

Grain legumes for food security- an adaptability study of mung bean (*Vigna radiata* (L.) Wilczek) genotypes for water deficit tropical environments

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ABSTRACT

This research was aimed to adapt some promising mung bean genotypes to water stress through a field based screening study which was conducted at the Field Crops Research and Development Institute, Maha Illuppallama. Three mung bean breeding lines (MIMB 901, MIMB 902 and MIMB 903) and two local varieties namely MI6 and Ari were grown under three different irrigation regimes – i.e. full recommended irrigation (no water stress), half of the recommended irrigation (mild water stress) and rain fed condition (severe water stress). Water stress was imposed two weeks after sowing. Treatments were arranged in a split plot with three replicates with water regimes in main plots and genotypes as sub plots. Soil moisture was determined gravimetrically over the growth period. The maximum leaf area per plant (L_A) was calculated by periodic destructive sampling. Unit leaf net photosynthetic rate (P_n) was measured at flowering. Number of pods per plant (P), seed yield (Y) and harvest index (HI) were measured at the harvest. The data were analyzed with SAS 9.1 statistical package through analysis of variance procedures and least significant differences (LSD) at 0.05 probability was used for mean separation. Based on the tolerant characters, MIMB 901 could be a tolerant genotype under both mild and severe water stress conditions. MI 6 and MIMB 903 were moderately tolerant to both water stress conditions. In contrast, ARI was tolerant under mild water stress while moderately tolerant to severe water stress. MIMB 902 was identified as drought susceptible genotype under both water stress conditions. These tolerant traits could be incorporated in future crop improvements of mung bean while doing confirmatory studies in several locations.

Keywords: Irrigation, Mung bean, Susceptible genotype, Tolerant genotype, Water stress