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Suitability of Lime, Green Leaf, and Farm Yard Manure and Inorganic Fertilizers for Sustaining Green Gram Yield and Rainwater Use Efficiency Under Moist Sub-Humid Alfisols in India

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ABSTRACT

Field experiments were conducted to assess the effect of nutrients management practices on yield and rainwater use efficiency of green gram (*Vigna radiata*), and soil fertility under moist sub-humid Alfisols at Phulbani, India, during 2005–2008. Ten treatment combinations of lime @ 10% and 20% of lime requirement (LR) @ 8.3 t ha^{-1}, farmyard manure (FYM) @ 5 t ha^{-1}, green leaf manure @ 5 t ha^{-1}, and nitrogen, phosphorus, and potassium (N–P–K) (20–40–20 kg ha^{-1}) were tested. The analysis of variance indicated that treatments differed significantly from each other in influencing yield and rainwater use efficiency. Application of lime @ 20% LR + FYM @ 5 t/ha + 40 kg P + 20 kg K ha^{-1} was superior with maximum mean yield of 531 kg ha^{-1}, while lime @ 10% LR + FYM @ 5 t ha^{-1} + 40 kg P + 20 kg K ha^{-1} was the second best with 405 kg ha^{-1} and maintained maximum soil fertility of nutrients. The superior treatment gave maximum sustainability yield index of 67.5%, rainwater use efficiency of 0.49 kg ha^{-1} mm^{-1}, improved soil pH, electrical conductivity, and soil nutrients over years.

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