

Studies on Pre-sowing and Pre-emergence Herbicides for Weed Control in Safflower (*Carthamus tinctorius* L.)

BY

R. KULANJAIVELL¹, V. S. SHANMUGASUNDARAM², N. T. JAGANNATHAN³,
Y. B. MORACHAN⁴ and S. SANKARAN⁵

ABSTRACT

A field trial was laid out to evaluate herbicides for effective weed control in safflower. EPTC, alachlor and nitrofen were tried in two different doses each along with control and hand weeding. Nitrofen and alachlor were found to be effective in reducing weed numbers. Application of herbicides did not influence the plant characters except the secondary branches. Alachlor at 15 l a. i./ha was found to have effective weed control followed by hand weeding twice.

INTRODUCTION

The growth habit of safflower makes it extremely susceptible to weed competition following emergence. After emergence the plants remain in a rosette stage for a period of 3 to 4 weeks and during this period control of weeds is important. Due to intense weed competition the reduction in yield may reduce the profit and in extreme cases crop failure may occur. Mechanical weeding in young safflower crop is difficult and it may cause damage to seedlings. Herbicides have proved of some success in controlling weeds in safflower. Trials conducted in U. S. A., Australia, and other countries have indicated that EPTC, trifluralin, and diuron applied as pre-emergence

have given the greatest degree of weed control with least damage to safflower plant (Rijn, 1964; Harbison, 1968 and Weiss, 1971). A new compound CP 31675 at 1.12 to 2.24 kg/ha was recommended for weed control in safflower and found to be effective against *Setaria* spp. (Pans, 1967). In India phenoxyene was found to be toxic to safflower (Fawlowski, 1961). Evaluation of herbicides for its selectivity in safflower has not been reported so far in India. With a view to fix a suitable herbicide for weed control in irrigated safflower, a trial was taken up with 3 commercially available herbicides.

1. and 2. Assistant Professors, 3. Instructor, 4. Professor and 5. Associate Professor, Department of Agronomy, Tamil Nadu Agricultural University, Coimbatore 641003.

MATERIALS AND METHODS

The investigation was undertaken during summer, 1973 at the Tamil Nadu Agricultural University Farm, Coimbatore. A total of eight weed control treatments were tried; unweeded control, hand weeding twice (15 and 30 days after sowing), EPTC (eptam) 1.0 and 1.5 l. a. i./ha, alachlor (lasso) 1.0 and 1.5 l. a. i./ha and nitrofen (Tok E-25) 1.5 and 2.0 l. a. i./ha. Randomised block design was adopted and the treatments were replicated thrice. The gross and net plot sizes were 3.9 × 3.3 m and 3.0 × 3.3 m respectively. EPTC was incorporated into the soil with a rake before sowing.

Alachlor and nitrofen were applied as pre-emergence spray immediately after sowing.

Safflower (Var. K. 1) was sown on 13-3-73 with a spacing of 45 × 15 cm. Nitrogen was applied at 20 kg/ha as basal dressing and the crop was irrigated as and when required. A hand weeding was given to all the treatments on 30th day after sowing. Weed counts and weed dry weight were recorded on 30th day and at harvest and the data are given in Table 1. Observations on growth and yield attributes of the crop were also recorded and are presented in Table 2. The

TABLE. 1. Effect of weed control treatments on weed attributes

Treatments	No. of weeds per sq. m.		Dry matter of weeds in g / sq. m.	
	30th day	At harvest	30th day	At harvest
Control	150	79	46.00	143.66
Hand weeding on 15th and 30th day	62	66	8.00	21.66
EPTC 1 l./ha	104	83	43.33	92.33
EPTC 1.5 l./ha	76	54	17.00	91.00
Nitrofen 1.5 l./ha	39	49	27.00	152.00
" 2 l./ha	26	40	11.33	72.00
Alachlor 1 l./ha	41	39	9.33	70.33
" 1.5 l./ha	10	24	9.00	24.66
S. E.	16	13	6.27	13.91
C. D. at 5%	47	N. S.	19.02	42.20

crop was harvested 85 days after sowing and the yield was recorded.

RESULTS AND DISCUSSION

Dactyloctenium aegyptium Beauv., *Echinochloa colona* Link., *Panicum* spp. and *Trianthema portulacastrum* L. were found to be the dominating weeds arranged in the order of their intensity of infestation.

The weed counts taken on 30th day (Table 1) was very low in alachlor at 1.5 l./ha and it was high in the

unweeded control. Among the herbicides, nitrofen and alachlor were efficient in curtailing the number of weeds. The weed counts taken at harvest was not significant. The dry weight of weeds on 30th day after sowing was high in the control and EPTC (1 l./ha) treated plots. In all the other treatments the dry weight was on par. The dry matter of weeds recorded at harvest has shown that alachlor at 1.5 l. a. i./ha recorded low weed infestation and it was on par with hand weeding. In all the other treatments the weed infestation was high.

TABLE 2. Effect of weed control treatments on yield components and yield

Treatments	Height of plant (cm)	No. of primary branches per plant	No. of secondary branches per plant	No. of earheads per plant	Diameter of earheads (cm)	No. of seeds per head	Yield (kg/ha)
Control	58.2	6.2	7.2	15.4	1.88	16.1	347
Hand weeding	61.3	6.7	9.1	24.1	1.99	25.3	704
EPTC 1 l./ha	60.2	6.9	10.2	20.3	1.99	21.5	377
EPTC 1.5 l./ha	60.3	7.7	8.8	22.7	1.78	20.4	632
Nitrofen 1.5 l./ha	59.3	6.6	11.7	27.5	1.78	22.1	587
.. 2 l./ha	59.3	6.6	11.7	27.5	1.83	21.5	574
Alachlor 1 l./ha	55.6	7.4	12.6	23.4	1.89	22.2	653
.. 1.5 l./ha	55.6	8.2	12.6	29.2	1.88	23.6	837
S. E.	3.0	0.6	1.2	3.4	0.08	3.6	47
C. D. at 5%	N. S.	N. S.	3.5	N. S.	N. S.	N. S.	

The observations on growth attributes of the crop were not statistically significant except in the number of secondary branches. In control and EPTC (1.5 l/ha) treatments, the number of secondary branches were low while the other treatments were statistically equal.

In the case of grain yield, alachlor (1.5 l/ha) has recorded the highest yield of 837 kg/ha which was on par with hand weeding. From the results, it is clear that applying alachlor 1.5 l. a. i./ha as pre-emergence spray followed by one hand weeding on 30th day is equivalent to hand weeding twice. As regards the comparative economics, a hand weeding by 30 women/ha at Rs. 3/woman, it was worked out to be Rs. 90/ha. In case of chemical weeding the cost of alachlor (lasso) at 3 litres of commercial product/ha at Rs. 25/l, it was Rs. 75/ha only. By adding the application charges at Rs. 15/ha the

total cost of lasso application was Rs. 90/ha. Since the cost of weeding by chemical and manual method is same, chemical method may be recommended for its simplicity and labour-saving technique.

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