



XIII SIGM

International symposium on
genetics and breeding

SELECTION OF THREE-WAY CROSS HYBRIDS OF TROPICAL MAIZE USING HARMONIC MEAN ACROSS TROPICAL ENVIRONMENTS IN BRAZIL

XIII International Symposium on Genetics and Breeding, 13ª edição, de 25/10/2022 a 27/10/2022
ISBN dos Anais: 978-65-5465-014-4

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RESUMO

The differential performance of genotypes across environments is an important factor in the selection for a group of environments. Thus, statistical methods must infer about the performance of genotypes. Also, they must allow the selection of those with satisfactory performance in the presence of genotype x environment interaction (G x E). In our study, we aimed to infer about the performance of three-way cross hybrids (TW) of tropical maize and select those with high adaptability and productive stability through harmonic means of the relative performance of the genetic values (MHPRVG). For this, 160 TW developed by Programa Milho - UFV and five commercial checks were evaluated across eight tropical environments in Brazil. Statistical analysis was performed based on mixed models with the grain yield (GY) data. The predicted genotypic values (BLUP) and parameters for inference of the TW were also obtained. With the BLUPs, the ranking of the TW was made through the MHRPVG for the overall environment group and for the macroenvironments considered favorable and unfavorable. The results indicated the presence of genotypic variance between TW as well as significant G x E interaction in all cases. The accuracy of the BLUPs in the combined analysis was 0.85, which indicates the proximity of the real genotypic value. The general mean of the HT in the environments was 8,323 kg ha⁻¹, which led to the formation of favorable and unfavorable macroenvironments, grouping the environments above and below the general means, respectively. Thus, the favorable and unfavorable macroenvironments were composed of five and three environments, respectively. In these scenarios, with the exception of favorable macroenvironments, the TW showed a better performance than the checks. Despite the strong G x E interaction, results of the graphical analysis indicated that there is a large group of HT with stability and adaptability to growing environments, and also that different hybrids can be recommended for specific environments. We concluded that there are hybrids with high yielding performance, stable and adapted to target environments that can be recommended tropical Brazilian environments.

PALAVRAS-CHAVE: REML/BLUP, genotype x environment interaction, hybrid recommendation

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