

Wheat in a Global Environment

6th

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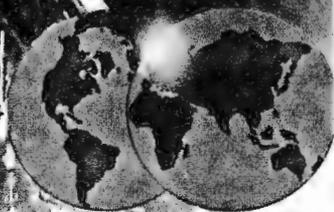
ABSTRACTS

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SYNTHETIC HEXAPLOIDS: OFFERING NEW SOURCES OF RESISTANCE AGAINST CROWN ROT (*FUSARIUM GRAMINEARUM*- GROUP 1) AND COMMON ROOT ROT (*BIPOLARIS SOROKINANA*) IN WHEAT

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Root rots caused by *Fusarium graminearum* and *Bipolaris sorokinana* are common and are implicated in causing significant yield losses of up to 50% on wheat. They are particularly important in marginal environments of low rainfall and poor soil nutrition, such as large regions in West Asia and North Africa. CIMMYT has begun a new program in screening and breeding resistance for these soilborne pathogens. These pathogens are difficult to work with as they are soilborne and cannot be easily screened in the field, hence a laboratory/field breeding strategy has been established. Select groups of germplasm have been screened. In particular the synthetics (*T.turgidum/Ae.tauschii*; $2n=6x=42$, AABBDD) have been emphasised as they provide a wide array of resistances to a range of other biotic stresses including head scab (*Fusarium graminearum* group 2, types 1 to 4), *Septoria tritici* and *Helminthosporium sativum*.

In controlled greenhouse conditions 46 synthetic derivatives (synthetic wheats crossed with improved bread wheats) were screened against both soilborne pathogens. A randomized complete block design with eight replicates per genotype was used. The plants were grown in open ended electrical conduit tubes (12.5 cm high x 2.5 cm wide) in a large tray of sterile soil. Plants were inoculated one week after planting with a prepared cultured oat seed inoculum (initially derived from monosporic cultures of these pathogens) which was applied above pre-germinated sterile seeds (one per tube) and covered with soil. After one month the plants were visually scored for lesion development (on roots, shoots and coleoptiles) and data analyzed using known resistant and susceptible checks to identify promising new lines.

To date it appears that certain synthetic hexaploid derivatives are potential sources of resistance to the root pathogens studied. Three derivatives indicated resistance as good as currently available: SABUF/3/BCN//CETA/*Ae.tauschii*(895) against both crown rot and common root rot. ALTAR84/*Ae.tauschii*(224)//YACO/6/CROC1/*Ae. Tauschii* (205)/5/BR12*3/4/... 224) for crown rot and MAYOOR/TKSN1081/*Ae. tauschii*(222) for common root rot. Interestingly these three lines all offer good resistance to head scab, perhaps inferring some association between the different *Fusarium* pathogens (foliar and root). It is essential that these results are confirmed in the field to verify their resistance under those conditions and in the adult plant stage. Hence field tests are currently being conducted.