



Association Analysis for Yield and Yield Component Traits in Sesame (*Sesamum indicum* L.)

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ABSTRACT

The experimental material comprised of 12 sesame genotypes of six lines (black and brown seed) and six testers (white seed) of various geographical origin. Crosses were made in 'Line x Tester' fashion and thirty six hybrids were developed. The 36 F₁s along with parents were utilized for correlation study to assess the relationship between yield and its components traits. Biometrical data were recorded on twelve quantitative characters viz., days to fifty percent flowering, plant height (cm), number of branches per plant, number of capsules on main stem, number of capsule per plant, capsule length (cm), number of seeds per capsule, height of first node from base (cm), height of first capsule (cm), thousand seed weight (g), single plant yield (g) and oil content (%). Character association analysis revealed that there was a positive significant association of seed yield with number of capsule per plant.

Keywords: *Sesame, Hybrids, Correlation, Yield*

INTRODUCTION

Sesame (*Sesamum indicum* L.) is Queen of oilseed crop (Weiss, 1971) [3] because of its high oil content. It is one of the ancient and traditional oilseed crops cultivated in India for its good quality oil. Not only it is a source of edible oil, the seed itself provides a nutritious food for human. Besides, it had a excellent characteristic feature of having resistance to oxidative deterioration. The seed yield is a complex quantitative trait controlled by polygenes and highly influenced by the environment. Selection based on yield is not effective. The change in one trait influences the change over several others traits. The knowledge on the relationship between yield and its component

traits are helpful to the plant breeder in selecting desirable strains. The study on nature and degree of association of component traits with yield assumes greater importance for fixing desirable trait which play a decisive role in influencing the yield. Hence, the present investigation was carried out to gather information on character association of crosses between white seeded testers with black and brown seeded lines for yield, oil content and oil quality from the cross

MATERIALS AND METHODS

Thirty six hybrids were obtained from the crosses involved crossing six lines (black/brown seeded type) with six testers (white seeded type) through Line x Tester fashion the method developed by Kempthorne (1957) [1]. Thirty six hybrids were raised along with parents (Table. 1) in a randomized block design replicated twice at Agricultural Research Station, Kovilpatti, Tamilnadu. The parents and hybrids were sown in each row of 4 meter length with a spacing of 30 cm between rows and 30 cm between plants. Recommended package of practices with need based plant protection measures were given to raise good crop. The association study was made to assess the relationship among yield with twelve traits viz., days to fifty percent flowering, plant height (cm), number of branches per plant, number of capsules on main stem, number of capsule per plant, capsule length (cm), number of seeds per capsule, height of first node from base, height of first capsule, thousand seed weight (g), single plant yield (g) and oil content (%). In each replication ten randomly selected plants were taken and observed on twelve quantitative traits were in yield and oil content was estimated in lab. The

association analysis was made with mean obtained from the 12 traits. The genotypic correlation done for yield and yield component characters in sesame are presented in Table. 2

RESULTS AND DISCUSSION

Correlation studies

Yield is a dependable complex inherited character as a result of interaction of several contributing attributes that may be related or unrelated. Correlation studies help in evaluating the direction and magnitude of yield and yield components and within yield contributing characters.

In the present study single plant yield had positive and significant association with number of capsule per plant Sobundharrya *et.al.* (2017) ^[2] and positive association with plant height, number of primary branches, number of capsule on main stem, capsule length, number of seeds per capsule thousand seed weight and oil content.

Inter-correlation among yield components

Inter-correlation among the yield component study is helpful for the simultaneous improvement of two or more characters that are directly related to each other.

Days to fifty percent flowering exhibited a positive and significant association with height of first node and height of capsule.

The trait plant height showed a positive and significant association with number of primary branches, number of capsule on main stem and number of capsules per plant. It had a positive association with height of first node, height of first capsule, capsule length and 1000 seed weight.

The association of primary branches exhibited positive significant association with plant height, height of first capsule and positive association with days to 50 percent flowering, number of capsule on main stem, number of capsule per plant and height of first node.

Number of capsule on main stem exhibited positive significant association with plant height and number of capsules per plant. The association was positive with capsule length, number of seeds per capsule, 1000 seed weight and single plant yield.

Number capsule per plant showed a very high positive significant association with plant height, number of capsule on main stem and single pant yield. It showed positive association with number of primary branches, capsule length, number of seeds per capsule and 1000 seed weight.

Height of first node showed a positive significant association with days to 50 per cent flowering and height of first capsule. However it exhibited positive but non-significant association with plant height, number of primary branches, capsule length, number of seeds per capsule and 1000 seed weight.

The association of height of first capsule showed a positive significant with days to 50 per cent flowering, number of primary branch and height of first node. It had positive association with plant height alone.

However, it had none of the character had a positive and signification relationship with capsule length. It had positive but non-significant association with plant height, number of primary branches, number of capsule on main stem, number of capsule per plant, height of first node, number of seeds per capsule, 1000 seed weight and single plant yield.

Number seeds per capsule exhibited a positive significant association with thousand grain only. However positive association was exhibited with number of capsule on main stem, number of capsule per plant, capsule length and single plant yield.

Thousand seed weight exhibited positive significant association with number of seeds per capsule only. But it showed a positive association with plant height, number of primary branches, number of capsule on main stem, number of capsule per plant and single plant yield.

It was interesting to observe that none of the traits had positively significant inter correlation with oil content.

However, it exhibited positive but non-significant association with days to 50 per cent flowering, number of capsule per plant, height of first capsule, number of seeds per capsule and single plant yield.

This result clearly indicate that the crosses differ in the contribution of seed yield and yield contributing traits. Hence separate selection indices are necessary for selection of genotype for improvement of yield.

Based on the correlation studies, it is inferred that the trait number of capsule per plant had a very high positive and significant association with single plant yield. Whereas the height of first capsule and 1000 seed weight had positive significant inter correlation with each other. Hence, in sesame the trait number of capsule per plant should be given prime importance during the selection programme for the improvement of yield.

Table.1 List of parents

S. NO	LINES	S. NO	TESTERS
1.	Co 1 (black)	1.	SVPR 1 (White)
2.	KMR 77 (black)	2.	VRI 3 (White)
3.	IC 199438 (black)	3.	Hima (White)
4.	Chandana (brown)	4.	ACM-14-004 (White)
5.	Punjab Til (white)	5.	ACM-14-005 (White)
6.	Rajeswari (white)	6.	ACM-14-007 (White)

Table.2 Genotypic correlation coefficient of different characters with single plant yield

	DFE	PH	NPB	NCMS	NCP	HFN	HFC	CL	NSC	1000	OC
DFE											
PH	-0.146										
NPB	0.2372	0.3436*									
NCMS	-0.2186	0.3846**	0.0397								
NCP	-0.2645	0.427**	0.1585	0.6035**							
HFN	0.3556*	0.107	0.2028	-0.1415	-0.3096*						
HFC	0.525**	0.1761	0.3978*	-0.2926	-0.2836	0.7669**					
CL	-0.0527	0.0813	0.2954	0.1843	0.2229	0.0375	-0.0134				
NSC	-0.2753	-0.0462	-0.1377	0.0576	0.0779	-0.0251	-0.3146	0.137			
1000	-0.123	0.0171	0.0762	0.1093	0.1031	-0.0786	-0.2678	0.117	0.5178**		
OC	0.1425	-0.0973	-0.0495	-0.164	0.0563	-0.0724	0.10149	-0.1583	0.1833	0.0505	
SPY	-0.0881	0.2585	0.1706	0.214	0.5707**	-0.2487	-0.1787	0.2409	0.0049	0.1146	0.0249

* Significant at 5% level ** Significant at 1% level

DFE	Days of 50 % flowering	HFC	Height of first capsule
PH	Plant height	CL	Capsule length
NPB	Number of primary branches	NS/C	Number of seeds / capsule
NCMS	Number of capsule on main stem	1000	1000 seed weight
NC/P	Number of capsule / plant	SPY	Single plant yield
HFN	Height of first node	OC	Oil content