Short communication

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Efficacy of weed management practices in ratoon sugarcane

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Reduction in cane yield due to weeds occurs up to 40-67% (Chauhan and Srivastava 2002). Weed in sugarcane need to be controlled at formative stage. Weed control in sugarcane can be achieved by mechanical, chemical, chemical + mechanical methods and trash mulching (Singh *et al.* 1996). Sugarcane ratoon occupies majority of the area in Maharashtra. Economical weed management in sugarcane ratoon is essential for sustainable cane yield. Manual hoeing and weeding are costly and labour intensive. Thus, there is need to identify effective herbicides and also to integrate various methods of weed control for effective and economical weed management. Sugarcane being a highly fertilized crop requires frequent irrigations. Weeds grow vigorously and compete with the crop at tillering stage. Present study was undertaken to study the influence of weed management practices in controlling weeds and economics of various treatments in ratoon sugarcane.

A field experiment was conducted during 2006-09 at Central Sugarcane Research station, Padegaon. Ten treatments, *viz.*, control (no hoeing, weeding and no herbicide application); three hoeings (1, 4 and 7 week after ratoon initiation); atrazine 2.0 kg/ha pre-emergence (PE) + 2,4 D 1.0 kg/ha at 45 days after ratoon initiation (DARI); atrazine 2.0 kg/ha PE + one hoeing at 45 DARI; metribuzin 1.0 kg/ha PE + 2.4-D 1.0 kg/ha at 45 DARI; metribuzin 1.0 kg/ha PE + one hoeing at 45 DARI; glyphosate 0.4 kg/ha at 3 weeks stage as directed spray + 2,4-D 1 kg/ha at 60 DARI; glyphosate 0.4 kg/ha at 3 weeks stage as directed spray + one hoeing at 60 DARI; trash mulching in alternate rows + hoeings at 1 and 6 week after ratoon initiation; trash mulching between all rows with recommended practice were replicated 3 times in a randomized block design. Ratoon of sugarcane variety '*Co 86032*' was cultivated during 2006-07, 2007-08 and 2008-09. Recommended dose of fertilizer *i.e.* 250 kg N + 115 kg P + 115 kg K/ha was applied, along with other package of practices. Soil was neutral (pH 7.6) and clay loam in texture. Data were analyzed and economics was calculated by considering the cost of cultivation, net returns and benefit: cost ratio.

Major weeds observed in the experimental plot were: *Cyperus rotundus, Cynadon dactylon, Parthenium hysterophours, Commalina benghalensis, Echinochloa* sp, *Virudus* sp, *Acalypha India, Convolvulus arvensis, Euphorbia hyperccifolia, Panicum isachmi* and *Digitaria sanguinalis*. The pooled data revealed that at 30, 60, 90 and 120 days after ratoon initiation, application of trash mulching between all rows with recommended practice recorded maximum weed control efficiency, followed by trash mulching in alternate rows + hoeings at 1 and 6 week after ratoon initiation (Table 1).

The highest cane yield (98.0 t/ha) and CCS yield (15.5 t/ha) were recorded with trash mulching between all rows with recommended practice. However, the cane yield obtained with trash mulching in alternate rows + hoeings at 1 and 6 week after ratoon initiation (95.3 t/ha) and three hoeings at 1, 4 and 7 week after ratoon initiation (94.0 t/ha) were at par with trash mulching between all rows with recommended practice. The minimum cane yield (66.6 t/ha) was observed in weed infested control. Similar results were reported by Chauhan and Srivastava (2002) in plant crop and Singh *et al.* (1995) in ratoon crop.

Gross monetary returns (₹ 1,07,831/ha) and net monetary returns (₹ 69,719/ha) were higher with trash mulching between all rows with recommended practice for sugarcane ratoon. However, these were at par with trash mulching in alternate rows + hoeings at 1 and 6 week after ratoon initiation and three hoeing (1, 4 and 7 week after ratoon initiation). Trash mulching between all rows with recommended practice also recorded higher B: C ratio (2.83), followed by trash mulching in alternate rows + hoeings at 1 and 6 week after ratoon initiation (2.69) and three hoeings (2.60).

It was concluded that trash mulching between all rows with recommended practice for sugarcane ratoon recorded higher weed control efficiency as well as produced significantly higher cane yield and net profit.

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Table 1. Mean yield and economics of sugarcane ratoon as affected by various treatments (pooled data of 3 years)

Treatment	Cane yield (t/ha)	CCS yield (t/ha)	Weed control efficiency at 120 DAR (%)	Total monetary returns (x10^3 ₹/ha)	Net profit (x10^3 ₹/ha)	B:C ratio
Unweeded control	66.6	9.08	-	73.43	37.50	2.04
Three hoeings (1, 4 and 7 weeks after ratoon initiation)	94.0	13.51	44.6	103.44	63.61	2.60
Atrazine 2.0 kg/ha PE + 2,4 D 1.0 kg/ha at 45 days after ratoon initiation (DARI)	76.9	11.17	37.7	84.76	45.76	2.17
Atrazine 2.0 kg/ha PE + one hoeing at 45 DARI	82.9	11.45	39.1	91.31	51.87	2.31
Metribuzin 1.0 kg/ha PE + 2,4 D 1.0 kg/ha at 45 DARI	87.8	12.56	41.1	96.61	56.43	2.40
Metribuzin 1.0 kg/ha PE + one hoeing at 45 DARI	91.6	13.05	45.4	101.03	60.68	2.50
Glyphosate 0.4 kg/ha at 3 weeks stage as directed spray + 2,4 D 1 kg/ha at 60 DARI	81.7	11.52	40.0	89.93	52.41	2.40
Glyphosate 0.4 kg/ha at 3 weeks stage as directed spray + one hoeing at 60 DARI	79.2	11.07	36.1	87.83	49.41	2.29
Trash mulching in alternate rows + hoeings at 1 and 6 week after ratoon initiation	95.3	13.87	47.9	104.85	65.84	2.69
Trash mulching between all rows with recommended practice	98.0	15.50	54.6	107.83	69.72	2.83
LSD (P=0.05)	5.0	1.20	-	5.62	6.67	-

SUMMARY

A field experiment was conducted to evaluate relative performance of weed management practices in sugarcane ratoon during 2006-09 at Padegaon, Maharashtra. Trash mulching between all rows with recommended practice recorded significantly higher cane yield (98 t/ha), which was at par with trash mulching in alternate rows + hoeings at 1st and 6th week after ratoon initiation (95.3 t/ha) and three hoeings at 1, 4 and 7 weeks after ratoon initiation (94.0 t/ha). Highest net returns (69,719/ha) and B:C ratio (2.83) were observed due to trash mulching between all rows for sugarcane ratoon with recommended practice.

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