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Assessing the impact of variety RKD-18 in Bundi district of Rajasthan through front line demonstration

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Abstract

A study was carried out at different villages of Bundi district under CSS-MIDH during 2017-2018, 2018-19 and 2019-2020. Total 50 front line demonstrations were conducted on coriander in 25 ha by the active participation of the farmers with the objective of increase coriander production through improved technologies. The improved technologies consist improved variety (RKD-18), balanced fertilizers (soil test based) application and integrated disease and pest management, etc. The demonstration recorded an average yield ranging from 14.72 q/ha to 16.12 q/ ha with a mean of 15.53 q/ha. The per cent increase yield in demonstration ranged from 16.55% to 28.55% in the respective years with an average of 21.17%. The average extension gap, technology gap and technology index were 2.71 q/ha, 2.47 q/ha and 13.70%, respectively. The demonstrated field gave higher net return Rs. 43900/- to Rs. 60200/ ha and B:C ratio 2.84 to 3.64with mean Rs. 51000/ha and 3.17, respectively. This study results clearly prove that the yield and economics of Coriander can be enhance by adoption of recommended technology.

Keywords: Variety RKD-18, front line demonstration, B:C ratio

Introduction

India is known as the "Land of Spices." It is the largest producer, consumer as well as exporter of spices and spice products in the world. Both the production and export of spices from India has increased considerably. "Spice production in India has increased by more than 2.5 million tons, so the export has also increased from about Rs 15 thousand crore to about Rs 19 thousand crore." Rajasthan is a leading producer of seed spices particulars coriander, cumin, fenugreek, fennel, ajwain etc. Coriander (*Coriandrum sativum* L.) is grown mainly in south and south eastern plains of Rajasthan comprising Kota, Bundi, Baran and Jhalawar districts, and accounts for entire production in Rajasthan. The productivity in Bundi district is very low, primarily due to unavailability of suitable variety(s) as well as lack of improved production technologies, more specifically the method of sowing, nutrient and plant protection management. The productivity of coriander could be increased by adopting recommended scientific and sustainable management production practices Tetarwal and Ramniwas (2022) [5]. Front line demonstration is the new concept of field demonstration with main objective to demonstrated newly released variety with improved technologies practices and its management practices at farmer's field under different agro climatic regions of the country with varying farming situations. Productivity of coriander can be increased by adopting feasible, scientific and sustainable management practices by selecting a suitable variety. With this view, front line demonstrations carried out at farmer's field, in a systemic manner, to evaluate the impact of high yielding new varieties and to encourage them about the potential of improved production technologies to enhance yield of coriander.

Materials and Methods

The frontline demonstrations were conducted by Krishi Vigyan Kendra, Bundi of Rajasthan. During 2017-2018, 2018-19 and 2019-2020, total 50 front line demonstrations on coriander variety RKD-18 were conducted at farmer's field. The data related to yield and economic performance of frontline demonstrations were collected from FLDs as well as local plots and finally the seed yield/ha, cost of cultivation/ha, net returns/ha with the benefit cost ratio was worked out. For the purpose of assessment, different location of Bundi district were selected. For selection of beneficiary farmers, a list of farmers where FLDs on coriander were conducted during Rabi 2017-2018, 2018-19 and 2019-2020 was prepared and taking equal representation. The data were collected through personal contacts with the help of well structured interview schedule. The gathered data were processed, tabulated, classified and analyzed in terms of mean percent score and ranks in the light of objectives of the study. The extension gap, technology gap and technology index were calculated using the formula as suggested by Samui *et al*., (2000) [7].

Extension gap (qha^{-1}) = Demonstration yield – Farmer's yield
Technology gap (qha^{-1}) = Potential yield – Demonstration yield
Technology index (%) = [Potential yield – Demonstration yield/Potential yield] x 100

Table 1: Comparison of farmers' practices and technological intervention for Coriander

SN.	Particular	Farmers' Practice	Demonstration Package
1.	Variety	Local selection	RKD-18
2.	Seed Treatment	No seed treatment	Hexaconazole/Tebuconazole 2 ml/kg seed
3.	Fertilizer dose	80:60 kg NP per ha	50:100:30 kg NPS
4.	Weedicide	No use of weedicide	Pendamethalin 30% EC (3.0 lit/ha)
5.	Plant protection measures	1. Carbendazim @ 2 gram/lit 2. Sulphur @ 2 gram/lit	1. Rogor/ 2 ml/lit 2. Acephate @ 0.50 gram/lit 3. Quinalphos @ 2 ml/lit 4. Hexaconazole @ 2 ml/lit

Differentiation in Farmers' Practices and Demonstration Package in Coriander Crop

The major differences were observed between demonstration package and farmer's practices regarding recommended varieties, seed treatment, fertilizer dose, application of herbicide and plant protection measures (Table 1). The data showed that under the demonstrated scheme recommended varieties, plant protection chemicals and herbicides were provided to the farmer and all package and practices were timely performed by the farmers under the supervision of scientists. Under farmers' practice, the variety Local selection was used at higher seed rate without any treatment. As a result, the farmers selected under demonstration program on Coriander were provided with the seed of stem gall tolerant Coriander var. RKD-18 with seed treatment from the year 2017 onwards.

Results and Discussion

Table 2: Extension gap, technology gap and technology index of coriander under FLDs

Variables	Extension gap (qha^{-1})	Technology gap (qha^{-1})	Technology index (%)
2017-18	2.09	3.28	18.22
2018-19	3.58	1.88	10.44
2019-20	2.45	2.24	12.44
Average	2.71	2.47	13.70

The Performance of Technology Demonstration on Production of Coriander variety RKD-18

A comparison of yield performance between demonstrated practices and local checks is shown in Table 2 and 3. It was observed that the improved Stem gall tolerant Coriander variety RKD-18 recorded the higher seed yield (15.53 q/ha) when compared to farmers practices (12.42 q/ha). The increase in the yield over local check was 21.17%. Similar yield enhancement in different crops in demonstration has been documented by Kumar *et al.* (2024) [2] and Jaidga and Brar (2023) [1]. The technology gap found might be due to dissimilarities in soil fertility and to erratic rainfall and other fluctuating weather component in the demonstration areas which was 247 kg/ha . These findings are similar to the findings of Ramniwas *et al.* (2022) [5]. A wide extension gap 2.71 q/ha highlighted the need to spread awareness among farmers to use various means to make easy adoption of improved production technologies, to reverse this trend. Similar enhancement in yield in coriander under front line demonstrations was documented by Ramniwas *et al.* (2022) [5]. Technology index refer to the feasibility of variety at farmers field. A lower the value of technology index (mean 13.70%) more is the feasibility (Table 2). This finding corroborates results of Poonia *et al.* (2017) [3].

Table 3: Year wise comparison Yield of Coriander variety RKD-18 under farmers' practice and technology demonstration

Variables	Avg. Yield (q/ha) Demo.	Avg. Yield (q/ha) Check	% increase over check
2018-19	16.12	12.54	28.5486
2019-20	15.76	13.31	18.4072
Average	15.53	12.83	21.17

Table 4: Year wise comparison Economics of Coriander variety RKD-18 under farmers' practice and technology demonstration

Variables	Economics of demonstration (Rs./ha)				Economics of Local check (Rs./ha)			
	Gross cost	Gross return	Net return	B:C Ratio	Gross cost	Gross return	Net return	B:C Ratio
2017-18	22800	83000	60200	3.64	25700	95800	70100	3.73
2018-19	23800	67700	43900	2.84	26700	87000	60300	3.26
2019-20	24100	73200	49100	3.03	30000	94600	64600	3.15
Average	23600	74600	52000	3.17	27500	92500	65000	3.38

It is clear from the observation that the yield of improved Stem gall tolerant variety was found better than the local check under same environmental during three years of study. Farmers were motivated by results of improved technologies used in the demonstration and it is expected that they would adopt these technologies for Coriander production, This results was in lined Samantaray *et al.* (2020) [6]. Fluctuations in yield observed over the years were mainly on account of variation in rainfall that will change soil moisture availability, sowing time and pest and disease attack.

The economics of growing coriander under front line demonstrations were estimated and results are presented in Table 4. Economic analysis of yield performance revealed that in addition to higher yield, participating farmers in FLDs got a higher price of their produce compared to that in the local checks during the period under study. This was so because of a better quality of the produce in form of high oil content and bold seeded coriander variety. Front line demonstrations recorded higher mean gross return (Rs. 74600/ha) and mean net returns (Rs. 51000/ha) with average benefit: cost ratio (3.17) compared to the local checks in our study (Poonia *et al*., 2017) [3]. The higher return of demonstrated variety is due to high market value of variety as compared to local check. Similar results were also reported by Raj *et al.* (2013) [4].

Conclusion

Use of the improved production technologies with use of high yielding varieties can later bridge this extension gap between demonstration yield and farmer's yield. New technologies, may, in due course lead farmers into discontinuing old varieties.

On the basis of above results in present study, it is found that front line demonstrations 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 farmers and scientists, and built confidence for adoption of the improved technology. Productivity enhancement under FLDs over farmer practices of coriander cultivation created a greater awareness, and motivated other farmers for taking cultivation variety RKD-18 with improved package of practices.

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