

Effect of nitrogen and potassium on growth and yield of frenchbean and potato grown in intercropping system

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ABSTRACT

A field experiment was conducted during winter season of 2003-04 and 2004-05 at J.V.P.G. College, Baraut (Bagpat) in western Uttar Pradesh to study the optimum dose of nitrogen for component crop in the sole french bean (*Phaseolus vulgaris* Linn.) and potato (*Solanum tuberosum* L.) and in intercropping system. Frenchbean and Potato yields increased significantly upto the application of 120Kg N and 60 Kg K₂O/ha. Frenchbean equivalent yield was highest of 31.90 q/ha at 120 kg N/ha and 29.63 q/ha which were found 2.28 q/ha (7.9%) and 6.88 q/ha (28.2%) higher than the equivalent yield in sole potato and sole frenchbean, respectively. Intercropping attained 1.17 L.E.R. which indicates that land may be utilized by 17 per cent more than pure cropping.

Key words : French bean, Potao, Potassium and Nitrogen application.

INTRODUCTION

French bean crop unlike other pulses, is assured crop responding well to irrigation and fertilizers. It gets favour of progressing farmers under input intensive agriculture. It produces 25-30 quintal grain per hectare which corresponds to 100-120 q/ha of wheat. It is grown with intensive inputs suitable for cultivation in relay cropping and inter cropping systems. Potato is in an important crop of north India, grown with intensive inputs.

French bean may be suitable crop for growing with potato as intercrop because it also responds to higher inputs. Therefore, the present investigation was carried out on intercropping of french bean with potato in western Uttar Pradesh, where intensive agriculture with higher inputs is mostly adopted.

Nitrogen and potassium both elements are of great importance in crop production. It is essential in the formation and transfer of starches and sugar thus required in large quantities for the crop like potato. It counteracts the injuries effect of excess nitrogen in plants (Yawalkar *et al.*, 1977). Inter cropping of potato with french bean in *rabi* has been advocated by Ali and Lal (1991) and french bean + potato 3:2 ratio is ideally remunerative crop Ahalawat, 1998.

MATERIALS AND METHODS

A field experiment was carried out during the winter season of 2003-04 and 2004-05 at Janta Vedic Post Graduate College, Baraut (Baghpat). The soil was silt loam having 0.30 and 0.36% organic carbon, 14.5 and 15.0 Kg/ha available P and; 275 and 263 Kg/ha available K with pH 7.5 and 7.4 pH values in two years of experimentation. The treatments consisted of two sole

stands each of frenchbean and potato in intercrop association of french bean + potato in 3:2 row ratio at 45 cm row spacing in all cases. These three systems were applied with three levels of K (0, 30 and 60 kg K₂O/ha). and four N levles (0, 60, 120 and 180 Kg N/ha). Combination of cropping systems and K levels were kept in main plots while, N levels were tried in sub plot of split plot design replicated thrice. Frenchbeen variety 'Amber' and Potato variety 'Khufri Chandramukhi' were sown on 26 October and 30 October with 125 kg/ha seed of frenchbeen and 25q/ha potato seed tuber. A uniform basal dose of 80 Kg P₂O₅/ha through single super phosphate was applied on row basis sown in different treatments. Potato crop was digged on 16th and 18th Feb. while frenchbean was harvested on 10th and 15th March during two years. The important result of investigation on pooled basis over years are presented for evaluation of french bean effect.

RESULTS AND DISCUSSION

Frenchbean :

Effect of cropping system:

Plant stand of french been was significantly high in pure cropping than intercropping because in inter cropping only 60 per cent area was sown with french bean against 100 per cent in pure cropping. french bean in intercropping showed significantly high values of growth characters crop growth rate, relative growth rate, net assimilation rate and dry matter accumulation per plant than in sole cropping. The better growth of french bean in intercropping might be due to availability of more space particularly above ground which was utilized by crop plants in their development by taking the advantage of