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Effect on different date of sowing and yield of mustard crop (*Brassica juncea* L.) under climatic condition Allahabad

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Abstract

The experiment was conducted at Research field of college of Forestry, Sam Higginbottom University of Agriculture Technology & Sciences, Allahabad. A field experiment was conducted during the period September 2016 to March 2017, Rabi season to observe the effect of different sowing dates on the yield of mustard seed. There were three dates viz. 25 October, 04 November, 14 November. Significant variations due to different sowing dates were observed yield plot⁻¹ yield ha⁻¹ of mustard. Results showed that the highest seed yield was 15.17 q ha⁻¹ obtained from 25 October. The lowest seed yield was 6.90 q ha⁻¹ from 14 November. From the result, the best sowing dates of mustard is on 25 October in the early sowing on climate condition Allahabad.

Keywords: sowing dates, grain and yields

Introduction

Rapeseed and mustard are the major *rabi* oilseed crops of India and stand next to groundnut in the oilseed economy. Rapeseed and mustard are one of the most important edible oils of northern and eastern parts of India. The crop distribution in different states of India is Assam, Orissa, W.B, Meghalaya, Tripura, Haryana, H.P, U.P, Jammu, M.P, and Rajasthan. But the major Mustard growing states are Haryana, U.P, M.P, and Rajasthan representing 81 percent of the total mustard and Rai seed production. (Anonymous, 2015) [3].

Mustard is rich in minerals like calcium, magnesium, iron, vitamin A, C and proteins. 100 g mustard seed contains 508 kcal energy, 28.09 g carbohydrates, 26.08 g proteins, 36.24 g total fat, 12.2 g dietary fiber, 31 I.U. vitamin A, 7.1 mg vitamin C, 266 mg calcium, 9.21 mg iron, 370 mg magnesium and 738 mg potassium. (USDA, 2014).

Mustard aphid, *Lipaphis erysimi* (Kalt.) is one of the most serious pest and is considered to be the limiting factor in the successful cultivation of rapeseed-mustard. The colonies of mustard aphids feed on the new shoots, inflorescence and underside of leaves. Loss in yield up to 91.3 percent (Singh and Sachan, 1994) [4].

Mainly two aphid species viz., *L. erysimi* and *M. persicae* were recorded from the mustard plants in which *L. erysimi* was found to be the most active pest of mustard. These aphids have appeared in the fields especially with the onset of flowering (Singh, P. *et al.*, 2011) [5] The damage is caused by both nymphs and the adults, these are louse-like and pale greenish insects, are seen feeding in large numbers, often covering the entire surface of the flower buds, shoots, pods etc, (Ahmed and Jalil, 1993) [1].

Materials and Methods

The experiment was carried out in field of Nursery college of Forestry, Sam Higginbottom University of Agriculture Technology & Sciences, Allahabad (U.P.), during Rabi season (2016-2017). Allahabad is located in the south-East part of Uttar Pradesh India. The site of experimental site (research and nursery area) situated 25.45° N 81.85° E and at an altitude of 98 meter above sea level. All the required materials and facilities necessary for the cultivation readily in the department. This region has a subtropical climate with extreme of summer and winter. These locations receive the mean annual rainfall ranges from 500 mm to 1500 mm. More than 70 per cent rains are received during S-W monsoon season 5 to 10 per cent rains are received in winter, 10-15 per cent in summer and 5-10 per cent during post monsoon season.

Temperatures vary greatly in these regions. May and June are the hottest and December and January are the coldest.

Monthly mean temperature more than 25 °C prevails during 8-10 °C frost for one or two days may also occur during winter months. The weekly average data on weather condition during the experimentation period was recorded at meteorological observatory location at the research and nursery area of the college of forestry an, SHUATS, Allahabad (U.P.) Pre-sowing operations the field was prepared by ploughing with a tractor drawn disc plough two times, followed by cross harrowing and planking. The field was thoroughly leveled by a scrapper before it was laid out. The weeds were picked up in order to get a clean field, after that lay out of the field was made according to plan of layout. Fertilizer application The basal dose of fertilizer at a rate of 40 kg ha⁻¹ N as urea, phosphorus and potash 60 kg ha⁻¹, 40 kg ha⁻¹ through DAP and MOP and 20 kg ha⁻¹ S as gypsum was applied as a basal dose applied sowing time treatment according to plan of layout Fertilizer were applied in nitrogen ½ half dose sowing time. Sowing of seed the Mustard variety used was Parasamani-8 Seed were sown at a depth of 2.5 to 5.0 cm in rows with a seed rate of 4-5 kg ha⁻¹. The rows were 30 cm apart. Post-sowing operations Gap filling Seed germinations was observed at five days of sowing. Which continued up to 6th day? Seeds were re-sown in the gaps where the previous seeds failed to germinate. Thinning of plant was done at 25th day after sowing when the crop developed 6 to 7 leaves/plant. This was done to maintain spacing of 15 cm between plants in a row as per treatment the optimum population in order to avoid overcrowding of the plants. Weeding one hand weeding was done by labourers with khurpi at 15 day after sowing, followed by second manual weeding at 30 days after sowing. This was done to control grassy as well as broad leaf weeds. Irrigation two irrigation was given during the crop growth period at 20 & 40 days after

sowing by flood method of irrigation. Fertilizer application (Top dressing) the dressing was done with the remaining half dose of nitrogen as urea at 40 days after sowing. Urea was applied by furrow placement method at a distance of 10 cm from the crop rows. Harvesting and Threshing the crop was harvested plot wise at maturity stage the siliqua turned brown yellow, 135- 140 days after sowing. Harvesting was done manually by sickle. After completed sun drying the bundles of harvested produce of each plot the experiment was carried out in a factorial design laid out as a randomized block design with three replications. The experiment has two factors (1) Date of sowing D₁-1st sowing date 25th October, D₂-2nd sowing date 04 November, D₃-3rd sowing date 14 November The Grain Yield (q ha⁻¹) The crop plant each plot were harvested and were put for sun drying. After the pods and plants were properly dried, threshing was done manually (by beating) and seeds obtained were weighed on single pan physical balance. The Grain Yield from the net plot area was recorded in gm/plot and figure converted into qha⁻¹

Result and Discussion

Significant variations were observed among three sowing time of mustard on yield per plot and depicted in the highest yield (606.67 g) was observed in T₁ (1st DOS 25 October/ Chlorpyrifos 20 EC) The lowest yield (276.0 gm) was recorded at T₀ (3rd DOS 14 November/control). Different Sowing date of mustard on yield per hectare. The highest yield (15.17q ha⁻¹) was observed in T₁ (1st DOS 25 October/ Chlorpyrifos 20 EC). The lowest yield (6.90 q ha⁻¹) T₀ (3rd DOS 14 November/control).

The seed yield was significant effect in the sowing date and interaction in insecticide first sowing on 25 October 2016 recorded significantly maximum seed yield 15.17qt/ha as compared second and third DOS with 12.23 and 11.30 qt/ha respectively.

Table 1: Effect of sowing dates and application of insecticides on yield (q ha⁻¹).

Levels of Date (D)	Yield Per Treatment			Mean (D)
	Insecticides (C)			
	C ₀ = Control	C ₁ = Chlorpyrifos	C ₂ = Imidacloprid	
25-Oct	10.54	15.17	14.03	13.25
4- Nov	9.21	12.23	10.50	10.64
14-Nov	6.90	11.30	9.71	9.30
Mean (C)	8.88	12.90	11.41	
	F-test	S. Em. (±)	C.D. at 5%	
Insecticides (c)	S	0.233	0.493	
Date (D)	S	0.233	0.493	
Inter (C x D)	S	0.403	0.854	

Conclusion

From the above study, it may be concluded that the best sowing time of the mustard is 25 October in the south-East part Allahabad.

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