

Effect of Foliar Fertilization of N and P on Protein Yield of Blackgram Varieties *

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Field experiments were conducted under rice fallow conditions in the summer seasons of 1976 and 1977 comparing the performance of the newly released short duration varieties of blackgram at the Tamil Nadu Agricultural University, Coimbatore. N and P were applied as foliar spray either alone or in combination at flowering and pod formation stages. The results indicated that variety Co 4 gave maximum protein yield of 336 kg/ha. Protein yield was increased by foliar application of N and P either alone or in combination in rice fallow condition.

Research towards quantitative and qualitative improvement of pulse crops is essential because of the vital role that these crops play in providing a reasonably balanced protein component in the diet of primarily cereal eating people of India. In a study undertaken to evaluate the varieties and fertilization under rice fallow condition, qualitative analysis of protein yield was also assessed with a view to find out the varietal variation and effect of fertilization.

MATERIAL AND METHODS

Field experiments were conducted in summer seasons of 1976 and 1977 in a moderately drained clay loam soil of the farm, having low, medium and high available nutrient status for N (211.00 kg/ha), P₂O₅ (16.4 kg/ha) and K₂O (728 kg/ha), respectively. Short duration blackgram varieties Co2, Co 3, and Co 4 of 65 to 75 days dur-

ation released from the Tamil Nadu Agricultural University, Coimbatore, were chosen. Five fertilizer levels viz., control, water spray, foliar application of 10 kg N/ha as urea, foliar application of 12.5 kg P/ha as super phosphate and foliar application of 10 kg N/ha + 12.5 kg P/ha as urea and super phosphate were tested on these varieties. Potassium was not applied. There were 15 treatment combinations laid out in randomised block design and replicated thrice. Rhizobium treated seeds were dibbled in between rice stubles with a spacing of 20 cm × 10 cm a day after the harvest of rice. Foliar spray as per schedule of treatments was given in two splits, one at flowering (35—40 days) and the other at early pod formation stage (45—50 days). The concentration of urea solution (to supply N) was 1.81 per cent and that of super phosphate (to supply P) was 6.5 per cent. All the routine

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cultural practices were followed and plot-wise grain samples were drawn for assessing protein yield.

Crud protein content of grain was calculated by multiplying the N content of grain with the factor 6.25 (Humphries, 1956). The protein yield per hectare was calculated from the protein per cent and grain yield.

RESULTS AND DISCUSSION

Variety Co 4 recorded the maximum protein yield followed by Co 3 and Co 2 (Table). Krober (1963) stated that protein content was of no major significance as compared to the seed yield since the seed yield was major deciding factor of the protein yield. The higher grain yield recorded by the variety Co 4 has contributed to higher yield of protein. Leng (1968) stated that common Indian pulses yielded 120 to 200 kg protein/ha. The average protein yield of the variety Co 4 (334.5 kg/ha) is fairly high and noteworthy.

Foliar application of N and P together or P alone gave similar increase in protein yield and were superior to other treatments. Application of P increased the N content of plant tissues and this would have resulted in higher N uptake by grain. Therefore, there was increased protein yield due to the foliar application of

N and P or P alone. Tej Singh *et al*y (1975) recorded increased protein yield due to the application of 25 kg N and 50 kg P 205/ha in greengram. The interaction between varieties and fertilization levels was not significant.

From the study it can be concluded that Co 4 is a suitable variety for rice fallow conditions both in terms of grain yield and protein yield. Foliar application of 12.5 kg P₂O₅/ha would help to increase the protein yield.

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TABLE Yield of grain and protein by blackgram varieties

Treatments	Grain yield (kg/ha)		Yield of protein (kg/ha)	
	1976	1977	1976	1977
Varieties				
Co 2	1200	1734	272	294
Co 3	1313	1792	313	300
Co 4	1349	1801	336	333
S. E.	35.1	41.6	8.9	2.7
C. D. (P = 0.05)	101.7	N. S.	25.8	7.8
Fertilizers				
Control (No N and P)	1134	1654	268	291
Water spray (No N and P)	1227	1699	300	297
Foliar application of 10 kg N/ha	1299	1773	300	314
Foliar application of 12.5 kg P/ha	1337	1819	319	319
Foliar application of 10 kg N/ha + 12.5 kg P/ha	1441	1933	348	325
S. E.	45.3	53.7	11.5	3.5
C. D. (P = 0.05)	131.3	155.4	33.3	10.0