Genetic behaviour for plant capacity to produce chlorophyll in wheat (Triticum aestivum) under drought stress.

ABSTRACT

The study was conducted with the objective of identifying parents to be used in a breeding program to develop high chlorophyll varieties. Combining ability, heterosis and inheritance of chlorophyll content, including chlorophyll a, chlorophyll b and total chlorophyll (a+b), were investigated in bread wheat obtained from half-diallel crossings among eight parental lines.Cultivars with names of Irena/Babax//Pastor, S-78-11, Tajan, Chamran, Moghan3, Hamoon, Veery/Nacozari and Hirmand have different capacities to produce chlorophyll. Eight parental genotypes and their resulting 28 F1s were grown in three replications of randomised complete block design. Drought stress was performed with irrigation at 75% soil moisture depletion, the data collected were subjected to analysis of variance and combining abilities were carried out according to Griffing's method 2, model 1. The study was conducted with the objective of identifying parents to be used in a breeding program to develop high chlorophyll varieties. General combining ability and specific combining ability effects were significant for traits' chlorophyll content, chlorophyll a, chlorophyll b and total chlorophyll; however, non-additive gene effects were predominant over additive effects. The line Irena/Babax//Pastor transmitted high chlorophyll content based on general combining ability to progenies that were made with it. Broad-sense heritabilities were high and strict-sense heritabilities were low for the traits, confirming the importance of non-additive gene effects. This could bring definition of reduced selection efficiency for these mentioned traits.

Keyword: Chlorophyll; Combining ability; Dominance; Gene action; Heritability.