

## Original Research Article

# Study on Weed Control and Yield of Seasonal Sugarcane as Influenced by Application of Different Herbicides

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## ABSTRACT

A field experiment was conducted during *Kharif* 2014-15 in RBD with seven treatments in three replications. The planting of sugarcane was done at 120 cm row spacing on ridges and furrows, The RDF and Plant protection schedule was followed. Weed flora of experimental site during *Kharif* season (Sugarcane) was divided with 60 per cent broad leaved and 40 per cent grassy weeds. Among broad leaved weeds *Euforbia jeniculata*, *Parthenium hysterphorus*. *Digera arvensis*, *Mereimia emerginata* and *Alteranthera sessile* were found dominant. Whereas, among grassy weeds *Cynodon dactylon*, *Brachiaria eruciformis*, *Cyperus rotundus* were found as dominant. As a result, the cane yield of sugarcane (t/ha) was significantly influenced due to various herbicidal treatments. From the research experiment, the data indicate that the highest cane yield (t/ha) and CCS yield (t/ha) were recorded with the treatment of Metribuzine 70 per cent WP @ 1 Kg/ha (POE) along with 2,4 D sodium salt 80 percent WP tank mixed and was found at par with the treatment of Ametryne 80 per cent WDG @ 2.5 kg/ha (POE) and the treatment of Metribuzine 70 per cent WP @ 1 Kg ai/ha. (POE) and B.C ratio similar trend was found.

## Keywords

Weeds,  
Herbicides,  
Weed control  
efficiency,  
Cane yield and  
seasonal  
sugarcane

## Introduction

Sugarcane (*Saccharum officinarum* L.) is an important commercial crop in the tropics and warm sub-tropics. Maharashtra is one of the leading states in sugar and sugarcane production in India. Sugarcane industry in Maharashtra state is second largest agro based industry next to cotton in which higher investment is made and has brought about desirable changes in social, economical, educational and political life in rural areas. In Maharashtra highest cane yield by farmers for seasonal sugarcane is 217 t/ha. However, the average yield of state is about 85 t/ha. Thus there is wide gap between the average yields and potential

yield. These production potential can be achieved by adopting better management practices of crop production.

In other hand, the problem of weeding becomes more critical in sugarcane crop due to the shortage of labours particularly women labours at appropriate time. As a result sugarcane yield will be reduced drastically. Singh and Tomar (2005) reported yield loss of sugarcane crop to an extent of 27-38 % due to presence of weed in crop and the critical period for weed competition was between 30-60 days after planting.

Keeping in view the losses caused by weeds, the present study was designed to examine weed effect on seasonal sugarcane.

## **Materials and Methods**

A proposed experimental study entitled 'Effect of different herbicides on weed control and yield of seasonal sugarcane' was conducted at Regional Sugarcane Research Station, Basmathnagar, District Hingoli on clay loam soil during 2013-14.

The experiment was designed in randomized blocks with seven different treatments viz. T<sub>1</sub> – Ametryne 80% WDG @ 2.5 kg ai/ha (POE), T<sub>2</sub> – 2,4-D Dimethyl amine salt 58% SL (POE), T<sub>3</sub> – Atrazine 50% WP @ 1 kg ai/ha (PE), T<sub>4</sub> – Metribuzine 70% WP @ 1 kg ai/ha, T<sub>5</sub> - Metribuzine 70% WP @ 1 kg ai/ha + 2,4-D sodium salt 80% WP tank mixed, T<sub>6</sub> - Hand weeding and T<sub>7</sub> – Control.

The treatments were replicated thrice. The gross and net plot size were 6x6x1.2 m and 5x4x1.2 m respectively. The planting of sugarcane was done at 120 cm row spacing on ridges and furrows.

The sugarcane variety CO-Vsi- 9805 was used for study. All the recommended management practices were followed.

The weed flora of experiment site during *kharif* season was divided with 60 % broad leaved and 40 % grassy weeds.

Among broad leaved weeds *Euphorbia geniculata*, *Parthenium hysterophorus*, *Digera arvensis*, *Mereimia emergianta*, *Alternanthera sessile*, *lactula runcianata*, *chenopodium album* were found dominated.

While, among grassy weeds *Cynodon dactylone*, *Brachiaria eruciformis*, *cyperus rotundus* were found as dominant.

## **Results and Discussion**

### **Cane yield**

Cane yield of sugarcane (t/ha) was significantly influenced due to various herbicidal treatments.

The data indicate that highest cane yield was recorded in T<sub>5</sub> i.e. Metribuzine 70% WP @ 1 Kg/ha (POE) + 2,4 D Sodium Salt 80% WP tank mixed and was found at par with T<sub>1</sub> i.e. Ametryne 80% WDG @ 2.5 kg/ha (POE) both of them found significantly superior over rest of the treatments.

### **Weed count and weed control efficiency**

The data presented in Table No 7 revealed that the lowest weed count grassy weed was recorded in treatments T<sub>6</sub> i.e. hand weeding and was found at par with the T<sub>5</sub> i.e. Metribuzine 70% WP @ 1 Kg/ha (POE) + 2,4 D Sodium salt 80% WP and T<sub>1</sub> i.e. Ametryne 80 % WDG @ 2.5 kg/ha (POE) in case of broad leaf weed count treatment T<sub>5</sub> i.e. Metribuzine 70% WP @ 1 Kg/ha (POE) + 2,4-D Sodium slat 80% WP recorded lowest broad leaf weed count and was found at par with T<sub>1</sub> i.e. Ametryne 80% WDG @ 2.5 Kg/ha (POE) and of them found significantly superior over rest of the treatments

### **Yield contributing characters**

In case of CCS yield (t/ha) and single cane weight (Kg/Plant) treatment T<sub>5</sub> i.e. Metribuzine 70% WP 1 Kg/ha (POE) + 2,4 D Sodium salt 80% WP tank mixed recorded highest CCS yield (t/ha) and single cane weight (Kg/plant) and found at par with T<sub>1</sub> i.e. Ametryne 80% WDG @ 2.5 Kg/ha (POE). Effect of treatments on CCS percent and NMC ('000'/ha) was found to be non-significant.

**Table.1** Yield contributing characters as influenced by different treatments

Treatments	Cane yield t/ha	Weed count at 60 DAP		Weed control efficiency at 60 DAP (%)		CCS yield	GMR (Rs./ha)	NMR (Rs./ha)	B:C Ratio
		Grassy	BL	Grassy	BL				
T <sub>1</sub> Ametryne 80% WDG @ 2.5 kg ai/ha (POE)	143.60	6.73	6.88	78	74	18.51	258600	147857	2.34
T <sub>2</sub> 2,4-D Dimethyl Amine Salt 58% SL (POE)	105.67	20.56	7.18	55	77	13.90	190200	87317	1.85
T <sub>3</sub> Atrazine 50% WP @ 1 kg ai/ha (P.E.)	95.64	18.33	18.28	54	67	11.14	172200	74490	1.70
T <sub>4</sub> Metribuzine 70% WP @ 1 kg ai/ha (POE)	127.30	13.14	15.39	60	71	15.43	229194	121873	2.13
T <sub>5</sub> Metribuzine 70 % WP @ 1 kg ai/ha (POE) + 2,4-D Sodium salt 80% WP Tank mixed	155.35	6.18	5.6	79	81	19.50	279600	166467	2.47
T <sub>6</sub> Hand weeding	119.00	6.11	8.5	75	70	11.46	214200	99765	1.87
T <sub>7</sub> Control	88.86	27.94	31.03	--	--	10.23	159600	61151	1.62
SE ±	4.98	0.44	0.51	--	--	0.74	8970.91	9297.7	0.08
CD at 5%	15.36	1.36	1.56	--	--	2.20	27641.85	28648.49	0.26
CV	7.23	5.42	6.63	--	--	9.78	7.23	14.85	7.22

### Economics

The cane yield of sugarcane, weed count, weed control efficiency and yield contribution characters of sugarcane are discussed herewith.

In case of gross monetary returns treatment T<sub>5</sub> Metribuzine 70% WP @ 1 Kg/ha (POE)+2,4-D Sodium salt 80% WP tank mixed recorded highest gross monetary returns and found significantly superior over rest of the treatment except T<sub>1</sub> i.e. Ametryne 80% WDG @ 2.5 Kg/ha (POE) which was found at par with each other. Similar trend was found in recording net monetary returns as well as B: C ratio.

Weed Menace is recognized as a Challenging problem in enhancing yield of sugarcane. To sustain the seasonal sugarcane and sugar yield, the weeds could be effectively controlled through the herbicidal treatment of Metribuzine 70 per cent WP @

1 Kg/ha (POE) along with 2, 4-D sodium salt 80 per cent WP tank mixed.

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