Effects of variable seed rates and potassium levels on yield components and quality parameters of Basmati Type No. 06 rice in Sri Lanka

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Basmati rice is known for its fragrance, long grains, and excellent cooking qualities. This study was conducted to identify the suitable seed rate and potassium fertilizer combination to achieve the maximum grain yield and quality of Basmati type No.06 rice variety. A field experiment was carried out at CIC seed farm, Pelwehera, Sri Lanka from May 2024 to August 2024. The study had nine treatments (T1- 45 g/plot + Department of Agriculture recommended Muriate of Potash [DoA MoP], T2- 45 g/plot + 1 ½ DoA MoP, T3 – 45 g/plot + no MoP, T4 – 90 g/plot + DoA MoP, T5 – 90 g/plot + 1 ½ DoA MoP, T6 – 90 g/plot + no MoP), T7 – 135 g/plot + DoA MoP - control, T8 – 135 g/plot + 1 ½ DoA MoP and T9 – 135 g/plot + no MoP) in a Randomized Complete Block Design (RCBD) with three plot replications with a plot area of 18 m^2. Based on the ANOVA results, selected combinations of seed rates and MoP levels did not have a significant effect ($p>0.05$) on vegetative growth and actual yield. The effect was significant ($p<0.05$) on grain quality characters. A moderate seed rate of 90 g per plot (one bushel per acre) combined with 1½ of the DOA recommended MOP had the best performance in terms of grain physical quality, with a significant ($p<0.05$) maximum grain length (8.04±0.05 mm). It also showed superior milling quality, with a significant ($p<0.05$) higher head grain percentage (35.03±0.37 %) and a significant ($p<0.05$) lower broken grains percentage (33.56±0.45 %), along with excellent cooking quality, including a significant ($p<0.05$) longer grain length after cooking (12.23±0.03 mm) and an elongation ratio of 1.52±0.01. Based on these findings, the study concludes that using a 90g seed rate per plot (one bushel per acre) with 1½ of the DOA recommended MOP is the optimal combination to achieve maximum yield and quality for Basmati type no. 06 rice variety. However, the research should be replicated and tested in other agro-ecological zones in Sri Lanka during both *Yala* and *Maha* seasons to validate the findings.

Keywords: *Basmati rice, Grain quality, Grain yield, Potassium (K) fertilizer, Seed rate*