

Effect of cultural practices and post emergence herbicides against weed control in soybean

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ABSTRACT

A field experiment on the "Effect of cultural practices and post emergence herbicides against weed control in soybean" was undertaken during *kharif* 2005 at Department of Agronomy. The experiment was laid out in Randomised Block Design with eight treatment combination in three replications. The treatment consist of post emergence application of imazethapyr 70 % @ 52.5, 75 and 87.5 g a.i. ha⁻¹, chlorimuran ethyl 25 % WP @ 9.37 g a.i. ha⁻¹ and one hoeing (20 DAS) + two hand weedings (30 and 60 DAS), weedy check and water spray. Soybean (cv. DS-228) was sown @ 75 kg seed ha⁻¹ at spacing of 30 x 10 cm on 31st July 2005. The yield attributing characters were significantly higher under mechanical weed control however, all these values were at par with application of imazethapyr @ 87.5 g a.i. ha⁻¹. Weed control efficiency, dry matter of weed were observed significantly highest in application of imazethapyr @ 87.5 g a.i. followed by @ 75 g a.i. ha⁻¹ at harvest.

Key words : Soybean, Herbicides, Mechanical methods, Cultural practices.

INTRODUCTION

Soybean is one of the most important pulse and oilseed crops grown in *kharif* season, which has become a miracle crop of the 20th century and often designated as "Golden Bean". Among the various pulse the soybean is recognized as an excellent source of high protein and oil. It is also rich in phosphorus, sulphur and vitamins, hence it is called "poor man's meat".

In the advanced countries, soybean oil is used for cooking and manufacturing of sweets, ghee, varnishes, surface coating, printing, inks, resins, greases and lubricants etc. Soybean is also the best crop for crop rotation. During the year 2004-2005 the area under this crop in India was 69 lakh ha with production of 75 lakh tonnes and in Maharashtra area is 21.02 lakh with production of 18.82 lakh tonnes with productivity of 900 kg/ha (Anonymous, 2006).

Due to growing season of soybean is *kharif*, weed control problem become a serious problem. Weed computational for light, moisture space and nutrients.

MATERIALS AND METHODS

A field experiment on the "Effect of cultural practices and post emergence herbicides against weed control in soybean" was undertaken during *kharif* 2005 at Department of Agronomy. The experiment was laid out in Randomised Block Design with eight treatment combination in three replications. The treatment consist of post emergence application of imazethapyr 70 % @ 52.5, 75 and 87.5 g a.i. ha⁻¹, chlorimuran ethyl 25 % WP

@ 9.37 g a.i. ha⁻¹ and one hoeing (20 DAS) + two hand weedings (30 and 60 DAS), weedy check and water spray. Soybean (cv. DS-228) was sown @ 75 kg seed ha⁻¹ at spacing of 30 x 10 cm on 31st July 2005.

Weed control efficiency (WCE) % :

Weed control efficiency (WCE) was calculated by using following formula proposed by Gautam *et al.* (1975).

$$WCE = \frac{WPC - WPT}{WPC} \times 100$$

Where,

WCE	=	Weed control efficiency
WPC	=	Weed population in control plot
WPT	=	Weed population in treated plot.

RESULTS AND DISCUSSION

Dry matter of weeds (g ha⁻¹) :

The significantly lowest dry matter of weeds was recorded in treatment T₆ i.e. one hoeing 20 DAS + two hand weeding at 30 and 60 DAS (0.46 q ha⁻¹). Among the herbicides significantly lowest dry matter of weed was recorded in imazethapyr @ 87.5 g a.i. ha⁻¹ (2.76 q ha⁻¹) and it was at par with imazethapyr @ 75 g a.i. ha⁻¹ (3.27 q ha⁻¹). From the weed dry matter data it indicates that total dry matter of weeds reduced with increase in rate of application of imazethapyr.

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Treatment details :

S. No.	Symbol	Treatments	Dose/ha	
			a.i. (g)	Formulation
1.	T ₁	Imazethapyr 70 % WG	52.5	75 g
2.	T ₂	Imazethapyr 70 % WG	75.0	100 g
3.	T ₃	Imazethapyr 70 % WG	87.5	125 g
4.	T ₄	Chlorimuron ethyl 25 % WP (Kloben)	9.37	37.5 g
5.	T ₅	Fenaxoprop-P-ethyl 9 % EC (Whip super)	67.5	750 m
6.	T ₆	One hoeing (20 DAS) + two hand weeding (30 & 60 DAS)	-	-
7.	T ₇	Weedy check	-	-
8.	T ₈	Water spray	-	-

Note : All post emergence herbicides applied at 2-3 leaf stage of weeds (14 DAS)

Weed control efficiency (WCE) :

The significantly highest weed control efficiency of monocot and dicot weeds was observed in one hoeing (20 DAS) + 2 hand weeding at 30 and 60 day after sowing (T₆). This may be due to total elimination of weeds at the critical stages of crop growth. Among the herbicidal applications highest weed control efficiency (85.77) was observed with application of imazethapyr @ 87.5 g a.i. ha⁻¹ as compared to other chemical weed control treatments, in monocot and dicot weeds. These results found conformity with Chandel and Saxena (2001) and Kushwah and Vyas (2005).

Grain and straw yield (q ha⁻¹) :

All herbicidal treatments were found effective in respect of yield as compare to weedy check and water spray treatment. One hoeing 20 DAS + 2 H.W. resulted in significantly higher grain yield (28.35 q ha⁻¹) and straw yield (28.13 q ha⁻¹). Over rest of the weed control treatments tried under investigation except yields obtained under post emergence application of imazethapyr @ 87.5 and 75.0 g a.i. ha⁻¹ where it was statistically at par with each other. Among post emergence herbicides, imazethapyr @ 87.5 g a.i. recorded significantly higher yield (27.19 q ha⁻¹) over rest of herbicidal treatment

Table 1 : Mean dry weight of weeds (g), weed control efficiency, grain and straw yield (q ha⁻¹) as influenced by different weed control treatments

S. No.	Treatments	Dry matter of weeds (g)	Weed control efficiency (%)		Grain yield (q ha ⁻¹)	Straw yield (q ha ⁻¹)
			Monocot weeds	Dicot weeds		
T ₁	Imazethapyr 52.5 g a.i. ha ⁻¹	5.17	63.33	57.40	22.66	23.61
T ₂	Imazethapyr 75.0 g a.i. ha ⁻¹	3.72	77.06	66.66	26.41	26.93
T ₃	Imazethapyr 87.5 g a.i. ha ⁻¹	2.76	85.77	77.77	27.19	27.27
T ₄	Chlorimuron ethyl 9.37 g a.i. ha ⁻¹	4.46	72.85	61.11	24.35	25.33
T ₅	Fenaxoprop-P-ethyl 67.5 g a.i. ha ⁻¹	3.92	73.29	74.07	25.16	25.78
T ₆	One hoeing (20 DAS) + 2 hand weeding (30 & 60 DAS)	0.46	87.93	96.29	28.35	28.13
T ₇	Weedy check	10.24	-	-	18.43	18.98
T ₈	Water spray	10.02	2.58	3.70	18.59	18.98
	S.E. ±	0.33	1.78	5.59	1.03	1.00
	C.D. at 5 %	0.99	5.39	16.98	3.13	3.04

except imazethapyr @ 75 g a.i. ha⁻¹ (26.41 q ha⁻¹), where it was at par with each other. Among post emergence herbicides tested, application of imazethapyr @ 87.5 and 75 g a.i. ha⁻¹ produced 47.53 and 43.29 per cent more grain yield than weedy check (18.43 q ha⁻¹). These results are in line with earlier findings of Chandel and Saxena (2001).

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