Abstract

An alternative to the field method for generating recommendations of management in Mexico is the use of modular, dynamic models of crop growth, which are additives in its conception and ignore the genotype. The objective in this study was: 1) to prove that the recommendations for the use of maize crop cultivation can not be used for all genotypes of maize available for this and 2) data from three maize field experiments conducted in southeastern Mexico, San Gregorio and Villa Flores, Chiapas and Piedras Negras, Veracruz, was analyzed in order to evaluate the genotype x crop management interactions on grain yield ($\bar{y}_g$). Twentyfive treatments of a Rotable, Central Composite Design for N, P, K and population stand were assigned to main plots of a split plot design replicated twice. Small plots were assigned to three or four modern maize hybrids that had similar agronomic performance but different genetic background. Grain yield ($\bar{y}_g$) was fitted by regression with an additive model that ignored maize genotype and an interactive quadratic model for management factors and maize hybrids, in the last model dummy variables valued 0 or 1 accounted for maize hybrids. Results reflected genotype by management interaction that varied significantly among hybrids and locations in the interactive model. The interactive model consistently improved 30% to 71% the determination coefficient ($R^2$) of grain yield as compared to the additive model.

Keywords

Dynamic models, modern maize hybrids, quadratic interactive model, quadratic additive model.