



Impact of dissemination and diffusion of conservation agronomical practices on area expansion in Hamirpur district of Bundelkhand

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Abstract : For promoting intensification and diversification of agricultural and horticultural programme, demonstrations were conducted on pulses, oilseeds, cereals, vegetables, cucurbits and spices for dissemination and diffusion of conservation agronomical practices on farmer's fields during 2008-09 to 2010-11 at Hamirpur district of Bundelkhand zone of Uttar Pradesh under Diversified Agriculture Support Project (DASP). Conservation agronomical practices included mainly the integrated crop management technologies, integrated pest management technologies, bio-composting, judicious use of chemical inputs, site specific improved/hybrid varieties, value added production, production in relation to markets opportunities and best management of available resources through actively participation of farmers. For skill upgradation and improvement in the knowledge level of the farmers about conservation agronomical practices, several transfer of technology programme like farmer-scientist-interaction, specialized farmers training, field day, exposure visit, environment camps, *kisan mela* etc. were organized to fulfill the target. The results of the activities, which were conducted under Diversified Agriculture Support Project (DASP) showed that dissemination and diffusion of conservation agronomical practices had positive impact on area expansion by 1012.4 ha in pulses, 586.3 ha in oilseeds, 634.4 ha in cereals, 389.6 ha in vegetables, 179.2 ha in cucurbits, 178.6 ha in spices and 23.3 ha in medicinal crops during three years. Agricultural crops *viz.*, pulses, oilseeds and cereals recorded 20671.5 q, 6774.5 q and 25376.0 q volume of the produce from area expansion with the value of Rs. 652.87 lac, Rs. 227.59 lac and Rs. 317.20 lac, respectively. Among horticultural crops, maximum volume of 100945.5 q was recorded in vegetables followed by 28947.0 q in spices, while lowest was 23650.0 q in cucurbits from area expansion with the value of Rs. 2225.21 lac, Rs. 688.59 lac and Rs. 510.42 lac, respectively. These results indicate that there was great impact of dissemination and diffusion of conservation agronomical practices on area expansion as well as volume and value of produce from area expansion of above crops at Hamirpur district of Bundelkhand (U.P.).

Key Words : Agricultural crops, Area expansion, Conservation agronomical practices, Horticultural crops

View Point Article : Rajiv (2014). Impact of dissemination and diffusion of conservation agronomical practices on area expansion in Hamirpur district of Bundelkhand. *Internat. J. agric. Sci.*, **10** (1): 221-224.

Article History : Received : 04.06.2013; Revised : 14.10.2013; Accepted : 13.11.2013

INTRODUCTION

Diversified Agriculture Support Project (DASP) has been started in Uttar Pradesh with an aim to intensify and diversify the agriculture sector under administrative control of U. P. Government with the financial support of Rashtriya Krishi Vikas Yojana (RKVY) in 38 districts, out of which Hamirpur district in Bundelkhand zone was one of them. The productivities of crops are much lesser than the state average in Hamirpur district. The major constraint in crops production is poor adoption of improved cultivation

techniques by majority of farmers. Most of the farmers were not aware about improved techniques of crops cultivation. For promoting intensification and diversification of agricultural and horticultural programme in the district, the concept of integrated crop technology management (ICTM), integrated pest management (IPM), bio-composting, introduction of site specific improved/hybrid varieties, *machan* cultivation in cucurbits, value added production, production in relation to markets opportunities, collective marketing through FIGs, judicious use of chemical inputs have been introduced in selected villages under DASP

programme to enhance the productivity and profitability of agricultural and horticultural crops, employment generation and best management of available resources through farmer participation. The project is also supporting new innovations such as build up of marketing linkage by participatory approach, employment generation through vegetables nursery, build up of farmer-led-extension mechanism, introduction of commercial venture *i.e.* bee-keeping, mushroom production etc. Diversification is concerned with income generation from a combination of different farm enterprises in agriculture sector which may shift from one crop to another crop or one enterprise to another in respect of area and other parameters. Keeping these factors in view, a study was undertaken during 2012 at Hamirpur district of Bundelkhand, Uttar Pradesh to know the impact of dissemination and diffusion of conservation agronomical practices on area expansion in agricultural and horticultural crops under DASP project.

MATERIAL AND METHODS

The selection of farmers was done block wise with the help of block level staff. Only willing farmers were selected for demonstrations on different crops and other activities of DASP project. The large, medium and small holding size farmers were included in the study. A strategic research and extension plan (SREP) was prepared with the help of researchers, extension workers, NGO workers, district level officers and innovative farmers for the district to identified and prioritized of research and extension activities and scientific implementation of them. All activities were implemented as per plan of SREP for dissemination and diffusion of conservation agronomical practices/ improved technologies. In the demonstrations, critical inputs *viz.*, seed and fertilizers as well as technical inputs were supplied to the farmers. Each demonstration was conducted on area of 0.4 ha under agricultural crops and 0.2 ha in horticultural crops. The half area was put under conventional system and in another half area, conservation agronomical practices of crop production were demonstrated. On the other hand included demonstrations many more others activities of transfer of technology were also organized.

The 5130 integrated crop technology demonstrations were conducted on pigeonpea and sesame during *Kharif* season and on chickpea, field pea, lentil, mustard and wheat during *Rabi* season in whole district from 2008-09 to 2010-11. The demonstrations were conducted in the way of integrated approaches of all scientific aspect *i.e.* sowing of site specific improved variety in rows with optimum seed rate, seed inoculation, thinning of extra plants to maintain optimum plant stand per unit area, balance dose of fertilizers according to crop requirement, use of bio-compost, proper weed management and eco-friendly plant protection measures. For improvement in the knowledge level of the

farmers about conservation agronomical practices of agricultural crops, several transfer of technology programme like 107 farmer-scientist-interaction, 5 exposure visits, 4 environment camps, 9 farmers participation in *kisan mela* etc. were also organized. Improvement in the soil health and quality production, 415 Nadep compost structures were constructed and 650 vermicompost production units were established on farmer's field for preparation of bio-compost, which was used in demonstrations.

For promoting intensification and diversification of horticulture programme, the demonstrations conducted 228 on tomato, 180 on capsicum, 335 on okra, 240 on cauliflower and 245 on cabbage in whole district during three years from 2008-09 to 2010-11 for introduction of site specific improved/hybrid varieties. The practice of staking in tomato was also adopted. For increasing in the productivity, quality and market value of cucurbits crop, *machan* cultivation technology was demonstrated. The demonstrations conducted 329 on bottle gourd, 254 on bitter gourd, 381 on sponge gourd and 199 on cucumber. The 1265 demonstrations were conducted on spices and medicinal crops, which were 320 on onion, 205 on garlic, 570 on chillies and 170 on basil under conservation agronomical practices. Complete package of conservation agronomical practices recommended for the region were demonstrated in spices and medicinal crops. Total number of 94 specialized farmers training and 186 field days were also organized for skill up gradation of farmers about conservation agronomical practices of horticultural crops. The data on area expansion were collected crop wise as well as year wise separately and summarized.

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Area expansion:

Impact of dissemination and diffusion of conservation agronomical practices was observed remarkable on area expansion as well as volume and value of produce under all the crops during three years of 2009-10, 2010-11 and 2011-12 (Table 1). Among agricultural crops, pulses recorded maximum area expansion due to dissemination and diffusion of conservation agronomical practices followed by cereals, while lowest area expansion was recorded in oilseeds crop. Among pulses, chickpea responded most in area expansion and followed by lentil and field pea, while pigeonpea responded lowest in area expansion. The sum of three years data displayed that the area expansion was 362.6 ha in chickpea, 273.2 ha in lentil, 263.7 ha in field pea and 112.9 ha in pigeonpea due to dissemination and diffusion of conservation agronomical practices. In sesame and mustard

crops recorded area expansion by 196.7 ha and 389.6 ha, respectively and in wheat it was recorded by 634.4 ha due to dissemination and diffusion of conservation agronomical practices. It might be due to conservation agronomical practices, site specific improved variety, sown in rows using optimum seed rate with seed inoculation, optimum plant stand, balance dose of fertilizers, use of bio-compost, proper weed management and eco-friendly plant protection measures. These practices provided favourable conditions for proper growth and development of individual plants by utilizing growth resources in a better way and had a great impact on productivity. Therefore, the yield of these crops was increased remarkable with conservation agronomical practices which were attracted to the farmers, thus, more area came under plough sole.

Among vegetables, okra responded much in area expansion followed by tomato, while capsicum responded lowest. The sum of three years data indicated that the area expansion of okra, tomato, cauliflower, cabbage and capsicum was recorded by 119.8 ha, 107.0 ha, 81.5 ha, 50.4 ha and 30.9 ha, respectively. It might be mainly due to the site specific improved/hybrid varieties adopted by cultivators. The area expansion under cucurbits *viz.*, bitter gourd, sponge gourd, cucumber and bottle gourd recorded by 86.1 ha, 51.8 ha, 26.2 ha and 15.1 ha, respectively. It was observed that in cucurbits, *machan* cultivation technology had a great impact on productivity, quality and market value of crop which was impressed to the farmers. Therefore, farmers were moving towards scientific cultivation of cucurbits crop. Among spices, the area expansion under

Table 1 : Impact of dissemination and diffusion of conservation agronomical practices on area expansion in Hamirpur district

Sr. No.	Crop	Area expansion(ha)				Volume of produce (q)	Value of produce (in lac)
		2009-10	2010-11	2011-12	Total		
1.	Pulses crop						
	Pigeonpea	22.5	35.6	54.8	112.9	2258.0	83.54
	Chickpea	39.5	109.8	213.3	362.6	7977.2	311.11
	Field pea	38.5	86.2	139.0	263.7	6065.1	157.69
	Lentil	33.0	102.7	137.5	273.2	4371.2	100.53
	Subtotal (A)				1012.4	20671.5	652.87
2.	Oilseeds crop						
	Sesame	19.7	51.8	125.2	196.7	540.9	28.12
	Mustard	51.4	128.9	209.3	389.6	6233.6	199.47
	Subtotal (B)				586.3	6774.5	227.59
3.	Cereals crop						
	Wheat	88.7	207.7	338.0	634.4	25376.0	317.20
	Subtotal (C)				634.4	25376.0	317.20
4.	Vegetables crop						
	Tomato	11.8	27.2	68.0	107.0	46545.0	1163.62
	Capsicum	5.1	8.0	17.8	30.9	6025.5	108.45
	Okra	15.2	40.2	64.4	119.8	13178.0	461.23
	Cauliflower	6.1	23.6	51.8	81.5	20782.0	311.73
	Cabbage	5.3	14.3	30.8	50.4	14415.0	180.18
	Subtotal (D)				389.6	100945.5	2225.21
5.	Cucurbits crop						
	Bottle gourd	2.5	5.4	7.2	15.1	2567.0	46.20
	Bitter gourd	5.1	10.7	70.3	86.1	11193.0	223.86
	Sponge gourd	5.4	15.4	31.0	51.8	5698.0	148.14
	Cucumber	3.1	8.6	14.5	26.2	4192.0	92.22
	Subtotal (E)				179.2	23650.0	510.42
6.	Spices crop						
	Onion	7.6	20.1	51.3	79.0	19750.0	335.75
	Garlic	2.3	8.4	16.4	27.1	3252.0	162.60
	Chillies	7.7	23.5	41.3	72.5	5945.0	190.24
	Subtotal (F)				178.6	28947.0	688.59
7.	Basil	1.9	5.9	15.5	23.3	186.4	13.04

onion, chillies and garlic was recorded by 79.0 ha, 72.5 ha and 27.1 ha, respectively. The area expansion was recorded by 23.3 ha in basil during three years.

Volume and value of produce:

The results obtained under volume and values of produce have been reported in Table 1. The sum of three years data indicated that the pulses, oilseeds and cereals gave 20671.5 q, 6774.5 q and 25376.0 q volume with the value of Rs. 652.87 lac, Rs. 227.59 lac and Rs. 317.20 lac, respectively, from the area of expansion. Cereals recorded maximum volume of produce followed by pulses and oilseeds, while maximum value of produce was recorded in pulses followed by cereals and oilseeds. It was due to higher market price of pulses as compared to cereals. Though, the value of per unit volume of produce was highest in oilseeds. It might be due to higher sale price of oilseeds. Among horticultural crops, vegetables, cucurbits and spices provided 100945.5 q, 23650.0 q and 28947.0 q volume of their produce, respectively. The values of these crops were recorded Rs.2225.21lac in vegetables, Rs.510.42 lac in cucurbits and Rs. 688.59 lac in spices. The highest value was recorded in vegetables followed by cucurbits, while lowest value was in spices. It might be attributed to highest area expansion under vegetables followed by cucurbits and

lowest area expansion in spices. Though, the value of per unit volume of produce was highest in spices. It might be due to higher sale price of spices. The basil crop was recorded 186.4 q dry leaves with the value of Rs.13.04 lac during three years. These results showed that there was a good impact of dissemination and diffusion of conservation agronomical practices on area expansion as well as volume and value of produce in all above crops in Hamirpur district of Bundelkhand, Uttar Pradesh. Therefore, the dissemination and diffusion of improved technologies added Rs.4634.92 lac in the district revenue of Hamirpur. These studies are in concordant to the results of Singh (1996) and Bhan and Singh (1998).

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