

### Weed Control Studies in Soybean\*

Soybean (*Glycine max* (L.) Merrill.) is a crop of high nutritive value having 40 per cent protein and 20 per cent oil. Weed infestation in soybean is one of the major hurdles limiting its productivity. The yield reduction could be as high as upto 71 per cent (Chandel and Saxena, 1988; Reddy *et al.*, 1990). The present study was undertaken to estimate the efficacy of herbicides to control weed in soybean.

A field experiment was conducted at College of Agriculture, University of Agricultural Sciences, Dharwad, during kharif 1996. The soil of the experimental site was black (vertisols) with pH of 7.70. The soil was low in available nitrogen (180.90 kg ha<sup>-1</sup>), medium in available phosphorus (32.59 kg ha<sup>-1</sup>) and high in available potassium (386.00 kg ha<sup>-1</sup>). The treatments consisted of three herbicides and three post-emergence herbicides. They were compared with hand weeding supplemented with intercultivation, weedy check and weed free check. The data on weed count and weed dry weight were subjected to square root transformation using  $V \times + 0.5$  (Singh *et al.*, 1995).

The major weed flora observed in the experimental field were *Celosia argentea* L., *Amaranthus aspera* L., *Ageratum conyzoides* Linn., *Commelina benghalensis*, *Amaranthus viridis* (L.) *Phyllanthus niruri*, *Solanum nigrum*, *Cyperus rotundus*, *Cyperus iria*, *Cynodon dactylon*. Weed free check recorded significantly less number of weeds (0.71/m<sup>2</sup>) while, the number of monocot weeds were significantly higher in weedy check (8.49/m<sup>2</sup>). Two intercultivations with two hand weeding had significantly less number of monocot weeds (2.68) followed by alachlor (pre-emergence) (2.75) and pendimethalin (pre-emergence) (3.81). Highest dicot weeds were observed in

weedy check (3.50) whereas, it was lowest in weed free check (0.71). Two intercultivations + two hand weeding and pre-emergent applications of alachlor recorded comparatively lower number of dicot weeds (1.81).

Weed free check recorded significantly lower dry weight of both monocot and dicot weeds (0.71). The highest dry weight of monocot and dicot weeds (7.54 and 3.59 g/0.6 m<sup>2</sup>) were observed in weedy check. Two intercultivations + two hand weeding recorded significantly lower weed dry weight (2.3 g). Pre-emergence application of alachlor revealed significantly lower weed dry weight (2.42 g) while, highest weed dry weight (5.27 g) was with anilophos (pre-emergence). Cultural operations consisting of two intercultivations + two hand weeding indicated the lowest dry weight of dicot weeds (1.27) compared to herbicides. Among the herbicide treatments, pre-emergence application of alachlor showed lower dry weight of dicot weeds (1.29).

The higher grain and stalk yields were observed with weed free check (2220 kg and 35.3 q ha<sup>-1</sup>). Two intercultivations + two hand weeding recorded higher seed yield (2026.66 kg ha<sup>-1</sup>) which was significantly superior to herbicidal treatments. Among the herbicide treatments, the maximum seed yield (1810 kg ha<sup>-1</sup>) was recorded with alachlor (pre-emergence) while, anilophos (pre-emergence) recorded significantly lower seed yield (1253 kg ha<sup>-1</sup>).

The harvest index (0.38) was higher with two intercultivations + hand weeding twice. Among herbicide treatments, alachlor (pre-emergence) exhibited the highest harvest index (0.37), it was minimum with propaquizafop, (post-emergence).

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Table 1. Effect of different weed control treatments on weed population and weed dry matter in soybean

Treatments	Weed population (No./m <sup>2</sup> ) at 40 DAS		Weed Dry Matter (g/0.6 m <sup>2</sup> ) at 40 DAS	
	Monocot	Dicot	Monocot	Dicot
1. Alachlor @ 2.0 a. i./ha (Pre-em)	2.75 (7.07)	1.81 (2.78)	2.42 (5.38)	1.29 (1.16)
2. Pendimethalin 30 EC @ 1.0 kg a. i. / ha (Pre-em)	3.81 (14.06)	2.22 (4.45)	2.95 (8.23)	1.41 (1.48)
3. Fenoxaprop-P 9 EC @ 50 g a.i./ ha (Post-em) at 20 DAS	5.76 (32.71)	2.63 (6.40)	3.94 (15.05)	1.64 (2.19)
4. Fenoxaprop-P 9 EC @ 70 g a.i./ ha (Post-em) at 20 DAS	4.28 (17.80)	2.57 (6.10)	3.37 (10.89)	1.47 (1.66)
5. Propaquizofop 10 EC @ 50 g a.i. /ha (Post-em) at 20 DAS	5.96 (35.04)	2.22 (4.45)	4.69 (21.52)	1.66 (2.25)
6. Propaquizofop 10 EC @ 70 g a.i. /ha (Post-em) at 20 DAS	5.01 (24.70)	1.98 (3.43)	3.83 (14.21)	1.48 (1.69)
7. Anilophos @ 1.5 a. i. /ha (Pre-em)	6.29 (39.66)	2.22 (4.45)	5.27 (27.35)	1.93 (3.24)
8. Imazethapyr @ 75 g a.i. /ha (Post - em) at 20 DAS	5.04 (25.06)	1.98 (3.42)	4.16 (16.81)	1.44 (1.58)
9. Imazethapyr @ 100 g a.i. /ha (Post - em) at 20 DAS	5.14 (26.01)	1.90 (3.13)	3.50 (11.76)	1.69 (2.37)
10. Two intercultivations + two hand weeding at 30 and 40 DAS	2.68 (6.70)	1.81 (2.78)	2.30 (4.79)	1.27 (1.12)
11. Weed free check	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)
12. Weedy check	8.49 (71.57)	3.50 (11.7)	7.54 (56.40)	3.59 (12.3)
SEM±	1.106	0.280	0.228	0.303
CD at 5%	3.243	0.822	0.843	0.888

Pre-em : Pre-emergence, Post-em : Post - emergence, DAS : Days after sowing  
 Figures in the parentheses indicate original values.

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Table 2. Effect of different weed control treatments on seed yield (kg/ha), stalk yield (q/ha) and harvest index in soybean

Treatments	Seed yield (kg/ha)	Stalk yield (q/ha)	Harvest index
1. Alachlor @ 2.0 a. i./ha (Pre-em)	1810.00	31.16	0.37
2. Pendimethaln 30 EC @ 1.0 kg a. i. / ha (Pre-em)	1720.00	30.13	0.36
3. Fenoxafrop-P 9 EC @ 50 g a.i./ ha (Post-em) at 20 DAS	1430.00	26.15	0.34
4. Fenoxafrop-P 9 EC @ 70 g a.i./ ha (Post-em) at 20 DAS	1510.00	26.96	0.35
5. Propaquizofop 10 EC @ 50 g a.i. /ha (Post-em) at 20 DAS	1418.33	27.00	0.34
6. Propaquizofop 10 EC @ 70 g a.i. /ha (Post-em) at 20 DAS	1503.33	26.16	0.36
7. Anilophos @ 1.5 a. i. /ha (Pre- em)	1558.33	23.16	0.36
8. Imazethapyr @ 75 g a.i. /ha (Post - em) at 20 DAS	1253.33	22.50	0.35
9. Imazethapyr @ 100 g a.i. /ha (Post - em) at 20 DAS	1526.66	26.33	0.36
10. Two intercultivations + two hand weeding at 30 and 40 DAS	2026.66	30.75	0.38
11. Weed free check	2220.00	35.33	0.39
12. Weedy check	814.00	17.30	0.31
SEM±	12.040	1.360	0.005
CD at 5%	33.320	3.988	0.016

Pre-em : Pre-emergence, Post-em : Post - emergence, DAS : Days after sowing

**References**

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