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Integrated Weed Management in Soybean through Front Line Demonstration in Farmer's Field

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A B S T R A C T

The front line demonstration on integrated weed management in soybean was conducted on farmers filed of Damoh district (MP) during kharif season of 2016-17 and 2017-18 at two different locations under rainfed conditions. Prevailing farmer practices were treated as control for comparison with recommended practice *i.e.* use of Integrated weed management practices such as preventive measure, cultural, mechanical and chemical methods i.e. application of Imazethapyr 35%+Imazamox 35% WG@ 70 g ai/ha at 15-20 days after sowing (DAS). The result of front line demonstration shows a greater impact on farming community due to significant increase in crop yield greater than farmers practice. The economics and benefit cost ratio of both farmers practice (FP) and recommended Practice (RP) were worked out. The weed intensity and weed biomass were found lower (51.5/M^2 and 45.7g/m^2) than FP (275/m^2 and 251g/m^2). An average of Rs. 26400/ha was recorded net profit under RP, while it was Rs. 14300/ha under FP. Benefit cost Ratio was 2.49 under RP, while it was 1.73 under FP. By introducing the proven technology *i.e.* integrated weed management, yield potential and net income from soybean in rainfed conditions can be enhanced to a great extent with increase in the income level of the farming community of the District.

Introduction

Soyabean *(Glycine max)* belongs to family legumineaceae. It is mainly grown in Kharif season oilseed which is mostly grown under rainfed condition. The average productivity of soybean is 950kg/ha in Madhya Pradesh (2016-17) which is very low as compared to national productivity (1450kg/ha). The Main reasons for low productivity are due to abiotic and biotic factors. The biotic stresses are primarily unavoidable and are the most harmful in relation to growth and productivity of crops especially under rainfed areas.

Similarly, biotic stress are caused by living organism *viz.*, weeds, insect, pests, disease, rodents etc

Among biotic stresses weeds are major culprit which causes around 37% yield reduction in soybean, hence weed management is an essential agronomic measure exploit the maximum yield potential of newly developed high yielding varieties (Choudhary *et al.*, 2019; Indian farming 68(11)68-72). Therefore, use of weed management practices such as preventive measures, cultural, mechanical and chemical methods may be used in increase production of soybean.

Farmers utilized the resources mainly seeds. Fertilizers and insecticides on soybean but they ignore the integrated weed management practices. Hence an Effort was made by the KVK Scientist to demonstrate The integrated weed management practices i.e. preventive measures, stale seed bed, soil solarization, inter culture using harrow and finally use chemical weeding i.e. application of imazethapyr 35%+Imazamax 35% WG@70g ai/ha at 15-20 days after sowing on soybean during kharif season of 2016-17 and 2017-18.

Materials and Methods

The present study is a part of mandatory programme of Krishi Vigyan Kendra, Damoh (MP). Participatory Rural Appraisal (PRA), group discussion and transect walk were followed to explore the detail information of study area and between technology intervention, HRD component (Training/ kisan sangosthi /kisan mela/ field day etc) were also include to excel the farmers understanding and skill about the demonstrated technology on integrated weed management in soybean.

The front line demonstration conduct in twenty four farmers' field at Bamori and Jortala village on soybean JS 95-60 during kharif season of 2016-17 and 2017-18. Under RP plots use of integrated weed management practices such as preventive measure, cultural, mechanical and chemical methods i.e. application of Imazethapyr 35%+Imazamax 35%WG@70.9 g.i/ha at 15-20 DAS. While farmers practices (FP) plots as one hand weeding (uprooting) when weeds come to flowering stage. Data on weed intensity, weed biomass, No of pods/plant biological yield, harvest index (Table 1) and gross return (Rs/ha), B:C ratio were computed (Table 2). Finally the extension gap, technology gap and technology index (Table 3) were also calculated.

Results and Discussion

Frontline demonstration on integrated weed management in soybean was conducted by using most popular variety JS 95-60 in area 10ha at 24 farmers field in Jortala and Bamori village of Damoh District. Weed intensity and weed biomass were calculated at 30 DAS.

Under RP (recommended Practices) weed intensity and weed biomass were found lower 51.5/m^2 45.7g/m^2 (results concluded that average of two year) followed by 275/m^2 and 251g/m^2 in FP (farmers practice). The same trend found in case of net profit, an average of Rs. 40024/ha was recorded under RP, while it was Rs. 17217/ha under FP. Benefit cost Ratio was 2.49 under RP, while it was 1.76 under FP (Table 2).

In table 3 the extension gap i.e. 6.2q/ha during the period of study emphasized the need to educate the farmers through varies means for the adoption of improved technology. The trend of technology gap ranging between 5.6-6.3q/ha reflected farmer's co-operation in carrying out such demonstration with encouraging results in both the years. The technology index showed the feasibility of the demonstrated technology at farmers field. The lower value of technology index, the more is the feasibility of the technology.

Table.1 Performance of FLD as affected by recommended practices as well as farmers practices (Mean of two year 206-17, 2017-18)

S.No.	Parameters	Treatment	
		RP	FP
1.	Weed intensity (No/m^2)	51.5	275
2.	Weed Biomass (g/m2)	45.7	251
3.	No of pod/plant (No)	65	40
4.	Seed/pod (No)	3	2
5.	Grain yield (q/ha)	19	12.8
6.	Biological yield (q/ha)	42.3	26.5
7.	Harvest Index (%)	44.9	48.3

Table.2 Economics of FLD as affected by RP as well as FP

Year	Yield q/ha		% increase over FP	Gross Expenditure Rs/ha		Grass income Rs/ha		Net Profit		B.C Ratio	
	RP	FP		RP	FP	RP	FP	RP	FP	RP	FP
2016-17	19.4	13.2	46.9	26410	23715	67176	40920	40766	17205	2.54	1.72
2017-18	18.7	12.5	46.6	27314	21520	66596	38750	39282	17230	2.43	1.80
Mean	19	12.8	48.2	26862	22618	66886	39835	40024	17217	2.49	1.76

Table.3 Productivity, Technology gap, extension gap and Technology index of soybean as affected by RP as well as FP

Year	Area (ha)	No. of farmer	Yield q/ha			% increase over FP	Technology Gap (q/ha)	Extension Gap (q/ha)	Technology Index (%)
			Potential	RP	FP				
2016-17	5	12	25	19.4	13.2	46.9	5.6	6.2	22.4
2017-18	5	12	25	18.7	12.5	49.6	6.2	6.2	25.2
Total/ Mean	10	24	25	19	12.8	48.2	5.9	6.2	23.8

As such, the reduction in technology index from 22.4% during 2016-17 to 25.2 during 2017-18 exhibited the feasibility of the demonstrated technology in this region.

Frontline demonstration on integrated weed management in soybean was conducted in two village of Damoh district and result concluded the average highest yield 19.4q/ha in RP fallowed by 12.5q/ha in FP, means 55.2% gain.

It was observed that potential yield can be archived by imparting scientific knowledge to the farmers providing the quality need based input and proper application of integrated weed management. Horizontal spread of improved technology may be achieved by successful implementation of FLD and various extension activities in farmers' field.

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