Yield gap analysis of Rapeseed-mustard through front line demonstrations

SUBHASH KATARE, S.K. PANDEY AND MOHD. MUSTAFA

See end of the article for authors' affiliations

Correspondence to :
SUBHASH KATARE
Krishi Vigyan Kendra, Kalu Kheda, Jaora, RATLAM (M.P.) INDIA
Email : kvk.katare@gmail.com

ABSTRACT

Front Line Demonstration is an appropriate tool to demonstrate recommended technologies among the farmers. Krishi Vigyan Kendra, Ratlam (M.P.) conducted 50 demonstrations on mustard since 2005-06 to 2009-10 in five adopted villages. The critical inputs were identified in exsting production technology through farmers meetings and group disscussions with the farmers. The average five years data revealed that an average yield of demonstration plot was obtained 18.94 q/ha. over local check (13.94q/ha) with an additional yield of 4.97q/ha and the increase average mustard productivity by 33.80%. Tzhe average technological gap and technological index were found to be 6.05 and 24.21%, respectivily.

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INTRODUCTION

Oilseeds form the second largest agricultural commodity in India after cearls sharing 14% of the gross cropped area and accounting for nearly three per cent of gross national product and 10% value of all agricultural products. The continuous increase in import of oilseed is a matter of great concern today. Among the oilseeds crops, mustard occupies a prominent position in Indian oilseeds scenario. During 2006-07, total area under rapeseed-mustard was 6.79 million hectares with a total production of 7.44 million tones, contributing 30.64% of the total production of oilseed in India (total oilseed production in India was 24.28 million tons during 2006-07) (Anonymous, 2005).

In Madhya Pradesh, during 2006-07 the productivity of mustard was 939 kg/ha. area under cultivation 830 thousand ha. and total production 706 thousand tones. Though rapeseed-mustard group of crops occupy prominent position in the state oilseeds scenario but vast yield gap exists between potential yield and yield under real farming situation.

In Ratlam district of M.P. the poor productivity is because resource poor farmers are very reluctant toward proper scientific management of the crop.

METHODOLOGY

The study was carried by KVK Ratlam during *Rabi* season from 2005-06 to 2009-10 (five consecutive years) in the farmers field of six adopted villages (Richha Dewada, Semalia, Sakkarkhedi, Roopnagar, Bhimakhedi, Bilandpur and KVK farm) of Ratlam district. During these five years of study, an area of 20ha. was covered with plot size 0.50ha. under front line demonstration with active participation of 50 farmers. Before conducting FLDs, a list of farmers was prepared from group meeting and specific skill training was imparted to the selected farmers regarding different aspects of cultivation (Venkattakumar *et al.,* 2010). The difference between the demonstration package and existing farmers practices are given in Table 1.

In general the soils under study was black cotton soil in texture with a pH ranging between 7.00-8-5 pH. The available nitrogen, phosphorus and potassium varied between 140-245, 9-32 and 255-570 kg/ha, respectively. However, the soils were deficient in sulphur status.

In demonstration plots, use of quality

Table 1 : Comparison between demonstration package and existing practices under rapeseed-mustard FLD

Sr. No.	Particulars	Rapeseed-mustard	
		Demonstration	Farmers practice
1.	Farming situation	Rainfed	Rainfed
2.	Variety	Vasundhara, Pusa Jaikisan and Pusa Agrani	Pusa bold and pvt. hybrid
3.	Time of sowing	10-15 Oct.	25-30 Oct.
4.	Method of sowing	Line sowing	Broadcasting
5.	Seed treatment	Bavistin 3g/kg seed	Without seed treatment
6.	Seed rate	5kg/ha	7.5kg./ha.
7.	Fertilizer dose	NPKS(60:30:20:20)	NPKS(40:20:00:00)
8.	Plant protection	Needbased application of Immidachloprid 17.8SL + Sulfex to protect the crop from sucking pests and disease	Injudicious use of pesticides
9.	Weed management	Pendimethalin @0.3kg. a.i./ha as pre-emergence followed by one hand weeding at 35 DAS	Two hand weedings at 15 and 35 DAS.

seeds of improved varieties, line sowing and timely weeding, need based of pesticide as well as balanced fertilization (using micronutrient sulphur) were emphasized and comparison has been made with the existing practices (Table 1). The necessary step for selection of site and farmers, layout of demonstration etc. were followed as suggested by Choudhary (1999). The traditional practices were maintained in case of local checks. The data output were collected from both FLD plots as well as control plots and finally the extension gap, technology gap, technology index along with the benefit cost ratio were worked out (Samui *et al.*, 2000) as given below:

Technology gap = Potential yield-Demonstration yield

Extension gap= Demonstration yield- Farmers yield

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

RESULTS AND ANALYSIS

The data of Table 2 reveal that the yield of rapeseed-mustard fluctuated successively over the years in demonstration plot. The maximum yield was recorded (21.19q/ha) during 2006-07 and minimum yield was recorded in year 2008-09(16.75q/ha) and the average yield of five years was recorded 18.94q/ha over local check (13.94q/ha). The increase in per cent of yield was ranging between 25.00-41.26 q/ha during five years of study. On an average basis, 33.80 per cent increase in yield was recorded. The results are in conformity with the finding of Tomer *et al.* (2003), Tiwari and Saxena (2001) and Tiwari *et al.* (2003). The results clearly indicate the positive effects of FLDs over the existing practices toward enhancing the yield of rapeseed-mustard in zone of M.P., with its positive effect on yield attribute(Table 3). Benefit-cost ratio was recorded to be higher under demonstration against control during all the years of study.

The extension gap showed an increasing trend. The extension gape ranging between 3.85-6.19 q./ha. during the period of study emphasizes the need to educate the farmer through various means for adoption of improved agricultural production to reverse the trend of wide extension gap.

The trend of technology gap (ranging between 3.81-8.25q./ha.) reflects the farmers cooperation in carrying out such demonstrations with encouraging results in subsequent years. The technology gap observed may be

Table 2 : Productivity, technology gap, extension gap and technology index in rapeseed-mustard under FLD

Year	Area (ha.)	No. of farmers	Seed yield (q/ha)			%Increase over control	Techno. gap (q/ha)	Ext. gap (qt./ha.)	Techno. index (%)	B:C ratio	
			Potential	Demo.	Control					Demon.	Control
2005-06	05	10	25	19.40	13.75	41.09	5.60	5.65	22.40	6.12	5.50
2006-07	05	10	25	21.19	15.00	41.26	3.81	6.19	15.24	4.20	3.50
2007-08	05	10	25	18.19	13.80	31.81	6.81	4.39	27.24	4.12	3.60
2008-09	05	10	25	16.75	12.90	29.84	8.25	3.85	33.00	3.77	2.90
2009-10	05	10	25	19.20	14.40	25.00	5.80	4.80	23.20	5.42	4.27
Average	25	50	25	18.94	13.94	33.80	6.05	4.97	24.21		

Table 3 : Yield parameters under demonstration package and existing farmers practices

Sr. No.	Yield parameters	Demonstration package	Existing farmers practices
1.	Number of siliqua per plant	85-90	65-70
2.	Number of seeds per siliqua	30-35	25-30
3.	Test weight	3.5-3.7	2.68-2.90

attributing to the dissimilarity in soil fertility status and weather conditions. Similar finding was recorded by Mitra *et al.* (2010).

The technology index showed the feasibility of the evolved technology at the farmer's fields. The lower value of technology index the more is the feasibility of technology. As such fluctuation in technology index (ranging between 15.24-33.00) during the study period in certain region, may be attributed to the dissimilarity in soil fertility status, weather condition, non-availability of irrigation water and insect-pests attack.

Conclusion:

From the above findings it can be concluded that use of scientific methods of mustard cultivation can reduce the technology gap to a considerable extent thus leading to increased productivity of rapeseed-mustard in the district. Moreover, extension agencies in the district need to provide proper technical support to the farmers through different educational and extension methods to reduce the extension gap for better oilseed production in the District.

Authors' affiliations:
S.K. PANDEY AND MOHD. MUSTAFA, Krishi Vigyan Kendra, Kalu Kheda, Jaora, RATLAM (M.P.) INDIA

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