

STUDIES ON PRODUCING POTATO SEED USING SOILLESS CULTURE

By

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ABSTRACT

Mohamed Mahmoud Maamoun Rashwan. Studies on producing potato seed using soilless culture, Department of Arid Land Agricultural Graduate Studies and Research Institute (ALARI) Faculty of Agriculture, Ain Shams University 2017.

Potato (*Solanum tuberosum* L.) Family Solanaceae is an economic tuberous crop cultivated worldwide in the temperate, tropical and subtropical zones. It occupies the fourth largest food crop following wheat, rice and maize. The present study was conducted in the private Tissue Culture Laboratory of star moon company, Giza during the period of 2013 to 2015. A reliable protocol for in vitro propagation of most important potato cultivars i.e., Sponta, diamant and Herms, grown in Egypt were established. Shoot proliferation was obtained from shoot tips at relatively high frequency when cultured the three cultivars on Murashige and Skoog (MS) medium (1962). Seedlings derived from tissue culture were exposed to acclimatization and cultured in soilless culture using aeroponic, deep water system and the sand soil culture (control). Potato cultivar Herms when grown in aeroponic system produced plants characterized with vigor vegetative growth which were taller, had much number of branches, width leaves, with more leaf chlorophyll content and at the same time gave higher total yield than those other cultivars and treatments. The best medium for shoot initiation was MS medium supplemented with 0.3 mg/l KIN. The favorable medium for multiplication was the tested medium augmented with 0.3 mg/l BA and 0.250 mg/l NAA. In addition, the most effective medium for elongation was the used medium enriched with 0.250 mg/l NAA. Furthermore, *in vitro* shoots showed healthy root development when the tested medium was supplemented with combination of 1.0 mg/l IBA and

0.50 mg/l NAA (rooting stage).The combination of perlite & peatmoss (1:1, v:v) was used as substrates for the hardening of the *in vitro* plantlets, as a potting mix, was the best suited mix for the acclimatization of plantlets *ex vitro*.

Keywords: Potato, Tissue Culture, Soilless culture, Cultivars, Aeroponic, Deep water.

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