

Original Research Article

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## Enhance the Productivity of Cumin in Barmer District of Rajasthan, India

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### ABSTRACT

#### Keywords

Cumin, Spices,  
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etc.

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Krishi Vigyan Kendra conducted front line demonstration on Cumin variety GC-04 at farmer's fields in district Barmer during years 2012-13 to 2018-19. The productivity and economic returns of Moong in demonstrated plots were calculated and compared with the corresponding local check. The data obtained was pooled for seven years. It was observed that on an average 27.14 percent higher grain yield was recorded in demonstration plots than the local check. The extension gap, technology gap and technology index were 1.37 q/ha, 5.09 q/ha and 42.47 percent, respectively. An additional investment of Rs.2520/ha coupled with scientific monitoring of demonstration and non monetary factors resulted in additional return of Rs. 22696/ha over the farmers practices. Fluctuating minimum selling price of Cumin during different years influenced the economic returns per unit area.

### Introduction

Front line demonstration was conducted on Cumin by Krishi Vigyan Kendra. The main objectives of the study were to exhibit the performance of recommended high yielding Cumin varieties with recommended practices for harvesting higher crop yields. To compare the yield levels of local check (farmers practices) and FLD plots. To collect feedback for further improvement in the performance of Cumin cultivation practices.

Botanical name of Cumin is *Cuminum cyminum*. In India, it is known as 'Jeera' or 'Zeera' in Hindi. It is an important spice used in Indian kitchens for flavoring various food preparations. The flavor of cumin seeds is due to the presence of a volatile oil. In indigenous varieties of cumin, this volatile oil is present up to 2.5–3.5%. Cumin seeds are extensively used in various ayurvedic medicines also especially for the conditions like obesity, stomach pain and dyspepsia. Nutritional value of cumin seeds is as follows: 17.7% protein, 23.8% fat, 35.5% carbohydrate and 7.7% minerals. Cumin are dried seeds, is used to

enhance the flavor of foods. Like any other agricultural product, Cumin may be contaminated by pathogens, naturally occurring toxins such as mycotoxins, agrochemicals such as fertilizers and pesticides, heavy metals and accidental contaminants. Food safety is of considerable significance in this globalized era and the safety of Cumin depends on maintaining good agricultural and hygienic practices along the food chain during primary production, post-harvest, packing, processing, retail and at the point of consumption.

### **Importance of GAP**

Good Agricultural Practices or GAP is "practices that need to be applied on farms to ensure food safety during pre-production, production, harvest and post-harvest. In many cases such practices also help protect the environment and safety of workers." They are a collection of principles to apply to farm production and post-production processes, taking into account economic, social and environmental sustainability. The purpose of this guide varies from fulfillment of trade and government regulatory requirements, in particular with regard to food safety and quality, to more specific requirements such as practices to be adopted during post harvest operations.

### **Materials and Methods**

The front line demonstrations on moong were conducted at farmer's field in district Barmer to assess its performance during the year 2012-2013 to 2018-19. The soil of the district is generally sandy to sandy loam in texture which is low organic carbon (0.09 - 0.215 %), available phosphorus (11-14 kg/ha) and medium to high in potash. Each demonstration was of 0.4 ha area and the critical inputs were applied as per the package of practices. The quality seed of Cumin variety during all the years of the study was

used for conducting FLD. The sowing was done during November and harvested during March to April. Demonstrated at farmers' fields were regularly monitored by scientist of Krishi Vigyan Kendra from sowing to harvesting. The grain yield of demonstration crop was recorded and analyzed. Different parameters were calculated to find out technology gaps (Yadav *et al.*, 2004) as follows

Extension gap = Demonstration yield - Local check yield

Technology gap = Potential yield - Demonstration yield

Technology index = Potential yield - Demonstration yield x 100/Potential Yield

### **Results and Discussion**

#### **Grain yield**

On an average the demonstrated plots showed 27.14 per cent increase in seed yield (Table 2).

The highest increase in seed yield (53.01 %) was observed in year 2018-19 it which might be due to seed of improved and other improved variety technologies about which the farmers were ignorant.

#### **Extension gap**

An extension gap between demonstrated technology and farmers practices range from 0.9 to 2.2 q/ha during different seven years and on average basis the extension gap was 1.37 q/ha (Table 2). This gap might be attributed to adoption of improved technology in demonstrations which resulted in higher grain yield than the traditional farmer's practices.

### Technology gap

Wide technology gap were observed during different years and this was lowest (4.7 q/ha) during 2013-14 and was highest during (5.68 q/ha) during 2017-18. The average technology gap returns found was 5.09 q/ha. The difference in technology gap during different years could be due to more feasibility of recommended technologies during different years. Similarly, the technology index for all the demonstrated during different years were in accordance with technology gap. Higher technology for transferring to farmers and insufficient extension services for transfer of technology.

### Economic gap

Different variables like seed, fertilizers, bio fertilizers and pesticides were considered as critical inputs for the demonstration as well as farmers practices and on an average an additional investment of Rs. 22696.50/ha were made under demonstrations. The highest incremental benefit: cost ratio was 4.25 during the year 2017-18. Overall average BCR was found to be 2.90. The results

confirm the findings of frontline demonstrations on oilseed and pulses crops by Yadav *et al.*, (2004) and Lathwal (2010).

In conclusion, frontline demonstration programme was effective in changing attitude of farmers towards Cumin cultivation. Cultivation of demonstrated plots of Cumin with improved technologies has increased the skill and knowledge of the farmers. FLD also helped in replacement of local un recommended varieties with improved recommended varieties. This also improved the relationship between farmers and scientist and built confidence between them. The farmers where improved technology was demonstrated also acted as primary source of information for other farmers on the improved practices of Cumin cultivation and also acted as source of good quality pure seeds in their locality for the next crop. The concept of Front line demonstration may be applied to all farmer categories including progressive farmers for speedy and wider dissemination of the recommended practices to other members of the farming community.

**Table.1** Difference between demonstration package and farmers practices of Cumin

S. No.	Particular practices	Demonstration package	Farmers practices
1	Variety	GC 04	Local
2	Seed rate	12 kg/ha	15-20 kg/ha
3	Seed treatment	Carbendazim@2gm/kg seed + Trichoderma@4g/kg seed	Not applied
4	Sowing method	Line/Broadcasting	Broadcasting
	Sowing time	15-30 Nov.	15 Oct-10 Dec
5	Fertilizers' doses	Recommended dose {30:20:10 (N:P:K)}	without recommendation {50:50:00 (N:P:K)}
6	Plant protection measures	Need based spray of insecticides and fungicides (Carbendazim 50 wp, Dimethoate, Zineb 68%)	Higher dose of insecticides and pesticides (Use Imidachloprid in 20 ml in 15 lit water)

**Table.2** Grain yield and gap analysis of front line demonstration on Cumin at farmer's field

Year	Crop	Variety	Demo area (ha)	Farmers (No.)	Yield (q/ha)					Technology index (%)
					Demo	Check	Increase (%)	Extension Gap	Technology Gap	
<b>2012-2013</b>	Cumin	GC-4	10	5	7.10	6.00	18.33	1.10	4.90	40.80
<b>2013-2014</b>	Cumin	GC-4	10	5	7.30	6.00	21.67	1.30	4.70	39.10
<b>2014-2015</b>	Cumin	GC-4	36	15	7.30	6.10	19.67	1.20	4.70	39.10
<b>2015-2016</b>	Cumin	GC-4	30	15	6.70	5.80	19.67	0.90	5.30	44.10
<b>2016-2017</b>	Cumin	GC-4	25	10	7.25	6.00	20.84	1.25	4.75	39.50
<b>2017-2018</b>	Cumin	GC-4	25	10	6.32	4.62	36.80	1.70	5.68	47.30
<b>2018-2019</b>	Cumin	GC-4	35	15	6.35	4.15	53.01	2.20	5.65	47.00

**Table.3** Economic analysis of demonstrated plots and farmers practice

Year	Demo		Check		Net returns (Rs./ha)		BCR	
	Demo	Check	Demo	Check	Demo	Check	Demo	Check
<b>2012-2013</b>	36000	33000	98000	73000	62000	40000	2.72	2.13
<b>2013-2014</b>	38000	35000	100000	75000	62000	40000	2.63	2.03
<b>2014-2015</b>	38000	35500	100000	78000	62000	42500	2.63	2.19
<b>2015-2016</b>	33500	30500	87000	64200	53500	33700	2.60	2.15
<b>2016-2017</b>	33500	30500	87000	64200	53500	33700	2.60	2.27
<b>2017-2018</b>	22300	19425	94800	69300	72500	49875	4.25	4.01
<b>2018-2019</b>	33160	32414	95250	62050	62090	29636	2.93	2.09

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