C2092. SCREENING FOR DROUGHT RESISTANCE IN SMALL SEEDED COMMON BEAN

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Abstract

Common bean (*Phaseolus vulgaris* L.) is extremely sensitive to drought. About 396,000t grain is lost annually in Africa. Drought resistant genotypes exist. This study was conducted to select small seeded bean genotypes resistant to drought, carry out participatory variety selection and determine traits associated to drought resistance. Study material of 160 genotypes of diverse characteristics from CIAT core collections, regional and national research programs, gene bank, released and local varieties were evaluated in drought nursery for five seasons 2008 to 2010 at Kabete, University of Nairobi. Experiment was organized in complete randomized block design (CRBD) evaluated under two treatments, irrigated (IR) for no stress and non-irrigated (NIR) for drought stress replicated three times. Whole trial received sprinkler irrigation water up to flowering stage to establish stand uniformity. Irrigated trial received supplemental irrigation water as required while NIR trial was subjected to natural rain. A combined analysis for water treatment and season effects were subjected to analysis of variance with 5% and 1% probability considered significant and highly significant respectively. Severe Drought Intensity Index (DII) 0.72 in short rain 2009 reduced grain yield by 60%. Moderate DII 0.45 in 2010 reduced grain yield by 40%. Twenty genotypes performed better than check variety by 55% and included GCI-ZEBRA-268-RAR-1, CIM-NAV02-02-11-1, MR 13508-7, RWR 2178. Farmers selected 12 genotype including GCI-CAL 271-AR2, AFRI 708 and KAB 150. Days to flowering (DF), days to maturity (DM), 100 seed mass and pod harvest index (PHI showed positive correlation under drought evaluation in all grain type categories. The traits 100 seed mass and pod harvest index were highly correlated to non-irrigated grain yield. We recommend use of 100 seed mass and pod harvest index for selection of common bean genotypes under drought.

Key words: Cariocas, Pintos, Purples, Small reds, Navy, Mesoamerica