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STUDIES ON HERITABILITY AND GENETIC ADVANCE OF SEED YIELD AND ITS COMPONENTS IN YELLOW SARSON (*BRASSICA CAMPESTRIS* LINN. VAR. *YELLOW SARSON* PRAIN)*

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ABSTRACT

Narrow sense heritability and genetic advance were studied for yield and its components of 20 parents partial diallel for F_1 and F_2 generations in yellow sarson. High heritability estimates were observed for days to flower, days to maturity, siliqua length and siliquae/plant in both the generations. High genetic advance was recorded for days to flower, siliquae/plant and seed yield/plant in both the generations. The days to flower and siliquae/plant had high heritability coupled with high genetic advance (%mean) indicated that heritability was due to additive gene effects and progress can be achieved by selection in segregating populations.

Narrow sense heritability is more reliable in predicting genetic advance under selection so that breeder can predict the probable improvement from different types and intensities of selection. In crop improvement programme selection is practised either directly or indirectly. Heritability estimates have been considered by many workers for the improvement in the characters to which selection is to be practised. It provides useful biometrical concept and has widely been used to estimate the degree to which a character may be transmitted from a parent to the offspring. It helps to partition the total variation into heredity and environmental effect. Hayman (1963) stated that the heritability estimates are influenced by the method of estimation, generation of study, sample size and environment. Genetic advance though not an independent entity, has an added advantage over heritability where the character is to be improved through segregating generations. The present study was taken up to estimate the narrow sense heritability and genetic advance for yield and its components to formulate suitable breeding methodology for improvement of yellow sarson.

The material consisted of 70 F_1s and 70 F_2s derived from 20 parent partial diallel (S=7) without reciprocals. The parents were AJL4, AJL6, AJL7, AJL17, AJL18, AJL19, AJL20, AJL21, AJL31, AJL40, AJL43, AJL52, AJL54, AJL55, AJL64, AJL65, YID1, IB 1997, YSB-17-7-C and YSIK80. All the F_1s and F_2s alongwith parents were raised in a Randomized Block Design with three replications at the Research Farm of College during1995-96. The inter-row and inter-plant distance were 50 cm and 15 cm, respectively. Data on 10 randomly plants in each parent and F_1s and 50 plants in each F_2s were recorded for days to flower, days to maturity, plant height, primary branches/plant, secondary branches/ plant, siliqua length, seeds/siliqua, siliquae/ plant, 1000-seed weight, oil content and seed yield/plant. Heritability in narrow sense was calculated according to the formula suggested by Kempthorne and Curnow (1961) and genetic advance with that of Robinson *et al.* (1949).

High estimates of heritability were observed for days to flower, days to maturity, siliqua length and siliquae/plant in both the generations (Table 1). However, other

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Table 1. Estimates of heritability and genetic advance for seed yield and its attributes in F_1 and F_2 generations of yellow sarson

Characters	Heritability %		Genetic advance		Genetic advance % over mean	
	F_1	F_2	F_1	F_2	F_1	F_2
Days to flower	75.69	62.33	6.64	5.38	12.01	10.84
Days to maturity	64.81	58.64	4.06	3.26	3.17	2.57
Plant height (cm)	74.63	20.04	7.46	2.73	4.92	1.79
Primary branches/plant	56.94	29.05	1.79	0.70	16.65	6.67
Secondary branches/plant	63.27	29.67	2.66	0.72	15.41	4.51
Siliqua length (cm)	59.21	35.19	0.62	0.31	14.75	7.67
Seeds/siliqua	33.94	4.67	1.96	0.19	8.77	10.87
Siliquae/plant	77.44	51.88	102.87	44.99	34.87	16.07
1000-seed weight (g)	9.73	17.70	0.07	0.11	1.54	2.59
Oil content (%)	8.91	1.81	0.15	0.06	0.38	0.14
Seed yield/plant (g)	52.51	25.14	6.94	2.27	23.99	10.18

characters exhibited low to moderate estimates of heritability in F_1 and F_2 generations indicating that these characters are more influenced by environment and therefore, selection may not be useful in improving these characters.

The high heritability alone is of little use in predicting the breeding value of any trait (Johanson *et al.*, 1955) and, therefore, this parameter can be better utilized in association with genetic advance. High heritability estimates were reported in mustard by Rao (1977) for days to flower, siliquae/plant and siliqua length; Yadav *et al.* (1981) for days to maturity. Low heritability value was observed for 1000-seed weight by Sharma *et al.* (1992). The high estimates of genetic advance (%mean) were recorded for days to flower, primary branches/plant, secondary branches/plant, siliqua length, siliquae/plant and seed yield/ plant in F_1 generation and it was low to moderate for F_2 generation except for siliquae/ plant. High genetic advance for siliquae/plant has been reported by Uddin *et al.* (1995). 100-seed weight and oil content were found to have low heritability with low genetic advance Selection for such traits might have not be rewarding.

The days to flower and siliquae plant had high heritability coupled with high genetic advance in F_1 and F_2 generations indicated that heritability was due to additive gene effects and progress can be achieved by selection in segregating population. Thus, finally it can be concluded that selection criteria based on days to flower and siliquae/plant can give better results for yield improvement of yellow sarson.

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