Morphological variation in the 7th generation soybean mutant lines irradiated by gamma ray under greenhouse conditions

M. Younessi Hamzehkhanlu[1]*, A. Izadi Darbandi[1], N. Pirvali Beiranvand[2] and M. T. Hallajian[2]

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Abstract

Genetic diversity is the base of plant breeding. Hence, 33 M7 soybean mutant lines, which were evolved by γ ray from cultivar L17 irradiated with doses of 150, 200 and 250 Gray (absorbed dose), with L17 cultivar and two commercial cultivars (Clark and Williams) were evaluated in view of some morphological traits (number of leaves/plant, pods/plant, seeds/pod, seeds/plant, 100-seed weight, dry weight of aerial parts, dry weight of roots, plant yield, harvest index, nodules/root and dry weight of nodules) under completely randomized design with three replications in greenhouse of Agricultural, Medical and Industrial Research School, Nuclear Science and Technology Research Institute, Atomic Energy Organization of Iran, Karaj, Iran. All traits in the studied mutant lines, except number of seeds per pod, showed a significant difference at α=1% and α=5% in comparison with L17 and commercial cultivars. Mutant line number 13 (M13) was recognized as the top line in view of the studied traits. Seed yield per plant showed the highest correlation (0.886) with harvest index (P<0.01). Cluster analysis of the studied traits along with Ward method resulted in separation of the lines into four independent groups. It can be inferred from the results that irradiation did induce significant genetic variability with regard to majority of the studied traits, such as number of nodules per plant and harvest index.

Keywords: Irradiation, Genetic diversity, Cluster analysis, Absorbed dose.

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1. Dept. of Agron. and Plant Breed., College of Agric., Aburaihan Complex, Univ. of Tehran, Tehran, Iran.
2. Agric., Medical and Industrial Res. School, Nuclear Sci. and Technol. Res. Institute, Atomic Energy Organization of Iran, Karaj.
*: Corresponding Author, Email: mehdiyounessi377@gmail.com