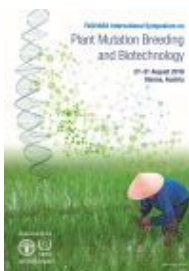


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INDUCED GENETIC VARIABILITY FOR YIELD AND HEAT TOLERANCE IN TOMATO (*SOLANUM LYCOPERSICUM* L.)

Tomato (*Solanum lycopersicum*) is highly sensitive to heat stress at flowering stage. Flowers drop at high temperature and this may result in 80% yield reduction. Variety MST32/1, commonly grown in Mauritius, is sensitive to heat stress. An improvement program for this variety through gamma irradiation of the seed was undertaken to identify potential high yielding varieties with heat tolerance ability. Irradiation assays were carried out to establish the GR50 dose. 3000 seeds were irradiated at identified GR50 dose (400 Gy) to generate the M1 population. Morphological abnormalities were noted in the M2 generation for plant growth habit, leaf morphology and fruit shape. These included lines exhibiting determinate to semi-determinate growth habit, standard and potato leaf shape and oblong to round fruit shape. The lines were also screened for heat tolerance in controlled condition at 35°C and 26°C. The sub-sequent mutated populations were screened up to M6 generations and selection of candidate mutant lines was made based on plant and fruit characteristics. Selected lines were assessed for yield performance in replicated trials at two different agro-climatic conditions. Twenty mutant candidates exhibiting characteristics which may highly correlate with both, higher yield and heat stress tolerance were identified. An average of 7 to 16 % higher yield was observed in five mutant lines in the replicated trials. Some also exhibited lower yield but higher tolerance to heat stress during controlled condition screens. Two mutant lines based on instantaneous chlorophyll fluorescence, quantum yield and leaf scorching, were identified as showing heat tolerance ability, which was confirmed in the controlled environmental conditions. Tomato mutants with high yield and heat tolerance characteristics, thus being adapted to climate change will be released to farmers for a constant supply on the market.

Country or International Organization

Mauritius

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