



International Journal of Research in Agronomy

E-ISSN: 2618-0618

P-ISSN: 2618-060X

© Agronomy

www.agronomyjournals.com

2024; SP-7(9): 45-49

Received: 02-07-2024

Accepted: 03-08-2024

Manoj Kumar Yadav

M.Sc Research Scholar,
Department of Horticulture,
Institute of Agricultural Sciences,
Bundelkhand University, Jhansi,
Uttar Pradesh, India

Harpal Singh

Assistant Professor, Department of
Horticulture, Institute of
Agricultural Sciences,
Bundelkhand University, Jhansi,
Uttar Pradesh, India

Kanchan Bajiya

M.Sc Research Scholar,
Department of Horticulture,
Institute of Agricultural Sciences,
Bundelkhand University, Jhansi,
Uttar Pradesh, India

Sanjay Kumar Yadav

M.Sc Research Scholar,
Department of Horticulture,
Institute of Agricultural Sciences,
Bundelkhand University, Jhansi,
Uttar Pradesh, India

Ajay Singh Netwal

M.Sc Research Scholar,
Department of Horticulture,
Institute of Agricultural Sciences,
Bundelkhand University, Jhansi,
Uttar Pradesh, India

Corresponding Author:

Manoj Kumar Yadav

M.Sc Research Scholar,
Department of Horticulture,
Institute of Agricultural Sciences,
Bundelkhand University, Jhansi,
Uttar Pradesh, India

Effect of organic liquid formulation on growth, yield and quality of red okra (*Abelmoschus esculentus* L.) Cv. Kashi Lalima in Bundelkhand

Manoj Kumar Yadav, Harpal Singh, Kanchan Bajiya, Sanjay Kumar Yadav and Ajay Singh Netwal

DOI: <https://doi.org/10.33545/2618060X.2024.v7.i9Sa.1423>

Abstract

A field experiment was conducted to study the effect of organic liquid formulation on growth, yield and quality of red okra (*Abelmoschus esculentus* L.) cv. Kashi Lalima in Bundelkhand region during Rabi 2023 at Organic Research Farm, Department of Horticulture, Institute of Agricultural Sciences, Bundelkhand University, Jhansi. The experiment was laid out in Randomized Block Design (RBD) 9 treatments comprising three replications each. Observations on Plant height (cm), Stem diameter (cm) concluded that high application of organic nutrients might have promoted the maximum vegetative growth while the minimum plant growth was due to non-availability of nutrients. Results revealed that number of leaves and branches per plant increased with increasing plant height successively with the increasing levels of nutrient. Combination of organic nutrients also recorded maximum plant height and number of leaves and branches. Observations on Days to first flowering, Days to 50% flowering, Days to first capsule setting, Days to first capsule picking and Number capsule per plant found that integration of organic liquid formulations favored vigorous growth and synthesized more these hormones in plants. Observations on Average capsule weight (g), capsule length, Average capsule diameter (cm), capsule Yield per plant (kg/plant), capsule Yield per capsule (kg/ capsule), Average capsule yield per hectare (t/ha), Seed index [1000-seed weight (g)] and Total soluble solid (0Brix) concluded that Organic liquid formulations play an important role in improving productivity and quality of fruit. Doses of Organic liquid formulations increased the vigor of plants, assimilating area, size of fruit, thereby resulting into higher weight of fruit.

Keywords: Organic, liquid formulation, *khariif*, organic nutrition

Introduction

Okra (*Abelmoschus esculentus* L.) Moench is a flowering plant in the Malvaceae family. It is also named ladies' finger, bamyah, bamieh, kacang, gumbo, dharos, bhindi, bendi or bamia in a particular region of the world. Various parts of the red okra plant have many benefits to the body. Fresh okra heals constipation, leucorrhoea, spermatorrhea, diabetes, and jaundice; the mucilage can cure diarrhea, dysentery, gastric ulcer, and syphilis, and when mucilage of okra is mixed with a ripe banana can be used to treat colitis, cystitis, hepatitis, and jaundice. The polysaccharides from okra modulate and improve organisms' immune response due to *S. aureus* infection. Okra pods contain polyphenols and flavonoids such as quercetin that have higher antioxidant activity can scavenge free radicals and decrease oxidative stress in the cells. The polyphenols and flavonoids can also protect the liver from the toxic effects of xenobiotics intoxication.

Using organic manures to meet the nutrient requirements of crops would be an unavoidable activity for sustainable agriculture in the years to come, as organic manures typically enhance the soil's physical, chemical and biological properties while retaining the soil's moisture-bearing ability, resulting in improved crop production and maintaining crop quality. While, organic manures contain plant nutrients in small amounts compared with inorganic fertilizers, the existence of growth promoting principles such as hormones and enzymes make them necessary in ordered to boost soil fertility and crop productivity.

Organic manure increases cation exchange capacity, water holding capacity and soil phosphate availability besides enhancing fertilizer use efficiency and soil microbial population, reducing nitrogen losses due to slow nutrient release.

Materials and Methods

Effect of 9 treatments viz., T₁- Cow Urine (100%) 10 ml/lit, T₂- Panchagavya (100%) 30 ml/lit, T₃- Vermiwash (100%) 100 ml/lit, T₄- Jeevamruth (100%) 50 ml/lit, T₅- Cow Urine (50%) + Panchagavya (50%) 20 ml/lit, T₆-Cow Urine (50%) + Vermiwash (50%) 55 ml/lit, T₇- Cow Urine (50%) + Jeevamruth (50%) 30 ml/lit, T₈- Cow Urine (25%) + Panchagavya (25%) + Vermiwash (25%) + Jeevamruth (25%) 50 ml/lit and T₉-Control (water spray) was evaluated to study the effects of organic liquid formulations on growth parameters, yield and yield attributes of okra. The variety was used Kashi lalima for the experiment. The experiment was conducted under field conditions in 2.4 m×1.8 m plot using randomized block design with three replications. Plots sprayed with plain water served as check/control.

Treatments

- T₁ Cow Urine (100%) 10 ml/lit
- T₂ Panchagavya (100%) 30 ml/lit
- T₃ Vermiwash (100%) 100 ml/lit
- T₄ Jeevamruth (100%) 50 ml/lit
- T₅ Cow Urine (50%) + Panchagavya (50%) 20 ml/lit
- T₆ Cow Urine (50%) + Vermiwash (50%) 55 ml/lit
- T₇ Cow Urine (50%) + Jeevamruth (50%) 30 ml/lit
- T₈ Cow Urine (25%) + Panchagavya (25%) + Vermiwash (25%) + Jeevamruth (25%) 50 ml/lit
- T₉Control (water spray)

The experimental data recorded during the investigation were subjected to statistical analysis of “Analysis of Variance (ANOVA)” technique for drawing comparison. The significance and non- significance of the treatments were judged with the

help of „F” test. The significance differences between the means were tested with the critical difference (CD) at 5% probability level.

Results and Discussion

Observations on Plant height (cm), Plant height at 30 DAS, Plant height at 60 DAS, Plant height at harvest, Stem diameter (cm), concluded that high application of organic nutrients might have improved the soil physical and chemical properties and leading to the adequate supply of nutrients to the plants which might have promoted the maximum vegetative growth while the minimum plant growth was due to non-availability of nutrients. It was noticed that number of leaves and branches per plant increased with increasing plant height successively with the increasing levels of nutrient. Combination of organic nutrients also recorded maximum plant height and number of leaves and branches also which helped the plants in better photosynthesis to attain vigor. Observations on Days to first flowering, Days to 50% flowering, Days to first capsule setting, Days to first capsule picking and Number capsule per plant found that integration of organic liquid formulations favoured vigorous growth and synthesized more these hormones in plants, which might have helped to the translocation as well as more quantity of available phosphorus through the xylem vessels and their accumulation in the auxiliary buds that would have favoured the plant to enter reproductive phase. Observations on Average capsule weight (g), capsule length, Average capsule diameter (cm), capsule Yield per plant (kg/plant), capsule Yield per capsule (kg/plot), Average capsule yield per hectare (t/ha), Seed index [1000-seed weight (g)] and Total soluble solid (OBrix) concluded that Organic liquid formulations play an important role in improving productivity and quality of fruit. Doses of Organic liquid formulations increased the vigour of plants, assimilating area, size of fruit, thereby resulting into higher weight of fruit.

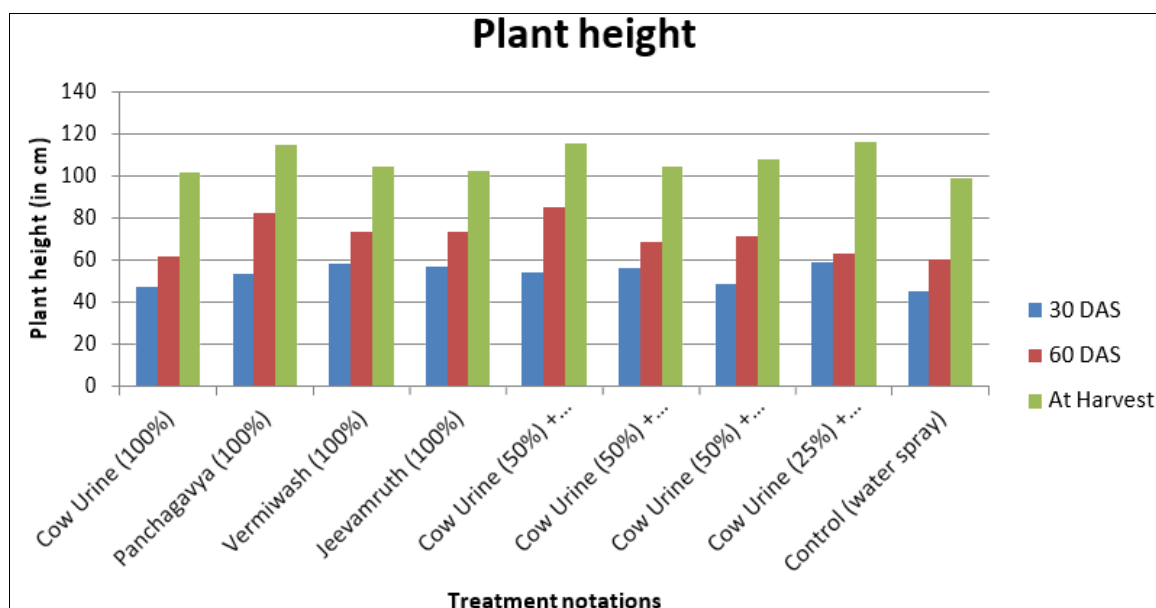


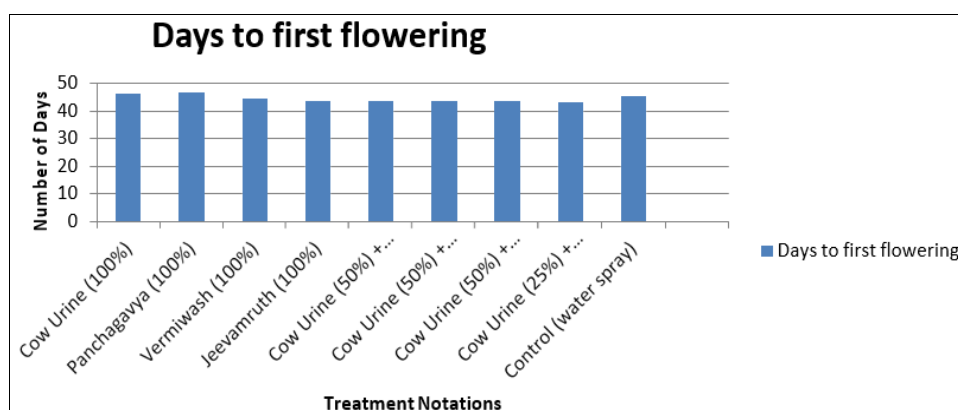
Fig 1: Histogram of effect of organic liquid formulations on plant height (cm) of red okra

Table 1: Effect of organic liquid formulations on plant height (cm) of the Red okra.

Treatment Notation	Treatment details	30 DAS (cm)	60 DAS (cm)	At Harvest (cm)
T ₁	Cow Urine (100%) 10 ml/lit	47.57	61.91	101.35
T ₂	Panchagavya (100%) 30 ml/lit	53.47	82.35	114.50
T ₃	Vermiwash (100%) 100 ml/lit	58.49	73.40	104.52
T ₄	Jeevamruth (100%) 50 ml/lit	56.57	73.38	102.50
T ₅	Cow Urine (50%) + Panchagavya (50%) 20 ml/lit	54.43	85.16	115.37
T ₆	Cow Urine (50%) + Vermiwash (50%) 55 ml/lit	56.37	68.60	104.42
T ₇	Cow Urine (50%) + Jeevamruth (50%) 30 ml/lit	48.46	71.60	107.49
T ₈	Cow Urine (25%) + Panchagavya (25%) + Vermiwash (25%) + Jeevamruth (25%) 50 ml/lit	58.62	63.28	116.33
T ₉	Control (water spray)	45.37	60.38	98.60
	Mean	53.26	71.11	107.23
	'F' Test	S	S	S
	S.E.(m)	0.37	0.27	1.37
	C.D. at 5%	0.86	0.37	3.40

Table 2: Effect of organic liquid formulations on days to first flowering of Red okra.

Treatment Notation	Treatment details	Days
T ₁	Cow Urine (100%) 10 ml/lit	46.31
T ₂	Panchagavya (100%) 30 ml/lit	46.65
T ₃	Vermiwash (100%) 100 ml/lit	44.81
T ₄	Jeevamruth (100%) 50 ml/lit	43.86
T ₅	Cow Urine (50%) + Panchagavya (50%) 20 ml/lit	43.75
T ₆	Cow Urine (50%) + Vermiwash (50%) 55 ml/lit	43.83
T ₇	Cow Urine (50%) + Jeevamruth (50%) 30 ml/lit	43.85
T ₈	Cow Urine (25%) + Panchagavya (25%) + Vermiwash (25%) + Jeevamruth (25%) 50 ml/lit	43.09
T ₉	Control (water spray)	45.39
	Mean	44.61
	'F' Test	S
	S.E.(m)	0.49
	C.D. at 5%	1.09

**Fig 2:** Histogram of effect of organic liquid formulations on days to first flowering of the red okra**Table 3:** Effect of organic liquid formulation on stem diameter (cm) of Red okra.

Treatment Notation	Treatment details	Stem diameter (cm)
T ₁	Cow Urine (100%) 10 ml/lit	7.67
T ₂	Panchagavya (100%) 30 ml/lit	11.35
T ₃	Vermiwash (100%) 100 ml/lit	8.02
T ₄	Jeevamruth (100%) 50 ml/lit	7.99
T ₅	Cow Urine (50%) + Panchagavya (50%) 20 ml/lit	11.77
T ₆	Cow Urine (50%) + Vermiwash (50%) 55 ml/lit	7.92
T ₇	Cow Urine (50%) + Jeevamruth (50%) 30 ml/lit	8.39
T ₈	Cow Urine (25%) + Panchagavya (25%) + Vermiwash (25%) + Jeevamruth (25%) 50ml/lit	11.87
T ₉	Control (water spray)	7.07
	Mean	9.11
	'F' Test	S
	c.v.	7.90
	S.E.(m)	0.32
	C.D. at 5%	0.81

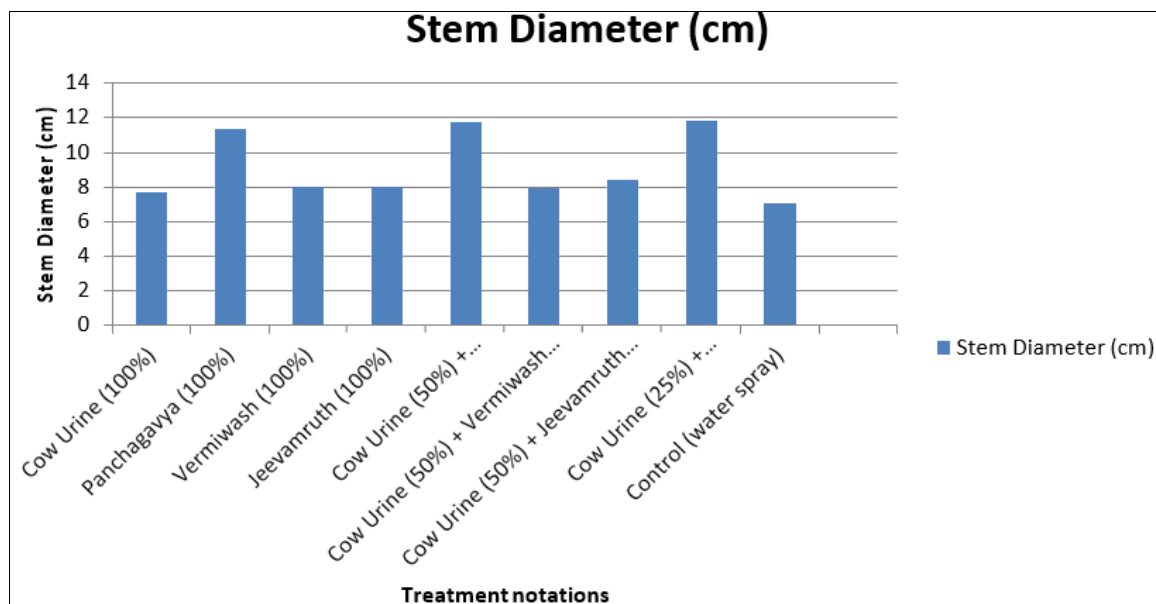


Fig 3: Histogram of effect of organic liquid formulations on stem diameter of the red okra.

Table 4: Effect of organic liquid formulations on capsule yield per plot (kg/plot) of red okra.

Treatment Notation	Treatment details	Kg/plot
T ₁	Cow Urine (100%) 10 ml/lit	14.78
T ₂	Panchagavya (100%) 30 ml/lit	15.33
T ₃	Vermiwash (100%) 100 ml/lit	14.91
T ₄	Jeevamruth (100%) 50 ml/lit	14.97
T ₅	Cow Urine (50%) + Panchagavya (50%) 20 ml/lit	16.93
T ₆	Cow Urine (50%) + Vermiwash (50%) 55 ml/lit	16.22
T ₇	Cow Urine (50%) + Jeevamruth (50%) 30 ml/lit	16.36
T ₈	Cow Urine (25%) + Panchagavya (25%) + Vermiwash (25%) + Jeevamruth (25%) 50ml/lit	17.31
T ₉	Control (water spray)	14.68
	Mean	15.72
	'F' Test	S
	S.E.(m)	0.88
	C.D. at 5%	2.49

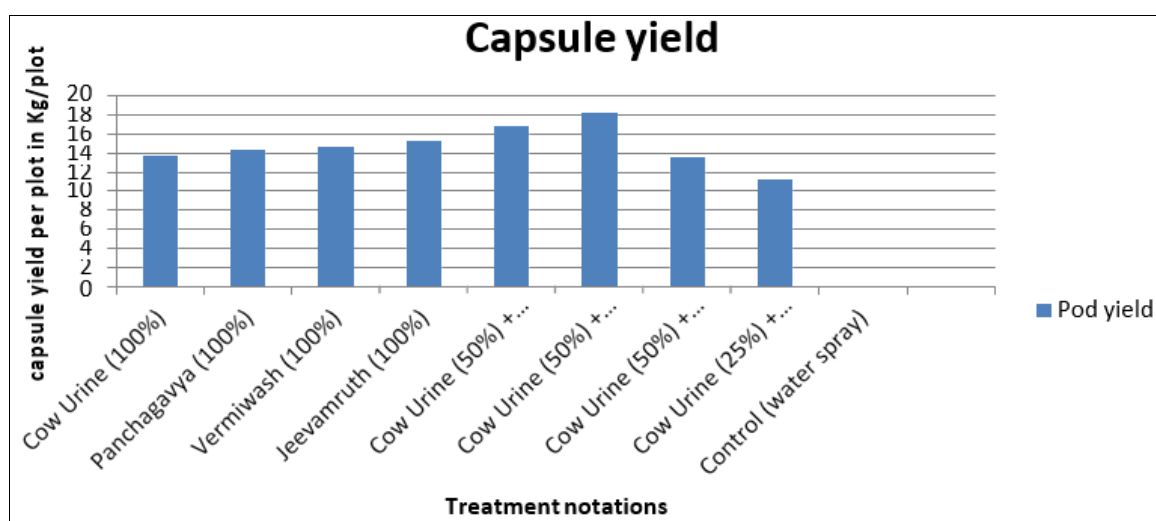


Fig 4: Histogram of effect of organic liquid formulations on capsule yield per plot (kg/plot) of the red okra.

Conclusion

The study concluded that the high application of organic nutrients significantly improved plant growth by enhancing soil physical and chemical properties, leading to better nutrient availability. This resulted in increased plant height, stem diameter, number of leaves, and branches. The combination of

organic nutrients promoted better photosynthesis, enabling plants to achieve maximum vegetative growth. Organic liquid formulations also favored vigorous growth and accelerated the reproductive phase by aiding in nutrient translocation and hormone synthesis. Additionally, these formulations improved fruit productivity and quality by increasing plant vigor, fruit

size, and weight, thereby enhancing overall yield and fruit characteristics such as seed index and total soluble solids.

References

1. Bhargavi. Evaluation of organic growth promoters on yield of dryland vegetable crops in India. *Journal of Organic Systems*. 2019;3(1):24.
2. Boraiah B, Devakumar N, Palanna KB. Yield and quality parameters of *Capsicum annuum* L. var. *grossum* as influenced by organic liquid formulations. *International Journal of Current Microbiology and Applied Sciences*. 2017;6(1):333-338.
3. Choudhary K, More SJ, Bhandari DR. Impact of biofertilizers and chemical fertilizers on growth and yield of *Abelmoschus esculentus* L. Moench. *The Ecoscan*. 2015;9(1&2):67-70.
4. Goveanthan AS, Sugumaran MP, Gudimetha GK, Akila S, Suganya K, Somasundaram E. Studies on organic inputs (Jeevamruth and Beejamruth) and their efficacy on fenugreek. *The Pharma Innovation Journal*. 2020;9:92-94.
5. Jadhav SD, Shinde SJ, Deshmukh KD. Influence of biofertilizer, liquid organic manures along with RDF on growth and flowering of *Abelmoschus esculentus* L. Moench. *Journal of Pharmacognosy and Phytochemistry*. 2021;10(1):303-306.
6. Jagdale A, Dhamak A, Pagar B, Wagh P. Effect of different organic formulations on growth and yield of soybean. *International Journal of Chemical Studies*. 2020;8(4):1634-1638.
7. Parvathi SU, Ushakumari K. Influence of on-farm liquid organic manures on soil health and crop production. [Incomplete reference details].
8. Rathore R, Sharma A. Short communication: Effect of integrated nutrient management (INM) on growth of *Abelmoschus esculentus* L. cv. Parbhani Kranti. [Incomplete reference details].
9. Safiullah K, Durani A, Durrani H, Akbar M. Effect of solid and liquid organic manures on growth, yield and economics of *Zea mays* L. Var. *Saccharata* Sturt under South Gujarat condition. *Indian Journal of Pure & Applied Biosciences*. 2018;6(2):567-574.
10. Smriti S, Ram RB. Effect of organic, inorganic, and bio-fertilizers on yielding and fruiting traits of *Abelmoschus esculentus* L. Moench. *Journal of Pharmacognosy and Phytochemistry*. 2018;7(5):90-93.
11. Sornalatha S, Esakkiammal B. Influence of cow products as a fertilizer on the fruits of ridge gourd and bottle gourd in nutrient analysis. *European Journal of Biomedical and Pharmaceutical Sciences*. 2018;5(3):897-900.