Journal of Agrometeorology 11 (2): 203-205 (Dec. 2009)

Short Communication

Effect of sowing date on some growth characters in linseed

F.G. SHAIKH, D.N. GOKHALE, B.S. ROKADE and P.J. JADHAV[2]
College of Agriculture, Latur-413 512 (MS)
Email : farukh.2008@rediffmail.com

Linseed is one of the important *rabi* oilseed crop grown in the country. Linseed yields oil and flax, the linen fibre. Linseed oil has an excellent drying quality due to which it is used in manufacture of paints, varnishes, linoleum, oilcloth, pad ink and printing ink. The oilcake obtained after the extraction of oil is very good concentrate for cattle feed. The fibre obtained from linseed is weather resistant, lustrous and blends well with wool, silk cotton etc. and it is, therefore used in the manufacture of canvass, matting and rugs. The woody part and short fibre of linseed can be utilized for preparing raw pulp for papermaking.

In Marathwada region of Maharashtra state this crop is grown in marginal and sub marginal lands under rain fed condition either as a pure crop or mixed crop on residual soil moisutre. No attention is paid to sow it timely with high yielding cultivars to provide suitable growing environment. However, Temperature, relative humidity and moisture are limiting factors affecting crop production. The phenological stages in linseed crop are known to be altered by photoperiod and temperature with the general trend of shortening of phase as day length or temperature increase (Robertson *et al.*, 2002). Hence an investigation to work out suitable sowing time and cultivars for linseed was carried out at Latur during rabi, 2007. Growing degree days (GDD) were worked out by considering the base temperature of 10 ^{o}C.

A field experiment was conducted at Agriculture College Farm, Latur, Marathwada Agricultural University, during *rabi* season, 2007-08. The soil of experimental site was deep black in colour with good drainage. The soil was clayey in texture, low in available nitrogen, medium in available phosphorus, high in available potassium and slightly alkaline in reaction. The field was fallow in *kharif* season and present investigation was taken in *rabi* season of 2007-08. The experiment was laid out in split plot design with three replications, with eighteen-treatment combination of date of sowing (D_1- 40th MW (Standerd met week), D_2- 41st MW, D_3- 42nd MW, D_4-43rd MW, D_5- 44th MW and D_6- 46th MW) in main plot and three varieties (V_1- Kiran, V_2- Garima and V_3- RLC-4) in sub plot. Sowing of crop was done by dibbling method as per the treatments. The gross and net plot size of experimental unit was 6.4 m x 3.6 m and 5.4 m x 2.4 m respectively with a row spacing of 30 cm and plant spacing of 10 cm. Basal dose of NPK @ 50:25:0 kg ha^{-1} in the form of Urea, SSP and Muraite of potash were applied uniformly to all the plots at the time of sowing.

The result (for two cultivars) indicates that higher seed yield (889 kg ha^{1}) and harvest index (30) were obtained by sowing linseed crop in 40th MW, which proved significantly superior to other dates of sowing (Table 1). Higher yield recorded in early sowing compared with late sowing may be due to the fact that the crop get sufficient time for its growth and development under suitable climatic conditions in comparison to late sowing. These results confirm the findings of Mathur *et al.*, (1984). Significantly reduction was observed in seed yield with successive delay in sowing perhaps due to unfavourable condition of temperature and humidity, particularly during grain filling and developement. These results are in conformity with those results reported

Table 1: Effect of sowing date on yield and quality of linseed

Treatment	Seed yield (kg ha^{-1})	Harvest index (%)	Oil content (%)	Protein content (%)
Date of sowing				
D_1	889	30	40.9	16.3
D_2	823	29	40.6	16.4
D_3	654	25	40.3	16.6
D_4	543	26	39.9	16.7
D_5	473	23	39.8	17.1
D_6	334	25	39.6	17.4
S.E.	7.33	1.55	0.12	0.33
CD at 5%	23.12	3.5	0.38	0.37

Table 2: Number of days and GDD required for variety Kiran

	D_1		D_2		D_3		D_4		D_5		D_6	
	No. of days	GDD	No. of days	GDD	No. of days	GDD	No. of days	GDD	No. of days	GDD	No. of days	GDD
D_1	9	135.5	10	161.8	11	159.3	11	159.2	11	168	11	162.0
D_2	25	371.5	24	322.7	23	322.7	24	321.7	23	298.5	22	270.3
D_3	22	283.3	20	245.5	19	227.5	19	202.3	19	214.5	19	214.7
D_4	25	284.3	26	277.3	24	269.1	23	259.6	22	251.5	23	258.8
D_5	26	282.3	25	268.7	24	249.7	25	259.7	26	267.2	25	251.7
D_6	16	156.9	16	138.0	15	152.7	14	142.5	14	148.5	15	176.0
Total	123	1514	119	1424	116	1381	116	1345	115	1349	115	1334

Table 3: Number of days and GDD required for variety RLC-4

	D_1		D_2		D_3		D_4		D_5		D_6	
	No. of days	GDD	No. of days	GDD	No. of days	GDD	No. of days	GDD	No. of days	GDD	No. of days	GDD
D_1	6	91.3	7	102.0	7	102.5	8	113.8	7	103.8	7	109.5
D_2	21	305.0	20	298.5	19	281.0	19	270.5	19	261.3	20	253.3
D_3	18	256.5	18	217.3	17	213.0	17	270.6	17	204.3	18	204.5
D_4	27	322.8	25	291.3	24	272.5	25	295.8	24	279.1	25	284.1
D_5	26	291.8	24	274.3	23	260.3	25	265.7	24	251.9	22	224.9
D_6	13	148.9	14	157.2	15	150.7	13	127.5	15	150.0	14	144.5
Total	111	1417	108	1335	105	1280	107	1275	106	1250	106	1221

by Tomar and Mishra (1988). The reduction in seed yield in subsequent delayed sowing beyond D_3 is attributable to the shorter reproductive period of the late sown crop (table 2). These results confirm the findings of Verma and Pathak (1993).

The oil content (40.9 and 40.6 %) was relatively higher in 40th MW and 41st MW sowing than the 45th MW sowing. The oil content in seed was higher in early sowing, it may be attributed to the fact that seeds in late sown crop did not develop fully and also contained more protein which is negatively correlated with the oil content (Norton and Haris, 1975). The protein content was higher in 45th MW sowing than 40th MW sowing. Further the higher temperature that prevailed at the vegetative and reproductive phases of the crop planted earlier might have decreased the protein content (Rajput and Gautam, 1993).

The number of days taken to complete each phenophase varied with cultivars and with date of sowing. On the basis of date of planting number of days taken for flowering were maximum in D_1 (56 and 45) days followed by D_2 (55 and 45) days and lowest in D_6 (52 and 45 days) in variety Kiran and RLC-4, respectively (Table 2 & 3). Days from sowing to flowering decreased as date of sowing were delayed (Mallick *et al.*, 2006). The number of days required for maturity was maximum in first (D_1) date of sowing (123 and 111 days) at 40th MW, followed by D_2 (121 and 108 days) and lowest in D_6 date of sowing (115 and 106 days) in variety Kiran and RLC-4, respectively. Variety Kiran and RLC-4 required 115-123 and 106-111 days for maturity, respectively.

It was observed that for different sowing dates GDD for sowing to maturity varied between 1221 to 1514 ^{o}C. (Tables 2, 3). GDD was higher in first date of sowing at 40th MW in Kiran and RLC-4. For variety Kiran GDD required for attaining maturity was more due to its longer duration (Goswami *et al.,* 2003 and Khushu *et al.,* 2008).

REFERENCES

Anonymous (2006). Annual progress report. All India coordinated Research Project on Linseed. Project coordinating Unit (Linseed). C.S.A.U.T. campus, Kanpur.

Dubey, R.N. and Srivastava, A. N. (1986). Three new linseed varieties. *Indian Farming:* 3-5

Goswami, B., Mahi, G.S., Hundal, S.S. and Saikia, U.S. (2003). Growing degree days for rice and wheat in Ludhiana region. *J. Agrometeorol.,* 5 (1): 117-119.

Kaniska Mallick, Chaitali sarkar, B.K.Bhattacharya, Rahul

Nigam and S.S. Hundal (2006). Thermal indices for some wheat genotype in Ludhiana region. *J. Agrometerol.*, 8(1): 133-136.

Khushu, M.K., Naseer-U-Rahman, Mahendra Singh, Arvind Prakash, Tiku, A.K. and Bali, A.S. (2008). Thermal time indices for some mustard genotypes in the Jammu region. *J. Agrometeorol.*, 10 (2): 224-227.

Mathur,Y.K., Basant Singh, Ram Anjor and srivastava, J.P. (1984). Effect of date of sowing on the incidence of *Dasineura lini* Barnes (Diptera: Ceciomyidae) and yield of linseed . *J. Oilseed Res.*, 1: 77-79.

Norton, G. and Haris, J.F. (1975). Compositional changes in developing rapeseed (*Brassica napus L.*). *Planta, Berl*. 123: 163.

Rajput, R.L. and Gautum , D. S. (1993). Response of sowing dates and nitrogen levels on growth, yield and quality of linseed. *Gujarat Agri Univ. Res. J.*, 19 (1): 88-93.

Robertson, M.J., Watkinson, A.R., Kirkegaard, J.A., Holland, J.F., Potter, T.D., Burton, W., Walton, G.H., Moor, D.J., Wratten, N.,Farre, I. And Asseng, S. (2002). Environmental and genotypic control of time to flowering in canola and Indian mustard. *Aust. J. Agric. Res.*, 53: 793-809.

Tomar, R.K.S. and Mishra, G.L. (1991). Performance of some linseed varieties on different date of sowing under rainfed conditions. *J Oilseed Res.*, 6(1) : 102-107.

Verma K.P. and Pathak R.K. (1993). Response of linseed (*Linum usitatissimum)* varieties to different date of sowing. *Indian J. Agron.*, 38 (1) : 60-63.

Received: July 2008; Accepted: July 2009