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YIELD AND ECONOMICS OF LINSEED AS INFLUENCED BY DIFFERENT LAND CONFIGURATION AND SOWING WINDOWS

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ABSTRACT

A field experiment was conducted during *rabi* season of 2022-23 at farm of AICRP on linseed, College of Agriculture, Nagpur to study the effect of land configuration and sowing windows on yield and economics of irrigated linseed. The experiment was laid out in split plot design with four replications and fifteen treatment combinations consisting of three land configurations *viz.*, L_1 (Flat bed), L, (Ridges and furrow) and L_3 (Broad bed furrow) and five sowing windows S_1 (44th SMW), S_2 (45th SMW), S_3 (46th SMW), S_4 (47th SMW), S_5 (48th SMW). The results of experiment showed that significantly highest values of yield attributes like number of capsules plant^{-1}, number of seeds capsule^{-1}, test weight, seed yield ha^{-1}, straw yield ha^{-1}, GMR, NMR and B:C ratio recorded in treatment L_3 (BBF) and it was at par with treatment L_2 (Ridges and furrow). Among the various sowing windows sowing of linseed during 45th SMW (S2) recorded highest yield attributes, GMR, NMR and B:C (2.44) ratio and it was at par with treatment S_1 (44th SMW). Interaction effect of land configuration and sowing windows found to be significant in terms of yield contributing characters like number of capsules plant^{-1}, seed yield ha^{-1} and straw yield ha^{-1} also in terms of NMR and it was highest in L_3S_2 (L_3 Broad bed furrow, S_2 45th SMW)

(Key words: Linseed, oilseed crop, sowing windows, land configuration, BBF)

INTRODUCTION

Linseed (*Linum usitatissimum* L.) is an important oilseed crop of central India, locally known as jawas or alsi. It has been grown since ancient times for flax (fiber) and for seed purposes, which are rich in oil. Linseed contains a high level of lignan, and omega-3 fatty acids possess anti-cancer properties.

In recent years linseed is very much popular among the farmers of Vidarbha region. In view of the rapid spread of crop, it is important to increase the productivity of crop. Production can be increased by Increasing productivity and taking additional area under cultivation. Productivity of crop can be increased by adoption of improved agronomic practices like use of suitable land configuration and sowing windows for cultivation of crop.

The proper land configuration is known for increasing moisture intake and resultant yield. Sowing of crop on broad bed and furrow, ridges and furrow are known to help linseed crop during water stress.

Optimum sowing time is one of the most important agronomic factor and non-monetary input but has noticeable impact on productivity of crop. Planting dates significantly affect growth character, yield and its components as well as oil yield in linseed. Sowing dates have been shown to provide differential growth conditions such as temperature, precipitation and growth periods. The appropriate sowing date is very important since it ensures good seed germination, as well as timely appearance of seedling and optimum development of root system.

MATERIALS AND METHODS

A field experiment was conducted at farm of AICRP on linseed, College of Agriculture, Nagpur during *rabi* season of 2022-23 in split plot design with fifteen treatment combinations consisting of four land configurations *viz.*, L_1- Flat bed), L, - Ridges and furrow and L_3- Broad bed furrow and five sowing windows S_1- 44th SMW (Standard Meteorological Week), S_2- 45th SMW, S_3- 46th SMW, S_4- 47th SMW, S_5-48th SMW as sub plot treatments replicated four times. The crop variety PKV NL-260 was used with row to row spacing of 30 cm.

At the time of harvesting, yield attributes like number of capsules plant, number of seeds capsule, test weight (g), seed yield (kg ha¹) and straw yield (kg ha¹) were recorded. In order to represent the plot, five plants of linseed from each net plot were selected randomly for various biometric observations on post harvest studies. The selected five plants were labeled and all biometric observations were recorded properly on them.

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Table 1. Yield attributes, yield and economics of linseed as influenced by land configuration and sowing windows

Treatments	No. of capsules plant^{-1}	No. of seeds capsule^{-1}	Test weight (g)	Seed yield (kg ha^{-1})	Straw yield (kg ha^{-1})	Total Cost of cultivation (Rs. ha^{-1})	Gross monetary returns (Rs. ha^{-1})	Net monetary returns (Rs. ha^{-1})	B:C ratio
Land Configuration									
L_1 - Flat Bed	52.43	7.49	7.31	730	1366	19270	37844	18574	1.96
L_2 - Ridges and furrow	61.25	8.07	7.39	850	1474	19770	43998	24228	2.23
L_3 - Broad bed furrow	63.62	8.17	7.39	872	1519	19770	45119	25349	2.28
SE (m) ±	0.79	0.15	0.01	12	18	-	-	625	-
CD at 5%	2.36	0.44	0.03	35	54	-	-	1869	-
Sowing windows									
S_1 - 44th SMW	64.00	8.27	7.41	881	1523	19270	45593	25989	2.37
S_2 - 45th SMW	66.65	8.28	7.42	910	1546	19270	47029	27425	2.44
S_3 - 46th SMW	60.22	8.18	7.39	841	1456	19270	43514	23911	2.25
S_4 - 47th SMW	54.55	7.53	7.33	748	1389	19270	38808	19205	2.01
S_5 - 48th SMW	50.08	7.28	7.29	706	1352	19270	36658	17055	1.90
SE (m) ±	1.08	0.11	0.005	11	15	-	-	530	-
CD at 5%	3.10	0.31	0.014	32	44	-	-	1580	-
Interaction									
SE (m) ±	1.87	0.19	0.008	18	26	-	-	918	-
CD at 5%	5.59	-	-	53	77	-	-	2745	-
GM	59.10	7.91	7.37	817	1453	19395	42320	22717	2.18

Table 2. Interaction effect of land configuration and sowing windows on number of capsules plant^{-1}, seed yield, straw yield and NMR

Treatments	No. of capsules plant^{-1}	Seed yield (kg ha^{-1})	Straw yield (kg ha^{-1})	Net monetary returns (Rs. ha^{-1})
L_1S_1	54.35	771	1445	20738
L_1S_2	56.00	779	1402	21069
L_1S_3	54.40	744	1348	19265
L_1S_4	51.90	700	1326	17043
L_1S_5	45.50	654	1312	14755
L_2S_1	69.00	936	1560	28623
L_2S_2	70.00	964	1607	30059
L_2S_3	60.75	872	1475	25293
L_2S_4	55.25	756	1401	19438
L_2S_5	51.25	724	1326	17728
L_3S_1	68.65	937	1564	28608
L_3S_2	73.95	986	1629	31148
L_3S_3	65.50	908	1546	27174
L_3S_4	56.50	789	1441	21133
L_3S_5	53.50	740	1418	18683
SE(m) ±	1.87	18	26	918
CD at 5%	5.59	54	78	2754

RESULTS AND DISCUSSION

Effect of land configuration

Data revealed that application of land configuration influenced the yield attributes *viz*., number of capsule plant^{-1}, number of seeds capsule^{-1}, test weight, seed yield ha^{-1}, straw yield ha^{-1}. Application of broad bed furrow (L_1) recorded highest values of all yield attributes and yield of linseed. Data also revealed that highest GMR (Rs 45119 ha^{-1}), NMR (Rs 25349 ha^{-1}) and B:C ratio (2.28) were observed under treatment L_3 (BBF) and it was at par with treatment L_2 (Ridges and furrow). This might be due to cumulative effect of improvement of yield attributes like number of capsule plant^{-1}, number of seeds capsule^{-1}, test weight which reflects higher yield. The results are in close conformity with Patil *et al.* (2011), who reported that application of BBF helps to maintain availability of moisture for longer duration and proper root growth of plant which helps in uptake of nutrient and ultimately results in increase in seed yield. Paul (2014) also reported that furrow opening concept is beneficial to increase the yield of linseed.

Effect of sowing windows

Sowing windows significantly influenced the yield attributes and yield of linseed. Treatment S_2 (45th SMW) recorded significantly highest value of yield attributes like number of capsule plant^{-1} (66.65), number of seeds capsule^{-1} (8.28), test weight (7.42 g), seed yield ha^{-1} (910 kg ha^{-1}) and straw yield ha^{-1} (1546 kg ha^{-1}) and it was at par with treatment S_1 (44th SMW). Also found that highest GMR (Rs 47029 ha^{-1}), NMR (Rs 427425 ha^{-1}) and B:C ratio (2.44) were observed in terms of crop sown during 45th SMW. This might be due to cumulative effect of yield attributes *viz*., number of capsules plant^{-1}, number of seeds capsule^{-1}, test weight turned into highest yield. Raundal (2015) reported that sowing of linseed during 45th SMW was favourable to high seed production because post anthesis period coincide with the relatively low temperature. Chopra and Badiyala (2016) also observed that as sowing delays yield of linseed decreases. Jiotode *et al*. (2017) reported that early sown crop received favorable weather conditions for longer duration in terms of cool winter period which helps in pollination, pollen development and seed setting during reproductive stages which reflects higher yield. Similar results were also reported by Gopale *et al*. (2022), who reported that crop sown during 30th October faced favorable environment for growth while delayed sown crop exposed to higher temperature and water deficit condition during reproductive stages leads to lower yield. The result are in close conformity with Kumhare *et al.* (2022), who reported that crop sown during 44th SMD having highest seed yield which might be due to optimum temperature prevailed during flowering which resulted in lower flower drop and more seed setting.

Interaction effect

Interaction effect of land configuration and sowing windows was found to be significant in terms of number of capsule plant^{-1}, seed yield ha^{-1}, straw yield ha^{-1} and NMR. Treatment L_3S_2 (L_3- Broad bed and furrow, S_2- 45th SMW) recorded highest number of capsules plant^{-1} and it was at par with treatment L_2S_2 (L_2- Ridges and furrow, S_2- 45th SMW), L_2S_1 (L_2- Ridges and furrow, S_1- 44th SMW) and L_3S_1 (L_3- Broad bed and furrow, S_1- 44th SMW). In case of seed yield and straw yield treatment L_3S_2 recorded highest seed yield and straw yield (kg ha^{-1}) and it was at par with treatment L_2S_2 L_3S_1 and L_2S_1. In terms of NMR treatment L_3S_2 recorded highest NMR and it was at par with treatment L_2S_2, L_2S_1 and L_3S_1. Linseed sown at 45th SMW by BBF method gave net monetary returns of Rs. 31148. Therefore, it may be recommended that sowing of linseed by BBF method during 45 SMW is found beneficial.

REFERENCES

Chopra, P. and D. Badiyala, 2016. Influence of sowing time on performance of linseed (*Linum usitatissimum* L.) varieties under mid hill conditions of Himachal Pradesh. J. Oilseeds Res. **33**(4): 256-258.

Gopale,R., R. D. Deotale, A. Raut, S. R. Kamdi, S. B. Baviskar and A. Aade, 2022. Effectivity of different sowing dates on chemical, biochemical, yield and yield traits in mustard genotypes. J. Soils and Crops. **32**(1) 171-179.

Jiotode,D. J., D. Patel, Shanti Patil and V. S. Khawale, 2017. Effect of different date of sowing and crop weather on linseed varieties. J. Soils and Crops. **27**(1): 232-238.

Kumhare, A., K. Kumar, D. J. Jiotode and S. Thakur, 2022. Effect of sowing dates on yield attributes, yield and economics of linseed (*Linum usitatissimum* L.) varieties. J. Exp. Agric. Int. **44**(1): 37-46.

Patil, D. B., S. N. Mendhe, H. S. Kolte and H. D. Sathe, 2011. Effect of land configuration and irrigation management on yield attributes and economics of linseed. J. Soils and Crops. **21**(1): 86-89

Paul S. A. 2014. Effect of land configuration and nutrient management on productivity of irrigated linseed. unpublished M.Sc. Thesis submitted to College of Agriculture, Nagpur.

Raundal, P. U., V. B. Pohare and L. D. Shinde, 2015. Response of different linseed varieties under extended sowing dates. Int. J. Trop. HYPERLINK "https://www.cabdirect.org/cabdirect/mobile/search/22 International + Journal + of + Tropical+Agriculture%22"Agric. **33**(4):3485-3488.

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