

## ABSTRACT

Development of drought resistant varieties is one of the most important strategies for coping with frequent droughts in bean production areas in eastern Africa. Drought resistant bean varieties are particularly important for small holder farmers who have few other alternative and practical options of reducing adverse impacts of drought stress. The objective of this study was to evaluate bean germplasm for tolerance under moderate to severe drought stress field conditions. Thirty-six small seeded advanced bean lines were evaluated in a 6 x 6 lattice design in drought stressed and non-stressed treatments at Thika for three years. Grain yield was used as the primary selection criterion. Significant ( $P > 0.05$ ) environment x stress levels, genotype x stress level, genotype x environment interactions were detected. Drought intensity (DII) was highest during the short rain season (DII = 0.5810) and lowest during the long rain season (DII = 0.3918). Yield reduction due to drought was highest during the first short rain season (58%) but remained at 40% during subsequent long and short rainy seasons. SEA 23, RAB 608, SEA 16 and RAB 618 were the best yielding lines under stress and non-stress environments. These four lines consistently out yielded all the checks. Yield advantage of the best nine lines varied from 18 to 66.7% under drought stress conditions compared to the drought susceptible and tolerant checks. SEA 16 showed the lowest drought susceptibility index (DSI). Results of this study indicate new possibilities of stabilizing bean yields in drought prone environments. Selected lines can be utilized in breeding drought tolerant bean cultivars.