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AN APPROACH TO OBTAIN THE OPTIMAL DOSE OF SEED IRRADIATION FOR MUTAGENESIS IN COFFEA ARABICA

Coffee is one of the most important crops in Latin America and has a significant socio-economic impact for thousands of families. The coffee crop is under threat due to exponential increases in biotic and abiotic factors. The use of mutation induction techniques has been successfully implemented in certain crops to obtain desirable agronomic characteristics. In coffee, mutation breeding has been initiated by the determination of the optimal dose of irradiation of seed. This is necessary to obtain high efficiency and efficacy in experiments of mutagenesis induction. This can be determined by identifying the 50% reduction in seed germination, known as LD50 or by reducing the average seedling growth by 50%, with respect to the control treatment, known as RD50. Seeds of *Coffea arabica* were irradiated with gamma rays at doses of 80, 100, 120, 140, 160 and 180 Gy, and 0 (as a control). The seeds were placed in a suitable substrate for germination (peat moss), 80 days later, the germinated seeds were transplanted to individual containers and the percentage of cotyledons involved was determined 30 days after sowing. An unrestricted randomized experimental design was used with six treatments and a control without irradiation, with 120 replicates per treatment. We performed a linear correlation analysis ($P \leq 0.01$), for the determination of the RD50. According to the preliminary results: the RD50 is in the range of 100-120 Gy. In previous experiments it was found that the lethal dose (LD50) is in the same range. This dose range will now be used to create an M1 population in developing advanced mutant populations and lines for screening for traits of interest.

Country or International Organization

COSTA RICAN COFFEE INSTITUTE-COFFEE CENTER RESEARCH

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Track Classification: Enhancing agricultural biodiversity through new mutation induction techniques