Genetic Analysis of Quantitative traits in Bread Wheat under Normal and Moisture Stress Conditions

S. S. Moosavi, B. Y. Samadi, A. Zali and M. R. Ghannadha

Agriculture Faculty, University of Tehran, Karaj, Iran, e-mail: ssmoosavu@ut.ac.ir

Abstract: Several genetic parameters such as average degree of dominance, proportion and distribution of dominant and recessive alleles in all parents and dominance direction were evaluated in 10 cultivars of bread wheat, using a half diallel design. All 10 cultivars were intercrossed in the first year and these parents and their hybrids were separately planted in a randomized complete block design under normal and moisture stress conditions in the second year. Results of analysis of variance in normal moisture condition showed that there is genetic variation among genotypes for most of the traits except for tiller and fertile tiller number, awn length and 50% heading date. In stress condition there was no significant difference for awn length, 50% heading date, dry weight of root and flag leaf area. Results showed that, there was over-dominance for number of spikelet per spike, number of kernel per spike, 1000-kernel weight, biomass, weight grain yield and harvest index, complete dominance for stomata number per unit of leaf area, and partial dominance for peduncle length, spike length and dry weight of root in normal moisture condition. Also the result in normal moisture condition showed that all traits other than stomate density were controlled by dominant alleles; stomate density was controlled by recessive alleles. In stress condition there were over dominance effect for number of spikelets per spike, spike length and number of kernels per spike, complete dominance for stomate density and partial dominance for peduncle length, 1000-kernel weight, biomass, weight grain yield and harvest index. In stress conditions, all traits were controlled by dominant alleles except 1000- kernel weight which was controlled by recessive alleles.