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Response of Lucerne Genotypes to Phosphorus and Potash

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Lucerne is one of the most important forage crops grown during winter season throughout the nation. It is a highly palatable, nutritious fodder, rich in protein and mineral constituents. To find out optimum requirement of phosphorus and potash fertilizers for different genotypes, a field experiment was conducted at Forage Research Farm, Gujarat Agricultural University, Anand in split plot design with three replications. The treatments consisted of four genotypes : Anand-2, Anand-3, L.L. Comp.-3 and T-9 as main-plot while three levels of phosphorus : 0, 50 and 100 kg/ha and two levels of potash : 0 and 50 kg/ha as sub-plot.

The soil was sandy loam with pH 8.7 containing 192.1, 51.9 and 220.0 kg/ha of available nitrogen, P_2O_5 and K_2O respectively. Phosphorus and potash fertilizers were applied as per treatment in the form of single super-phosphate and muriate of potash respectively. A basal dose of 20 kg nitrogen per hectare was given before sowing. The crop was sown during December 1987 using a seed rate of 10 kg/ha. The first cutting of lucerne was harvested after 60 days of sowing while subsequent cuttings were harvested at an interval of 25 to 30 days. In all six cuttings were taken.

The results reveal that the genotype, Anand-2 gave significantly higher yield of green forage, dry matter and crude protein than the other three (Table 1), although the genotype, L. L. Comp.-3 had higher crude protein content (22.21 %), Patel *et al.* had also reported similar results.

The application of 50 kg P_2O_5/ha gave significantly higher yield of green forage, dry matter and crude protein than the dose of 0 and 100 kg P_2O_5/ha. The higher forage yield obtained could be due to higher plant heighst (61.7 cm) and more tillers/m row length (66.9) in this treatment. The highest crude protein content and its yield registered by an application of 50 kg P_2O_5/ha. Similar type of results were noted by Patel *et al.* (1985).

The differences in yield due to potash were found not significant. However, an application of 50 kg K_2O/ha produced 3.6, 4.6 and 4.3 per cent higher green forage, dry matter and crude protein yields, respectively over no application of potassium. The low response of potassium was obtained might be due to high initial status of potassium and addition of potassium slightly increase the availability of native potassium. The interaction effect of phosphorus and potash with different genotypes were found non-significant.

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TABLE 1

Effect of phosphorus and potash on the forage yield, quality and yield attributing characters of lucerne genotypes.

Treatment	*Yield (q/ha)*			*Crude protein content (%)*	*Plant height (cm)*	*Tillers/m row length*
	Green forage	*Dry matter*	*Crude protein*			
Genotypes (G)						
Anand-2	360	84.0	17.65	21.03	63.6	66.5
Anand-3	304	72.3	15.83	21.86	59.8	64.8
L. L. Comp.-3	288	68.4	15.23	22.21	61.3	63.5
T-9	300	72.2	15.05	20.81	60.8	68.2
S. Em. ±	13	3.0	—	—	—	—
C.D. at 5%	45	10.3	—	—	—	—
C.V. %	17.6	17.0	—	—	—	—
P_2O_5-kg/ha (P)						
0	301	71.2	15.25	21.43	61.1	65.6
50	335	79.5	17.15	21.62	61.7	66.9
100	303	72.1	15.42	21.38	61.3	64.8
S. Em. ±	10	2.3	—	—	—	—
C. D. at 5%	28	6.7	—	—	—	—
K_2O-kg/ha (K)						
0	307	72.6	15.60	21.54	61.0	65.2
50	318	75.9	16.27	21.42	61.7	66.3
S. Em. ±	8	1.9	—	—	—	—
C. D. at 5%	NS	NS	—	—	—	—
C. V. %	15.1	15.5	—	—	—	—

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