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MUTATION INDUCTION IN PEARL MILLET (*Pennisetum glaucum*) AND FINGER MILLET (*Eleusine coracana*) FOR DRY LANDS IN SUDAN

The plant breeders before undertaking a large-scale mutagenesis need to determine an appropriate dose of irradiation on target genotypes or germplasm. The objective of this study was to determine an optimum dose of gamma irradiation to induce genetic variation in three Sudanese pearl millet varieties (Okoa, Dar Masa and HSD 1173) and two finger millet varieties (RA and OH). To determine the lethal dose (LD) at 50% (LD50) and 30% (LD30), seeds were exposed to different doses of ^{60}Co gamma ray irradiation (0 control, 75, 150, 300, 450 and 600) in 2016 at Plant Breeding and Genetic Laboratory (PBGL) of the Joint FAO/IAEA Division, Seibersdorf, Austria. The experiment was conducted in glasshouse following the established procedure in the PBGL. The treatments assigned in a randomized complete block design with three replications in plastic trays. Survival rate and seedling height were measured at 15 days after sowing. The results showed that seedlings length and survival rate percentage decreased dramatically when gamma rays dose increased. In addition, most of the tested varieties showed 100% mortality in 600 doses. For pearl millet, using linear regression model, the LD50 and LD30 values calculated for genotypes Okoa (346 Gy, 468 Gy), Dar Masa (328 Gy, 446 Gy) and HSD 1173 (302 Gy, 405 Gy), respectively. For finger millet, the results for the LD50 and LD30 values for genotypes RA (339 Gy, 457 Gy) and OH (331 Gy, 453 Gy), respectively. Based on the findings of this study bulk seeds were treated with three doses; the LD50 plus and minus 20% to produce M1 seeds for pearl millet mutation breeding for drought tolerance in Sudan.

Country or International Organization

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