Development and evaluation of drought resistant mutant germ-plasm of *Vigna unguiculata*[#]

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Abstract

The aim of this project was to select cowpea plants with improved levels of drought resistance without alteration to the colour of the testa or the growth form. Seed from M_2 to M_5 generations (M = mutant) were used in the study. The M_2 to M_4 seeds were planted and evaluated in wooden boxes in the greenhouse and in the field. It was demonstrated that it was possible to examine mutant lines at the seedling stage in wooden boxes. Mature plants were screened in a rain-out shelter and physiological traits for drought stress were identified among the lines tested. Roots of mature plants were also assessed and the variation observed could be correlated with drought tolerance. Six mutant cowpea lines were included in a physiological screening experiment that was conducted on greenhouse plants. The data demonstrated that the mutant line 217 performed very well in terms of relative water content, free proline concentration and yield. The yield performance of the mutant lines 447, MA_2 and 217 proved to be outstanding under well-watered conditions, whereas lines 447, 217 and 346 performed well under drought stress conditions.

Keywords: abiotic stress, cowpea, JIP test, mutation technology