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EFFICACY OF HIGH ENERGY GAMMA IRRADIATION DOSES (^{60}CO) EFFECTS FOR MUTAGENESIS IN STRAWBERRY *cv. Chandler*

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Abstract

High-energy gamma irradiation plays a crucial role in changing the metabolic activity in fruit crops. The process of mutation breeding for strawberry varieties entailed subjecting runner sections to irradiation, specifically utilizing three unique dosages of ^{60}Co-gamma rays. Different concentrations, i.e., 20 Gy, 30 Gy, 40 Gy, and 0 Gy, were administered at a consistent dosage rate of 1.52 Gy per minute. The highest mortality rate was recorded in the group exposed to the maximal dosage of irradiation, which was 40 Gy. Furthermore, the 20 Gy dose exhibited the largest leaf area index, number of leaves, and chlorophyll levels. The occurrence of early flower bud formation was documented at a dose of 30 Gy, while late flower bud formation was observed at a dose of 20 Gy. However, an early fruit set was recorded at a dose of 40 Gy, while a late fruit set was recorded at 20 Gy. In our observation of yield, we recorded the largest number of buds, flowers, and fruits at a radiation dose of 20 Gy. Conversely, we noticed a lesser number of buds with a radiation dose of 40 Gy. The results indicate that the maximum values for primary secondary root length and root number were recorded in the 30 Gy treatment, while the lowest values were observed in the 40 Gy treatment. Additionally, more deformed fruit and leaves were observed in the 40 Gy treatment of gamma irradiation dose. These findings would be beneficial in future endeavors aimed at producing potential mutants in the strawberry plant.

Key words: ^{60}Co, flowering, fruit set, gamma irradiation, LD_{50}, runners, yield

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