

Impact of Front Line Demonstration on Rapeseed-Mustard Yield Improvement

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ABSTRACT

The present study was carried out to know that the yield gaps between improved package and practices (IP) and farmers practice (FP) of rapeseed-mustard crop. The yield of rapeseed –mustard in IP under irrigated conditions ranges from 15.89 to 17.53q/ha whereas in FP ranges from 12.53 to 13.12q/ha. The per cent increase in yield with IP over FP was recorded in the range of 26.82 to 33.61. The extension gap ranging between 3.36-4.41q/ha during the period of study. The trend of technology gap reflected the farmer's cooperation, in carrying out such demonstrations with encouraging results in subsequent years. The cost benefit ratio was 3.33 to 3.67 under demonstration, while it was 2.62 to 2.75 under control plots. By conducting front line demonstration of proven technologies, yield potential from rapeseed –mustard cultivation can be enhanced to a great extent with increase in the income level of the farming community.

Key word: Extension gap; Technology gap; Rapeseed-mustard;

Oilseeds crop is one of the second largest agricultural commodity in India after cereals sharing 14 % of the gross cropped area and accounting for nearly three per cent of gross national product and 10 per cent of value of all agricultural products. The continuous increase in import of oilseeds is a matter of great concern today. Among the oilseeds crops, rapeseed-mustard occupies a prominent position in Indian oilseeds scenario. Rapeseed-mustard crops in India are grown in diverse agro climatic conditions ranging from north-eastern / north western hills to down south under irrigated/rainfed, timely/late sown, saline soils and mixed cropping. Indian mustard accounts for about 75-80 per cent of the 5.8 m ha under these crops in the country during 2009-10 crop seasons. The rapeseed-mustard production trends represent fluctuating scenario with an all time high production of 8.13 m t from 7.28 m ha acreage during 2005-06. The yield levels also have been variable ranging from 854 (2002-03) to 1142 kg/ha (2009-10) during the past eight years.

Rajasthan is an agrarian state, where eighty per cent of the total population resides in rural area and largely dependent on agriculture as the source of their

livelihood. The economy of state is mostly depended on agriculture. 22.5 per cent of state's GDP comes from agriculture. Recognized as the largest state of India, Rajasthan has cultivated area of almost 20 million hectares but due to some unavoidable circumstances on 20 per cent of the total cultivated area is irrigated. In Rajasthan, the productivity of rapeseed-mustard was 1266 kg/ha during 2008-09 and 27.37 lakh ha area under cultivation and total production was 34.65 lakh tons (2009-10).

The available agricultural technology does not serve its purpose till it reaches and adopted by its ultimate users, the farmers. Technology transfer refers to the spread of new ideas from originating sources to ultimate users (Prasad *et. al.* 1987). Conducting of front line demonstrations on farmer's field help to identify the constraints and potential of the rapeseed –mustard in specific area as well as it helps in improving the economic and social status of the farmers. The aim of the front line demonstration is to convey the scientific technical message to farmers that if they use recommended package and practices then the yield of this crop can be easily doubled than their present level. In view of the

importance of demonstrations in crop productivity and continuously getting feedback of problems and constraints faced by the farmers, front line demonstration with full skill and knowledge with scientists have been taken up in rapeseed-mustard also. In the present study various front line demonstrations on different aspects of rapeseed-mustard were conducted in the district Rajsamand by the scientists to prove the advantages of a recommended practice.

METHODOLOGY

Krishi Vigyan Kendra, Rajsamand has conducted 106 front line demonstrations on rapeseed –mustard in 45ha area under real farming situations between 2005-06 and 2007-08 in the farmer's fields of six adopted villages (Pipali Ahiran, Pema Khera, Mali Khera, Tara Ka Khera, Arjungarh and Sadari) of Railmagara block district Rajsamand. The area under each demonstration was 0.4ha (1 acre). Before conducting front line demonstrations a list of farmers was prepared from group meeting and specific skill training was imparted to the selected farmers regarding different aspects of cultivation etc. were followed as suggested by Chaudhary (1999). Through survey, farmers meeting and field diagnostic visit during the cropping period, low yield of rapeseed-mustard was

conceived due to imbalance use of nitrogenous fertilizer, improper seed rate, seed sowing by broad casting and indiscriminate practice to manage the aphid on crop. To manage the assessed problem, improved and recommended technologies were followed as intervention during the course of front line demonstrations programme. The differences between the demonstration recommended package and existing farmers practices are given below.

In case of recommended practice, balanced use of nitrogenous fertilizer and use of suitable fungicidal i.e. Mancozeb 75 per cent WP for seed treatment as suggested by Chattopadhyay *et. al.* (2003) was used as technical interventions. For the control of aphid (*Lipaphis errysimi*), Methyl parathion 2% dust was used in demonstrated plots which is suggested in package and practices for the Rajsamand region. Visit of farmers and the extension functionaries were organized at demonstration plots to disseminate the message at large scale. The yield data were collected from both the demonstration and control plots (farmers practice) and their technology gap and extension gap were worked out Samui *et. al.* (2000) as given below.

Technology gap = Potential yield - Demonstration yield

Extension gap = Demonstration yield - Farmers yield

Comparison between demonstration package and existing farmers practice under Rapeseed-mustard FLD

Particulars	Rapeseed-mustard	
	Demonstration package	Farmers Practice
Farming situation	Irrigated medium land	Irrigated medium land
Variety	Bio 902	Local
Time of sowing	16 September to 15 October	Last week of October
Method of sowing	Line sowing	Broad casting
Seed rate	2.5 kg/ha	4-5 kg/ha
Fertilizer dose	60 kg N + 40 kg P ₂ O ₅ + 40 kg Sulphur dust/ha	20 kg N + 20 kg P ₂ O ₅ /ha
Plant protection	Need based methyl parathion 2% dust @ 25 kg/ha to protect the crop against mustard aphids (<i>Lipaphis errysimi</i>)	Nil
Weed management	Pend amethalin @ 0.3 kg a.i./ha as pre emergence followed by one hand weeding at 35 DAS	Two hand weeding at 15 and 35 DAS

RESULTS AND DISCUSSION

The data in the Table 1 showed that the yield variations were quite large during the year 2005-06 to 2007-08. In total 106 front line demonstrations on rapeseed-mustard were conducted during the period on improved package and practices (IP) v/s farmers

practices (FP). In IP mainly recommended dose of fertilizers (60 kg N + 40 kg P₂O₅ + 40 kg Sulphur dust/ha) under irrigated condition with 1-2 weeding and hoeing were practiced.

The yield of rapeseed-mustard increased successively over the years in demonstration plots.

Table 1 Productivity, Technology gap, Extension gap and cost benefit ratio of rapeseed-mustard (cv -Bio 902) under FLDs

Year	Area (ha)	No. of farmers	seed Yield (q/ha)			% increase over control	Tech. gap (q/ha)	Extension gap (q/ha)	B-C ratio	
			Potential	Demo.	Control				Demo.	Control
2005-06	20	44	20	17.53	13.12	33.61	2.47	4.41	3.67	2.75
2006-07	15	37	20	15.89	12.53	26.82	4.11	3.36	3.33	2.62
2007-08	10	25	20	16.65	12.85	29.57	3.35	3.80	3.48	2.69
Mean	-	-	20	16.69	12.83	30.00	3.31	3.86	-	-

During 2005-06, the average demonstration yield was recorded to be 17.53q/ha; it was 16.65q/ha during 2007-08. The increase in percentage of yield was ranging between 26.82-33.61 during the three years of study. The results clearly speak of the positive effect of front line demonstration over existing practice towards enhanced the yield of rapeseed-mustard in Rajsamand region of Rajasthan with its positive effect on yield attributes (Table 2). The similar results of yield enhancement in rapeseed-mustard crop in front line demonstration has been documented by *Mitra and Samajdar (2010)* in tarai zone of West Bengal.

Table 2. Yield parameters under demonstration package and existing farmers practice

Yield parameters	Demonstration package	Existing farmers practice
No. of siliqua/plant	76-85	60-70
No. of seeds/siliqua	12-15	8-11
Test weight (g)	5.35-5.65	3.55-3.85

The extension gap ranging between 3.36-4.41 q/ha during the period of study, emphasizes the need to educate the farmers through various means for adoption of improved agricultural production to reverse the trend of wide extension gap.

The trend of technology gap (ranging between 4.11-2.47q/ha) reflected the farmer's cooperation, in carrying out such demonstrations with encouraging results in subsequent years. The technology gap observed may be attributed to the dissimilarity in soil fertility status and weather conditions. *Mukherjee (2003)* has also opined that depending on identification and use of farming situation, specific interventions may have greater implications in enhancing system productivity.

The benefit cost ratio of front line demonstrations are presented in Table 1 clearly revealed that, the BC ratio from recommended practice were substantially higher than control plot i.e. farmers practice during all the years of demonstration. The benefit cost ratio of

demonstrated and control plots were 3.67 and 2.75, 3.33 and 2.62, 3.48 and 2.69 during 2005-06, 2006-07 and 2007-08 respectively. Hence, favorable benefit cost ratios proved the economic viability of the intervention made under demonstration and convinced the farmers on the utility of intervention. Similar findings were reported by *Sharma (2003)* in moth bean and *Gurumukhi and Mishra (2003)* in sorghum.

Reasons of low yield of rapeseed-mustard at farmer's fields:

1. Optimum sowing time is not followed
2. Sometimes non availability of quality seed or variety seed and farmers go for the local seed in hand.
3. More than 90 per cent of farmers mustard seed sowing by broad casting and in most of the situation the plant population at farmers field is high or two-three times high of the recommended stand.
4. Lack of popularization of seed cum fertilizer drill for sowing.
5. Use of inadequate and imbalance dose of fertilizers especially the phosphatic fertilizers by farmers does not make possible to fetch potential yield.
6. The incidence of insect pest and disease is not up to a great extent but sometimes the problem of aphids (*Lipaphis errysimi*) cause substantial loss in the mustard crop and farmers do not adopt the chemical control measures.
7. Mechanical weed control is costly and chemical control is quite uncommon in this region.

Specific constraints with Marginal / Sub marginal farmers:

- a) Small Holding: The adoption of well proven technology is constrained due to small size of holding and poor farm resources. Small and marginal farmers have less capability to take risk and do not dare to invest in the costly inputs due to high risk and the purchase capacity of small farmer is also very low.

- b) Farm Implements and Tools: Traditional implements and tools are still in practice due to small holdings which have poor working efficiency. The lack of simple modern tools for small holdings also hinders the adoption of improved technologies.

CONCLUSION

The results of front line demonstrations convincingly brought out that the yield of rapeseed-mustard could be increased by 26.82% to 33.61 % with the intervention on balanced nutrition coupled with the improved seed and disease management in the Rajsamand region. From

the above findings it can also be concluded that use of scientific method of rapeseed-mustard cultivation reduced the technology gap to a considerable extent. 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. Favorable benefit cost ratio itself explanatory of economic viability of the demonstration and convinced the farmers for adoption of intervention imparted.

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