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Bio-efficacy of Herbicides in Polybag Transplanted Sugarcane

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Weed management is a key factor deciding the cane yield. For effective control of weeds in sugarcane, sequential spray of atrazine at 2 kg ha^{-1} and 2, 4-D at 1 kg ha^{-1} has been recommended (Srivastava *et al.*, 1997). Continuous use of atrazine resulted in resistant biotypes of 58 weeds (Le Baron, 1992). Hence, equally potential herbicides have to be screened for effective weed control.

Field experiment was carried out during December 2001 to December 2002 at Annamalai University Experimental Farm, Annamalainagar, Tamil Nadu. The soil was clayey loam, low in available nitrogen, medium in available phosphorus and high in available potassium with a pH of 7.4. Eleven treatments consisting of hand hoe weeding and different herbicides applied alone and in combination were tested in randomized block design with three replications (Table 1). Herbicidal applications were done at 3 DAT except 2, 4-D at 15 DAT. The 30 days old polybag raised seedlings of sugarcane variety CoC 98061 were transplanted. One seedling was planted in each pit and irrigation was given immediately after transplanting.

The predominant weed flora observed in the experimental plots were *Cyperus rotundus, Cynodon dactylon, Dactyloctenium aegypticum, Echinochloa colona, Panicum repens, Acalypha repens, Acalypha indica, Commelina benghalensis, Cleome viscosa, Corchorus olitorius* and *Trianthema portulacastrum*. Hand hoe weeded

Table 1. Effect of treatments on weeds and sugarcane

Treatment	Weed density (No. m^{-2}) 60 DAT	Weed dry weight (kg ha^{-1}) 60 DAT	Millable cane population ('000 ha^{-1})	Cane yield (t ha^{-1})	Sugar yield (t ha^{-1})
Handhoe weeding at 30 DAT	(121) 11.02*	197.60	97.44	97.60	11.36
Atrazine 2 kg a. i. ha^{-1}	(242) 15.56*	523.33	88.18	94.60	10.99
Alachlor 1.5 kg a. i. ha^{-1}	(309) 17.58*	710.40	84.21	85.66	9.92
Oxyfluorfen 0.30 kg a. i. ha^{-1}	(336) 18.34*	791.00	80.36	82.00	9.46
Pendimethalin 1.5 kg a. i. ha^{-1}	(252.33) 15.90*	569.27	87.34	92.33	10.72
2, 4-D Na salt 1 kg a. i. ha^{-1}	(703) 26.51*	1995.93	65.70	60.67	6.90
Atrazine+2, 4-D (1+0.5 kg ha^{-1})	(836.00) 28.92*	2059.60	61.72	57.48	6.78
Alachlor+2, 4-D (0.75+0.5 kg ha^{-1})	(847.00) 29.11*	2073.80	62.78	56.26	6.38
Oxyfluorfen+2, 4-D (0.15+0.5 kg ha^{-1})	(843) 29.04*	2260.67	59.21	54.80	6.21
Pendimethalin+2, 4-D (0.75+0.5 kg ha^{-1})	(820) 28.64*	2042.40	59.68	56.88	6.47
Weedy	(922) 30.84*	2529.90	57.38	51.40	5.81
LSD (P=0.05)	4.34	164.11	11.03	5.80	0.61

*Data are root transformation values of x+0.5. Data in parentheses are original values.

treatment registered the lowest weed count and weed biomass (Table 1). The tank mix application of 2, 4-D with other herbicides proved inferior in controlling the weeds, which were almost comparable with the unweeded control treatment (Table 1). The hand hoe weeded treatment registered the highest cane yield of 97.60 t ha^{-1} and this was comparable with the atrazine (94.60 t ha^{-1}) and pendimethalin (92.33 t ha^{-1}) treatments. The increase in yield might be attributed to efficient control of weeds by the treatments and reduced crop-weed competition.

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