

Management of *Trianthema portulacastrum* in Sesame

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ABSTRACT

Field experiment was carried out in Mogra Block Farm, Hooghly, West Bengal in pre-kharif 2005 and 2006 to evaluate the relative efficacy of different herbicides alone and in combination with hand weeding. Results revealed that pre-emergence application of herbicides integrated with one hand weeding were superior to their sole application in controlling *Trianthema portulacastrum* and increasing seed yield of sesame. Butachlor with one hand weeding proved its superiority over rest of the treatments in respect of weed control efficiency, seed yield and net return. Farmers' practice recorded at par result with butachlor integrated with one hand weeding in seed yield of sesame.

Key words : *Trianthema*, butachlor, hand weeding, weed management

INTRODUCTION

Sesame is one of the important oil seed crops of West Bengal grown in summer season but its productivity is low. Inadequate weed management and poor fertility management appear to be major constraints for low productivity of sesame. Prevalence of high temperature with high relative humidity and intermittent rainfall during the crop season coupled with slow plant growth particularly during early growth stages favours luxuriant weed growth since seedling emergence causes about 50-75% reduction in seed yield (Ghosh and Mukhopadhyay, 1980). The period from 15 to 30 DAS is the most critical period of crop-weed competition in sesame (Venkatakrishnan and Gnanamurthi, 1998). The menace of *Trianthema portulacastrum* was reported from the Gangetic Alluvial Region particularly in Hooghly district in sesame in rice-potato-sesame cropping system. The problem of *Trianthema* was so severe that the growing of sesame was in threat in the region. Keeping this in view, an experiment was conducted to find out effective herbicide (s) for controlling *Trianthema* in sesame in the Gangetic Alluvial Region.

MATERIALS AND METHODS

The herbicidal field trial was laid out in randomized block design with eight treatments and three replications during pre-kharif season in two consecutive

years of 2005 and 2006 at Mogra Block Seed Farm, Hooghly district, West Bengal. The details of treatments are in given in Table 1. All the herbicides were applied one day after sowing of sesame with sprayer fitted with flat fan nozzle at a spray volume of 500 l/ha. The soil of the experimental field was alluvial deep loam, low, medium and medium to high in available nitrogen, phosphorus and potassium, respectively, with a pH of 7.0. The crop was grown with recommended package of practices except weed management. Weed counts and dry weight of *Trianthema portulacastrum* were taken at 60 DAS and yield of crop was recorded accordingly. Other minor weeds were removed at periodic intervals.

RESULTS AND DISCUSSION

Effect on Weeds

The experimental field was mainly infested with *Trianthema portulacastrum*. The minor weeds were *Echinochloa colona*, *Cyperus rotundus*, *Alternanthera sessilis*, *Phyllanthus fraternus*, *Euphorbia hirta*, *Cleome viscosa* and *Physalis minima*.

The maximum density of *Trianthema* was recorded in weedy check (452/m²). All the herbicidal treatments significantly reduced the density of *Trianthema* over weedy check when observations were

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Table 1. Effect of treatments on *Trianthema portulacastrum*, yield of sesame, net return and benefit : cost ratio (Pooled over two years)

Treatment	Dose (g/ha)	Weed density at 60 DAS ₂ (No./m ²)	Weed dry matter at 60 DAS ₂ (g/m ²)	WCE (%)	Yield (kg/ha)	Cost of cultivation (Rs./ha)	Net return (Rs./ha)	Benefit : cost ratio
Weedy	-	452	227.4	-	303	5500	(-) 955	0.17
Farmers' practice	-	24	8.5	96	1062	9950	(+) 5980	0.60
Oxyfluorfen	100	158	72.0	68	864	8650	(+) 4310	0.50
Butachlor	1000	20	9.0	96	1028	8400	(+) 7020	0.84
Pendimethalin	750	32	20.2	91	931	9100	(+) 4865	0.53
Oxyfluorfen+1 HW	100	53	27.3	88	935	9400	(+) 4625	0.49
Butachlor+1 HW	1000	11	6.3	97	1085	9150	(+) 7125	0.79
Pendimethalin+1 HW	750	20	12.2	95	1006	9850	(+) 5240	0.53
LSD (P=0.05)	-	16.6	2.27	-	37.9	-	-	-

Sesame @ Rs. 15/kg.

taken at 60 DAS. Butachlor was found to be most effective in controlling *Trianthema* (20/m²) even better than farmers' practice (24/m²). However, butachlor, pendimethalin and oxyfluorfen when supplemented with one hand weeding (HW) at 30 DAS had more pronounced effect as compared to their lone application. Least density of *Trianthema* was recorded under butachlor 1000 g/ha+1 HW (11/m²) which were at par with pendimethalin 750 g/ha+1 HW (20/m²). Butachlor+1 HW showed its superiority by recording least weed dry matter (6.3 g/m²) which was at par with farmers' practice (8.5 g/m²). Highest weed control efficiency was recorded in butachlor+1 HW (97%) and it was closely followed by butachlor alone and farmers' practice (96%).

Effect on Crop

The minimum seed yield was obtained with weedy check (303 kg/ha). The herbicidal treatments recorded higher seed yield over unweeded control. All the herbicides integrated with one hand weeding at 30 DAS gave significantly higher seed yield than that of herbicides applied alone. Similar effect was also observed by Sukhadia *et al.* (2004). Butachlor 1000 g/ha supplemented with one hand weeding resulted in highest

seed yield (1085 kg/ha) which was at par with farmers' practice (1062 kg/ha).

Economics

Among the three herbicides applied alone, higher net return (Rs. 7020/ha) was recorded with butachlor but it was highest (Rs. 7125/ha) when butachlor was supplemented with hand weeding. The highest benefit : cost ratio of Re. 0.84 (in one Re. investment) was obtained in butachlor treated plot, whereas it was lower in butachlor supplemented with hand weeding (Re. 0.79). Though butachlor with hand weeding recorded highest seed yield and net return but in case of limited resources application of butachlor alone would be wise.

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