



# Consequence of nutrient management on growth and yield of lucerne (*Medicago sativa* L.) – paddy (*Oryza sativa* L.) sequential cropping

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**Abstract :** A field experiment was conducted on nutrient management on lucerne (*Medicago sativa* L.) and their residual effect on succeeding Kharif rice (*Oryza sativa* L.) during Rabi and Kharif seasons of 2004-2005 and 2005-2006. The growth and yield attributing characters of lucerne significantly enhanced due to application of 2<sup>nd</sup> cutting then left for seed production + 50 per cent RD of phosphorus + PSB ( $T_9$ ) over rest of the treatments during both the years as well as in pooled data. The highest values of growth and yield attributes like grain and straw yield of rice were recorded under the treatment combination of application of 2<sup>nd</sup> cutting then left for seed production + 50 per cent RD of phosphorus + PSB ( $T_9$ ) to preceding lucerne and 100 per cent recommended dose of fertilizer ( $F_3$ ) to rice being at par with treatments combinations  $T_8F_3$ ,  $T_7F_3$  and  $T_6F_3$  indicating that the treatment combination of  $T_9 \times F_3$  was adequate for obtaining comparable grain and straw yields from succeeding rice.

**Key Words :** Lucerne, Paddy, Cropping sequence

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## INTRODUCTION

Lucerne is one of the crops that respond well to phosphatic fertilizers as compared to nitrogen and potassium fertilizers in all the territories and in all soil types. It plays a vital role in plant nutrition. It is a key nutrient in cell division and tends to be concentrated in actively growing young plants tissues. Its deficiency in soil severely limits root and shoot growth and thereby decreases the yield. Since phosphorus fixation is usually more common in heavy textured soil and under heavy irrigation, the deficiency of phosphorus to lucerne is most likely under South Gujarat conditions requiring heavy demands to support luxuriant plant growth. It is reported by many scientists that yield of lucerne increases with increase in dose of phosphorus up to 120 to 150 kg  $P_2O_5$  ha<sup>-1</sup> (Singh and Bajpai, 1972 and Anonymous, 1989).

The demand of rice in India is projected to be 100 million

tons in 2006 A.D., which is to be produced from 42.3 million hectares of paddy area. Therefore, country has to reach an average production level of 2454 kg ha<sup>-1</sup>, from the present level of 1851 kg ha<sup>-1</sup> (Siddiqui *et al.*, 1999). In India, 45 per cent of yield advantage obtained with modern technologies over traditional package of practices could be attributed from a single factor *viz.*, fertilizer, which had played a significant role in the success of green revolution. Fertilizer management seems to be the most important component influencing rice yields with the increase in the intensity of cropping in the rice multiple cropping system and continuous removal of plant nutrients. Nitrogen is one of the costliest and perhaps the most crucial nutrient limiting rice yield. The second mineral element, phosphorus plays a key role in vigorous root growth and proliferation, early tillering with more panicles, higher percentage of filled spikelet's, early maturity/ripening and good grain quality of rice.

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