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WEED MANAGEMENT IN DRY SEEDED LOWLAND RICE

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ABSTRACT

Pre-emergence application of pretilachlor plus 0.3 kg a.i./ha at 3 days after seeding (DAS) with one hand weeding (HW) effectively reduced the density of dominant *Trianthema portulacastrum* (2.9 No.m^{-2}) which recorded the minimum total weed dry weight (39.5 g m^{-2}) and maximum weed control efficiency (WCE) of 85.0 per cent. Pretilachlor plus did not exhibit any crop injury and recorded the maximum seedling growth characters and stand establishment leading to increased number of panicles (319 m^{-2}). This treatment gave the best per hectare yield of 5.5 t and benefit cost ratio (B:C) of 3.12.

KEY WORDS: Weed Management, Dry seeded rice, Herbicides

Rice contributes about 40 per cent of total food grain production in India and is grown under diversified situations. The traditional transplanted rice growers in Cauvery new delta zone of Tamil Nadu often switch over to direct sown semi-dry rice wherein premonsoon dry seeding is followed by (fb) flooding after a month due to scarcity of water and labour. In dry seeded rice, weed management plays a vital role because of simultaneous emergence of crop and weed (Moody, 1977). Use of herbicides becomes the only practical alternative. But most of the pre-emergence herbicides applied at germination stage becomes toxic to rice seedlings. Hence, an attempt was made to identify the efficient weed management strategy for dry seeded lowland rice.

MATERIALS AND METHODS

Field experiments were conducted in the Cauvery new delta zone during September to January, 1992 and 1994 following randomized block design with four replications and five weed control treatments viz., pre-emergence thiobencarb fb post emergence 2, 4-D Na salt, pre-emergence thiobencarb fb HW, pre-emergence pretilachlor plus fb HW, post emergence bentazon fb HW and

Table 1. Effect of weed control treatments on weed in dry seeded low land rice of Cauvery new delta zone (Mean of two seasons) Tamil Nadu, India.

Weed control treatments	Time DAS	Herbicide rate (kg ai ha^{-1})	Dominant Weeds (No. m^{-2}) at 60 DAS			Weed dry wt. (g/m^2)	WCE* 60 DAS (%)
			E.c	C.r	T.p		
Thiobencarb fb 2, 4-D Na salt	6 & 20	2.0+1.0	1.6 (41.9)	1.5 (29.6)	1.4 (20.6)	61.9	62.5
Thiobencarb fb 2 HW at 45 DAS	6	1.5	1.6 (35.4)	1.5 (31.9)	1.0 (8.3)	50.6	74.9
Pretilachlor fb HW at 25 DAS	3	0.3	1.4 (21.6)	1.3 (18.6)	0.7 (2.9)	39.5	85
Bentazon fb HW at 45 DAS	20	0.8	1.8 (55.0)	1.8 (57.8)	1.5 (32.2)	76.8	56.6
Two HW at 25 & 45 DAS	-	-	1.6 (36.2)	1.8 (61.2)	1.49 (18.6)	68.4	65.6
LSD (p=0.05)	-	-	0.15	0.05	0.23	5.1	-

* Data not statistically analysed

Figures in parentheses are original values

E.C = *Echinochloa colonum*

C.r = *Cyperus rotundus*

T.p = *Trianthema portulacastrum*

two hand weedings. An observational plot was maintained separately as unweeded control for assessing the WCE.

Soil was sandy loam. The KCl treated dry seeds of ADT 38 rice (135 days of duraion were sown dry and brought under submergence after 30 days. The experimental fields were dominated by *Echinochloa colonum* (grass), *Cyperus rotundus* (sedge) and *Trianthema portulacastrum* (broadleaved) weeds. The Weed number and dry weight were recorded at 60 DAS using the quadrat of 0.25 m^2 size. The weed data showing high variations were subjected to log (x + 2) transformation before statistical analysis. The two years pooled data on weed and crop characters are presented.

RESULTS AND DISCUSSION

Weed number and dry weight

Application of pretilachlor fb HW gave efficient control of dominant broadleaved weed *T. portulacastrum* (2.9 No. m^{-2}) followed by *C. rotundus* (18.6 No. m^{-2}) and *E. Colonum* (21.6 No. m^{-2}). This treatment also recorded the minimum weed dry weight (39.5 g m^{-2}) and maximum WCE of

Table 2. Effect of weed control treatments on dry seeded low land rice of Cauvery new delta zone, Tamil Nadu, India (mean of two seasons)

Weed control treatments	Time DAS	Herbicide rate (kg ai ha^{-1})	Seedling growth at 20 DAS Shoot length (cm)	Root length (cm)	Crop Popula-tion (No. m^{-2})	DMP (t ha^{-1})	Pani-cles No. m^{-2}	Filled grain No. Pani-les^{-1}	Grain yield (t ha^{-1})	B:C*
Thiobencarb fb 2, 4-D Na salt	6&20	2.0 + 1.0	13.7	5.4	320	5.3	257	118	3.8	2.04
Thiobencarb fb HW at 25 DAS	6	1.5	14.2	5.7	314	5.5	282	128	4.7	2.44
Pretilachlor fb HW at 25 DAS	3	0.3	15.8	7.1	368	6.1	319	133	5.5	3.12
Bentazon fb HW at 45 DAS	20	0.8	12.1	4.8	255	5.0	235	114	2.9	1.67
Two HW at 25 & 45 DAS			14.0	6.3	262	5.3	274	125	4.5	2.33
LSD (p=0.05)			1.4	0.7	26	0.2	15	3	0.1	-

* Data not statistically analysed

85 per cent. Similar results were reported by Xue *et al.* (1992) in direct sown rice. Pre-emergence thiobencarb fb HW recorded higher WCE (74.9%) next to pretilachlor fb HW. Application of bentazon fb HW recorded the maximum dominant weed populations and total weed dry weight resulting in the minimum WCE of 56.6% which might be due to early dominance of weed and delayed weeding. Tosh and Jena (1984) also reported that bentazon was not effective for controlling weeds in dry seeded rice.

Growth and yield of rice

Application of pretilachlor fb HW suppressed the weeds at the time of emergence itself which in tunr increased the vigour and growth of rice seedlings recording maximum shoot length (15.8 cm), root length (7.1 cm) and seedling stand establishment (368 No. m^{-2}). Pretilachlor plus also recorded 0 visual rating indicating the absence of crop injury. Pretilachlor fb HW recorded the maximum dry matter production (DMP) of 6.6 t/ha, number of panicles (319 m^{-2}) and filled grains (133 $panicle^{-1}$) leading to significantly increased grain yield (5.5 t ha^{-1}) and B:C (3.12). Similar results were reported by Singh and Bhan (1986) due to better weed control in dry sown rice. Delayed weeding by the post emergence bentazon very much reduced the seedling growth and grain yield (2.9 t ha^{-1}) and B:C (1.67).

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IMPACT OF PAPER MILL EFFLUENT IRRIGATION ON THE YIELD, NUTRIENT CONTENT AND THEIR UPTAKE IN RICE

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ABSTRACT

The impact of paper mill effluent irrigation along with soil amendments (FYM, composted coir waste, pressmud and lime + FYM) on the yield, nutrient content and their uptake in rice was studied in an acid and a neutral soil of Thambirabarani river tract. Effluent irrigation resulted in an increase in the Ca and Na contents and a decrease in the K content of rice grain and straw in both the soils. The N content of the grain and straw showed an increase for the effluent irrigation in neutral soils and a decrease in acid soil. A marked reduction in the total N and K uptake as well as the grain and straw yield of rice under the effluent irrigation treatments was recorded in both the soils. Effluent irrigation decreased the Ca uptake of rice in neutral soil and increased the Na uptake in acid soil. The soil amendments had a favourable effecton the P and K uptake of rice in acid soil. The use of 50% diluted clarified effluent was found superior to raw effluent irrigation more particularly in neutral soil. The adverse effect of raw effluent irrigation was more in neutral soil compared to acid soil. Application of composted coir waste improved the grain yield of rice when raw effluent was used for irrigation in neutral soil.

KEY WORDS : Paper mill effluent, Utilisation of effluent, Rice, nutrient content, Nutrients uptake