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Short Communication

Performance, Variability, Correlation and Coheritability Estimates in Horsegram (*Macrotyloma uniflorum* Lam. Verd.)

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Horsegram (*Macrotyloma uniflorum* Lam. Verd.) is grown under rainfed conditions in unbunded uplands as a pre-*rabi* crop in North Central Plateau Zone of Orissa. Improvement of yield of horsegram requires knowledge of magnitude of variation in available germplasm, interdependence of quantitative characters with yield, extent of environmental influence on these factors and heritability of genotypic material. This experiment was conducted in order to asses the local germplasm for development of better genotypes.

A field experiment, consisting of 18 promising homozygous lines/genotypes along with three checks, was conducted during pre-*rabi* season of 1994 at Regional Research Station, OUAT, Keonjhar, in randomised block design with two replications. Each genotype was grown in 4 rows of 3 m length and each row kept 30 cm apart. Observations on days to 50% flowering, plant height, branches/plant, pods/plant, seeds/pod, 100-seed weight and yield/plant were recorded on five randomly selected plants from each genotype.

Table 1. Genetic parameters of variation for yield and its attributes in horsegram

Characters	Mean	Range	Phenotypic variance	Genotypic variance	PCV	GCV	Heritability (broad sense, %)	Genetic advance	Genetic advance (% of mean)
Plant height (cm)	58.8	43.2-73.5	93.5	59.7	16.4	13.1	63.9	12.7	6.1
Branches/ plant	4.5	2.6-6.3	1.4	0.8	25.8	19.5	57.0	1.4	26.0
Pods/plant	36.9	22.1-55.9	102.3	90.4	27.4	25.8	88.4	18.4	11.6
Seeds/pod	3.8	3.4-4.4	0.1	0.1	8.7	7.9	83.5	0.6	19.8
Days to 50% flowering	38.9	34.5-44.0	7.8	5.1	7.2	5.8	65.0	3.7	5.0
Yield/plant	4.7	2.7-8.4	2.6	2.2	34.7	31.8	84.0	2.8	35.8

PCV = Phenotypic coefficient of variation; GCV = Genotypic coefficient of variation.

Table 2. Phenotypic (P) and genotypic (G) correlations for different character pairs in horsegram

Characters		Branches/ plant	Pods/ plant	Seeds/ pod	Days to 50% flowering	Plant height
Yield/plant	P	0.19	0.90**	0.68**	-0.08	0.17
	G	0.21	1.03**	0.80**	-0.05	0.33
Branches/plant	P		0.30	0.07	-0.08	0.41
	G		0.46	0.02	-0.18	0.49
Pods/plant	P			0.54*	-0.08	0.28
	G			0.64**	-0.13	0.47
Seeds/pod	P				0.01	0.15
	G				-0.10	0.24
Days to 50% flowering	P					-0.10
	G					-0.06

* Significant, P = 0.05, ** Significant, P = 0.01.

Analysis of variance was done (Panse and Sukhatme, 1978) and the phenotypic and genotypic coefficient of variation (PCV and GCV) heritability in broadsense, phenotypic and genotypic correlations and coheritability (Singh and Choudhary, 1985) were computed. Genetic advance was estimated as per the methods of Johnson *et al.* (1955a).

The results in Table 1 indicate a wide range of variation for all characters except seeds/pod. Ten out of 18 genotypes produced more than 17% yield over the highest yielding check (JND-2). KHG 23 recorded highest yield, followed by KHG 22. The phenotypic and genotypic variances were maximum for pods/plant and minimum for seeds/pod. Yield/plant and days to 50% flowering showed the highest and lowest PCV and GCV, respectively. The similarity in the PCV and GCV for all the traits shows low environmental influence. The low PCV and GCV for days to 50% flowering indicated less scope of selection. Heritability estimates higher for pods/plant and the lowest for branches/plant. The expected genetic advance (as % of mean) was maximum for yield/plant and minimum for days to 50% flowering.

Table 3. Estimates of heritability for different character pairs in horsegram

Characters	Branches/plant	Pods/plant	Seeds/pod	Day to 50% flowering	Plant height
Yield/plant	0.78	0.98	0.99	0.48	1.41
Branches/plant		1.07	0.22	1.30	0.71
Pods/plant			1.01	1.25	1.25
Seeds/pod				-0.59	1.21
Days to 50% flowering					0.40

High heritability, coupled with high GA observed for yield/plant, seeds/pod and pods/plant, indicated additive gene effects and selection might be based on these characters.

The genotypic correlations were, in general, higher than phenotypic correlations (Table 2), possibly due to modifying effects of environment on association of characters at genic level (Johnson *et al.*, 1955b). Yield/plant showed positive correlations (phenotypic and genotypic) with all the traits, except for days to 50% flowering.

Plant height, pods/plant, seeds/pod and branches/plant had higher coheritability estimates with yield/plant (Table 3). This suggests that selection for either of these attributes may result in simultaneous selection for other coinherited characters.

It was inferred that yield/plant, pods/plant and seeds/pod might be considered while making selection. KHG 23 was the best genotype, followed by KHG 22.

References

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