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A DECADE OF PROGRESS IN COWPEA GENETIC IMPROVEMENT USING MUTATION BREEDING IN ZIMBABWE

Cowpea has continued gaining popularity due to its wide stress tolerance and high nutritive value. The crop is highly adapted to areas marginal for crop production. It is a niche crop, improving livelihoods and sustaining crop-livestock farming systems in the wake of climate change. In Zimbabwe different generations of mutant lines have been developed through gamma irradiation and advanced through single plant selections. Desirable characteristics including drought tolerance, pods above canopy and uniform maturity have been developed and fixed. Fourteen advanced pure-line mutants were extensively tested during three seasons in Zimbabwe. The lines were evaluated for grain yield potential, seed size, adaptation and stability across environments under optimum, random stress and farmer managed conditions. Trials were laid out in randomised complete block designs (RCBD) with four replications on-station at 14 sites and, unreplicated under on-farm at 8 sites. Genotype plus genotype-by-environment interaction (GGE) biplots and the, Lin and Binns and Wricke's eco-valence stability coefficients were used to assess the adaptability and stability of the genotypes and depict the most desirable cultivar. The mutant cultivar CM/150/M6-1 was selected and released as it combined stress tolerance, high grain yield potential, adaptability and stability across environments. The cultivar outperformed CBC1 (its parent) and CBC2 (a stable cultivar) on-station ($P<0.05$) but performed similarly to CBC2 on-farm. Cultivar CM/150/M6-1 has grains that are significantly ($P<0.001$) larger than those of CBC1 and CBC2 by at least 8%. It is a determinate, short season cultivar that matures uniformly. It has good resistance to major cowpea diseases and insect pests including blights, scab, viruses and aphids. Cultivar CM/150/M6 is a good replacement for CBC1, it is recommended for production in high and low potential production environments.

Country or International Organization

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