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Anjum Ahmad
Department of Agronomy,
Indira Gandhi Krishi
Vishwavidyalaya, Raipur,
Chhattisgarh, India

GS Tomar
Department of Agronomy,
Indira Gandhi Krishi
Vishwavidyalaya, Raipur,
Chhattisgarh, India

SK Taunk
Department of Agronomy,
Indira Gandhi Krishi
Vishwavidyalaya, Raipur,
Chhattisgarh, India

N Verma
Department of Agronomy,
Indira Gandhi Krishi
Vishwavidyalaya, Raipur,
Chhattisgarh, India

MS Shah
Department of Agronomy,
Indira Gandhi Krishi
Vishwavidyalaya, Raipur,
Chhattisgarh, India

Correspondence
Anjum Ahmad
Department of Agronomy,
Indira Gandhi Krishi
Vishwavidyalaya, Raipur,
Chhattisgarh, India

Economic feasibility and correlation coefficient of forage cowpea - A Review

Anjum Ahmad, GS Tomar, SK Taunk, N Verma and MS Shah

Abstract

The present investigation was carried out to determine the economic feasibility and correlation coefficient between growth and yield contributing characters with the forage yield of cowpea. Results revealed that Interaction of variety and levels of phosphorus enabled the crop to increase seed and fodder yields significantly. Variety UPC-626 when fertilized with 80 kg P₂O₅ ha⁻¹ recorded maximum green (322 q ha⁻¹) and dry fodder yields (50 q ha⁻¹) as compared to other varieties. With respect to economics of the treatments, variety UPC-626 gave maximum net profit of Rs. 15248 ha⁻¹ with a B:C ratio of 1.85. Application of phosphorus at 80 kg ha⁻¹ was found to be beneficial for getting higher profit (Rs. 12772). Variety UPC 626 gave highest net returns of Rs. 16548 and B:C ratio of 1.43 when fertilized with 80 kg P₂O₅ ha⁻¹. Estimates of correlation coefficient indicated positive significant relationships, existed between growth attributes (*viz.*, plant height, no. of leaves, branches and DMA g plant⁻¹) and green forage yield of cowpea.

Keywords: Economic feasibility, forage cowpea

Introduction

Forage plays an important role in the dietary of animals, even though little attention was paid in the past for the improvement of forages. The major constraints in the field of forage production and utilization include lack of high yielding varieties suitable for different agro-climatic conditions, inadequate availability and management of plant nutrients, which are the important factors affecting growth, quality and forage yield to a great extent.

Variety x Levels of phosphorus

Cowpea varieties interacted significantly with phosphorus fertilizer and resulted in higher forage yields. Rajshree and Pillai (2001) [11] concluded that enhancing the P level to 60 kg increased the LAI, number of branches per plant in different varieties of cowpea. All the cowpea varieties except Karnataka Local were found to respond positively to phosphorus application, which is in line with the results obtained by Jain *et al.* (1986) [5]. Similar observation was reported by Oko *et al.* (2001) [7] for all cultivars except T81D-1228-14 in which the effect of P fertilizer increased with increasing rate of application. Bhilare and Patil (2002) [11], however, observed that the interaction effects due to cultivars and P levels were non-significant but cowpea cv. UPC-951 with the application of 60 kg P₂O₅ ha⁻¹ showed the highest forage (247.08 q ha⁻¹) and dry matter (51.47 q ha⁻¹) yield at Rahuri (Maharashtra).

Economics

Economic feasibility studies conducted by numerous scientists, indicated the monetary advantages due to high yielding varieties of cowpea and levels of phosphorus. Tripathi *et al.* (1977) [13] reported that response to applied phosphorus was maximum in case of variety FOS1. It was estimated that with the application of economic dose of 40 kg P₂O₅ ha⁻¹ in the variety HFC 42-1, the highest net profit expected was Rs. 1300 ha⁻¹, whereas it was lowest in case of variety Russian giant. On the other hand, Rajput (1994) found highest monetary returns and B: C ratio were found owing to 50 kg P₂O₅ ha⁻¹ compared with the other treatments. Economic evaluation conducted by Chattopadhyay and Dutta (2003) [3] revealed that dual inoculation with bio-fertilizers gave maximum net return and benefit: cost ratio. Patel *et al.* (2003) [8] reported that the highest, net return (Rs. 5330 ha⁻¹) was obtained with the application of P at 40 kg ha⁻¹ through DAP. Vikrant *et al.* (2005) [14] also reported highest net returns, benefit cost ratio and per cent increase in net returns over the control with 40 kg P ha⁻¹. Results of an experiment conducted in AICRP on Forage crops, at Rahuri (Maharashtra) showed that cowpea cultivar Bundel Lobia-1 recorded higher seed yield, gross and net monetary returns and cost benefit ratio than others (Pathan *et al.* 2006) [9].

Correlation studies

Fodder yield of a crop is the result of interaction of number of interrelated characters. Correlation studies of Singh *et al.* (1998) ^[12] revealed that grain yield per plant was positively and significantly associated with cluster per plant, pods per plant and total biomass per plant. In a correlation and path analysis studies done by Borah and Khan (1999) ^[2], it was found that green fodder yield showed positive significant correlation with number of leaves, leaflet width, days to 50 % flowering, dry matter yield, dry weight of leaves and dry weight of stem. The path coefficient analysis showed that the highest positive direct effect on green fodder yield was exhibited by dry matter yield followed by leaf: stem ratio and plant height. Similarly, Kohli and Agrawal (2002) ^[6] also obtained positive correlation in forage yield with yield components (no. of branches, plant height, leaf: stem ratio, leaf and plant weight). Dhanasekar and Pandey (2005) ^[4] found that leaf area and other morphological characters have been found to be significantly and positively correlated with yield as correlation studies give us idea of the magnitude and direction of association plant parts to the yield and yield components.

Conclusion

Interaction effect of cowpea varieties and levels of phosphorus on forage production was found to be significant. Application of phosphorus at 80 kg P₂O₅ ha⁻¹ increased the growth and fodder yields of all the varieties. Significantly higher fodder yield was obtained with UPC-626 at higher level of phosphorus fertilization. Economics of the treatment combinations suggests that variety UPC-626 fertilized with 80 kg P₂O₅ ha⁻¹ resulted into a net returns of Rs. 16548/- per hectare with a B:C ratio of 1.43, being found superior compared with other treatment combinations. Correlation studies estimated the growth parameters had significant positive interrelationship with the forage yield of cowpea. Hence, growth traits like plant height, leaves, branches and DMA per plant needs to be considered while selecting cultivars.

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