

Fusarium head blight in barley: identification of the causal *Fusarium* species in Europe and testing of resistance using artificial inoculation

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Abstract

Fusarium head blight (FHB) in barley can be caused by different *Fusarium* species producing various mycotoxins. Breeding for resistance requires 1) resistance sources and 2) a reliable screening technique. We wanted to investigate FHB resistance of a barley nursery as a basis for future breeding programs. We also compared different inoculation methods and the resistance to DON (deoxynivalenol)/NIV (nivalenol) and T2/HT2-toxin producing *Fusarium* species. We started with the isolation, purification and identification of *Fusarium* isolates from infected barley kernels originating from France, Germany and the UK. In total 63 isolates were identified belonging to 8 different *Fusarium* species. Most frequently detected isolates in Germany was *F. poae*, in France *F. cerealis* and *F. graminearum* and in the UK *F. avenaceum*. FHB resistance was tested with spray inoculation and with the

kernel spawn method. Five different *Fusarium* species were used for inoculation. Scored was disease incidence and severity. ANOVA analyses showed highly significant differences between genotypes and treatments. Resistance data obtained with both inoculation techniques and with most *Fusarium* species were significantly related ($r = 0.57-0.81$). Correlation coefficients between disease incidence and severity data were highly significant ($r = 0.93-0.99$). We could not find any evidence for specific resistance against a particular type of toxin producer.

Keywords

Fusarium, *Hordeum vulgare*, mycotoxin, resistance

Acknowledgments

This work was funded by Syngenta Seeds Ltd., UK

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