

STUDIES ON WEED MANAGEMENT IN SOYBEAN THROUGH CHLORIMURON ETHYL

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ABSTRACT

The field experiment was conducted during kharif season of the year 2000 with Bragg variety of soybean. Hand weeding twice at 15 and 30 DAS had the lowest weed count and weed dry matter at every stages of crop growth and the highest seed yield of the crop. Among the chemical treatments, presowing application of Classic - 25 WP @ 4 g a.i. ha⁻¹ had the best control of different categories of weed and increased the seed yield of soybean crop to the tune of 73.85% over the unweeded control. This was followed by pendimethalin 30 EC @ 1 kg a.i. ha⁻¹ as preemergence that produced a seed yield of 28.73 q ha⁻¹. Both these chemical treatments were statistically at par with hand weeding twice. All the chemical treatments except Classic 25 WP at 8 g a.i. ha⁻¹ as presowing application which reduced the crop stand to 20.75 plants m⁻² did not show any phytotoxic symptom on crop plants.

Key words : Chlorimuron ethyl, Soybean, Weed management and Yield

INTRODUCTION

Soybean is an erect, much branched pubescent annual having high yield potential with high nutritive value. It contains 20% oil and 40% high quality protein. Though soybean was introduced in India much earlier in 1880, but till now this crop is only grown in Northern hilly regions with mere management practices. As this crop has the potential to improve our day to day diet in respect to protein and mineral it should have been given better emphasis to popularize its cultivation with the need based management practices.

Among the different problems associated with the cultivation of the crop,

weed infestation is no doubt a severe menace in kharif season. Weed infestation at the early growth stage of the crop causes tremendous damage resulting heavy loss in crop growth and yield due to slow growth rate of crop as its early stage. Earlier findings revealed that weeds alone were responsible to decrease the crop yield to the extent of 41.81% (1). Efficient weed control measures are, therefore, extremely important to increase the productivities of this crop. Mechanical methods of weed control are very cumbersome and time consuming. Therefore, to find out a suitable weed management device the present trial was designed in *kharif* soybean.

MATERIALS AND METHODS

A field trial was carried out at University Teaching Farm B.C.K.V. on medium fertile soil of sandy loam texture during the period of kharif season of 2000. The experiment was laid out in randomized block design consisting of seven treatments with four replications. The crop (cv. Bragg) was sown in line on 6th August 2000 at a spacing of 40 cm x 10 cm row to row and plant to plant distance respectively. The fertilizer dose of 30 kg N., 60 kg P₂O₅ and 40 kg K₂O per hectare in the form of urea, single super phosphate and

muriate of potash respectively was applied to the crop as basal.

Observation on weed species present, population, dry weight of weeds, grain yield and yield attributing characters were carefully noted at 25 DAS, 50 DAS and 75 DAS. Weed control efficiency was calculated with the formula.

$$\frac{X - Y}{X} \times 100$$

Where X = weed dry weight in unweeded plot and Y = weed dry weight in treated plot.

Table 1. Treatments used in the experiment

Treatment	Dose (g a.i. ha ⁻¹)	Time of application
Classic-25 WP	2	1 DBS
Classic-25 WP	4	1 DBS
Classic - 25 WP	6	1 DBS
Classic - 25 WP	8	1 DBS
Pendimethalin - 30 E	1000	1 DAS
Hand weeding twice	---	15 and 30 DAS
Unweeded control	---	---

Table 2. Details of the herbicide used

Trade Name	Active Ingredient	Common Name	Chemical Name
Classic	25 WP	Chlorimuron ethyl	Ethyl 2-[[[(4-Chloro-6-methoxy pyrimidinyl) amino] carbonyl] amino]sulfonyl]benzoate
Stomp	30 EC	Pendimethalin	N-(1-ethylpropyl)-3, 4-dimethyl-2, 6- dinitrobenzenamine

The formula used to calculate weed index is -

$$\frac{H - T}{T} \times 100$$

Where H = Grain yield in hand weeded plot and T = Grain yield in treated plot.

RESULTS AND DISCUSSION

The predominant weed flora recorded in the experimental field throughout the different growth stages of the crop were *Digera arvens*, *Spillanthes acmela*, *Phyllanthus niruri*, *Dactyloctenium*

aegyptium, *Eleusine indica* and *Cyperus rotundus*.

Effect on weed :

Hand weeding treatment recorded the lowest weed population throughout the growing season of the crop. Among the chemical treatments, higher doses of Classic-25 WP, like 4, 6 and 8 g a.i. ha⁻¹ reduced the weed population considerably. Weed control efficiency was the highest in hand weeding twice. This was followed by Classic-25 WP @ 8 g a.i. ha⁻¹, Classic-25 WP @ 6 g a.i. ha⁻¹ and Classic 4 g a.i. ha⁻¹ as presowing application.

Table 3. Effect of treatments on weed population, weed dry weight and weed control efficiency (WCE) in soybean

Treatment	Total weed population (m ⁻²)			Total weed dry weight (g m ⁻²)			Weed control efficiency (%)		
	DAS			DAS			DAS		
	25	50	75	25	50	75	25	50	75
Classic 2 g	56.50	61.28	49.75	9.95	12.66	9.43	22.81	31.94	56.09
Classic 4 g	40.25	41.75	38.00	6.84	9.06	7.33	46.94	51.29	65.88
Classic 6 g	36.50	39.25	45.75	5.98	8.17	11.82	53.61	56.08	44.97
Classic 8 g	32.75	35.75	41.25	5.14	7.54	11.24	60.12	59.46	47.67
Pendi 1000 g	41.36	44.89	40.35	6.97	9.75	8.06	45.93	47.58	62.62
HW twice	29.75	33.75	31.25	4.83	7.26	7.05	62.53	60.97	67.18
U. Control	72.50	85.75	91.00	12.89	18.60	21.48	-	-	-
S.Em (±)	3.85	4.97	2.78	1.04	1.16	0.81	-	-	-
CD at 5%	11.44	14.77	8.26	3.09	3.45	2.41	-	-	-

Table 4. Effect of treatments on weed population, yield attributes and seed yield in soybean

Treatment	No. of Plants m ⁻²	No. of pods plant ⁻¹	No. of seeds pod ⁻¹	100 seed weight (g)	Seed yield (q ha ⁻¹)	Yield increase over unweeded control (%)	Weed Index (WI)
Classic 2 g	32.00	23.7	2.6	21.85	24.87	46.81	21.99
Classic 4 g	34.50	26.5	2.9	21.59	29.45	73.45	7.62
Classic 6 g	28.25	20.0	2.1	21.18	21.99	29.81	31.02
Classic 8 g	20.75	18.3	1.9	21.76	18.16	7.20	43.04
Pendi 1000 g	31.25	25.9	2.5	21.52	28.73	69.59	9.88
HW twice	35.50	27.6	2.9	21.48	31.88	88.19	-
U. Control	34.25	13.8	1.6	21.35	16.94	-	46.86
S.Em (±)	1.24	1.06	0.48	0.32	1.96	-	-
CD at 5%	3.68	3.15	NS	NS	5.82	-	-

Classic-25 WP @ g.a. ha⁻¹ recorded 6.84, 9.06 and 7.33 g m⁻² dry matter weed at 25, 50 and 75 DAS respectively. This was statistically at par with hand weeding twice and Classic-25 WP @ 6 and 8 g.a. ha⁻¹ at all stages of crop growth (Table 3).

Effect on crop :

Classic-25 WP @ 8 g.a. ha⁻¹ had phytotoxic symptom on crop plant as it was evident from the count of plants m⁻². This higher dose of Clasic-25 WP hindered the germination of the crop plant and thereby, reduced the crop stand and ultimately affected the crop yield though weeds were controlled effectively at different growth stages of the crop. This is corroborated with the findings of Kumbhakar and Bhattacharya.

Clasic-25 WP @ 4 g.a.i. ha⁻¹ had no phytotoxic symptom and gave a crop yield of 29.45 q ha⁻¹. This was statistically at par with hand weeding twice. Pendimethalin 30 EC @ 1000 g a.i. ha⁻¹ was equivalent with classic 25 WP i.e. 2 g a.i. ha⁻¹ in respect of yield of the crop (Table 4).

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