Impact of Front Line Demonstrations on the Yield of Cumin

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ABSTRACT

he sardar sarovar Projct has been established in October 2010 at Agricultural School, JAU, Halvad with the financially support of sardar sarovar project command Area (Phase II). The broad objectives of this project is to develop sound soil and water crop management technology apply for efficient use of irrigation water at critical stages of crop as well as through Micro Irrigation System and for sustained soil health for the medium black soil with clayey texture and sodic nature soil of the Bhal area in middle of Gujarat. Cumin is one of the most important oilseeds crop in India, which plays a major role in supplementing the income of small and marginal farmers of Surendranagar district in Gujarat. The front line demonstrations were allocated with recommended practices of Nutrient management, Pest management and Irrigation management for the cumin crop. One of the major constraints of existing Cumin farming is low productivity due to non-adoption of recommended package of practices and improved varieties. To replace this anomaly, Agricultural school, had conducted 32 frontline demonstrations to adopted farmers' fields. Cultivation practices comprised under FLD viz., use of improved variety, balanced application of fertilizers and control of Cumin aphid through insecticide at economic threshold level and efficiently use of irrigation water through MIS showed that average of 39.48 % increase in the yield of Cumin over local check during the course of study from 2010-11 to 2012-13.

Keywords : *Front line demonstration, Cumin, Impact*

INTRODUCTION

India is well known throughout the world as the 'Land of spice' because it possess favorable climatic conditions suitable for the growth and development of spices, Whereas, Gujarat and Rajasthan are known as the bowl of seed spices. India is largest producer of cumin seed and it is cultivated on 6.43 lacs hectares land with a production of 12.47 thousand tones in the year 2008-09. The cumin seed were exported to the tune of 13750 tonnes valued worth Rs. 12280 lacs during the year 2008-09 (Anonymous, 1). The prevailing world wide demand for seed spices, India contributes 55.7 per cent of the total. The seed spices account for about 36% and 17% of the total area and production of spices in country (O.P. Aishwath *et al,* 2011).

The main objective of Front Line Demonstrations 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. Front Line Demonstrations are conducted under the close supervision of scientists of the National Agricultural Research System comprising of ICAR Institute, National Research Centre, Project Directorates, Krishi Vigyan Kendras and State Agricultural Universities and its regional research stations. Front Line Demonstrations 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 improved technology packages were also

found to be financially attractive. Yet, adoption levels for several components of the improved technology were low, emphasizing the need for better dissemination (Sharma, 3). Several biotic, abiotic and socio-economic constraints inhibit exploitation of the yield potential and these needs to be addressed.

The state-wise yields obtained both under improved technology and farmer's practice ranges from 5 to 12 q/ ha between states and the national average being 13 q/ ha. Keeping the above point in view, the FLD on cumin using new crop production technology was started with the objectives of showing the productive potentials of the new production technologies under actual farm situation over locally cultivated cumin crop (Meena et al, 2011)

METHODOLOGY

The present study was carried out by the Agricultural School under Junagadh Agricultural University, Halvad three consequently years during rabi season from 2010-11 to 2012 -13 with 32 demonstration with total area covered with 12.8 ha at farmers' fields of Halvad taluka villages viz., Juna Devaliya, Shaktinagar, Charadava, Ishanpur, Juna Amrapur, Raysangpur, Sapakada, Sundaribhavani Ranjitgadh Sukhpur, Devipur, Vegadvav and Halvad of Surendranagar district in Central Zone of Gujarat. In total 32 frontline demonstrations in 12.8 ha area. Materials for the present study with respect to FLD and farmer's practices were given in the Table 1.

In case of local check plots, existing practices being used by farmers were followed. In general, soils of the area under study were sandy loam to loamy sand and medium to low in fertility status. The FLD was conducted to study the gaps between the potential yield and demonstration yield. In the present evaluation study, the data on output of Cumin cultivation were collected from FLD plots, besides the data on local practices commonly adopted by the farmers of this region were also collected. In demonstration plots, a few critical inputs in the form of quality seed, balanced fertilizers, agro-chemicals etc. were provided and non-monetary inputs like timely sowing in lines and timely weeding were also performed. Whereas existing practices were maintained in case of local checks. The demonstration farmers were facilitated with proper improved cultivation practices by Junagadh Agricultural University scientists in performing field operations like sowing, spraying, weeding, harvesting etc. during the course of training and visits. The technologies demonstrated are mentioned in Table 1 and compared with local practices.

Table1 : Particulars showing the details of Cumin cultivation under FLD and existing practices during year 2010-11 to 2012-13

Sr. No.	Treatment	Variety of seed	Existing Practices	Improved Practices
1	Nutrient Management	GC-4	DAP 50 kg/ha + Urea 25 kg/ha +ken 25 kg/ha + FYM 5 ton/ha.	P_2O_5 /ha 15kg+ N/ha 30 kg + FY M 6 ton/ ha. + Azotabector 2.5 lit.
2	Pest management	GC-4	6 - 7 sprays of insecticide for controlling the Aphid and Thrips	Dimetheat 30EC @ 10ml/10 Lt., Imidacloprid 17.8 SL @ 4 ml/10 Lt, Acetamiprid 20 SP @ 2g/10 Lt, Thiame-thoxam 25% WG @ 4g/10 Lt. at ETL of the above pests.
3	Irrigation Management	GC-4	5 Irrigations by Flood.	4 irrigations at sowing, 10 DAS, 37 DAS, 59 DAS, and 80 DAS During crop growing stages of cumin.
(1) Collection of soil samples and analysis for the requirement of supplemental nutrient for the crop.				
(2) Use of seed GC.4, an improved variety released from SDAU, Dantiwada. Line sowing by country plough followed by thinning.				
(3) Fertilizer application FYM at the rate of 6 ton/ha + 15 Kg P_2O_5 for addition of Phosphourus and 30 Kg N in form of Urea and 2.5 liter of Azotobector.				
(4) Control of pest in Cumin Dimetheat 30EC @ 10ml/10 Liter, Imidacloprid 17.8 SL @ 4 ml/10 Liter, Acetamiprid 20 SP @ 2g/10 Liter, Thiame-thoxam 25% WG @ 4g/10 Liter at ETL of the above pests.				

The steps followed for the Frontline demonstration to the farmers

RESULTS AND DISCUSSION

Table 2 : Exploitable productivity, extension gap, technology gap and technology index of Cumin as grown under FLD and existing package of practices n=32

Year	No. of FLD	Area (ha)	Yield (q/ha)		% Increase over Existing Practices	Extension Gap (q/ha)	Technology Gap (Kg/ha)	Techno-logy Index (%)
			FLD	Existing Practices				
2010-11	04	1.6	8.98	7.00	28.33	1.98	4.02	30.90
2011-12	14	5.6	8.99	7.32	22.81	1.67	4.01	30.85
2012-13	14	5.6	9.76	8.23	18.68	1.54	3.24	24.90

Gujarat is the second largest producer of Cumin in India with major 10 districts in Gujarat produce cumin, thus raw material will be readily available for the proposed unit. The production of spices is likely to increase in the coming years, with irrigation facilities made available through Narmada Canal System, in spices growing area of Central and North Gujarat. Results of 32 frontline demonstrations conducted during consequent years i.e., 2010-11 to 2012-13 in 12.8 ha area in the farmer's fields of 13 selected villages of Surendrenagar district indicated that the cultivation practices comprised under FLD viz., use of improved variety (GC 4), line sowing, balanced application of fertilizers (N:P @ 30:15 kg/ha^{-1}and FYM @ 6 ton ha^{-1}) ,control of cumin aphid and thriphs through insecticide at economic threshold level and efficient use of irrigation water through MIS produced on an average 23.02 % more yield of cumin as compared to local check (7.52 q/ha).

The results indicate that the Frontline Demonstration as given a good impact over the farming community of Surendranagar district as it is motivated by the new agricultural technologies applied in the Frontline Demonstration fields. Data further showed that the yield of cumin in the following years increased successively which clearly speaks of the positive impact of Front Line Demonstration over existing practices of cumin cultivation (Table 2) and it also shows that the gap between FLD practices and local practices decreases that is the benefit derived from the allocating the farmers field as well as on station farmer's training. Moreover from first year onward farmers co-operated enthusiastically in carrying out of Front Line Demonstrations which lead to encouraging results in the subsequent years.

The technology gap observed (depicted in figure) may be attributed to the dissimilarity in the soil fertility status and weather conditions. Hence, variety wise location specific recommendation appears to be necessary to minimize the technology gap for yield level in different farming situations. The highest extension gaps which ranged froth 1.98 q/ha to 1.54 q/ha during the period of study emphasized the need to educate the farmers through various means for the adoption of improved agricultural production technologies.

More and more use of latest production technologies with high yielding varieties will subsequently change different this alarming trend of galloping extension gap. The new technologies will eventually lead to the farmers to discontinuance of old varieties with the new technology. The technology index shows the feasibility of the evolved technology at the farmer's fields. The lower the value of technology index more is the feasibility of the technology. As such, reduction of technology index from 30.90 (2010-11) to 24.90 % (2012-13) exhibited the feasibility of technology demonstrated.

CONCLUSION

From the above results and discussion it can be concluded that knowledge level and adoption level of the farmers enhanced after imparting training and conducting FLDs by Sardar Sarovar Narmada Nigam Ltd Project of Agricultural Demonstration Activities in SSP Command area Phase-II. Agricultural School is working as a knowledge hub for latest agricultural technology in Surendranagar district. The frontline demonstration conducted on cumin at farmer's fields in Surendranagar district of Gujarat revealed that the farmers can get increased cumin yield by following the recommended package of practices. It can improve the quality as well as productivity of the cumin. The productivity gain under FLD over farmer's practice created awareness

and aggravated the other farmers to adopt scientific crop management and high yielding variety of cumin in the district. This study suggests for conducting intensive trainings, FLDs and effective use of all means of extension education to educate the cumin growers for higher production of cumin and to increase net return on sustainable basis.

Thus, it can be concluded that timely training and well framed frontline demonstration conducted under the close supervision of scientists is one of the most important tool of extension to demonstrate newly released crop production and protection technologies and its management practices in the farmers' field under different agro-climatic regions and farming situations. Trainings and FLDs are playing important role in motivating the farmers for adoption of improved agriculture technology resulting in increasing their yield and profits.

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