Somaclonal Variation among Tissue Culture-derived Planting Materials of Peanut cv. Gajah

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Somaclonal variation was common among tissue culture-derived planting materials, especially due to prolonged culture period or due to utilization of calli prior to development of shoot embryos. Somaclonal variation phenomena have been used to generate mutants for specific purposes. In relation to genetic engineering, however, the existence of somaclonal variation was not desirable. The ultimate goal of plant genetic engineering was to obtain transgenic plant lines with no one or a few new traits due to the introduced genes, and with the same genetic background as the original cultivar. Therefore, utilization of plant tissue culture technique inducing as low somaclonal variation as possible were necessary. This study was conducted to identify the existence of somaclonal variation among different tissue culture techniques.

Three tissue culture strategies, such as: shoot proliferation and somatic embryo formation from mature embryo axis, and adventive shoot regeneration from mature embryonic leaflets, were employed. Shoot proliferation and adventive shoot regeneration were done by culturing the respective explants on MS medium containing BAP (3 mg/l) and NAA (1 mg/l) for one month, followed by transferring the culture on MS medium containing BAP (5 mg/l) until shoots were regenerated. Plantlets were obtained by transferring the regenerated shoots onto MS medium containing NAA (1 mg/l). Somatic embryos were induced by culturing embryo axis on MS medium containing picloram (3 mg/l). Once the somatic embryos were obtained, they were induced to regenerate on MS medium without plant growth regulator. All plantlets (primary regenerant = R_0 generation), regenerated through the three different schemes, were transferred into soil and subsequently were grown in the plastic house for evaluation. At the R_0 generation, the occurrence of phenotype variation was recorded, and the R_r (self-) seeds were collected. The $R_r$seed were planted and evaluated for the occurrence of phenotypic variation and their yield. In all steps of evaluation, the original peanut cultivar that did not undergo through tissue culture period were also evaluated and used as control. The degree of variation occurring among tissue culture hyphen derived planting materials and differences of the yield among lines as compared to the original lines were used to predict the existence of somaclonal variation due to the differences of tissue culture techniques.

At this moment, planting materials derived from shoot proliferation and adventive shoot regeneration have been regenerated and were transferred into soil. Planting materials derived from somatic embryo were still in the process of regeneration.