

## STUDIES ON WEED MANAGEMENT IN FINGER MILLET (*Eleusine coracana* Gaertn.)

R. JAYAKUMAR, N. ASOKARAJA, N.KEMPUCHETTY and S.SANKARAN

Directorate of soil and crop management studies, Tamil Nadu Agricultural University, Coimbarore-641 003.

### ABSTRACT

Field experiments were conducted during *Kharif* 1986 and 1987 at Tamil Nadu Agricultural University, Coimbatore to study the weed management practices in finger millet. The major weed flora in the experimental plots was the *Trianthema portulacastrum* which constituted 85 per cent of the weed population. Pre-emergence application of Oxadiazon 0.5 kg.ha<sup>-1</sup> or pendimethalin 0.75 kg.ha<sup>-1</sup> followed by one late manual weeding at 30 days after transplanting reduced the weed number and dry matter production and enhanced the weed control efficiency yield and net profit.

KEY WORDS : Finger Millet, Weeds, Weed management.

Finger millet (*Eleusine coracana* Gaertn.) is cultivated in Tamil Nadu in an area of above 2m ha and is an important crop in many of the crop rotations. Finger millet receives adequate fertilization which compliment the weed competition to the crop. Effective weed management is needed for the accomplishment of higher yield. Number of herbicides were tried in early period and proved very effective. As early as in 1958, Naidu and Singh (1958) found that hand weeding was useful to control weeds in finger millet. Patro and Das (1972) reported that propanil (stam F34) was the effective herbicide to control weeds and to obtain highest grain yield in combination with one weeding. Promising results were obtained with pre-emergence buturon, post-emergence MCPA, propanil and 2, 4-D in this crop (Kasasian, 1971). Thangavel (1973) found that 2,4-D was the useful herbicide for finger millet where *Solanum elaeagnifolium* formed the main constituent of the weed flora. The above herbicides are not available in the market at present and hence the present study was conducted to find out suitable weed management practice for the finger millet crop with the available promising herbicides.

### MATERIALS AND METHODS

Field experiments were conducted at Tamil Nadu Agricultural University, Coimbatore, during *Kharif*, 1986 and 1987 to find out the effective weed management practice for finger millet CO.11. The experiment was laid out in a randomised block design with three replications. The soil was vertic ustropepts (Vertisol) containing 31.4 per cent clay. The pH of the soil was 8.2 and electrical conductivity 1.8 d.s.m<sup>-1</sup>. The organic carbon content was 0.3 per cent. The treatments were pre-emergence application of butachlor 1.25 kg.ha<sup>-1</sup>, pendimethalin 1.0 kg.ha<sup>-1</sup>, oxadiazon 0.75 kg.ha<sup>-1</sup> alone and butachlor 1.0 kg.ha<sup>-1</sup>, pendimethalin 0.75 kg.ha<sup>-1</sup> and oxadiazon 0.50 kg.ha<sup>-1</sup> followed by one late manual weeding 30 DAT. The above treatments were compared with farmers' practice of two manual weeding at 15 and 30 DAT and unweeded control. A basal dose of 30, 30 and 30 kg.ha<sup>-1</sup> of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O were applied. A top dressing of 30 kg.ha<sup>-1</sup> N was given at 30 DAT. Herbicides were sprayed two DAT with the help of a hand operated sprayer fitted with fan nozzle and irrigation was given immediately after application. Weed count and dry matter production (DMP) were taken on 45 DAT. The weed control

efficiency was worked out from the weed count as described by Mani *et al.* (1973). The yield and yield parameters were recorded at harvest.

## RESULTS AND DISCUSSION

The weed flora in the experimental plots consisted of *Cynodon dactylon*, *Dactyloctenium aegyptium* and *Chloris barbata* in grasses, *Cyperus rotundus* in sedges and *Trianthema portulacastrum*, *Amaranthus viridis*, *Flaveria australasica*, *Portulaca oleracea* and *Parthenium hysterophorus* in broad leaves. *Trianthema portulacastrum* was the major weed occupying 85 per cent of the total weed population followed by *D. aegyptium* (8.2%).

The weed count, weed dry matter and efficiency as influenced by various weed control treatments are presented in Table 1.

The weed control treatments in general reduced the weed number and weed DM at 45

DAT during both seasons (*kharif*, 1986 and 1987). Among the weed control treatments oxadiazon 0.5 kg.ha<sup>-1</sup> followed by one late manual weeding at 30 DAT proved superior to the rest of the treatments in reducing the weed population and weed DM which was evidenced by the highest weed control efficiency. The grain yield of finger millet was also the highest in the same treatment and was significantly superior to all the other treatments during *kharif*, 1986, whereas it was comparable with pendimethalin 0.75 kg.ha<sup>-1</sup> followed by one late manual weeding during *kharif*, 1987.

The economics of various weed control treatments are given in Table 2. Application of oxadiazon 0.5 kg.ha<sup>-1</sup> followed by one late manual weeding at 30 DAT gave the highest net return and net profit which was closely followed by application of pendimethalin 0.75 kg.ha<sup>-1</sup> with one late manual weeding at 30 DAT.

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Table 1. Weed number, weed dry matter and Finger millet yield as influenced by weed control treatments.

S.No	Treatments	Weed (No.m <sup>-2</sup> ) 45 DAT		Weed dry mater (kg.ha <sup>-1</sup> ) 45 DAT		Weed control efficiency (%)		Grain yield (kg.ha <sup>-1</sup> )		straw yield (t.ha <sup>-1</sup> )	
		1986	1987	1986	1987	1986	1987	1986	1987	1986	1987
1.	Butachlor 1.25 kg.ha <sup>-1</sup>	98.8	106.8	395	503	72.2	64.1	2313	2283	6.9	7.8
2.	Pendimethalin 1.0 kg.ha <sup>-1</sup>	77.2	74.8	328	443	78.3	74.9	2417	2440	7.2	8.2
3.	Oxadiazon 0.75 kg.ha <sup>-1</sup>	85.2	86.8	301	420	76.1	70.8	2525	2700	7.4	8.1
4.	Butachlor + Hand 1.0 kg.ha <sup>-1</sup> weeding at 30 DAT	65.2	53.2	315	387	81.7	82.1	2400	2760	7.8	8.4
5.	Pendimethalin + Hand 0.75 kg.ha <sup>-1</sup> weeding 30 DAT	58.8	54.8	275	347	83.5	81.6	2625	3013	7.8	8.5
6.	Oxadiazon + Hand 0.5 kg.ha <sup>-1</sup> weeding 30 DAT	21.2	33.2	215	420	94.0	88.8	2968	3027	8.1	8.5
7.	Hand Weeding twice 15 & 30 DAT	72.0	85.6	285	488	79.8	71.2	2667	2770	7.6	8.2
8.	Unweeded control	356	297.2	1028	1073	—	—	1458	1533	4.8	6.4
	CD (5%)	81.2	73.6	102	148	—	—	186	168	0.6	0.5

Table 2. Economics of weed control treatments

S.No. Treatments	Cost of cultivation excluding weeding Rs.ha <sup>-1</sup>	Cost of weed control treatment Rs.ha <sup>-1</sup>	Net return Rs.ha <sup>-1</sup>		Net profit Rs.ha <sup>-1</sup>	
			1986	1987	1986	1987
1. Butachlor 1.25 kg.ha <sup>-1</sup>	2500	240	5428	5555	2688	2815
2. Pendimethalin 1.0 kg.ha <sup>-1</sup>	2500	460	5670	5910	2710	2950
3. Oxadiazon 0.75 kg.ha <sup>-1</sup>	2500	475	5899	6345	2924	3370
4. Butachlor + Hand 1.0 kg.ha <sup>-1</sup> weeding 30 DAT	2500	360	5760	6510	2900	3650
5. Pendimethalin + Hand 0.75 kg.ha <sup>-1</sup> weeding 30 DAT	2500	510	6154	6973	3144	3963
6. Oxadiazon + Hand 0.5 kg.ha <sup>-1</sup> weeding 30 DAT	2500	485	6814	6997	3829	4012
7. Hand weeding twice 15.35 DAT	2500	520	6187	6488	3167	3468
8. Unweeded control	2500		3512	3963	1012	1463