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Response of Fodder Sorghum (*Sorghum bicolor*) Varieties to Levels of Nitrogen and Phosphorus

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A field experiment to study the response of fodder sorghum varieties (GFS-4 and Gundari) to nitrogen (0, 20, 40 and 60 kg N/ha) and phosphorus (0, 20 and 40 kg P_2O_5/ha) was carried out during *rabi* season of 1992-93 at Agronomy Farm, Gujarat Agricultural University, Junagadh. The soil was clayey in texture and slightly alkaline in reaction with low available nitrogen, medium available phosphorus and high available potassium. The experiment was laid out in split plot design with three replications. The crop was sown on November 5, 1992 with inter-row spacing of 30 cm using 60 kg/ha seed rate.

The data presented in Table 1 indicated that growth attributes and fodder yield were significantly differed among both the varieties. The variety GFS-4 was found superior in respects of plant height (at 30 and 45 days after sowing (DAS) as well as at harvest), leaf area/plant, internodes/plant, length of internode and stem thickness which ultimately resulted in significantly higher green and dry fodder yield. Variety GFS-4 produced 19.8 and 20.7% higher green and dry fodder yield, respectively over variety Gundari, Vekaria (1989) also made similar observations.

Growth attributes and fodder yield were significantly increased with each increament in level of N, except number of internodes/plant. Application of 60 kg N/ha recorded significantly the highest plant height (at 30 DAS, 45 DAS and harvest), leaf area/plant, length of internode and stem thickness which reflected in significantly higher green and dry fodder yield. N fertilization @ 60 kg/ha registered 100.3, 43.5 and 15.4% higher green fodder yield as well as 101.1, 44.5 and 15.0% higher dry fodder yield over 0, 20 and 40 kg N/ha, respectively. Similar results were also obtained by Vekaria (1989) and Patel (1991).

Different levels of phosphorus exert thier significant influence on growth attributes and fodder yield. Both the higher levels of P i.e. 20 and 40 kg P_2O_5/ha being on par, significantly improved plant height, leaf area/plant, length of internode and stem thickness and consequently higher green and dry fodder yield to the tune of 29.8 and

TABLE 1

Effect of nitrogen and phosphorus on growth and yield of sorghum varieties.

Treatment	Plant height (cm)			Leaf area/ plant (dm^2)	Number of internodes/ plant	Length of internode (cm)	Stem thickness (mm)	Fodder yield (q/ha)	
	30 DAS	45 DAS	Harvest					Green	Dry
Variety									
GFS-4	55.3	121.7	160.0	14.66	7.1	21.8	3.9	218.0	75.5
Gundari	47.2	108.8	138.9	12.90	6.2	19.8	5.4	182.0	62.6
C. D. at 5%	4.3	7.2	12.8	1.44	0.5	1.8	0.5	28.4	8.4
Nitrogen (kg/ha)									
0	41.3	90.8	110.2	12.29	6.5	15.3	3.6	130.4	44.9
20	49.4	108.6	147.4	13.54	6.6	20.7	4.2	182.0	62.5
40	55.1	121.1	163.1	14.20	6.7	22.8	5.0	226.4	78.5
60	59.4	130.5	177.2	15.09	6.7	24.4	5.6	261.2	90.3
C. D. at 5%	1.8	3.6	6.4	0.60	NS	1.1	0.2	13.6	3.9
Phosphorus (kg/ha)									
0	48.8	110.5	120.8	13.35	6.6	16.8	4.2	166.0	57.4
20	51.2	115.1	162.6	14.07	6.6	22.7	4.7	215.5	74.4
40	53.8	112.7	165.0	13.92	6.7	22.9	4.9	218.5	75.4
C. D. at 5%	1.6	3.2	5.6	0.52	NS	0.9	0.2	11.8	3.4
Interactions	NS	Ns	NS	NS	NS	NS	NS	NS	NS

29.6%, respectively over control. The findings are in confirmity with those of Patel (1991).

Interaction effects of variety, nitrogen and phosphorus were found non-significant for all the growth parameters and yield.

Thus, the sorghum variety GFS-4 can be fertilized with 60 kg N + 20 kg P_2O_5/ha for securing higher fodder yield under south Saurashtra agro-climatic conditions.

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