

Effect of nitrogen, phosphorus and cutting management on fodder yield of cowpea (*Vigna unguiculata*)

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Cowpea [*Vigna unguiculata* (L.) Walp.] is a versatile legume fodder crop, which performs better than cereal fodders in eastern region of the country (Yadav *et al.*, 1979). In case of fodder crops, stage of cutting is important in terms of nutrition, better distribution and continuous supply of green fodder.

A field experiment was conducted during rainy season 1990 at Bhubaneswar, to study the effect of cutting management and fertility levels on green-fodder, dry-matter and crude protein yields of cowpea. Two cutting managements (1 cut at 50% flowering stage and 2 cuts — 1 at 40 days after sowing and other at 50% flowering stage); and 7 fertility levels (0 : 0, 20 : 20, 20 : 40, 40 : 20, 40 : 40, 60 : 20 and 60 : 40 kg N and P_2O_5 /ha respectively) were tried in randomized block design with 4 replications. The soil was sandy loam with pH 5.5. Cowpea 'EC 4216' was sown in rows at 30 cm x 10 cm spacing on 26 July 1990. The final harvesting of the crop was done at 65 days after sowing in 1-cut system and at 75 days in 2-cut system. The weight of green fodder was taken *in situ* immediately after the harvest.

The green-fodder yield was highest in 2-cut system, followed by 1-cut system. However, the dry-matter yield in the latter system was significantly superior to the former (Table 1). The results are in line with those of Faroda and Tomar (1976). The fertility

level of 20 : 40 kg N and P_2O_5 /ha gave significantly highest green-fodder and dry-matter yields over the other fertilizer combinations. All the growth parameters such as number of branches, leaves/plant, leaf-area index, number of nodules/plant, were found significantly superior with 20 and 40 kg N and P_2O_5 /ha to the other fertilizer combinations. The crude protein yield was significantly superior in 1-cut system. Similarly, crude protein yield was 508 kg/ha and 510 kg/ha at 20 and 40 and 40 and 40 kg N and P_2O_5 /ha respectively. Arora and Das (1978) reported that balanced use of fertilizer resulted in higher crude protein content in cowpea. The economic analysis showed the superiority of 1-cut system in combination with the fertility level of 20 and 40 kg N and P_2O_5 /ha, giving a net return of Rs 4,108/ha and a benefit : cost ratio 2.09.

The results indicated that any of the cutting systems with 20 and 40 kg N and P_2O_5 /ha may be used in cowpea for higher yield.

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Table 1. Green-fodder, dry-matter and crude protein yields and growth parameters of cowpea as influenced by cutting management and fertility levels

Treatment	Branches/ plant	Leaves/ plant	Leaf- area index	Nodules/ plant at 35 DAS	Green- fodder yield (q/ha)	Dry-matter yield (q/ha)	Crude protein yield (kg/ha)	Net return (Rs/ha)	Benefit : cost ratio
<i>Cutting management</i>									
1 cut	4.6	25.6	7.0	11.9	204.2	32.1	461	3,603	2.00
2 cuts	5.5	26.8	7.5	11.9	208.3	28.0	417	3,348	1.84
<i>Fertilizer (kg/ha)</i>									
N ₀ P ₀	3.4	19.7	6.0	9.4	139.8	20.9	212	1,515	1.45
N ₂₀ P ₂₀	3.8	22.7	6.4	10.5	204.1	31.6	423	3,531	1.97
N ₂₀ P ₄₀	6.2	29.2	7.7	15.0	224.7	33.7	508	4,108	2.09
N ₄₀ P ₂₀	5.4	26.3	7.4	12.6	211.8	30.7	467	3,675	1.98
N ₄₀ P ₄₀	6.5	30.4	8.2	14.1	230.9	31.0	510	4,212	2.09
N ₆₀ P ₂₀	5.3	27.0	7.2	10.3	208.8	29.5	463	3,456	1.90
N ₆₀ P ₄₀	5.8	28.3	7.8	11.9	223.7	31.1	490	3,844	1.97
CD (P = 0.05)	2.0	1.4	1.1	1.2	12.3	1.9	2.0		

N, Nitrogen; P, P₂O₅
DAS, Days after sowing