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YIELD CONTRIBUTING CHARACTERS IN LINSEED UNDER RAINFED CONDITION

Yield is a polygenically controlled characters, hut is not an efficient character for selection. Inter-relationship among various agronomic traits along with **multiple** regression analysis of component characters of yield is also important for determining the components of yield. Such information may he used in prediction of correlated response to directional selection and in the detection of some characters which may have no value in themselves but are useful as indicators of the, more important ones under consideration (Johnson *et al.*, 1975). This investigation was undertaken to find out the major yield components of yield in linseed through correlation and multiple linear regression analysis.

Double purpose 23 diverse genotypes of linseed were grown in randomised block design with three replications at Ranchi during winter 1988-89 and 1989-90 under rainfed conditions. The spacing was maintained 20 cm between rows and 120 cm between plants. There were six rows of 4 m long in each genotype. The observations were taken on five random selected competitive plants of each treatment of every replication for plant height, dry matter, number of primary branches per plant, number of secondary branches per plant, number of seeds per capsule and seed yield. Correlation and multiple regression analyses were done using mean data of two years of each character as per procedure suggested by Snedecore and Cockran (1966).

Linseed yield showed a highly significant positive association with number of primary branches per plant and dry matter as also reported by Patil *et al.* (1989). However, Saxena and Asthana (1962), Badwal *et al.* (1971), and Patil *et al.* (1981) showed a highly significant inter-relationship between yield and number of primary branches per plant (Table 1). Seed yield had non-significant association with plant height and technical height as earlier observed by Pathak and Bajpaye (1964) in linseed. Dry matter showed significant positive association with number of secondary branches per plant, number of capsules per pant and days to 50% flowering and maturity. Plant height had significant negative association with number of capsules per plant, number of primary branches per plant and number of seeds per capsule and highly significant positive correlation with technical height, days to maturity and days to 50% flowering. Saxena and Asthana (1962) obtained similar result earlier for number of primary branches per plant and plant height. Number of capsules per plant had significant positive inter-relationship with number of seeds per capsule, as also reported by Pathak and Bajpaye (1964). Technical height showed highly significant and positive interrelationship with days to maturity and days to 50% flowering. Number of primary branches per plant had significantly positive correlation with number of secondary branches per plant and number of seeds per capsule.

The multiple regression equation taking all yield components together accounted for 80.59% of variability in seed yield (Table 2) and the multiple regression equation based on five character combinations viz., dry matter, plant height, technical height and number of primary branches per plant accounted 86.78%. The multiple regression equation representing six variables including number of secondary branches per plant was also significant (83.58%). Partial regression coefficients of yield attributing characters were positive for dry matter and technical height, and negative for plant height, number of capsules per plant, number of primary branches per plant, number of secondary branches per plant and number of seeds per capsule. Similar results were found for number of branches, plant height, dry matter and number of capsules earlier by PatiJ *et al.* (1989) in linseed, whereas Mahto *et al.* (1995) showed similar finding for plant height. This was expected in view of positive correlation coefficient between yield and yield contributing characters. This indicates the importance of dry matter, plant height, technical height and number of primary branches per plant for rainfed linseed crop.

Table 1. Correlation coefficient between different pair of characters in linseed

Characters	X2	X3	X4	X5	X6	X7	Seed yield, g
X1	-0.034	0.416*	-0.032	0.447*	0.479*	0.248	0.967**
X2		-0.518**	0.894**	-0.531**	0.228	-0.616**	-0.117
X3			-0.490*	0.431*	0.253	0.651**	0.359
X4				-0.483*	-0.228	-0.559**	-0.086
X5					0.565**	0.394*	0.468*
X6						0.428*	0.415*
X7							0.228

X1 - Dry matter (g); X2 = Plant height; X3 = No. of capsules/plant; X4 = Technical height (cm); X5 = No. of primary branches/plant; X6 = No. of secondary branches/plant; X7 = No. of seeds/capsule
*, ** - Significant at 5 per cent and 1 per cent probability levels, respectively

Table 2. Multiple linear regression equation along with contribution to seed yield in linseed

Multiple regression equation	Contribution to seed yield, %
$\hat{Y}$ - 1.474 + 0.367**X1 - 0.044**X2 - 0.003X3 + 0.033**X4 - 0.206**X5 - 0.017**X6 - 0.006X7	80.59
$\hat{Y}$ = 1.429 + 0.367X1** - 0.043X2** - 0.063**X3 + 0.033**X4 - 0.203**X5 - 0.018**X6	83.58
$\hat{Y}$ = 1.231 + 0.365**X1 - 0.044**X2 - 0.035**X4 - 0.217**X5 - 0.016**X6	83.68
$\hat{Y}$ - 1.62 + 0.364**X1 - 0.045**X2 + 0.036**X4 - 0.250**X5	86.78

$\hat{Y}$ = Expected seed yield

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