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SCREENING LENTIL GERMPLASM ACROSS TWO FERTILITY REGIMES

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A set of fifty lentil genotypes was used to study its response to extra nitrogen application through foliar spray of urea. The response was measured in terms of plant height, number of pods per plant, number of secondary branches per plant, days to maturity and grain yield per plant. Different genotypes responded differentially. A positive response was observed for yield and its determinants in 12 genotypes.

Key words : Lentil, germplasm, yield, fertilizer, evaluation

Pulses have been cultivated on marginal lands for ages. This has resulted in the erosion of genetic variability responsive to better management conditions (Jain, 1981). Lentil is second most important *rabi* pulse crop of India. It is considered to be one of the oldest food crops of mankind. Traditionally, lentil has been considered to have a lower fertilizer requirement (Lal, 1989). This concept, however, has been one of the important reasons for its low productivity at 6.7 q/ha (Sharma, 1995). One of the potential strategies to increase its productivity is to breed for response to better management including higher fertilizer doses. The present investigation was, therefore, undertaken to screen lentil germplasm across two fertility regimes to identify responsive characters and genotypes.

MATERIALS AND METHODS

A set of fifty diverse genotypes of lentil were sown in a RBD in six replications at the research farm of the Institute during *rabi* 1993-94. Along with all other standard agronomic practices, a basal dose of 20 kg N/ha was given. Additionally, 20 kg urea/ha was applied in form of foliar spray only to three replications at the end of flowering, thus creating two sets of experiment each with three replications, one with only 20 kg N/ha (F_1) and the other

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with an additional 20 kg urea/ha (F_2). The data were recorded on plant height (cm), number of pods per plant, number of secondary branches per plant, days to maturity and grain yield per plant (g). Individual and pooled RBD analyses were performed subsequently.

RESULTS AND DISCUSSION

Application of extra nitrogen through foliar spray of urea caused changes in three characters, number of secondary branches per plant, number of pods per plant and grain yield per plant among various genotypes studied (Table 1). The maturity duration was increased only for VL 110 by 3.3 per cent. There was no significant change in any genotype for plant height. Mean number of pods per plant increased by 16.7 per cent in F_2 as compared to F_1. A total of 21 genotypes showed significant increase for this character. The maximum increase of 53.3 per cent was observed in PL 81-340.

Table 1. Mean, coefficient of variation (CV) and genotypes* showing positive response

Sl.No.			No. of pods per plant	No. of secondary branches per plant	Grain yield per plant
1.	Mean F_1		49.6	6.2	2.81
	F_2		57.9	8.0	3.62
2.	CV F_1		23.6	10.7	20.20
	F_2		23.8	12.7	23.90
3.	Genotypes showing increase	No.	21	23	25
		Names	PL81-340 (53)	VL 109 (55)	VHC 396 (52.8)
			NP 59A (42)	VL 119 (55)	L 4076 (50.8)
			VL 109 (48)	DPL 510 (51)	K 301 (45.7)
			VL 118 (47)	VL 110 (46)	DPL 504 (46.6)
4.	Genotypes showing no change	No.	29	27	25
		Names	NP 6565	NP 43	NP 6565
			VH 8801	VHL 8801	NP 44
			DPL 507	DPL 507	DPL 507

*Values in parentheses indicate the amount of change in %.

Table 2. Pooled ANOVA for yield and other characters in lentil under two fertility regimes

Parameter	Plant height (cm)	No. of pods per plant	No. of secondary branches per plant	Days to maturity	Grain yield per plant (g)
Mean squares					
Fertility regime	1.61	6.75	1.98	0.05	0.08
Genotype	65.60**	1128.30*	5.40*	10.60**	0.36**
Fertility regime × Genotype	0.80	28.80	0.59	0.14	0.02
Other Parameters					
Pooled mean	28.60	47.80	6.20	194.00	1.43
SE (Mean)	2.20	3.09	0.64	1.17	0.19
Critical difference at p = 0.05	6.11	8.58	1.81	3.24	0.55
Coefficient of variation	11.40	28.40	15.10	6.70	19.10

**Significant at p = 0.01.

A total of 23 genotypes showed an increase in number of secondary branches per plant increasing the average value of F_2 for this character by 29% as compared to that of F_1. The maximum increase (56.8%) was observed on VL 109. Half of the genotypes studied showed an increase in grain yield per plant, the maximum being 52.8% for VHC 396. The mean grain yield per plant increased by 28.9%. There were a total of 12 genotypes viz., VL 105, VL 4, VL 109, PML 8803, VL 111, VL 107, VL 110, HUL 12, VL 119, VL 106, VL 117 and VL 120 which showed an increase for all the three characters. The results indicate at the hidden potential in lentil germplasm for utilization in breeding programmes.

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