

Impact of FLD on fennel (*Foeniculum vulgare* Mill) variety (RF-125) in Nagaur district of western Rajasthan

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ABSTRACT

Impact assessment of front line demonstrations was carried out on fennel (*Foeniculum vulgare* Mill.) variety (RF-125) during *Rabi* seasons of 2007-08 to 2010-11. The data revealed that the yield in demonstration plots increased from 15.40 to 33.85 per cent over farmers practice during the understand period. Similarly, the economic analysis of data revealed that fennel variety RF-125 resulted higher B: C ration over farmer during all four years. The adoption of variety RF-125 ranged from 65 to 92 per cent in operational as well as in nearby villages. The use of improved variety RF-125 of fennel under semi arid conditions of Nagaur proved superior in respect to adoption by farmers and productivity levels.

Key words : Fennel, FLD, Nagaur

INTRODUCTION

India is the largest producer and exporter of seed spices in the world. Fennel is one of an important high value seed spice crop belonging to family apiaceae. In India, the area under fennel is 74149 hectares with the total production of 114277 tones with an average productivity of 1541 kg ha⁻¹ (Anwer *et al.*, 3). It is mainly grown in Gujarat, Rajasthan, Karnataka, UP, Punjab and Haryana. The Gujarat contributes 80% of the total production in the country followed by Rajasthan (10%). In state like Rajasthan, area under fennel is spreading in semi arid regions but the productivity of the crop is low as compared to Gujarat. The yield potential of fennel is low primarily due to less availability of better genotype for cultivation under the prevailing agro-climatic conditions and secondly due to poor management of production sites (Singh *et al.*, 5). Improved agronomical practices along with good quality seed are the key factors to increase the productivity levels.

Keeping these facts in view front line demonstrations were laid out by Krishi Vigyan Kendra (KVK), Nagaur to evaluate the impact of high yielding variety (RF-125) along with balanced fertilization during *Rabi* seasons of 2007-2008 to 2010-11.

MATERIALS AND METHODS

The front line demonstrations were carried out at farmers field in village somana, Khiwtana, Nimbri, Chardas and sarasni of Nagaur during four *Rabi* season from 2007-08 to 2010-11. The soils of demonstration sites were mostly sandy loam in texture with low organic carbon (0.13

to 0.27 percent). The available NPK were 134 to 140, 12 to 14 and 168 to 192 kg ha⁻¹ respectively. PH of irrigation water was +8.7 with high EC (+ 4.68 dsm⁻¹) The sowing of fennel variety RF-125 was done in between second week October to last week of October in all the four seasons.

The recommended dose of nitrogen and phosphorus (90:60 kg ha⁻¹) & seed of RF-125 were provided by the KVK, Nagaur. Full dose of phosphorus and 1/3rd of nitrogen was applied as basal dose and remaining dose of nitrogen was applied in two equal splits at 30 and 60 days after sowing. Seed treatment was done with carbendazim @2 g per g seed. The other crop management practices were preferred as per standard recommendation of the region. One block of farmer's practice (Local variety with +50 kg N ha⁻¹) was also kept for comparison. Harvesting of crop was done during 2nd fortnight of April and grain yield was recorded.

RESULTS AND DISCUSSION

Yield

The yield data presented in table-1 showed that the yield in demonstration plots increased from 15.40 to 33.85 percent over farmers practice during the study period. The variation in yield data during the years was due to aberrant weather condition like frost and sudden development of cold waves. However, owing to dry conditions, the arid region of north western parts of Rajasthan like Nagaur offers an excellent opportunity for high quality seed spices. This congenial weather condition together with quality input management like quality seed and recommended fertilization can be an effective tool to achieve better yield.

Table 1. Year wise Impact of fennel RF-125 on yield

S.No.	Year	No. of Farmers	Area (ha)	Average yield q ha ⁻¹		% increase in yield
				Demonstration	Farmer's Practice	
1.	2007-08	10	5	12.17	10.31	18.04
2.	2008-09	10	5	21.05	17.11	23.00
3.	2009-10	10	5	14.38	12.46	15.40
4.	2010-11	15	6	17.40	13.00	33.85

The higher yield in demonstration plots might be due to higher yield potential of the variety (RF-125) and direct role of balanced fertilization during crop season. The higher seed yield and hence the higher monetary return might be due to fact that use of organic material has maintained and restored the soil fertility (Vadiraj *et al.*, 6). Among the primary nutrients, nitrogen play an important role in growth and dry matter production of the crop (Patel *et al.*, 1). Basal and split application of nitrogen helped in

better growth & yield. More over, the soils of experimental sites were inherently poor in phosphorus (12 to 14 kg/ha). Basal application of phosphorus helped in mitigation of phosphorus deficiency and higher grain yield. Nutrient management helped in better growth & development of plant and ultimately grain yield. (Aishwath *et al.*, 4)

Economic analysis

The adoption of any technology in modern agriculture can only be feasible and acceptable to farmers if it is economically viable.

Table 2. Economic analysis of Fennel variety (RF-125) under semi arid condition of Nagaur

S.No.	Year	Demonstrations		Farmers practice		B:C Ratio	
		Cost (Rs. ha ⁻¹)	Return (Rs. ha ⁻¹)	Cost (Rs ha ⁻¹)	Return (Rs ha ⁻¹)	Demo.	Farmer's Practice
1.	2007-08	16650	58416	15470	49488	1:3.51	1:3.19
2.	2008-09	17800	86305	16100	70151	1:4.85	1:4.36
3.	2009-10	17950	59520	16200	49840	1:3.32	1:3.08
4.	2010-11	18720	78300	17127	58500	1:4.12	1:3.42

In seed spices the potential yields are not achieved due to poor seed replacement rate and slow initial growth.(Jangir and Rathore, 2).The cultivation of traditional crops has become uneconomical due to

increasing cost of cultivation under such circumstances, farmers always look forward for more remunerative option. The economic analysis data of fennel (RF-125) presented in Table-2 indicated that fennel (RF-125) along with

balanced fertilization gave higher B:C ratio and net return over farmers practice during all the four years of crop season. the study reveals that use of improved variety (RF-125) along with balanced fertilization may provide a net additional return up to Rs. 18207 per hectare.

Impact and Horizontal spread of Fennel (RF-125)

The level of adoption and horizontal spread of fennel variety RF-125 was assessed in operational area and nearby villages. As a result of four years of demonstration, there was 92 per cent adoption of improved variety in operational villages. The beneficiary farmers were advised to sale their seed among farmers. The “farmer to farmer” approach for horizontal spread of seed resulted in significant spread of seed in near by villages. The survey data are summarized in table-3. The adoption of variety RF-125 ranged from 65 to 92 per cent in nearby villages of operational area.

Table 3. Horizontal spread of fennel variety (N=100)

S N	Name of operational villages	Per cent adoption
1	Nimbri	92.0
2	Chardas	87.5
3	Sarasani	85.0
4	Somna	75.0
5	Khiwatana	67.5

In the light of above findings it may be concluded that use of improved variety RF-125 of fennel under semi arid conditions of Nagaur proved superior in respect to adoption by farmers and productivity levels.

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