

Worachak Wongpila 2008: Drought Tolerance of Tropical Maize (*Zea mays* L.) as Affected by Pre-anthesis Drought. Master of Science (Agriculture), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Associate Professor Wasana Wongyai, D.Agr 63 pages.

Drought stress is a major reason for instable grain yield of maize (*Zea mays* L.); it is a severe problem as well for other grain crops in lowland tropical and subtropical areas. Time and growth stage showed difference susceptible to drought. The objective of this study was to determine the application of pre-anthesis drought stress treatment that can discriminate hybrids for their tolerance to mild and severe stress and was to test the hypothesis that can easy to measure physiological and morphological potential indicator traits. The experiment by split plot arrangement in randomized complete block design with four replications was employed. Main plot consisted of three water regimes were water every 7 days interval from planting to physiological maturity (W1), water regimes were half of W1 (W2) and withholding water from 5 weeks after planted to the beginning of anthesis (W3). Subplots consisted of eight single cross hybrids were KSX 4452, KSX 4605, NSX 012002, NSX 022027, CP 888, BIG 949, PAC 903 and NT 6621. A study of the effects of drought stress on hybrids was conducted at the National Corn and Sorghum Research Center in two dry seasons from late November to April in 2003 and 2004.

The results indicated that yields decreased averages of 26 % and 67 % of W2 and W3 compared to those achieved under control condition. Three tolerant hybrids were NSX 012002, NSX 022027 and PAC 903, significant positive correlation with grain yield under W3 were dry weight (0.98) and kernel number (0.92). Therefore, the W3 condition is a good condition for testing drought tolerance in the breeding program.

All in all it could be shown that there exists the genetic scope for drought tolerance that could be transferred to breeding programs for early maturing hybrids that would be more suitable for being planted in the early rainy season.

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31/1/08