

**Genotype X Environment Component of
Variance and its Implications in Maize
(Zeamays L.) Yield Trials.**

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Abstract:

Grain yield data obtained from yield trials conducted in 1981 and 1982 for five open-pollinating cultivars and eight varietal hybrids of maize (*Zea mays* L.) were used to investigate the effectiveness of 3 different yield trial methods. These included experiments A: 2 years, 2 locations, 1 planting date; experiment B: 1 year, 2 locations, 3 planting dates, and experiment C: 2 years, 1 location, 3 planting dates. Variance components were obtained for each method and optimum combinations of numbers of years, locations, planting dates and replications for varietal testing were determined by calculating theoretical standard error of the mean (SEM).

Analysis of variance for the three methods showed highly significant location, year, planting date and genotype effects. SEM of 0.256 was obtained for 2 years, 2 locations, 1 planting date and 4 replications, and this was used as the standard for comparing the other two methods. When planting dates were substituted for years in experiment B, the SEM of 0.256 was obtained for combinations ranging from 1 year, 8 locations, 2 planting dates and 1 replication, to 1 year, 2 locations, 2 planting dates, and 4 replications. Substituting planting dates for location in experiment C however, resulted in the use of a larger number of planting dates than in experiment B, and not less than a 1-year period of testing to obtain the minimum SEM of 0.256. Planting dates can therefore be effectively substituted for years in order to reduce the time for conducting preliminary maize yield trials. Planting dates can also be substituted for locations where funds but not time, are limiting.

Keywords: Pollination/ grain/ genotype/ hybrids

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