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Technological gap in adoption of recommended herbicides in soybean

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Abstract
This study investigates the technological gap in adoption of recommended herbicide in soybean growers in Akola district, Maharashtra. Through an exploratory research design involving 120 purposively selected farmers across Akola and Barshitakli tahsils of Akola district, the study analyzed knowledge, technological gap, constraints, and correlates of technological gap. Results revealed that 96% of respondents had moderate to high knowledge towards adoption of recommended herbicidal application practices in soybean crop. The majority (53.83%) of the respondents had low level category of technological gap followed by 44.17 per cent respondents had medium category of technological gap while 33.33% reported high level of technological gap in adoption of recommended herbicidal practices in soybean. However, marketing gaps and compatibility issues with herbicides limited its full adoption. Education, annual income, land holding, area under soybean crop, scientific orientation and knowledge significantly influenced adoption. The findings underline the need for targeted extension and market strategies.

Keywords: Knowledge, technological gap, adoption, herbicide, soybean

Introduction
Soybean is an important crop globally, and effective weed management is critical for maximizing yields and profitability. Herbicides are a key component of weed management in soybean cultivation and their judicious use is essential for sustainability and minimizing environmental Impacts. Inadequate weed control is one of the main factors related to decrease in soybean production. The grain yield reduction due to the weed infestation in soybean may be up to 31-84 percent. Herbicides are playing increasingly important role in the modern scientific agriculture which cannot be overestimated. The herbicides are more important inputs for improving agricultural production.

Objectives
To study the technological gap between recommended and adopted herbicides by the soybean growers

Methodology
The study entitled “Technological gap in adoption of recommended herbicides in soybean” was conducted in Akola district in Vidarbha region of Maharashtra state out of seven tahsil Akola and Barshitakli tahsil were selected purposively. For this study, Akola and Barshitakli talukas were deliberately chosen. Six villages from each tahsil viz., Akola and Barshitakli tahsil were selected on the basis of higher area under the cultivation of soybean crop.
Thus, in all 12 villages was identified from the Akola district. Ten respondents were randomly selected from each selected village those who cultivating soybean. Thus, in total 120 respondents were selected and they were considered as sample respondents for present study.
Exploratory research design of social research was used for the present study.

Results and Discussion
The categorization of soybean growers according to technological gap has been done and presented in Table 1.

Table 1: Distribution of respondents to the adoption in herbicides application practices

Sr. No	Statement	Adoption		
		C A	PA	NA
1	Recommended herbicides for soybean crop (Diclosulam, Imazythapyr + Imazamox, Propaquizafop +Imazethapyr)	79 (65.83)	28 (23.33)	13 (10.83)
2	Recommended dose of herbicide in soybean crop (Diclosulam 84% WDG @ 12.4 gm/acre, Imazythapyr + Imazamox 70 WDG @0.070 kg ai./ha, Propaquizafop @ 0.50 kg a.i. +Imazethapyr @ 0.075 kg a.i. 800ml / acre)	40 (33.33)	35 (29.17)	45 (37.50)
3	Time of application of herbicide (Pre-emergence: After 0-3 days of sowing before germination of seed, post-emergence: 2-4 leaf stage of weed and crop is 15-20 DAS)	85 (70.83)	27 (22.50)	08 (6.67)
4	Spray pump for spraying of herbicides (Knapsack)	68 (56.67)	19 (15.83)	33 (27.50)
5	Calibration of spray pump is necessary time to time	06 (05.00)	--	114 (95.00)
6	Quantity of water required for spraying of herbicide (200 lit/acre or 500 lit/ha)	07 (05.83)	02 (01.67)	111 (92.50)
7	Weather condition during spraying of herbicide (Avoid spraying in windy condition can cause herbicide drift, avoid spraying immediately after it rains)	116 (96.67)	02 (01.67)	02 (01.67)
8	Type of nozzle used for spraying of herbicide (Flat fan)	67 (55.83)	27 (22.50)	26 (21.67)
9	Quality of water to be used for spraying of herbicide (Clean water)	106 (88.33)	08 (06.67)	06 (05.00)
10	Soil conditions for application of herbicide (Sufficient moisture condition required)	99 (82.50)	04 (03.33)	17 (14.17)
11	For spraying of herbicide separate pump need to be used	20 (16.67)	08 (6.67)	92 (76.67)
12	Span of gap required for intercultural operation after spraying of herbicide (4-5 Days)	107 (89.17)	04 (03.33)	09 (07.50)
13	Precautionary measure to be followed during spraying (Mask, cloth, gloves)	06 (05.00)	--	114 (95.00)

(Figures in parentheses indicate percentage)

Table 2: Distribution of respondents according to practice wise extent of technological gap in adoption of recommended herbicides in soybean

Sr. No	Recommended herbicide application practices in soybean	Technological gap index
1.	Recommended herbicides for soybean crop (Diclosulam, Imazythapyr + Imazamox, Propaquizafop +Imazethapyr)	13 (10.83%)
2.	Recommended dose of herbicide in soybean crop (Diclosulam 84% WDG @ 12.4 gm/acre, Imazythapyr + Imazamox 70 WDG @0.070 kg ai./ha, Propaquizafop @ 0.50 kg a.i. +Imazethapyr @ 0.075 kg a.i. 800ml / acre)	45 (37.50%)
3.	Time of application of herbicide (Pre-emergence: After 0-3 days of sowing before germination of seed, post-emergence: 2-4 leaf stage of weed and crop is 15-20 DAS)	16 (13.50%)
4.	Spray pump for spraying of herbicides (Knapsack)	06 (05.00%)
5.	Calibration of spray pump is necessary time to time	114 (95%)
6.	Quantity of water required for spraying of herbicide (200 lit/acre or 500 lit/ha)	111 (92.50%)
7.	Weather condition during spraying of herbicide (Avoid spraying in windy condition can cause herbicide drift, avoid spraying immediately after it rains)	2 (01.67%)
8.	Type of nozzle used for spraying of herbicide (Flat fan)	26 (21.67%)
9.	Quality of water to be used for spraying of herbicide (Clean water)	08 (06.67%)
10.	Soil conditions for application of Herbicide (Sufficient moisture condition required)	17 (14.17%)
11.	For spraying of herbicide separate pump need to be used	92 (76.67%)
12.	Span of gap required for intercultural operation after spraying of herbicide (4-5 Days)	09 (07.50%)
13.	Precautionary measure to be followed during spraying (Mask, cloth, gloves)	112 (93.33%)

Table 3: Distribution of the respondents according to their level of Technological gap of herbicide application practices

Sr. No	Technological Gap	Respondents (n=120)	
		Frequency	Percentage
1	low (Up to 51.02)	08	6.67
2	Medium (51.03 to 82.96)	96	80.00
3	High (Above 82.97)	16	13.33
Total		120	100.00

Conclusion

The findings revealed that majority of respondents belonged to medium level of technological gap in adoption of recommended herbicidal application practices.

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