

Short Communication

Studies on Weed Management in Ber (*Ziziphus mauritiana* Lamk.)

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Ber (*Ziziphus mauritiana* Lamk.) is an important fruit crop of Rajasthan, due to lucrative returns farmers get. Ber exhibits greater susceptibility to weed competition than most other fruit crops. Weeds compete with the fruit crops for nutrients and moisture. The yield losses from 34 to 70% due to unchecked weeds have been reported in various fruit crops (Leela, 1993). Manual weedings are uneconomical and difficult. Work on the control of weeds by various herbicides has shown that weed control in different fruit crops gave good results (Dhuria *et al.* 1980 and Thatai *et al.* 1994), but such studies on ber are lacking. Therefore, the present investigation was carried out on weed management in ber.

The experiment was conducted in a 15-year-old Umran ber orchard located at SKN College of Agriculture, Jobner, during 1998-99 and 1999-2000 to find out the efficacy of various pre- and post-emergence herbicides along with hand and mechanical weeding. The plants in the orchard were planted at 8 x 8 m distance. The treatments given were: diuron (pre-emergence) followed by glyphosate (post-emergence) (T₁), diuron (pre-emergence) followed by paraquat (post-emergence) (T₂), atrazine

(pre-emergence) followed by glyphosate (post-emergence) (T₃), atrazine (pre-emergence) followed by paraquat (post-emergence) (T₄), hand weeding (3 times a year at 4 month interval) (T₅), hand weeding (6 times a year at 2 month interval) (T₆), weeding by power tiller (3 times a year at 4 month interval) (T₇), weeding by power tiller (6 times a year at 2 month interval) (T₈), local weeding practice (hand weeding once in a year) (T₉), and control (weedy check) (T₁₀).

The treatments were replicated thrice and there were two plants per unit. The experiment was laid out in RBD. All the herbicides were applied @ 2 kg ha⁻¹. Before pre-emergence spray, the area was cleaned off all the weeds and the herbicides were sprayed at pre- and post-emergence stages using 600 L water ha⁻¹. The post emergence herbicides were applied after 15 days of pre-emergence application. All the herbicidal treatments were repeated after a period of six months. Observations on weed population were recorded at 60 day interval.

The dominant weed species observed in the experimental orchard included monocot weeds (viz., *Cyperus rotundus*, *Cynodon dactylon*, *Gragestis minor*, *Sorghum halepense*, *Andropogon* spp.,)

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Table 1. Effect of pre- and post-emergence herbicides on weed control in ber

Treatment	Weed number m ⁻²						Mean	WCE*
	Days after first spray of pre-emergence herbicides			Days after second spray of pre-emergence herbicides				
	60	120	180	60	120	180		
Monocots (Grasses)								
T ₁	28.0	33.0	41.8	26.8	29.3	34.5	32.2	71.5
T ₂	38.0	41.8	49.2	35.0	39.5	43.0	41.1	63.7
T ₃	48.0	52.0	47.0	44.5	48.7	53.2	48.9	56.8
T ₄	44.2	47.2	68.7	40.7	45.2	51.2	49.5	56.2
T ₅	67.3	70.7	58.8	64.7	69.2	74.2	67.5	40.4
T ₆	56.7	60.2	70.7	52.5	57.8	63.7	60.2	46.7
T ₇	70.5	72.5	55.5	68.2	72.8	78.5	69.7	38.4
T ₈	51.8	57.2	80.0	48.7	52.7	80.5	61.8	45.4
T ₉	77.5	79.8	111.1	75.0	81.2	87.5	85.4	24.5
T ₁₀	105.3	113.3	131.3	102.3	109.8	116.7	113.1	—
SEm±	1.2	0.9	1.0	0.9	0.9	0.9	—	—
CD (P = 0.05)	3.5	2.7	2.9	2.6	2.7	2.7	—	—
Dicots (Broad leafed weeds)								
T ₁	14.5	19.2	23.8	13.8	17.0	20.7	18.2	70.2
T ₂	18.0	23.8	28.3	16.5	20.8	24.7	22.0	63.9
T ₃	25.0	27.7	33.7	21.0	24.5	29.3	26.9	56.0
T ₄	22.2	26.8	32.5	20.2	24.3	28.8	25.8	57.7
T ₅	34.2	39.5	44.5	31.2	37.3	42.7	38.2	37.3
T ₆	28.5	33.3	37.3	25.5	25.7	33.8	30.7	49.7
T ₇	36.2	41.5	45.8	32.3	36.2	40.8	38.8	36.4
T ₈	28.7	35.2	40.0	24.3	30.3	34.3	32.1	37.3
T ₉	38.5	44.7	49.2	35.2	43.3	45.7	42.7	29.9
T ₁₀	57.2	62.2	70.8	53.0	60.0	62.8	61.0	—
SEm±	1.0	1.0	1.0	0.9	1.0	1.2	—	—
CD (P = 0.05)	2.8	3.0	3.0	2.6	2.0	3.3	—	—

* Weed control efficiency over weedy check after 360 days of first spray (%).

Dactyloctenium aegyptium and dicot weeds (viz., *Chinopodium album*, *C. murale*, *Euphorbia hirta*, *Euphorbia thymbifolia*, *E. microphylla*, *Convolvulus arvensis*, *Oxalis corniculata*, *Digera arvensis* and *Boerhavia diffusa*).

All the treatments reduced the number of weeds significantly over control. The herbicidal treatment T₁ was observed to be the most effective in controlling weeds (Table 1). It reduced the monocot weeds (grasses) by 71.50% over control, which

Table 2. Effect of weed management on growth, yield and quality of ber

Treatment	Stem girth (cm)	Plant height (m)	TSS (%)	Acidity (%)	Yield	Yield increased over control (%)
T ₁	54.50	3.22	22.16	0.094	92.33	94.38
T ₂	51.83	2.96	20.66	0.107	84.83	78.59
T ₃	50.33	2.85	17.33	0.109	77.50	63.16
T ₄	51.33	2.94	18.50	0.113	79.67	67.73
T ₅	44.17	2.40	16.83	0.117	65.33	37.54
T ₆	48.50	2.36	17.83	0.112	67.66	42.44
T ₇	44.00	2.30	15.33	0.113	62.66	31.91
T ₈	49.50	2.66	16.00	0.108	71.50	50.53
T ₉	43.33	2.26	16.17	0.112	57.50	21.05
T ₁₀	41.00	2.11	15.66	0.114	47.50	—
SEm±	0.92	0.04	0.47	0.0015	1.14	—
CD (p=0.05)	2.63	0.12	1.34	0.0043	3.27	—

was closely followed by T₂ (63.69%), T₃ (56.79%) and T₄ (56.24%). Treatment T₁ also reduced dicot (broad leafed) weeds by 70.23%, followed by T₂ (63.90%), T₄ (54.70%) and T₃ (55.97%) over control. The herbicidal treatments reduced the weeds effectively and the results were significantly better than the hand weeding and mechanical weeding. Similar results were also reported by Jawanda *et al.* (1974) and Josan *et al.* (1987) in citrus.

The herbicide treatments increased vegetative growth and yield with better quality fruits over control, hand weeding and mechanical weeding (Table 2). Treatment T₁ exhibited maximum stem girth (54.50 cm), plant height (3.2 m), TSS (22.1%) and yield (92.3 kg plant⁻¹), and minimum acidity (0.094%). It is also clear from Table 2 that T₁ treatment increased 94.38% yield, followed by treatment T₂

(78.59%) over control. Thatai *et al.* (1994) in date palm and Dhuria *et al.* (1980) in stone fruits also reported similar findings.

References

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