Screening for Resistance to Deoxynivalenol in Wheat

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Our goal was to screen for resistance to deoxynivalenol (DON) in wheat. A population of 127 genotypes was tested during two seasons. Included were lines with a high resistance level towards Fusarium head blight (FHB), breeding material and susceptible checks. The wheat lines were evaluated for DON resistance (DONR) after application of the mycotoxin in the flowering ear as described by LEMMENS et al. (2005). The same genotypes were investigated for FHB resistance after spray inoculation. Disease incidence (Type I resistance) and disease severity (Type I+II) were assessed. Resistance to fungal spread (Type II) was investigated using single spikelet inoculation. In selected lines concentrations of DON and DON-3-glucoside were determined.

Application of DON in the ear resulted in symptoms resembling Fusarium head blight (bleaching of spikelets). ANOVA analyses showed highly significant differences in DONR between the wheat lines. 'Sumai3', 'Nobeokabozu' and their derivatives expressed high DONR in the ear. 'Frontana' reacted very sensitive. DONR was significantly correlated with Type II resistance. DON-3-glucoside was detected after DON application in the ears.

Literatur

LEMMENS, M., U. SCHOLZ, F. BERTHILLER, C. DALL'ASTA, A. KOUTNIK, R. SCHUHMACHER, G. ADAM, H. BUERSTMAYR, A. MESTERHAZY, R. KRSKA and P. RUCKENBAUER, 2005: The ability to detoxify the mycotoxin deoxynivalenol co-localizes with a major QTL for Fusarium head blight resistance in wheat. MPMI 18, 1318-1324.

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