

Chemical weed control in fodder sorghum (*Sorghum bicolor*)

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Of the many production constraints, presence and competition from weeds seem to be of paramount importance in rainy-season crops. Weeds culminate forage or dry-matter yield reduction to an extent of 15-54% (Singh, 1988; Raghuvanshi *et al.*, 1990). Acceptability of atrazine by farmer can be more if its post-emergence application is effective.

The field experiment was conducted at Hisar during the rainy seasons of 1990 and 1991 to study the chemical control of weeds in fodder sorghum [*Sorghum bicolor* (L.) Moench]. The field soil was sandy loam in texture, medium in organic carbon and fertility, and was slightly alkaline in reaction (pH 8.1). Sorghum 'JS 20' was sown on 26 July 1990 and 5 June 1991. The 10 and 13 weed-control treatments (Table 1) were replicated 3 times in randomized block design with a plot size of 4.5 m × 3.15 m. Visual toxicity of weed-control treatments on weeds was recorded 45 days after sowing using a scale of 0 to 100, where 0, no control and 100, complete control. The dry weight of weeds was recorded 45 days after sowing and fodder yield of crop at 70 days after sowing. Fodder yield in 1990 could not be recorded due to heavy rains.

Major weeds of the experimental field were carpet weed (*Trianthema portulacastrum* L. and barnyardgrass [*Echinochloa colonum* (L.) Link]

constituting 94% of the total weed flora. Other weeds were *latmhuria* [*Digera muricata* (L.) Mart.; syn. *D. arvensis* Forssk], nut grass (*Cyperus rotundus* L.) and makra [*Dactyloctenium aegypticum* (L.) Willd.]. Visual toxicity of atrazine was significantly higher with higher doses on both the weeds. Atrazine @ 0.25 or 0.5 kg/ha applied 7 or 14 days after sowing showed higher toxicity on both weeds than its pre-emergence and late post-emergence (21 days after sowing) application. 2, 4-D sodium salt @ 0.25 kg/ha gave 80-95% control of carpet weed when applied 7-21 days after sowing, but failed to control the barnyard grass. All the herbicide treatments significantly reduced the total weed weight compared with the unweeded control. Atrazine @ 0.5 kg/ha significantly reduced the weed weight than atrazine @ 0.25 kg/ha at all the stages of application except 21 days after sowing in both the seasons. Average data of 2 seasons revealed that atrazine application at 7 or 14 days after sowing proved either equally effective or better in minimizing weed weight than its early recommendation (as pre-emergence). The 2, 4-D was only specifically effective on broad-leaf weeds.

Fodder yield of crop clearly revealed no toxicity on crop as well as superiority of atrazine application on 7 and 14 days after sowing at both the rates compared with its pre-emergence or late post-emergence (21

Table 1. Visual toxicity, dry weight of weeds and fodder yield of sorghum as influenced by weed-control treatments

Table 1. Visual toxicity (%)

Herbicide	Dose (kg ai/ha)	Time of application (DAS)	Visual toxicity(%)				Dry weight of total weeds (g/m ²)		Fodder yield (kg/ha) (1991)
			Carpet weed		Barnyard grass		1990	1991	
			1990	1991	1990	1991			
Atrazine	0.25	1	40.4 (42)	56.3 (70)	34.9 (33)	50.7 (60)	111.5	73.5	9,484
Atrazine	0.50	1	56.9 (70)	77.1 (95)	39.5 (40)	71.5 (90)	64.8	37.2	10,818
Atrazine	0.25	7	44.8 (50)	77.0 (95)	33.4 (30)	71.6 (90)	139.5	48.3	10,374
Atrazine	0.50	7	80.1 (97)	81.9 (98)	41.6 (43)	77.0 (95)	22.9	10.4	10,967
Atrazine	0.25	14	46.1 (52)	77.2 (95)	30.9 (27)	73.6 (92)	123.9	54.1	10,225
Atrazine	0.50	14	81.9 (97)	80.0 (97)	44.1 (48)	77.1 (95)	20.7	11.5	11,115
Atrazine	0.25	21	20.7 (13)	47.9 (55)	15.3 (7)	33.2 (30)	152.9	91.5	8,299
Atrazine	0.50	21	24.1 (17)	56.8 (70)	15.3 (7)	39.1 (40)	143.9	63.8	9,337
2, 4-D sodium	0.25	7		63.4 (80)		0 (0)		64.1	9,929
2, 4-D sodium	0.25	14		77.0 (95)		0 (0)		51.3	10,077
2, 4-D sodium	0.25	21		77.1 (95)		0 (0)		50.5	10,079
Unweeded check			0.0 (0)	0.0 (0)	0 (0)	0 (0)	309.5	135.4	5,187
Weed-free check			90.0 (100)	90.0 (100)	90.0 (100)	90.0 (100)	0	0	11,411
CD (P=0.05)			4.3	4.9	2.9	3.4	37.2	19.8	745

Original toxicity data are in parentheses which are transformed to arc sin

days after sowing) application (Table 1). Atrazine @ 0.5 kg/ha gave significantly higher fodder yield than 0.25 kg/ha at 1, 7, and 14 days after sowing. Post-emergence 2, 4-D application also gave better fodder yield than unweeded check and late atrazine application. Higher and lower crop yields were owing to better and poor control of dominant weeds.

It was concluded that atrazine may be effectively used as post-emergence, i.e. 7-14

days after sowing, along with pre-emergence recommendation.

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Role of bio-fertilizer in productivity of finger millet (*Eleusine coracana*)

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Finger millet [*Eleusine coracana* (L.) Gaertn.] shows better adaptability under adverse environments (Seetharam and Harinarayana, 1986). The yield potentiality can be increased up to 5,000 grain kg/ha with higher inputs of fertilizers and improved management practices. However, use of bio-fertilizers, especially *Azospirillum*, reduces cost on fertilizers. Hence an experiment was conducted to study the effect of biofertilizer on productivity of finger millet.

The experiment was conducted at waghai, to examine the response of finger millet to different levels during 1988-90. The

experiment was laid in randomized block design with 10 treatments (Table 1) in 3 replications. The seedlings were raised in the nursery and 25-day-old seedlings were transplanted 30 cm apart, keeping 7.5 cm distance between plants within the row. The seedling roots were treated with different concentrations of *Azospirillum* at the time of transplanting. Half of the N fertilizer was applied at the time of transplanting and remaining half 1 month after transplanting.

All the treatments gave significantly higher yield than the control except treatment T₂ (Table 1). N @ 40 kg/ha (T₁₀)