

VIRUS FREE POTATO MINI-TUBER PRODUCTION THROUGH MERISTEM CULTURE

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Executive Summary

The experiments were conducted with a view to establish a protocol for virus free mini-tubers production, *in-vitro*, using potato meristem as explant, collected from potato sprouts of three popular potato varieties Diamant, Cardinal, Granola. In the present study four levels of GA3 (100, 200, 300 and 400 ppm) were used to assess the influence on sprouting abilities in three selected potato varieties. The maximum sprouting efficiency was observed in 400 ppm GA3 treatment within short period of time in Granola variety. The effect of different combination and concentration of IBA, 2, 4-D and BAP was used along with fresh MS media to inoculate meristems of potato sprouts. IBA concentration were 0.25 mg/L, 1.5 mg/L; 2, 4-D concentration were 0.125 mg/L, 0.25 mg/L, 0.37 mg/L, 0.50 mg/L, 1.0 mg/L, 2.0 mg/L and BAP concentration were 0.5 mg/L, 1.0 mg/L, 1.5 mg/L and 2mg/L. The effect of combined hormones was also studied. The Diamant variety showed the maximum callus size (0.74cm) within a very short period of time (2 days) while treated at the concentration of 0.25 mg/L IBA, 0.25 mg/L 2, 4-D and 1.00 mg/L BAP. Granola meristem inoculated in hormonal treatment showed the best results regarding minimum days required to shoot initiation (5.34 days) followed by Diamant (6.68) days and Cardinal (7.64 days). The highest number of shoots/plantlet (4.33 shoots/plantlet) and the longest plantlet (9.32 cm) was found in Granola variety followed by Diamond (3.67 shoots/plantlet; 7.53cm) and Cardinal (4.0 shoots/plantlet; 7.62 cm). Maximum numbers of leaves were also found in Granola variety (15 leaves) in the treatment combination of 0.25 mg/L IBA, 0.125 mg/L 2, 4-D and 0.5 mg/L BAP. Granola gave maximum performance in respect of maximum length of root (6.55 cm roots/plantlets) within a short time of root initiation (20 days), followed by Diamant (4 cm roots/plantlets) of root initiation (24.47 days) and Cardinal (4.53 cm roots/plantlets) of root initiation (26.39 days). However, in overall observation in this study, Granola showed better performance from meristem tissue culture and all plants were found normal and free from potato viruses that were tested through ELISA test.

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