Evaluation of Growth and Yield Performances of Two Potato Varieties, CONNECT and MASAI Under Different Levels of Nitrogen Fertilizer

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ABSTRACT

Potato is extensively grown in Nuwara-Eliya and Badulla districts under Sri Lankan conditions. Although a fertilizer recommendation by the Department of Agriculture is available for potatoes, farmers do not comply with it. Instead, fertilizers are overused in up-country in many instances causing economic losses, and health and environmental issues. However, there are low-fertilizer responsive potato varieties such as CONNECT and MASAI that can produce optimum yield under lower nitrogen (N) but show abnormalities under higher N applications. A field experiment was conducted in Nuwara-Eliya to identify the effective N level to optimize the yield and quality of CONNECT and MASAI potato varieties. The experiment was arranged in a Randomized Complete Block Design (RCBD) with five N levels (110, 150, 190, 230, and 270 kg ha^{-1}) and replicated thrice. The N level of 230 kg ha^{-1} was the N recommendation of the Agriculture Research Station, Seetha-Eliya, while 270 kg ha^{-1} was a rate applied by some farmers. Phosphorus (100 kg ha^{-1}) and potassium (250 kg ha^{-1}) levels were kept constant with all treatments. Nitrogen level had no significant ($P>0.05$) effect on tuber yield or dry matter content in both varieties meaning that the yield was not affected even by the lowest N level used. The potato yield ranged from 22.54 to 25.67 and 13.62 to 19.66 t ha^{-1} in CONNECT and MASAI, respectively. In MASAI, 110 kg ha^{-1} of N recorded the highest number of tubers (6.5 $plant^{-1}$), whereas 230 kg ha^{-1} recorded the lowest (4.1 $plant^{-1}$). The N level had no significant ($P>0.05$) effect on the number of tubers in CONNECT. In conclusion, the lowest N level (110 kg ha^{-1}) can be recommended for MASAI and CONNECT potato varieties as it is an economically and environmentally sound option without causing any yield or quality reduction in the present study and further research is suggested for confirming results.

Keywords: CONNECT, Fertilizer, MASAI, Potato, Tuber yield