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EFFECT OF *GHANJEEVAMRUT* AND *JEEVAMRUT* ON GROWTH AND QUALITY OF CUCUMBER (*CUCUMIS SATIVUS* L.)

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ABSTRACT

Experiment was laid out in Randomized Block Design with three replications. Total twelve treatments were evaluated in the present study. *Ghanjeevamrut* was given as basal dose according to each treatments, drenching of *jeevamrut* was given at 20, 40 and 60 DAS and spray was given at 30, 50, and 70 DAS respective to the treatments. Results showed that length of main vine at 60 DAS (163.06 cm) and at last harvest (247.33 cm), number of branches per vine at last harvest (11.80), number of female flowers (20.33) and fruit length (276.87cm) and was found maximum in treatment T_{12} (*Ghanjeevamrut* @4t/ha + *Jeevamrut* @600 l/ha + 10 % *Jeevamrut*) which is statistically at par with T_{11} (*Ghanjeevamrut* @4t/ha + *Jeevamrut* @600 l/ha + 5% *Jeevamrut*) and T_{10} (*Ghanjeevamrut* @4t/ha + *Jeevamrut* @600 l/ha + 10% *Jeevamrut*).

Keywords: *ghanjeevamrut*, *jeevamrut*, cucumber, *Cucumis sativus* L., drenching, spray, sex ratio

Introduction

Vegetable cultivation is a profitable enterprise suitable for small and marginal farmers, providing quick returns and contributing significantly to agricultural development and farm income. India is the world's second largest vegetable producer after China, with a production of 207.21 million MT, while Gujarat contributes 15.26 million MT (Anonymous, 2023–24). Cucurbitaceae is one of the largest vegetable families, valued for its nutritional, medicinal and therapeutic importance in traditional medicine (Mukherjee *et al*., 2022). Cucumber (*Cucumis sativus* L.), believed to have originated in India, is an important cucurbit grown under both open field and protected conditions. It is nutritionally rich and possesses antioxidant, antimicrobial and skin-soothing properties (Khan *et al*., 2021; Choubey *et al*., 2023). Cucumber is a fast-growing, monoecious crop, where flowering and sex expression play a crucial role in fruit set and yield (Ahmed *et al*., 2004).

Material and Methods

The study was undertaken during summer season of the year 2024 under field conditions at College Farm, College of Horticulture, Sardarkrushinagar Dantiwada Agricultural University, Jagudan, Dist. Mehsana, Gujarat, to find out effect of *ghanjeevamrut* and *jeevamrut* on growth and quality of cucumber (*Cucumis sativus* L.). The experiment was laid out in randomized block design with twelve treatments. Treatments contained various dosage of *ghanjeevamrut*, drenching and foliar application of *jeevamrut*. *Ghanjeevamrut* was given as a basal dose with respect to each treatment. Drenching of *jeevamrut* was done at 20, 40 and 60 DAS in all the treatments. Foliar application of *jeevamrut* was given at 30, 50 and 70 DAS. Disease and pest control done without use of

chemicals. The growth and quality parameters were evaluated by means of below described methods.

Growth parameters

Germination per cent

The germination of seeds were counted at 10 days after sowing. It was determined by the number of normal seedlings obtained from the total no seeds sown. It was expressed in the form of percentage.

$$\text{G.P.} = \frac{\text{Number of germinated seeds}}{\text{Total number of seeds sown}} \times 100$$

Length of main vine at 60 DAS and at last harvest (cm)

The length of main vine was measured in centimeters with the help of meter scale. It was measured from the base to the apex of the main shoot at the 60 days after sowing and at last harvest. The average length of five tagged plants for each treatment was calculated.

Number of branches per vine at last harvest

The numbers of primary branches from the ground level to the growing tip of the main stem were recorded for five tagged plants and averaged out.

Initiation of first male flower

The five tagged plants were inspected every day for the first appearance of male flower and noted down in days after sowing.

Initiation of first female flower

The five tagged plants were inspected every day for the first appearance of female flower and noted down in days after sowing.

Number of male flowers

The five tagged plants were inspected every day and total numbers of male flowers were counted from the date of appearance of first female flower to the last harvest and averaged out.

Number of female flowers

The five tagged plants were inspected every day and total numbers of female flowers were counted from the date of appearance of first female flower to the last harvest and averaged out.

Sex ratio of male: female flowers

For this, total numbers of male and female flowers were counted in all the tagged plants and number of male flowers divided by female flowers to obtain the sex ratio.

$$\text{Sex} = \frac{\text{Number of male flowers}}{\text{Number of female}}$$

Quality parameters

Fruit length (cm)

Five fruits were randomly selected from tagged plants and measured in centimeter with the help of scale from the base to the tip of the fruit and mean value of fruit length was worked out.

Fruit diameter (cm)

Five fruits were randomly selected from tagged plants and measured in centimeter with the help of Digital Vernier Caliper at the middle of fruit and mean value of fruit diameter was recorded.

Total soluble solid (°Brix)

For the measurement of TSS values, five individual fruits from tagged plants were cut into small pieces and mixed thoroughly and juice was extracted. Then readings were recorded with the help of digital hand refractometer (Atago pocket refractometer pal-1).

Table 1: Treatment details

Notation	Treatment
T_1	*Ghanjeevamrut* @2t/ha + *Jeevamrut* @400 l/ha
T_2	*Ghanjeevamrut* @2t/ha + *Jeevamrut* @600 l/ha
T_3	*Ghanjeevamrut* @2t/ha + *Jeevamrut* @400 l/ha + 5% *Jeevamrut*
T_4	*Ghanjeevamrut* @2t/ha + *Jeevamrut* @400 l/ha + 10% *Jeevamrut*
T_5	*Ghanjeevamrut* @2t/ha + *Jeevamrut* @600 l/ha + 5% *Jeevamrut*
T_6	*Ghanjeevamrut* @2t/ha + *Jeevamrut* @600 l/ha + 10% *Jeevamrut*
T_7	*Ghanjeevamrut* @4t/ha + *Jeevamrut* @400 l/ha
T_8	*Ghanjeevamrut* @4t/ha + *Jeevamrut* @600 l/ha
T_9	*Ghanjeevamrut* @4t/ha + *Jeevamrut* @400 l/ha + 5% *Jeevamrut*
T_{10}	*Ghanjeevamrut* @4t/ha + *Jeevamrut* @400 l/ha + 10% *Jeevamrut*
T_{11}	*Ghanjeevamrut* @4t/ha + *Jeevamrut* @600 l/ha + 5% *Jeevamrut*
T_{12}	*Ghanjeevamrut* @4t/ha + *Jeevamrut* @600 l/ha + 10% *Jeevamrut*

Results and Discussion

Effect of *ghanjeevamrut* and *jeevamrut* on growth and flowering parameters

Length of main vine at 60 DAS and last harvest (cm)

The study found that the impact of *ghanjeevamrut* and *jeevamrut* on the length of the main vine at 60 DAS and final harvest was statistically significant. Maximum length of main vine at 60 DAS (163.06 cm) and at last harvest (247.33 cm) was observed with treatment T_{12} (*Ghanjeevamrut* @4t/ha + *Jeevamrut* @600 l/ha + 10% *Jeevamrut*), The enhanced nutrient solubilization may be attributed to increased beneficial microbial activity in the soil, ensuring a steady nutrient supply and improved plant growth (Sharma, 2023). The application of *Jeevamrut* likely created a favorable environment for microorganisms, enhancing nutrient availability to plants (Devakumar *et al.*, 2008). Similar findings were reported by Sutar *et al.* (2018) in cowpea.

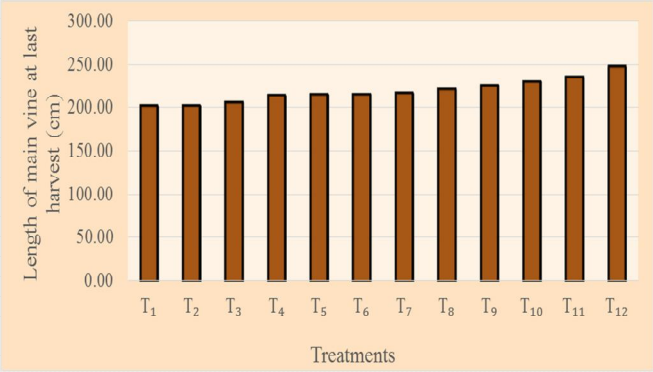

Fig. 1: Effect of *ghanjeevamrut* and *jeevamrut* on Length of main vine at 60 DAS and last harvest (cm)

Number of branches per vine at last harvest

Results revealed that the effect of *ghanjeevamrut* and *jeevamrut* on number of branches per vine at last harvest was statistically significant. Maximum number of branches per vine (12.80) observed in treatment T_{12} (*Ghanjeevamrut* @4t/ha + *Jeevamrut* @600 l/ha + 10% *Jeevamrut*). The growth of plants can be attributed to the beneficial microorganisms from *ghanjeevamrut* and *jeevamrut*, which improve soil health and enhance plant nutrient absorption. These microorganisms encourage more branches, increase leaf initiation, and produce growth promoting compounds like cytokinin and auxins, thereby increasing plant growth in okra (Manisha *et al.*, 2024).

Number of female flowers and sex ratio of male: female flowers

The data indicate that the number of female flowers (20.33) and the lowest sex ratio (6.59) were achieved in the treatment T_{12} (*Ghanjeevamrut* @4t/ha + *Jeevamrut* @600 l/ha + 10% *Jeevamrut*). The positive response may be due to *Jeevamrut* application, which provides essential nutrients like phosphorus and growth regulators such as gibberellic acid. These components enhance root growth, energy transfer, cell elongation, and early flowering (Goldberg-Moeller *et al.*, 2013). Similar improvements in flowering and fruit set with *Jeevamrut* were observed in bottle gourd (Sakthivel *et al.*, 2022).

Effect of *ghanjeevamrut* and *jeevamrut* on quality parameters

Fruit length (cm)

The statistical study showed that how different treatments affected the fruit length parameter. The treatment T_{12} (*Ghanjeevamrut* @4t/ha + *Jeevamrut* @600 l/ha + 10% *Jeevamrut*) produced maximum fruit length (26.27 cm) compared to other treatments. The application of *Jeevamrut*, enriched with plant growth hormones such as auxins, gibberellins, and cytokinins, enhances cell division and elongation, resulting in larger fruit size (Thejaswini *et al.*, 2022). Similarly, Shilpa *et al.* (2023) reported that its rich microbial population and improved nutrient availability contribute to better plant growth and development.

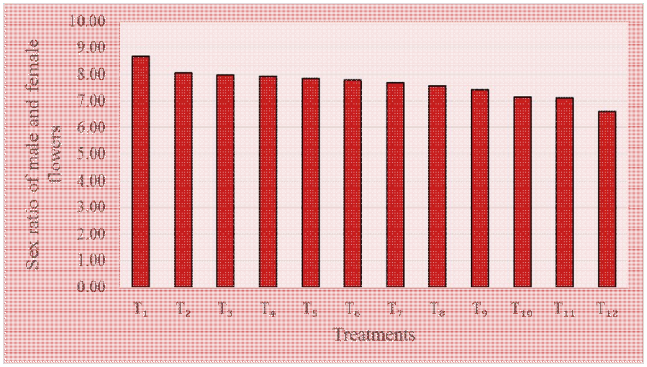

Fig. 2: Effect of *ghanjeevamrut* and *jeevamrut* on sex ratio of male and female

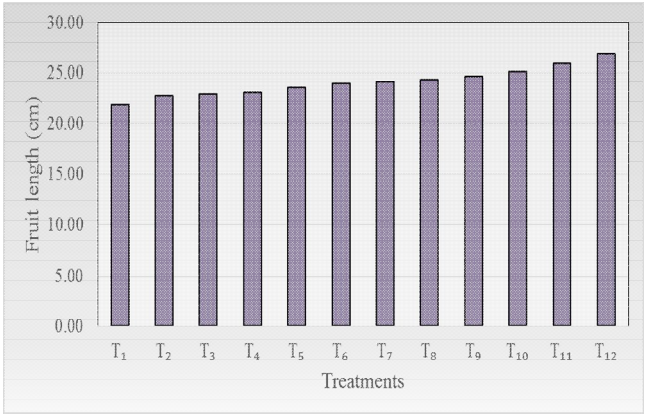

Fig. 3: Effect of *ghanjeevamrut* and *jeevamrut* on Fruit length

Table 2: Effect of *ghanjeevamrut* and *jeevamrut* on growth and flowering parameters

Treatment	Length of main vine at 60 DAS and last harvest (cm)		Number of branches per vine at last harvest	Number of female flowers	sex ratio	Fruit length (cm)
T_1	130.65	201.07	10.07	16.33	8.68	21.87
T_2	132.87	201.63	10.53	17.60	8.07	22.73
T_3	135.53	205.55	10.40	17.67	7.98	22.97
T_4	139.17	213.65	10.93	17.73	7.92	23.10
T_5	140.79	214.62	11.20	17.80	7.85	23.57
T_6	143.12	215.11	11.27	17.87	7.81	23.97
T_7	143.46	216.34	11.33	18.00	7.70	24.13
T_8	143.66	220.89	11.53	18.13	7.53	24.30
T_9	153.25	225.51	11.67	18.40	7.41	24.67
T_{10}	158.52	230.16	11.73	18.93	7.15	25.13
T_{11}	160.64	235.43	11.93	18.93	7.13	25.90
T_{12}	163.06	247.33	12.80	20.33	6.59	26.87
S.Em. ±	6.18	8.64	0.46	0.63	0.34	0.92
C. D. (P = 0.05)	18.13	25.34	1.35	1.85	1.00	2.70
C.V. %	7.37	6.84	7.05	6.01	7.75	6.61

Conclusion

In view of the results obtained from the present investigation, it can be concluded that basal application of *ghanjeevamrut* @4t/ha, drenching of *jeevamrut* @400 or 600 l/ha applied at 20, 40, 60 DAS and spray of *jeevamrut* at 30,50, 70 DAS @5 or 10 per cent is beneficial for obtaining maximum growth and better quality in cucumber.

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