influenced due to application of these amendments, to a lesser degree, probably due to short term effects of the amendments. It is therefore concluded that application of pressmud @ 5 t/ha or lime @ 2 t/ha over a long period of time will be beneficial in increasing crop yields and improving the physico-chemical properties of soil.

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NUTRIENT UPTAKE IN MESTA (*Hibiscus sabdariffa*) UNDER VARYING FERTILIZER COMBINATIONS

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ABSTRACT

A field experiment was conducted at the Agricultural College Farm, Dharwad during *kharif* 1984-85 to study the nutrient uptake in mests under different fertilizer levels. It was observed that N uptake increased with an increase in N levels. The P uptake varied from 10.73 to 12.56 kg/ha which indicated the low P requirement by mesta. On the other hand, the K uptake by mesta was more than N and P and showed higher K requirement.

KEY WORDS : Mesta, Fertilizer Combinations, Nutrient Uptake

Mesta, a fibre and hardy crop which suppresses the weeds, can be cultivated under low levels of fertility with less care and expense. This crop can be cultivated where jute cultivation is not possible. The crop can be cultivated on almost all types of soils with varying fertility levels in low rainfall areas. The main reasons for low yield of this crop in India as compared to other countries are the low yielding local varieties and lack of proper crop management practices.If the yield and quality of the crops is to be increased, there is a need to generate the information on the fertilizer requirement of the crop. With this objective, the present experiment was undertaken to study the nutrient uptake under different fertilizer combinations.

MATERIALS AND METHODS

A field experiment was conducted at the Agricultural College Farm, Dharwad (Karnataka) during *kharif* 1984-85 under rainfed condition. There were 36 treatment combinations consisting of 3 levels of phosphorus, 3 levels of potassium forming 9 treatment combinations in main plot and 4 levels of nitrogen in sub-plots in each main plot. The experiment was laid out in split plot design with three replications. The fertilizer combinations tried were:

Phosphorus (P_2O_5) : O (P_0), 20 (P_1) and 40 (P_2)

Potassium (K_2O) : O(K_0), 20 (K_1) and 40 (K_2)

Table 1. Nutrient uptake (kg/ha) as influenced by different combinations of N, P and K in mesta

		K Uptake (kg per ha)					P uptake (P_2O_5 kg per ha)					K uptake (K_2O kg per ha)				
		N_0	N_1	N_2	N_3	Mean	N_0	N_1	N_2	N_3	Mean	N_0	N_1	N_2	N_3	Mean
	K_0	15.79	29.26	48.52	56.44	37.50	8.93	10.67	11.80	14.78	11.54	39.23	44.52	79.03	92.36	63.78
P_0	K_1	17.40	28.29	45.02	64.75	33.88	7.21	9.73	10.99	12.22	10.04	41.83	51.06	68.26	84.25	59.35
	K_2	17.93	47.59	57.67	60.21	45.85	7.05	10.08	11.37	13.94	10.61	38.10	53.10	39.47	102.11	90.97
	Mean	17.06	35.04	55.40	60.47	40.74	7.73	10.16	11.39	13.65	10.73	39.72	49.59	76.59	92.90	64.70
	K_0	22.00	34.83	50.63	63.44	43.97	8.83	10.00	11.33	14.15	11.07	56.07	50.21	58.07	98.92	65.81
P_1	K_1	29.05	48.22	55.10	66.56	49.73	7.45	9.65	11.32	15.20	10.91	112.90	51.32	60.53	94.04	62.20
	K_2	28.75	43.18	56.37	53.45	50.44	8.68	9.52	10.47	14.23	10.79	45.53	54.41	65.10	97.25	65.57
	Mean	26.60	42.08	54.03	69.49	45.05	8.32	9.73	11.04	14.59	10.92	48.17	51.98	61.24	96.73	64.53
	K_0	30.77	41.60	59.77	73.27	51.35	9.50	11.57	13.07	14.74	12.21	36.33	40.56	46.73	60.72	46.08
P_2	K_1	30.89	48.28	53.10	66.17	49.61	10.33	11.18	13.98	14.56	12.51	43.59	53.60	60.54	68.13	56.45
	K_2	29.83	43.80	54.25	64.72	48.15	10.35	12.29	14.12	15.02	12.94	45.27	45.79	68.20	99.46	64.93
	Mean	30.50	44.56	55.71	68.05	49.70	10.05	11.68	13.71	14.77	12.56	42.06	46.65	58.49	76.10	55.82
	K_0	22.85	35.23	52.97	66.05	44.27	9.05	10.74	12.06	14.56	11.61	43.87	45.10	61.28	84.00	58.56
	K_1	25.79	41.60	51.07	65.83	46.07	8.33	10.19	12.10	13.99	11.15	42.77	51.99	60.44	82.14	59.34
	K_2	25.50	44.86	56.10	66.13	48.15	8.69	10.63	11.99	14.46	11.45	43.30	51.13	74.59	99.60	67.16
	Mean	24.72	40.56	53.98	66.00		8.70	10.52	12.05	14.34		43.32	49.41	65.43	88.58	

	S.Em ±	C.D. at 5%	S.Em ±	C.D. at 5%	S.Em ±	C.D. at 5%
N	0.38	1.15	0.13	0.41	1.11	3.25
P	0.33	0.93	0.15	0.43	0.95	2.69
K	0.33	0.93	0.15	0.43	0.95	2.69
NP	1.62	4.74	0.67	1.95	4.70	13.72
NK	1.62	4.74	0.67	NS	4.70	13.72
PK	0.57	1.62	0.26	0.74	1.64	4.67
NPK	2.81	8.22	1.16	3.38	8.14	23.78

NS = Not significant

Nitrogen (N) : O(N_0), 30 (N_1), 60 (N_2) and 90 (N_3)

The experimental area was deep black cotton soil (vertisols) with 7.7 pH and 0.72 per cent organic carbon. Soil contained 1474 kg/ha total N, 154 kg/ha available P_2O_5 and 374 kg/ha available K_2O. The test crop seeds were dibbled (2 seeds per spot) at 10cm intra row spacing and 20 cm inter row spacing and the seedlings were thinned 15 days after sowing (DAS) retaining one plant per spot. Full doses of P_2O_5 and K_2O along with 50 per cent N were applied in bands around the plant at the time of sowing and remaining 50 per cent N was given as top dressing at 30 DAS. Five randomly selected plants in each treatment at harvest were oven dried to a constant weight. Then dried plants were powered in a Willey mill and analysed for N, P and K by standard methods (Jackson, 1967).

RESULTS AND DISCUSSION

Nitrogen uptake

The effect of all N levels differed significantly to N uptake by mesta. The lowest N uptake was recorded in control (N_0) treatment (24.72 kg/ha) as against a highest uptake of 66.0 kg/ha at 90 kg

N/ha. This might be due to higher N application which led to enhanced vegetative growth and increased uptake of N. The results are in agreements with those of Adamson *et al* (1979) and Sinha and Saha (1980).

The effect of P was found to be significant in influencing the N uptake by mesta wherein increased P levels increased the N uptake. The control (P_0) treatment treatment recorded the lowest N uptake. (40.74 kg/ha) as against higher P level of 40 kg/ha which recorded the maximum N uptake of 49.70 kg/ha. The effect of K in the uptake showed similar trend as that of P. The lowest N uptake (44.27 kg/ha) was recorded in control (K_0) treatment and the highest (48.15 kg/ha) at higher K level of 40 kg/ha. The interaction effects of N and P, N and K, P and K and N, P and K were significant in influencing the nitrogen uptake by mesta (Table 1).

Phosphorus uptake

All N levels differed significantly with regard to P uptake. The P uptake increased with an increase in N levels. The lowest P uptake was recorded in control (N_0) treatment and the highest in 40 kg/ha level.

The effect of P was found significant on the uptake of P by mesta. The P uptake at P_0 (10.73 kg/ha) and 20 kg P/ha level (10.92 kg/ha) were on par with each other but recorded significantly lower P uptake (12.56 kg/ha) at higher level of 40 kg P/ha.

The effect of K on the P uptake of mesta followed a different trend but differed significantly among the treatment. The lowest P uptake (11.51 kg/ha) was recorded at 20 kg K/ha, level which was however on par with P uptake of 11.62 kg/ha recorded in control treatment (K_0). In general, the P uptake varied from 10.73 to 12.56 kg/ha indicating lower P requirement by mesta. These results are in conformity with the findings of Adamson *et al.* (1979) and Sinha and Saha (1980). Such lower requirement of P by mesta might be due to the higher availability of P in the soil of experimental site (Table 1).

The interaction effects of N and P, P and K and N, P and K were found significant in influencing the uptake. But N and K interaction was not significant (Table 1).

Potassium uptake

All N levels differed significantly in K uptake by mesta (Table 1). The lowest K uptake (43.42 kg/ha) was recorded in control (K_0) treatment and the highest (88.58 kg/ha) at 90 kg N/ha. Similarly the effect of P was found significant for K uptake. The lowest K uptake (55.82 kg/ha) was recorded 40 kg P/ha level as compared to control (64.2 kg/ha) and at 20 kg P/ha (64.53 kg/ha), which were on par with each other. The K uptake increased with an increase in K levels (40 kg K/ha) and was significant, between different K levels. This might be due to the presence of higher available K in the soil of the experimental site. The uptake ranged from 58.86 kg to 67.16 kg/ha (Table 1). Among the nutrients, the K uptake of mesta was maximum as compared to N and P (Lakshminarayana *et al.* 1980). The interaction effects of N and P, N and K P and K and N, P and K were found significant influencing the K uptake.

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