

HERITABILITY, CORRELATION AND GENETIC GAINS OBTAINED IN THE POPULATIONS OF EGE 88 AND KUNDURU DURUM WHEATS IRRADIATED WITH GAMMA RAYS

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ABSTRACT

The objective of this study was to study the heritability, correlations and the genetic gains for grain yield and protein content in the populations of Ege 88 and Kunduru cultivars irradiated with different doses of gamma rays. The experiment was conducted over three years (from 1997 to 2000) in Bornova-Izmir, Turkey. The seeds of the two cultivars were irradiated by 0 (control), 5, 10, 15, 20 and 25 krad doses of gamma rays just before sowing in 1997. In 1997-98 and 1998-99 growing seasons, the irradiated seeds were grown in a randomized complete block design (RCBD) with two replications. In 1998-99, 150 spikes of wheat were taken from each plot, bulked and grown in RCBD with two reps in 1999-2000. In each generation, plant height (cm), heading date (days), thousand kernel weight (g) and grain yield/plot (g) were measured and protein content (%) was determined. Using the data, the analysis of variance, phenotypic and genotypic variances, heritabilities and genetic gains and correlation analysis were performed over three years.

Ege 88 populations had higher grain yields but lower protein contents than those of Kunduru. None of the Ege 88 populations had gave higher grain yield than the control over three years. However, this situation was reversed in the Kunduru populations where the control population had only higher yield (1300 g/plot) than the mean (1215 g/plot) of the population irradiated with 25 krad gamma rays. Genetic gains computed based on population means for grain yield/plot and protein content were 513 g and 2.87 % for the Kunduru, and 872 g and 2.54 % for the Ege 88 populations, respectively. Grain yield had positive significant correlations ($r=0.66^{**}$ and $r=0.67^{**}$) with days to heading and plant height for Kunduru where these correlations were found to be negative for Ege 88 ($r=-0.64^{**}$ and $r=-0.36^{*}$, respectively). Protein content had negative significant correlations with heading date, plant height and grain yield ($r = -0.67^{**}$, $r=-0.53^{**}$ and $r=-0.63^{**}$, respectively). Genetic gains computed based on population means for grain yield (g) and protein content (%) were 513 g/plot and 2.87 % for Kunduru, and 872 g and 2.55 (%) for Ege 88 populations, respectively.

Key words: Durum wheats, protein content, genotypic variances