PLANT SCIENCE TODAY
Vol 13(sp1): 1-6
https://doi.org/10.14719/pst.9455

eISSN 2348-1900

RESEARCH ARTICLE

Can mulching-based weed management practices influence okra (*Abelmoschus esculentus* (L.) Moench) production under organic farming?

Sukanya Bharti[1], Satesh Kumar[2], Parshant Bakshi[3], S K Singh[1], A P Rai[1], Balbir Dhotra[1] & Neha Kumari[2*]

[1]Centre for Organic and Natural Farming (CONF), Sher-e- Kashmir University of Agricultural Sciences and Technology of Jammu, Chatha 180 009, Jammu and Kashmir, India

[2]Division of Vegetable Science, Sher-e- Kashmir University of Agricultural Sciences and Technology of Jammu, Chatha 180 009, Jammu and Kashmir, India

[3]Division of Fruit Science and Technology, Sher-e- Kashmir University of Agricultural Sciences and Technology of Jammu, Chatha 180 009, Jammu and Kashmir, India

*Correspondence email - nehakumari220999@gmail.com

Received: 16 May 2025; Accepted: 30 October 2025; Available online: Version 1.0: 04 February 2026

Cite this article: Sukanya B, Satesh K, Parshant B, Singh SK, Rai AP, Balbir D, Neha K.Can mulching-based weed management practices influence okra (*Abelmoschus esculentus* (L.) Moench) production under organic farming? Plant Science Today. 2026; 13(sp1): 1-6. https://doi.org/10.14719/pst.9455

Abstract

Okra is infested by successive flushes of diverse weed flora throughout its growing season with competition particularly intense in direct-seeded crops. Hand-weeding is a predominant weed control method used by farmers. However, it is very tedious, sometime inefficient, time-consuming and associated with high labour demands. Labour scarcity and high costs make manual weeding challenging. A field experiment at the Center for Organic and Natural Farming (CONF), SKUAST-J, Chatha, using okra variety Jammu Okra-05, showed that while weed-free conditions gave the best results, organic mulches also proved effective. Application of sawdust @ 1.0 t/ha or saccharum @ 5 t/ha combined with one hand weeding at 30 days after sowing (DAS), or 2 hand weedings at 20 and 40 DAS, produced comparable growth and yield. These treatments except saw dust application, were not found economical because of having manual labour which is expensive and many times unavailable to the farmers. Therefore, the study pointed out that saw dust or wood dust, which is a by-product or waste product of woodworking operations such as sawing, sanding, milling, planing and routing, applied in low volume, after sowing of the seeds suppress weeds and maximise yields in okra. The study revealed that adding small amounts of sawdust helps to prevent weeds from popping through or even spreading in the field, that helps in achieving higher yields and better premiums.

Keywords: economics; growth; mulches; okra; organic farming; weed suppression; yield

Introduction

Okra (*Abelmoschus esculentus* (L.) Moench), a member of the family Malvaceae also known as bhindi, is produced widely during the summer and the rainy season and is termed as "Perfect villager's vegetable" because it contains all 9 essential amino acids, particularly lysine and tryptophan in seed protein and has low fat content (1). Okra is a highly nutritious vegetable, providing about 30-35 kcal of energy per 100 g of fresh edible portion. It contains 1.9-2.0 g protein, 6.5-7.0 g carbohydrates, 2.0–3.0 g dietary fibre and only 0.2 g fat, making it a healthy low-calorie food. It is also a rich source of essential minerals, supplying approximately 80-90 mg calcium, 50–60 mg magnesium, 250–300 mg potassium and 0.8–1.0 mg iron. In terms of vitamins, okra provides 350–400 IU of vitamin A, about 0.2 mg vitamin B6 and 20–25 mg vitamin C per 100 g, thereby contributing significantly to daily nutritional requirements (2). India ranks first in the world, with 6.37 million tonnes of okra produced from over 0.52 million ha land and productivity of 12.3 t/ha (3).

Weeds are undesirable plants that interfere with food and fibre production , compete with the crops for the resources namely, direct sunlight, soil nutrients, water and (to a lesser extent) space for growth. They provide hosts and vectors for plant pathogens, giving them greater opportunity to infect and degrade the quality of the desired plants. Crop-weed competition is most severe during the early growth stage, slowing initial crop growth and reducing competitiveness (4). The uncontrolled weeds exert severe competition for nutrients, water and light, resulting in reduced pod yield of okra by 73–75 %, 78–85 % and 61.99 % (5–7), depending on the type of weed flora, their intensity and stages. Continuous monitoring and refinement in management strategies is essential for alleviating adverse effects of weeds on agricultural productivity and environmental health (8).

Hence, to check these weeds and improve plant growth and yield, an effective weed management practice in organic and natural farming is mulching. Mulch is a protective layer of different materials that can be either organic or inorganic that is put over the soil surface to prevent moisture evaporation,

enhance plant growth and to suppress the growth of weeds specifying examples (e.g., straw, crop residues) (9). The choice of mulch depends on several factors, including price, use, availability, time of year, crop to be mulched (10). Mulch can lower down the germination and development of weed seeds through mechanical and allelopathic effects (6).

The aim of this study was to identify the most efficient, cost-effective mulch that can be utilised to increase growth and yield parameters of okra in an organic system.

Materials and Methods

Experimental site

The experiment was conducted at CONF, Main Campus Chatha, SKUAST- Jammu, during the kharif season of 2023. The site is located in the Shiwalik foothills of the northwestern Himalayas, at 32˚40' N latitude and 74˚58' E longitude, with an altitude of 332 m above mean sea level.

Climate

Subtropical climates are often characterised by hot summers and mild winters with infrequent frost. Jammu region of Jammu and Kashmir (India), fall into humid subtropical (Köppen climate classification: Cfa/Cwa), where rainfall is often concentrated in the warmest months (July to September). During the crop growth, temperature (both maximum and minimum increased in the month of April to June with maximum temperature (38.7 ºC and 26 ºC) in the month of June and receeds to 31.2 ºC and 18.1 ºC in October (Fig. 1). Such temperature regime is mostly suited both to the crop as well as weeds, if accompanied by high moisture or peak rainfall days which is evident from Fig. 2.

Seed sowing and layout

Seeds were pre-soaked in distilled water for 24 hr and treated with *Trichoderma* spp @ 5.0 g/kg of seed. Sowing was carried out at a seed rate of 20 kg/ha on June 6, 2023. Each plot measured 3.0 × 3.0 m (9 m^2). From a total of 36 plants per plot, 5 plants were randomly selected and tagged for detailed observation and data collection pertaining to growth and yield attributes.

Experimental design and treatment details

The experiment was conducted in Randomized Complete Block Design (RCBD) comprising 12 treatments. Treatment combination followed in the experiment were T_1- Mulching with wheat straw at the rate 3.0 t/ha; T_2-Mulching with wheat straw at the rate 3.0 t/ha + Hand weeding at 30 DAS;T_3-Mulching with mustard straw at the rate 3.5 t/ha;T_4-Mulching with mustard straw at the rate 3.5 t/ha + Hand weeding at 30 DAS;T_5- Mulching with *Saccharum* spp. at the rate 5 t/ha; T_6-Mulching with *Saccharum* spp. at the rate 5.0 t/ha + Hand weeding at 30 DAS; T_7- Mulching with saw dust at the rate 1.0 t/ha;T_8- Mulching with rice bran at the rate 2.5 t/ha;T_9- Stale seed bed method;T_{10}- Hand weeding at 20 and 40 DAS;T_{11}- Weedy check (No weeding); T_{12}- Weed free (4 weeding at 15 days interval after seed germination). Each treatment was replicated thrice onto Jammu Okra-05 variety of okra developed by SKUAST-Jammu.

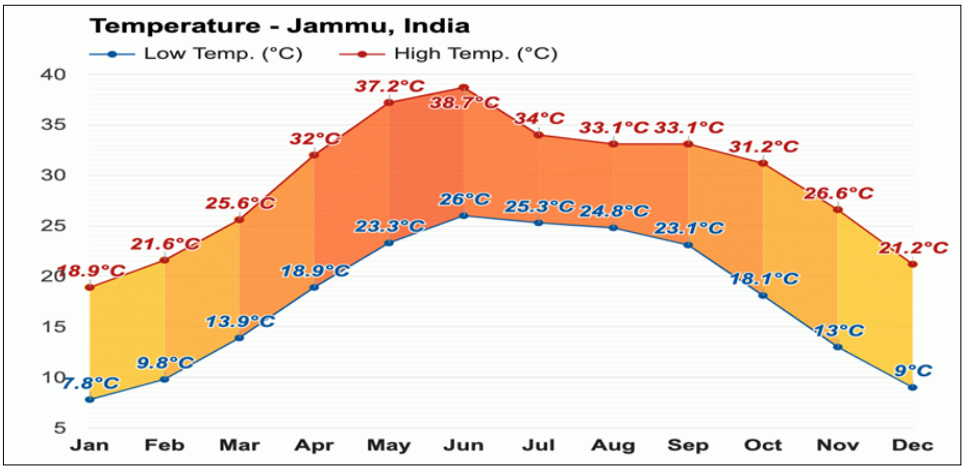

Fig. 1. Temperature regimes observed during the experimental period.

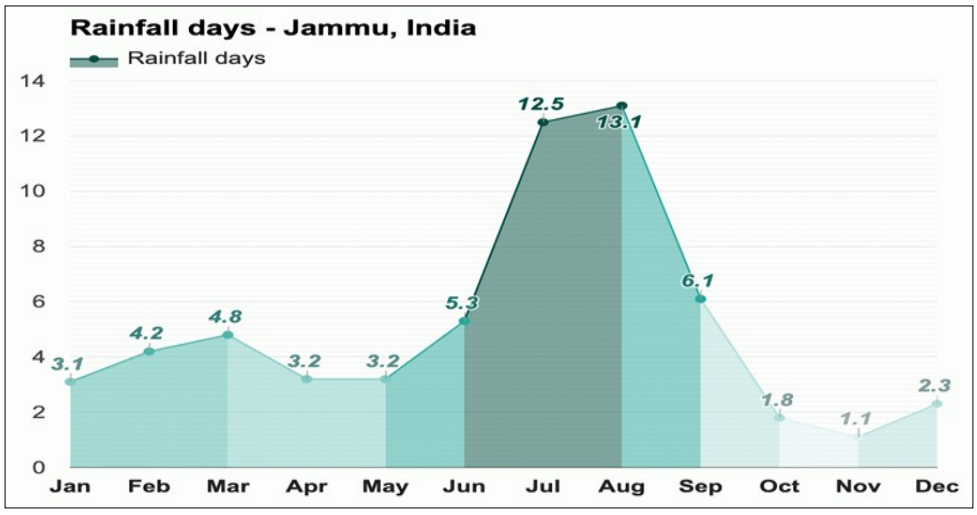

Fig. 2. Rainfall statistics observed during the experimental period.

Time and method of organic mulch application

Organic mulch in okra was applied at sowing or within 7–10 days of seedling emergence. Early mulching proved beneficial as it suppressed weed growth, conserved soil moisture and stabilised soil temperature during the crop's critical early developmental stages. The field was prepared by removing existing weeds and levelling the soil before laying mulch. A 5–8 cm thick layer of organic mulch was spread between the rows and around the base of the okra plants, ensuring that there was no direct contact with the plant stems to prevent stem rot and irrigation was applied below or through the mulch to maintain moisture content.

Statistical analysis

Analysis was performed using MS-Excel and OPSTAT for all the Traits. The mean value of the data was subjected to analysis of variance and ANOVA was set for RCBD.

Results and Discussion

Growth parameters

Among all the treatments, the study found that maintaining a weed-free environment (T_{12}) significantly enhanced okra growth parameters, including plant height, days to 50 % flowering and days to first harvest. These findings are consistent with earlier reports that weed-free conditions enhance okra growth by minimising competition for resources, resulting in significantly taller plants (11, 12). Comparable effects were also observed with sawdust mulch at 1.0 t/ha combined with hand weeding at 20 and 40 DAS. Other treatments involving sawdust mulch at 1.0 t/ha and hand weeding at 20 and 40 DAS yielded comparable results with plant heights of 153.33 cm and 155.33 cm, days to 50 % flowering at 48.00 and 49.00 and days to first harvest at 58.00 and 58.67, respectively (Table 1, Fig. 3).

In consistent with the present study, reported that mulching enhances plant growth by minimising intra-species competition, thereby supporting overall okra development and yield (13).

Yield parameters

Fruit length, fruit weight, number of pickings defines the yield of okra, which is expressed as quintals per hectare (q/ha), is a crucial metric for assessing the productivity of different cultivation practices. In the study, the highest yield was recorded in the weed-free treatment, with a statistically significant value of 127.8 q/ha (14). According to the previous study maintaining a weed-free environment allows crops to access essential resources such as water, nutrients and light without competition. Other treatments that were at par were 2 hand weeding at 20 and 40 DAS (124.25 q/ha) and saw dust mulch (119.38 q/ha) (Table 2, Fig. 4). Similar findings were described earlier, who reported that sawdust mulch enhances soil water retention and reduces weed competition, leading to better nutrient availability and improved fruit weight (15). The effectiveness of sawdust mulch in this study highlights its potential as a valuable mulching material in okra cultivation.

Weed parameters

Weed growth in okra fields saw a peak in temperature in the month of May and June (23.3 °C-38.7 °C), (Fig. 1). Driven by high heat, from July to September (23.1 °C-34 °C), monsoon sustains high weed activity, with species like *Amaranthus* and

Table 1. Effect of organic mulches on growth characters in okra

Treatments	Plant height (cm)	Days to 50 % flowering	Node at which Ist flower appears	Internodal length (cm)	Days to first harvest
T_1	153.00	51.33	6.67	3.90	62.67
T_2	148.33	51.00	6.33	4.33	62.33
T_3	152.67	50.67	6.00	6.00	62.33
T_4	161.00	50.33	6.00	4.00	61.67
T_5	162.67	50.00	5.33	4.00	60.33
T_6	150.67	48.00	5.00	5.20	59.00
T_7	153.33	48.00	5.33	5.73	58.00
T_8	156.33	50.33	5.67	5.00	61.33
T_9	163.33	49.00	5.67	4.67	60.00
T_{10}	155.33	49.00	4.67	3.60	58.67
T_{11}	141.67	54.00	7.00	4.67	64.00
T_{12}	165.33	46.33	4.33	5.00	56.33
SE (m) ±	4.17	0.95	0.65	0.91	0.98
CD (0.05)	12.23	2.80	NS	NS	2.88

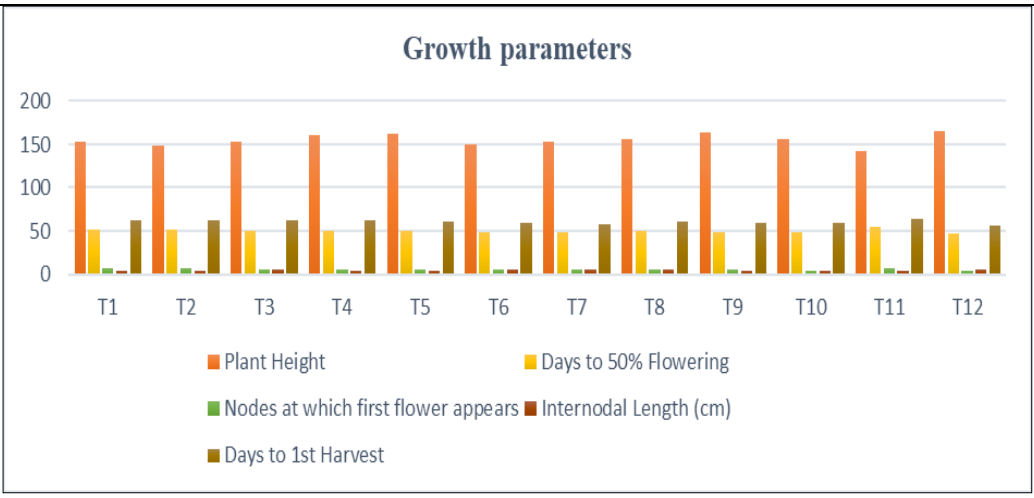

Fig. 3. Effect of organic mulching on growth parameters in okra.

Table 2. Effect of organic mulches on yield contributing characters in okra

Treatment No.	Fruit length (cm)	Fruit circumference (cm)	Fruit weight (g)	No of fruitsplant^{-1}	Yield plant^{-1}	Yield ha^{-1}	No. of pickings plant^{-1}
T_1	8.37	8.14	12.26	23.18	284.02	90.89	5.67
T_2	10.69	7.82	12.25	23.80	290.68	93.02	4.00
T_3	10.75	7.73	12.00	24.47	293.97	94.07	5.67
T_4	11.17	8.17	12.00	26.13	313.60	100.35	4.00
T_5	10.41	8.13	12.44	28.67	356.33	114.03	5.67
T_6	10.03	8.03	12.49	29.20	364.54	116.65	5.67
T_7	10.81	8.03	13.03	28.67	373.05	119.38	6.00
T_8	11.12	8.30	12.87	25.83	332.54	106.41	5.00
T_9	9.75	8.27	12.17	27.83	338.58	108.35	6.00
T_{10}	10.96	8.13	11.20	34.67	388.29	124.25	6.00
T_{11}	9.39	7.73	11.67	18.53	216.48	69.27	5.00
T_{12}	11.38	8.24	12.53	31.87	399.34	127.79	6.00
SE (m) ±	1.24	0.25	0.31	0.91	12.748	4.079	0.186
CD (0.05)	NS	NS	0.91	2.67	37.390	11.965	0.545

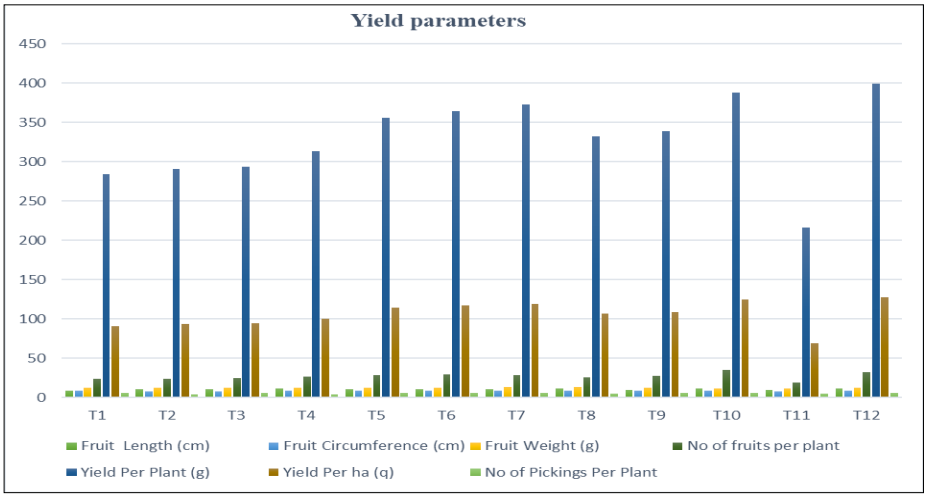

Fig. 4. Effect of organic mulching on yield parameters in okra.

Cynodon dactylon thriving. From October onwards, a decline in weed growth was observed as temperatures fall (9 °C–31.2 °C). June, with moderate rainfall (5.3 days) and high heat, encourages rapid weed growth, making okra seedlings vulnerable. Peak weed pressure occurs from July to August (12.5–13.1 days of rain), when hot, wet conditions favour aggressive weed species. Rainfall decreases in September (6.1 days), but weeds persist. By October to December, low rainfall and cooler weather reduce weed activity (Fig. 2). Effective weed management is essential for optimizing crop yield and quality, with the level of weed infestation in a crop area serving as a critical measure for evaluating weed control strategies. All the parameters including weed density, weed control efficiency, weed index and weed biomass showed significant results after organic mulches were applied in the okra crop (Table 3, Fig. 5). The study found that sawdust mulch (T_7), which recorded weed density of 4.84, 11.68 and 16.47 weeds/m^{2}at 30, 60 and 90 DAS, weed biomass of 0.81, 1.95 and 2.21 kg of dry weight at the same period and weed control efficiency of 78.62 % was statistically at par with stale seed bed treatment (T_9) and weed-free treatment (T_{12}). Sawdust mulch was found to reduce soil temperature and act as a barrier to weed growth, thereby providing better weed control compared to other mulches in dry and semi-arid areas. The weed index is a key indicator of the effectiveness of various weed control strategies, measuring the extent of weed infestation relative to crop yield. A lower weed index signifies better weed management and enhanced crop performance. The weed-free plot achieved the lowest weed index of 0.00 % followed by 3.54 % in 2 hand weedings at 20 and 40 DAS (T_{10}) and 10.71 % in saw dust treatment - T_7. Similar findings were previously observed in okra, 2 hand weeding followed by grass mulch @ 5 t/ha laid 1 week after germination, recorded no weed index (0.00 %) and all the growth and yield attributes were found maximum under 2 hand weeding at 30 and 60 DAS (16, 17). It was

Table 3. Effect of organic mulches on weed parameters in okra

Treatments	Weed densities at 30, 60 and 90 DAS			Weed control efficiency (%)	Weed index (%)	Weed biomass at 30, 60 and 90 DAS		
T_1	4.63	49.55	35.03	49.55	35.03	1.23	2.96	4.17
T_2	4.34	55.40	33.02	55.40	33.02	1.15	2.78	3.77
T_3	3.60	61.06	32.02	61.06	32.02	0.96	2.31	3.39
T_4	4.66	52.43	24.10	52.43	24.10	1.24	2.98	3.97
T_5	6.04	37.00	43.59	37.00	43.59	1.60	3.86	5.01
T_6	5.88	44.64	10.71	44.64	10.71	1.56	3.76	4.50
T_7	3.05	78.62	8.05	78.62	8.05	0.81	1.95	2.21
T_8	4.84	50.39	10.44	50.39	10.44	1.28	3.10	4.11
T_9	3.09	70.53	18.55	70.53	18.55	0.82	1.97	2.76
T_{10}	3.31	64.93	3.54	64.93	3.54	0.88	2.12	3.13
T_{11}	7.52	0.00	55.43	0.00	55.43	1.99	4.81	7.50
T_{12}	2.49	82.83	0.00	82.83	0.00	0.66	1.59	1.93
SE (m) ±	0.208	4.462	6.599	4.462	6.599	0.05	0.13	0.30
CD (0.05)	0.610	13.08	19.35	13.088	19.355	0.16	0.39	0.88

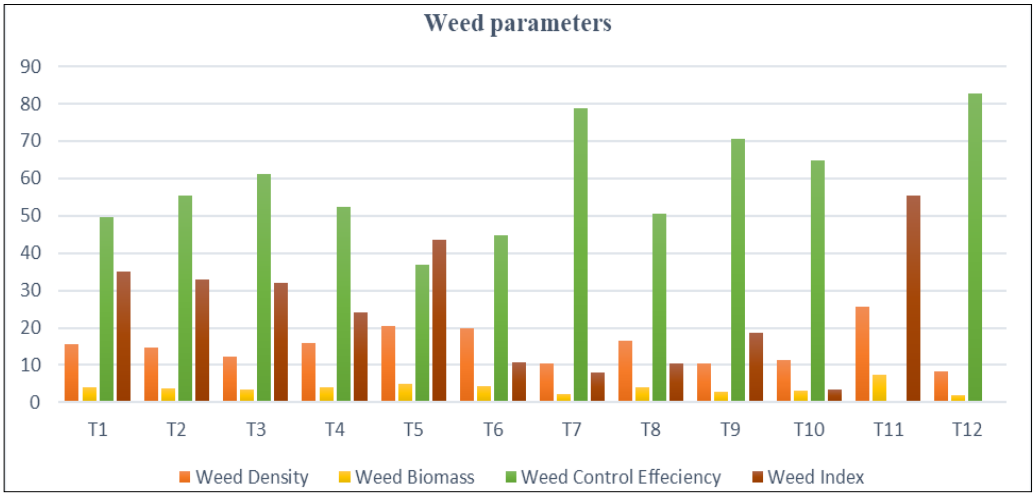

Fig. 5. Graphical representation of various weed parameters of okra.

observed that weed density in the weed-free plot was 4.6 weeds/m^2, with a weed index of 0.00 %, while 2 hand-weedings at 20 and 40 DAS recorded a weed index of 14.1 %, supporting the present study. These results are in line with previous findings, who reported that reducing weed competition enables okra plants to channel more resources into fruit development, thereby producing longer and potentially superior-quality fruits (17).

Economic parameters

Data in Table 4, showed maximum fruit yield of 128.0 q/ha in weed free treatment which was closely followed by hand weeding at 20 and 40 DAS and saw dust mulching @ 1 t/ha. Among these, the lowest input cost was recorded in sawdust mulch (₹ 106525), followed by hand weeding (₹129525), while the weed-free treatment incurred the highest cost (₹157525).

Having lowest total input cost in saw dust treatment, net returns in this treatment showed maximum value of ₹251885 resulting in highest cost benefit ratio of 1: 2.36 while as weed free treatment resulted in comparatively lower cost benefit ratio of 1: 1.43.

Market price of organic mulch viz; Saw dust = ₹ 5/kg, Rice bran = ₹12/kg, Wheat straw = ₹18/kg, Mustard straw = ₹12/kg, Saccharum mulch = ₹3/kg.

Conclusion

The study highlighted the critical role of organic mulches in enhancing growth, yield and economics of okra. The weed-free treatment consistently outperformed all other treatments across most growth and yield parameters, demonstrating that the elimination of weed competition allows okra plants to utilise available resources more efficiently. This resulted in vigorous vegetative growth, early flowering, higher yields and more frequent harvesting. However, these benefits were offset by the heavy reliance on manual hand-weeding, which led to the highest total input cost of ₹157525 and comparatively lower net returns of ₹226475, with a cost–benefit ratio of 1:1.43. This highlights the trade-off between yield advantage and economic feasibility under labor-intensive weed management practices.

Future research should focus on developing sustainable and cost-effective alternatives to manual weeding. Priority areas include optimising the use of organic mulch types and their application rates, exploring bio-mulches and cover crops and integrating mulching with limited hand-weeding to reduce labor drudgery while sustaining crop productivity. Region-specific studies across diverse agro-climatic zones are also essential to evaluate the adaptability, effectiveness and economic viability of such approaches. Additionally, the development and promotion of mechanised or semi-mechanised weeding tools suitable for smallholder farming systems may further reduce dependence on labor, thereby improving profitability. These strategies will collectively contribute to sustainable okra production by enhancing weed management efficiency, ensuring higher yields and maximising economic returns.

Table 4. Cost benefit ratio of different treatments

Sl. No	Treatments	Fixed cost (₹)	Variable cost (₹)	Total cost (Fixed + variable)	Fruit yield (q/ha)	Gross returns (₹)	Net (₹)	Cost benefit ratio
1	Wheat straw @ 3 t/ha	101525	24000	125525	90.89	272670	147145	1.17
2	Wheat straw @ 3 t/ha+ Hand weeding at 30 DAS	101525	52000	104000	93.02	279060	175060	1.68
3	Mustard straw @ 3.5 t/ha	101525	35000	136525	94.07	282210	145685	1.06
4	Mustard straw @ 3.5 t/ha+ Hand weeding at 30 DAS	101525	63000	164525	99.54	298620	134095	0.81
5	Saccharum@ 5t/ha	101525	15000	116525	114.03	342090	225565	1.93
6	Saccharum @ 5t/ha+ Hand weeding at 30 DAS	101525	43000	144,525	116.65	349950	205,425	1.42
7	Saw dust @ 1 t/ha	101525	5000	106525	119.47	358410	251885	2.36
8	Rice bran @ 2.5 t/ha	101525	27500	129025	106.41	319230	190205	1.47
9	Stale seed bed method	101525	0.00	101525	108.35	325050	223525	2.20
10	Hand weeding at 20 and 40 DAS	101525	28000	129525	124.25	372750	243225	1.87
11	Weedy check	101525	0.00	101525	69.27	207810	106285	1.04
12	Weed free	101525	56000	157525	128	384000	226475	1.43

Note: Marketable sale rate of organic okra= ₹ 30/kg

Findings further revealed that utilising saw dust mulching statistically enhanced growth and yield parameters of the crop but also marked its role in suppressing weeds. Economically too, this treatment resulted in higher net returns with maximum cost benefit ratio of 2.36. Therefore, application of saw dust @ 1 t/ha after sowing proved beneficial in enhancing yield with highest net returns to farmers growing okra organically.

Acknowledgements

The authors would like to express their gratitude to the authorities of Sher-e- Kashmir University of Agricultural Sciences and Technology of Jammu for providing the facilities and support for conducting this research.

Authors' contributions

SB performed the experiments and collected prescribed data. SK, SKS and NK conceptualised and designed the study and interpretation of the data, also assisted in data analysis and tabulation. PB contributed to critical review. APR and BD provided resources and visualisation. All authors read and approved the final manuscript.

Compliance with ethical standards

Conflict of interest: Authors do not have any conflict of interest to declare.

Ethical issues: None

References

1. Meena AR, Narolia RK, Yadav PK, Lata K, Meena S. Improvement in yield and quality of okra (*Abelmoschus esculentus*) through crop spacing, mulching and irrigation levels in arid regions. Indian Journal of Agricultural Sciences. 2024;94(3):270–5. https://doi.org/10.56093/ijas.v94i3.142770
2. Bhobhriya V, Gandhi N, Loona A. Effect of different types of mulches on yield contributing characters and yield of okra (*Abelmoschus esculentus*). Journal of Pharmacognosy and Phytochemistry. 2019;8 (1):241–3.
3. National Horticulture Board. Annual report 2022–23. Gurugram (Haryana): Ministry of Agriculture and Farmers Welfare, Government of India; 2024.
4. Imoloame EO, Muinat U. Weed biomass and productivity of okra (*Abelmoschus esculentus* (L.) Moench) as influenced by spacing and pendimethalin-based weed management. Journal of Agricultural Science. 2018;63:379–98. https://doi.org/10.2298/JAS1804379I
5. Sah D, Heisnam P, Pandey AK. Weed management in okra under foothill conditions of North Eastern Himalaya. Journal of Crop and Weed. 2018;14(1):201–4.
6. Dhivya S, Kalpana R, Murali Arthanari P, Senthil A. Effect of non-chemical weed management practices on weed dynamics and yield in organic okra (*Abelmoschus esculentus* L.). Pharma Innovation Journal. 2021;10(10):1417–21.
7. Rao AN, Nagmani A. Eco-efficient weed management approaches for rice in tropical Asia. In: Proceedings of the 4th Tropics Weed Science Conference on Weed Management and Utilization in the Tropics; 2013; Chiang Mai, Thailand. p. 78–87.
8. Thakur S, Chauhan RP, Singh OP. Effect of different mulching materials on growth and yield of okra (*Abelmoschus esculentus* (L.)). Journal of the Institute of Agriculture and Animal Science. 2020;36:197–205. https://doi.org/10.3126/jiaas.v36i1.48419
9. Chacko SR, Raj SK, Jacob D, Pillai PS, Radhakrishnan NV. Non-chemical weed management to improve fruit yield and net income in lady finger. Indian Journal of Weed Science. 2021;53(3):230–7. https://doi.org/10.5958/0974-8164.2021.00059.9
10. Patel DB, Patel TU, Patel HH, Patel DD, Patel HM, Zinzala MJ. Irrigation scheduling and weed management in rabi greengram (*Vigna radiata*). International Journal of Chemical Studies. 2020;8 (3):204–10. https://doi.org/10.22271/chemi.2020.v8.i3c.9224
11. Kumar A, Singh R, Sharma M. Influence of organic mulches on growth and yield of okra. Journal of Agricultural Science and Technology. 2015;7(3):212–18.
12. Mahadeen AY, Al-Omari A, Al-Qudah A. Improvement in growth characters as a result of mulching through enhanced photosynthesis and metabolic activities. International Journal of Agronomy. 2014;2014:1–8.
13. Manju B, Yadav KS, Satish K, Narayan L, Govind S. Effect of integrated weed management in okra. International Journal of Chemical Studies. 2017;5(4):1103–6.
14. Ali M, Khan Z. Effect of compost mulch on soil nutrient availability and okra yield. Indian Journal of Agricultural Research. 2017;51 (4):382–8.
15. Pakdel P, Hosseini SM, Mirzaei H. Organic mulching and nutrient availability to plants. International Journal of Agricultural Science. 2011;3(2):145–52.
16. Patel R, Chaudhary N, Verma P. Sugarcane bagasse mulch for soil moisture conservation and yield improvement in okra. Journal of Agro-Industrial Research. 2021;19(2):115–22.
17. Singh K, Verma P, Chaudhary A. Organic mulches and their role in weed management and yield enhancement of okra. Horticultural Science Journal. 2018;14(1):78–83.

Additional information

Peer review: Publisher thanks Sectional Editor and the other anonymous reviewers for their contribution to the peer review of this work.

Reprints & permissions information is available at https://horizonepublishing.com/journals/index.php/PST/open_access_policy

Publisher's Note: Horizon e-Publishing Group remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Indexing: Plant Science Today, published by Horizon e-Publishing Group, is covered by Scopus, Web of Science, BIOSIS Previews, Clarivate Analytics, NAAS, UGC Care, etc
See https://horizonepublishing.com/journals/index.php/PST/indexing_abstracting

Publisher information: Plant Science Today is published by HORIZON e-Publishing Group with support from Empirion Publishers Private Limited, Thiruvananthapuram, India.