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Efficiency of Some New Herbicides for the Weed Control in Transplanted Rice (Var. IR 20)

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ABSTRACT

An experiment was conducted in Tamil Nadu Agricultural University farm during both *Khariff* 1972 and *Rabi* 1973 seasons with different herbicides like 2,4 — D IPE, MCPA, Machete, C 19490, C 288, Benthiocarb, Tavron, TOK E-25, Ronstar and Propanil. The results revealed that in both the seasons C 19490, C 288 and Ronstar controlled the weeds effectively and recorded more grain yield compared to the other herbicide treatments.

INTRODUCTION

Though hand weeding is the common practice of weed control in rice, due to increased cost of labour and inadequate availability at the optimum time, the situation is being changed, necessitating the use of chemicals for weed control. Both granular and liquid herbicides are available in the market. Rethinam and Sankaran (1973) reported that acetanilide (G) at 2.0 kg a. i/ha as a pre-emergence herbicide controlled most of the weeds and increased the yields. The recent herbicides namely C 19490 and C 288 are stated to be better than butachlor for rice (Anon. 1972). Since many newer herbicides are available in the market it is necessary to test the relative efficiency of herbicides over the existing ones. With this objective a field trial was laid out during *Kharif* 1972 and *Rabi* 1973 seasons and the results are discussed in this paper.

MATERIALS AND METHODS

The experiment was laid out in a randomised block design with four replications in the Tamil Nadu Agricultural University farm, Coimbatore. Fourteen different weed control treatments with different granular pre-emergence herbicides like 2,4-D IPE (G) at 0.8 kg (T_1); MCPA at 0.8 kg (T_2); Machete at 1.0 kg (T_3); C 19490 at 1.0 kg (T_4); C 19490 + 2,4-D at 0.75 + 0.5 kg (T_5); C 288 at 1.0 kg (T_6); Benthiocarb + 2,4-D at 1.0 + 0.5 kg (T_7); Tavron at 0.75 kg (T_8); Machete at 1.5 kg (T_9); TOK E-25 at 2.0 kg (T_{10}); Ronstar at 1.0 kg (T_{11}) and Post-emergence liquid herbicide Propanil at 3.0 kg (T_{12}) per hectare on active in-gredient basis, hand weeding (T_{13}) and unweeded control (T_{14}) were compared. The gross plot size was 15 Sqm and the net plot size was 1.8 x 7.1 m. The nurseries were raised during 6—7—72 and 21—1—73 for *Kharif* 1972 and *Rabi*

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1973, respectively. The transplanting was done on 27—7—72 and 20—2—73 and harvesting on 27—11—72 and 22—6—73 respectively during *Kharif* and *Rabi* seasons. Both the crops received fertiliser N at 120 kg/ha applied in three splits viz. 60 kg N as basal, 30 kg N at tillering and 30 kg N at panicle initiation stage. Besides a basal dose of 60 kg P_2O_5 and 40 kg K_2O/ha were applied to all plots uniformly. To have a uniform weed population mixed weed seeds mostly consisting of *Echinocloa colonum* were broadcast at the rate of 5 kg/ha after transplanting rice. The granular herbicides were applied on sixth day of transplanting and the post emergence Propanil on 21st day of transplanting. The weed and plant characters were recorded and presented hereunder.

RESULTS AND DISCUSSION

The common weed flora present in the experimental area are *Echinocloa colonum*, *Echinacloa crusgalli*. *Marsilea* sp and *Cyperus* sp.

The results are presented in the Table 1. Among the different herbicides tried the weed control efficiency was more in C 19490, C 288, and Machete followed by Machete and Ronstar during *Kharif* 1972 and C 19490, in the decending order during *Rabi* 1973 as seen from the dry matter of weeds. During both the season maximum dry matter of weeds were recorded in TOK E-25 treatment followed by Propanil and unweeded control.

The number of panicle and panicle weight differed significantly with different treatments. Maximum panicle number was recorded in the treatment C 19490 + 2, 4-D (T_5) followed by MCPA (T_2) and C 19490 (T_4) which were 17.5, 11.7 and 4.6 per cent respectively over hand weeding and the minimum was recorded in TOK E-25 (T_{10}) and unweeded control (T_{14}) during *Kharif* 1972. During *Rabi* 1973 maximum panicle number was recorded in C 288 (T_6) followed by MCPA (T_2) which were 7.0 and 2.8 per cent over hand weeding. The minimum was recorded in the unweeded control (T_{14}) followed by Propanil T (12) and TOK E-25 (T_{10}). The mean panicle weight was maximum in C 288 (T_6) followed by C 19490 + 2, 4-D (T_5) and C 19490 (T_4) which were 27.1, 19.5 and 18.7 per cent more than hand weeding (T_{13}) and the lowest, has recorded in Propanil (T_{12}) during *kharif* 1972. During *Rabi* 1973 maximum panicle weight was recorded in C 19490 (T_4) which was 54.8 per cent more than hand weeding (T_{13}) followed by Machete (T_9) which was 29.2 per cent more than hand weeding (T_{13}).

The grain yield data revealed that maximum yield was obtained in C 19490 (T_4) which was 34.8 per cent more than hand weeding (T_{13}) followed by Ronstar (T_{11}) during *kharif* 1972. The treatment C 288 ranks fourth in the order of yield which was 18.5 per cent over hand weeding. During *Rabi* 1973 hand weeding recorded the maximum yield followed by C 19490 (T_4) C 288 (T_6) and Ronstar (T_{11}). The lowest yields were recorded in unweeded control (T_{14}), TOK E–25 (T_{10}) and Propanil (T_{12}). The lowest yield in the above treatments may be attributed

TABLE 1. *Influence of different weed control methods on crop and weed*

Treatments		Kharif 1972				Rabi 1973			
		Dry matter of weeds kg/ha.	Mean No. of panicles per sq. m	Mean panicle weight gm	Mean yield of grain kg/ha	Dry matter of weeds kg/ha.	Mean No. of panicles per sq. m.	Mean panicle weight gm.	Mean yield of grain kg/ha.
2, 4.D IPE (G)	0.8 kg a.i/ha	1900	375	1.28	3458	2230	297	0.78	1593
MCPA	0.8 ,,	1960	439	1.43	3389	3000	439	0.87	1564
Machete	1.0 ,,	1350	336	1.50	3003	3060	285	1.08	1819
C. 19490	1.0 ,,	1080	411	1.58	4140	220	424	1.75	3532
C. 19490+2. 4-D=0.75+ 0.5	,,	1630	462	1.59	3574	1310	399	1.32	2892
C. 288	1.0 ,,	1550	356	1.69	3640	450	457	1.24	3443
Benthiocarb 1.0+0.5	,,	1660	378	1.48	3378	3020	371	1.01	3038
Tavron+2, 4-D	0.75 ,,	1620	350	1.56	3793	3700	349	1.24	1635
Machete	1.5 ,,	1130	342	1.54	3446	1510	400	1.46	1661
TOK E-25	2.1 ,,	3750	296	1.35	1717	9540	203	0.59	762
Ronstar	1.0 ,,	1180	334	1.41	4084	1730	416	1.23	3402
Propanil	3.0 ,,	3080	354	1.08	2295	6500	141	0.32	261
Hand weeding	—	—	393	1.33	3071	500	427	1.13	4082
Control	—	8050	249	1.45	2195	7200	100	0.70	220
S. E.	—	41.0	33.2	0.11	226.9	16.5	51	0.27	266
CD (P = 0.05)		117.5	94.6	0.31	647.1	48.0	146	0.78	757

to the lesser panicle number and weight when compared to the other treatments, In both the seasons. The newly introduced herbicides C 19490, C 288 and Ronstar gave better weed control and higher yields compared to other herbicides. The lesser weed weight, increased panicle number and weight had reflected in increased yields in the above treatments. Hence it may be concluded that the newly introduced pre emergence herbicides like C 19490 (8 – 2 – methyl – 1 piperidyl – carbonyl methyl) – 0,0 di N propyl di thio phosphate); C 288 consisting of C 19490 and C 18898 (2 – 1' – 2' – dimethyl prophalamino) 4 ethylamino–6–ethylamino – 6–methyl mercapto –S–triasine) and Ronstar (Oxidiazon 2, two, butyl – 4 (2,4 dichloro–5– isopropyloxy phenyl) – 1, 3, 4 Oxidiazoline –5–one) are suited for rice weed control under transplanted conditions and increased the yields.

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