Mad. Agric. J., 83(10): 619-620 October 1996
https://doi.org/10.29321/MAJ.10.A01063

INFLUENCE OF BACKGROUND TRAITS IN SESAME

C.R. ANANDA KUMAR AND N. SIVASAMY
Agricultual Research Station
Tamil Nadu Agricultural Unversity
Kovilpatii 628 501

ABSTRACT

The correlation studies in sesame revealed that the traits *viz.*, number of capsules on main stem as well as on branches, leaf area and shoot weight showed positive correlation with yield and an intensive selection for these traits in positive side will improve the yield automatically. When correlation among different traits were further partitioned, four traits *viz.*,) shoot weight, number of capsules on main stem, number of capsules on the branches and leaf area, had both direct positive effect as well as indirect influence via each other for the expression of yield. Hence, selection pressure applied on these traits individually or simultaneously will increase the productivity in sesame.

KEY WORDS : Sesame, Traits, Influence, Yield

Yield in sesame (*Sesamum indicum* D.C and L.) needs to be to augmented, by evolving high yielding varieties or hybrids. To achieve this objective, it is essential to know the genetics of yield and its components. Since all the quantitative traits are complexly inherited, a simultaneous selection for all the yield contributing characters combining superiority for each one of them will be very difficult. However, if correlation coefficients are high for two or more traits, it will reduce the burden of the breeder to a considerable extent. The efficiency of selection mainly depends upon the direction and magnitude of association between yield and its component characters. By identifying these characters, early screening and selection is possible without waiting till harvest. The interrelationship between various traits and the background traits responsible for yield expression were studied in the present investigation.

MATERIALS AND METHODS

Six high yielding homozygous genotypes from different regions of Tamilnadu *viz.*, TSS 6, TNAU 12, TNAU 17, TNAU 86, VS 117 and DPI 1589 were used as female parents and the high yielding varieties *viz.*, CO 1, TMV 3 and TMV 6 were used as male parents in a " line x tester " fashion to get eighteen cross combinations. The 18 combinations along with their parents were raised in a randomised block design with three replications during *rabi* 1992. Each plot with an area of nine sq.m. containing 120 plants in which 20 plants were selected at random for recording the biometrical observations on important traits *viz.*, first flowering, 50 per cent flowering, plant height, first capsule bearing node, capsules on main stem and on branches, leaf area, shoot and root weight, oil content in seeds, 1000 seed weight and seed yield per plant. Correlation coefficients for yield and its component traits (Goulden, 1959) and Path coefficient analysis (Dewey and Lu, 1959) were worked out.

RESULTS AND DISCUSSION

The correlation between yield and its contributing characters indicated that the yield per plant was positively associated with all the traits except first and 50 per cent flowering and oil content (Table 1). Among the positive association, significant association was exhibited by shoot weight, capsules on the main stem, capsules on branches and leaf area. Positive association between capsule number and seed yield was earlier reported by many including Ananda Kumar (1991). Chandrasekhara and Ramana Reddy (1993) reported that the weight of the stem contributed more than the root weight for yield expression which is in agreement with the present finding.

The 1000 seed weight showed non-significant contribution in the present study. It may be concluded that an intensive selection in the positive side for number of capsules on main stem as well as on branches, leaf area and shoot weights will automatically improve the seed yield per plant since, they showed positive and significant inter correlation among themselves.

Table 1. Correlation coefficient for different traits

Treatments	1	2	3	4	5	6	7	8	9	10	11	12
1	1.000	.852**	.083	-.192	-.013	.150	.046	-.196	-.015	-.199	-.031	-.086
2		1.000	.045	-.215	-.031	.116	.037	-.127	-.055	-.175	-.140	-.057
3			1.000	.364**	.419**	.416**	.232**	.354**	.411**	-.039	.149	.213
4				1.000	.067	.082	.052	.328**	.234*	.069	-.042	.063
5					1.000	.641	257	.492	.281	-.159	.216	.503
6						1.000	.312**	.531**	.255*	-.117	.196	.502**
7							1.000	.225*	-.028	.102	.057	.304**
8								1.000	370**	.058	.057	753**
9									1.000	-.148	.040	.163
10										1.000	-.220*	.083
11											1.000	-.015

1=First flowering; 2=50% flowering; 3=plant height; 4-First productive node; 5=No of capsule/main stem; 6=No. of capsules/branches; 7=Leaf area; 8=Shoot weight; 9-Root weight; 10=1000 seed weight 11=Oil content; 12=Seed yield/plant
*, ** = Significant at 5% & 1% respectively

Table 2. Direct and indirect effects as partitioned by path analysis

Treatments	1	2	3	4	5	6	7	8	9	10	11	Corr. with yield
1	.139	-.115	-.004	.032	-.002	.007	.004	-.147	.002	.007	.003	-.086
2	.119	-.135	-.002	.36	-.005	.005	.004	-.095	.006	-.006	-.016	-0.57
3	.012	-.006	-.044	-.063	.069	.019	.022	.266	-.045	-.001	-.016	.213
4	-.027	.029	-.016	-.172	.011	.004	.005	.247	-.026	.003	-.005	.063
5	-.002	-.004	-.018	-.012	.167	.031	.024	.369	-.030	-.006	-.024	.503**
6	.021	-.016	-.019	-.014	.109	.047	.029	.399	-.028	-.004	-.022	.502**
7	.006	-.005	-.010	-.009	.043	.015	.095	.168	.003	.004	-.006	.304**
8	-.027	.017	-.016	-.055	.080	.024	.021	.753	-.040	.002	-.006	.753**
9	-.002	.007	-.018	-.040	.047	.012	-.003	.279	-.109	-.005	-.005	.163
10	-.028	.024	.002	-.012	-.027	-.005	.009	.040	.016	.036	.025	.083
11	-.004	.019	-.007	.007	.036	.009	.005	.043	-.004	-.007	-.112	-.015

Diagonal = Direct effect; Residual effect = 0.334
1=First flowering; 2=50% flowering; 3=plant height; 4-First productive node; 5=No. of capsules/main stem; 6-No. of capsules/branches; 7=Leaf area; 8-Shoot weight; 9=Root weight; 10- 1000 seed weight 11=Oil content; 12=Seed yield/plant

In the partitioning analysis (Table 2), low residual effect indicted that the traits of this study had contributed more for the expression of yield. Maximum direct effect towards seed yield was shown by shoot weight followed by number of capsules on the main stem and first flowering. Positive but low level of direct effect was observed for number of capsules on branches, leaf area and 1000 seed weight. It is interesting to note that the traits *viz.*, plant height, first productive node and root weight which showed positive relation in the correlation studies, actually had negative direct effect. The indirect effect of those characters via shoot weight was found to be positive and moderate which enhance its expression. The indirect effect of leaf area for other traits were low and positive except for root weight. The shoot weight showed positive and high indirect influence on all the other traits except for first and 50 per cent flowering. Hence, it may be concluded that four traits *viz.*, shoot weight, number of capsules on the main stem as well as on branches and leaf area had direct positive effect as well as indirect positive influence via one another towards the seed yield. So selection pressure applied on these traits simultaneously will ultimately increase the seed yield per plant in shorter time.

REFERENCES

ANANDAKUMAR, C.R. (1991). Association and regression analysis in sesame. **Ann. Agric. Res., 12 :** 419-421.

CHANDRASEKHARA, B. and RAMANA REDDY, C. (1993). Correlation and path coefficient analysis in sesame (*Sesamum indicum* L.), **Ann. Agric. Res., 14 :** 178-184.

DEWEY, D.R. and LU, K.H. (1959). A correlation and path analysis of components of crested wheat grass seed production, **Agron. J., 51:** 515-518.

GOULDEN, C.H. (1959). **Method of Statistical Analysis.** Asia Publishing House., New Delhi, 467 pp.

(Received : February 1995 Revised : September 1995)