

Effect of Stage and Dose of Cyhalofop-butyl on *Echinochloa colona* Control in Blackgram Grown as Paira Crop

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Cultivation of blackgram as a paira (uthera) crop in rice fallows is a unique system in coastal districts of A. P., wherein sprouted seeds of blackgram are broadcasted in standing rice crop, two to three days prior to its harvest. The crop sown in this system survives entirely on residual moisture and fertility only. As there is no field preparation, the weed growth particularly *Echinochloa colona* is severe and effectively competes with the crop for residual moisture, nutrients and reduces yields upto 53% (Appanna *et al.*, 1998). The information available on post emergence control of *E. colona* in rice fallow blackgram is very much meagre. Keeping this in view, the present investigation was conducted in order to test the efficacy of cyhalofop-butyl in blackgram at various doses and stages of application.

A field experiment was conducted during rabi season of 2001-02 at pulse project area of Regional Agricultural Research Station, Lam, Guntur (A. P.). The experiment consisting of 13 treatments (Table 1) was laid out in a randomised block design with four replications. The soil of the experimental field was clay loam with pH of 7.5 and medium in fertility status. The sprouted seeds of blackgram (cv. LBG 685) were broadcasted in rice crop three days before its harvest. Cyhalofop-butyl at different doses was sprayed at 15, 18 and 21 days after sowing (DAS) using a spray volume of 500 l ha⁻¹. The crop survived on residual moisture except for one irrigation given at 40 DAS and also received a rainfall of 90 mm on the next of irrigation. The data on *Echinochloa* density were recorded at 30 and 45 DAS and dry weight at harvest.

The experimental field was dominated by the natural infestation of *E. colona* which consisted of 80% of the total weed population. Other weeds like *Cyperus*

spp., *Chrozophora rottleri*, *Xanthium strumarium*, *Nasturtium indicum*, *Gnaphalium polycaulon*, *Euphorbia virgatus* and *Cleome chelidonii* were also present but their population was negligible.

All the cyhalofop-butyl treatments caused significant reduction in density and dry weight of *E. colona* compared to weedy check (Table 1). Among the different doses, cyhalofop-butyl at 100 and 112 g ha⁻¹ applied at 15, 18 and 21 DAS was significantly superior to 88 g ha⁻¹ in controlling *E. colona*. These treatments recorded a WCE ranging from 46 to 58% at harvest against 60% in hand weeding.

Cyhalofop-butyl treatments did not cause any injury to blackgram, whereas imazethapyr at both the doses (50 and 63 g ha⁻¹) caused slight injury to crop. Cyhalofop-butyl at 112 g ha⁻¹ applied at 21 DAS recorded highest seed yield (740 kg ha⁻¹) and was on par with 100 g ha⁻¹ and similar trend was observed at other stages of application. Hand weeding at 25 DAS recorded the highest seed yield of 755 kg ha⁻¹. The increased seed yield in these treatments was the result of reduced density and dry weight of *E. colona*. Further, it was observed that seed yields were higher in later stages of application (18 and 21 DAS) compared to early application of 15 DAS at higher doses (100 and 112 g ha⁻¹). Unchecked weed growth during the crop season reduced the seed yield to the extent of 43% compared to hand weeding at 25 DAS, whereas, cyhalofop-butyl at 100 and 112 g ha⁻¹ applied at 18 and 21 DAS recorded an increase of 50 to 58% in blackgram yield over weedy check. Thus, it can be summarised that cyhalofop-butyl at 100 and 112 g ha⁻¹ applied at 18 and 21 DAS was more effective in controlling *E. colona* and increased blackgram yield without any phytotoxicity.

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Table 1. Effect of treatments on *Echinochloa colona*, yield and yield components of blackgram

Treatment	Dose (g ha ⁻¹)	Application stage (DAS)	<i>E. colona</i> density (No. m ⁻²)		<i>E. colona</i> dry weight (g m ⁻²) at harvest	No. of seeds plant ⁻¹	100-seed weight (g)	Seed yield (kg ha ⁻¹)
			30 DAS	45 DAS				
Cyhalofop-butyl	88	15	10.6 (112)	12.2 (148)	156	72	4.0	515
Cyhalofop-butyl	100	15	8.5 (72)	9.8 (96)	134	72	4.0	670
Cyhalofop-butyl	112	15	7.5 (56)	8.5 (72)	126	72	4.0	693
Cyhalofop-butyl	88	18	9.8 (96)	11.5 (132)	146	73	4.0	540
Cyhalofop-butyl	100	18	7.5 (56)	9.0 (80)	124	75	4.1	710
Cyhalofop-butyl	112	18	7.0 (48)	8.3 (68)	117	75	4.1	730
Cyhalofop-butyl	88	21	9.2 (84)	11.2 (124)	136	74	4.1	640
Cyhalofop-butyl	100	21	7.2 (52)	9.4 (88)	118	76	4.2	730
Cyhalofop-butyl	112	21	7.0 (48)	8.0 (64)	104	77	4.2	740
Imazethapyr	50	15	5.3 (28)	7.8 (60)	186	76	4.0	590
Imazethapyr	63	15	2.9 (8)	7.0 (48)	116	76	4.2	620
Hand weeding		25	4.1 (16)	7.8 (60)	098	74	4.0	755
Weedy check		-	23.8 (568)	24.2 (584)	246	66	3.8	430
LSD (P=0.05)		-	1.9	2.3	025	04	NS	055

Echinochloa density transformed to x+0.5 transformation. Original values are given in parentheses.

NS-Not Significant.

REFERENCE

- Appanna, G., A. Subrahmanyeswara Rao, R. Sriharinarayana
 Rao and A. Ravikumar, 1998. Evaluation of herbicides for weed management in rice fallow blackgram. *The Andhra Agric. J.* **45** : 116-118.