

Integrated weed management in forage oat (*Avena sativa*)*

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Weed infestation is one of the major constraints limiting the production of crops. The plant yield as well as nutrient up take by the crop are reduced substantially on account of increased crop-weed interference (Singh *et al.* 1988). Reduction in crop yield due to weeds has been recorded up to 20 to 40% in winter cereals, depending upon the nature and persistence of weed population. Very little attention has been given to weed-control aspect in forage crops. Forage oat (*Avena sativa* L.) is a prominently cultivated winter forage

crop in India. It provides energy-rich nutritious and palatable forage to livestock. Owing to meagre information about weed management in oat, the forage yield potential of the crop could not be achieved. Hence a study was undertaken to find out the suitable weed-control measure for forage oat.

The experiment was conducted during winter (*rabi*) 1996–97, 1997–98 and 1998–99 at Faizabad, in randomized block design with 4 replications. There were 7 weed-control treatments including unweeded check under study (Table 1). The soil was sandy loam with pH 7.8, low available N (228.0 kg/ha) and P (7.4 kg/ha) and high K (278 kg/ha). 'Kent' oat was sown on 15, 12 and 15 November in 1996, 1997 and 1998 respectively using 100 kg seed/ha in rows 25 cm apart. The

*Short note

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Table 1 Weed population, dry-weed biomass, plant height, shoots, green-fodder and dry-matter of oat as affected by weed control (pooled data of 3 years)

Treatment	Weed population/m ²	Dry-weed biomass (tonnes/ha)	Plant height (cm)	Shoots/plant	Green-fodder yield (tonnes/ha)	Dry-matter yield (tonnes/ha)	Net return (Rs/ha) over control
Weedy check	13.2	1.6	57.3	2.3	34.8	8.3	
2,4D @ 0.75 kg ai/ha (6 WCS)	11.2	1.1	85.5	3.4	39.0	9.3	1 148
Hoeing (4 WCS)	10.1	0.8	95.7	4.2	42.8	10.8	2 040
Hoeing (4 WCS)+2,4-D @ 0.37kg ai/ha (6 WCS)	7.2	0.4	120.8	5.3	47.0	11.4	3 413
Manual weeding (4 WCS)	10.6	0.9	88.5	4.0	41.2	10.2	820
Manual weeding (4WCS) 2,4-D @ 0.37kg ai/ha (6 WCS)	7.6	0.5	116.6	5.0	46.2	11.2	2 513
Hoeing (3 WCS)+manual weeding (5 WCS)	5.8	0.2	130.4	6.1	49.4	12.2	3 520
CD (<i>P</i> =0.05)	1.0	0.1	2.8	0.4	2.1	0.7	

WCS, Weeks crop stage

crop was fertilized with a dose of 120 kg N and 17.6 kg P/ha. Half of N along with full dose of P was applied basal and remaining N was top-dressed 25 days after sowing. The crop was harvested at 50% flowering stage. The species-wise weed population was recorded at harvest of the crop and subjected to square-root transformation using $\sqrt{x+0.5}$ for statistical analysis.

The prominent weed species of the experimental field were *Cyperus rotundus* L. (5.41/m²), *Chenopodium album* L. (5.02/m²) and *Cynodon dactylon* (L.) Pers.] (2.77/m²) with relative density of 41, 38 and 21% respectively at harvest of the crop. Maximum weed population and dry-weed biomass were recorded under unweeded plots. All the weed-control treatments significantly reduced the weed population and dry biomass of weeds as compared to unweeded check (Table 1). Hoeing at 3 weeks crop stage followed by 1 manual weeding at 5 weeks crop stage brought maximum reduction in weed population and dry biomass and proved superior to rest of the treatments. The manual weeding and hoeing have been found as most effective weed-control measure by Pandey *et al.* (1988) and Verma and Srivastava (1989) in wheat (*Triticum aestivum* L. emend. Fiori & Paol.).

Significantly higher values of plant height, shoots/plant, green-fodder and dry-matter yields were recorded with hoeing 1 at 3 weeks crop stage followed by 1 manual weeding at 5 weeks crop stage over other treatments (Table 1). Hoeing at 3 weeks crop stage followed by weeding at 5 weeks crop stage gave 29.5 and 27.5 % more green-fodder and dry-matter

yields than the unweeded check respectively. The increase in growth and fodder yield might be due to less weed competition for moisture and nutrients.

Hoeing at 3 weeks crop stage followed by manual weeding at 5 weeks crop stage gave highest net return of Rs 3 520/ha over unweeded check (Table 1).

Thus one hoeing at 3 weeks crop stage followed by 1 manual weeding at 5 weeks crop stage may be recommended as the most effective and remunerative weed-control measure in forage oat.

SUMMARY

On the basis of the results obtained from our investigation, 1 hoeing at 3 weeks crop stage followed by 1 manual weeding at 5 weeks crop stage may be used as the most effective and remunerative weed-control measure in forage oat (*Avena sativa* L.).

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