EVALUATION OF DIFFERENT METHODS OF REDUCING NIGHT TEMPERATURE IN SEED POTATO (*Solanum tuberosum* L.) PRODUCTION IN SIMPLIFIED NUTRIENT FILM TECHNIQUE

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ABSTRACT

Potato is a starchy, tuberous crop belongs to the family *Solanaceae*. Although potato is the 4th largest food crop and the staple food in some countries, potato is commercially grown only in Nuwara-Eliya, Badulla, Jaffna and Puttalam districts in Sri Lanka. However, Seed potato is mainly produced in Nuwara-Eliya due to favourable weather conditions in this area specially low night temperature. Seed potato production in Banadarawela is relatively low because of the high temperature compared to Nuwara-Eliya. Tuberization is promoted under low night temperatures. Because of that high night temperature in Bandarawela may reduce tuberization. Thus, reducing night temperature by different methods may help to increase the seed potato production. The current study was conducted under controlled environmental conditions using Simplified Nutrient Film Technique (SNFT) to identify the best method to reduce night temperature for seed potato production in Bandarawela. Five night temperature controlling methods (T1-Control, T2-Mini exhaust fans in bins, T3-Fan pad method combined with mini exhaust fans in bins, T4-Fan pad, T5-Nutrient cooling) with three replicates were installed and plant performances were measured once a week. Key yield determining parameter, number of tubers (25) was significantly higher in SNFT with T3 compared to other treatments (T1-13, T2-12, T4-19, T5-14). Mean values of plant height (cm), stem height (cm), number of stolons, root volume (cm^3) and stolon volume (cm^3) were significantly higher in T3 (126.8, 102.6, 15, 14.3, 10.3, respectively) compared to control (105.9, 76.7, 10, 12.4, 6.4, respectively). Moreover, T3 reduced the night temperature by approximately 1-2 °C. Therefore, fan pad method combined with mini exhaust fans in bins method is the most suitable method to reduce night temperature for seed potato production in Bandarawela region.

Keywords: Night temperature control, Plant performance, Seed potato, Simplified Nutrient Film Technique