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Effect of non-chemical weed management practices on weed dynamics and performance of sweet corn (*Zea mays* L.)

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Abstract

A field experiment was undertaken at the College Farm, Agricultural College, Polasa, Jagtial, during the *rabi* season of 2024-25 to evaluate the effect of non-chemical weed management practices on weed dynamics and performance of sweet corn. The study comprised ten weed management strategies: straw mulch, live mulch with cowpea, *Gliricidia sepium* leaf mulch, *Sesbania* as intercrop incorporated as mulch after 30 days, coriander as intercrop, weed mat (110 GSM), inter-cultivation at 20 and 40 DAS along with hand weeding at 20 DAS, a herbicide mixture of tembotrione 34.4% SC at 100 g ha⁻¹ + atrazine 50% WP at 500 g ha⁻¹ applied at 20 DAS, a weed-free control and a weedy check. The treatments were arranged in a randomized block design with three replications. Among the treatments, the weed mat mulch significantly reduced total weed density and dry weight comparable to the weed-free check at 20 DAS and second only to it at 40 and 60 DAS. This was closely followed by the chemical herbicide combination and the inter-cultivation with hand weeding treatment. In terms of crop performance, the weed mat mulch treatment recorded the highest values for growth parameters, yield attributes and yield, followed by the weed-free check and the inter-cultivation treatment. In contrast, the weedy check exhibited the poorest weed control efficiency and the lowest crop growth and yield performance, underscoring the necessity of effective weed management for enhancing sweet corn productivity.

Keywords: Weed density, weed dry weight, growth parameters, yield attributes

1. Introduction

Sweet corn, which is a variety of maize known for its greater sugar percentage is an important crop in global agriculture and food systems. Sweet corn kernels have tenderness and naturally high in sugar levels, thus making it suitable for both fresh and processed consumption. Sweet corn is a specialty maize grown for its immature cobs, valued for both fresh consumption and use in processed foods. It provides significant amounts of roughage, essential minerals, and vitamins, particularly A and C. Its palatability and nutritive quality have driven widespread consumer acceptance and increasing cultivation worldwide (Olabode and Sangodele, 2015) ^[1].

One of the major issues contributing to lower yields of sweet corn is competition from weeds for growth resources like nutrients, water, sunlight, and space (Sharma *et al.*, 2010 ^[2]; Mali *et al.*, 2019) ^[3]. Early-establishing weed species and elevated weed pressure are often responsible for more pronounced yield reductions compared to weeds that emerge later in the crop cycle. In maize, yield losses attributable to weed interference may vary between 28% and 93%, influenced by the composition of weed flora, their competitive ability, and the duration of weed-crop competition (Choudary *et al.*, 2021) ^[4].

Weed management encompasses a range of strategies including physical, chemical, cultural, biological and integrated methods. In recent years, there has been a notable shift away from herbicide-dependent practices toward non-chemical alternatives. This transition is largely driven by growing public concern over environmental sustainability and the adverse impacts associated with synthetic herbicides. Non-chemical weed control techniques focus on reducing pesticide reliance while promoting eco-friendly and sustainable agricultural practices (Duwadi *et al.*, 2021) ^[5]. Mulch is a layer of material, either natural or artificial, placed on the soil surface to improve soil conditions and helps to regulate soil temperature, reduces fertilizer leaching,

suppresses weeds and can increase crop yield (Nithisha *et al.*, 2022) [6]. Cover crops, also known as living mulch, green manure, smother crops or catch crops are grown not for harvest but for their ecological benefits. They help in suppressing weeds, conserving soil moisture, improving soil fertility and structure, attracting useful insects and reducing erosion (Mennan *et al.*, 2020) [7]. Keeping the above points into consideration, the present study was undertaken to evaluate the impact of non-chemical weed management practices on weed dynamics and the growth and yield of sweet corn.

2. Materials and Methods

The field experiment was conducted during Rabi 2024–25 at the College Farm, Agricultural College, Polasa, Jagtial, Telangana, India, to evaluate the effect of non-chemical weed management practices on weed dynamics and performance of sweet corn. The experiment comprised ten weed management treatments: T₁ – straw mulch (2-inch thickness), T₂ – live mulch with cowpea (one additive row between maize rows), T₃ – *Gliricidia sepium* leaf mulch (2-inch thickness), T₄ – *Sesbania* as intercrop used as mulch after 30 DAS, T₅ – coriander as intercrop, T₆ – synthetic weed mat (110 GSM), T₇ – intercultural operation at 20 and 40 DAS + hand weeding at 20 DAS, T₈ – tembotrione 34.4% SC at 100 g ha⁻¹ + atrazine 50% WP at 500 g ha⁻¹ applied at 20 DAS (for comparison), T₉ – weed-free check, and T₁₀ – weedy check. These treatments were evaluated under a randomized block design (RBD) with three replications. The experimental field was characterized by well-drained sandy clay loam soil with a textural composition of 66.1% sand, 6.2% silt, and 27.7% clay. The initial soil chemical properties included a neutral pH of 7.33, electrical conductivity of 0.24 dS m⁻¹, and a bulk density of 1.60 g cm⁻³. The organic carbon content was moderate (0.49%). Prior to sowing, the soil was low in available nitrogen (135 kg ha⁻¹), medium in phosphorus (21.9 kg ha⁻¹), and potassium (213.9 kg ha⁻¹). During the experimental period, the average maximum and minimum temperatures were 32°C and 13.7°C, respectively. The crop variety used was sweet corn hybrid 'SUGAR-75', which has a duration of 90–100 days. Sowing was done at a spacing of 60 × 20 cm using a seed rate of 6 kg ha⁻¹. The recommended dose of fertilizers (200:60:50 kg ha⁻¹ of N, P₂O₅, and K₂O) was applied using urea, DAP and MOP, respectively.

Weed management practices were implemented according to the treatment schedule. All mulch materials were applied immediately after the sowing of sweet corn, except for the synthetic weed mat (T₆), which was laid out prior to sowing. Intercrop seeds were sown simultaneously along with sweet corn in designated rows as per the respective treatments. The crop was cultivated following the recommended package of practices for sweet corn.

Weed density observations for grasses, sedges, and broad-leaved weeds were recorded at 20, 40, and 60 days after sowing (DAS) using a 0.5 × 0.5 m quadrat (0.25 m²) placed randomly at three locations within each plot. For statistical analysis, data on the total number of weeds and weed dry matter were collected, tabulated, and subjected to square root transformation ($\sqrt{x + 0.5}$) to normalize variance and improve data reliability (Gomez and Gomez, 1984). Weeds collected from each quadrat were oven-dried at 65°C for 24 hours until constant weight and expressed in grams per square meter (g m⁻²). Weed control efficiency (WCE) was calculated based on weed dry weight using the following formula:

$$\text{Weed control efficiency (\%)} = \frac{\text{DM}_c - \text{DM}_t}{\text{DM}_c} \times 100$$

Where,

WCE = Weed Control Efficiency (%)

DM_c = Dry matter of weeds in unweeded check (Control)

DM_t = Dry matter of weeds in treatment plot

The experimental design data were statistically analysed using Fisher's analysis of variance approach, and treatment means were compared using an F-test and the least significant difference test at a 5% probability level to determine CD values. On all of the gathered data, analysis of variance was carried out.

3. Results and Discussion

3.1 Weed flora

The common weeds observed in the experimental site were *Cyperus esculentus* among sedges and *Echinochloa colona*, *Cynodon dactylon*, *Digitaria sanguinalis*, *Dactyloctenium aegyptium* among grasses and *Commelina benghalensis*, *Digera arvensis* L., *Amaranthus viridis*, *Phyllanthus madraspatensis*, *Trianthema portulacastrum* and *Boerhavia erecta* L. etc. among broad-leaved weeds. Among the different groups of weeds, broad leaved weeds were predominant followed by sedges and grasses. Comparable results were reported by Chaudhari *et al.* (2023) [9] and Swetha *et al.* (2018) [10].

3.2 Weed parameters

At 20 DAS, the lowest weed density and dry matter were recorded in T₆ (Weed mat mulch) and T₉ (Weed-free check), due to effective physical and manual suppression. Among mulches, T₃ (*Gliricidia*) and T₁ (Straw) recorded moderate densities (36.33 and 45.00 no. m⁻²) and dry matter (10.97 and 18.8 g m⁻²), while T₂ (Cowpea) and T₅ (Coriander) were least effective. T₇ and T₈ showed high pre-treatment weed loads (92.67–93.17 m⁻²; 29.21–29.80 g m⁻²) and T₁₀ (Weedy check) recorded the highest density and biomass (103.33 no. m⁻² and 32 g m⁻²).

At 40 DAS, T₉ again showed the lowest weed growth, followed by T₆ (21.67 no. m⁻² and 24.67 g m⁻²) and T₈ (34.00 no. m⁻² and 9.83 g m⁻²). T₃ and T₁ showed moderate suppression, while intercrops (T₂, T₄, T₅) remained less effective. T₁₀ registered the highest density (196.67 m⁻²) and dry matter (251.67 g m⁻²).

At 60 DAS lowest weed density and dry matter was recorded in T₉ (Weed-free check), followed by T₆ (Weed mat mulch) (34.33 no. m⁻², 68.33 g m⁻²) and T₇ (IC at 20 and 40 DAS + HW at 20 DAS) was on par with T₆ with regarding to dry matter (73.33 g m⁻²).

Weed control efficiency (WCE) reflected these trends, T₆ and T₉ reported 100% at 20 DAS. At 40 and 60 DAS, T₉ maintained full control, while T₆ showed high WCE values (90.19 – 82.11%). T₇ and T₈ treatments recorded high weed control efficiency values next to T₆ and T₉ treated plots. T₃ treatment plot consistently outperformed other mulches and intercrops like T₂ and T₅ remained least effective across all stages. Similar results was noted by Uwah *et al.* (2011) [11].

3.3 Crop parameters

Among the treatments, T₆ - mulching with weed mat (110 GSM) recorded significantly the highest plant height (83.0 cm at 30 DAS, 209.2 cm at 60 DAS and 229.0 cm at 90 DAS), which was followed by T₉–weed-free check (79.1 cm at 30 DAS, 201.4 cm and 220.5 cm, respectively) at 30 and 90 DAS, T₇–interculture

and T₈ (tembotrione + atrazine), at all the stages of observation. The lowest plant height (61.5 cm at 30 DAS, 152.2 cm at 60 DAS and 194.2 cm at 90 DAS) was observed in T₁₀—weedy check, indicating the suppressive effect of weed competition on vegetative growth.

At 30 DAS, highest dry matter was recorded in T₆ (788 kg ha⁻¹) which was on par with T₉ and T₇ (772 kg ha⁻¹, 766 kg ha⁻¹) respectively, followed by T₈ (714 kg ha⁻¹). Maximum crop dry matter production was recorded in T₆ (6736 kg ha⁻¹), which was on par with T₉ (6600 kg ha⁻¹) and followed by T₇ (6536 kg ha⁻¹), T₃—Gliricidia mulch (6433 kg ha⁻¹) at 60 DAS. At 90 DAS, T₆ again recorded the highest dry matter (8927 kg ha⁻¹), followed by T₇ (8755 kg ha⁻¹) which in turn on par with T₉ (8652 kg ha⁻¹). The lowest dry matter at all stages of observation was observed in T₁₀ (4565 and 6306 kg ha⁻¹), due to greater competition. The superior performance of T₆ and T₉ can be attributed to uninterrupted growth by providing proper micro climate in case of T₆. Similar results were provided by Ramakrishna *et al.* (2006) [12] and effective weed suppression during critical crop stages in both the treatments.

3.4 Yield Attributes

A significant variation was recorded among weed management practices for cob characters. The maximum cob length (22.53 cm), kernel rows cob⁻¹ (18.00 no.), and kernel number row⁻¹ (36.00 no.) were observed in T₆ (weed mat mulching), which is

statistically on par with T₉ (weed-free check), followed by T₇ (IC + HW) and T₈ (tembotrione + atrazine). Treatments involving organic mulches like T₁ and T₃ showed improvement over weedy check but which was inferior to T₆ (weed mat). The lowest values cob length (18.97 cm), kernel rows cob⁻¹ (14.33), and kernel number row⁻¹ (26.00) were associated with T₁₀ (weedy check) followed by T₅ (coriander intercrop) due to intense weed competition restricting effective cob growth and kernel development. Similar findings were observed by Yaseen *et al.* (2014) [13].

3.4 Yield

T₆ (weed mat) treatment plot recorded the highest green cob (22,689 kg ha⁻¹) and fodder yield (36,944 kg ha⁻¹), which was significantly superior to all other treatments. It was followed by T₉ (19,933 and 31,389 kg ha⁻¹) and T₇ (19,322 and 29,111 kg ha⁻¹). Among organic mulches, T₃ (Gliricidia) performed better (16,872 and 25,556 kg ha⁻¹), while T₅ (Coriander) treatment reported poor green cob (12,957 kg ha⁻¹) and fodder yield (19,166 kg ha⁻¹). T₁₀ (Weedy check) recorded the lowest green cob (10,050 kg ha⁻¹) and fodder yields (17,666 kg ha⁻¹). Maximum harvest index was observed in T₄ (44.36%), which was on par with T₂ (43.53%) and T₁ (42.36%), whereas T₈ (35.35%) and T₁₀ (36.26%) showed the least, indicating poor assimilate partitioning under high weed pressure. These findings are similar to Asif *et al.* (2020) [14].

Table 1: Crop growth parameters at 30, 60 and 90 DAS as influenced by different weed management practices in sweet corn

Treatment details	Plant Height (cm)			Dry Matter (kg ha ⁻¹)		
	30 DAS	60 DAS	90 DAS	30 DAS	60 DAS	90 DAS
T ₁ - Straw mulch	71.1	177.1	210.9	739	6345	8360
T ₂ - Live mulch with cowpea	69.0	164.0	204.5	708	6270	8208
T ₃ - <i>Gliricidia sepium</i> leaves as mulch	73.0	178.4	213.3	750	6433	8458
T ₄ - <i>Sesbania</i> as intercrop in between rows and used as mulch after 30 days	69.9	168.2	204.7	727	6250	8435
T ₅ - Coriander as intercrop in between rows	64.9	158.1	198.1	611	4891	6606
T ₆ - Mulching with weed mat (110 GSM)	83.0	209.2	229.0	788	6736	8927
T ₇ - IC at 20 and 40 DAS and HW at 20 DAS	75.1	194.8	216.8	766	6536	8755
T ₈ - Tembotrione 34.4% SC 100 g ha ⁻¹ + Atrazine 50% WP 500 g ha ⁻¹ at 20 DAS	70.5	184.5	218.3	714	6485	8308
T ₉ - Weed free check	79.1	201.4	220.5	772	6600	8652
T ₁₀ - Weedy check	61.5	152.2	194.2	500	4565	6306
S.Em±	1.2	2.9	2.4	18	50	58
CD (P=0.05)	3.7	8.7	7.4	56	152	175

Table 2: Weed density (No. m⁻²) at 20, 40 and 60 DAS as influenced by different weed management in sweet corn

Tr. No.	20 DAS				40 DAS				60 DAS			
	Grasses	Sedges	BLW	Total	Grasses	Sedges	BLW	Total	Grasses	Sedges	BLW	Total
T ₁	1.86 (3.00)	5.88 (34.33)	2.85 (7.67)	6.74 (45.00)	4.37 (18.67)	6.45 (41.33)	4.66 (21.33)	9.04 (81.33)	4.59 (20.67)	7.65 (58.00)	5.58 (30.67)	10.48 (109.33)
T ₂	3.51 (12)	6.46 (41.33)	4.40 (19.00)	8.52 (72.33)	5.49 (29.67)	7.19 (51.33)	6.09 (36.67)	10.87 (117.67)	6.67 (44.00)	8.13 (65.67)	6.39 (40.33)	12.27 (150.00)
T ₃	2.34 (5.00)	5.10 (25.67)	2.46 (5.67)	6.06 (36.33)	3.60 (12.67)	5.86 (34.67)	4.04 (16.00)	7.92 (63.33)	4.22 (17.33)	7.10 (50.00)	5.01 (24.67)	9.62 (92.00)
T ₄	2.90 (8.00)	6.28 (39.33)	4.48 (19.67)	8.21 (67.00)	4.70 (21.67)	6.24 (38.67)	5.50 (30.00)	9.52 (90.33)	5.30 (27.67)	6.79 (45.67)	5.81 (33.33)	10.35 (106.67)
T ₅	3.93 (15.00)	6.71 (44.66)	4.59 (20.67)	8.98 (80.33)	6.12 (37.00)	7.91 (62.00)	6.18 (37.67)	11.71 (136.67)	7.40 (54.33)	8.26 (67.67)	6.44 (41.00)	12.79 (163.00)
T ₆	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	2.11 (4.00)	3.50 (12.00)	2.23 (5.67)	4.67 (21.67)	2.44 (7.00)	4.12 (16.67)	3.33 (10.67)	5.88 (34.33)
T ₇	3.76 (13.67)	6.98 (48.33)	5.58 (30.67)	9.65 (92.67)	3.45 (11.67)	5.67 (31.67)	4.22 (17.33)	7.81 (60.67)	3.79 (14.00)	5.17 (26.33)	4.26 (18.00)	7.67 (58.33)
T ₈	3.99 (15.50)	7.15 (50.67)	5.24 (27.00)	9.68 (93.17)	1.56 (2.00)	5.70 (32.00)	0.71 (0.00)	5.87 (34.00)	2.50 (6.00)	9.35 (87.00)	3.24 (10.00)	10.17 (103.00)
T ₉	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)
T ₁₀	4.22 (17.33)	7.40 (54.33)	5.67 (31.67)	10.19 (103.33)	7.91 (62.33)	9.70 (93.67)	6.41 (40.67)	14.04 (196.67)	9.21 (84.33)	11.14 (123.67)	7.06 (49.33)	16.06 (257.33)
S.Em ±	0.13	0.24	0.18	0.20	0.22	0.28	0.29	0.33	0.31	0.14	0.18	0.17
CD(P=0.05)	0.40	0.72	0.55	0.61	0.68	0.84	0.89	0.99	0.95	0.43	0.56	0.59

Table 3: Weed dry matter (No. m⁻²) at 20, 40 and 60 DAS as influenced by different weed management in sweet corn

Tr. No	20 DAS				40 DAS				60 DAS			
	Grasses	Sedges	BLW	Total	Grasses	Sedges	BLW	Total	Grasses	Sedges	BLW	Total
T ₁	0.79 (0.13)	4.01 (17.60)	1.13 (1.07)	4.16 (18.80)	4.33 (18.30)	7.24 (52.00)	6.12 (37.33)	10.39 (107.63)	5.74 (32.500)	8.76 (76.33)	8.22 (67.33)	13.28 (176.17)
T ₂	1.44 (1.57)	4.45 (19.47)	1.81 (3.04)	4.94 (24.07)	5.31 (28.33)	8.78 (77.00)	7.28 (52.5)	12.55 (157.83)	8.65 (75.00)	9.27 (85.67)	9.19 (84.00)	15.66 (244.67)
T ₃	0.85 (0.23)	3.19 (9.77)	1.19 (0.98)	3.37 (10.97)	4.10 (16.67)	6.79 (46.00)	5.52 (30.00)	9.63 (92.67)	5.27 (27.33)	8.39 (70.00)	6.61 (43.33)	11.88 (140.67)
T ₄	0.98 (0.47)	4.39 (19.00)	1.57 (1.97)	4.66 (21.43)	4.83 (23.00)	6.96 (48.33)	7.12 (50.33)	11.05 (121.67)	6.28 (39.00)	7.92 (62.33)	8.33 (69.33)	13.08 (170.67)
T ₅	1.27 (1.15)	4.51 (19.87)	2.12 (4.20)	5.07 (25.220)	5.87 (34.00)	9.15 (85.00)	7.39 (54.67)	13.11 (173.67)	8.96 (80.33)	9.80 (95.67)	9.46 (89.00)	16.29 (265.00)
T ₆	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	1.68 (2.33)	3.82 (14.33)	2.89 (8.00)	5.01 (24.67)	4.27 (18.33)	5.53 (30.33)	4.49 (19.67)	8.28 (68.33)
T ₇	1.42 (1.51)	4.56 (20.33)	2.80 (7.37)	5.45 (29.21)	4.19 (17.13)	4.41 (19.33)	2.99 (8.67)	6.72 (45.13)	4.01 (15.67)	6.51 (42.33)	3.97 (15.33)	8.57 (73.33)
T ₈	1.46 (1.63)	4.59 (20.70)	2.82 (7.47)	5.49 (29.80)	1.15 (0.83)	3.06 (9.00)	0.71 (0.00)	3.20 (9.83)	3.18 (9.67)	9.52 (90.33)	2.85 (7.67)	10.4 (107.67)
T ₉	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)
T ₁₀	1.50 (1.77)	4.65 (23.07)	2.77 (7.17)	5.57 (32.00)	8.48 (71.67)	10.85 (117.33)	7.93 (62.67)	15.87 (251.67)	10.61 (112.67)	13.20 (173.93)	9.80 (95.53)	19.55 (382.13)
S.Em ±	0.19	0.14	0.06	0.39	0.23	0.42	0.30	0.47	0.40	0.29	0.25	0.29
CD(P=0.05)	0.06	0.42	0.19	1.18	0.70	0.12	0.19	1.41	1.20	0.87	0.75	0.87

Table 4: Weed control efficiency (%) as influenced by different weed management practices in sweet corn

Treatment details	20 DAS	40 DAS	60 DAS
T ₁ - Straw mulch	41.25	57.23	53.89
T ₂ - mulch with cowpea	24.77	37.28	35.97
T ₃ - <i>Gliricidia sepium</i> leaves as mulch	65.70	63.10	63.10
T ₄ - <i>Sesbania</i> as intercrop in between rows and used as mulch after 30 days	33.02	51.65	55.33
T ₅ - Coriander as intercrop in between rows	21.18	30.99	30.65
T ₆ - Mulching with weed mat (110 GSM)	100.00	90.19	82.11
T ₇ - IC at 20 and 40 DAS and HW at 20 DAS	-	82.06	80.80
T ₈ - Tembotrione 34.4% SC 100 g ha ⁻¹ + Atrazine 50% WP 500 g ha ⁻¹ at 20 DAS	-	96.09	71.82
T ₉ - Weed free check	100.00	100.00	100.00

Table 5: Yield attributes as influenced by different weed management practices in sweet corn

Treatment details	Cob length (cm)	Kernel rows cob ⁻¹	Kernel no. row ⁻¹
T ₁ - Straw mulch	21.07	17.00	33.33
T ₂ - Live mulch with cowpea	20.20	16.33	31.67
T ₃ - <i>Gliricidia sepium</i> leaves as mulch	21.07	17.00	33.67
T ₄ - <i>Sesbania</i> as intercrop in between rows and used as mulch after 30 days	20.67	16.67	31.67
T ₅ - Coriander as intercrop in between rows	19.37	15.33	30.33
T ₆ - Mulching with weed mat (110 GSM)	22.53	18.00	36.00
T ₇ - IC at 20 and 40 DAS and HW at 20 DAS	21.83	17.00	34.67
T ₈ - Tembotrione 34.4% SC 100 g ha ⁻¹ + Atrazine 50% WP 500 g ha ⁻¹ at 20 DAS	20.73	17.00	33.00
T ₉ - Weed free check	22.00	17.67	35.33
T ₁₀ - Weedy check	18.97	14.33	26.00
S.Em±	0.24	0.53	0.27
CD (P=0.05)	0.72	1.61	0.83

Table 6: Yield as influenced by different weed management practices in sweet corn

Treatment details	Green cob yield (kg ha ⁻¹)	Green fodder yield (kg ha ⁻¹)	Harvest index (%)
T ₁ - Straw mulch	16422	22341	42.36
T ₂ - Live mulch with cowpea	15611	20244	43.53
T ₃ - <i>Gliricidia sepium</i> leaves as mulch	16872	25556	39.97
T ₄ - <i>Sesbania</i> as intercrop in between rows and used as mulch after 30 days	16167	20277	44.36
T ₅ - Coriander as intercrop in between rows	12967	19166	40.35
T ₆ - Mulching with weed mat (110 GSM)	22689	36944	38.04
T ₇ - IC at 20 and 40 DAS and HW at 20 DAS	19322	29111	39.89
T ₈ - Tembotrione 34.4% SC 100 g ha ⁻¹ + Atrazine 50% WP 500 g ha ⁻¹ at 20 DAS	17011	31111	35.35
T ₉ - Weed free check	19933	31389	38.84
T ₁₀ - Weedy check	10050	17666	36.26
S.Em±	457	1847	1.62
CD (P=0.05)	1367	5529	4.85

4. Conclusion

Among all the weed management practices, T₆ (weed mat mulch) treatment recorded higher growth parameters, yield attributes and yield; lower weed density and dry weight. Among mulches and intercropping T₃ (*Gliricidia* leaves mulch) was found to be superior to other treatments.

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