



INDUCTION OF GENETIC VARIABILITY IN GROUNDNUT (*ARACHIS HYPOGAEA* L.) VARIETIES USING NEUTRON IRRADIATION

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ABSTRACT

Improvement of groundnut (*Arachis hypogaea* L.) is constrained by its narrow genetic base. The use of thermal neutrons is an effective technique for inducing novel variability for traits of economic importance. Three varieties of groundnut; SAMNUT 21, SAMNUT 23 and SAMNUT 24 were irradiated with four doses, 3Gy (Gy), 6Gy, 9Gy and 12Gy of thermal neutron irradiation to determine the effective dose and assess the variability in the induced varieties. A total of 96 M₁ families generated from the irradiated seeds including three controls were evaluated using 11 x 12 augmented designs at Zaria in 2014. Data collected on some agronomic traits were subjected to analysis of variance using SAS. The mutagenic effectiveness of irradiation doses ranged from 0.1% for 12Gy to 2.6% for 3Gy, indicating that 3Gy was the most effective dose for inducing mutation in the varieties. There was highly significant differences (P<0.01) among the progenies for all the measured traits (data not shown). Neutron irradiation at 3Gy resulted in increased plant height and pod yield per plant especially for SAMNUT 24 at M₂ generation. Pod yield of M₂ progenies in SAMNUT 21 ranged from 321 to 1538 kg ha⁻¹, from 1310 to 2649 kg ha⁻¹ in SAMNUT 23 and from 877 to 2671kg ha⁻¹ in SAMNUT 24. The induced variability for agronomic traits offers possibility for future selection and improvement of groundnut for the traits.

Keywords: Groundnut, irradiation dose, mutation, thermal neutrons.

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