was the challenge/demand for the work?

The European Commission will consider legislation for the mycotoxins, HT2 and T2 in 2015. If legislative limits are set then it will be necessary for growers to reduce the levels of these mycotoxins in harvested cereal grains intended for human consumption. Previous studies have identified that high concentrations of these mycotoxins can occur in harvested oat grains in the UK and that one of the limited mechanisms to reduce the levels of HT2 and T2 is through the use of more resistant varieties.

How did the project address this?

The aim of this project was to monitor the concentration of the fusarium mycotoxins HT2 and T2 in oat samples collected from the AHDB Recommended List trials from 2012, 2013 and 2014.

What outputs has the project delivered?

Results showed that the current indicative level of 1000 ppb for HT2 and T2 combined (HT2+T2) was exceeded in one of 14 spring oat trials and in nine of the 18 winter oat trials conducted between 2012 and 2014. The trends were similar to previously reported results with spring oats routinely lower than winter oats, although some high levels occurred in one spring oat trial in 2014. For spring oats, there was little difference between varieties, whilst for winter oats they had a broader and higher range of HT2+T2 levels compared to spring oat trials. For winter oats, the short-strawed variety, Balado had consistently higher HT2+T2 levels compared to other varieties and naked varieties were consistently low. Several new varieties were at the low end of the HT2+T2 range, with Maestro having the lowest mean of 218 ppb HT2+T2, which was ca. four-fold lower than the mean for Balado.

The method adopted within this project to normalise the dataset by using the varietal value as a percentage of the average of standard “control” varieties is used for other Recommended List parameters and allows for varieties that are only present in a limited number of years to be compared to varieties in trial in other years.

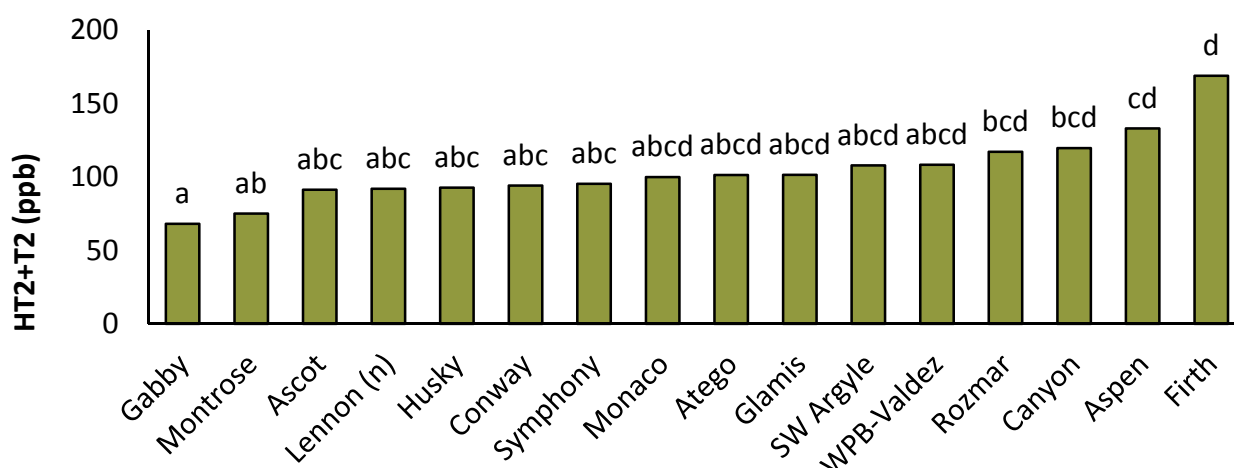
This method has allowed the host resistance against HT2+T2 producing *Fusarium* species of new oat varieties entering the Recommended List to be determined and ensure accurate and complete information on the comparative resistance of UK Recommended List oat varieties is available if or

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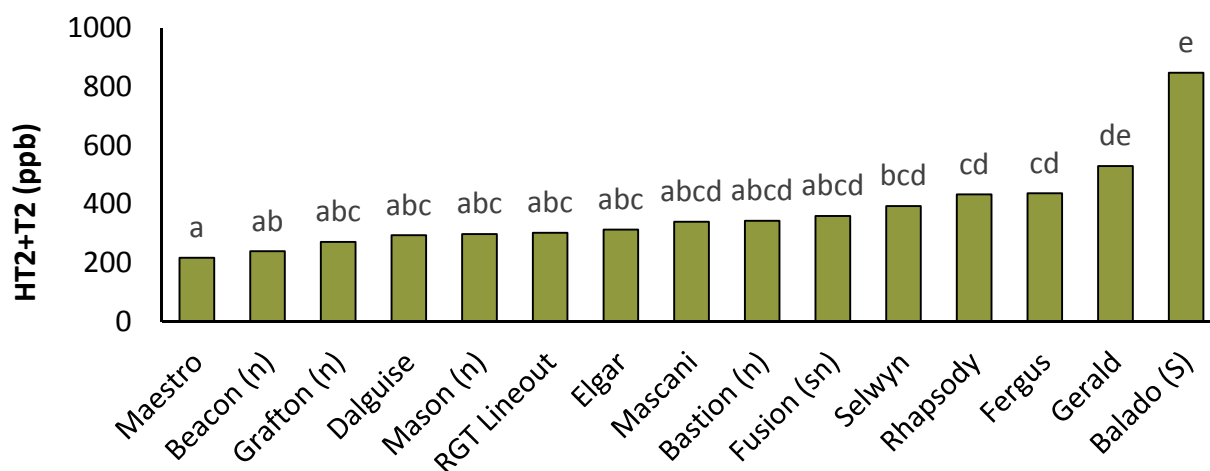
Final Project Summary

when legislation is set. Figures 1 and 2 show the overall results for spring and winter oat varieties from 2012 to 2014.



Spring Oats 2012-2014

Figure 1. Back-transformed mean HT2+T2 concentration of spring oat varieties from the combined analysis of the AHDB Recommended List trials in 2012, 2013 and 2014. Varieties with the same letter are not significantly different (LSD; $p=0.05$).



Winter Oats 2012-2014

Figure 2. Back-transformed mean HT2+T2 concentration of winter oat varieties from the combined analysis of the AHDB Recommended List trials in 2012, 2013 and 2014. Varieties with the same letter are not significantly different (LSD; $p=0.05$).

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Final Project Summary

Who will benefit from this project and why?

The method adopted within this project to normalise the dataset by using the varietal value as a percentage of the average of standard “control” varieties is used for other RL parameters and allows for varieties that are only present in a limited number of years to be compared to varieties in trial in other years. This will also allow long-term trends to be monitored. Such a method could also be used to determine a fusarium resistance score for oats and to set a threshold of acceptance for fusarium resistance for new varieties to be included on the Recommended List if deemed necessary.

If the challenge has not been specifically met, state why and how this could be overcome

The challenge is dependent on European legislation. If legislation is set, then there will be the requirement for continued monitoring of oat RL trials so that the fusarium resistance of new varieties can be determined and reported.

Lead partner	Harper Adams University
Scientific partners	None
Industry partners	None
Government sponsor	None

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