Diallel Analysis of Yield Stability in Twelve Maize Breeding Populations. (C01-lee142649-Oral)

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Abstract:

Phenotypic stability has long been recognised as an important target in plant breeding. Yet, very little is known about the genetic components underlying stability, and how population improvement strategies have influenced stability. In this study we used 12 recurrently selected populations to examine changes in the genetic structure of the phenotypic stability of three traits, and two associated selection indices. Partitioning the G x E sums of squares from diallel matings of the original and advanced cycle populations into linear trends indicated that only grain yield and the UPI followed a predictable linear response. Grain yield and UPI linear trends were further partitioned using Analysis III to examine the genetic components of stability. Recurrent selection has improved grain yield stability, and it is heritable, predictable and is mostly controlled through additive gene action. Improvement in stability is observed both in cross and per se performance and it accompanied significant improvement in the mean performance of the populations. However, the improvement in grain yield stability did not result in substantial changes in the gi estimates of most populations.

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