



## ZERO COST TECHNOLOGY FOR INCREASING THE YIELD OF INDIAN MUSTARD

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### ABSTRACT

The field study was under taken during two consecutive years at Regional Research Station of the C.S. Azad University of Agriculture & Technology, Kanpur at Mainpuri. The experimental soil was sandy loam, having poor fertility status. Five treatments *i.e.*, N-S direction sowing, E-W direction sowing, flower nipping at 75 DAS, leaf plucking and control (broadcasting sowing) were tested. Cultivar *Varuna* was planted in first fortnight of November and harvested in second fortnight of March after 130 days of seeding during two experimental seasons. The maximum increase in seed yield was recorded in flower nipping at 75 DAS (7.06 q/ha), closely followed by leaf plucking (6.06 q/ha) and N-S direction sowing (5.85 q/ha) over control. N-S direction sowing gave yield 19.31 q/ha, which was higher in comparison to E-W direction sowing (15.33 q/ha). The minimum yield by 13.46 q/ha was reaped from broadcasting sowing (control) of Indian mustard. The growth and yield contributing characters were concordance to the seed yield recorded under different treatments.

**KEY WORDS:** Alternaria blight, E-W direction sowing, Flower nipping, Leaf plucking, N-S direction sowing.

### INTRODUCTION

India is the largest producer of Indian mustard in the world. Next only to groundnut, Indian mustard ranks second in terms of area and production in the country. Poor germination, reduced plant stand establishment, poor or no management of biotic and abiotic factors, lack of high yielding varieties among the farming community, non follow of smart agronomy and inadequate plant stand are some of important constraints responsible for poor yield of Indian mustard. Feedback received from the farmers field that there are several constraints for poor yield of Indian mustard. Out of which, the major constraints are sowing with broadcasting, no plant thinning, no proper distance between rows and plants, imbalanced use of fertilizers, no addition of organic manure, no attention on direction of sowing for utilization of natural resources. Among these factors plants thinning for maintaining the plant distance and direction of sowing are most important factors for enhancing the yield of Indian mustard.

Rathi *et al.* (1978), Rathi *et al.* (1979) and Rathi *et al.* (1979) reported from C.S. Azad University of Agriculture & Technology, Kanpur that maintaining the row to row distance by 60 cm and plant to plant by 15 cm with two times thinning at 15 days and 25 days of sowing enhance the seed yield of Indian mustard cv. *Varuna* more than 45 q/ha.

Singh (1996) reported that seed yield of Indian mustard increased with north-south direction sowing over the east-west sowing because north-south sowing fully availed the benefits of natural resource *i.e.*, sun light.

Keeping the above point in view, the plan for study of enhancing grain yield of Indian mustard through utilization of natural resources without any additional cost was made and under taken.

### MATERIALS AND METHODS

The field study was undertaken during 1999-2000 and 2000-01 at Regional Research Station of the C.S. Azad University of Agriculture and Technology, Kanpur at Mainpuri. The soil was sandy loam, having pH 8.5, organic carbon 0.45%, total nitrogen 0.04%, available phosphorus 10 kg/ha and available potassium 278 kg/ha, thus, the nutrients of experimental soil were analysed low in organic carbon, total nitrogen, available phosphorus and high in available potassium. The pH was determined by Electrometric glass electrode method (Piper, 1950), while organic carbon was determined by Colorimetric method (Datta *et al.*, 1962). Total nitrogen was analysed by Kjeldahl's method as discussed by Piper (1950). The available phosphorus and potassium were determined by Olsen's method (Olsen *et al.*, 1954) and Flame photometric method (Singh, 1971), respectively. Five treatments *i.e.*, N-S direction sowing, E-W direction sowing, flower nipping at 75 DAS, leaf plucking and control (sowing with broadcast) were tested. Cultivar *Varuna* was planted in first fortnight of November during both experimental seasons. The crop was harvested in second fortnight of March after 130 days of seeding during both years. The recommended agronomical practices were followed in both the season of experiment as suggested by Singh and Rathi (1985). The irrigation was given to crop as and when required. The experiment was conducted in RBD with five replications. The experimental data of both years were statistically analysed as suggested by Gomez and Gomez (1984).

### RESULTS AND DISCUSSION

The pooled data of growth, yield traits and seed yield of individual year were statistically analysed and reported in Table 1 and discussed here under appropriate heads.

### Effect on growth parameters

The different treatments did not much differ for improvement in plant height. The lowest primary branches/plant was counted in control (broadcast sowing), while other tested treatments displayed at par branches/plant. The insignificant response was noted in production of siliquae/plant under different treatments. The similar trend was also noted in weight of siliquae/plant (Table 1).

### Effect on yield contributing characters:

The lowest seed weight/plant was weighed in control (broadcast sowing) but insignificant response was found under different treatments. Flower nipping at 75 DAS, N-S direction sowing, leaf plucking and E-W direction sowing displayed almost at par seed yield/plant but superior to over control. The similar trend was also recorded in test weight (Table 1). These findings are in agreement with those reported by Singh (1996).

### Effect on seed yield:

Result displayed that all the treatments were found effective in order to increase of seed yield of mustard over the control (Table 1). The maximum increase in seed yield was recorded in flower nipping at 75 days after sowing (7.06 q/ha) closely followed by leaf plucking (6.06 q/ha) and N-S direction sowing (5.85 q/ha) over control. It is worthwhile to mention here that E-W direction sowing was increased seed yield by 1.87 q/ha in comparison to control (broadcast sowing). The N-S direction sowing of Indian mustard increased the seed yield by a margin of 3.98 q/ha or 27.00% over E-W direction sowing.

The flower nipping at 75 DAS increased the number of siliquae/plant, which was responsible for higher seed yield over the other treatments. Likewise, the plucking of *Alternaria blight* affected leaves maintained the superiority in increasing of seed yield of Indian mustard over other tested treatments excepts flower nipping at 75 DAS treatment. The N-S direction sowing availed the benefit of natural resources especially sunlight during winter season in comparison to E-W direction sowing, which was responsible in increasing the seed yield of Indian mustard. The similar observations have also been reported by Singh (1996).

### CONCLUSION

On the basis of two years results North-South direction sowing and nipping of flowers at 75 days after planting

may be suggested to the farming community for obtaining higher yield of Indian mustard without any extra cost.

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**TABLE 1:** Growth parameters, yield traits and seed yield of Indian mustard as influenced by different treatments (pooled data of two years).

S. No	Treatment	Plant height (cm)	Primary branches / plant	Siliquae / plant	Weight of siliquae/ plant (g)	Weight of seed/ plant (g)	1000-seed weight (g)	Yield (q/ha)		Pooled
								1 <sup>st</sup> year	2 <sup>nd</sup> year	
1.	N-S direction sowing	219	12	231	32.34	16.80	4.85	19.34	19.28	19.31
2.	E-W direction sowing	217	12	229	32.06	16.65	4.75	15.30	15.37	15.33
3.	Flower nipping at 75 DAS	219	13	232	32.48	16.85	4.90	22.95	18.10	20.52
4.	Leaf plucking	218	12	231	32.34	16.80	4.82	23.17	15.87	19.52
5.	Control (broad casting sowing)	221	10	219	30.66	15.94	4.70	14.03	12.89	13.46
	C.D. 5%	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	3.26	2.75	-