



Increasing oilseed production through cluster demonstration in Patna district: A case study

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Abstract

Cluster Frontline Demonstration was conducted to study the impact of improved cultivar, seed treatment, sulphur application, diseases and pest management on production as well as productivity of linseed and mustard. Results revealed that Shekhar variety of linseed performed better as compared to local variety with 28.6 % yield gap between both the varieties. Similarly, RNG-48 of Indian mustard recorded 32.0 % higher seed yield compared to local variety. Therefore, the results clearly indicate that the use of improved varieties with scientific package and practices under Cluster Frontline Demonstration programme can play a key role in improving the seed yield of oilseeds and will significantly contribute to increase the productivity of oilseeds in Bihar state.

Key words: Cluster frontline demonstrations, local vs improved varieties, oilseeds

Introduction

Oilseed crops are the second most important determinant of agricultural economy, next only to cereals. India is the largest producer of oilseeds in the world and accounts for about 14 per cent of the global oilseeds area, 7 % of the total vegetable oil production and 10 % of the total edible oil consumption. In India, oilseeds account for 3% to the Gross National Product and 10% to the total value of all agricultural products. The total oilseed cultivated area, production and productivity of nine oilseed crops in India during 2014-15 were 25.6 mha, 27.5 mt and 1075 per ha, respectively (Anonymous 2016). Presently, India's annual edible oil consumption is about 17.5 mmt, which in the last decades has increased steadily at a compounded annual growth rate of 4.6%. The growth in per capita consumption is attributable to both rising income levels and living standards. However, the current per capita consumption of 14.3 kg/year in 2012-13 in India is considerably lower than the global average of 24 kg/year. Indian mustard is an important oilseed crop of Indian subcontinent contributes more than 80% of the total rapeseed-mustard production in India (Meena *et al.*, 2014; Meena *et al.*, 2015). Indian mustard is the second important oilseed crop the country, next to groundnut (Shivani and Kumar, 2002). Mustard seed is the second largest produced oilseed in the world with an area of 37.0 m ha, with the production of 63.1 m tonnes and the productivity of 18.5 q/ha. In India it had the area of 6.3 m ha with production of 7.6 m tonnes and productivity of 11.90 q/ha (Bhati and Sharma, 2014). Among *Rabi* oilseed

crops in India, linseed happens to occupy the second position i.e. next to rapeseed-mustard in area as well as production (Chauhan *et al.*, 2009). India ranks first in the world in respect of acreage accounting for 23.8% of the world and third in production contributing 10.2% of the world. In India, it is cultivated on 0.53 m. ha with a production of 0.21 m. tonnes. Its cultivation is mostly confined to Madhya Pradesh, Maharashtra, Chattisgarh, Uttar Pradesh and Bihar (Damodaran and Hegde, 2005). Now a day, mustard and linseed crop is maintaining its increasing trend in productivity while, the area registered shows a declining trend resulting in its stagnant production. The decrease in area might be due to socio-economic factors as per capita holding is shrinking owing to population increase, thereby encouraging the growers to grow linseed and mustard by scientific method. In order to increase the area and productivity of mustard and linseed, we have to make it more remunerative with added advantages to attract growers for oilseed production and cluster demonstration programme may be a good approach to achieve the goal.

Materials and Methods

Cluster Frontline Demonstration was conducted by KVK, Patna (BAU, Bhagalpur, Bihar) on farmer's field at six blocks namely Barh, Pandarak, Ghoshwari, Fatuha, Sampathchak, and Mokama, which were traditionally oilseed producing area. In this study, 121 farmers were involved for large scale cluster demonstration of various oilseed crops viz. Linseed and mustard in 20 ha and 30 ha

area, respectively. Soil of the selected fields for cluster demonstration was analysed for pH, EC, Organic carbon, N, P, K, Fe, Cu, Mn and Zn. Seed treatment of the entire oilseed crops was done at farmers house in supervision of KVK scientist with Carbendazim@2gm/Kg seed and Chlorpyrifos 20EC@6ml/Kg seed. Based on the soil test value, fertilizers were applied as N:P₂O₅:K₂O :: 50:37.5:20 in linseed and 80:50:40:10 in mustard crop. N was applied in two split half as basal and remaining half after 35 days of sowing after irrigation. Suitable plant protection measures were applied in problematic field to protect the crop from white rust in mustard. No disease was observed in linseed crop. Only pod borer was reported to be a serious problem in Sampathchak block for which Profenophos@ 2 ml/lit water was recommended to spray.

Results and Discussion

From above study it was observed that soil samples of all the plots were deficient in zinc and sulphur. So, recommended dose of Zn and S along with other fertilizers were applied in the entire demonstration field. Linseed (Shekhar) was given to 50 farmers of Barh and Pandarak blocks for sowing in 20 ha area (Table 1). It was observed that the productivity of linseed in demonstration plots in Barh and Pandarak block ranged from 8.1 q/ha and 7.8 q/ha respectively (Table 2), where as in check plots where farmer's local variety was grown, the yield range from 6.4 q/ha to 6.2 q/ha. The average yield of 50 demonstration plots of linseed was 8.0 q/ha which is 28.6 % higher than that of local check. It was observed that the % increase in yield of demo plot ranged from 28.7 % in Barh block to 28.6 % in Pandarak block.

Table 1: Area covered for different oilseed crop in different block under CFLD in Patna district

Linseed (Shekhar)			Mustard (RNG-48)		
Block	No of farmers	Area (ha)	Block	No of farmers	Area (ha)
Barh	41	16.4	Barh	36	15.2
Pandarak	09	3.6	Pandarak	03	1.2
			Ghoshwari	06	2.6
			Fatuha	04	1.6
			Sampathchak	01	0.4
			Mokama	21	9.0
Total	50	20		71	30

In case of mustard, the yield of demonstrated plots where improved cultivar i.e. RNG-48 was introduced, it was observed to be maximum (10.2 q/ha) at Ghoshwari block and minimum (8.9 q/ha) at Barh block. The yield of farmer's local variety ranged from 6.9 q/ha to 7.9 q/ha, the lowest productivity found in Sampathchak block and highest productivity found in Ghoshwari block. The percentage increase in yield in demo plot over the check plot ranged from 25.6 % in Pandarak to 44.9 % in Sampathchak block. The average yield of 71 demonstration plots of mustard

was observed to be 10.17q/ha which was 29.26 % higher than the local check where only plant protection measure was followed (Table 2).

The linseed and mustard crop yield varies from place to place depending on the climate, soil and technology. The linseed crop yields obtained under CFLDs with improved technology varied from 7.8 to 8.1 q/ha and 6.2 to 6.4 q/ha in check plot. There is a vast gap between the check yield and yield of demonstrated variety through Frontline

Table 2: Yield of different oilseed crop in different block under cluster demonstration programme in Patna district

Name of the Block	Name of the technology demonstrated	No. of the farmer		Yield (q/ha) Demonstration		Yield (q/ha) Local check		% increase in yield over check	
		Linseed	Mustard	Linseed	Mustard	Linseed	Mustard	Linseed	Mustard
Barh	Improved cultivars,	41	36	8.1	8.9	6.4	7.1	28.7	26.5
Pandarak	Sulphur application, weed management, Seed treatment with	09	03	7.8	9.1	6.2	7.3	28.6	25.6
Ghoshwari			06		10.2		7.9		29.3
Fatuha			04		10.1		7.7		31.7
Sampathchak	Carbendazim@2gm/Kg seed, Chlorpyrifos 20EC@3ml/Kg		01		10.0		6.9		44.9
Mokama			21		10.1		7.5		33.9
Average				8.0	9.7	6.3	7.4	28.6	32.0

Demonstrations on farmers' field. Vittal *et al.* (2005) also supported that Frontline Demonstrations is better than farmer practices. The mustard crop yields obtained under cluster frontline demonstration with improved technology varied from 8.9 to 10.2 q/ha and 6.9 to 7.9 q/ha in check plot. Bhati and Sharma (2014) also supported that mustard yield varies from 11.3 to 15.6 q/ha under effective management of mustard. The present findings are also in accordance with the findings of Sharma (2014) who found that the yield levels under farmers' practices were always lower than obtained under frontline demonstration. The programme of cluster frontline demonstration could be popularized for other oilseed crops also in order to increase farmer's income and attain self sufficiency in oilseeds production.

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Reference

- Anonymous. 2016. Agricultural statistics at a glance. DAC Government of India. p. 118
- Bhati R and Sharma R C. 2014. Efficacy of newer chemicals against mustard aphid. *Biolife* **2**: 1165-1169.
- Chauhan MP, Singh S and Singh AK. 2009. Post Harvest Uses of Linseed. *J Hum Ecol* **28**: 217-219.
- Damodaran T and Hegde DM. 2005. Oilseeds Situation: A Statistical Compendium 2005, Directorate Oilseeds Research, Indian Council of Agricultural Research, Hyderabad.
- Meena HS, Kumar A, Ram B, Singh VV, Singh BK, Meena PD and Singh D. 2015. Combining ability and heterosis for seed yield and its components in Indian mustard (*B. juncea*). *J Agri Sci Tech* **17**: 1861-1871.
- Meena HS, Ram B, Kumar A, Singh BK, Meena PD, Singh VV and Singh D. 2014. Heterobeltiosis and standard heterosis for seed yield and important traits in *B. juncea*. *J Oilseed Brassica* **5**: 134-140.
- Sharma VP. 2014. Problems and prospects of oilseeds production in India, Centre for Management in Agriculture (CMA), Indian Institute of Management (IIM), Ahmedabad, November 2014.
- Shivani and Kumar S. 2002. Response of Indian mustard (*B. juncea*) to sowing date and row spacing in mid-hills of Sikkim under rainfed conditions. *Indian J Agron* **47**: 405-410.
- Vittal KPR, Kerkhi SA, Chary GR, Sankar GRM, Ramakrishna YS, Srijaya T and Samra JS. 2005.

Districtwise Promising Technologies for Rainfed Linseed based Production System in India. A Compendium by NARS, State Department(s) of Agriculture and Agro-Industries. All India Coordinated Research Project for Dryland Agriculture Central Research Institute for Dryland Agriculture Santoshnagar, Hyderabad 500 059.