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IMPROVING YIELD AND COMMERCIAL POTENTIAL OF WHEAT FOR HEAT TOLERANCE BY MUTATION INDUCTION TECHNIQUES

Worldwide, wheat is one of the most used cereal in human nutrition. However, its productivity has been affected by the increase of temperature, decreasing about 10% for each increment of 1° C. Therefore, wheat production demands the generation of new varieties with the capacity to tolerate increases of predicted temperature for future years under the climate change scenario. The dose studied in the field experiment were 100, 200 and 300 Gy, following the radiosensitivity test from 0 to 600 Gy (at intervals of 50 Gy). In the field experiment, seeds (M0) were irradiated using Cobalt 60, the M1 seeds were sown in the 2016-2017 cycle, the material collected from M2 was treated with Chlorothalonil following the standard NOM-EM-001-FITO-1994, and was sown in the 2017-2018 cycle for the identification of chlorophyll mutants and the development of germplasm for the M3 generation. In the M1 generation, in the field experiment, and in the radiosensitivity test the percentage of germination, survival and height were negatively affected by the doses of gamma rays used, obtaining in the dosimetry test a median lethal dose (LD50) of 433.88 Gy. In the M2 generation, an identification of chlorophyll mutants was found, which were: albino, chlorine, viridis, maculata, tigrina, Striata, alboviridis, viridoalbina, among others. The dosimetry test helped in the identification of the LD50, which indicated the optimal dose to obtain the highest number of mutations without reducing the population below 50%. In the segregation of the M2, different chlorophyll mutant's types were found, which may not have an economic value due to their lethal nature, although these can be of great help in identifying the effective dose of a mutagen, which will increase the variability and the number of useful mutants.

Country or International Organization

Mexico

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