

Sowing Time: A factor in increasing linseed yield in Madhya Pradesh*

by

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Synopsis: The results of trials conducted on the proper time of sowing for Linseed crop in Madhya Pradesh are reported in this article.

Introduction: Richharia (1950) in his efforts to produce good linseed fibre, indirectly found that the crop sown in the latter half of September gave more grain yield than the crop sown in August or the first fortnight of September at Powarkheda. There were no significant differences in grain yield of the crop sown on 19th September and 4th October. Sowings later than 4th October were not attempted. Richharia (*loc. cit*) conducted similar experiments at Sabour and the end of September was considered the best time for the production of maximum straw and grain yield. Culbertson (1952), reported varietal differences with respect to the time of sowing as one variety was found to respond better with early sowing and the other with late sowing. Dastur and Bhatt, in their investigations on the growth of the linseed crop at Indore, found the first fortnight of October the optimum period to sow linseed for obtaining high yield and oil content.

In view of the results obtained at Indore, field experiments to determine the optimum period for linseed were carried out at the experimental farms in several linseed growing regions of Madhya Pradesh where the crop is cultivated under rainfed conditions.

Materials and methods: During the *rabi* season of 1959-'60, experiments on different dates of sowing linseed were conducted at the experimental farms at (1) Kuthulia, (2) Reora, (3) Khamaria, (4) Powarkheda, (5) Nabibagh and (6) Vidisha. Results from Khamaria and Vidisha farms were not received. These experiments were repeated in 1960-'61. Information about the local practices and the normal time of sowing linseed was obtained before the trials were laid out. There were four dates of sowing and these were so arranged that the crop could be sown earlier as well as later besides the normal period of sowing. A gap of about ten days was kept between the successive sowings. The local variety of a particular region was sown. The experiment was laid out in simple randomised blocks with eight replicates. The plot size was kept at 11 feet 8 inches by 40 feet and was modified to suit the spacings adopted in different regions.

Results and Discussion: Experiments on the effect of time of sowing linseed on grain yield were conducted first at Indore from 1954-'55 to 1958-'59. In

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this tract, the crop is normally sown between the 21st October and the 23rd November. This sowing period appeared to be late for producing enough vegetative structure before the reproductive phase set in.

As a result of these experiments the optimum period to sow the linseed crop at indore appeared to be the first half of October, depending upon the rainfall conditions. The early sown crop produced more dry weight and grain yield per plant than the late sown crop. This would be evident from the yield per hectare obtained on different dates of planting in 1958-'59 (Table 1).

TABLE I
Yield in kg. per hectare at Indore.

Sowing date	Varieties			
	I. P. I.—6	Mohoba	H—469	Mean
9th October	531.0	546.4	448.5	508.6
20th October	486.0	524.8	415.8	475.5
29th October	384.6	395.6	340.6	373.6
8th November	329.8	365.8	290.7	328.7
Mean	432.8	458.1	373.9	
For sowing date C. D. at 1% = \pm 81.5				
For varieties C. D. at 1% = \pm 54.3				

The linseed yield decreased as the sowing date advanced. The crop sown on 9th and 20th October gave significantly higher yield than when it was sown on 29th October and 8th November. Both Mohoba and I. P. I. 6 yielded significantly better than the variety H-469. On an average the net gain by sowing the crop during the first fortnight of October was over 125 kg. per hectare more than the late sown crop.

TABLE 2
Linseed yield at Reora (Satna):

Sowing date	Yield in kg. per hectare
16th October	393.1
26th October	399.4
5th November	134.2
15th November	107.9
C. D. at 5%	54.5

It would be seen from Table 2 that highly significant increase in yield was obtained when the linseed crop was sown on 16th and 26th October as compared with the crop sown on 5th and 15th November. With a gap of ten days after 26th October there was drastic reduction in yield. The normal time for sowing linseed in this region is from the last week of September to the first week of October. However the crop sown on 16th and 26th October gave practically the same yield. It is therefore not certain if still higher yields could have resulted by sowing the crop earlier than 16th October. This has to be determined by further trials.

TABLE 3

Linseed yield at Kuthulia (Rewa)

Sowing date	Yield in kg. per hectare
22nd September ...	162.6
2nd October ...	278.3
12th October ...	353.3
22nd October ...	189.3
C. D. at 5%	54.6

At Kuthulia the highest yield was recorded when the crop was sown on 12th October, while the crop sown on 22nd September gave the lowest yield. Besides, the 12th October sowing yielded significantly higher than the crop sown on any other date. From 22nd September onwards the yield increased as the sowing date advanced and reached the maximum on 12th October and then declined.

The crop at Kuthulia is normally sown from the last week of September to the first week of October. From the above results the optimum period to sow linseed in this area appears to be the first fortnight of October as the sowings done in the last week of September and the last week of October gave significantly lower yields.

TABLE 4

Linseed yield at Nabibagh (Bhopal)

Sowing date	Yield in kg. per hectare
5th November ...	674.3
15th November ...	456.9
25th November ...	385.3
5th December ...	434.7
C. D. at 5%	108.3

At Nabibagh also the trend was for early sowing of linseed. Though there were no differences in yields of crop sown on 15th November and 5th December, the yield decreased as the sowing date advanced. The crop sown on 5th November gave significantly higher yield than the yields recorded under the subsequent three dates of sowing. Dates earlier than 5th November should have been tried to ascertain the optimum period of sowing linseed in this tract. The normal practice at Nabibagh is to sow the crop from the last week of October to the first fortnight of November. The results indicate that further trials should be conducted in this area for sowing linseed on different dates, starting with the first week of October and extending upto the middle of November or the end of November.

TABLE 5

Yield in kg. per hectare at Powarkheda.

Sowing date	Varieties		
	E. B. 3	I. P. I. 6	Mean
1st October	536.5	511.2	523.8
11th October	493.3	432.1	462.7
21st October	436.2	376.4	406.3
31st October	339.5	296.4	317.8
Mean	451.3	403.9	
C. D. at 5%	59.2		

The yield of both the varieties decreased as the sowing date advanced (Table 5). The highest yield was obtained in the crop sown on 1st October. In the variety E. B. 3, the yield recorded in the first three sowings was significantly higher than the fourth sowing. The first and the second sowings on 1st and 11th October, also gave significantly higher yield than the other two sowings done on 21st and 31st October. A similar trend was noted in I. P. I. 6 but the differences in yield were non-significant.

At Powarkheda, linseed is generally sown after mid-October. It would be seen that the yields decrease appreciably after 11th October. Experiments conducted by Richharia (1950) at Powarkheda were aimed at the improvement of linseed fibre and though the sowings were done from 4th August to 4th October, this period is unsuitable from the point of view of maximum seed production. Moreover, as observed by the author recently the high soil temperature in the latter half of September adversely affects the germination of the crop. At Powarkheda therefore, the optimum period to sow linseed appears to be the first fortnight of October.

These experiments conducted in different regions indicate considerable reduction in yield if the time of sowing is shifted earlier or later than the optimum time. When sown during the optimum period, the vegetative

and reproductive phases of growth of the crop are balanced with respect to the soil moisture and temperature which when excessive or inadequate during very early and late sowings respectively result in unbalanced growth and low yield. The results are in agreement with those of Tiver and Williams (1943), who showed that a delay of 18 days from the optimum period reduced the seed yield of Punjab linseed from 15.7 to 5.4 bushels per acre.

Summary: Experiments to find out the optimum period for sowing linseed were conducted in different parts of Madhya Pradesh. At Indore, Powarkheda and Kuthulia, the optimum period appeared to be the first fortnight of October, while mid-October sowing gave the maximum yield at Reora. The crop sown earlier or later than this peak period gave significantly lower yields. At Nabibagh the crop sown on 5th November yielded over 200 kg. more than the crop sown on 15th November and later. It remains to be determined if still higher yields could be obtained by sowing the crop earlier than 5th November.

It is suggested that keeping in view the monsoon conditions in a particular tract, the time of sowing may be adjusted in the peak period, as by adopting this simple practice considerably high linseed yield can be obtained without incurring any extra expenditure.

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