SHORT COMMUNICATION

Genetic Variability for Seed Yield and Component Traits in Newly Collected Germplasm of Yellow Sarson (*Brassica rapa* L. syn. *Brassica campestris* L. spp. yellow *sarson*)

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Rapeseed breeding strategy involve assembling or generating variable germplasm for selection of superior genotypes for utilizing them in hybridization programme to develop a superior variety. Assessment of genetic variability, heritability and genetic advance are necessary pre-requisite. The present study was undertaken to estimate the magnitude of genetic variability, heritability and genetic advance to determine breeding strategy and select superior genotypes from newly collected germplasm of yellow sarson.

Thirty seven germplasm of yellow sarson (*Brassica campestris* L. var. yellow *sarson*) collected form different districts of Uttar Pradesh under NATP on Sustainable Management of Plant Biodiversity including one standard variety Type-151 were grown in Randomised Block Design (RBD) with three replications during *rabi* season 2000-2001. Each treatment consisted of one row of three-meter length and 45 cm spaced apart. An approximate distance of 15 cm between plants was maintained by thinning after 15 days of sowing. Observations were recorded on five randomly selected plants in each replication for nine characters, namely days to flowering, number of primary branches/plant, number of siliquae on main raceme, number of siliquae/plant, length of siliqua (cm), number of seeds/siliqua, days to maturity, 1000 seed weight (g), and seed yield (g). Data recorded on 37 entries were subjected to analysis of variance for RBD according to standard procedure (Panse and Sukhatme, 1978). Genotypic and Phenotypic coefficients of variation were calculated according to method of Burton (1952). Heritability in broad sense (Burton and deVane, 1953), and expected genetic advance (Johnson *et al.*, 1955) were also estimated.

The differences among the germplasms were highly significant for all the characters under study. A wide range of variation was noticed in days to flowering, number of primary branches, number of siliquae on main raceme, number of siliquae/plant, length of siliqua, number of seeds/siliqua, days to maturity, 1000 seed weight and seed yield/plant (Table 1). High genotypic coefficient of variation was found for number of primary branches, number of siliquae/plant, length of siliqua and

Table 1. Range, mean, variance and coefficients of variation for seed yield and component traits in yellow sarson germplasm

Characters	Range	Means	SE	Variance		Coefficient of Variability,%		
				Phenotypic	Genotypic	Phenotypic	Genotypic	Environmental
Days to flowering	36.93-54.2	47.22	0.64	7.50	16.26	8.59	8.54	2.36
Number of primary branches/plant	4.93-15.07	9.85	0.47	7.21	6.52	27.27	25.93	8.43
Number of siliquae on main racemes	26.8-61.6	38.02	0.27	50.26	50.09	18.65	18.60	1.27
Number of siliquae/plant	89-252.6	161.33	5.44	1344.71	1255.64	22.72	21.96	5.85
Length of siliqua (cm)	2.98-7.5	4.42	0.04	1.08	1.074	23.51	23.43	1.89
Number of seeds/siliqua	26.8-46.0	86.07	0.53	19.78	18.92	12.33	12.06	2.57
Days to maturity	106.4-118.07	112.58	0.78	13.16	11.30	3.22	2.99	1.21
1000 seed weight (g)	2.13-5.13	3.787	0.40	0.82	0.46	23.96	17.85	15.97
Seed yield/plant (g)	11.3-22.75	17.31	0.34	7.11	6.61	15.40	14.85	4.09

1000-seed weight. Moderate genotypic and phenotypic coefficients of variation were observed for number of seeds/silique and seed yield/plant. Gupta and Singh (1998) reported high estimates of genotypic coefficient of variation for yield/plant followed by pods on main shoot, plant height and number of branches. The coefficient of variation indicated high magnitude of variability in the germplasm. Selection may, therefore, be effective for these characters. Days to maturity showed low genotypic and phenotypic coefficient for this character. Hussain *et al.* (1998) observed highest phenotypic coefficient of variation and genotypic coefficient of variation alongwith high estimates of heritability and genetic advance for secondary branch number, biological yield per plant and number of seeds per siliqua. High heritability was observed for all the characters except 1000-seed weight, which showed moderate estimate of heritability (Table 2). Number of seeds/siliqua and days to maturity showed very low genetic advance.

High heritability with high genetic advance were observed for length of siliqua (cm), number of primary branches and number of siliqua/plant. Moderate heritability and genetic advance were observed for 1000 seed weight. Phenotypic and genotypic coefficient of variability together with heritability estimates revealed selection will be more effective for number of seeds/siliqua and seed yield/plant. This is in conformity with the finding of Bagrecha *et al.* (1972).

The genotypes having high heritability with high genetic advance for length of siliqua (cm), number of primary branches, number of siliquae/plant, seed yield/plant (g) indicated that additive gene effects were more important for these characters and selection pressure could be applied on these for yield improvement. A wide range of variation was noticed for phenoytypic coefficient of variability, genotypic coefficient of variability, environmental coefficient of variability, heritability and genetic advance.

Table 2. Estimate of genetic parameters in yellow sarson

Characters	Heritability (%)	Genetic advance	Genetic advance in percent of mean
Days to flowering	92.92	7.93	16.78
Number of primary branches	90.43	4.98	50.53
Number of siliquae on main raceme	99.54	14.46	38.02
Number of siliquae/plant	93.38	70.25	43.59
Length of siliqua (cm)	99.35	4.37	98.66
Number of seeds/siliqua	95.65	0.73	1.94
Days to maturity	85.85	6.34	5.62
1000-seed weight (g)	55.93	0.27	29.18
Seed yield/plant (g)	92.98	5.05	27.13

References

Bagrecha LR, KS Nathawat and P Joshi (1972) Estimation of genetic variance and heritability in Indian colza (*Brassica campestris* L. var. *sarson* prain). *Indian J. Agric. Sci.* **42(4)**: 285-8.

Burton GW (1952) Quantitative inheritance in grasses *Proc. 6th Int. Grassld Congr.* **1**: 277-83.

Burton GW and EH de Vanc (1953) Estimating heritability in tall fescue (*Fescue arundicacea*) from ieplicated clonal material. *Agron. J.* **45**: 478-81.

Hussain S, GN Hazarika and PK Barua (1998) Genetic variability, heritability and genetic advance in Indian rapeseed (*Brassica campestris* L.) and mustard (*B. juncea* Czern & Coss). *J. of the Agriculture Science, Society of North East India* **11**: 2, 260-261.

Gupta TR and J Singh (1998) Estimates of variability, correlations and co-heritability in *toria. Journal of Maharashtra Agricultural Universities* **23(1)**: 45-46.

Johnson HW, HF Rohinson and RE Comstock (1955) Estimates of genetic and environmental variability in Soybeans. *Agron. J.* **47**: 314-8.

Panse VG and PV Sukhatme (1978) *Statistical methods for Agricultural Workers.* ICAR, New Delhi.