

Effect of foliage-applied plant nutrients on seed production of kanzungula grass (*Setaria sphacelata*)

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Kanzungula grass [*Setaria sphacelata* (Schumach.) Stapf & Hubbard ex Moss] cv. 'Nandi' is one of the nutritious grasses adapted to tropical and subtropical environments (Dwivedi, 1985; Dwivedi *et al.*, 1991). The acute shortage of seed material of this grass, however, poses great problem in forage production. In view of its adaptability to marginal soil conditions, the availability of nutrients to plant during reproductive stage is crucial for seed setting (Gray, 1977). Application of nutrients through foliar spray accelerates the absorption and assimilation mechanism and correct the nutritional deficiency quickly. Therefore the present experiment was conducted to study the effect of foliar fertilization on seed yield of this grass.

The experiment was conducted during 1987 and 1988 in randomized block design with 3 replications at Jhansi. The soil of the experimental field was sandy loam with neutral pH. The 45-day-old grass seedlings were transplanted in the second week of July 1987, at 50 cm x 50 cm spacing. Sixteen treatments consisted of foliar spray of KNO_3 , urea, single superphosphate, ZnSO_4 and MgSO_4 individually @ 2 kg/ha and their combinations along with the control. The rainfall during 1987 was 828.2 mm in 43 rainy days and 815.9 mm during 1988 in 52 rainy days. Crop was harvested in the first week of October in both the years after

manual collection of seeds.

All the nutrients significantly increased the seed yield compared with the control (Table 1), indicating the need for these nutrients during reproductive phase of seed crop. The increase in seed yield over the control due to individual nutrients was 55.1, 45.3, 34.7, 15.0 and 12.4% for KNO_3 , urea, ZnSO_4 , single superphosphate and MgSO_4 respectively. The KNO_3 with urea or single superphosphate resulted in 68.9 and 50.7% more seed than the control. It indicates synergistic effect of nutrients in combination on seed yield. Foliar application of KNO_3 + urea significantly increased the plant height, tussock diameter, number and length of ears/spike. Stover yield (tonnes/ha) was found in order of KNO_3 > urea > ZnSO_4 > single superphosphate > MnSO_4 . Therefore KNO_3 + urea combination gave the highest stover yield, followed by urea + ZnSO_4 . The highest seed and stover yields with KNO_3 + urea were owing to its influence both on vegetative growth (height, tiller and tussock diameter) and reproductive organs (spike length and ear number/plant). These results are in conformity with those of Dwivedi *et al.* (1991).

Application of KNO_3 and single superphosphate resulted in 1,000-seed weight of 0.550 and 0.537 g respectively. Application of KNO_3 either with single superphosphate or urea gave test weights of

Table 1. Effect of foliage-applied plant nutrients on plant vigour, yield attributes, 1,000-seed weight and germination (%) of kanzungula grass seed (mean data of 2 years)

Treatment	Height (cm)	Tillers (No.)	Tussock diameter	Ear (No.)	Spike length (cm)	Stover yield (tonnes/ha)	Seed yield (kg/ha)	1,000-seed weight (g)	Germination (%)
KNO ₃	192.8	75	20.06	45	23.46	14.11	39.71	0.550	60
Urea	202.8	50	16.73	26	19.83	13.87	37.21	0.510	62
SSP	186.3	44	15.23	33	23.77	12.65	29.45	0.537	64
ZgSO ₄	149.4	49	14.67	28	22.77	12.70	34.51	0.453	42
MnSO ₄	116.0	40	14.30	28	21.08	12.55	28.83	0.480	52
KNO ₃ + urea	202.8	68	17.10	35	24.53	15.82	43.25	0.597	70
KNO ₃ + SSP	192.9	56	14.50	31	24.40	14.24	38.60	0.600	66
KNO ₃ + ZnSO ₄	180.7	60	15.73	21	23.37	13.46	37.45	0.513	58
KNO ₃ + MgSO ₄	182.3	53	15.46	29	21.67	13.42	35.83	0.507	50
Urea + SSP	185.3	56	17.07	35	22.70	15.35	38.53	0.593	54
Urea + ZnSO ₄	175.2	60	15.80	33	23.90	14.20	38.10	0.550	50
Urea + MnSO ₄	162.1	53	14.67	24	22.67	13.55	35.83	0.487	44
SSP + ZnSO ₄	200.7	66	14.40	35	24.00	13.17	32.85	0.507	48
SSP + MgSO ₄	154.9	51	14.80	32	21.77	11.81	32.60	0.497	48
ZnSO ₄ + MgSO ₄	198.6	44	13.87	29	22.93	12.01	30.86	0.490	50
Control	127.4	32	12.83	24	21.17	10.33	25.61	0.427	42
LSD (P = 0.05)	44.2	NS	2.32	12	NS	0.88	3.03	0.050	

SSP, Single superphosphate

0.60 and 0.59 g, which were at par each other. The germination (%) was the highest in KNO_3 + urea - sprayed plots, followed by KNO_3 + single superphosphate. The minimum germination occurred in seeds obtained from the control plots.

It may be concluded that foliar application either of KNO_3 or single superphosphate or ZnSO_4 with urea is essential for potential seed harvest in kanzungula grass.

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