

## Performance of Front Line Demonstrations on Mustard Hybrids

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### ABSTRACT

Frontline demonstrations were conducted during rabi of 2011-12 at 6 Krishi Vigyan Kendras (KVKs) of Uttar Pradesh and Uttarakhand, to study the effect of different hybrids/composites on yield and economic return parameters of mustard (*Brassica juncea*) as compared to local check. It is one crop which has found place in existing cropping systems in order to improve land use efficiency and economic gains while minimizing the risk to the farmers. Average yield (20.59 q/ha) of mustard was obtained which was 38.18 per cent higher over local check. The net return of ₹ 40,820/ha was realized by the farmers with benefit cost ratio of 2.6:1. The variety NRCDR 2 in district Sant Ravidas Nagar provided higher yield of 30.05 q/ha followed by Haridwar district (24.83q/ha) and Kaushambi district (20.90 q/ha) as compared to farmers' practices. Variety NRCHB 506 gave average yield of 22.5 q/ha at KVK Pratapgarh and variety NRCHB 101 resulted yield of 19.0 q/ha at KVK Saharanpur. The average yield increased ranging between 30-40 per cent over local check.

**Keywords:** Front line demonstrations mustard hybrids, mustard composites productivity, profitability.

### INTRODUCTION

Rapeseedmustard is occupying 6.80 mha area, 8.20 million tonnes production and 1176 kg/ha productivity in 2012-13. The productivity is quite low due to sub-optimal application of fertilizers, lack of hybrid varieties and cultivation on marginal lands under rainfed conditions. The productivity of oilseeds can be increased by proper fertilizer management in conjunction with other inputs. Some sporadic work on nitrogen fertilization has showed that the mustard crop responded to nitrogen up to 120 kg/ha (Tomar, *et al.*, 1996). The gap between production and demand of oilseeds is progressively widening, therefore, the production of oilseed is to be increased for self sufficiency. Mustard is a major oilseed crop and its oil is consumed mainly in North India. Therefore, the front line demonstrations were carried out at multi locations with full package of practices with objective to study the effect of hybrids/composites on production and productivity per unit area by the farmers in Uttar Pradesh and Uttarakhand.

### METHODOLOGY

The demonstrations were conducted on 29 farmers' fields covering 4.56 ha area in 6 districts (Saharanpur, Sant Ravidas Nagar, Muzzafarnagar, Kaushambi, Pratapgarh of Uttar Pradesh and Haridwar of Uttarakhand) during 2011-12 under irrigated conditions. The recommended practices for mustard were followed. Three mustard hybrids viz., NRCHB 101, NRCHB 506 and NRCDR 2 were demonstrated at farmers' fields. Recommended dose of N: P: K: S were supplied @ 120:40-60:40:40 kg/ha through Urea, Diammonium

Phosphate, Muriate of Potash and Sulphur. The district specific information on soil types, annual rainfall mm, longitude and altitude is given in Table 1. The mustard crop was sown at 30 cm apart in lines during the month of September to mid October using seed 5 kg/ha. Full dose of phosphorus and potassium and half of nitrogen were applied at the time of sowing. Remaining half dose of nitrogen was applied after first irrigation. Thinning was done 15-20 days after sowing to maintain plant to plant distance of 15 cm. The mustard was irrigated at 30 days after sowing followed by second one after 45 days of first irrigation at growth and siliqua formation stages. The crop was harvested at physiological maturity between 25-30 March. The participating KVKs and farmers made efforts for making difference in higher production and productivity of mustard. In this paper, results in terms of productivity and profitability per unit area realized by the farmers are given.

**Table 1: District specific characteristics of soil types, longitude and altitude, fertilizer consumption and annual rainfall**

Name of KVK	Soil type	Crop rotations followed	Fertilizer consumption N:P:K@ (kg/ha)	Annual rainfall (mm)
Sharanpur	Sandy loam to loam.	Mustard-sugarcane /sorghum	190.32: 34.69: 12.96	877.82
SRD Nagar	Sandy loam to loam	Mustard-vegetables	146.94: 33.19 :5.35	1563
Muzaffaranagar	Sandy to Sandy loam	Mustard-sugarcane /sorghum	164:44.70:5.49	753
Haridwar	Sandy to Sandy loam	Mustard-sugarcane		
Kaushambi	Sandy to Sandy loam	Mustard-vegetables/black gram/green gram	112.45: 33.96: 3.60	914
Pratapgarh	Sandy to Sandy loam	Mustard- black gram/green gram	96.30: 21.15: 4.31	977

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## RESULTS AND DISCUSSION

### Location wise yield of varieties

The front line demonstration results of hybrid/composite varieties over different locations are given in Table 2.

The variety NRCDR 2 performed better and provided average yield of 30.05 q/ha in district Sant Ravidas Nagar with the application of N:P:K:S @120:40:40:40 kg/ha followed by district Haridwar (24.83 q/ha) with the application of N:P:K@120:60:40 kg/ha and district Kaushambi (20.90 q/ha) with proper fertilizer management (Table 2).

Yield increase were ranged between 5-92 per cent as compared to local check at different locations. Variety NRCHB 506 with fertilizer dose of N:P:K:S @120:60:60:40 Kg/ha gave average yield of 22.5 q/ha in district Pratapgarh and variety NRCHB 101 with fertilizer combination of N:P:K@120:50:40 kg/ha resulted average yield of 19.0 q/ha in district Saharanpur.

Yield increase were ranged between 30-40 per cent as compared to local check. The main function of nitrogen in cell multiplication, cell elongation and tissue differentiation were resulted in healthy plant, production of more branches, siliqua/plant, seeds/siliqua. These findings are in conformity with the observation of Bhagat and Soni (2000).

### Location-wise economics of varieties

Maximum net income of ₹ 60,140/ha was obtained at KVK Sant Ravidas Nagar followed by KVK Haridwar of ₹ 56,710/ha and at KVK Kaushambi of ₹ 46,120/ha with variety NRCDR 2. Benefit-cost ratio ranged between 2.0-3.71:1.

Among the hybrids, variety NRCHB 506 was resulted maximum net income of ₹ 39,000/ha at KVK Pratapgarh followed by NRCHB 101 with net return of ₹ 27,190/ha at KVK Saharanpur. Benefit-cost ratio ranged between 1.33-3.71:1.

The cost of cultivation for mustard was computed ₹18,860/ha with gross income of ₹ 59,690/ha and net income ₹ 40,820/ha with benefit cost- ratio of 2.6:1. Thus, it is concluded that the recommended dose of fertilizers should be applied in mustard crop hybrids and composites provided maximum yield.

**Table 2: Performance of mustard hybrids/composites**

Name of KVK	Fertilizer doses N:P:K:S @ (kg/ha)	Variety	No. of Demo	Area in (ha)	Yield (q/ha)			Yield increase (%)	Economics of demonstration (₹/ha)				
					High est	Low est	Avg.		Gross Cost	Gross Return	Net Return	BCR	
Saharanpur	120:50:40	NRCHB 101	12	2.0	20.75	16.50	19.00	13.50 (Vardan)	40.74	20304	47500	27196	1.33
Sant Ravidas Nagar	120:40:40:40	NRCDR 2	6	1.0	19.50	17.00	17.50	13.50	29.62	20531	43750	23219	1.13
		NRCDR 2	2	0.5	31.30	28.80	30.05	23.96 (Pusa J.Kisan)	25.41	28993	89140	60147	2.07
Muzaffarnagar	120:40:40:35	NRCDR 2	2	0.02	21.6	19.8	20.7	15.6	32.69	18500	51860	33360	1.8
Haridwar	120:60:40	NRCDR 2	3	0.22	26.00	23.50	24.83	12.91 (Varuna)	92.33	20823	77550	56716	2.72
Kaushambi	120:60:40:20	NRCDR 2	1	0.25	21.20	20.60	20.9	19.78 (Pusa Bold)	5.66	12400	58520	46120	3.71
Pratapgarh	120:60:60:40	NRCHB 506	3	0.57	25.8	19.20	22.5	17.25 (Urvashi)	30.43	10500	49500	39000	3.71
<b>Mean</b>			<b>29</b>	<b>4.56</b>	<b>22.35</b>	<b>18.82</b>	<b>20.59</b>	<b>14.90</b>	<b>38.18</b>	<b>18864.42</b>	<b>59688.57</b>	<b>40822.57</b>	<b>2.16</b>

## CONCLUSION

Front line demonstrations were carried out with mustard hybrid/composite at different locations in Uttar Pradesh and Uttarakhand in 2011-12. Full package of practices was followed by the participating farmers. KVKs facilitated the farmers to conduct effective demonstrations. On an average 20.59 q/ha was realized by the farmers which was 38.18 % higher over local check. Net return of ₹ 59690/ha was obtained by the participating farmers. The varieties NRCDR 2, NRCHB 101 and NRCHB 506 performed better in varied conditions. For realizing higher productivity and profitability per unit area by cultivating hybrid mustard, suitable varieties, integrated nutrient management, integrated pest management play a greater role to the farmers. District specific technology modules again can make a difference for enhancing productivity.

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