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EFFECT OF INTEGRATED WEED MANAGEMENT IN SORGHUM

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Abstract

The field experiment was conducted at Annamalai University experimental farm during 2013 in randomized block design with twelve treatments replicated thrice to study the integrated weed management practices in irrigated sorghum. The field was highly infested with grasses and broad leaved weeds. The results revealed that application of metribuzin 1.0 kgha^{-1} + intercropping with blackgram was found to be the most effective to control the weeds as compare to other treatments. The treatment recorded the lowest weed control, weed biomass production. The highest weed control efficiency and higher grain yield.

Key words : Randomized block design, integrated weed management, weed biomass, weed control.

Introduction

Sorghum (*Sorghum bicolor* L.) is the fifth important food crop after wheat, rice, maize and barley and it is the major staple 'diet of the people' of the Semi-Arid Tropics (SAT) Sorghum is cultivated over an area of 37.85 million hectares worldwide with a production of about 58 million tones and productivity of 1.53t ha^{-1}, while in India it occupies an area of about 6.32 m ha^{-1} under sorghum a with production of 6.01 million tones of grass with an average productivity of 950 kg ha^{-1} (Somasundaram, 2013).

Comparing the production potential of sorghum, the low productivity in India is attributed to several reason. Among them weed is a major constrains. Now-a-days intercropping is common in intensive agriculture. Although intercropping is practiced to maximize land use. It has also have a significant effect in suppressing weed growth, less weed infestation was recorded in an intercropping system than monoculture system (Rao, 2001).

Keeping in view the above fats, the present investation was conducted to evaluate the suitable method of weed control for the sorghum.

Materials and Methods

Field experiments was conducted at Annamalai University. Experimental farm during 2014 in a randomized block design with twelve treatments and replicated thrice the treatments consists of *viz*., T_1 - Unweeded control, T_2 - Twice hand weeding on 15 and 30 DAS, T_3 - Pre-emergence application of alachlor of 1.5 kg ha^{-1}, T_4 – pre-emergence application of metribuzih 1.0 kg ha^{-1}. T_5 - Alachlor 1.5 kgha^{-1} tone hand weeding on 30 DAS. T_6 - Metribuzin 1.0 kg ha^{-1} + one hand weeding T_7 - Alachlor 1.5 kgha^{-1} + intercropping with blackgram. T_8 – metribuzin 1.0 kgha^{-1} + intercropping with blackgram. T_9 - Alachlor 1.5 kgha^{-1} + Sugarcane trash mulch, T_{10} – Metribuzia 1.0 kgha^{-1} + Sugarcan tragh mulch, T_{11} – intercropping alone and T_{12} – Mulching alone.

Weed sampling was done randomly by placing 0.25 × 0.25 quadrates at four different location in the experimental unit to asses the weed count at 45 DAS and expressed in number m^3. Weed control efficiency was calculated by suing the formula.

$$\text{Weed control efficiency (\%)} = \frac{\text{Weed biomass in Unweeded control plot} - \text{Weed biomass in treated plot}}{\text{Weed biomass in unweeded control plot}} \times 100$$

Results and Discussion

The experimental plot was uniformaly infested with weed flora *viz*., *Echinochloa colonum*, *Cyndon dactylon* and *Trianthema portulacastrum*.

Weed population

All the weed control treatments were significantly

Table 1 : Effect of integrated weed management practices in sorghum.

Treatments	Total weed population M^2 at 30 DAS	Weed biomass gm^2 at 30 DAS	Weed control efficiency (%)	Grain yield $kgha^{-1}$
T_1 – Unweeded Control	13.82 (190.42)	175.55	-	1895.14
T_2 – Twice hand weeding 15 and 30 DAS	7.69 (58.63)	17.92	89.99	3730.63
T_3 – Pre-emergence application of alachlor 1.5 $kgha^{-1}$ on 3 DAS	11.94(142.06)	120.60	31.30	2746.27
T_4 – Pre-emergence application of metribuzin 1.0 $kgha^{-1}$ on 3 DAS	11.32(127.64)	111.66	36.39	2843.11
T_5 – Alachlor 1.5 $kgha^{-1}$ pre-emergence on 3 DAS + one hand weeding	10.67(113.34)	104.11	40.69	3107.49
T_6 – Metribuzin 1.0 $kgha^{-1}$ pre-emergence on 3 DAS + one handweeding	10.07(100.9)	84.56	51.83	3294.08
T_7 – Alachlor 1.5 $kgha^{-1}$ pre-emergence on 3 DAS + intercropping with blackgram	8.25(67.59)	31.87	81.85	3639.25
T_8 – Metribuzin 1.0 $kgha^{-1}$ pre-mergence on 3 DAS + intercropping with blackgram	7.47(55.30)	15.16	91.40	3786.00
T_9 – Alachlor 1.5 $kgha^{-1}$ pre-emergnece on 3 DAS + sugarcane trash mulch	9.44(88.61)	68.31	61.09	3385.72
T_{10} – Metribuzin 1.0 $kgha^{-1}$ pre emergence on 3 DAS + sugarcane trash mulch	8.86(77.99)	48.12	72.59	3535.58
T_{11} – Intercropping alone	12.61(158.51)	130.56	25.63	2578.98
T_{12} – Mulching alone	13.20(173.74)	140.55	19.94	2391.98
S.Ed.	0.14	1.35	-	34.75
CD (P = 0.05)	0.29	2.99	-	76.47

*Original value are given in parenthesis.

reduced the weed population compared to that in unweeded check plot (table 1). Twice handweeding at 15 and 30 DAS, metribuzin 1.0 kg ha^{-1} + intercropping with blackgram were found to be very effective in reducing the weed density and their growth at 30 DAS. This was followed by other treatments.

Weed control efficiency

The highest weed control efficiency was recorded with twice hand weeding at 15 and 30 DAS followed by metribuzin 1.0 kg ha^{-1} + intercropping with blackgram.

Metribuzin might have also shorter was lesser persistence its volatility, rapid action and the primary mechanisms of interfering with oxidative and photosynthetic phosphorelation, important better control of weeds compare to alachlor. Similarly, among the cultural measures, intercropping suppressed with lesser weed counts, biomass and nutrient depletion by weeds. This probably because of early germination, stand establishment and ground coverage by the canopy of inter crops (Baldev Ram *et al*., 2004).

Grain yield

Efficient control of weeds the treatment metribuzint intercropping, throughout the crop critical period, by virtue of higher activity of metribuzin favoured better nutrient uptake and the growth of the crop. Including blackgram as an intercrop although with the objective of smothering weeds. This was reflected on higher number of grains per ear head and grain yield (Varshany and Arya, 2004; Elamathiyan, 2010).

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