Evaluating the effect of different fertilizer formulations on pod filling in the groundnut variety "*Lanka Jumbo*"

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Lanka Jumbo is a popular medium-duration jumbo peanut (*Arachis hypogaea* L.) variety released by GLORDC, Angunakolapelessa, Sri Lanka. Pod filling is a crucial phase in groundnut development, significantly affecting yield and plant health. Calcium plays a key role in pod formation, yield improvement, and nutritional quality. This study aimed to identify an optimal fertilizer mix to enhance pod filling and increase the yield of groundnut variety Lanka Jumbo. A field experiment was conducted in Rideemaliyadda, Badulla district (IL2 Agro-ecological zone), Sri Lanka, to evaluate the effectiveness of seven fertilizer treatments. The Department of Agriculture (DOA) Sri Lanka recommendation (T1 - Urea 65 kg/ha, TSP 100 kg/ha, MOP 75 kg/ha) was compared with six alternatives: a 20% increase in TSP and MOP (T2), 250 kg/ha gypsum with enhanced nutrients (T3), gypsum with the DOA recommendation (T4), DOA recommendation + 500 kg/ha Nutri Pellets compost (T5), Commercially available complex fertilizer (125 kg/ha) + Commercially available calcium nitrate and boron mix fertilizer (62.5 kg/ha) (T6), and DOA recommendation + nitrogen foliar spray (T7). Treatments were arranged in a Randomized Complete Block Design (RCBD) with three replicates. Plant height and the number of branches per plant were recorded as plant growth data at 25 and 60 days after planting, while yield parameters included the number of pods per plant, the number of filled and unfilled pods per plant, and the dry weight of 100 seeds. No significant differences in plant growth were observed among treatments at 60 days after planting, although T7 recorded the highest plant height (58.7 cm) and number of branches (9.6). T4 showed the best yield performance, producing 134.67 g of dry pod weight per plant, with 53.3 pods per plant, a 96.2% pod filling rate, and a 100-seed weight of 210 g. In contrast, T7 had the lowest performance, with 40.7 pods per plant and a significantly lower pod filling rate (39.3%). These findings suggest that applying 250 kg of gypsum with the DOA-recommended fertilizer mixture improves pod filling and enhances the yield of groundnut var. Lanka Jumbo.

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