

Development of methods for bunt resistance breeding for organic farming

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Introduction

Two bunt diseases are associated with wheat in Austria: common bunt (*Tilletia caries*) and dwarf bunt (*T. controversa*). Bunt can be controlled by chemical seed treatments but due to the expansion of organic farming, there is renewed interest in bunt diseases and their management without synthetic fungicidal treatments (EIBEL et al., 2005). One way of eliminating or reducing the disease is the cultivation of resistant varieties (FISCHER, 2002). This study was designed to assess resistance to *T. caries* and *T. controversa* for selected genotypes in field trials under organic farming conditions.

Materials and Methods

Tilletia caries

An international assortment consisting of 98 resistant and susceptible winter wheat genotypes including the Bt-differential lines was evaluated for resistance to *T. caries* in one field experiment with 6 replications. The seeds were artificially inoculated with 1g teliospores per 100 g seeds before sowing.

Tilletia controversa

Resistance against *T. controversa* was studied on 31 winter wheat genotypes in

one experiment with three replications. Plots consisted of double rows of 2.5 m length which were spray inoculated with a teliospore suspension twice. The final spore concentration used for inoculations was 4.4g teliospores/L. Disease severity for both bunts was estimated in percent infected heads per plot.

Results and Discussion

Screening of winter wheat germplasm for resistance to *T. caries* resulted in a broad range in variation from as low as 0.0 percentage of diseased spikes up to 67.5 percentage of diseased spikes for the cultivar WW_BIO_225. For *T. controversa* disease severity varied between 0.0 to 85.3 percent diseased spikes. Despite that resistance to *T. caries* and *T. controversa* is reported to be regulated by the same resistance genes in wheat (GOATES, 1996) only few genotypes resistant to *T. caries* were found as resistant to *T. controversa* in our trials. All tested lines which were resistant to *T. controversa* showed also resistance to *T. caries*, but not *vice versa*.

References

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