

**Efficacy of Herbicides in Transplanted Tomato (*Lycopersicon esculentum* Mill.)
under Earthingup and without Earthingup Situation**

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Weeds compete with transplanted tomato crop and reduce the fruit yield to the tune of 57.6% (Singh *et al.*, 1989). Weeding during early stages of crop growth is required due to slow growth of transplanted tomato. Moreover, continuous rains do not allow timely control of weeds manually at critical period of crop growth. Keeping this in view, present study was undertaken to find out an effective and economical herbicide for transplanted tomato under earthingup and without earthingup situations.

The field experiment was conducted during **kharif** seasons of 1997 to 1999 at Research Farm of All India Co-ordinated Research Programme, Gujarat Agricultural University, Anand. The soil of the experimental site was sandy loam in texture with alkaline reaction (pH 8.1), low in nitrogen, medium in available phosphorus and high in available potassium. The treatments comprised post-transplant application of alachlor, butachlor, fluchloralin, trifluralin and pendimethalin each at 1.0 kg ha⁻¹ and oxadiazon and metribuzin at 0.50 kg ha⁻¹ with and without earthingup at 45 days after transplanting (DATP), weed-free (five hand weedings at 20, 45, 60, 90 and 120 DATP) and unweeded check. Common hand weeding was done in all the herbicidal treatments at 45 DATP. Sixteen treatments were evaluated in randomized block design with four replications. Four weeks old healthy seedlings of tomato (cv. Mahabaleshwar) were transplanted at 90 cm x 60 cm spacing in August during all the seasons. Marketable tomato was harvested and recorded periodically.

The dominant weed species observed in the experimental field included *Eleusine indica*, *Cyperus iria*, *Phyllanthus niruri*, *Mollugo nudicaulis*, *Eragrostis major*, *Digitaria sanguinalis* and *Cynodon dactylon*. All the weed

control measures significantly reduced the weed dry weight as compared to unweeded control (Table 1). Minimum dry weight of weeds was recorded in five hand weedings with 82.3% weed control efficiency but was at par with post-transplant application of pendimethalin at 1.0 kg ha⁻¹ with and without earthingup at 45 DATP and oxadiazon at 0.50 kg ha⁻¹ with and without earthingup. Pendimethalin and oxadiazon applied before transplanting with higher persistence in sandy loam soil could be the reason for higher weed control efficiency as compared to other herbicide.

No phytotoxicity of post-transplant application of any of the herbicides was seen on tomato seedlings. The highest fruit yield of tomato was obtained under the treatment of five hand weedings which was significantly at par with post-transplant application of pendimethalin at 1.0 kg ha⁻¹ with and without earthingup and fluchloralin applied at 1.0 kg ha⁻¹ with earthingup at 45 DATP in pooled analysis. The increase in fruit yield of tomato due to application of pendimethalin could be attributed to better weed control efficiency. Five hand weedings gave the highest additional profit (Rs. 25112 ha⁻¹). Among herbicidal treatments, higher additional profit over control was obtained due to pendimethalin at 1.0 kg ha⁻¹ without earthingup followed by pendimethalin at 1.0 kg ha⁻¹ with earthingup, fluchloralin at 1.0 kg ha⁻¹ with earthingup and butachlor at 1.0 kg ha⁻¹ with earthingup.

REFERENCE

- Singh, G., V. M. Bhan and S. S. Tripathi, 1989. Relative efficacy of different herbicides on weeds in tomato crop. *Indian J. Weed Sci.* 13 : 180-184.

Table 1. Effect of treatments on weeds, fruit yield and economics of transplanted tomato

Treatment	Dose (kg ha ⁻¹)	Weed dry weight at harvest (kg ha ⁻¹)	Fruit yield (t ha ⁻¹)				Additional profit over control (Rs. ha ⁻¹)	Net ICBR
			1997	1998	1999	Pooled		
Alachlor	1.0	1382	31.58	25.35	29.80	28.91	15084	1:7.8
Alachlor+Earthingup	1.0	1168	32.23	25.58	31.22	29.67	16218	1:7.0
Butachlor	1.0	1267	21.69	28.48	30.82	26.99	11368	1:6.3
Butachlor+Earthingup	1.0	1106	31.87	28.89	32.14	30.96	18914	1:8.6
Fluchloralin	1.0	1152	26.92	29.31	34.28	30.17	16960	1:6.6
Fluchloralin+Earthingup	1.0	1131	29.74	29.34	35.54	31.54	19298	1:6.5
Trifluralin	1.0	1475	21.87	26.88	32.38	27.04	10686	1:4.1
Trifluralin+Earthingup	1.0	1271	26.31	27.56	33.12	28.99	14260	1:4.7
Pendimethalin	1.0	923	32.98	30.47	37.15	33.53	23154	1:7.5
Pendimethalin+Earthingup	1.0	967	31.85	29.48	38.43	33.25	22202	1:6.3
Oxadiazon	0.50	991	32.85	27.63	33.04	31.17	18674	1:6.5
Oxadiazon+Earthingup	0.50	1032	29.61	28.56	33.70	30.62	17176	1:5.2
Metribuzin	0.50	1425	26.32	25.15	29.98	27.15	16634	1:3.7
Metribuzin+Earthingup	0.50	1099	26.92	26.40	32.56	28.62	13194	1:4.1
Five hand weedings		630	35.28	31.23	39.15	35.22	25112	1:5.6
Weedy		3552	18.01	21.62	21.27	20.30	-	-
LSD (P=0.05)		436	9.71	NS	5.57	3.91	-	-

NS-Not Significant.