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Adoption of Improved Late Sown Mustard Cultivation Practices in Bihar

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ABSTRACT

Mustard contributes around 23.2 per cent of total oilseed production in India. Attempts are being made to improve productivity and to increase area under mustard by adoption of HYVs (High yielding varieties). In order to compare conventional mustard with HVY, 65 front line demonstrations were carried out. The demonstrations resulted enhancement in productivity. The yield was found to be increased from 7 (q/ha) in local check to 11 (q/ha) in FLDs. Similarly, the benefit: cost ratio can be further improved to 2.92 as compared to 1.6 in local check. Lack of market and support price (93.47) were recorded major constraints in late sown mustard cultivation. Hence increase in yield over farmer's practices was evident which indicated the need of educating farmers through front line demonstration.

Key words: Knowledge, adoption, mustard cultivation, improved production technology.

INTRODUCTION

Oilseeds constitute the second largest agricultural commodity in India after cereals accounting for nearly 5 percent of gross national products. . The total oil seed production of India is 25.56 MT and share of mustard production is 8.94 MT (Anonymous, 2010). The acreage under mustard in Bihar did not much increase during last five years. Presently, area, production and productivity in Bihar are 0.85 lakh ha, 0.81 lakh tones and 959 kg/ha, respectively. The constraints in production are use of traditional varieties, inadequate moisture availability at sowing time and late sowing of mustard particularly in rice –fallow areas, broadcasting method of sowing and use of high seed rate and aphid infestation. KVK's role in agriculture and its allied sector is crucial as it is ideally placed to disseminate field – tested proven technologies with appropriate modulation which addresses location specific problems and concern on the prevailing natural and socio–economic conditions, needs and priorities. Keeping the above point in view, the FLD on mustard using new crop varietal technology with inclusion of sulphur-based fertilizers were started with the objectives of showing the productive potential of the new production technologies under real farm situation over the locally cultivated late sown mustard crop.

METHODOLOGY

An extensive survey was conducted to collect information pertaining to various usage of mustard in the Katihar district. 65 respondents from seven villages (who grow mustard) were selected from 5 block *viz* Balrampur, Azamnagar, Barari, Kadwa and Pranpur for collection of data. An interview schedule was prepared and administered to the respondents and data were analyzed. Preferential ranking technique was utilized to identify the constraints faced by the farmers in mustard production. Farmers were also asked to rank the constraints they perceived as limiting mustard production in order of preference.

Based on ranks of farmers' problems were identified, the front line demonstrations (FLD's) were planned and conducted at the farmer's field under technology demonstration. In all 65 full package front line demonstration in 20 ha area of late sown mustard Rajendra Suflam during 2012-13 and 2013-14,were conducted. All the farmers trained for improved package of practices through training programmes. The technology gap and technology index were calculated using the following formulas as given by Samui *et al.* (2000) B. Shanumugasundaram (2015) and Anavrat, V. (2015) confirmed the findings.

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Technology gap= Potential yield- Demonstration yield

$$\text{Technology index} = \frac{\text{Potential yield- Demonstration yield}}{\text{Potential yield}} \times 100$$

The harvest index was worked out by using following formula given by Donald (1962).

$$\text{Harvest index} = \frac{\text{Seed yield (kg/ha)}}{\text{Seed yield (kg/ha)+ Stalk yield (kg/ha)}}$$

Knowledge level of the farmers about improved cultivation practices of the late sown mustard variety before frontline demonstration and after implementation were measured and compared by applying dependent't' test.

Client satisfaction Index was calculated by using formula as developed by (Kumaran and Vijayaragavan, 2005).

$$\text{Client satisfaction index} = \frac{\text{Individual obtained score}}{\text{Maximum possible score}}$$

RESULTS AND DISCUSSION

A comparison of productivity levels check is shown in Table1. It was observed that in front line demonstrations, the improved mustard variety Rajendra Suflam recorded higher seed yield (11q/ha) as compared to local check variety (7q/ha). The percentage increase in yield over check was recorded 78.5 per cent. It is evident from table 2 that performance of improved high yielding variety Rajendra Suflam performed well as comparison to local check conducted in different locations of the district. Yield of the demonstration and potential yield of the crop was compared to estimate the yield gap which were further categorize into technology index and harvest index. Potential yield recorded for variety Rajendra Suflam (16.3 q/ha).The technology gap shows the gap in the demonstration yield over potential yield and it was 5.3 (q/ha). The observed technology gap resulted from table 2 is due to various constraints like low soil fertility, availability of low moisture content during sowing time, weather condition and climatic hazards *etc.* Hence to reduce the yield gap location specific recommendation for variety, soil testing and timely sowing appears to be necessary. Technology index showed the suitability of variety at farmer's field. Lower technology values indicated that feasibility of variety among the farmers is more. It is revealed from table 2 technology index (32.51%) indicated that mustard late sown mustard variety (Rajendra Suflam) is much better than the local one. Stalk yield recorded 25.85 (q/ha) for local check while for high yielding variety 38.70 (q/ha). Harvesting index recorded higher for demonstrated variety *i.e.* 0.221and 0.213 for local check. It indicated that Rajendra Suflam is more feasible variety for the farmers (Singh and Kumar, 2012).

Table 1: Yield, technology gap, technology index and harvesting index of front line demonstration

Variables	Seed yield (q/ha)	(%) increase over check	Potential yield (q/ha)	Technology gap (q/ha)	Technology index (%)	Stalk yield (q/ha)	Harvesting index
Local check	7					25.85	0.213
Demonstration	11	78.51	16.3	5.3	32.51	38.70	0.221

Economic analysis of the yield performance Table 2 revealed that front line demonstrations recorded higher gross return (` 38000/ha) and net return (` 25000/ha) with higher benefit cost ratio 2.92 compared to 1.6 of local check (Table 3). Similar results were also reported by (Hiremath and Nagaraju, 2009) and Singh *et al.* (2014).

Table 2 Economics of local check and front line demonstration

Variables	Cost of cultivation (₹/ha)	Gross return (₹/ha)	Net return (₹/ha)	Benefit cost ratio
Local check	10,000.00	16000.00	6000.00	1.6
Demonstration	13,000.00	38000.00	25000.00	2.92

Technology satisfaction among respondents

The extent of satisfaction level of farmers about performance of demonstrated varieties was measured by Client Satisfaction Index (CSI) and results presented in table 4. It is observed that majority of the farmers indicated high (43.07%) to the medium (33.85%) level of adoption or satisfaction for improved cultivation practices and HYV of mustard. Whereas, 23.08 percent respondents expressed lower level of satisfaction with respect to improved late sown variety and cultivation practices. The medium to higher level of satisfaction with respect to improved cultivation practices, linkage with farmers, services rendered *etc.* indicated stronger conviction, physical and mental involvement in the front line demonstration. It is resulted that front line demonstration had good preference among the respondents. Similar findings obtained by (Tomar 2010) and (Dudi and Meena, 2012)

Table 3: Extent of farmers satisfaction of improved cultivation practices of late sown mustard

(n=65)

Satisfaction level	Mean of level	Percentage
Low	15	23.08
Medium	22	33.85
High	28	43.07

Figures in parentheses indicate percentages

Knowledge gain regarding new variety and technology among respondents

Knowledge level of respondent farmers on various aspects of improved mustard production technologies before conducting the front line demonstration and after front line demonstration was measured and compared by applying dependent 't' test. It could be seen from table 4 that farmers mean knowledge score has increased by 47.70 after implementation of frontline line demonstrations. The increase in mean knowledge score of farmers was observed significantly higher as the computed value of't' (6.25) was significant at 5 percent probability level. It indicates that there was significant increase or gain in knowledge level of farmers that have resulted in higher adoption of improved farm practices. This shows positive impact of front line demonstration on knowledge of the farmers that have resulted in higher adoption of improved farm practices. The results obtained in trial might be due to the concentrated educational effort and close monitoring made by KVK scientists.

Table 4: Knowledge gain in improved late sown mustard cultivation practices

n= 65

Improved farming practices of late sown mustard	Mean scores		Mean difference	"t" value
	Before FLD implementation	After FLD implementation		
	32.30	80.00	47.70	6.25*

***Significant at 5% probability level, degree of freedom=64**

Constraints in late sown mustard cultivation

In the cultivation of late sown mustard problems encountered and ranking given by the farmers are mentioned in table 5. Preferential ranking technique was utilized to identify the constraints faced by the farmers in late sown mustard production. A perusal of table indicates that lack of market and support price ranked first by 65 respondent's with RBQ value (93.45). Disease and insect pest infestation, lack of high yielding varieties of late sown mustard, lack of moisture availability in the field during sowing, low soil fertility and weed infestation were major constraints faced by the mustard farmers. While lack of technical support, Undulated topography of land, lack of credit facilities, illiteracy among the farmers and crop damage by wild animals were also found as a constraints to reduce the production of late sown mustard crop. The view is also supported by Singh *et al.* (2007).

Table 5: Constraints faced by respondents and their Rank based quotient

Problem encountered	RBQ	Overall rank
Lack of high yielding varieties of late sown mustard	86.42	III
Lack of technical support	70.42	VII
Lack of moisture availability in the field during sowing	83.68	IV
Undulated topography of land	69.15	VIII
Weed infestation	72.14	VI
Disease and insect pest infestation	88.25	II
Lack of market and support price	93.45	I
Low soil fertility	78.47	V
Illiteracy among farmers	50.75	X
Lack of credit facilities	58.43	IX
Damage by wild animals	40.75	XII

CONCLUSION

The results revealed that lack of market and support price was recorded as a major constraint while disease and insect pest infestation, lack of high yielding varieties of late sown mustard, lack of moisture availability in the field during sowing were also recorded as a main constraints which inhibit the adoption of late sown mustard cultivation. The yield of HYV of late sown mustard (Rajendra Suflam) in demonstration was recorded (11q/ha) as compared to local check (7q/ha). The benefit cost ratio for HYV was 2.92 as compared to local check. The impact of FLD was also analyzed which showed that there was significant improvement in knowledge level and satisfaction on the part of mustard farmers.

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REFERENCES

Anonymous. 2010. Economic survey of India. Economic Division. Ministry of Finance, Government of India.

Dudi, A. and Meena, M .L. (2012). "Adoption of improved mustard production technology in Pali district of Rajasthan". *International Journal of Extension. Education* Vol. (8): 5-8.

Singh, D. K. ; Gautam, U.S. and Singh, R.K.. (2007). "Study on yield gap and level of demonstrated crop production technology in Sagar district". *Indian Research Journal of Extension. Education* Vol. 7 (2&3): 94-95.

Kumaran, M. and Vijayaragavan, K. (2005). "Farmer's satisfaction of agricultural extension services in an

irrigated command area". *Indian Research Journal of Extension. Education* , Vol. 41 (3&4): 8-12.

Tomar, R.K.S.. (2010). "Maximization of productivity for chickpea (Cicer arietinum Linn.) through improved technologies in farmer's fields". *Indian Journal Natural Products and Resources*. Vol.1(4): 515-517.

Samui, S. K.; Maitra, S.; Roy, D. K.; Mondal, A. K. and Saha, D. (2000). "Evaluation of front line demonstration on ground nut (Arachis hypogeal L.) in Sundarbans". Journal Indian Soc Coastal Agric Res. Vol.18 (2): 180-183.

Hiremath, S. M. and Nagaraju M. V. (2009). "Evaluation of front line demonstration trials on onion in harevi district of Karnataka". *Karnataka Journal of Agriculture Science.* Vol. (22): 1092-1093.

Singh, A . K.; Singh, D.; Singh J.; Patel, A. K. and Singh K. C. (2014)." Evaluation of front line demonstration to enhance the yield of sesame in Sidhi district of Madhya Pradesh". Environment & Ecology. Vol. 32(3A): 1182-1186.

Shanmugasundaram, B. (2015). Adoption of System of Rice Intensification (SRI) in Kerla. *Indian Journal of Extension Education,* 51 (3&4), 121-124.

Anavrat, V. (2015). Adoption of Improved Technologies Among Nagpur Mandarin Growers in Vidarbha, *Indian Journal of Extension Education,* 51 (3&4), 58-61

Singh, K. R. and Kumar, H. (2012). On farm evaluation of front line demonstration on mustard in eastern plain zone of Uttar Pradesh. *Indian Journal of Extension Education.* Vol.(8):115-117.