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Effect of Sowing Dates and Varieties on Production of Linseed (*Linum usitatissimum* L.)

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Abstract

An experiment to find out production potential of linseed (*Linum Usitatissimum* L.) in relation to sowing dates (15 and 30 October 15 and 30 November) and varieties (Laxmi-27, Jawahar-23, Neelum and T-397) was conducted in split plot design on silty-loan soil under rainfed condition with a life-saving irrigation during winter seasons of 2006–07 and 2007–08. Sowing on 30 October with Laxmi-27 out yielded (8.39 q/ha) among four varieties. Except primary branches per plant and plant height all other growth and yield attributes like capsules per plant, seeds per capsules, seed yield per plant and 1,000-seed weight were more at 30 October sowing. All phonological characters, seed oil percentage, seed yield and harvest index showed its best expression in Laxmi-27 variety. Higher oil percentage on October sowing than that of November sowing was observed. Neelum gave lowest seed oil content (35.1%).
Key words : Linseed. Date of sowing. Variety, Seed yield.

Linseed (*Linum usitatisssimum* L.) is not a traditional *rabi* oilseed crop of orissa. Now a days farmer of inland districts of orissa try to adopt this crop owing to linseed presently fetching better market price for its diverse use in industries, particularly for surface coating industry and gave edible oil for home consumption. The photo and thermo sensitiveness of linseed greatly influenced its growth and production behavior. Since meager information on production technology of linseed has been made available for the agroclimatic conditions of orissa, so an experiment was designed to identify promising varieties and optimum time of sowing of linseed under rainfed situation with a life saving irrigation.

Methods

The field experiment was carried out during winter seasons of 2006-07 and 2007-08 at Experimental farm of Krishi Vigyan Kendra, OUAT, Sonepur. The trial made in medium land, red silty loam soil having low in organic carbon status, total nitrogen (0.04%), available phosphorus (14.8 kg/ha) and available potassium (176 kg/ha) with pH 7.3. The experiment was laid out in split plot design with dates of sowing in main plots (4 m × 8 m) and varities in sub-plots (4 m × 2 m) with three replication. The treatments consisted of four dates of sowing (15 October, 30 October, 15 November and 30 November) and four varieties of linseed (Laxmi-27, Jawahar-23, Neelum and T-397). Recommended dose of fertilizer 50 kg nitrogen, 40 kg phosphorus and 20 kg potash per hectare was applied with split application of nitrogen. Precipitation during *rabi* season (October to February) of 2007-08 (78.5 mm) was better than previous year 2006-07 (52.4 mm). The experiment was conducted in the same plot for twoconsecutive years under rain fed condition with a life saving irrigation. Growth and yield attributes were recorded at harvest and five-gram dry seed sample was taken for determining seed oil content by soxhlet extraction method (1).

Results and Discussion

Date of Sowing

Seed yield of linseed varieties were significantly affected by sowing dates. Table 1 shows that 30 October sowing yielded highest followed by 15 October, 15 November and 30 November sowing dates. Because of early sowing (30 October and 15 October) had earlier flowering and caused prolonged reproductive stage as compared to late sowing (15 November and 30 November). Yield attributes viz. capsules per plant, seeds per capsule, 1,000-seed weight and

Table 1. Effect of dates of sowing and varieties on different growth and yield attributes of linseed crop (mean of 2006-07 and 2007-08).

Treatment	Plant Population per square (m)	Plant height (cm)	Primary branches per plant	Days to 50% flowering	Capsules per plant	Seeds per capsules	1000-seed weight (g)	Seed yield per plant (g)
Date of Sowing								
15 Oct	95.3	60.2	4.0	65.5	26.6	8.6	7.98	1.95
30 Oct	106.5	56.7	3.8	62.3	29.1	8.7	8.32	2.27
15 Nov	103.4	53.4	3.3	74.7	25.8	8.5	7.21	1.76
30 Nov	97.8	50.8	2.9	79.8	19.4	8.3	6.88	1.14
CD (P = 0.05)	2.42	3.07	0.21	0.51	1.08	NS	0.34	0.83
Variety								
Laxmi-27	108.7	57.8	4.2	73.6	26.3	8.4	8.70	2.04
Jawahar-23	105.3	45.6	3.8	81.3	23.8	8.4	7.36	1.57
Neelum	91.8	52.7	3.6	84.1	20.6	8.2	7.14	1.32
T-397	102.5	61.8	3.2	78.3	18.7	8.1	6.92	1.18
CD (P = 0.05)	2.35	4.52	0.18	1.12	0.95	NS	0.19	0.72

seed yield per plant recorded higher in October sowing, then subsequently reduced in 15 and 30 November sowing. Except plant height and primary branches per plant all other biometric and yield characters were found more in 30 October sowing than 15 October sowing. It could be due to little cooler atmospheric temperature, slow rate of evapotranspiration and less relative humidity in second fortnight of October which favor growth and production of linseed crop, 15 October sowing showed greater plant height and more number of primary branches which might be because individual plant got space more than enough as plant population per square meter was least of all. Under late sown condition linseed crop substantially/declined in plant population, plant height, primary branches per plant, capsules per plant, seeds per capsule, 1,000-seed weight and seed yield per plant. Early sowing gave chance for enough vegetative growth and prolonged reproductive phase had positive influence on seed oil percentage in seed which is being highest in 15 October sowing and lowest in 30 November sowing date. These results confirm the findings of Samui and Bandopadhya (2). Seeds per capsule did not differ significantly due to dates of sowing. The seed yield and harvest index were highest and lowest in 30 October and 30 November sowing respectively.

Varieties

Out of four tested varieties Laxmi-27 gave the maximum expression in growth characters, yield attributes, seed yield, harvest index and seed oil content (%). Varieties differed significantly in all noted characters except seed per capsule (Tables 1 and 2). Neelum variety took more time to flower and lowest in plant stand than other three varieties. Variety T-397 was significantly less in all growth and yield attributes but greater in plant height. It produced little more seed oil than Neelum and Jawahar-23. The harvest index, seed yield and seed oil percentage were high-

Table 2. Seed oil content, seed yield and harvest index of linseed crop as influenced by dates of sowing and varieties (pooled data of 2006-07 and 2007-08).

Treatment	Seed oil content (%)	Seed yield (q/ha)	Harvest index
Date of Sowing			
15 Oct	39.2	7.03	22.07
30 Oct	38.8	8.71	24.86
15 Nov	36.4	6.68	21.74
30 Nov	34.9	6.13	20.63
CD (P = 0.05)	1.47	0.58	1.88
Variety			
Laxmi-27	38.4	8.39	27.68
Jawahar-23	35.7	7.25	23.41
Neelum	35.1	7.02	22.03
T-397	37.3	5.89	21.84
CD (P = 0.05)	1.62	0.21	1.92

Table 3. Effect of dates of sowing and varieties on seed yield (q/ha) of linseed crop. Y_1 and Y_2 indicate for 2006-07 and 2007-08 respectively.

Date of sowing	Year	Laxmi-27	Jawahar-23	Neelum	T-397	Mean
15 Oct	Y_1	7.54	6.22	7.16	5.00	6.48
	Y_2	8.82	7.30	7.23	6.97	7.58
30 Oct	Y_1	9.26	7.35	7.85	5.83	7.54
	Y_2	12.80	10.64	8.24	7.72	9.85
15 Nov	Y_1	6.84	4.32	5.39	4.13	5.17
	Y_2	9.12	8.28	7.93	7.37	8.18
30 Nov	Y_1	5.37	5.62	6.00	4.33	5.33
	Y_2	7.38	8.22	6.34	5.75	6.92
Mean	Y_1	7.25	5.88	6.60	4.82	
	Y_2	9.53	8.61	7.44	6.95	
CD (P = 0.05) for date of sowing				Y_1—0.76		
				Y_2—0.59		
Variety				Y_1—1.23		
				Y_2—1.06		
Interaction (date of sowing × Variety)				Y_1—2.97		
				Y_2—2.23		

est in Laxmi-27 followed by Jawahar-24, Neelum and T-397 Varieties.

Interaction (Date of Sowing × Variety)

Table 3 shows that seed yield differed significantly high on year 2006-07 and 2007-08 and month (October and November) indicated yielding potentiality of linseed varieties subjected to wide seasonal vriation. Seed yield of test varieties at four scheduled sowing dates was comparatively high in second year of trial (2007-08) than first year of trial 2006-07 on account of favorable climatic condition and better precipitation during *rabi* of 2007-08 than during *rabi* of 2006-07. Interaction of sowing date and variety for seed yield was found to be significant for both the years. Perhaps due to less rainfall during 2006-07 variety Neelum gave slightly higher yield than Jawahar-23 and sowing on 15 November produced little less yield than 30 November sowing (Table 3). Whereas in both the years Laxmi-27 and 30 October sowing out yielded which established its genetic potentiality and optimum sowing date on this region for linseed crop.

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