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K. SIVAPRAKASAM
K. PILLAYARSAMY
S. RAMU

Regional Agricultural Research Station
Kovilpatti 627701.

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Estimates of Genetic and Environmental Variability in Lentil (*Lens esculenta* Moech)

The efficiency of selection depends mainly upon the extent of variability present in a population. The phenotypic or observed variability consists of genetic and environmental variations. The genetic or heritable portion of variation can be estimated with the help of genotypic coefficient or variation, heritability and genetic advance. The present investigation was undertaken to work out the estimates of genetic and environmental variability in lentil.

The experiment was laid out with thirty diverse strains of lentil, in a randomised block design with four replications during *rabi* 1972—'73. Each plot consisted of six rows, each of 5 metre length, spaced at 25 cm. At maturity, observations were recorded for five traits viz., number of seeds per pod, test weight and grain yield per plant on five plants in each plot.

The genetic and environmental coefficients of variation, heritability and expected genetic advance were calculated according to the procedure adopted by Burton (1952), Hansen *et al.* (1956) and Jahnson *et al.* (1958) respectively.

The results of variability, heritability and expected genetic advance are being discussed below: 1. *variability*: Range, mean and standard error of mean are presented in Table 1. The characters like primary branches, test weight and grain yield per plant

TABLE 1. Range mean and standard error of mean for five traits in lentil.

Character	Range	Mean	± S. E.
Primary branches/plant	2.33 — 11.66	5.75	1.05
Pods/cluster	1.89 — 3.82	2.60	0.14
Seeds/pod	1.14 — 1.76	1.50	0.07
Test weight (g)	4.02 — 8.85	4.93	0.85
Grain yield/plant (g)	1.10 — 6.72	3.12	0.63

showed wide range of variation, other characters viz., pods per clusterand seeds per pod exhibited comparatively low range of variation. The genetic coefficients of variation were found higher than environmental ones. Three characters viz., primary branches, test weight and pods per cluster showed comparatively high genotypic coefficient of variation (Table 2). These results are in conformity with those of Singh and Malhotra (1970) and Yohe and Poehlman (1972) in mung.

TABLE 2. Genetic and environmental coefficients of variation, heritability, expected genetic advance and genetic Advance in percentage of mean

Character	Genetic coefficient of variation	Environmental coefficient of variation	Heritability (%)	Expected genetic advance	Genetic advance in % of mean
Primary branches/plant	15.94	12.00	60.39	1.47	25.56
Pods/cluster	10.63	4.05	87.42	0.54	20.76
Seeds/pod	5.89	3.33	75.23	0.16	10.99
Test weight	14.01	4.87	89.21	1.34	27.18
Grain yield/plant (g)	7.23	6.12	20.31	0.21	6.86

2. Heritability: The estimates of heritability were found high for all the characters except grain yield per plant, where it was the lowest. The highest heritability was observed for test weight as reported in mung by Empig *et al.* (1970).

3. Genetic advance: The values of expected genetic advance as expressed in percentage of mean (Table 2) ranged from 6.86 to 27.18. Three characters viz., primary branches, test weight and pods cluster showed comparatively high expected genetic advance, while it was low for other traits. The highest genetic advance was observed for test weight and the lowest for grain yield plant.

The present study reveals that the estimates of genetic coefficient of

variability, heritability and genetic advance are comparatively high for primary branches, test weight and pods cluster. This suggests that these traits may be improved through selection.

U. SINGH
P. SINGH

Division of Plant Breeding and Genetics
U. P. Institute of Agricultural Sciences
Kanpur-2.

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Effect of 2, 4-D on Mineralization of Nitrogen in Black Soils

In general, the herbicides applied at normal rates do not affect the mineralization of nitrogen in the soils. But under certain conditions, the herbicides could be detrimental to the ammonification or nitrification processes in soils. Fleig (1952) reported that the application of 2, 4-D had no effect on nitrification. But Treater *et al.* (1958) found that application of 2, 4-D at higher rates inhibited nitrification. According to Dakhanian and Kolosova (1962) 2, 4-D at 4 kg/ha increased nitrogen content of soil twice or thrice than the normal content. Castro (1964) observed that at normal rates of application, 2, 4-D did not reduce the nitrogen content of the soil. Bubey (1969) studied the effect of certain herbicides on nitrification in some tropical soils and reported that maximum inhibition of nitrification by the herbicides occurred in a soil of low nitrifying capacity while soils of normal field values had no effect. An incubation study was conducted to find out the effect of the herbicides 2, 4-D on the mineralisation of nitrogen in black soils, and the results are presented below.

The herbicide 2, 4-D was dissolved in sufficient water to bring the soil to approximately 60 per cent of the maximum water holding capacity. These solutions were added to the beakers containing the soils in such a manner as to moisten uniformly 250 g samples of air dry soils. Samples were replicated twice and incubated at room temperature.