

EFFECTS OF GAMMA IRRADIATION ON YIELD CHARACTERISTICS OF GROUNDNUT

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Abstract: Groundnut is a key field crop in the tank cascade systems of in the dry zone of Sri Lanka. It is a main source of protein and a source of income for smallholder farmers. Groundnut has little diversity and self-pollinates. Therefore, standard breeding techniques can only improve groundnut cultivars to a certain point. Therefore, this study was conducted to examine the effect of gamma irradiation on the yield characteristics of groundnut. The field experiment was conducted from July 2022 to October 2022 at the Crop Farm, Eastern University of Sri Lanka. Groundnut seeds were exposed to Gamma irradiation using a "Gamma chamber 1200 Cobalt- 60" research irradiator. Treatments such as 0Gy (T1), 100Gy (T2), 200Gy (T3), 300Gy (T4), 400Gy (T5), and 500Gy (T6) were used in this experiment. Seedlings from treated seeds were transplanted in an open field after being planted in poly bags with rooting media. Treatments were laid out in a randomized complete block design with five replications. Yield parameters such as number of pods, fresh weight of pods, 100 seed weight, and total yield were recorded. The recorded data were analyzed using ANOVA and the Duncan multiple range test was used to compare the treatment means at a 5% significant level. The study revealed that there was a significant difference ($P<0.05$) among the different levels of gamma irradiation and treatment T3 (200 Gy) showing significantly increased number of pods (47%), fresh weight of pods (28.8%), dry weight of pods (41.4%), 100 seed weight (47.7%) and total yield (65.6%) compared to control. Therefore, based on the above results, the treatment T3 (200 Gy) is the best to improve the yield of groundnut (var. Indi).

Keywords: Crop improvement; Gamma chamber; Gamma irradiation; Groundnut