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RELATIVE EFFICIENCY OF DIFFERENT HERBICIDES ON RICE UNDER SEMI DRY CONDITIONS

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In Kerala although rice is grown in an area of nearly 9 lakhs hectares with an annual production of 13 lakh tonnes, it meets only 50 per cent of the requirement of the State. Among many factors responsible for the low yields, the role played by weeds is quite substantial to the tune of 20 per cent for transplanted, 30 per cent for direct seeded under puddled condition and about 50 per cent for upland rice. It is worth mentioning that more than 80 per cent of the rice area in the first crop season is under semi dry system of cultivation. The high temperature and frequent showers that prevail in the early growth period are conducive for the emergence of a wide variety of weeds.

There is very little information regarding the use of herbicides in controlling weeds under semi dry system of cultivation in Kerala. This investigation was therefore undertaken to compare the relative efficiency of the different herbicides either alone or in combination in the Research Station and Institutional Farm, Mannuthy, during the first crop season of 1977-'78.

Materials and methods

There were 16 treatments including control (Vide Table 1). The experiment was laid out in Randomised Block Design with 3 replications with a net plot size of 16 sq. m. The test variety was ''Aswathy''. The seed rate adopted was 100 kg/ha. The crop received 45 kg nitrogen, 45 kg. phosphorus and 45kg. potash per hectare at sowing. Nitrogen (45 kg/ha) was topdressed in 2 splits at the tillering and panicle initiation stages.

Cynodon dactylon, Cyperus iria, Cyperus cyperinus, Cyperus difformis, Amaranthus viridis, Ageratum Conyzoides Eupatorium odoratum, Tridax procumbens, Phyllanthus niruri were more widely prevalent weeds in the paddy fields of Mannuthy. Number of monocot and dicot weeds per sq. m., dry weight of monocot and dicot weeds per sq. m. and yield of paddy grain were used as criteria for treatment evaluation.

Results and Discussion

Monocot and dicot weeds. The data on the mean number and dry weight for each of monocot and dicot weeds are given in Table-1, The data

Table 1 Mean number and weight of weeds on 120th day

Treatments	Mean number of weeds per Sq. M.		Mean dry weight of weeds (GM/Sq. M)	
	Monocot	Dicot	Monocot	Dicot
Propanil EC (1 kg/ha)	162	1.66	82	0.36
-do- (1.5 kg/ha)	162	1.49	85	0.36
Butachlor EC (1 kg/ha)	303	1.99	150	0.46
-do- (1.5 kg/ha)	188	1.24	97	0.23
Benthiocarb EC (1 kg/ha)	155	8.29	81	1.60
-do- (1.5 kg/ha)	288	2.90	142	0.88
Penoxalin EC (1 kg/ha)	223	3.32	108	1.05
-do- (1.5 kg/ha)	267	1.66	128	0.36
C 288 EC	73	4.61	38	1.21
Propanil EC + 2, 4—D Sodium Salt	78	1.24	67	0.20
Benthiocarb + -do-	263	1.24	128	0.23
Butachlor + -do-	197	1.79	113	0.43
Penoxalin -do-	174	2.62	80	0.78
C 288 EC + -do-	216	1.24	108	0.23
Hand Weeding	160	3.94	72	0.95
Untreated control	399	8.93	188	1.70
C. D. at 5%	75.27	4.23	81.71	0.73

(Data after transformation)

on the mean number of monocot weeds at 120th day showed that application of C 288 EC (0.5 kg. a. i/ha) was the best in controlling monocot weeds followed by application of propanil EC in combination with 2, 4-D sodium salt (0.75 + 0.5 kg. a. i/ha) and benthiocarb EC (1 kg. a. i/ha) and were significantly superior to the rest of the treatments. The data on the mean number of dicot weeds also showed that application of butachlor EC (1.5 kg. a. i/ha), Propanil EC in combination with 2, 4-D sodium salt (0.75 + 0.5 kg a. i/ha), Benthiocarb in combination with 2, 4-D sodium salt (0.75 + 0-5 kg. a. i/ha) and C 288 in combination with 2, 4-D sodium salt (0.5 +0.5 kg. a. i/ha) though on par but significantly superior to the rest of the herbicides in controlling the dicot weed population. Similar results have been reported by Thakur *et. at.* (1967)and Sahu and Jena (1968).

Table 2 Mean yield of grains from plots treated with various weedicides

Treatments	Grain yield (kg/ha)	Percentage increase over unweeded control
Propanil EC (1 kg/ha)	2375	268
-do- (1.5 kg/ha)	2625	307
Butachlor EC (1 kg/ha)	1992	209
-do- (1.5 kg/ha)	2521	291
Benthiocarb EC (1 kg/ha)	2408	273
-do- (1.5 kg/ha)	2185	239
Penoxalin EC (1 kg/ha)	2234	246
-do- (1.5 kg/ha)	2308	258
C 288 EC	2298	256
Propanil EC + 2, 4—D Sodium Salt	3425	431
Benthiocarb + -do-	2511	289
Butachlor + -do-	2234	246
Penoxalin + -do-	2190	239
C 288 EC + -do-	2406	273
Hand Weeding	2427	276
Untreated control	645	—
C. D. at 5%	640	—

The data on the dry weight of monocot and dicot weeds suggest that propanil alone and in combination with 2, 4—D, Benthiocarb (1 kg. a. i/ha), penoxalin in combination with 2, 4—D and C288 (avirosan) were superior to all other treatments in controlling monocot weeds. Propanil either alone or in combination with 2, 4—D, Benthiocarb in combination with 2, 4—D, Butachlor (1.5 kg. a. i/ha) were on par but significantly superior to the rest of the treatments in controlling the dicot weeds. This is in agreement with the findings of Nair *et. al.* (1964) and Sajo (1965).

Grain yield: The mean yields of paddy grain are furnished in Table 2. All the weed control treatments gave significantly higher yield over unweeded control. It was

found that propanil in combination with 2, 4—D gave maximum yield over control followed by propanil alone (1.5 kg. a.i/ha), Butachlor alone (1.5 kg. a. i/ha) and Benthiocarb in combination with 2, 4 — D. All the above treatments were significantly superior to the rest of the treatments. From a perusal of the data on mean dry we ght of monocot and dicot weeds, it is seen that combined application of propanil and 2, 4—D would be the most efficient treatment in controlling weeds and hence in the maximum grain yield. As reported by previous workers like Verma and Mani (1964) propanil has been proved best for controlling weeds especially grasses in paddy field. It can also be inferred that propanil in combination with 2, 4—D in the early crop growth period has played a dominant role in increasing the yield under this treatment.

Summary

The findings of the present investigation reveal that amongst different weed control measures tried the application of propanil (Stam F — 34) in combination with 2, 4—D (Feronoxone) at the rate of 0.75 and 0.5 kg. a. i/ha respectively, followed by propanil (Stam F — 34) alone at the rate of 1.5 kg. a.i/ha and Butachlor (Machete) alone at the rate of 1.5 kg. a. i/ha are beneficial in controlling weeds and improving grain yields of rice.

സംഗ്രഹം

വിരിപ്പ് കൃഷിക്കു വിത്തു് നരിയിട്ടന്ന നെല്പാടങ്ങളിൽ ഉപയോഗിയ്ക്കാവുന്ന കള നശീകരണ raocroaiadwco ഏതൊക്കെയാണെന്നു് കണ്ടുപിടിക്കുന്നതിനു വേണ്ടിയുള്ള ഒരു പരീക്ഷണം കേരള സർവ്വകലാശാലയുടെ കീഴിലുള്ള മണ്ണുത്തി നെല്ലുഗവേഷണ കേന്ദ്രത്തിൽ 1977-ൽ നടത്തുകയുണ്ടായി. ഏകപത്രികളും ദ്വിപത്രികളും ആയ ഒട്ടേറെ കളകളെ നശിപ്പിയ്ക്കുവാൻ ഈ കളനാശിനികളും പൊതുവെ ഉപയോഗപ്രദമാണെന്നു് ഈ പരീക്ഷണം തെളിയിച്ചു. സ്റ്റാം. എഫ്. 34 ഉം, ഫെറനോക്സോനും കൂടി കലർത്തി വിത്തു് വിതച്ചു് 10 ദിവസം കഴിഞ്ഞു് തളിച്ചു് കൊടുക്കുന്നതാണു് ഏറ്റവും ഫലപ്രദമായി കണ്ടതു്. ഈ കളനാശിനി ഉപയോഗം കൂടുതൽ വിളവു് ലഭ്യമാകുവാൻ സഹായമാകുകയും ചെയ്യു.

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