

## Weed Management in Soyabean Through Sulfonylurea Herbicide

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### Abstract

A field experiment was conducted during August—December, 2000 to evaluate the weed controlling ability of chlorimuron ethyl in soyabean (Bragg). The results revealed that hand weeding twice at 15 and 30 DAS recorded the lowest weed dry weight of 8.43, 7.26 and 7.05 g/m<sup>2</sup> at 25, 50 and 75 DAS respectively which however was at par with chlorimuron ethyl at 4 and 6 g ai/hectare applied 1 DAS (Pre-emergence). The highest soyabean seed yield of 22.86 q/hectare was recorded with two hand weedings which was at par with chlorimuron ethyl at 4 and 6 g ai/hectare yielding 20.45 and 21.39 q/hectare. The lowest seed yield of 8.47 q/hectare was obtained in the unweeded control treatment.

The bulk of the Indian population are vegetarians, so grain legumes provide a rich and cheap source of protein to the Indian diet. Soyabean (*Glycine max*) being a well accepted legume as a source of protein and edible oil in India deserves special attention for its praiseworthy qualities. But even in the beginning of the new millennium the domestic production is far below the national need in India. The low productivity of soyabean is linked with the heavy weed infestation during kharif season particularly in the heavy rainfall areas of lower gangetic plains of West Bengal. To improve the productivity and total production, weed management needs special care as weed infestation causes 40—60% yield loss in soyabean (1). Hand weeding is always disadvantageous due to its inherent multifaceted weaknesses. Herbicides with high effectivity and low destructivity to the ecosystem could be the choice for weed management in soyabean. Therefore, the recently introduced sulphonylurea herbicide, chlorimuron ethyl

was chosen for evaluating for its weed controlling ability in soyabean in the southern plains of West Bengal.

### Methods

The field experiment was conducted during the kharif season of 2000 at Mondouri Teaching Farm (23° N, 89° E, 9.75 m AMSL) of Bidhan Chandra Krishi Viswavidyalaya. The trial was laid out in a randomized block design with six treatments replicated thrice and the net size of each plot was 4 m × 3 m. The treatments were chlorimuron ethyl (25 WP) at 2, 4 and 6 g ai/hectare, applied 1 DAS; pendimethalin (30 EC) at 1 kg ai/hectare applied 1 DAS; hand weeding twice at 15 and 30 DAS, as in soyabean the most critical period of crop weed competition is 20—40 DAS (1) and unweeded control.

The soyabean variety used was Bragg (Jackson × D 49-2491). The seeds were sown during the first week of August with a row spacing of 40 cm and the crop was harvested in the first week of December at 120 days crop age. Weed variables were recorded at 25, 50 and 75 DAS. The yield and yield attributes of soyabean were recorded at harvest (120

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Table 1. Effect of different treatments on weed dry weight ( $\text{g/m}^2$ ) and weed control efficiency (%) in kharif soyabean. DAS, days after sowing.

Treatment	Dose (g ai/ha)	Total weed dry weight ( $\text{g/m}^2$ ) on DAS			Weed control efficiency (%) on DAS		
		25	50	75	25	50	75
Chlorimuron ethyl (25 WP)	2	10.87	14.32	11.98	15.67	23.01	44.23
Chlorimuron ethyl (25 WP)	4	6.84	9.06	8.45	46.94	51.29	60.66
Chlorimuron ethyl (25 WP)	6	5.98	8.17	10.25	53.61	56.08	52.28
Pendimethalin (30EC)	1000	8.42	10.37	11.29	34.68	44.25	47.44
Hand weeding (twice)	15 DAS + 30 DAS	4.83	7.26	7.05	62.53	60.97	67.18
Unweeded control		12.89	18.60	21.48			
CD at 5%		3.09	3.45	2.41			

DAS).

### Results and Discussion

#### Weed Flora Present

The predominant weed flora recorded in the experimental plots throughout the different growth stages of soyabean were *Digera arvens*, *Spillanthes acmela*, *Phyllanthus niruri*, *Dactyloctenium aegyptium*, *Eleusine indica* and *Cyperus rotundus*. Presence of similar weed flora was recorded earlier in the production systems of kharif pulses and oilseed crops including soyabean (2, 3).

#### Effect on Weeds

Herbicides used in this experiment at all doses and hand weeding twice significantly reduced weed dry weight at 25, 50 and 75 DAS (Table 1). The lowest weed dry weight of 4.83, 7.26 and 7.05  $\text{g/m}^2$  were recorded with the twice hand weeding treatment at 25, 50 and 75 DAS respectively and was statistically at par with chlorimuron ethyl at 4 and 6 g ai/hectare at all observation dates. Similar results were reported earlier (3-5). Due to obvious reason unweeded control treatment resulted the highest weed dry weight of 12.89, 18.60 and 21.48  $\text{g/m}^2$  at 25, 50 and 75 DAS respectively.

Hand weeding twice (15 and 30 DAS) sho-

wed highest weed control efficiency (WCE) to the tune of 65.53, 60.97 and 67.18% at 25, 50 and 75 DAS respectively which was followed by chlorimuron ethyl at 4 and 6 g ai/hectare resulting WCE of 60.66 and 52.28% at 75 DAS.

#### Effect on Soyabean Plants

Application of chlorimuron ethyl (25 WP) upto 6 g ai/hectare showed no phytotoxicity symptoms on soyabean crop. Earlier it was reported that chlorimuron ethyl (classic) had low toxicity in soyabean and subsequent crops (4).

#### Effect on Yield Attributes and Seed Yield of Soyabean

The number of soyabean plants per m<sup>2</sup> varied between 31.25 and 35.50 which was statistically not significant for all the treatments (Table 2). The highest number of pods per plant (27.6) was recorded in the hand weeded (twice) plots which was at par with the treatments of chlorimuron ethyl at 4 and 6 g ai/hectare resulting 26.5 and 27.5 pods per plant respectively. Number of seeds per pod and 100 seed weight did not differ significantly in all the treatments. However, the highest number of seeds per pod was 2.9 and the highest 100 seed weight was 21.94 g in this exper-

Table 2. Effect of different treatments on yield attributes and seed yield (q/ha) of kharif soyabean. DAS, days after sowing.

Treatments	Dose (g ai/ha)	No. of plants/m <sup>2</sup>	No. of pods/plant	No of seed/pod	100 seed weight (g)	Seed yield (q/ha)
Chlorimuron ethyl (25 WP)	2	32.0	23.7	2.6	21.9	17.03
Chlorimuron ethyl (25 WP)	4	34.5	26.5	2.9	21.6	20.45
Chlorimuron ethyl (25 WP)	6	33.8	27.5	2.8	21.9	21.39
Pendimethalin (30EC)	1000	31.3	22.9	2.5	21.5	17.83
Hand weeding (twice)	15 DAS +30 DAS	35.5	27.6	2.9	21.5	22.86
Unweeded control		34.3	13.8	2.4	21.3	8.47
CD at 5%		NS	3.15	NS	NS	3.32

ment. The maximum seed yield of soyabean (22.86 q/hectare) was recorded with two hand weedings (15 and 30 DAS) which was at par with the treatments chlorimuron ethyl at 4 and 6 g ai/hectare producing 20.45 and 21.39 q/hectare. Similar findings were reported in the recent past (3, 5).

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