

## Effect of front line demonstrations on yield enhancement of fenugreek: A case study in arid zone of Rajasthan

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### ABSTRACT

Fenugreek (*Trigonella foenum-graecum* L) is a predominantly *rabi* seed spices crop in arid zone of Rajasthan. The crop accounts for 5.67 and 9.87 per cent of area and production, respectively in Rajasthan. However, the average district yield is 13.90 q/ha, which is substantially lower than the national average (18.78 q/ha). Considerable scope of enhancement in productivity leading to higher production exists, especially in Pali in arid zone, which is earmarked as important Agro Export Zone for fenugreek in the country. To demonstration this 55 Front Line Demonstrations (FLDs) were organised by KVK, CAZRI, Pali between 2004-05 and 2008-09 at five locations under actual farm situations. The economics and cost benefit ratio of both control and demonstrated plot was worked out. An average of Rs.41191 was recorded net profit under recommended practices while it was Rs. 27615 under farmers practice. Benefit cost ratio was 2.08-3.12 under demonstration, while it was 1.80-1.95 under control plots. By conducting FLDs of proven technologies, yield potential and net income from fenugreek production technology can be enhanced to a great extent with increase in the income level of the farming community.

**Key words :** Technology, yield, FLD, cost benefit ratio, fenugreek;

### INTRODUCTION

India is well-known as "Land of Spices" across the world since long back. We have been cultivating these precious spices for fulfilling our various needs since ages. Our ancestors have been using these spices for adding taste and flavour in 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 flavour. They change flavour and taste, and drink or 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. Fenugreek is used in preparing different traditional and ayurvedic medicines. It has many medicinal properties like diuretic, tonic, carminative and aphrodisiac. Some special dishes prepared from it are very beneficial in increasing appetite, regulating digestive system and giving relief from joint pain particularly common in old people. In leucorrhoea, 3-6g of fenugreek powder and 6-12 g of sugar candy with 50-100 ml of fresh cow milk should be taken twice daily. Its seeds ground into paste and one teaspoon of the same

in lukewarm water taken internally at early morning is helpful in *vata* diseases, especially in joint pain, back pain etc. fenugreek is traditionally used to stimulate the metabolism and to help control blood sugar level in case of diabetes.

India is the largest producer of fenugreek seed and it is cultivated on 1.02 lacs hectares land with a production of 90.40 thousand tones in year 2008-09. The fenugreek seed were exported to the tune of 21000 tones valued worth Rs. 6972.00 lacs during the year 2008-09 (Anonymous, 1). The main markets for fenugreek are Japan, USA, U.K., Canada, Singapore, Saudi Arabia and U.A.E. In India, its production is concentrated mainly in the state of Rajasthan, Madhya Pradesh, Maharashtra, Haryana, Punjab, Gujarat and Uttar Pradesh. Fenugreek is one of the most important *rabi* seed spices crop in the Rajasthan state. It occupies about 62894 hectare area and 77319 tones production in the state, which is 5.87 per cent and 9.65 per cent of total seed spices area and production is the highest in the country. Rajasthan and Gujarat contribute more than 80 per cent of the total seed spices production in the country. This belt can, therefore, be called as "seed spices bowl" of the country. But the average productivity of fenugreek crop (1000 kg/ha) in the state is very low as compared to other parts of the country. The reasons for low productivity may be the

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traditional methods of cultivation followed by the farmers. Productivity of the crop can be enhanced by adopting the improved practices as recommended by the Agricultural Universities, Department of Agriculture and ICAR Research Institutes. This study was therefore designed with the objective of assessing the knowledge and adoption of improved practices by the farmers of the arid zone. The present study was carried out with following specific objectives:

The main objective of FLDs is to demonstrate newly released crop production and protection technologies and its management practices in the farmers' fields under different agro-climatic regions farming situations. While demonstrating the technologies in the farmers field, the scientist are required to study the factor contributing higher crop production, field constraints of production and thereby generate production data and feedback information. FLDs are conducted under the close supervision of scientists of the National Agricultural Research System comprising of ICAR Institute, National Research Centers, Project Directorates, Krishi Vigyan Kendras and State Agricultural Universities and its regional research stations Choudhary (3). FLDs are organized in a block of 2 to 5 hectares involving all those farmers whose plots fall in the identified demonstration block. Only critical inputs and training are provided from the scheme budget, remaining inputs are supplied by the farmers themselves. The purpose is to be convince extension functionaries and farmers together about the potentialities of the technologies for further wide scale diffusion and Front Line demonstration are used as a source of generating data on factors contributing higher crop yield and constraints of production under various farming situation. The present study was carried out with following specific objective effect of front line demonstration on yield enhancement of fenugreek cultivation in arid zone of Rajasthan.

#### **METHODOLOGY**

Krishi Vigyan Kendra, CAZRI, Pali- Marwar conducted 55 Front Line Demonstrations under real farming situations between 2004-05 and 2008-09 at five different villages, namely Bhagwanpura, Dayalpura, Hingolla Kallan, Sodawas and Bittura Kallan located in different blocks, namely Sumerpur, Pali, Marwar Junction and Raipur, respectively under KVK, CAZRI operational area. The area under each demonstration was 0.50 hectare. Through survey, farmers meeting and field diagnostic visit during the cropping period, low yield of fenugreek was conceived due to imbalanced use of nitrogenous fertilizer and indiscriminate practices to manage the wilt disease and aphids (Moyala) on cumin crop. To manage assessed problem, improved and recommended technologies were followed as intervention during the course of FLDs programme.

In case of recommended practices, balanced use of nitrogenous fertilizer and use of suitable fungicide (Mancozeb) and pesticide (Dimethoate 30 EC) as suggested by Loda (7) and Kant *et al* (6) was sprayed as foliar at 30, 45 and 60 days after sowing. In case of local check (control plots), existing practice being used by farmers i.e. imbalanced use of N:P:K. fertilizers, particularly lower dose (10-15 kg./ha) of nitrogen and use of fungicide/pesticide supplied by the local venders like Carbendazim (Bavistin) and Eldrine to manage wilt diseases and aphids was considered. Well before the conduct of demonstrations, training to the farmers of respective villages was imparted with respect to envisaged technological interventions. Visit of the farmers and the extension functionaries were organized at demonstration plots to disseminate the message at large. Yield data was collected from control (Farmer's practices) and demonstration plots and cost of cultivation, net income and cost benefit ratio were computed and analysed.

#### **RESULTS AND DISCUSSION**

The yield performance and economic indicators are presented in Table 1. The data reveal that under demonstration plot, the performance of fenugreek yield was found to be substantially higher than that under local check during all the years (2004-05 to 2008-09). The yield of fenugreek under demonstration recorded was 13.80, 16.10, 14.15, 15.11 and 17.00 q/ha during 2004-05, 2005-06, 2006-07, 2007-08 and 2008-09, respectively. The yield enhancement due to technological intervention was to tune of 57.35, 66.84, 29.11, 70.75 and 53.15 per cent over control. The cumulative effect of technological intervention over five years, revealed an average yield of 15.23 q/ha, 55.44 per cent higher over local check. The year-to-year fluctuations in yield and cost of cultivation can be explained on the basis of variations in prevailing social, economical and prevailing microclimatic condition of that particular villager. Depending on identification and use of farming situation, specific interventions may have greater implications in different crops in Front Line Demonstration has amply been documented by Chand (3), Tiwari and Saxena (9) and Tiwari *et al*. (10).

Economic indicators i.e. gross expenditure; gross returns, net returns and BC ratio of FLDs are presented in Table 1. The data clearly revealed that, the net returns from the recommended practices were substantially higher than control plot, i.e. farmers practice during all the years of demonstration. An average net return from recommended practice was observed to be Rs 25297 in comparison to control plot i.e. Rs 13486. On an average Rs 11811 as additional income is attributed to the technological interventions provided in demonstrations plots, i.e. balanced nutrition and timely, management of wilt disease and cumin aphids.

**Table 1.** Yield performance and economic indicators of Front Line Demonstration of fenugreek cv. RMt 143

Year	No. of FLD	Yield q/ha		% Increase over	Gross Expenditure		Gross Return		Net Return		CB Ration	
		RP	FP	FP	RP	FP	RP	FP	RP	FP	RP	FP
		2004-05	10	13.80	8.77	57.35	16600	15000	34500	26925	17900	11925
2005-06	10	16.10	9.65	66.84	14800	13000	46170	24125	31370	11125	3.12	1.86
2006-07	10	14.15	10.96	29.11	15200	14280	35375	27400	20175	13120	2.33	1.92
2007-08	10	15.11	08.85	70.73	15600	13700	42308	29125	26708	16425	2.71	1.95
2008-09	15	17.00	11.10	53.15	17270	15666	47600	30500	30330	14834	2.76	1.94

RP – Recommended Practice    FP – Farmers Practice    CB Ratio – Cost-Benefit Ratio

Economic analysis of the yield performance revealed that cost benefit ratio of demonstration plots. The cost benefit ratio of demonstrated and control plots were observed significantly higher than control plots. The benefit cost ratio of demonstrated and control plots were 2.08 and 1.80, 3.12 and 1.86, 2.23 and 1.92, 2.71 and 1.95, 2.77 and 1.94 during 2004-05, 2005-06, 2006-07, 2007-08 and 2008-09, respectively. Hence, favorable cost benefit ratios proved the economic viability of the intervention made under demonstration and convinced the farmers on the utility of intervention. Similar findings were reported by Sharma (8) in moth bean and Gurumukhi and Mishra (4) in sorghum. The data clearly revealed that the maximum increase in yield observed was during 2007-08, while maximum cost benefit ratio of 3.12 was observed during 2005-06. The variation in cost benefit ratio during different years may be on account of yield performance and input out put cost in that particular year.

#### CONCLUSION

The results of FLDs convincingly brought out that the yield of fenugreek could be increased by 29.11 per cent to 70.73 per cent with the intervention on balanced nutrition coupled with the disease and pest management in the Pali district. Favorable cost benefit ratio is self explanatory of economic viability of the demonstration

and convinced the farmers for adoption of intervention imparted. The technology suitable for enhancing the productivity of fenugreek crop and calls for conduct of such demonstrations under the transfer of technology programme by KVKs or other Transfer of Technology centres.

#### REFERENCES

1. Anonymous 2008. Vital Agricultural Statistics, Directorate of Agricultural, Pant Krishi Bhawan, Jaipur (Rajasthan): 56.
2. Chand, K. 2005. Economic analysis of FLD of seed spices in rainfed condition of Rajasthan. CAZRI, Anusandhan Patrika: 45-47.
3. Choudhary, B.N. 1999. Krishi Vigyan Kendra-A guide for KVK managers. Publication, Division of Agricultural Extension, ICAR: 73-78.
4. Gurumukhi, D.R. and Mishra, S. 2003. Sorghum Front Line Demonstrations- A success story. *Agricultural Extension Review*, **15(1)**:22-23.
5. Jaitawat, V.S. 2006. Knowledge and adoption of recommended cumin production technology in Jodhpur region of Rajasthan. Ph. D. Thesis, R.A.U., Bikaner

6. Kant, K., Sharma, Y. K., Meena, S. S., Meena, R. S., and Mehta, R. S. 2005 Saving seed spices from insect enemies. *Indian Horticulture*, **55 (4)**: 25-27.
  7. Loda, S. 2007. Pest and disease management in field crops in Rajasthan. CAZRI, Annual Report pp 67.
  8. Sharma, O.P. 2003. Moth bean yield improvement through Front Line Demonstrations. *Agricultural Extension Review*. **15(5)**:11-13.
  9. Tiwari, B.K. and Saxena, A. 2003. Economic Analysis of oil seeds in Chindwara. *Bhartiya Krishi Anusandhan Patrika*. **16(3&4)**: 185-189.
  10. Tiwari, R.B., Singh, V. and Parihar, P. 2003. Role of Front Line Demonstration in transfer of gram. production technology. *Maharashtra Journal of Extension Education* **22(1)**:19.
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