

ABSTRACT

Groundnut (*Arachis hypogaea* L.) is the most important agricultural commodity as a protein and vegetable oil source. This study aimed to determine the effect of gamma irradiation on morphological and agronomic diversity in peanut varieties of bison in the M₁ generation. Gamma irradiation was conducted at the Radiation Process Technology Research Centre (RPTRC), Organisation for Nuclear Research (OFNR) BRIN, Pasar Jumat, Jakarta. Field research was conducted at Paloh Lada village, Dewantara sub-district, North Aceh district and Agroecotechnology Laboratory, Faculty of Agriculture, Malikussaleh University. This research was conducted from October 2023 to January 2024. The method used in this research is a single-factor Randomised Group Design (RGD). The dose of gamma irradiation was 0 Gy (K₀), 100 Gy (K₁), 200 Gy (K₂), and 300 Gy (K₃). There were 4 treatments with 3 replications, which resulted in a total of 12 experimental units. In 1 experimental unit, there were 50 peanut plants, so there were 600 plants. The observed variables included morphological diversity, growth percentage, plant height, number of branches, flowering age, harvesting age, number of pods, number of empty pods, dry pod weight per plant, dry seed weight per plant, 100 seed weight per plot, dry seed weight per plot, production, length, width, and number of leaf stomata. The results of the research showed that gamma irradiation treatment caused changes in the morphology and agronomy of bison variety peanuts in the M₁ generation. Morphological changes that occur include leaf color, pod shape, and seed coat color. Changes in agronomy include reducing plant height, number of branches, dry seed weight per plant and dry seed weight per plot, but slowing down flowering time and harvest time.

Keywords: morphology, mutant, mutation breeding, M₁ generation