



Research Article

Watershed based front line demonstration is a path of prosperity to Bundelkhand farm families

■ R.A. SINGH, V.K. SHARMA AND S.B. PAL

ARTICLE CHRONICLE :

Received :
08.06.2012;

Revised :
28.01.2013;

Accepted :
01.03.2013

SUMMARY : The frontline demonstration on pulses and oilseed crops were carried out from 1989-90 to 1991-92 during both rainy and winter seasons on farmers fields at different villages, situated in ravines affected area of Bundelkhand, U.P. The soils of pilot area was *Mar*, *Kabar* and *Mixed Kabar*, having neutral pH and good fertility status. The watershed technology was applied for conducting the front line demonstrations. The yield of gram pushed up by 280.50% over the state productivity followed by lentil (185.90%) and field pea (161.50%). The productivities of urd and moong increased by 132.25% and 29.37%, respectively in comparison to their state average yields. The productivity of linseed, mustard, soybean and sunflower was increased by 445.25%, 157.70%, 75.30% and 14.25%, respectively as compared to their average yields of state. The maximum benefit cost ratio was computed from lentil followed by gram and mustard, while lowest benefit cost ratio was recorded in sunflower under dry environment of Bundelkhand. Therefore, the pulses and oilseeds cultivation in ravines affected area may be suggested and recommended with conservation production system of crop.

How to cite this article : Singh, R.A., Sharma, V.K. and Pal, S.B. (2013). Watershed based front line demonstration is a path of prosperity to Bundelkhand farm families. *Agric. Update*, 8(1&2): 42-44.

KEY WORDS :

Conservation production system, Ravines affected area, Conducive, Double cropping

BACKGROUND AND OBJECTIVES

In U.P., the front line demonstration Programme on pulses and oil seed crops was launched under National Pulse Development Project and National Oil Seed Development Project/Oilseed Production Thrust Programme, respectively, from 1988-89 for the purpose to increase per hectare productivity of these crops through recommended package of practices. The secondary aim of these front line demonstrations was to produce quality and certified seed with multiplication.

Climatologically, edaphically and socially the Bundelkhand zone is quite different from other zones of Uttar Pradesh. It is characterised by semi-arid climate, undulating topography, residual soil of erodible nature, deep water strata underlain with hard impermeable rocks, poor crop husbandry including low fertilizer use and irrigations. The major pulses and oilseed crops grown in the region included arher, soybean and urd during *Kharif* and gram, lentil, pea, mustard and linseed during

Rabi season, have low productivity. The annual precipitation is of the order of 1014 mm which is largely concentrated from mid June to mid September. The total rainy days are about sixty. During rainy season, the residual nature of soil and rocks reduce the infiltration rate and consequently leads to high runoff. Since the irrigation facilities are available only in 30% of the cultivated area and rest of the 70% area is rainfed in this region, the only approach which can improve dry land agriculture in this zone is frontline field extension approach, based on watershed technology.

RESOURCES AND METHODS

As per mandate of National Pulse Development Project and National Oilseed Development Project, the frontline demonstrations were carried out for four years, during *Kharif* and *Rabi* season of 1989-90 to 1991-92 on farmers fields of different villages of Bundelkhand. The soils of demonstration site was *Mar*, *Kabar* and *Mixed*

Author for correspondence :

R.A. SINGH
Directorate of
Extension, C.S.A.
University of Agriculture
and Technology,
KANPUR (U.P.) INDIA
Email : sbpalcsau@gmail.com
rasing_csa@yahoo.co.in
See end of the article for
authors' affiliations

Kabar having neutral pH and good fertility status. The size of demonstration was 10-100 hectare. The high yielding varieties recommended by Agriculture Universities, Kanpur, Pantnagar and Jawalpur were used in all the front line demonstrations. Gaurav, Durga and PK 327 varieties of soybean; T9 variety of urd; T44 variety of moong. Modern variety of sunflower, K 468, K850, Radhey, Awrodhi, H-208, C 235 and P.G. 114, varieties of gram; K 75, variety of lentil, Rachana and H.F.P. 4, varieties of pea; Garima variety of linseed and Varuna variety of mustard were grown with recommended package of practices based on watershed technology.

Urd, moong, sunflower and soybean crops were raised under rainfed condition and no irrigation was given while one life saving irrigation was provided to gram, lentil, linseed, pea and mustard at flower initiation stage. The inputs like seeds, fertilizers, rhizobium culture and gypsum were provided to the farmers from the funds of projects. The collaborating agencies

were Ministry of Agriculture and Cooperation, Govt. of India, New Delhi; Indian Council of Agricultural Research, New Delhi; Department of Agriculture, Lucknow; Tarai Development Corporation, U.P. Lucknow; Agriculture University, Kanpur and farmers themselves.

The farmers were registered in Seed Certification Agency, U.P., Lucknow. The inspection and certification of demonstrations crop were done by Officers of Seed Certification Agency, Orai. The certified seed of soybean was purchased by Vegepro Foods and Feeds Ltd., Orai for seed and industrial purposes. The certified seed of gram, lentil, urd, linseed was purchased by Tarai Development Corporation, UP, for seed.

OBSERVATIONS AND ANALYSIS

The results obtained from the front line demonstrations

Table 1: Yield of pulses and oilseed crops under front line demonstrations

Sr. No.	Crop	Year	No. of demonstration	Size of demonstration (ha)	Yield (q/ha)	State average yield (q/ha)	Increased over state yield
<i>Kharif</i>							
1.	Soybean	88-89	1	50	19.40	-	-
		89-90	1	100	21.90	-	-
		90-91	1	50	23.00	-	-
		91-92	1	10	23.22	-	-
		Average				21.88	12.48
2.	Urd	88-89	1	50	9.15	-	-
		89-90	1	100	10.40	-	-
		90-91	1	50	10.40	-	-
		91-92	1	100	10.65	-	-
		Average				10.15	4.37
3.	Sunflower	91-92	1	10	13.80	12.08	14.25
4.	Moong	90-91	1	50	8.75	-	-
		91-92	1	50	8.70	-	-
		Average				8.72	6.74
<i>Rabi</i>							
5.	Gram	88-89	1	50	26.15	-	-
		89-90	1	60	26.00	-	-
		91-91	1	10	27.35	-	-
		90-91	1	100	26.50	-	-
		91-92	1	30	27.75	-	-
Average				26.75	7.03	280.50	
6.	Lentil	89-90	1	26	18.95	-	-
		90-91	1	10	18.15	-	-
		90-91	1	50	18.60	-	-
		91-92	1	10	19.80	-	-
		Average				18.87	6.60
7.	Pea	91-92	1	100	28.40	10.86	161.50
8.	Mustard	91-92	1	10	26.80	10.40	157.70
9.	Linseed	90-91	1	35	22.30	4.09	445.25

are reported under appropriate heads :

Productivities of different crops under front line demonstrations:

The yields of different crops, raised in front line demonstrations during four years including state average yields and increased over state average yield have been shown in Table 1. Perusal of the data makes it clear that the yield of both pulses and oilseed crops were increased by two to five fold in dryland area of Bundelkhand.

The yields of gram was increased by 280.50% over the state productivity under dry eco-system of Bundelkhand followed by lentil (185.90%) and field pea (161.50%) during winter season. The productivity of urd increased by 132.25% in comparison to state average yield, while moong enhanced the grain productivity by 29.37% during rainy season. The conducive factor of soil associated with full package of practices through front line demonstration based on watershed technology was responsible for better productivity of pulses in Bundelkhand. These results confirm the findings of Singh (1991) and Singh (1995).

During *Rabi* season, productivity of linseed increased by 445.25% followed by mustard (157.70%) over the state average yield. The productivities of soybean and sunflower was pushed up by 75.30% and 14.25%, respectively, as compared to their state average yields. These results are in accordance with those of Singh (1995).

Benefit cost ratio in frontline demonstrations of pulses and oilseed crops:

One of the major aim of the frontline demonstrations programme was to boost production per unit area and per unit time. In order to find out the return per rupee invested, the gross return, cost of production and benefit cost ratio, have been worked out from demonstrations. The cost of monetary input have been taken into account for working the cost of production. It is clear from Table 2 that in frontline demonstrations return per rupee investment was under all crops over their state average yields was higher. The maximum benefit cost ratio was obtained from lentil (1:5.75) followed by gram (1:5.08) and mustard (1:4.00) while sunflower gave minimum benefit cost ratio (1:1.35) in Bundelkhand under dry environment.

Extension education activities:

The front line demonstration programme carried out by

Table 2 : Net return and benefit cost ratio of different crops grown under frontline demonstrations

Sr. No.	Crop	Net return (Rs./ha)	Benefit cost ratio
1.	Soybean	12820	1:1.65
2.	Urd	13687	1:2.15
3.	Sunflower	7200	1:1.35
4.	Moong	14678	1:2.25
5.	Gram	64200	1:5.00
6.	Lentil	46801	1:5.75
7.	Pea	49478	1:3.30
8.	Mustard	60698	1:4.00
9.	Linseed	37127	1:2.25

Note: Prevailing market rates of different commodities were used for calculating the economics of front line demonstrations

the scientific staff of C.S. Azad University of Agriculture and Technology, Kanpur had a close linkage with the staff of Department of Agriculture posted in Bundelkhand region for the training activities on various aspect of crop production. The farmers of the area have gained considerable knowledge on the improved crop production technology for different crops. Good yield in front line demonstrations was due to better package of practices and better return of their produce brought about, an spurt in area under oilseed and pulse crops. It also helped in spread of quality seeds among the masses. Double cropping of soybean with gram and urd with gram / lentil was not in vogue in the region before these demonstrations, which spread on farmers fields.

Thus, the technology transferred through front line demonstration programme is economically viable, easily transferable and widely acceptable.

Authors' affiliations :

V.K. SHARMA AND S.B. PAL, Directorate of Extension, C.S.A. University of Agriculture and Technology, KANPUR (U.P.) INDIA

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