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IMPLEMENTATION OF MUTATION INDUCTION TO IMPROVE BARLEY PRODUCTION

Production of mutant crop varieties with sustainable high yield under Kuwait's environmental conditions could increase crop production within the constraint of desert ecosystems and reduce its import in Kuwait. A study to address this was implemented under a 'Technical Cooperation (TC) programme' (2016-2017) of the IAEA. It evaluates the potential of mutation breeding to develop new improved barley lines with desirable characteristics and thus enhance barley productivity sustainably under harsh environmental conditions of Kuwait. Three selected barley genotypes were mutated using gamma rays (in cooperation with the FAO/IAEA's Plant Breeding and Genetics Laboratory, Seibersdorf, Austria. Mutated seeds of each barley variety were planted in the greenhouse in Kuwait. M1-spike progeny were harvested to form the M2 seed population. The head-rows of M2 were planted in the field along with parental lines to compare and observe putative mutants. The M3 family rows were sown in the field and the plants developed were subjected to various phenotyping screening procedures for drought and salinity tolerance. Changes were observed in the germination and growth pattern in the mutant lines tested, these included seedling height, number of tillers, number of secondary spikes, number of spikes, number of spikelets and number of seeds. Presently the M3 plants are producing the next mutant generation (M4). The present study forms the preliminary phase of development of a sustainable national strategy for the improvement of barley production in Kuwait. Extensive studies are recommended to release novel barley mutant varieties with improved yield, nutrient quality and drought and salinity tolerance.

Country or International Organization

Kuwait Institute for Scientific Research

Primary author: Prof. AL-MENAI, Habibah (Kuwait Institute for Scientific Research)

Co-authors: Dr BABU, Merlena (Kuwait Institute for Scientific Research); Ms ANEESH, Nisha (Kuwait Institute for Scientific Research); Ms AL-RAGAM, Ouhoud (Kuwait Institute for Scientif research)

Presenter: Prof. AL-MENAI, Habibah (Kuwait Institute for Scientific Research)

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