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YIELD GAP AND ECONOMIC ANALYSIS OF FRONTLINE DEMONSTRATIONS ON CORIANDER IN PORBANDAR DISTRICT

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Abstract- Krishi Vigyan Kendra, JAU, Porbandar (Gujarat) conducted 30 demonstration in 12 hectare area on improved variety Guj. Coriander-2 with recommended practices during 2010-11 to 2012-13 in different adopted villages. Prevailing farmers' practices were treated as control for comparison with demonstration. The average three year data showed that an average yield of demonstrated plot was obtained 1610 kg ha^{-1}over control (1454 kg ha^{-1}) which was 10.6% higher than farmers' practice. The overall average extension gap of 155 kg ha^{-1} with technology gap (404 kg ha^{-1}) and technology index (20.2) was recorded. The higher net returns of Rs. 52105 ha^{-1} was obtained under the demonstration fields than farmer's practice (Rs. 42669 ha^{-1}) with additional return of Rs. 9436 ha^{-1}. Benefit cost ratio was also considerably higher in demonstration plot (3.70) than farmer's practice (2.90). So, improved variety Guj. Coriander-2 with recommended package of practices should be adopted in Saurashtra region of Gujarat for gaining higher yield and profit from coriander cultivation.

Keywords-Frontline demonstration, Yield gap, Technology gap, Extension gap, Technology index.

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Introduction

India is the world's largest producers, consumers and exporter of seed spices. Among all the states of India, Gujarat and Rajasthan together contribute more than 80 per cent of the total seed spices production in the country and thus, both the states together are known as "seed spices bowl" of India. Coriander (*Coriandrum sativum* L.) is an annual herb from *umbelliferae* family with 90 to 120 days growth period. Coriander leaves are being used in cooking, flavouring, beverages etc., and seeds are being used for preparing value added products such as coriander powder, *dhana dal*, curry powder, oleoresin and essential oil. So, it is known as low volume but high value crop of arid and semi-arid regions. In Gujarat, coriander is cultivated in 15396 hectare area contributing production of 43946 tones with productivity of 1570 kg ha^{-1}. In Porbandar district, coriander is grown in 1315 hectare area with production of 1973 tones and productivity of 1500 kg ha^{-1} [1].

In Porbandar district, generally farmers are growing traditional variety of coriander with conventional practices which leads to low yield, low productivity and lower economic gain to the farmers. The low production and productivity of coriander in the district is mainly attributed to unawareness of the farmers about improved varieties and scientific cultivation practices. So with a view to enhance production and productivity of coriander in the district, front line demonstrations of improved variety Guj. Coriander-2 was conducted on farmer's field in different adopted villages of the Porbandar district. Keeping in view the present investigation attempts to study the yield gap between front line demonstration trials and farmer's yield, extent of technology adoption and benefit cost ratio.

MaterialsandMethods

The present investigation was conducted in Porbandar district of Gujarat state where large area and great potential of boosting production and productivity of coriander. The study was carried out by Krishi Vigyan Kendra, Porbandar, Gujarat during 2010-11 to 2012-13 (3 years) in 12 hectare area on 30 farmers' field of operational area of Porbandar district. Each FLD was allotted 0.4 hectare area. Improved variety of Coriander (Guj. Coriander-2) was given as input to the farmers and in demonstration plots recommended package of practices were followed under the guidance of KVK scientists [Fig-1 & 2[. Whereas conventional variety with traditional practices were as local check. KVK scientists visited the FLDs frequently and guided the farmers in performing field operations like sowing, spraying, weeding, harvesting etc.Field days were also organised on the FLD fields. The data was collected during the course of visit. The extension gap, technology gap and the technology index were worked out as per formulae given by [3].

Fig-1 Luxurious growth of Coriander under

Technology gap = Potential yield – Demonstration yield

Extension gap = Demonstration yield - yield under existing practice
Technology index = {(Potential yield – Demonstration yield)/Potential yield} × 100
Additional Return = Demonstration Return – Farmers' Practice Return
Net returns = Total (Gross) Returns – Total Cost of Production

Fig-2 Visit of the FLD field

Result and Discussion

Seed yield

The data [Table-1] revealed that the seed yield was consistently and noticeably improved in demonstration plot with improved variety Guj. Corander-2 and recommended practices as compared to conventional variety with farmers' practice during all the three years. The yield recorded under demonstration plot during the year 2010, 2011 and 2012 were 12.7%, 10.7% and 8.5% higher than the yields under conventional variety and farmers' practice respectively. On the basis average data, it is inferred that the improved and high yielding variety Guj. Coriander-2 with recommended practices recorded 10.3 percent higher yield (1610 kgha^{-1}) as compared to conventional variety and farmers' practice (1454 kgha^{-1}).

Gap analysis

Data [Table-1] revealed that an extension gap of 111 – 184 kg ha^{-1} was found between demonstrated technology and farmers' practice and on average basis the extension gap was 155 kg ha^{-1}. The lowest extension gap (111 kg ha^{-1}) was in the year 2012-13. Such gap might be attributed to adoption of improved technology especially high yielding varieties sown with the help of seed cum fertilizer drill with balanced nutrition and appropriate plant protection measures in demonstrations, which resulted in higher grain yield than the traditional farmers' practices. These results are in the agreement of the findings of [3, 5].

The technology gap shows the gap in the demonstration yield over potential yield and it was 404 kg ha^{-1}. It was highest (595 kg ha^{-1}) in the year 2012-13 while lowest (253 kg ha^{-1}) in the year 2011-12. The Front line demonstrations were laid down under the supervision of KVK Scientists at the farmers' field. There exists a gap between the potential yield and demonstration yield. This may be due to the soil fertility and weather conditions. Hence, location specific recommendations are necessary to bridge the gap. Technology index shows the feasibility of the variety at the farmers' field. The lower the value of technology index more is the feasibility. Result of the study depicted in [Table-1] revealed that the average technology index value was 20.2 percent ranging from 12.6 to 29.8 percent. As such variation in technology during the study period in certain area may be attributed to dissimilarity in the soil fertility condition, pest-diseases attack, non-availability and poor quality of irrigation water and weather condition. These results are in confirmation with the findings of [2, 4, 6].

Table-1 *Yield and gap analysis of FLDs on coriander*

Year	Area (ha.)	Potential yield (kgha^{-1})	Demo. yield (kgha^{-1})	FP yield (kgha^{-1})	Yield increase over FP (%)	Ext. gap (kgha^{-1})	Tech. gap (kgha^{-1})	Tech. index (%)
2010-11	4.0	2200	1636	1451	12.68	184	365	18.2
2011-12	4.0	2200	1788	1615	10.70	170	253	12.6
2012-13	4.0	2200	1405	1295	8.50	111	595	29.8
Overall average	**4.0**	**2200**	**1610**	**1454**	**10.6**	**155**	**404**	**20.2**

The economics of coriander production under front line demonstrations were estimated and the results of the study have been presented in [Table-2]. The results of economic analysis revealed that on an average front line demonstrations recorded higher gross return (Rs. 71297 ha^{-1}) and net return (Rs. 52105 ha^{-1}) with higher benefit cost ratio (3.7) as compared to local variety with farmers' practice. Additional return of Rs. 9436 was obtained in FLDs than farmers' practice. It suggests the higher profitability and economic viability of the demonstration. The highest gross return, net return and BCR with highest additional return in the year 2012-13 was due to the increased price of coriander in the year 2012-13.These findings are in accordance with that of [3, 4].

Table-2 *Economic analysis of FLDs on coriander*

Year	Cost of cultivation (Rs.ha^{-1})		Gross returns (Rs.ha^{-1})		Net returns (Rs.ha^{-1})		Add. Return in demo. (Rs.ha^{-1})	BCR	
	Demo.	FP	Demo.	FP	Demo.	FP		Demo	FP
2010-11	18770	22105	49065	43542	30295	21437	8858	2.61	1.97
2011-12	18630	21465	52425	47322	33795	25857	7938	2.81	2.20
2012-13	20175	22850	112400	103563	92225	80713	11512	5.57	4.53
Overall average	**19192**	**22140**	**71297**	**64809**	**52105**	**42669**	**9436**	**3.70**	**2.90**

Conclusion

The findings of the study revealed that wide gap existed in potential and demonstration yield in high yielding coriander variety due to technology and extension gap in Porbandar District of Gujarat. Yield potential of coriander can be increased to a great extent by adoption of improved variety Guj. Coriander-2 with recommended practices, this will substantially increase the income as well as the livelihood of the farming community. There is need to adopt multi-pronged strategy that involves enhancing coriander production through improved variety and technologies in Porbandar district. The study emphasizes the needs to educate the farmers in adoption of improved variety and technology to narrow the extension gaps through various technology transfer centers. Therefore it is suggested that these factors may be taken for considered to increase the scientific temperament of the farmers.

Abbreviations: Demo. - Demonstration, FP - Farmers' practice, Ext. - Extension, Tech.- Technology

Conflict of Interest: None declared

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