# HETEROTIC PATTERNS OF EARLY MATURING INBRED LINES OF MAIZE *(Zea mays* L.) IN *STRIGA*–INFESTED AND *STRIGA*–FREE ENVIRONMENTS

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## ABSTRACT

The study was designed to separate early maturing yellow- and white-endosperm inbred lines of maize *(Zea mays L.)* into heterotic groups; evaluate the effects of tester, location and infestation of *Striga hermonthica* (Del.) Benth on the heterotic groups; and rank the heterotic patterns of the inbreds in *Striga-free* and Striga-infested environments.

Seventy *yellow and 84 white endosperm testcrosses were* generated by crossing 35 yellow and 42 white endosperm inbred lines to two testers each under irrigation in the dry season of 2004. The testers for the yellow inbred lines were 4001 and KU 14 l4 while those for the white inbred lines were 1368 and 907L The testcrosses plus 7 checks for the yellow and 4 for the white lines, were evaluated under *Striga*-free environments at Obafemi Awolowo University Teaching and Research Farm as well as under ,*Striga*-free and *Striga*-infected environments at IITA's experimental outstations in Abuja and Mokwa in 2005. Each trial was laid out as 11 x 7 and 11 x 8 randomised incomplete block design for the yellow and white testcrosses, respectively. Data were collected on flowering traits, root and stalk lodging, plant and ear heights, incidence of diseases (ratings), grain yield and yield components. Additional data were collected at 8 and 10 weeks after planting (WAP) on *Striga* damage rating 'on a 1 to 9 scale and *Striga* emergence count in the *Striga*-infested environments. Analysis of variance was performed for each set of testcrosses in each location as well as combined across the three locations. Line x tester analysis was performed from which values for general (GCA) and specific (SCA) combining ability effects were obtained. Correlation of GCA effects among the traits was computed also.

The results revealed that, mean squares for location and line GCA effects were significant for grain yield and several other agronomic traits in both evaluation environments. In *Striga-free* environments, SCA effects were significant (f = 1.54, P<0.05) for blight and days to 50% anthesis among yellow testcrosses while for white testcrosses ear aspect and grain yield had significant SCA effects. Under *Striga*-infested conditions, SCA was significant only for *Striga* damage rating at 10 WAY among the white testcross hybrids. About 62% of the white and 77% of the yellow lines had large GCA effects for grain yield in the two evaluation environments. Only 13 of the 42 white inbred lines could be classified into heterotic groups based on the SCA effects and testcross mean grain yield in *Striga-free* environments. Three of these white inbreds maintained their heterotic group under the two evaluation environments. None of the yellow inbred lines could be classified into heterotic groups under any of the evaluation environments.

It was concluded that the testers used in this study were not sufficiently effective in classifying the yellow inbred lines and most of the white lines into heterotic groups.