

Assessment of front line demonstration on yield enhancement of fennel (Abu Sonf) under TSP area in Dungarpur, Rajasthan

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Abstract

Front line demonstrations on fennel consisting of local selection variety (Abu Sonf) with scientific interventions viz, seed treatment, raising seedling, line transplanting, schedule irrigation, weed management and application of recommended doses of nutrient with appropriate plant protection schedule were carried out at farmers fields in different villages of Simalanra Panchayat Samiti, Dungarpur District of Rajasthan during Rabi season of 2013-14, 2014-15 and 2015-16. Grain yield of fennel variety Abu Sonf under improved practices was recorded 17.9q ha⁻¹, 17.8q ha⁻¹ & 18.2q ha⁻¹, increased by 34.81 per cent over farmers practice. The ranges of average yield were 14.4-18.5q ha⁻¹, 14.6-18.2q ha⁻¹ & 14.9-21.7q ha⁻¹ in demonstration fields and 11.9-15.3q ha⁻¹, 10.4-16.3 q ha⁻¹ & 9.9-15.1q ha⁻¹ in farmer's fields, respectively during Rabi 2013-14, 2014-15 and 2015-16. The technological gap existing between the potential and demonstrable yields was not substantial (3.8q ha⁻¹ & 4.7q ha⁻¹) during Rabi 2013-14, 2014-15 and 2015-16 and extension gap between the improved technology and farmers practice was (7.53q ha⁻¹, 7.63q ha⁻¹ & 7.23q ha⁻¹) during Rabi 2013-14, 2014-15 and 2015-16. The net gain per hectare was ` 68005/-, ` 69195/- & ` 70100/- and was ` 47205/-, ` 48585/- & ` 52420/- higher by investing additionally ` 20800/-, ` 20610/- & ` 17680/- during Rabi 2013-14, 2014-15 and 2015-16. The improved package of practice fetched a higher B : C ratio of 3.34, 3.41 & 3.35 while farmer's practice gave 2.70, 2.82 & 2.91 during respective years. Front line demonstration period was an effective tool for increasing the productivity of crops and changing knowledge, attitude and skill of TSP area farmers. This created greater awareness and motivation to other farmers adopt improved practices of fennel cultivation.

Key words : B : C ratio, extension gap, fennel, front line demonstration.

Introduction

Fennel (*Foeniculum vulgare* Mill) a native of Southern Europe and Mediterranean area is one of the important seed spices. India is well-known as "Land of Spices" across the world since long. Our ancestors have been using these spices for adding taste and flavour to edibles and beverages. It has been used in treatment of various ailments, which is evident from our old literature. These spices possess many medicinal properties. They are carminative, appetizer, digestive, stimulant, tonic, spasmolytic, antipyretic, anthelmintic etc, and these properties increase their importance and value. Spices are valuable due to different aroma, taste and flavor. They change flavour and taste, of drink & edible food, whenever added to these products. The aroma of seed spices is due to presence of volatile oil and its quantity determines quality and value. Fennel is used in diseases like cholera, biliousness, dysentery, diarrhea, cough, cold and constipation. Fennel seeds and its oil both stimulate appetite and stop flatulence. Its decoction is given to women for blood purification and uterus clearing. India is

the largest producer of fennel seed and it is cultivated on 99723 hectares land with a production of 142995 tones in year (2014-15). In India, its production is concentrated mainly in the state of Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Harayana, Punjab and Utter Pradesh. The yield of fennel crop is adversely affected by incidence of collar rot, wilt & blight diseases and attack of aphid. Fennel can be cultivated in all types of soils but well drained sandy loam and medium loamy soils are suitable for the crops. Front line demonstration programme has been an effective tool for increasing the productivity of crops and changing knowledge, attitude and skill of farmers. This created greater awareness and motivated other farmers to adopt improved practices of fennel cultivation. Though several factors and conditions are responsible for the existence of such yield gaps but the nature and extent of adoption of the improved technology is primarily concerned with such gaps and has direct bearing on the farmers production output. In view of this, a study was conducted in Rajasthan to examine some important aspects related to the utilization of the recommended fennel production

technology. These aspects include farmer's adoption of improved practice of fennel production technology, their perception about the technology with respect of attributes known for facilitating technology utilization, farmer's level of adoption of the recommended technology and finally the constraints encountered by the farmers in the adoption improved practice of fennel production technology.

Material and methods

A study was conducted on 115 front line demonstrations of fennel during Rabi 2013-14, 2014-15 and 2015-16 in Vagard region of southern Rajasthan to evaluate the economic feasibility of technology transfer and adoption under front line demonstration programme. These, demonstration were conducted at farmer's field at Simalanra Panchayat Samiti, Dungarpur district of Rajasthan. The crop was seed sown in nursery from 4th week of August to 2nd week of September. The seedlings were transplanted from 1st week to 3rd week of October. During this period extension activity like farmers training, literature, SMS, diagnostic visits etc were undertaken. The farmers selection was as per guidelines provided by National Horticulture Mission to bridge the gap existing between state productivity and district productivity and the whole package approach was demonstrated to farmers through FLDs trials included component such as variety, seed rate, seed treatment, weed management and irrigation schedules through sprinkler, fertilizers and plant protection measures, under strict supervision of KVK, Dungarpur scientists from seed sowing, seedling transplanting to harvesting. The FLDs is an important method of transfer of latest package of practices in totality to farmers and main objective of this programme is to demonstrate newly developed crop production and protection technologies and management practices at the farmer's field under real farming situation at his own field under different agro climate regions. Through it, farmers learn the latest technology that may lead to higher production or adoption. Realizing the importance of front line demonstration in transfer of latest technologies through KVKs, the present study has been undertaken to study the difference between demonstration package & farmers practices of fennel and to assess effect of FLDs technology on increasing the productivity of fennel. The primary data were collected with the help of well structured interview schedule, which was pretested before application. To measure the knowledge level of farmers they were requested to reply 32 questions on the selected components of the recommended fennel production technology.

Technology gap: Improved yield – Farmers yield

Extension gap: Potential yield – Improved yield

$$\text{Technology index} = \frac{\text{Technology gap}}{\text{Extension gap}} \times 100$$

Results and discussion

The study revealed that improved technology registered 34.81 percent increase in seed yield over the farmer's practice during Rabi 2013-14, 2014-15 and 2015-16 (Table 2). The ranges of average yield were 14.4-18.5q ha⁻¹, 14.6-18.2q ha⁻¹ & 14.9-21.7q ha⁻¹ in demonstration fields and 11.9-15.3q ha⁻¹, 10.4-16.3 q ha⁻¹ & 9.9-15.1q ha⁻¹ in farmer's fields, respectively during Rabi 2013-14, 2014-15 and 2015-16 (Table 2). The most favourable one for fennel when the highest yield of demonstration practice 19.2q ha⁻¹ 18.5q ha⁻¹ & 24.0q ha⁻¹ and farmers practice 16.5 ha⁻¹, 15.2q ha⁻¹ & 17.6q ha⁻¹, respectively were recorded during Rabi 2013-14, 2014-15 and 2015-16. These results confirm those obtained by conducting in FLD trials on various pulse crops (Das and Willey, 1991; Khan and Chouhan, 2005) and seed spices (Pagaria and Jain, 2012; Choudhary and Kantwa, 2014). Overall, the yield of demonstration plots exceeded to that of farmers plots in all FLD. This was attributed to the quality seed used, stage of seedling transplanting, adequate seed rate, management practices and judicious use of fertilizers. In terms of monetary return, the net gain per hectare was ` 68005/-, ` 69195/- & ` 70100/- and was ` 47205/-, ` 48585/- & ` 52420/- higher by investing additionally ` 20800/-, ` 20610/- & ` 17680/- during Rabi 2013-14, 2014-15 and 2015-16. Improved package of practice fetched a higher B : C ratio of 3.34, 3.41 & 3.35 while farmers practice gave 2.70, 2.82 & 2.91 during Rabi 2013-14, 2014-15 and 2015-16 (Table 1). These results confirm those obtained by conducting in FLD trials on cumin crop (Choudhary and Pagaria, 2012; Pagaria and Jain, 2012; Choudhary and Kantwa, 2014). The data revealed that the technological gap existing between the potential and demonstrable yields was not substantial (3.8q ha⁻¹, 3.8 q ha⁻¹ & 4.7q ha⁻¹) during Rabi 2013-14, 2014-15 and 2015-16 (Table 2). Thus indicating that it was possible to replicate the result obtained in research experiments in real farm situation too. Result also indicated an extension gap between the improved technology and farmers practice. Due to this a yield gap of 7.53q ha⁻¹, 7.63q ha⁻¹ & 7.23q ha⁻¹ was recorded which could be overcome by adopting improved varieties and efficient management practices during Rabi 2013-14 and 2014-15 (Table 2). Technology index 76.89% & 77.64%

gave evidence that there was a scope for further improvement in the productivity of fennel. However, to further bridge the gap between technology developed and technology transferred, there is a need to strengthen the extension network besides emphasis on specific local recommendations. These results confirm those obtained by conducting in FLD trials on various seed spices crops (Singh and Varshney, 2010; Veerasamy *et. al.*, 2003; Verma *et. al.*, 2010; Pagaria and Jain, 2012; Choudhary and Kantwa, 2014).

Reactions and constraints

During crop period and after harvest the reaction of farmers about critical input supplied under demonstration was asked and they replied good seed germination, seedling and early maturity of the variety than local seeds. While

the farmers suggested collar rot, wilt and blight tolerant varieties should be developed and major constraints were the unavailability of newly released seeds and plant protection chemicals on time and in view of marketing lack of proper post harvest management and value addition and lack of centralized facilities for cleaning, grading, processing, packing and storage in the state are prior requirement.

Conclusion

It is concluded that the front line demonstration programme was an effective tool for improving the productivity of crops and changing knowledge, attitude and skill of farmers. This created greater awareness and motivated the other farmers for adoption to improved practice of fennel production technology. These demonstrations also built

Table 1. Impact of improved technology on the economics of fennel cultivation.

S. No	Particulars	2013-14	2014-15	2015-16
1.	Production cost			
	Improved practice	28990	28740	29800
	Farmers practice	27780	26630	27400
2.	Additional cost over FP	4000	3950	3500
3.	Gross return			
	Improved practice	96995	97935	99900
	Farmers practice	74985	75215	79820
4.	Net return			
	Improved practice	68005	69195	70100
	Farmers practice	47205	48585	52420
5.	B:C ratio			
	Improved practice	3.34	3.41	3.35
	Farmers practice	2.70	2.82	2.91
6.	Additional return	20800	20610	17680
7.	Increase in net return (%)	44.06	42.42	33.73
8.	B:C ratio additional input demonstration	5.20	5.22	5.05

IP – Improved practice; FP – Farmers practice

Table 2. Impact of improved technologies on the productivity and gaps of fennel cultivation.

No. of FLDs & Years	Variety	Mean yield (q ha ⁻¹)		Range yield index (q ha ⁻¹)		Technol ogy gap (q ha ⁻¹)	Extensi on gap (q ha ⁻¹)	Techn ology index (%)	Increase in yield (%)
		Improved practice	Farmers practice	Improved practice	Farmers practice				
2013-14 (33)	Abu Sonf	17.9	14.1	14.4-18.5	11.9-15.3	3.8	7.53	50.46	27.85
2014-15 (125)	Abu Sonf	17.8	14.0	14.6-18.2	10.4-16.3	3.8	7.63	49.80	27.14
2015-16 (185)	Abu Sonf	18.2	13.5	14.9-21.7	9.9-15.1	4.7	7.23	52.55	34.81

Potential yield of fennel (Abu Sonf) – 25.43 q ha⁻¹, TG = IY - FY, EG = PY – IY and TI = TG/EG*100

the relationship & confidence between farmers and scientists. The beneficiary farmers of FLDs also play an important role as source of information and pure seeds for wider dissemination of the HYV of fennel for other nearby farmers.

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