

Prediction of maize double-cross hybrids using the best linear unbiased prediction with microsatellite marker information

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ABSTRACT. We examined the usefulness of the best linear unbiased prediction associated with molecular markers for prediction of untested maize double-cross hybrids. Ten single-cross hybrids from different commercial backgrounds were crossed using a complete diallel design. These 10 single-cross hybrids were genotyped with 20 microsatellite markers. The best linear unbiased prediction associated with microsatellite information gave relatively good prediction ability of the double-cross hybrid performance, with correlations between observed phenotypic values and genotypic prediction values varying from 0.27 to 0.54. Taking into account the predictions of specific combining ability, the correlation between observed and predicted specific combining ability varied from 0.50 to 0.88. Based on these results, we infer that it is feasible to predict maize double-cross hybrids with different unbalance degrees without including any prior information about parental inbreed lines or single-cross hybrid performance.

Key words: BLUP; Similarity-by-descent; Specific combining ability; Molecular markers