Indian J. Weed Sci. 37 (3 & 4): 283-284 (2005) Integrated Weed Management Studies in Tomato Crop of Sub-Montane and Low Hills Sub-Tropical Conditions of HP

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In Himachal Pradesh, there is a great scope of vegetables, especially, "off-season vegetable crops". Tomato crop is very important among the off-season vegetables and is being grown in about 3000 ha of land in Sub-montane low hills, sub-tropical conditions of HP with a production of 53,000 mt. Weeds are one of the major problems of tomato cultivation. Favourable weather conditions, wider spacing, frequent irrigation and liberal doses of manure and fertilizers promote the luxuriant growth of weeds (Singh and Tripathi, 1988). In hills, manual weeding is a common practice and herbicides are hardly used for the purpose. Hence, commonly used herbicides can find a place in vegetable cultivation. Therefore, the present investigation was undertaken to find out the performance of various herbicides as alone, followed by hand weeding and manual

weeding alone for weed control efficiency and yield.

A field experiment was conducted at Hill Agricultural Research and Extension Centre. Dhaulakuan, Distt. Sirmour (HP) during spring summer seasons of 2002 and 2003. The experimental farm is situated at 30.4° N latitude and 77.5° E longitude (468 m a. s. l.). The soil was acidic in reaction and medium in NPK availability. The texture of the soil was sandy loam. In all, 17 treatments comprised alachlor, fluchloralin and pendimethalin each at 1.0, 1.5 and 2.0 kg ha⁻¹ and lower dose of each herbicide followed by hand weeding at 40 days after transplanting. Fluchloralin was incorporated into the soil by doing light hoeing. Other herbicides were applied as pre-emergence. Hand weeding at 40 DAT, hand weeding at 60 DAT, hand weeding at 40 DAT followed by another HW at 60 DAT, weed-free

Treatment Dose Weed density Weed dry weight Fruit yield (kg ha') (No. m⁻²) (g m⁻²) (kg ha-1) 2002 2003 2002 2002 2003 2003 Alachlor 1.0 94 (9.74) 86 (9.31) 52.3 (7.30) 49.8 (7.10) 9600 11500 37.1 (6.10) 35.3 (6.00) Alachlor 1.5 83 (9.16) 75 (8.70) 12100 14900 32.0 (5.70) Alachlor 2.0 66 (8.18) 62 (7.91) .32.3 (5.70) 17800 22200 Alachlor fb HW 1.0 73 (8.60) 68 (8.30) 34.4 (5.90) 32.9 (5.80) 15400 18600 Fluchloralin 1.0 12 (10.63) 104 (10.23) 49.2 (7.00) 46.6 (6.80) 8400 10300 Fluchloralin 1.5 98 (9.94) 92 (9.61) 38.4 (6.20) 37.5 (6.20) 9500 11800 67 (8.24) 31.6 (5.70) Fluchloralin 2.0 77 (8.83) 35.3 (6.00) 13300 16200 Fluchloralin fb HW 1.0 84 (9.21) 85 (9.26) 36.5 (6.10) 32.4 (5.70) 11500 13800 Pendimethalin 1.0 56 (7.54) 50 (7.12) 38.2 (6.20) 35.6 (6.00) 16900 20200 34.0 (5.90) Pendimethalin 43 (6.63) 1.5 39 (6.32) 34.9 (5.90) 18200 22400 Pendimethalin 2.0 38 (6.24) 32 (5.73) 28.1 (5.30) 27.3 (5.30) 18600 24500 Pendimethalin fb HW 1.0 32 (5.74) 29 (5.47) 26.4 (5.20) 25.9 (5.00) 20300 25400 HW at 40 DAT 116 (10.81) 124 (11.18) 69.3 (8.30) 64.3 (8.00) 6400 7800 HW at 60 DAT 98 (9.94) 122 (11.08) 54.6 (7.40) 57.2 (7.60) 8100 9800 HW at 40 and 60 DAT 95 (9.79) 91 (9.58) 52.7 (7.30) 50.0 (7.10) 9200 11500 Weed-free 0 (1.00) 0 (1.00) 0.00 (1.00) 0.00 (1.00) 21400 26300 158 (12.58) 77.3 (8.80) 79.3 (8.90) 8400 Weedv 139 (11.83) 7000 LSD (P=0.05) 0.53 0.50 0.46 0.43 1420 1670

Table 1. Effect of treatments on weeds and crop

fb-followed by, HW-Hand weeding at 40 days after transplanting, DAT-Days after transplanting.

and weedy check (No weeding) were the other treatments. The treatments were replicated thrice in a randomized block design. Variety Rupali spaced at 90 x 30 cm was grown.

The experimental crop was infested with the prominent weed species i. e. Fumaria parviflora, Cyperus rotundus, Cynodon dactylon, Ageratum conyzoides and Poa annua. Weed density reduced significantly in all the treatments when compared with the weedy check. Weed intensity reduced with the increase in the doses of herbicides or herbicide followed by hand weeding. The lowest weed intensity and dry weight were recorded with pendimethalin at 1.0 kg ha⁻¹ followed by hand weeding at 40 days after transplanting. The highest weed intensity was recorded in the weedy check.

Weed density and weed dry weight were less during the 2nd year of experimentation and it may be due to the favourable climatic/weather conditions for the herbicidal action (Table 1).

Fruit yield was significantly higher in weedfree treatment. However, it was at par with pendimethalin at 1.0 kg ha⁻¹ fb HW at 40 DAT (Table 1). This increase in yield may be due to the less weed density, lower weed dry weight and higher weed control efficiency.

REFERENCE

Singh, P. P. and S. S. Tripathi, 1988. Effect of herbicides and time of weeding on control and fruit yield of tomato. *Indian J. Weed Sci.* 20 : 39-43.