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WEED CONTROL EFFICACY OF TRIAFAMONE 200 SC IN TRANSPLANTED RICE

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ABSTRACT

A field investigation conducted during two consecutive cropping seasons (*Rabi* 2017–18 and *Kharif* 2018–19) at the Agricultural Research Station, Jangamaheswarapuram, Andhra Pradesh, India, to evaluate the performance of Triafamone 200 SC in transplanted Rice."Among the various herbicide treatments, Triafamone 200 SC applied at 100 g a.i. ha-¹ at 0-3 days after transplanting (DAT) recorded superior weed suppression efficiency in *Rabi* 2017-18 (68.64%) and in *Kharif* 2018-19 (60.83%) and also yielded 4967 kg ha^{-1} in *Rabi* and 5518 kg ha^{-1} in *Kharif,*with performance comparable to conventional farmer-managed two hand weeding practices, which produced 5342 kg ha^{-1} in Rabi and 5849 kg ha^{-1} in *Kharif*. The weed-free treatment recorded the maximum yields (5762 kg ha^{-1} in *Rabi* and 6376 kg ha^{-1} in *Kharif*), while the weedy check plots showed the lowest yields (3066 kg ha^{-1} in *Rabi* and 3825 kg ha^{-1} in *Kharif*).

Keywords: Herbicide efficacy,Transplanted Rice,Triafamone 200 SC, Weed control efficiency, Weed management

INTRODUCTION

Rice (*Oryza sativa* L.) serves as a staple food crop and plays a crucial role in ensuring food security in India. It contributes 45 per cent to the total food grain production in India and is grown in an area of 47.83 million ha with a production of 137.82 million tones and productivity of 2.88 t ha^{-1}(Anonymous, 2025). Effective weed management remains a crucial constraint, as uncontrolled weed growth significantly reduces crop productivity. Previous studies indicate that yield losses due to weed competition may range from moderate (>30%) to severe (>70%), depending on management practices and environmental conditions (Patel *et al.,* 2023; Yadav *et al.,* 2018). Therefore, proper management of weeds is the fundamental requisite for ensuring quality rice production. In situations where continuous standing water cannot be maintained particularly during the first 45 days, weed infestation in transplanted rice may be as high as direct-seeded rice.

Manual weeding has traditionally been the predominant method of weed control in rice cultivation. Although this approach can be effective, rising labour costs and a shrinking agricultural workforce make hand weeding less practical. Rising labour shortages and increasing wage rates have limited the feasibility of manual weeding, thereby accelerating the adoption of chemical weed

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Table 1. Treatment Details

Treatment	Dosage(g a.i. ha^{-1})
$T_{1.}$ Untreated control	-
$T_{2.}$ Triafamone 200 SC at 2-3 leaf stage of weed growth	30
$T_{3.}$ Triafamone 200 SC at 2-3 leaf stage of weed growth	40
$T_{4.}$ Triafamone 200 SC at 2-3 leaf stage of weed growth	50
$T_{5.}$ Triafamone 200 SC at 2-3 leaf stage of weed growth	100
$T_{6.}$ Pyrazosulfuron ethyl 10% WP	15
$T_{7.}$ Triafamone 200 SC at 0-3 DAT	30
$T_{8.}$ Triafamone 200 SC at 0-3 DAT	40
$T_{9.}$ Triafamone 200 SC at 0-3 DAT	50
$T_{10.}$ Triafamone 200 SC at 0-3 DAT	100
$T_{11.}$ Pretilachlor 50% EC at 0-3 DAT	750
$T_{12.}$ Farmer practice (two hand weedings)	-
$T_{13.}$ Weed free	-

control methods. A new herbicide Triafamone 200 SC has shown excellent control of weeds in recent trials a single application and also along with tank mix application with ethoxysulfuron, for rapidly knocking down diverse weed species and boosting Rice yields. Yet its performance in transplanted rice, across different doses and application timings, remains to be fully compared against established approaches. In view of these constraints, the present study was designed to assess the effectiveness of Triafamone 200 SC under transplanted rice conditions.

MATERIAL AND METHODS

The experiment was conducted over two consecutive years under field conditions atthe Agricultural Research Station, Jangamaheswarapuram, Guntur District, Andhra Pradesh, India, during *Rabi*, 2017-18 and *Kharif*, 2018-19. The design followed a Completely Randomized Block Design (CRBD) with 13 treatments and four replications. Weed control efficiency (WCE), weed density, weed biomass reduction, and Rice yield were recorded at different growth stages to evaluate the impact of each treatment.Weed data were subjected to square root transformation prior to statistical analysis, and analysis of variance (ANOVA) was performed following standard procedures (Gomez and Gomez, 1984).

Weed control efficiency (WCE) was used to quantify the reduction in weed biomass in treated plots relative to the untreated control. Based on dry matter of weeds produced at 42 days after application the WCE was calculated by using the following formula and expressed in percentage (AICRPWC, 1988).

$$WCE\ (\%) = \frac{DWC - DWT}{DWC} X\ 100$$

Where,

DWC = Weed dry weight in unweeded control

DWT = Weed dry weight in treated plot

Yield loss attributed to weed competition was expressed in terms of weed index and determined using the formula outlined by Gill and Vijay Kumar (1969).

Table 2. Effect of weed management practices on total weed dry weight (g m^{-2}) and weed control efficiency (%) measured at 42 days after herbicide application in transplanted rice during *Rabi* 2017–18 and *Kharif* 2018–19.

Treatments	Dose (g *a.i.* ha^{-1})	*Total weed dry weight		**Weed control efficiency	
		42 DAA		42 DAA	
		2017-18	2018-19	2017-18	2018-19
$T_{1.}$ Untreated control	-	15.35 (235.4)	13.98(195.9)	0.00 (0.0)	0.00 (0.0)
$T_{2.}$ Triafamone 200 SC at 2-3 leaf stage of weed	30	9.87 (98.5)	9.67 (93.1)	49.54 (57.7)	46.05 (51.8)
$T_{3.}$ Triafamone 200 SC at 2-3 leaf stage of weed	40	8.51 (72.0)	8.72 (75.7)	56.34 (69.3)	50.88 (60.0)
$T_{4.}$ Triafamone 200 SC at 2-3 leaf stage of weed	50	8.01 (64.1)	7.98 (63.3)	58.54 (72.7)	54.98 (66.9)
$T_{5.}$ Triafamone 200 SC at 2-3 leaf stage of weed	100	6.83 (46.5)	7.19 (51.2)	63.60 (80.1)	59.02 (73.4)
$T_{6.}$ Pyrazosulfuron ethyl 10% WP	15	9.96 (99.2)	10.28 (105.8)	49.32 (57.4)	42.53 (45.7)
$T_{7.}$ Triafamone 200 SC) at 0-3 DAT	30	9.53 (90.6)	8.46 (71.2)	51.58 (61.3)	52.77 (63.4)
$T_{8.}$ Triafamone 200 SC) at 0-3 DAT	40	8.58 (73.4)	7.84 (61.2)	56.01 (68.7)	55.65 (68.0)
$T_{9.}$ Triafamone 200 SC) at 0-3 DAT	50	7.59 (57.1)	7.19 (51.2)	60.35 (75.4)	59.06 (73.5)
$T_{10.}$ Triafamone 200 SC) at 0-3 DAT	100	5.61 (31.1)	6.79(45.8)	68.64 (86.7)	60.83 (76.1)
$T_{11.}$ Pretilachlor 50% EC at 0-3 DAT	750	10.13 (102.7)	10.14(103.1)	48.32 (55.7)	43.37 (47.2)
$T_{12.}$ Farmer practice (two hand weedings)	-	3.63 (13.2)	3.71 (13.3)	76.56 (94.4)	74.78 (93.0)
$T_{13.}$ Weed free	-	0.71 (0.0)	0.71 (0.0)	90.00 (100.0)	90.00 (100.0)
SEm +	-	0.35	0.29	1.70	1.47
CD (P = 0.05)	-	1.01	0.84	4.87	4.23

Note: *Data are “x+0.5 transformed. Values in parentheses correspond to the original data

** Data were subjected to arcsine transformation; original values are provided in parentheses for reference.

Table 3. Effect of weed management practices on grain yield and weed index of transplanted rice during *Rabi* 2017–18 and *Kharif* 2018–19.

Treatments	Dose (g *a.i.* ha^{-1})	Grain yield (kg ha^{-1})		*Weed index (%)	
		42 DAA		42 DAA	
		2017-18	2018-19	2017-18	2018-19
$T_{1.}$ Untreated control	-	3066	3825	42.71 (46.0)	39.24 (40.1)
$T_{2.}$ Triafamone 200 SC at 2-3 leaf stage of weed	30	3838	4459	34.87 (33.0)	33.12 (30.2)
$T_{3.}$ Triafamone 200 SC at 2-3 leaf stage of weed	40	4251	4936	30.38 (26.0)	27.76 (22.6)
$T_{4.}$ Triafamone 200 SC at 2-3 leaf stage of weed	50	4527	5178	27.42 (21.4)	25.01 (18.9)
$T_{5.}$ Triafamone 200 SC at 2-3 leaf stage of weed	100	4651	5313	23.86 (18.5)	22.31 (16.7)
$T_{6.}$ Pyrazosulfuron ethyl 10% WP	15	4168	4898	31.44 (27.7)	27.63 (23.0)
$T_{7.}$ Triafamone 200 SC) at 0-3 DAT	30	4211	4672	30.51 (26.4)	30.73 (26.7)
$T_{8.}$ Triafamone 200 SC) at 0-3 DAT	40	4329	5037	28.56 (24.4)	25.61 (20.9)
$T_{9.}$ Triafamone 200 SC) at 0-3 DAT	50	4659	5276	24.10 (18.8)	23.57 (17.4)
$T_{10.}$ Triafamone 200 SC) at 0-3 DAT	100	4967	5518	21.01 (13.5)	19.91 (13.4)
$T_{11.}$ Pretilachlor 50% EC at 0-3 DAT	750	3797	4328	34.84 (33.3)	34.46 (32.2)
$T_{12.}$ Farmer practice (two hand weedings)	-	5342	5849	14.04 (7.4)	15.06 (8.2)
$T_{13.}$ Weed free	-	5762	6376	0.00 (0.0)	0.00 (0.0)
SEm +	-	242.27	335.92	3.04	3.04
CD (P = 0.05)	-	694.87	963.46	8.71	8.71

*Note: Data are “x+0.5 transformed. Values in parentheses correspond to the original data

$$W1\ (\%) = \frac{X - Y}{X} \times 100$$

Where,

X = Grain yield in weed free plot

Y= Grain yield in treated plots.

RESULTS AND DISCUSSION

Effect of herbicides on Weeds

The experimental field was dominated by weed species such as *Echinochloa colonum, Cyperus rotundus, Cyperus difformis, Eclipta alba, Ammania baccifera,* and *Trianthema portulacastrum*. Triafamone 200 SC at 100 g *a.i.* ha^{-1} applied at 0-3 DAT achieved the highest weed control efficiency, 68.64% in *Rabi,* 2017-18 and 60.83% in *Kharif,* 2018-19 at 42 days after application of herbicide and this resulted in the lowest weed dry matter among herbicide treatments. The weed-free treatment recorded the highest weed control efficiency (76.56% in r*abi,* 2017-18 and 74.78% in *kharif,* 2018-19). The Triafamone 200 SC at higher doses and early application timing (0-3 DAT) helped in lower weed establishment and early weed competition. Similar trends have been reported in earlier studies (Jyothi Basu *et al.,* 2023).

Effect on Rice Yield

The weed-free treatment recorded the highest Rice grain yield (6376 kg ha-¹ in *Kharif,* 2018-19 and 5762 kg ha-¹ in *Rabi,* 2017-18). Among herbicide treatments, Triafamone 200 SC at 100 g *a.i.* ha-¹ applied at 0-3 DAT yielded 5518 kg ha-¹ in *Kharif* and 4967 kg ha-¹ in *Rabi*, making it the most effective chemical strategy. Two hand weedings (Farmer practice) in transplanted Rice reported the grain yield 5849 kg ha-¹ in *Kharif* and 5342 kg ha-¹ in *Rabi.* These results shows that weed management with herbicides was comparable to Hand weeding practices. The untreated control recorded the lowest yield (3825 kg ha-¹ in *Kharif* and 3066 kg ha-¹ in *Rabi*), emphasizing the detrimental impact of weed competition on Rice yields.

The weed index is a crucial parameter that quantifies the impact of weed competition on crop yield. In this study, lower weed index values were observed in plots treated with Triafamone 200 SC at 100 g *a.i.* ha-¹ (T_{10}), with values of 21.01% in *Rabi* and 19.91% in *Kharif*. This indicates its effectiveness of triafamone 200 SC in minimizing yield losses due to less weeds and it helps the Rice crop to utilize available resources effectively. The results of this research align closely with the findings of Jyothi Basu *et al.,* 2023.

The superior performance of Triafamone 200 SC at 100 g a.i. ha-¹ can be attributed to its higher herbicidal activity at this concentration, effectively controlling a broad spectrum of weed species in transplanted rice. The early application timing (0-3 DAT) proved particularly effective, as it targets weeds during their vulnerable establishment phase, preventing early weed-crop competition that is critical for achieving higher yields.The weed index values confirm that chemical weed management with Triafamone 200 SC minimizes yield losses effectively, positioning it as a viable alternative to labor-intensive weeding practices.

CONCLUSION

The findings of the present investigation demonstrate that Triafamone 200 SC is effective for weed management in transplanted Rice, when applied at 100 g *a.i*. ha-¹ at either 2-3 days after transplanting or the 2-3 leaf stage of weeds. These herbicidal treatments significantly reduced weed competition, enhanced rice yield, and provided an efficient alternative to manual weeding.

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