

Note on Effect of Seeding Rate, Nitrogen and Phosphorus on Fodder Yield of Irrigated Sundhia Jowar (*Sorghum vulgare*, var. *Paniculatella*) 'S 1049'

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Among the various types of forage sorghums Sundhia 'S 1049' grows quickly and attains flowering and maturity in 45 and 65 days, respectively. The plant characteristics and their performance have been described by Patel, Patel and Patel (1959). Several workers have studied the yield potentiality of Sundhia jowar "S 1049" in relation to seed rate and response to nitrogen and phosphate

(Motiwale, 1959 and Patel, 1968). Purohit (1960) and Rao (1960) observed that application of nitrogen alone increased the green and dry fodder of Sundhia jowar "S 1049". In the present experiment, therefore, an attempt was made to study the effect of seeding rate and certain levels of nitrogen and phosphorus on fodder yield of Sundhia jowar "S 1049" under irrigation during the hot weather season of 1967-68.

This field experiment was conducted at the farm of Agricultural College, Institute of Agriculture, Anand, during hot weather season of 1967-68. Two levels of seed rate viz., 90 and 120 kg/ha and six selected fertilizer treatments as shown in Table 1 were tried. In all, there were 12 treatment combinations

TABLE 1
Effect of different treatment on yield and other characters of Sundhia jowar 'S 1049'.

Treatments	Yield kg/ha		Plant population/m length	Stem thickness, cm	Leaf to stem ratio	Net profit Rs/ha
	Grain	Dry fodder				
Fertilizer						
U-N ₈₀ -P ₀	768	8894	95.0	0.25	0.844	1147
ASP-N ₄₀ P ₄₀ + U-N ₄₀	727	9038	95.3	0.27	1.004	1048
U-N ₁₀₀ P ₀	913	8977	94.0	0.26	0.871	1230
ASP-N ₅₀ P ₅₀ + U-N ₅₀	758	9715	93.8	0.27	1.038	1107
U-N ₁₂₀ P ₀	1081	8897	95.4	0.26	0.847	1308
ASP-N ₆₀ P ₆₀ + U-N ₆₀	913	9593	93.8	0.27	0.920	1146
SEm ±	83.7	563.7	1.9	0.014	0.05	—
CD 5%	241.4	NS	NS	0.040	0.14	—
Seeding rate						
90 kg/ha	871	8699	85.2	0.27	0.926	1116
120 kg/ha	848	9672	103.9	0.25	0.915	1212
SEm ±	48.3	325.7	1.1	0.0026	0.03	—
CD at 5%	NS	942.9	3.2	0.0074	NS	—

U = Urea, ASP = Ammonium Sulphate Phosphate.

which were replicated four times in a randomised block design.

The soil was a typical sandy loam locally known as "goradu" soil. Fifty per cent of nitrogen and all phosphate was applied before sowing, while the remaining fifty per cent of the nitrogen was applied one month after sowing. Nitrogen and phosphate in 1:1 proportion were applied in the form of ammonium sulphate phosphate. The rest of the nitrogen was applied as urea.

The data collected for grain and fodder yield, plant population, stem thickness and leaf to stem ratio were subjected to statistical analysis. A standard method of analysis of variance for randomised block design was used and the treatment effects on the character studied were further compared by employing "F" test.

Grain yield results (Table 1) showed that the differences were significant due to fertilizer treatment only in the case of 120 kg/ha seeding rate. Among the treatments $U-N_{120}P_0$ gave the maximum (1081 kg/ha) while $ASP-N_{80}P_{40}$ produced the lowest (727 kg/ha) grain yield. Application of P_2O_5 reduced the grain yield in all the cases. Seeding rate was not found significant. However, 90 kg gave slightly more grain yield than the seeding rate 120 kg/ha. A combination $U-N_{120}P_0$ with 90 kg or 120 kg seeding rate/ha was found superior to 80 or 100 kg nitrogen. The interaction fertilizer $\times$ seeding rate was not significant.

Dry fodder yield was not affected by fertilizer treatments. However the

treatment $ASP-N_{80}P_{50} + U-N_{50}$ produced the highest yield (9715 kg/ha). The lowest yield (8844 kg/ha) was obtained from $U-N_{80}P_0$. The association of P_2O_5 showed favourable effect on fodder yield. Seeding rate of 120 kg/ha gave maximum yield (9672 kg/ha) which was significantly higher (11.2%) than that obtained from 90 kg seeding rate. This may be attributed to the higher plant population under seeding rate of 120 kg/ha.

The data on plant population revealed that the differences in plant population due to seeding rate were statistically significant. The number of plants per meter length were 103.9 in the case of 120 kg/ha seeding rate where as there were 85.2 plants under the seeding rate of 90 kg/ha. This was very obvious because the number of seeds sown per unit area were more in higher seeding rate. The effects of fertilizer treatments and interaction of fertilizer $\times$ seeding rate were not significant.

The differences in the stem thickness was significant due to seeding rate. The lower seeding rate of 90 kg/ha produced thicker stem of 0.27 cm as compared to 0.25 cm in 120 kg/ha seeding rate. In 90 kg as well as 120 kg seeding rate the effects of fertilizer treatments were significant. The stem thickness was the least under the treatment of $N_{80}P_0$.

The difference in the leaf to stem ratios was not significant due to seeding rate. It was significant due to fertilizer treatments. The interaction of seeding rate $\times$ fertilizer was not significant.

Monetary returns and net returns

per hectare were worked out for all treatment combinations. It was found that the crop sown at the rate of 120 kg/ha seeding rate and fertilised with 120 kg nitrogen/ha alone was the best combination.

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