

EFFECT OF 2, 4-D COMPOUNDS ON SORGHUM

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Field experiments were conducted at the Agricultural Research Station, Bhavanisagar during summer and rabi seasons of 1980 to study the effect of different 2, 4-D compounds on weed control and grain yield of sorghum. The studies indicated that post emergence application of 2, 4-D ethyl ester at 3 litre ai/ha + one hand weeding on 40th day was the effective method of weed control in sorghum. *Trianthema portulacastrum* was the dominant weed and constituted 70 percent of the total weed population.

The latest trend in agriculture is intensive cropping in the lands available for cultivation. As the population is increasing day by day and to meet the demand for food we have to go in for improved methods of agronomic practices as usage of herbicides to control the weeds effectively and to increase the per hectare yield of field crops. Use of different formulations of 2,4-D compounds on sorghum and other crops is reported by Shashkov and Kalmakor (1978) in wheat and Shushu (1976) in Maize crop.

MATERIAL AND METHODS

To study the effect of different 2, 4-D compounds on weed control and grain yield of sorghum, field experiments were conducted at the Agricultural Reserch Station, Tamil Nadu Agricultural University, Bhavanisagar during summer and rabi seasons of 1980. During summer 1980, the experiment was conducted on sorghum USV.3 with the following treatments viz., (i) Unweeded control, (ii) Hand weeding twice, (iii) 2, 4-D sodium salt (80% WP) at 1.5kg ai/ha,

iv) 2, 4-D ethyl ester (20% WP) at 1.5kg ai/ha, (v) 2, 4-D ethyl ester (34% E C) at 3 litre ai/ha, (vi) 2, 4-D dimethyl amine (58% EC) at 3 litre a.i/ha and, (vii) 2, 4-D ethyl ester (4% G) at 9.8kg ai/ha. The 2, 4-D compounds were applied with and without one hand weeding on 40th day of the crop. The design adopted was RBD with three replications. During rabi, 1980 the same treatments excluding 2, 4-D ethyl ester (4%G) at 0.8kg ai ha were tried on cholam (var.) Co 24. The 2, 4-D compounds were sprayed as post emergence with knapsack sprayer 20 days after sowing. 2, 4-D ethyl ester (4%G) was applied in soil as pre-emergence on 7th day after sowing. The weed counts were taken at 4th, 6th and 8th weeks and the weed dry matter was recorded at 8th week after sowing. Grain yield was recorded at harvest.

RESULTS AND DISCUSSION

The most dominant weed species in the experimental site was *Trianthema Portulacastrum* L. accounting 70.8 and 74.9% infestation during summer

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and rabi, 1980 respectively. *Dactyloctenium aegyptium* Beauv. ranked second with 15.1 and 13.9% and was followed by *Cyperus rotundus* L. with 7.5 and 6.3% during summer and rabi, 1980 respectively.

The data on grain yield, weed count and weed dry matter in summer and rabi, 1980 are presented in Table 1 and 2 respectively. During summer 1980, the number of weeds ranged from 8-28/M² for different weed control methods and the unweeded control recorded significantly higher weed number (28/m²) on 4th week. The weed count at 6th week revealed that there was no weed in those treatments which included one weeding. The control plot registered the weed number of 27/M². During rabi 1980, 2, 4-D ethyl ester at 3 litre a. i./ha + one hand weeding recorded significantly minimum weeds (23/M²) at the 4th week and the same trend was noticed on 6th week. During the 8th week in summer and rabi seasons the treatments 2, 4 D ethyl ester (4%G) at 0.8kg ai/ha + one hand weeding and 2, 4-D ethyl ester (34% EC) at 3 litre ai/ha + one hand weeding, have given the lowest weed number respectively. In both the seasons the highest number of weeds were recorded in unweeded control plots. The treatment 2, 4-D ethyl ester (4%G) at 0.8 kg ai/ha + one hand weeding registered the lowest dry matter of weeds (1.78g/m²) followed by 2,4-D ethyl ester + one hand weeding (2.28/m²) in summer, 1980. During rabi, 1980 hand weeding twice recorded the lowest weed dry matter (4.17g/m²) and it was on par with other 2, 4-D

compounds + one hand weeding treatments.

In summer, 1980, 2, 4-D ethyl ester (4% G) at 0.8kg ai/ha + one hand weeding has given significantly higher grain yield (2010kg/ha). During rabi 1980 the treatment 2, 4-D ethyl ester (34% EC) at 3 litre ai/ha + one hand weeding gave significantly higher grain yield (1700 kg/ha) than other treatments. In both the seasons control plots recorded the lowest grain and straw yields. Monstulaite (1976) obtained higher yields in barley by the combined application of 2, 4-D with one harrowing. Effective weed control and increased grain yields by application of 2, 4-D compounds were also reported by Rish and Fayed (1978) on wheat and Shushu (1976) in maize.

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Table 1. Effect of 2, 4-D compounds on weed characters and grain yield of sorghum USV. 3
(Transformed values)

Treatments	Weed intensity (No/m ²)			Weed dry wt. (g/m ²) on 8th week	Grain yield (kg/ha)	straw yield (kg/ha)
	4th week	6th week	8th week			
Control	(5.34)**	(5.24)	(5.24)	9.17	244	6750
Weeding and hoeing twice	(3.57)	(0.71)	(3.76)	6.41	1173	9667
2, 4-D sodium salt (80% WP) at 1.5 kg ai/ha	(4.06)	(3.89)	(3.85)	9.75	986	7333
2, 4-D ethyl ester (20% WP) at 1.5 ai/ha	(3.85)	(3.89)	(3.93)	8.43	1043	7500
2, 4-D ethyl ester (34% EC) at 3 lit ai/ha	(3.29)	(3.18)	(3.08)	8.44	1036	7583
2, 4-D dimethyl amine (58% EC) at 3 lit ai/ha	(4.70)	(5.18)	(5.08)	9.62	734	7500
2, 4-D ethyl ester (4% G) at 0.8 kg ai/ha	(2.85)	(3.23)	(3.18)	7.20	1000	8583
2, 4-D sodium salt (80% WP) at 1.5 kg ai/ha + one hand weeding	(3.67)	(0.71)	(2.34)	2.84	1484	8750
2, 4-D ethyl ester (20% WP) at 1.5 kg ai/ha + one hand weeding	(4.06)	(0.71)	(2.11)	2.78	1727	10083
2, 4-D ethyl ester (34% EC) at 3 lit. ai/ha + one hand weeding	(3.85)	(0.71)	(2.11)	2.28	1738	10083
2, 4-D dimethyl amine (58% EC) at 3 lit. ai/ha + one hand weeding	(4.69)	(0.71)	(2.74)	3.03	1467	8000
2, 4-D ethyl ester (4% G) at 0.8 kg ai/ha + one hand weeding	(2.84)	(0.71)	(1.77)	1.78	2010	9917
CD	0.50	0.29	0.29	3.63	755	NS

Table. 2. Effect of herbicides on weed characters and grain yield of Sorghum Co. 24

Treatments	Weed Intensity (No/M ²)			Weed dry wt (g/m ²) on 8th week	Grain yield (kg/ha)	straw yield (kg/ha)
	4th week	6th week	8th week			
Unweeded Control	17.7* (4.26)**	17.0 (4.18)	16.3 (4.10)	13.67	325	6417
Weeding and hoeing twice	2.7 (1.77)	— (0.71)	3.7 (2.04)	4.17	1025	7083
2, 4-D Sodium salt (80% WP) at 0.8 kg ai/ha	5.3 (2.42)	3.7 (2.04)	4.3 (2.20)	12.00	508	6500
2, 4-D ethyl ester (20% WP) at 1.5 kg ai/ha	4.0 (2.11)	3.7 (2.04)	3.7 (2.04)	10.83	767	6750
2, 4-D ethyl ester (34% EC) at 3 lit. ai/ha	2.7 (1.77)	3.3 (1.95)	2.3 (1.68)	10.33	1025	6000
2, 4-D dimethyl amine (58% EC) at 3 lit. ai/ha	6.0 (2.55)	4.0 (2.11)	4.0 (2.11)	11.77	367	5500
2, 4-D sodium salt (80% WP) at 1.5 ai/ha + one hand weeding	5.3 (2.42)	— (0.71)	2.7 (1.77)	8.17	825	5917
2, 4-D ethyl ester (20% WP) at 1.5 kg ai/ha + one hand weeding	5.0 (2.34)	— (0.71)	1.7 (1.39)	7.00	542	6667
2, 4-D ethyl ester (34% EC) at 3 lit. ai/ha + one hand weeding.	2.3 (1.66)	— (0.71)	0.3 (0.88)	4.57	1700	7167
2, 4-D dimethyl amine (58% EC) at 3 lit. ai/ha + one hand weeding	6.0 (2.55)	— (0.71)	3.3 (1.95)	7.17	783	5750
CD	0.29	0.29	0.42	3.87	210	945

*Actual values

**Transformed values