Heterosis Prediction Based on Genetic Distance Using DNA Molecular Data in Tropical and Subtropical Maize Germplasm. (C01-urrea151500-Poster)

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Abstract:

CIMMYT's tropical and subtropical germplasm has a broad genetic-based. The objective of this research is to predict F1 heterosis using RFLP data. We considered a group of 60 CIMMYT maize lines to identify the divergent crosses based on genetic distance (GD). GD was calculated using Roger's distance provided by 28 RFLP identifying 32 loci. Two single-cross hybrid trials in white and yellow grain types were grown in 4 Mexican locations during 2001. For the white hybrid trial GD ranged from 0.14 to 0.76 with a mean of 0.59, and yield ranged from 3.3 to 12.0 ton/ha with a mean of 9.2 ton/ha. For the yellow hybrid trial GD range from 0.14 to 0.72 with a mean of 0.56 and yield from 0.7 to 10.3 ton/ha with a mean of 7.1 ton/ha. Correlation of GD based on RFLP data with F1 yield heterosis was significant (r= 0.70) when combined for all crosses in white grain type. For yellow grain type the correlation was low and not significant (r= 0.21). Based on these results hybrid combinations with GD less than 0.5 between lines from different heterotic groups in white hybrids can be avoided. In case of yellow hybrids the prediction based on GD was not conclusive enough to make any recommendation.

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Presentation Information:

Presentation Date: Monday, November 11, 2002

Presentation Time: 4:00-6:00 pm
Poster Board Number: 1012

Keywords: