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PROMISING LINES OF LUPINUS MUTABILIS SWEET DERIVED FROM MUTATION INDUCTION WITH IONIZING RADIATIONS

The cultivation of *Lupinus mutabilis* Sweet is considered strategic for the alimentary food security of the Andean countries, due to its high content of protein, fat, carbohydrates, minerals and fibre. Ongoing research focuses on developing new lines with disease resistance and improved agronomic traits. Regarding the first goal, the production of *L. mutabilis* is facing a major challenge associated with a destructive disease that affects the stems and pods, called anthracnose. This disease is caused by the fungus *Colletotrichum lupine*, and it is transmitted by infected seeds. To obtain seeds free of this pathogen, we irradiated them with doses of 1.2, 1.5, 2.0, 4.0, 8.0 and 16.0 kGy in a ELU-6U linear electron accelerator beam. Previously, we had determined that the decimal reduction dose (D10) for *Colletotrichum* spp. was 0.7 kGy. It was observed that the dose of 2.0 kGy allowed a 99.0% elimination of the spore-forming fungus. Then, the effect of the radiation dose on the initial development of the plants was evaluated. The germination and vigour percentages were between 89.37 and 92.08% in the control, and between 83.13 and 89.47% in the plants derived from seeds irradiated with 2.5 kGy. The plant heights, 30 days after sowing, were 24.61 and 12.40 cm, respectively. The Ecuadorian *Lupinus* breeding programs try to combine higher yields, low alkaloid levels, high seed protein and oil contents, and early flowering and maturity. Mutation breeding has just been incorporated in the program. Currently, plants resulting from seeds irradiated with doses from 25 to 350 Gy in a ⁶⁰Cobalt source are being evaluated. So far, they show high germination rates and vigour values, and several morphological differences. We expect to have the first harvest in July 2018.

Country or International Organization

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