



Performance of peanut mutants and their offspring generated from mixed high-energy particle field radiation and tissue culture

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ABSTRACT. To develop new ways to breed peanut, we irradiated seeds of the Luhua 11 cultivar with a mixed high-energy particle field at different doses. The embryonic leaflets were extracted as explants and incubated on somatic embryo induction medium and then on somatic embryo germination and regeneration medium. After being grafted, the M₁-generation plants were transplanted, and seeds from each M₁-generation plant were harvested. In the following year, the M₂-generation seeds were planted separately. Some M₂-generation plants showed distinct character segregation relative to the mutagenic parent in terms of vigor, fertility, plant height, branch number, and pod size and shape. M₂-generation plants that had a high pod weight per plant tended to produce M₃-generation offspring that also had a high pod weight per plant, much higher than that of the mutagenic parent, Luhua 11. M₄-

generation seeds varied greatly in quality, and 35 individuals with an increased fat content (>55%) were obtained. Overall, the results indicate that the combination of mutagenesis via mixed high-energy particle field exposure and tissue culture is promising for peanut breeding.

Key words: Peanut; Mixed high-energy particle field; Radiation; *In vitro* culture; Mutants