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CORRELATION AND REGRESSION IN INDIAN MUSTARD FOR YIELD AND YIELD ATTRIBUTES UNDER RAINFED ENVIRONMENTS

Indian mustard (*Brassicajuncea* L. Czernj & Cosson) is an important oil yielding crop among the oil seeds grown in India, China and Pakistan. Yield is a complex character and depends on a number of component traits. Keeping this in view, the present study was undertaken to know the correlation and multiple regression among seed yield and its contributing characters, to determine their relative role and to quantify the degree of association and per cent of contribution to seed yield per plant.

Table 1. Association between different pairs of characters in Indian mustard under rainfed environments

Characters	X2	X3	X4	X5	X6	X7	X8	Seed yield / plant, Y
X1	0.9899**	0.7639**	0.5815**	0.0535	0.5889**	-0.1878	0.5831**	0.6751
X2		0.7378**	0.3263	0.0490	0.5619**	-0.1865	0.6532**	0.6629**
X3			0.6425**	0.1419	0.6788**	-0.1525	0.5991**	0.6996**
X4				0.7529**	0.8278**	0.1754	0.1554	0.2140
X5					0.1408	-0.0319	-0.0990	-0.1532
X6						-0.2003	0.5982**	0.7687**
X7							0.0869	-0.1767
X8								0.7104**

X1 = Days to first flowering; X2 = Days to 50% flowering; X3 = Plant height; X4 = No. of primary branches per plant; X5 = No. of secondary branches per plant; X6 = No. of siliquae per plant; X7 = No. of seeds per siliquae; X8 = Days to maturity
*, ** - 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 Indian mustard

Multiple regression equation	Contribution to seed yield, %
$\hat{Y}$ - -4.9249 - 0.0570 X1 + 0.0682 X2 + 0.0132 X3 -0.1095 X4 -0.0670 X5 + 0.0129 X6 - 0.0087 X7 + 0.0264 X8	62.4
$\hat{Y}$ - -4.3801 + 0.0168X2 + 0.0122X3 - 0.1509X4 - 0.0650X5 + 0.0130X6 -0.0084X7 + 0.0243X8	32.5
$\hat{Y}$ - -4.2919 + 0.0192X2 + 0.0120X3 - 0.1430X4 - 0.0671X5 + 0.0138X6 +0.0214X8	37.6
$\hat{Y}$ = -4.5389 + 0.0186X2 + 0.0106X3 - 0.0757X5 + 0.0130X6 + 0.0228X8	60.4
$\hat{Y}$ - -4.7090 + 0.0154X2 - 0.0766X5 + 0.0130X6 + 0.0259X8	48.4

Nineteen genotypes of Indian mustard *(Brassica juncea* L. Czernj & Cosson) were grown in a randomised block design with three replications at experimental area of Birsa Agricultural University, Ranchi during winter seasons 1990-91, 1991-92, 1992-93 and 1993-94. Each genotype was sown in six rows of 4 m long with a spacing between plants and rows, 10 cm and 30 em respectively. The data were recorded on five randomly selected competitive plants of each treatment of every replication for days to first flowering, days to

50 per cent flowering, plant height (cm), number of primary branches per plant, number of secondary branches per plant, number of siliquae per plant, number of seeds per siliqua, days to maturity and seed yield per plant (g). The simple correlation and multiple regression analysis were done as per Snedecor and Cockran (1968).

Seed yield per plant had a strong significant positive association with days to first flowering, days to 50 per cent flowering, plant height, number of siliquae and days to maturity (Table 1). Similar results have been reported by Verma and Mahto (1993) in Indian mustard. Krishnadoss and Kadambavanasundaram (1986) in sesame, Thakral *et al.* (1984) in toria and Mahto and Haider (1990) in soybean reported high significant association between plant eight and seed yield per plant in agreement to the results of this study. Chatterjee and Sengupta (1984) reported strong significant positive association between seed yield per plant and number of siliquae per plant. Days to first flowering had a high significant positive association with days to 50 per cent flowering and days to maturity, which confirmed that finding of Thakral *et al.* (1984). A strong and positive inter-relationship had been found between plant height and days to maturity as reported by Krishnadoss and Kadambavanasundaram (1986) in sesame. Number of primary branches had strong and positive correlation between number of secondary branches and number of siliquae as reported by Reddy (191) and Krishnadoss and Kadambavanasundaram (1986) in Indian mustard and sesame, respectively.

Multiple regression analysis (Table 2) showed the positive partial regression for the days to 50% flowering, plant height, number of siliquae and days to maturity, whereas negative partial regression for the days to first flowering, number of primary and secondary branches per plant and number of seeds per siliqua. The regression equation based on all the characters, revealed maximum contribution to seed yield (62.4%). By eliminating days to first flowering the contribution to seed yield was 32.5%. The third equation contributed to seed yield per plant 37.6% which was based on the all characters except days to first flowering and number of siliquae per plant. Days to 50% flowering, number of secondary branches per plant, number of siliquae per plant and days to maturity contributed (48.4%) to seed yield, whereas this equation along with plant height contributed 60.4 to seed yield per plant.

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