

## Evaluation of anilofos in rice weed control

V. RAVI, S. MURALI KRISHNASAMY AND K. GANESAMURTHY

Department of Agronomy, Tamil Nadu Agricultural University, Coimbatore - 641 003, Tamil Nadu

**Abstract :** Field experiments were conducted during 1994-95 to evaluate various doses of anilofos (Arozin) in controlling weeds in transplanted rice. The major weeds were *Echinochloa colomum*, *Cyperus difformis* and *Ammania baccifera*. Of all the doses minimum weed population and maximum rice grain yield were noticed in anilofos 0.6 kg a.i. ha<sup>-1</sup> treated plots. The crop growth was comparable with weed free check. (**Key Words :** Rice, Weed control, Anilofos)

Weed competition in rice is a major impediment for increasing the productivity of rice. In transplanted rice inspite of sanitary precautions carried in seeds and nursery some of the seed borne weeds will be prevalent due to their versatile adaptability to the environment and fecundity of seed production. Hence, in the present study different doses of anilofos were evaluated to minimize weed population in rice and to achieve higher grain yield.

### Materials and Methods

Field experiments were conducted from 1994-1995 during *Kuruvai* and *Thaladi* season at Agriculture Research Station, Pattukkottai on sandy loam soils. Seven treatments were evaluated in Randomized Block Design with three replications as follows :

T <sub>1</sub>	:	Anilofos 0.40 kg a.i. ha <sup>-1</sup>
T <sub>2</sub>	:	Anilofos 0.45 kg a.i. ha <sup>-1</sup>
T <sub>3</sub>	:	Anilofos 0.50 kg a.i. ha <sup>-1</sup>
T <sub>4</sub>	:	Anilofos 0.55 kg a.i. ha <sup>-1</sup>
T <sub>5</sub>	:	Anilofos 0.60 kg a.i. ha <sup>-1</sup>
T <sub>6</sub>	:	Weed free check
T <sub>7</sub>	:	Unweeded check

The herbicide was applied as pre - emergence on the third day after transplanting. The rice cultivar ADT 36 was used during *Kuruvai* and *Thaladi* season in both the years.

### Results and Discussion

The major weed species of different groups were *Echinochloa colomum* among grasses and *Cyperus difformis* among sedges. The dominant broad-leaved weed was *Ammania baccifera*.

#### Plant height

The mean plant height at harvest (Table 1) ranged between 84.5 cm in unweeded check and

98.9 cm in weed free check. This clearly indicates that there is suppression in plant height due to weeds. Among the doses tested, anilofos at 0.6 kg ha<sup>-1</sup> recorded the maximum plant height. In lower doses, the plots were relatively more weedy, consequently resulting in gradual reduction in plant height.

#### Productive tillers

There was significant variation in the number of productive tillers (Table 1) produced per m<sup>2</sup> due to the various weed control treatments. In all the seasons, anilofos applied @ 0.6 kg ha<sup>-1</sup> was on par with weed free check and significantly superior to the rest of the treatments except during *thaladi* 1994 in which the dose at 0.55 was also on par with the above treatments. In all the seasons consistently lesser productive tillers were noticed in unweeded check. There was a linear increase in the number of productive tillers in proportion to the dose applied.

#### Grain yield

During *Kuruvai* 1994, the maximum grain yield of 5824 kg ha<sup>-1</sup> was recorded in anilofos 0.6 kg ha<sup>-1</sup> on par with weed free check with 5633 kg ha<sup>-1</sup> significantly superior to the rest of the treatments (Table 1). In *Thaladi*, the treatments anilofos 0.6 kg ha<sup>-1</sup> and weed free check recorded 4933 and 5030 kg ha<sup>-1</sup> respectively. During 1995 also the same trend as in 1994 was observed. Due to weeds the yield reduction was 47.5 per cent and 44.5 per cent during *Kuruvai* and *Thaladi* seasons respectively. The increase in yields may be attributed to increased productive tillers and reduced competition due to weeds. Also, the linear increase in the yield upto 0.6 kg ha<sup>-1</sup> indicated that there was no phytotoxicity due to the application of anilofos upto 0.6 kg ha<sup>-1</sup>. Similar increase in yield due to weed free maintenance in Thanjavur conditions was reported by Mohamed Ali and Sankaran, 1997 and Arokiaraj *et al.* 1989).

**Table 1.** Effect of anilofos on plant height, productive tillers, grain and straw yield of rice (ADT 36)

Treatment	Season	1994		1995	
		Kuruvai	Thaladi	Kuruvai	Thaladi
Plant height (cm)					
T <sub>1</sub> Anilofos 0.40 kg ha <sup>-1</sup>		90.0	87.3	90.4	84.0
T <sub>2</sub> Anilofos 0.45 kg ha <sup>-1</sup>		93.3	92.5	93.2	84.5
T <sub>3</sub> Anilofos 0.50 kg ha <sup>-1</sup>		94.8	94.0	96.0	88.2
T <sub>4</sub> Anilofos 0.55 kg ha <sup>-1</sup>		96.0	98.0	99.0	90.4
T <sub>5</sub> Anilofos 0.60 kg ha <sup>-1</sup>		96.8	96.8	99.8	93.6
T <sub>6</sub> Weed free check		99.3	97.5	102.8	95.8
T <sub>7</sub> Unweeded check		85.0	86.0	83.8	83.2
SE <sub>d</sub>		2.0	1.4	1.0	0.97
CD (P=0.05)		6.0	4.2	3.5	3.5
Productive Tiller (No./m <sup>2</sup> )					
T <sub>1</sub> Anilofos 0.40 kg ha <sup>-1</sup>		189	192	188	172
T <sub>2</sub> Anilofos 0.45 kg ha <sup>-1</sup>		223	216	210	198
T <sub>3</sub> Anilofos 0.50 kg ha <sup>-1</sup>		226	219	228	222
T <sub>4</sub> Anilofos 0.55 kg ha <sup>-1</sup>		242	227	262	240
T <sub>5</sub> Anilofos 0.60 kg ha <sup>-1</sup>		248	235	280	272
T <sub>6</sub> Weed free check		267	252	298	285
T <sub>7</sub> Unweeded check		132	120	127	132
SE <sub>d</sub>		14.4	12.1	5.3	7.0
CD (P=0.05)		42.7	36.1	20.0	28.0
Grain Yield (kg ha <sup>-1</sup> )					
T <sub>1</sub> Anilofos 0.40 kg ha <sup>-1</sup>		4369	4163	3640	3592
T <sub>2</sub> Anilofos 0.45 kg ha <sup>-1</sup>		4084	4214	4012	3820
T <sub>3</sub> Anilofos 0.50 kg ha <sup>-1</sup>		4697	4420	4455	4230
T <sub>4</sub> Anilofos 0.55 kg ha <sup>-1</sup>		4909	4556	5648	5140
T <sub>5</sub> Anilofos 0.60 kg ha <sup>-1</sup>		5824	4933	6100	5928
T <sub>6</sub> Weed free check		5633	5030	6328	6190
T <sub>7</sub> Unweeded check		3027	3209	3250	3020
SE <sub>d</sub>		166	92	125	179
CD (P=0.05)		494	274	438	645
Straw Yield (kg ha <sup>-1</sup> )					
T <sub>1</sub> Anilofos 0.40 kg ha <sup>-1</sup>		4661	4454	3825	3610
T <sub>2</sub> Anilofos 0.45 kg ha <sup>-1</sup>		4244	4318	4290	4030
T <sub>3</sub> Anilofos 0.50 kg ha <sup>-1</sup>		4798	4674	4728	4580
T <sub>4</sub> Anilofos 0.55 kg ha <sup>-1</sup>		4870	4756	5970	5420
T <sub>5</sub> Anilofos 0.60 kg ha <sup>-1</sup>		5443	5216	6522	6354
T <sub>6</sub> Weed free check		6080	5210	6750	6425
T <sub>7</sub> Unweeded check		3531	3310	3522	3252
SE <sub>d</sub>		220	142.1	140	187
CD (P=0.05)		652	298.5	532	750

Straw yield

Straw yield (Table 1) also showed significant response to the weed control treatments. Over unweeded check weed free check recorded increased straw yields of 72.18 per cent, 57.4 per cent, during 1994 and 91.6 per cent and 97.5 per cent during 1995 in *Kuruvai* and *Thaladi* seasons respectively. This might be due to the reduction in plant height and tiller production in unweeded control. Among the doses studied anilofos @ 0.6 kg ha<sup>-1</sup> registered the highest mean straw yield of 6415 kg ha<sup>-1</sup> and 5818 kg ha<sup>-1</sup> during *Kuruvai* and *Thaladi* respectively.

Weed population

The maximum weed population (Table 2) value of 478 numbers m<sup>-2</sup>, 436 numbers m<sup>-2</sup> during *Kuruvai* and *Thaladi* of 1994 was noticed in unweeded check. Similarly, during 1995 the population was 495 numbers m<sup>-2</sup> and 384 numbers m<sup>-2</sup> respectively in *Kuruvai* and *Thaladi*. In anilofos 0.6 kg ha<sup>-1</sup> treated plots the weed count ranged from 46 numbers m<sup>-2</sup> in *Kuruvai* 1994 to 25 numbers m<sup>-2</sup> in *Kuruvai* 1995. Control of weeds in rice by anilofos was also reported by Pamplona and Evangelista (1984). Reduction in weed population might have contributed to reduction in competition for nutrients, sun light and water, consequently increasing the plant growth and yield components and yield of rice.

References

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Table 2. Effect of anilofos on weed population (No/m<sup>2</sup>) in transplanted rice (ADT 36)

Treatment	1994						1995							
	Season		Kuruvai		Thaladi		Kuruvai		Thaladi		Thaladi			
	Observed	Transformed	Observed	Transformed	Observed	Transformed	Observed	Transformed	Observed	Transformed	Observed	Transformed		
T <sub>1</sub> Anilofos 0.40 kg ha <sup>-1</sup>	348	18.6	414	20.3	298	17.3	265	16.3	478	21.8	436	20.9	384	19.6
T <sub>2</sub> Anilofos 0.45 kg ha <sup>-1</sup>	307	17.5	339	18.4	210	14.5	223	14.9	478	21.8	436	20.9	384	19.6
T <sub>3</sub> Anilofos 0.50 kg ha <sup>-1</sup>	248	15.7	274	16.5	174	13.2	220	14.8	478	21.8	436	20.9	384	19.6
T <sub>4</sub> Anilofos 0.55 kg ha <sup>-1</sup>	174	13.0	162	12.7	112	10.6	98	9.9	478	21.8	436	20.9	384	19.6
T <sub>5</sub> Anilofos 0.60 kg ha <sup>-1</sup>	46	6.7	34	5.8	25	5.0	32	5.7	478	21.8	436	20.9	384	19.6
T <sub>6</sub> Weed free check	9	2.9	4	1.9	5	2.2	8	2.8	478	21.8	436	20.9	384	19.6
T <sub>7</sub> Unweeded check	478	21.8	436	20.9	495	22.2	384	19.6	478	21.8	436	20.9	384	19.6
SE <sub>d</sub>		0.7		0.48		0.785		0.409						
CD (P=0.05)		2.08		1.43		1.649		0.860						