Use of DNA Markers in Breeding for Bunt Resistance at the National Agricultural Research and Development Institute Fundulea, Romania

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Abstract: Breeding high-yielding bunt resistant wheat cultivars faces many difficulties related to: (1) The poor agronomic performance of most known sources of resistance. Our data show that, even after several cycles of crossing with high-yielding cultivars, the association of bunt resistance with some unfavourable traits remains difficult to break; (2) The incomplete expressivity of susceptibility alleles. Even under artificial inoculation, susceptible genotypes are not 100% diseased, and this creates difficulties in selection for resistance; (3) The need to pyramid genes giving complete resistance for achieving durability. Our work, aiming at the use of molecular markers for alleviating these problems, has been directed towards: (1) Use of already published marker for the gene *Bt10* to understand the resistance of breeding lines obtained by crossing with PI178383 (a *Bt9* + *Bt10* carrier); (2) Work for identifying markers for the gene *Bt8*. A set of 23 randomly extracted lines from the cross F 676T2-1 (Yala 305/2*Aura//2* Rapid – *Bt-8* resistant) × Delabrad was phenotyped for bunt resistance, during 2 years. Resistance and susceptible lines have been analyzed with 56 primers. Preliminary results will be presented; (3) Preliminary identification of DNA polymorphism, possibly associated with bunt resistance genes *Bt11*, *Bt12*, *Bt5*, based on a comparison between resistance lines selected after several cycles of crossing and the respective susceptible parents. Results obtained so far will be used for a detailed analysis in specially built genetic population.

Keywords: wheat breeding; molecular markers; DNA polymorphism; *Bt* genes