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Methods for fusarium head blight field screening used at Embrapa, Brazil

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Fusarium Head Blight (FHB) or scab is considered one of the most important diseases in triticale in the southern region of Brazil. This work reports the methods used to evaluate FHB under field conditions, at 'Embrapa Trigo', Brazil. The first method uses the evaluation based on the percent of tombstone kernels infected at ripening. The second method uses at full flowering, the central floret of spikes that was inoculated with a suspension containing propagules of *F. graminearum*. The disease severity was evaluated at the soft dough stage.

Introduction

Triticale (*X Triticosecale* Wittmack) is an important winter season crop in southern Brazil. The area sown to triticale has stabilized near 130,000 hectares in the last three years. FHB induced by *Gibberella zeae* (*Fusarium graminearum* Schwabe (Sch.) Petch.), is considered one of the most important diseases in the region. Heavy rainfall and air temperature from 20 to 25ºC during flowering and maturation are favorable to FHB. The objective of this work was to report the methods used to evaluate FHB under field conditions, genotypes of triticale at 'Embrapa Trigo', Brazil.

Material and Methods

For the first method, one-row, 0.40 m apart and 2.0 m longs plot were seeded to each genotype. The space between rows was 0.80 m alternately to every fourth plot in order to set the irrigation system. Foliar diseases control with fungicide was used until the booting stage. To induce the natural infection, wheat grains with *G. zeae* perithecia were spread over the ground after the inflorescence emergence and the experimental area was submitted to daily fog irrigation for five minutes every 30 minutes, except on rainy days. A hundred spikes sample at ripening stage was collected from each plot (Lima, 2000). The dry spikes were threshed in a stationary electric thresher, adjusting the air entrance. The excess of straw was removed with a mechanical puffer. Representative subsample with a thousand kernels was used to calculate the percent of tombstone kernels infected and to evaluate genotype reaction.

For the second method, three sowing periods were used to screen the genotypes. At full flowering, the central floret of 30 spikes in each plot was inoculated with 0.02 mL of a suspension containing $5x10^5$ propagules of *F. graminearum*. At the soft dough stage the disease severity was evaluated using the following scale: 10 = disease did not spread beyond the infected spikelet; 30 = disease spread to no more than three spikelets; 50 = disease spread to less than half of the spike; 70 = disease spread to less than three quarters of the spike; and 90 = disease spread all over the spike and to the peduncle (Baier and

Piccinini, 1998). The disease indexes were represented by averaging the scores over sowing periods.

Results and Discussion

Since 2005, the first method has been used to evaluate FHB on triticale in Brazil. The irrigation system is constituted by water reservoir, 5 HP pump, aluminum pipes of 50 mm of diameter and flexible hoses with micropores. The components can vary with the water availability and pressure and the experimental area size. Five minutes of irrigation at every 30 minutes keep the spikes with free water and associated with the pathogen distribution, let the disease develop and enhances genotype evaluation even in years with inadequate natural conditions.

The second method has been used since the eighties. The highest disease index was used to rank the genotypes to FHB.

References

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