

## Herbicidal cum Mechanical Control of Weeds in Doob (*Cynodon dactylon*) infested Hybrid Sorghum

*Sorghum vulgare* like any other rainy season crop is badly infested with a variety of annual weeds on heavy soils of Udaipur and around. Many fields however are additionally infested with *Cynodon dactylon*. While a herbicidal cum cultural practice using atrazine has been worked out for control of annual weeds in sorghum (Gupta and Singh, 1967), work on control of weeds in doob infested sorghum fields needed attention. The present paper provides results of a weed control trial conducted in such a situation during 1967. It comprised three pre-emergence treatments viz, simazine at 0, 0.25 and 0.50 kg a.i./ha, and six post-emergence treatments viz, hand weeding, hoeing, hand weeding+hoeing and atrazine at 0, 0.5 and 1.0 kg/ha. These 18 treatment combinations along with one earlier recommended herbicide treatment i.e. pre + post-emergence 2, 4-D (Na salt) at 1.0 kg a.i./ha were tried in a randomized-block design with 4 replications and net plot size of 40 sq m. Hybrid sorghum CSH 1 was planted on July 18th. Pre and post-emergence treatments were applied one and 30 days after planting respectively. Crop was grown using recommended agronomic practices. During milk stage, sorghum was severely infested with *Helminthosporium* which greatly reduced its grain yield. The infestation being late, its stover production was not much affected. Soil of the site was clay loam of pH 8-8.4 and 2.1% active organic matter.

A perusal of data in Table 1(a) showed that pre-emergence application of simazine at 0.25 and 0.5 kg/ha reduced dry matter weight of annual weeds significantly over unsprayed plots; the reduction being 6.8 and 10.4 q/ha respectively. *Cynodon dactylon*, which appeared in the field about 30 days after planting sorghum, not only proved tolerant to pre-emergence simazine treatments, but was found to spread more freely in treated plots in spaces vacated by susceptible annual weeds. Dry matter weed data in Table 1(b) bears this out.

Of the post-emergence treatments which were superimposed 30 days after pre-emergence treatments, both atrazine and mechanical weeding methods reduced growth of annual weeds significantly over absolute control with no difference amongst themselves (Table 1(a)). But, again as was the case with pre-emergence simazine application, post-emergence treatment with atrazine too exhibited increased infestation of doob grass. It was only the mechanical weeding methods like hand weeding and hand weeding+hoeing which reduced

Table 1. Effect of treatments on dry matter weight of weeds associated with sorghum 90 days after planting (q/ha)

Emergence treatments	(a) Dry matter weight of annual weeds					(b) Dry matter of <i>Cynodon dactylon</i>					(c) Total dry matter of weeds				
	Pre Emergence simazine doses (kg/ha)					Pre Emergence simazine doses (kg/ha)					Pre Emergence simazine doses (kg/ha)				
	0.0	0.25	0.50	Average (Post em.)		0.0	0.25	0.50	Average (Post em.)		0.0	0.25	0.50	Average (Post em.)	
1	63.2	34.0	17.1	38.1		3.6	3.9	9.4	5.6		65.9	38.0	26.5	43.5	
led once	22.1	24.3	21.1	22.5		4.9	3.0	3.1	4.0		27.0	27.2	24.2	26.1	
	41.2	22.5	23.6	29.1		6.1	4.6	8.2	6.3		47.3	27.1	31.9	35.4	
s 2+3	13.1	15.0	14.0	14.0		2.5	3.5	3.5	3.8		15.6	18.0	19.6	17.7	
5 kg/ha	16.9	19.2	18.7	18.3		8.1	7.4	15.1	10.2		25.1	26.6	33.8	25.5	
0 kg/ha	20.5	21.2	19.9	20.5		12.7	7.1	14.3	11.4		33.2	28.3	34.2	31.9	
re em.)	29.5	22.7	19.1	23.8		6.3	5.1	9.3	6.9		35.7	32.5	38.1	30.5	
pre + Post em.)	—	—	—	18.6		—	—	—	11.3		—	—	—	22.0	
%															
emergence			7.1					3.4						N.S.	
emergence			10.2					4.8						N.S.	
Post emergence			17.6					N.S.						N.S.	
id V/S others			N.S.					N.S.						N.S.	

TABLE 2. *Effect of treatments on grain and stover yield of sorghum*

Emergence treatments	(a) Grain yield (q/ha)			(b) Stover yield (q/ha)		
	Pre emergence		Simazine doses (kg/ha)	Pre emergence		Simazine doses (kg/ha)
	0.0	0.25	0.50	0.0	0.25	0.50
			Average (Post em.)			Average (Post em.)
ed	5.2	10.2	6.2	57.2	63.3	62.5
ed once	9.2	12.8	8.2	88.7	98.5	70.2
ice	5.0	7.2	4.2	68.3	78.3	99.0
nts 2 + 3	13.6	9.6	11.0	123.1	98.5	97.8
0.5 kg/ha	6.8	6.2	7.8	68.7	65.2	72.0
1.0 kg/ha	0.2	7.8	6.4	77.6	66.4	72.9
(Pre em)	7.7	9.0	7.3	80.6	78.4	79.1
1 (Pre+Post em 2, 4-D)	—	—	—	—	—	—
t 5%						
mergence			N.S.			N.S.
emergence			2.8			18.3
× Post emergence			N.S.			N.S.
dard V/S others			N.S.			N.S.

.S. = Not significant statistically at 5% level,

with pre-emergence simazine at 0.25 kg/ha. Even then this reduction in weed growth was significantly less in comparison to hand weeding treatments (Table 1(b)). This was because weeds were left undisturbed amongst the crop rows by the hoe. As a result, minimum dry matter of *doob* as well as that of total weeds (Table 1(c)) was recorded under the treatment combination pre-emergence simazine at 0.25 kg/ha plus postemergence hand weeding 30 days later.

Crop performance data in respect of main effects in Table 2 (a and b) showed that despite significant reduction in growth of annual weeds, sorghum yields were not increased. This showed that adverse effect of uncontrolled *Cyanodon dactylon* prevailed upon whatever benefit crop could derive from control of annual weeds. When such pre-emergence control of annual weeds by simazine at 0.25 kg/ha was followed by mechanical post-emergence weeding, particularly hand weeding, to effectively control *doob* grass crop yields, grain and stover, were increased by 146% and 72% over untreated control and by 156% and 44% over cultivator's practice of hoeing respectively.

2, 4-D as pre-and post-emergence herbicide in this situation proved completely ineffective.

The study showed that mixed infestation of sorghum with annual weeds and bermuda grass (*doob*) could best be controlled using pre-emergence simazine at 0.25 kg a.i./ha followed by one hand weeding about 30 days later. This treatment combination gave 39.1 and 11.0% increase in grain and stover yield of hybrid sorghum over hand weeding alone and much more so over hoeing alone. In the absence of perennial grasses, post-emergence mechanical weeding could be substituted with atrazine at 0.5 kg a.i./ha.

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#### REFERENCE

- Gupta, O. P. and R. M. Singh. 1967. Observations on the efficacy of band application of fluometuron, simazine and atrazine in weed control in hybrid sorghum. *Indian J. Sci. & Indust.*, 1: 155-62.
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