



## RESEARCH PAPER

# Drought tolerance effects on maize hybrids

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**Abstract :** Drought is one of the most important abiotic stress limiting crop yields including maize. Maize is being grown in drought prone, marginal lands having low fertility in South East Asia resulting in lower grain yields. Drought stress has deleterious effects on the seedling establishment, vegetative growth, photosynthesis, root growth, anthesis, anthesis silking interval, pollination and grain formation in maize crop. Improvement of grain yield in maize under large environments is of utmost importance, in order to meet the increasing demands of food for the ever increasing population. Grain yield under water deficit stress is culmination of various physiological and metabolic functions in a plant. Assessing the drought tolerance on the basis of yield stability or drought susceptibility index is a major approach to identify drought tolerant genotypes. Drought tolerance studies in maize help to understand the parameters which are associated with drought stress in the crop. This research was conducted to analyze the impact of drought on yield of maize (*Zea mays* L.). The initial study started with 100 genotypes from which the 10 best genotypes (lines) were selected for drought tolerance studies. Screening was carried out using physiological and phenotypic data. Thirty hybrids were developed from the 10 lines and 3 testers (locally adapted varieties) utilizing a LxT analysis. Parents and hybrids were phenotypically assessed in two field conditions: irrigated and moisture stress. Results showed that hybrid IBET IE 1253-8 x UMI 61 was best under normal irrigation and IBET IE 1256-6 x COH (M)5 was best under moisture stress. Taking both fields together, the best hybrid was IBET IE 1253 x UMI 61 which averaged 6.4t/ha. The best parental lines for both conditions were COH (M) 5 and Hy R '06 6143-16. Results support the fact that yields are low when maize is subjected to drought stress. The best hybrid was equal to the local variety under both irrigated and moisture stress condition. Drought susceptibility index developed based on yield as well as morpho-physiological traits across the environments were useful in identifying the best genotypes with high yield and very good drought tolerance. Drought tolerant maize hybrids can help to improve productivity in drought stressed areas.

**Key Words :** Anthesis silking interval, Drought tolerance, Hybrids, Susceptibility

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