Oral Presentations

Combining ability among maize inbred lines for tolerance to low phosphorus content in the soil

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The best twelve out of a group of 200 maize lines belonging to the Embrapa Maize Breeding Program for drought tolerance and low phosphorus efficiency were selected for this study. In 2005, F1 hybrids were produced in a diallel scheme without reciprocals. The 66 F1 hybrids, the 12 parental lines, and three commercial hybrids used as testers were evaluated in soil conditions at two phosphorus (P) levels: low P (2 ppm) and high P (20 ppm). The experiment consisted of a randomized block design with two replications. Spacing was 80 cm between rows e 20 cm between plants within a row. Data were collected for flowering date (FD), plant height (PH), ear height (EH), % plant lodging (PL), % ear rot (ER), prolificacy (PROL), and grain yield (GY). General combining ability (GCA) estimates were statistically significant (P<0.01) only for the traits FD, PL, ER, and GY, and specific combining ability (SCA) estimates were significant (P<0,01) and (P<0,05) for the traits FD, EH, PH, ER, GY and PL, PROL, respectively. The ratio between additive and non-additive genenetic effects (GCA/SCA) indicated that a larger part of the total genetic variation was always due to SCA than to GCA for the traits PH, EH, PROL and EY, with a predominance of non-additive effects in the crosses. Considering performance, lines L 5680027 and L 5680017 presented the highest estimated Gi values among the 12 lines. Line 5680027 presented the highest Gi estimate in the high P environment, while line L 5680017 had de highest Gi estimate in low P environment. The predominance of non-additive effects for the most important traits that were studied suggested that crosses might be selected on the basis of their SCA.