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Yield and economic viability of coriander under frontline demonstration in Bundi District of Rajasthan

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ABSTRACT

A study was conducted in Bundi district of Rajasthan to analyze yield and economics of coriander under frontline demonstration. Results of the study revealed that yields in coriander were substantially higher over the Local Check (Control), fetching the participating farmers a higher price for their produce. A majority of the respondent farmers expressed high (44.32%) to very high (37.50%) level of satisfaction with extension services and performance of the technology under the demonstration.

Key words: Coriander, farmer, frontline demonstration, yield

INTRODUCTION

Rajasthan is a leading producer of seed spices, mainly coriander, and contributes 62% of India's total production. It is grown mainly in the south and south-eastern plains of Rajasthan comprising Kota, Bundi, Baran and Jhalawar districts, and accounts for the entire production in Rajasthan. However, productivity of coriander is low compared to its potential yield. Farmers face numerous problems in an effort to realize the full potential of coriander production. Lack of suitable high-yielding varieties and poor knowledge of improved production technologies are ascribed as major reasons for this. Productivity of coriander per unit area or time can be increased by adopting feasible, scientific and sustainable management practices by selecting a suitable variety. With this in view, frontline demonstrations were held at farmers' fields, in a systematic manner, to showcase the worth of high-yielding varieties, to convince them about the potential of improved production technologies for enhanced productivity in coriander.

MATERIAL AND METHODS

The study was conducted in Bundi district of Rajasthan during 2008-09 to 2011-12. During this period, a total of 88 frontline demonstrations on coriander variety RCr 436 were conducted at the farmers' fields in the service area of our KVK to convince farmers about the potential of this improved variety. All the demonstrations were conducted on medium-black soils, under an area of 0.5 ha each. The participating farmers were trained in all the aspects of coriander production management. Yield data was collected from all the 88 participating farmers, and economic viability calculation was based on the prevalent market price of the produce and inputs.

Technology gap, extension gap and technology index were calculated using the following formulae (Samui *et al*, 2000):

Technology gap = Potential yield – Demonstration yield

Extension gap = Demonstration yield – Farmers' yield

Technology index = Potential yield – Demonstration yield/Potential yield ×100

Further, satisfaction level of the respondent farmers was measured based on various dimensions like training of the participating farmers, timeliness of the services, supply of the inputs, solving field problems, and extending advisory services, fairness of the scientists, performance of the variety demonstrated and, overall impact of the FLDs. Satisfaction level of the farmers was measured using an index prepared by Kumaran and Vijayaragavan (2005), upon necessary modification. A total of 15 statements were scored on a five-point continuum, viz., strongly agree (5), agree (4), undecided (3), disagree (2) and strongly disagree (1). Possible highest score obtainable was 75, and the lowest 15. The respondents selected were interviewed personally

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on a pre-tested and well-structured interview schedule. Responses were summed up to get the score on satisfaction. Satisfaction index was calculated as follows:

$$\text{Farmer's satisfaction index} = \frac{\text{Individual score of the farmer}}{\text{Maximum score}} \times 100$$

The respondents were classified into five categories, from very-low to very-high, by dividing the score into five classes of equal intervals.

RESULTS AND DISCUSSION

A comparison of the productivity level between frontline demonstrations and Local Checks is shown in Table 1. It is evident from results that under the demonstration plot, performance of coriander (yield) was substantially higher than that in the Local Check in all the years of study (2008-09 to 2011-12). Yield in coriander under demonstration ranged from 1575-1800kg/ha, compared to the Local Checks (1217-1628kg/ha) during the period under study. Technological intervention, thus, enhanced yield to a tune of 31.88%, 32.35%, 12.50% and 10.20%, respectively, over the Local Check. Fluctuations in yield observed over the years were mainly on account of variation in soil moisture availability, rainfall, soil type and pest attack, besides a change in the location of the trials each year. Similar enhancement in yield in different crops under frontline demonstrations was documented by Mishra *et al* (2009), Dhaka *et al* (2010), and Kumar *et al* (2010).

Yield in frontline demonstrations and the potential yield of the crop was compared for estimating yield gaps. These gaps were further categorized as technology and extension gaps. Technology gap indicates a gap in demonstration-yield over the potential yield, and this was 395, 425, 200 and 206kg ha^{-1} during 2008-09, 2009-10, 2010-11 and 2011-12, respectively (Table 2). The technology gap observed may be attributed to dissimilarities in soil fertility, salinity, and to an erratic rainfall and other vagaries of weather in the demonstration area. Hence, to narrow down the gap between the two types of yield in different varieties, location-specific recommendations may become necessary.

Table 1. Productivity of coriander under frontline demonstration

Year	No. of FLDs	Yield (kg ha^{-1})		Additional yield over Local Check (kg ha^{-1})	% Increase over Local Check
		FLD	Local Check		
2008-09	10	1605	1217	388	31.88
2009-10	27	1575	1190	385	32.35
2010-11	36	1800	1600	200	12.50
2011-12	15	1794	1628	166	10.20

FLD: Frontline demonstrations

Table 2. Yield gap and technology index in frontline demonstration

Year	No. of FLDs	Technology gap (kg ha^{-1})	Extension gap (kg ha^{-1})	Technology index (%)
2008-09	10	395	388	19.75
2009-10	27	425	385	21.25
2010-11	36	200	200	10.00
2011-12	15	206	166	10.30

FLD: Frontline demonstrations

Extension gap ranged from 166 to 388kg ha^{-1} during the period under study (Table 2). A wide extension gap emphasizes the need to educate farmers using various means to facilitate adoption of improved production technologies, to reverse this trend. Greater use of the latest, improved production technologies applied to high-yielding varieties can subsequently bridge this extension gap between demonstration yield and potential yield. New technologies, may, eventually lead farmers into discontinuing obsolete varieties.

Technology index refers to the feasibility of a variety at farmers' field. A lower value for technology index indicates greater feasibility. Table 2 reveals that technology index values obtained were 19.75, 21.25, 10.00 and 10.30 during 2008-09, 2009-10, 2010-11 and 2011-12, respectively. This finding corroborates results of Hiremath and Nagaraju (2009) and Dhaka *et al* (2010).

The economics of growing coriander under frontline demonstrations were estimated and results are presented in Table 3. Economic analysis of yield performance revealed that besides higher production, participating farmers in FLD realized a higher price of their produce compared to that in the Control (Local Checks) during the period under study. This was so because of a better quality of the produce. Frontline demonstrations recorded higher gross returns (Rs. 61793, 54968, 73800 and 80730 ha^{-1}), and net returns (Rs. 45743, 38218, 56000 and 61630 ha^{-1}), with higher benefit:cost ratio (2.85, 2.28, 3.15 and 3.23) compared to the Local Checks in our study, respectively. These results are in line with findings of Gurumukhi and Mishra (2003), Sawardekar *et al* (2003), and Hiremath *et al* (2007).

Farmers' satisfaction

Satisfaction level of the respondent farmers with the extension services and performance of frontline demonstrations was measured, and results are presented in

Table 3. Economics of frontline demonstration

Variable	Demonstration				Local Check				Additional gain in demonstration over Local Check			
	08-09	09-10	10-11	11-12	08-09	09-10	10-11	11-12	08-09	09-10	10-11	11-12
Cost of cultivation (Rs ha^{-1})	16050	16750	17800	19100	14500	15100	16300	17600	1550	1650	1500	1800
Sale price (Rs. q^{-1})	3850	3490	4100	4500	3610	3140	3950	4370	240	350	150	130
Gross returns (Rs. ha^{-1})	61793	54968	73800	80730	43934	37366	63200	71144	17859	17602	10600	9586
Net returns (Rs. ha^{-1})	45743	38218	56000	61630	29434	22266	46900	53544	16309	15952	9100	7786
Benefit:cost ratio	2.85	2.28	3.15	3.23	2.03	1.47	2.88	3.04	10.52*	9.67*	6.07*	4.33*

*****Incremental benefit:cost ratio

Table 4. Extent of farmers' satisfaction with extension services (n=88)

Satisfaction level	Class	Number	Per cent
Very Low	15-30	0	0.00
Low	16-30	0	0.00
Medium	31-45	16	18.18
High	46-60	39	44.32
Very High	61-75	33	37.50

Table 4. A majority of the respondents expressed high (44.32 %) to very high (37.50 %) level of satisfaction at the extension services offered and performance of the technology under demonstration; whereas, a meagre (18.18) per cent of respondents expressed a medium level of satisfaction. High- to very-high level of satisfaction at the services rendered, linkage with farmers and technologies demonstrated, indicated a stronger conviction, and, physical and mental involvement in frontline demonstration. This, in turn, could lead to higher adoption of the technologies, which would prove the relevance of frontline demonstrations.

It is concluded that frontline demonstration of improved technology reduces technology gap to a considerable extent, thus leading to increased productivity of coriander in Bundi district of Rajasthan. This also improved linkages between the farmers and scientists, and built confidence for adoption of the improved technology. Productivity enhancement under FLD over farmers' practices of coriander cultivation created a greater awareness, and motivated other farmers not growing coriander to adopt improved technologies in this spice crop.

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