Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 4599-4601

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-7 pp. 4599-4601**
Journal homepage: http://www.ijcmas.com

Original Research Article

Effect of Date of Sowing and Crop Geometry on Yield, Oil Content and Economics of Indian mustard (*Brassica juncea* L.)

R. S. Singh*, C. S. Chaudhary and U. Mukherji

Tirhut College of Agricultue, Dholi, Dr. Rajendra Prasad
Central Agricultural University, Bihar, India
**Corresponding author*

Keywords

Yield, Oil Content and Economics of Indian mustard (*Brassica juncea* L.)

A B S T R A C T

To assess the effect of changing climate and different spacing on yield, oil content and economics of newly released variety NRCHB101 of Indian mustard an experiment was carried out during 2015-16 at Agricultural Research Farm of Tirhut College of Agricultue, Dholi (Muzaffarpur), Dr. RPCAU, Pusa, Bihar. It was found that sowing on different dates as well as crop geometry had significant bearing on mustard seed and stalk yields, harvest index, oil content and oil yield, net return and B: C ratio. Sowing on 14th and 24th November resulted in reductions in seed yield 43.3 and 23.3, oil content 1.45 and 1.27, oil yield 23.5 to 57.7, net return 32.2 to 59.8 and B: C ratio 23.4 to 55.8 per cent as compared to sowing on 4th November. Reductions caused due to different crop geometry was to the extent of 11.12 to 31.08 per cent in seed yield, 9.70 to 25. 64 per cent in stalk yield, 10.92 to 30.44 per cent in net return and 15.71 to 50 14 per cent in B: C ratio was found as compared to the crop geometry of 30 cm x 10 cm.

Introduction

Indian mustard (*B. juncea*) is the most important edible oilseeds crop in India in terms of oil yield and ranked second after soybean in terms of production. In Bihar, it occupies first position both in area and production but there is large gap between its yield potential and average productivity.

Thus there is a need to develop suitable crop management practices for enhancing crop productivity. Sowing time and crop geometry has profound effect on growth as well as yield of mustard. Therefore, these two important non-monetary inputs were taken into account to improve the productivity. Since information on sowing dates and crop geometry on Indian mustard in Bihar is meagre, this experiment was conducted.

Materials and Methods

The experiment was carried out during 2015-16 at Agricultural Research Farm of Tirhut College of Agricultue, Dholi (Muzaffarpur), Dr. RPCAU, Pusa, Bihar. There were three dates of sowing (D_1-4th, D_2-14th and D_3-24th November) and five different crop geometry (G_1-30cm x 10cm, G_2-30cm x 20cm, G_3-30cm x 30cm, G_4-45cm x 15cm and G_5-45cm x 30cm). The experiment was laid out in split plot design on sandy loam soil and replicated thrice. The soil of the experimental plot was sandy loam

in texture, alkaline in reaction (pH - 8.3), low in organic carbon, available nitrogen and phosphorus but medium in available K_2O and S. Variety of the Indian mustard taken was-'NRCHB 101'. Fertilizer @ 80:40:40 as N: P_2O_5: K_2O with sulphur @ 20 kg per hectare was applied uniformly and all the agronomical practices were followed properly. Observations were recorded as per schedule.

Results and Discussion

The effect of different dates sowing as well as crop geometry on mustard seed and stalk yields, harvest index, oil content and oil yield, net return and B: C ratio was found significant (Table.1)). Sowing on 14th and 24th November resulted in reductions in seed yield 43.3 and 23.3, oil content 1.45 and 1.27, oil yield 23.5 to 57.7, net return 32.2 to 59.8 and B: C ratio 23.4 to 55.8 per cent as compared to sowing on 4th November.

Reduction in seed yield in later date of sowings may be due late germination and increasing temperature that shortened days to maturity thus providing less time for carbon fixation and biomass accumulation before seed setting which in turn resulting in poor seed yield, oil content and ultimately net return. Similar observations were also reported by Rawson (1992) and Morrison (1996).

Table.1 Effect of date of sowing and crop geometry on yield, oil content economics of Indian mustard

Treatments	Seed Yield (Kg/ha)	Stalk Yield Kg/ha)	Harvest Index (%)	Oil Content (%)	Oil Yield (Kg/ha)	Net Return (Rs./ha)	B : C Ratio
Date of Sowing							
D_1(4th Nov.)	1915	4753	28.72	40.088	768	55041	3.56
D_2(14th Nov)	1468	3716	28.32	40.013	587	37323	2.74
D_3(24th Nov)	1085	2821	27.78	39.499	429	22127	2.03
CD (0.05)	404	1014	0.38	0.49	166	13752	0.53
Crop geometry							
G_1-30x10 cm	1772	4390	28.76	39.784	705	49310	3.29
G_2-30x20 cm	1575	3964	28.44	39.861	628	41563	2.93
G_3-30x30 cm	1392	3542	28.21	39.848	555	34315	2.60
G_4-45x15 cm	1358	3495	27.99	39.877	542	33030	2.54
G_5-45x30 cm	1350	3494	27.87	39.963	540	32749	2.52
CD (0.05)	241	899	0.31	NS	101	9833	0.31

Reductions caused due to different crop geometry was to the extent of 11.12 to 31.08 per cent in seed yield, 9.70 to 25. 64 per cent in stalk yield, 10.92 to 30.44 per cent in net return and 15.71 to 50 14 per cent in B: C ratio was found as compared to the crop geometry of 30 cm x 10 cm. Reductions may be due to differences in getting different growth factors like nutrients, moisture, light, air and space in different proportions by individual plants.

Individual plants performed better in terms of growth and yield attributing parameters in wider crop geometry but due to higher plant population per unit area, seed yield, oil yield, net return and B:C ratio were found significantly higher in G_1 as compared to G_3,

G_4 and G_5. These results corroborates with the findings of Shivani and Sanjeev Kumar (2002).

Indian mustard variety 'NRCHB 101'sown on 4th November and at 30 cm x 10 cm spacing was found best for getting seed yield, oil yield and net return as compared to sowing on later dates and other spacings under condition of north Bihar.

Acknowledgements

DRMR, Bharatpur and Dr. RPCAU, Pusa, Samastipur for providing all the necessary facilities for conducting the experiment successfully.

References

Morison, J.I.L. 1996. Global environmental change impacts on crop growth and production in Europe. Implications of global environmental change for crops in Europe. Aspects of Applied Biology. 45: 62–74.

Rawson, H.M. 1992. Plant responses to temperature under conditions of elevated CO2. Australian Journal of Botany. 40:473–490.

Shivani and Kumar, S. 2002. Response of Indian mustard *(Brassica juncea)* to sowing date and row spacing in mid-hills of Sikkim under rainfed conditions. *Indian Journal of Agronomy* 47 (3): 405-410.