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TRANSFER OF TECHNOLOGY OF CUMIN CULTIVATION IN SIROHI DISTRICT OF RAJASTHAN

Dileep Kumar*, S. K. Agarwal and Pankaj Lawania*****

ABSTRACT

Cumin (*Cuminum cyminum*) is an important low volume high value seed spice crop. Cumin is grown in 5402 ha area in Sirohi district with an annual production of 2756 tones (Rabi 2011-12) with average productivity of 510 kg/ha. The yield of cumin crop is adversely affected by incidence of wilt, blight disease and attack of aphid. To increase the productivity of cumin, high yielding cumin variety GC-4 was evaluated at farmer's field during Rabi 2012-13. Twenty five demonstrations were conducted at farmer's field. Grain yield of cumin variety GC-4 obsenved under improved practices was 5.35q/ha and increased significantly by 40.79 per cent over farmers practice (control). In terms of monitory return, the net gain per hectare was Rs. 40850/- and was Rs. 15800/- higher by investing additionally Rs. 1850/-, with the improved package of practices fetch a higher B:C ratio of 3.16 while farmers practice gave 2.50. The yield range in improved practice was 4.25-6.50 q/ha while under farmers practice it ranged from 3.20 - 4.25 q/ha. In improved package of practices, inputs supplied to farmers were improved seed only. During crop period and after harvesting the reaction of farmers about critical inputs supplied under demonstration was asked and they replied that variety showed vigorous plant growth, gave good seed yield than other local seed available in the region, seed treatment with Carbendazim, *Trichoderma* resulted in less incidence of wilt. The farmers suggested wilt resistant varieties should be developed and major constraints was the unavailability of newly released seeds and plant protection chemicals in time.

INTRODUCTION

Cumin (*Cuminum cyminum*) is an important low volume high value seed spice crop grown in India. India is the largest producer and consumer of cumin seed in the world. In India, Gujarat is the leading state in cumin production (219000 tonnes in the year 2010-11) while Rajasthan in area under cultivation (330637 ha in the year 2010-11). Cumin is grown in 5402 ha area with an annual production of 2756 tones. Average productivity of cumin is 510 kg/ha. The yield of cumin crop is adversely affected by incidence of wilt and blight diseases and attack of aphid. Cumin seeds have an aromatic fragrance due to an alcoholic compound i.e. cuminol. The seeds are largely used as condiments in the form of an essential ingredient in all mixed spices and in curry powder for flavouring, vegetables, pickles, soups etc. Besides, it has medicinal properties and is used as a carminative, stomachic, astringent and is useful against diarrhea. Cumin is largely exported in form of seed. Some quantities are also exported in form of Cumin seed oil, Cumin powder and Cumin oleoresin. The present study was conducted to find out impact of Frant Line Demonstrations in improving productivity of cumin.

RESEARCH METHODOLOGY

A study of 25 frontline demonstrations (FLDs) on cumin as a major spice crop was conducted on farmer's field during 2012-13 in agroclimatic Zone IIb i.e. "Transitional Plain of Luni Basin" of southern Rajasthan to evaluate the economic feasibility of technology transfer and adoption under Front Line Demonstration programme. Total 25 demonstrations were conducted at farmer's field at village Bawli, *Satapura and Manora* villages. The crop was sown from 2nd week of November to 4th week of November. During this period extension activities like field days, farmer's trainings, literature, SMS, diagnostic visits etc were undertaken which benefitted the farmers. The farmers selection was made as per guidelines

* Subject Matter Specialist, Krishi Vigyan Kendra, Sirohi.
** Associate Professor, Krishi Vigyan Kendra, Chittorgarh.
*** Subject Matter Specialist, Krishi Vigyan Kendra, Sirohi.

provided by Zonal Project Directorate, Zone VI of ICAR to bridge the gap existing between state productivity and district productivity and the whole package of practices were demonstrated to farmers. The FLD trials included components such as variety, seed rate, seed treatment, weed management and irrigation, fertilizers and plant protection measures but only improved seed was provided by the KVK. The study was made under supervision of KVK scientists from sowing to harvesting. Data on crop yield was recorded by per sq. meter observation method randomly from 3 to 4 place from an acre. The data generated was utilized for calculating the technology index, technology and extension gaps using the following formula:

(i) Technology gap: Improved yield – Farmers yield

(ii) Extension gap: Potential yield - Improved yield

(iii) Technology index: (Technology gap/ Potential yield) X 100

RESULTS AND DISCUSSION

The study revealed that improved technology (5.35 q ha^{-1}) registered 40.79 per cent increase in seed yield over the farmers practice (3.80 q ha^{-1}). The range of average yield were 4.25 - 6.50 qha^{-1}, 3.20 - 4.25 qha^{-1} in demonstration and farmers plots, respectively. The most favorable one for cumin when the highest yields of 6.50 and 4.25 qha^{-1} in FLD and farmer's practice, respectively were recorded. It was evident from the yield levels recorded in demonstrations that the improved package of practices can boost the yield to the tune of even 2.80 qha^{-1}. These results confirm from those obtained by conducting FLD trials on various pulse crops (Das and Willey, 1991). Overall, the yield of demonstration plots exceeds that over the farmer's plots. This was attributed to the quality seed used, adequate seed rate, management practices and judicious use of fertilizers. In terms of monitory return the net gain per hectare was Rs. 40850/- and was Rs. 15800/- higher by investing additionally Rs. 1850/-. With the improved package of practices fetch a higher B:C ratio of 3.16 while farmers practice gave 2.50 (Table 1). The data revealed that the technological gap existing between the potential and demonstrable yields was not substantial (1.55). Thus indicating that it was possible to replicate the results obtained in research experiments in real farm situation too. Results also indicate an extension gap between the improved technology and farmers practice. Due to this, a gap of 6.65 qha^{-1} in yield and which could be overcome by adopting improved varieties and efficient management practices. Technology index 12.92 gave evidence that there was a scope for further improvement in the productivity of cumin. The marginal difference between benefit-cost ratio of improved practice and farmer's practice proves adoption of improved technologies by the farmers. However, to further bridge up the gap between technology developed and technology transferred, there is a need to strengthen the extension network besides emphasis on specific local recommendations.

Reactions and Constraint

During crop period and after harvesting in of the crop, the reaction of farmers about critical inputs supplied under demonstration was asked and they replied good seed germination and early maturity of the variety than local seeds. While the farmers suggested wilt tolerance varieties should be developed

Table 1: Impact of improved technology on the economics of cumin cultivation (Rs/ ha)

S. No.	Particulars	Year 2012-13
1.	**Production cost**	
	Improved practice (IP)	18600
	Farmers practice (FP)	16750
2	**Additional cost over FP**	**1850**
3	**Gross return**	
	Improved Practice	58850
	Farmers Practice	41800
4	**Net return**	
	Improved Practice	40850
	Farmers Practice	25050
5	**B:C ratio**	
	Improved Practice	3.16
	Farmers Practice	2.50
6	**Additional return**	**15800**
7	**Increase in net return (%)**	**63.07**
8	**B:C on additional input in demonstration**	**8.54**

Table 2: Impact of improved technologies on the productivity and gaps of cumin cultivation

No. FLD's	Variety	Mean yield (q/ha-1) Improved practice	Farmers Practics	Range yield index (q/ha-1) Improved Practice	Farmers Practics	Technology Gap (q/ha-1)	Extension Gap (q/ha-1)	Technology Index (%)
2012-13 (25)	GC-4	5.35	3.80	4.25-6.50	3.20-4.25	1.55	6.65	12.92

Potential yield of cumin - 12 q/ha
TG=IP-FP and EG= PY-IP
TI=TG/PY*100

and major constraint was unavailability of newly released seeds and plant protection chemicals in time and in view of marketing lack of proper post harvest management, value addition, lack of centralized facilities for cleaning, grading, processing, packing and storage.

CONCLUSION

From the above discussion, it can be concluded that adoption level of farmers was amplified after training and conducting FLD by KVK scientists. The Front Line Demonstrations conducted on impact of improved package of practices of cumin production technology at farmer's field in Sirohi district of the Rajasthan. Study revealed that farmers could increase cumin production significantly. In demonstration the cumin performed better than control plots. It increase the productivity by 40.79 per cent over control. The productivity gain under FLD over farmer's field practice created awareness and motivated the other farmers to adopt improved cultivation practices of cumin. This study sheltered the way for extension workers effective and efficient TOT in the field of agricultural extension. This study suggest for conducting intensive training, FLDs and effective use of all means of extension education to educate the cumin growers for high production of cumin and to get higher net return on sustainable basis.

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