



Impact of improved technologies on the productivity and economics of sesame (*Sesamum indicum*) at farmer's fields in Fatehpur district of Uttar Pradesh

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Abstract : Improved cultivation techniques of rainfed sesame were demonstrated against farmer's practice in front line demonstration during *Kharif*-2008 and 2009 at farmer's fields in Fatehpur district of central Uttar Pradesh. Combination of all technologies, viz., fertilizers, plant protection, varieties and intercropping system increased the seed yield over farmer's practice by 150.5 and 148.5 per cent while net return increased by 214.7 and 213.1 per cent during 2008 and 2009, respectively. All the individual technologies also increased the seed yield and net return over farmer's practices. Among these, highest seed yield and net returns were observed with improved variety followed by fertilizers, plant protection and intercropping system.

Key Words : Sesame, Demonstrations, Improved techniques, Rainfed, Economics, Productivity

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INTRODUCTION

Sesame is a rainy season crop in central Uttar Pradesh and grown under rainfed condition. The production of sesame per unit area is quite low in the state of Uttar Pradesh (162 kg/ha) against national average (345 kg/ha) and average productivity obtained in front line demonstrations (600kg/ha). Sesame productivity in India also is far below the world's average. Such low productivity is because the crop is grown mostly on poor and marginal lands under rainfed situation without adoption of improved cultivation techniques. Results of research experiments are available to show that with improved package of practices, average productivity of 600-700 kg/ha may be easily obtained from sesame crop even under rainfed situation. The need is to popularize these practices among farmers. With this view, some improved technologies of sesame were demonstrated on farmers fields against farmer's practice in front line demonstrations.

MATERIALS AND METHODS

Front line demonstrations was carried out on farmers fields of district Fatehpur of Central Uttar Pradesh. In all 55 demonstrations were conducted during *Kharif*-2008 and 2009. All demonstrations were carried out under rainfed condition. The soils in general were sandy loam with pH ranging from 7.2 to 7.5. The soils were low in nitrogen (175-200kg/ha), low to medium in phosphorus (9-14kg P₂O₅/ha) and medium in potassium (250-300 kg/ha). Demonstrations on improved technology consisted, whole package of practices (improved variety + Rec. fertilizers + Rec. plant protection measures + thinning + weeding), recommended fertilizers, recommended plant protection measures, improved variety and intercropping with greengram. Farmer's practice contained local variety and hand weeding only. Improved variety used was "Shekhar". Recommended fertilizers were applied @ 30kg N+15 kg P₂O₅+ 15kg K₂O/ha. In case of recommended plant protection measures, seed was treated with thirum @ 2.5g/kg seed and

phorate-10G was applied in seed furrows @ 15kg/ha. Standing crop was sprayed with methyle-o- dimeton (25EC) @ 1 litre/ha and with 3 kg/ha copper oxichloride. Sowing of crop was done in furrows during second fortnight of July in all cases using 4 kg seed/ha at furrow spacing of 30 cm in case of sole sesame and 45 cm in case of intercropping. In intercropping, one row of greengram was sown between two sesame rows. Plant spacing was maintained 10 cm by thinning after 3 weeks of sowing in improved technology. All fertilizers were applied as band placement at sowing. One hand weeding was done in between 21-30 days in both improved technology and farmer practice. Crop was harvested at maturity and seed yield was recorded. Economics of different practices was also worked out in all cases.

RESULTS AND DISCUSSION

The results obtained from different demonstrations are furnished in Table 1.

Productivity:

Improved technology has given higher productivity

than farmer's practice in all cases. Adoption of whole package practices increased productivity over farmer's practice by largest margin of 150.5 and 148.5 per cent in two different years. It was followed by plant protection technology which increased productivity of sesame over farmer's practice by the margins of 141.4 and 135.3 per cent during two years. Improved variety and recommended dose of fertilizers had almost similar impact on sesame productivity. Improved variety increased seed yield over local variety by the margins of 130.7 and 127.6 per cent during 2008 and 2009, respectively. Increase in productivity due to fertilizers was found 130.1 and 124.9 per cent in the two years of study. Intercropping system of sesame with greengram grown by adopting improved technology increased sesame equivalent productivity over farmer's technique by 109.9 and 104.2 per cent in two years demonstrations. It is proved from these results that by adopting improved techniques either individually or in whole package, sesame productivity was increased more than two times as compared to farmer's practices in rainfed condition. Venkatakrishnan (1998) also reported that the combination of different dry land technologies and also the all individual technologies increased the seed yield of sesame over farmer's

Table 1 : Seed yield and economic parameters of rainfed sesame as influenced by improved technologies in front line demonstrations (FLDs) at farmer's field of Fatehpur district

Improved practices demonstrated	No. of FLDs	Mean seed yield (kg/ha)		Mean gross return (Rs./ha)		Mean cost of cultivation (Rs./ha)		Mean net return (Rs./ha)		B:C ratio	
		IT	FP	IT	FP	IT	FP	IT	FP	IT	FP
Kharif-2008											
Whole package	6	556	222	20016	7659	9536	4329	10480	3330	2.09	1.76
		(150.5)	-	(161.3)	-	(120.3)	-	(214.7)	-	(18.8)	-
Fertilizers	6	490	213	17640	7349	8304	4154	9336	3195	2.12	1.77
		(130.1)	-	(140.0)	-	(99.9)	-	(192.2)	-	(19.8)	-
Plant protection	6	478	198	17208	6831	8502	4261	8706	2570	2.02	1.60
		(141.4)	-	(151.9)	-	(99.5)	-	(238.8)	-	(26.3)	-
Variety	6	503	218	18108	7521	8426	4431	9682	3090	2.14	1.69
		(130.7)	-	(140.8)	-	(90.2)	-	(213.3)	-	(26.6)	-
Intercropping*	6	424	202	15264	6969	7251	4274	8013	2695	2.10	1.63
		(109.9)	-	(119.0)	-	(69.7)	-	(197.3)	-	(28.8)	-
Kharif-2009											
Whole package	10	512	206	20480	7828	9686	4380	10794	3448	2.11	1.78
		(148.5)	-	(161.6)	-	(121.1)	-	(213.1)	-	(18.5)	-
Fertilizers	3	452	201	18080	7629	8456	4198	9624	3440	2.14	1.81
		(124.9)	-	(137.0)	-	(101.4)	-	(179.8)	-	(18.2)	-
Plant protection	4	440	187	17600	7106	8650	4310	8950	2872	2.03	1.64
		(135.3)	-	(147.7)	-	(100.7)	-	(211.6)	-	(23.8)	-
Variety	4	462	203	18480	7714	8578	4480	9902	3234	2.15	1.72
		(127.6)	-	(139.6)	-	(91.5)	-	(206.2)	-	(25.0)	-
Intercropping*	4	392	192	15680	7296	7402	4322	8278	3050	2.12	1.68
		(104.2)	-	(114.9)	-	(71.3)	-	(171.4)	-	(26.2)	-

IT- Improved technology; FP- Farmers practice; * Sesame equivalent yield

Note:- Figures given in parenthesis are for per cent increase over farmer's practice

practices.

Economics:

Gross return from sesame cultivation followed the same pattern of seed yield under different improved practices. Similar was the case of cultivation cost involved in different practices, but the margins of increase over farmer's practice were lesser than the seed yield and gross income. However, position changed in case of net return and benefit: cost ratio. During the year 2008, recommended plant protection measures resulted maximum increase of 238.8 per cent in net return over farmer's practice while in 2009, whole package showed highest increase of 213.1 per cent in net return over farmer's practice. Next in order was found improved variety which showed yield increase of 213.3 and 206.2 per cent over local variety in two different years. Intercropping technique and recommended fertilizers increased net return over farmer's practice by the margins of 197.3 and 192.2 per cent during 2008 and 171.4 and 179.8 per cent during the year 2009, respectively.

As regards total net return with different techniques, it was observed that maximum net return of Rs. 10480 and 10794/ha was observed with adoption of whole package of practices during 2008 and 2009, respectively. It was followed by improved variety which earned Rs. 9682 and 9902/ha net return during two years study. Next in order was fertilizers with Rs. 9336 and 9624/ha net return followed by plant protection

(Rs.8706 and 8950/ha) while intercropping system earned minimum of Rs. 8013 and 8278/ha net return during the years 2008 and 2009, respectively. It is thus proved that if only single technique is to be adopted, it is the improved variety, while the second preference may be given to recommended fertilizers for both productivity and net return point of view from sesame crop under rainfed situation. Importance of variety in sesame production was reported by Narayanan and Narayanan (1987) while that of fertilizers by Lal *et al.* (1995).

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