

Chemical control of weeds in safflower (*Carthamus tinctorius*)

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Safflower (*Carthamus tinctorius* L.) is an important oilseed crop. It is poor weed competitor at initial stages of growth. A field trial was conducted during winter (*rabi*) season of 1988–89 at Ludhiana, to find out suitable herbicide. The soil was loamy sand, having pH 8.0, low in organic carbon (0.17%), available nitrogen (112.2 kg/ha), phosphorus (11.6 kg/ha) and medium in available potassium. The treatment consisted of 2 levels of each alachlor (1.5 and 2.5 litres/ha), fluchloralin (0.75 and 1.25 li-

ters/ha), pendimethalin (0.75 and 1.25 litres/ha), terbutryn (0.50 and 0.75 kg/ha), methabenzthiauron (1.00 and 1.50 kg/ha), isoproturon (0.75 and 1.00 kg/ha), 2 hand-weedings and a unweeded control. The experiment was replicated 4 times in randomized block design.

After the lay out of the experiment, fluchloralin was applied before the sowing (pre-plant) and all other herbicides were applied after the sowing of the experiment as pre-emergence.

Table 1. Effect of different herbicides on dry matter of weeds, growth and yield of safflower

Treatment	Dose (kg or litre/ha)	Plant height (cm)	Heads/ plant*	Seeds/ head	Weed dry weight (q/ha)	Seed yield (q/ha)
Alachlor	1.50	143.0	36.1	25.25	12.10	12.43
Alachlor	2.50	144.1	38.5	26.72	10.40	15.28
Fluchloralin	0.75	143.5	34.5	26.10	10.20	12.53
Fluchloralin	1.25	143.6	34.6	25.14	11.13	13.18
Pendimethalin	0.75	144.2	39.6	27.49	9.63	16.49
Pendimethalin	1.25	142.2	38.2	26.64	9.41	15.78
Terbutryn	0.50	144.3	39.3	27.03	9.37	15.50
Terbutryn	0.75	144.8	41.6	26.99	9.22	16.43
Methabenzthiauron	1.00	142.5	36.4	25.95	10.71	13.61
Methabenzthiauron	1.50	136.8	31.2	23.42	9.85	8.43
Isoproturon	0.75	137.4	32.1	23.18	10.22	9.00
Isoproturon	1.00	134.8	31.8	23.63	10.08	8.62
Hand-weedings	2	142.6	38.1	26.63	11.71	14.90
Unweeded control		141.7	30.0	23.73	15.98	9.90
CD (P = 0.05)		3.2	3.14	1.36	1.47	2.03

*Flower head

The crop was sown on 24 October 1988. The seed of 'Bhima' safflower @ 17.50 kg/ha was used. The sowing was done by dibbling method at a plant spacing of 45 cm x 20 cm. A dose of 50 kg of nitrogen and 30 kg/ha of each of phosphorus and potash was applied. Half of the N and full dose of P and K were applied at the time of sowing and remaining half dose of N was side-dressed 40 days after sowing.

To assess the performance of different herbicides, observations on the growth and yield of safflower were made. The dry matter of weeds was recorded by placing a 50 cm quadrat at 2 places in each plot.

Dry-matter accumulation by weeds at harvest showed that it was lowest in plots treated with terbutryn, followed by pendimethalin, isoproturon, methabenzthiauron, fluchloralin and alachlor.

The yield data revealed that application of herbicides significantly affected the seed yield of safflower. The application of pendimethalin and terbutryn registered significantly higher seed yield than the unweeded control and were at par with 2 hand-weedings. Pendimethalin @ 0.75 litre/ha gave highest seed yield of 16.49 q/ha, which was followed by the yield obtained under terbutryn (0.75 kg), pendimethalin (1.25 litres), and terbutryn 0.50 kg/ha.

Pre-emergence application of isoproturon and (0.74 and 1.00 kg/ha) and methabenzthiauron at higher dose (1.50 kg/ha) though gave effective control of weeds, these were found phytotoxic to the safflower and thus gave significantly poor seed yield compared with hand-weedings and the unweeded control. The phytotoxic effects of higher dose of substituted urea herbicides on safflower was also observed by Gacso and Foldesi (1979).

The higher seed yield in pendimethalin and terbutryn-treated plots was mainly due to reduction in weed biomass and increase in yield attributes like number of flower heads/plants and number of seeds/flower head (Table 1). Similar increase in yield of safflower was observed with these herbicides by Jain *et al.* (1985).

It was concluded that pre-emergence application of pendimethalin, 0.75 litre, terbutryn 0.75 kg/ha and 2 hand-weedings were equally effective in controlling weeds in safflower.

REFERENCES

- Gacso and Foldesi, D. 1979. Chemical weed control experiments in false saffron (*Carthamus tinctorius* L.). *Herba Hungarica* 18 (1): 75-89 (*vide Weed Abstracts* 2109).
- Jain, K. K., Tiwari, J. P. and Bisen, C. R. 1985. Effect of herbicides on control of *Phalaris minor* and yield of safflower. *Indian Journal of Weed Science* 17 (1): 43-46.