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Yield Enhancement through Improved Variety of Soybean

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Abstract

The study was conducted in the field of 25 farmers selected from different villages of Raipur district during *kharif* seasons from 2008 to 2009. In demonstration trails, quality seed of soybean (cv JS-93-05) was provided as critical input. All the cultural operations were performed under the close supervision. Based on mean of two years data yield of soybean was recorded at 16.3 q/ha compared to farmers practice 12.4 q/ha. The yield enhancement due to technological intervention was 31.2% over farmers' practice. The mean value of two years of extension gap and technological gap was 3.9 and 3.7 q/ha, respectively. Mean value of two years data of average net returns from recommended practice was observed to be Rs 16,310 compared to farmers practice i.e. Rs 10,609. The benefit cost ratio of improved practice and farmers practice were 2.22 and 1.88, and 2.03 and 1.76 during 2008 and 2009, whereas mean values of two years of cost-benefit ratio were found to be 2.12 and 1.82, respectively. The study emphasized the need to educate the farmers through various means for the adoption of improved production technologies of soybean to minimize this wide extension and technological gap.

Key words : Yield gap, Extension gap, Technology gap, Benefit-cost ratio.

Soybean (*Glycine max*), otherwise known as a 'miracle crop' with over 40% protein and 20% oil, originated in China and introduced into India through the Himalayan mountains centuries ago. Because of its high protein and oil content, another attributes such as its beneficial effects on soil fertility, several attempts were made in the past decades to popularize soybean cultivation in India. Soybean, the number one oilseed crop in the world has recently occupied an important place in the edible oil and agricultural economy of the country. Its inclusion in the cropping system of the country in general and in the state of Chhattisgarh particular has resulted in improvement of socio-economic status of farmers and provided employment in villages and in adjoining cities where soya based industries is located. Being more remunerative than other crops, it raised the income levels of the farmers and also living standard. Mostly sowing of soybean in Chhatisgarh was during first to second week of July. During *kharif* of 2009, area sown under soybean in Chhattisgarh was 1.290 lakh hectare and average yield of 929 kg/ha with production of 1.193 lakh MT was recorded (based on crop survey conducted by SOPA—September 19 to 27, 2009). Ripur district covered under soybean crop was 2,032 ha with an average yield of 1081 kg/ha having total production of 2,200 t during the year 2009. Productivity of soybean in Chhattisgarh is quite low as compared to other states like MP and Maharashtra. This was mainly because of inadequate knowledge about its cultivation and high-yielding varieties. Keeping the above points in view, the FLD on soybean (cv JS-93-

Table 1. Particulars showing the details of soybean growing under FLD and existing.

	Operation	Existing practice	Improved practices demonstrated
1	Use of seed	Local seed	Improved variety JS-93-05 released by JNKVV, Jabalpur, 2002
2	Sowing method	Broadcasting	Line sowing by Seed drill, spacing 30 cm line to line
3	Time of sowing	Late sowing	Timely sowing (15 June to 15 July)
4	Fertilizer application	Imbalanced use of fertilizers	Balanced use of fertilizers on the basis of soil testing

Table 2. Mean of yield attributing characters as affected recommended practice.

Characters	IP	FP	Increase (%)
Pods/plant (No)	31	24	29.2
Seeds/pod (No)	2.70	2.40	12.5
Pod length (cm)	3.60	3.21	12.1

05) using new crop production technology was started with the objectives of showing the productive potentials of the new production technologies under real farm situation over the locally cultivated soybean crop.

Methods

The study was carried out in the farmers' fields of nine villages of Raipur district by the Krishi Vigyan Kendra, Bhatapara (Raipur) under IGKV, Raipur during *kharif* seasons from 2008 to 2009 (2 years). A total of 25 farmers were selected for frontline demonstrations of soybean (cv JS-93-05) in 9.8 ha area from different villages. In demonstration trails, quality seed was provied and all the cultural operations were performed under the close supervision of KVK scientists. The technologies demonstrated are mentioned in Table 1 and compared with local practices. The purpose of this FLD's was to assess the yield gap between improved practice and farmers practice, to determine the gaps between the potential yield, and demonstration yield and extension gap, and to find out the reasons for low yield and specific constraints with the practicing farmers. The data on yield attributing characteristics as number of pods/plant, number of seeds/pod and pod length were collected from 1 m^2 each in randomly selected 5 demonstrations from different villages. The information on output data and inputs used per hectare was collected from the frontline demonstration trails and local practices commonly adopted by the farmers of this region.

Formula used are :

Precent increase in yield (Yield gap) = 100 × (Yield of IP —Yield of FP)/Yield of FP

Benefit-cost Ratio = Gross return/Gross cost

Technology gap = Potential yield—Demonstration yield

Extension gap = Demonstration yield—yield under existing practice.

Results and Discussion

Table 2 shows the comparison between improved practice and farmers practice in their mean values of yield attributing characteristics of two years (*kharif*/ 2008 and 2009). The data reveal that the pods/plant of improved practice was about 29.2% higher than the farmers practice. Hence, seeds/pod and pod length length of improved practice was 12.5 and 12.1% higher than the farmers practice, respectively.

The technological impact of soybean (cv JS-93-05) is presented in Table 3. The data reveal that under improved practice, the performance of soybean yield was found to be substantially higher than that under farmers practices during both the years. Based on mean of two years data, yield of soybean under demonstration recorded was 16.3 q/ha, whereas yield of farmers practice was 12.4 q/ha. The yield enhancement due to technological intervention was 31.2% over farmers' practice. Tiwari et al. (1) reported increased soybean yield in demonstration over local check during 2000. The mean values of two years of extension gap and technological gap were 3.9 and 3.7 q/ha, respectively. The study emphasized the need to educate the farmers through various means for the adoption of improved production technologies of soybean to minimize this wide extension and technological gap. Kiresur et al. (2) emphasized the need for

Table 3. Technological impact of soybean (JS-93-05) grown under FILD.

Year	Variety	No. of FLD	Area (ha)	Yield (q/ha) IP	Yield (q/ha) FP	Yield gap (%)	Extension gap (q/ha)	Technology gap (q/ha)
Kharif 2009	JS-93-05	13	4.8	15.65	12.00	30.40	3.65	4.35
Kharif 2008	JS-93-05	12	05	16.9	12.8	32	4.10	3.10
Mean				16.3	12.4	31.2	3.9	3.7

Table 4. Economic performance of imporved practice over farmers practice.

Year	Average cost of cultivation (Rs/ha)		Average gross return (Rs/ha)		Average net return (Rs/ha)		Benefit-cost ratio	
	IP	FP	IP	FP	IP	FP	IP	FP
Kharif 2009	15400	13623	31300	24000	15900	10377	2.03	1.76
Kharif 2008	13700	12200	30420	23040	16720	10840	2.22	1.88
Mean	14550	12912	30860	23520	16310	10609	2.12	1.82

better dissemination of improved technology to increase the adoption levels.

Economic performance of improved practice over farmers practice i.e. gross expenditure, gross returns, net returns and BC ratio are presented in Table 1. The data indicated that the net returns from the improved practice were substantially higher than the farmers practice during both the years of demonstration. Mean value of two years data of average net returns from recommended practice was observed to be Rs 16,310 compared to farmers practice i.e. Rs 10.609. The benefit cost ratio of improved practice and farmers practice were 2.22 and 1.88, and 2.03 and 1.76 during 2008-09 and 2009-10, whereas mean values of two years of Cost-Benefit ratio were found to be 2.12 and 1.82, respectively. Tiwari et al. (3) reported the similar findings.

Conclusion

It is concluded that front line demonstration can be used as a most beneficial tool for enhancing adoption level of farmers about improved cultivation practices of crops like soybean. The front line demonstration (FLD) plays an important role to disseminate recommended technologies because it shows the potential of technologies resulting in an increase in yield at farmers' level. This will substantially increase the income and the livelihood of the farming community. Under demonstrations some specific technologies likeseed treatment, spacing, improved varieties, balance use of fertilizer, intercultural and plant protection measures were undertaken.

References

1. Tiwari R. B., V. Singh and D. P. S. Chauhan. 2003. Impact of front Line demonstration of soybean in transfer of improved technology. *Maha. J. Ext. Educ*. 22 : 139.
2. Kiresur V. R., S. V. Ramanna Rao and D. M. Hedge. 2001. Improved technologies in oilseeds production-An assessment of their economic potentials in India. *Agric. Econ. Res. Rev.* 14 : 95—108.
3. Tiwari K. B. and A. Saxena. 2001. Economic analysis of front line demonstration of oil seeds in Chhindwars. *Bhartiya Krishi Anusandhan Patrika* 16 : 185—189.