

**HETEROISIS, GENERAL AND SPECIFIC COMBINING ABILITY ESTIMATES  
AT F<sub>1</sub> And F<sub>2</sub> GENERATIONS OF A 8 X 8 DIALLEL CROSS POPULATION  
OF BARLEY**

Necdet Budak

*Ege University, Faculty of Agriculture, Dept. of Field Crops., Bornova-Izmir-Turkey*

**ABSTRACT**

This study was carried out over three growing seasons (from 1997 to 2000) under Bornova-Izmir ecological conditions. Eight parents (Schooner, Prisma, Nomad, Alexis, Ariel, Vulga, Kaya and Quantum-109)-diallel crosses without reciprocals were made in the 1997-98 growing season. Eight parents and 28 F<sub>1</sub> crosses obtained were grown at single progeny rows with three replications in the 1998-99 growing season. In 1999-2000 growing season, the parents and F<sub>2</sub>'s were grown in two reps in which the planting was done by machine in a plot consisting of six rows, 5 m long and 20 cm apart. Days to heading (days), plant height (cm), thousand kernel weight (g) and grain yield/plot (g) were measured and the protein content (%) was determined in both F<sub>1</sub> and F<sub>2</sub> generations.

The preliminary analyses of variance indicated that significant differences among genotypes were present for all the traits at F<sub>2</sub> but except the heading date and protein content at F<sub>1</sub> generation. Analysis of variance for general and specific combining abilities (GCA and SCA) at F<sub>1</sub> and F<sub>2</sub> generation showed that GCA and SCA were significant for all traits at F<sub>2</sub>. GCA were significant for grain yield, plant height and thousand kernel weight whereas SCA was only significant for plant height at F<sub>1</sub> generation. Highly significant positive correlations between GCA and SCA variances obtained from F<sub>1</sub> and F<sub>2</sub> indicated that the F<sub>2</sub> generation could effectively be used for assessing the GCA and SCA.

Kaya and Schoorer were found to be good general combiners for the protein content. Schoorer x Vulga (11 % and 10 %), Prisma x Alexis (10 % and 11 %), Alexis x Ariel (10 % and 12 %), Alexis x Vulga (9 % and 11 %) and Ariel x Vulga (10 % and 12 %) having always relatively low protein contents at F<sub>1</sub> and F<sub>2</sub> were considered as desirable crosses for beer industry. Kaya x Prisma (16 %), Schoorer x Alexis (15 %) and Prisma x Ariel (15 %) having high protein content at F<sub>2</sub> generation could be recommended for animal feeding.

**Key words:** Barley, heterosis, general and specific combining ability, grain yield and protein content