

Studies on Chemical Weed Control in Tomato

By

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ABSTRACT

Alachlor at 2.0 kg, nitrofen at 2.0-2.7 kg and metribuzin at 0.5 to 1.0 kg a.i./ha resulted in good early weed control in tomato. Alachlor and metribuzin gave yields comparable to hand weeding in combination with earthing up on 30th day.

INTRODUCTION

Chemical weed control has been successfully practiced in tomato with diphenamid, amiben and trifluralin. Different herbicides like EPTC (Morans, 1961), alachlor (Leela *et. al.*, 1972) and nitrofen (Ayodhya Prasad and Hiralal, 1972) were found effective for weed control in tomato. Investigations were taken up on the chemical weed control in tomato with different herbicides, combination of herbicides and the results are discussed in this paper.

MATERIALS AND METHODS

Field study was taken up during monsoon, 1974 with EPTC, alachlor, nitrofen and metribuzin at various levels and combinations (Table). Farmers' method of one hand weeding followed by an earthing up and hand weeding was also included besides an unweeded control. The seedlings were planted on the sides of ridges with a spacing of 75 x 60 cm. Earthing up of the crop was taken up on the 30th day for all the treatments except unweeded control and no weeding was given on the 45th

day except hand weeding treatment. Data were collected on weed population, dry matter production, plant growth and fruit yield.

RESULTS AND DISCUSSION

The main weed species found was *Trianthema portulacastrum*. It constituted eighty per cent of the weed population. Other weed species found in the experimental area were *Gynandropsis pentaphylla*, *Portulaca oleracea*, *Cyperus rotundus* and other grasses like *Echinochloa* sp.

Weed count on the 30th day revealed that the data (Table) was not statistically significant. Dry matter production of weeds on the 30th day/ha showed that control (1666 kg per ha) has recorded significantly higher dry matter compared to other treatments. Various levels of metribuzin effectively controlled the weeds and resulted significantly lower dry matter production (44-110 kg/ha). With 3.0 kg a.i. of pre-planting EPTC + early post emergence of 0.50 kg a.i. of metribuzin, effective weed control has been resulted and

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TABLE. Effect of herbicides and mechanical Weed Control methods on Weed, plant growth and yield of tomato

Treatments	No. of weeds/m ²		Weed dry matter kg/ha		Plant height (cm)		Fruit yield kg/ha
	30 days	60 days	30 days	60 days	45 days	At harvest	
EPTC 3.0 Kg a.i./ha	353 (2.5)	496 (2.7)	453 (21.0)	1000	34.8	50.3	15122
EPTC 4.0 Kg a.i./ha	621 (2.8)	337 (2.5)	533 (22.8)	1147	37.6	47.5	16903
EPTC 5.0 Kg a.i./ha	446 (2.6)	668 (2.8)	460 (20.8)	1233	37.9	49.1	13202
Alachlor 1.0 Kg a.i./ha	160 (2.4)	360 (2.5)	226 (15.1)	1373	40.5	52.4	20547
Alachlor 2.0 Kg a.i./ha	203 (2.3)	415 (2.6)	220 (14.8)	1280	35.6	50.1	18189
Nitrofen 1.0 Kg a.i./ha	295 (2.5)	341 (2.5)	373 (19.3)	1000	37.4	56.2	11277
Nitrofen 2.0 Kg a.i./ha	303 (2.4)	431 (2.6)	253 (15.9)	893	41.9	51.8	17441
Metribuzin 0.50 Kg a.i./ha (Pre-em.)	128 (2.1)	547 (2.7)	110 (10.4)	1080	44.0	58.1	22916
Metribuzin 0.75 Kg a.i./ha (Pre-em.)	163 (2.2)	495 (2.6)	66 (7.0)	800	39.9	52.3	19654
Metribuzin 1.00 Kg a.i./ha (Pre-em.)	114 (2.1)	355 (2.5)	70 (8.5)	1067	45.4	54.3	22303
Metribuzin 0.50 Kg a.i./ha (Post-em.)	132 (2.1)	484 (2.7)	44 (6.7)	733	39.5	55.7	18099
Metribuzin 1.00 Kg a.i./ha (Post-em.)	143 (2.2)	483 (2.7)	60 (7.7)	867	36.80	53.1	18186
Metribuzin 1.00 Kg a.i./ha (Post-em.)	96 (2.1)	307 (2.4)	46 (5.9)	600	38.3	55.9	20597
EPTC+Alachlor 3.0+1.0 Kg a.i./ha (Pre-pl.+Pre-em.)	323 (2.5)	623 (2.8)	213 (14.5)	1000	35.9	49.4	11930
EPTC+Nitrofen 3.0+2.0 Kg a.i./ha (Pre-pl.+Pre-em.)	403 (2.6)	737 (2.8)	353 (18.8)	1267	32.6	49.1	14562
EPTC+Metribuzin 3.0+0.5 Kg a.i./ha (Pre-pl.+Pre-em.)	165 (2.2)	388 (2.9)	173 (12.9)	1413	32.9	52.3	18311
EPTC+Metribuzin 3.0+0.5 Kg a.i./ha (Pre-pl.+Post-em.)	116 (2.0)	339 (2.5)	— (1.0)	733	33.5	46.0	15187
EPTC 3.0 Kg a.i./ha+one hand weeding	417 (2.6)	671 (2.8)	433 (20.8)	713	34.1	52.5	13966
Hand Weeding	465 (2.6)	473 (2.6)	373 (19.3)	1200	41.3	55.7	21032
Control	563 (2.8)	425 (2.6)	1666 (40.5)	1910	43.7	51.8	8481
C. D. (P=0.05)	N. S	N. S	9.1	345	8.4	N. S	5204

Figures in parentheses are transformed values N. S: Not significant

samples were not available for dry matter estimation.

Weed count on the 60th day after transplanting indicated that there was not much difference in the weed population among the treatments. This is attributed to the loss of persistence of the herbicides which might have been caused with degradation and fixation in the clay complex with earthing up the crop on the 30th day. Earthing up is one of the important tillage practices adopted in the experiment for all the treatments except control. The data on dry matter production on the 60th day revealed that control registered significantly higher dry matter production. Different doses of metribuzin and EPTC + post-emergence metribuzin treatments registered significantly lower dry matter (733-1080 kg) compared to control (1910 kg) and hand weeding (1200 kg/ha).

Plant height on the 45th day after planting was indicating no definite trend, and at the final stage also it was not varying due to treatments. Significantly higher yield of fruits (18,099-22,916 kg) was registered by different levels of metribuzin, alachlor and EPTC + metribuzin (post emergence) combination which were on a par with hand weeding (21032 kg). The increase in yield with metribuzin compared to other treatments and control is attributed to the increased weed control with selectivity of metribuzin for tomato. The present finding falls in line with Fortino and Splittstoesser (1974) who have reported effective weed control

and higher yields of tomato with surface application of metribuzin. Similar results were reported by Mulder (1972). Good weed control with alachlor which resulted in higher fruit yield was reported by Leela *et al.* (1972). Nitrofen 2.0 kg, EPTC 4.0, 5.0 kg, EPTC 3.0 + metribuzin 0.5 kg (pre-emergence) have recorded comparable yields of 13202 to 17441 kg/ha (Table). EPTC (3.0 kg) + alachlor (2.0 kg) combination and nitrofen (1.0 kg) have given yields comparable with that of control probably due to phytotoxic effect resulted in EPTC+alachlor combination and low persistence in nitrofen treatment. It has been noted that the growth of the plant was affected as seen from leaf scorching in EPTC+alachlor combination during the early stage of the crop.

Earthing up of the crop, an important operation usually practiced in tomato culture, was taken up on the 30th day. This tillage operation disturbed the early weed-free environment and resulted in the weed growth after 30 days. In the present experiment a second hand weeding was given only to the treatment 'farmers method'. As such earthing up of the crop and chemical weed control are incompatible in accomplishing weed control. In the case of chemical weed control no inter-culture was done during experimentation and normal yields were reported by Dhuria *et al.* (1975). The need for closer spacing and earthing up tomato crop warrants further investigation in the context of chemical weed control.

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