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Effect of different level of macro nutrients on the growth and development of spinach (Spinacia oleraceae L.)

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Abstract

This study investigates the effect of varying levels of macro nutrients on the growth and development of spinach (Spinacia oleracea L.) using a Completely Randomized Design (CRD) with two varieties: Sindhi and English spinach. Conducted during 2024, the experiment utilized a total of six nutrient combinations, including control, NPK (3g/L, 4g/L, 5g/L), and Calcium Nitrate (1g/L), applied to two per pot across replicated treatments. Parameters such as seed germination percentage, germination index, plant height, leaf metrics, root characteristics, and chlorophyll content were assessed. Results indicated a significant enhancement in growth metrics with NPK (3g/L) plus Calcium Nitrate (1g/L), particularly for Sindhi spinach, where it exhibited a germination rate of 95.16% and an increase in chlorophyll to 64.86. Conversely, higher concentrations of NPK negatively affected germination and growth in both varieties, suggesting that balanced nutrient application is crucial for optimal spinach development. This investigation underscores the importance of macro nutrients in enhancing spinach yield, contributing valuable insights for growers aiming to maximize crop productivity.

Key Words: Spinach1, Macro Nutrients2, Growth3, Development4