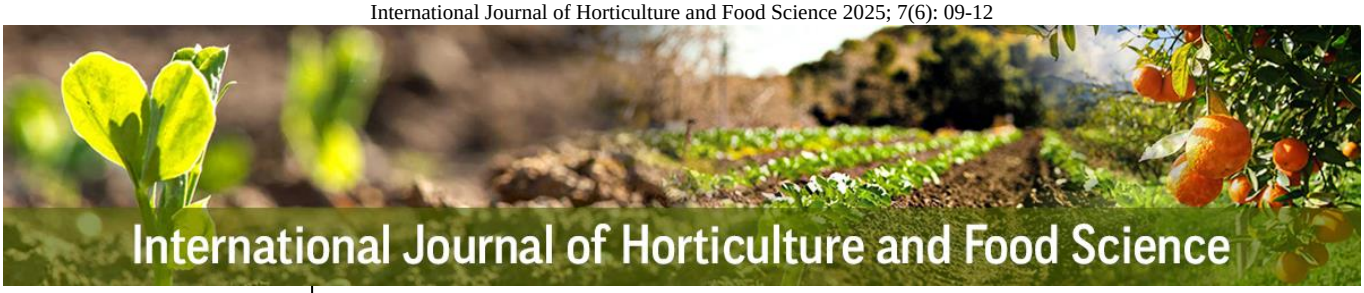


**E-ISSN:** 2663-1067
**P-ISSN:** 2663-1075
NAAS Rating: 4.74
www.hortijournal.com
IJHFS 2025; 7(6): 09-12
Received: 01-04-2025
Accepted: 03-05-2025

**Dhanraj Kumawat**
Department of Horticulture, School of Agricultural Sciences Career Point University, Kota, Rajasthan, India

**Manish Kumar**
Department of Horticulture, School of Agricultural Sciences Career Point University, Kota, Rajasthan, India

**Mahaveer Suman**
Department of Horticulture, School of Agricultural Sciences Career Point University, Kota, Rajasthan, India

**Dheerendra Kumar**
Department of Horticulture, School of Agricultural Sciences Career Point University, Kota, Rajasthan, India

**Gunjeet Kaur**
Department of Horticulture, School of Agricultural Sciences Career Point University, Kota, Rajasthan, India

**Arjun Nagar**
Department of Horticulture, School of Agricultural Sciences Career Point University, Kota, Rajasthan, India

**Corresponding Author:**
**Dhanraj Kumawat**
Department of Horticulture, School of Agricultural Sciences Career Point University, Kota, Rajasthan, India

# Impact of natural farming approaches on productivity of tomato (*Solanum lycopersicum*)

**Dhanraj Kumawat, Manish Kumar, Mahaveer Suman, Dheerendra Kumar, Gunjeet Kaur and Arjun Nagar**

**DOI:** https://www.doi.org/10.33545/26631067.2025.v7.i6a.310

**Abstract**
The present investigation aimed to find out the "Impact of natural farming approaches on productivity of tomato (*Solanum lycopersicum*)" was carried out at the Instructional Farm (Horticulture), Career Point University, Alaniya, Kota during 2024-2025. The experiment was laid out in Randomized Block Design. Replicated thrice with 9 treatment combinations, comprising like $T_1$ Control, $T_2$ 1.5 t/h Ghanjeevamrit + Jeevamrit 25%, $T_3$ 1.5 t/h Ghanjeevamrit + Jeevamrit 30%, $T_4$ 2 t/h Ghanjeevamrit + Jeevamrit 25%, $T_5$ 2 t/h Ghanjeevamrit + Jeevamrit 30%, $T_6$ 3 t/h Ghanjeevamrit + Jeevamrit 25%, $T_7$ 3 t/h Ghanjeevamrit + Jeevamrit 30% $T_8$ 3.5 t/h Ghanjeevamrit + Jeevamrit 25%, $T_9$ 3.5 t/h Ghanjeevamrit + Jeevamrit 30%. The natural farming approaches on productivity combinations was found most effective improve success and growth yield and quality of tomato parameter like maximum plant height (29.29, 39.20, 52.38 and 70.20 cm) at 30 DAS, 45 DAS and 120 DAS maximum days taken to first flowering (43.35), maximum flower per plant (51.52), highest fruit per plant (38.25), The highest fruit weight (39.42 g), maximum fruit yield (1.50 kg), Maximum TSS (4.85 $^0$Brix), The maximum titraable acidity (0.68), The maximum ascorbic acid (24.73 g/100)

**Keywords:** Natural farming tomato

## Introduction
Tomato (*Solanum lycopersicum* L.), most of the commercial crop globally, its belongs to the Solanaceae family. Its chromosomal number is 24, and it is believed to have originated from Peru, Tomato are cultivated both for fresh consumption as well as for the diverse range of processed products like salads, ketchup, soups, powders, juices, pastes, and purees. This versatile vegetable is incredibly nutrient-rich, containing high levels of antioxidants such as carotenoids (particularly lycopene and beta carotene), phenolics, vitamin C and vitamin A. Additionally tomato are a valuable source of essential nutrients like calcium, phosphorus and iron. Their consumption has been linked to a reduced risk of various cancers, including breast head and neck cancers and regular tomato consumption has been shown to lower cardiovascular risks associated with type diabetes.

The foundation of Subhash Palekar Natural Farming (SPNF) rests on four pillars namely jeevamrit, Ghanjeevamrit, beejamrit, wapasa and acchadana. Natural farming is an agricultural system that follows the laws of nature. In this method, no chemical or organic fertilizers are used on the soil instead the nutrients in the soil come from the natural decomposition of organic matter by microbes and earthworms. This approach promotes healthier soil biology enhances agro-biodiversity and encourages more efficient water usage leading to smaller carbon and nitrogen footprints.

The Natural Farming System is a chemical-free and distinctive approach to farming that primarily relies on Agro-ecology. It emphasizes the cultivation of beneficial microorganisms without the need for external manures or chemical fertilizers. Zero Budget Natural Farming (ZBNF) is a part of this system, aimed at reducing the financial burden and market dependency of farmers on external inputs. In this approach, botanical pesticides are employed to naturally control pest and disease outbreaks. Natural farming practices utilize naturally fermented organic inputs, such as ghanjeevamrit, beejamrit and jeevamrit, which are cost-effective and eco-friendly, made from cow products like cow urine and cow dung.

Organic sources play a crucial role in tomato cultivation as they provide numerous benefits

that contribute to the overall health and productivity of tomato plants. First organic manures such as compost and well-rotted animal manure enhance soil fertility by increasing the organic matter content. This improves soil structure, water-holding capacity and nutrient availability creating a favorable environment for root development and nutrient uptake by the plants. Furthermore organic manures release nutrients slowly and steadily ensuring a steady supply of essential elements to the tomato plants throughout their growth cycle

## Materials and Methods

The study was carried out during the *kharif* season at Research Farm Department of Horticulture, School of Agriculture Science, Career Point University Kota, India. Variety used in research Arka vikash period of experiment work 5 Month.

### Preparation of Ghanjeevamrit

- Take 100 kg indigenous cow dung (air dried for 4-5 days) and spread it on clean floor
- Add kg of Jaggery + 1 kg of pulse flour (Besan, Chickpea flour) + 3 litres of indigenous cow urine and 250 g of soil from undisturbed bunds or forest or under tree cover to the cow dung.
- After 10 days, ghanjeevamrit is ready for application

### Preparation of Jeevamrit

- Take 200 litre water in a drum add 10 kg of fresh desi cow dung and 5 litres of cow urine in drum
- Now mix 2 kg pulse flour, 2 kg jaggery and a handful live soil under canopy of the banyan tree
- Stir the solution well up to 15 minutes and let it ferment for 48 hours in the shade
- Now jeevamrit is ready for application
- 200 litres of jeevamrit is sufficient for one acre of land and apply drop by drop with irrigation water

## Results

### Plant height

The significant differences in plant height in tomato were recorded to different natural farming approaches treatments. The maximum plant height (29.29, 39.20, 52.38 and 70.20 cm) at 30 DAS, 45 DAS and 120 DAS were recorded with $T_9$ (3.5 t/h Ghanjeevamrit + Jeevamrit 30%), which is statistically at par to $T_8$ and $T_7$ at 30 DAS, 45 DAS and 120 DAS. However the minimum plant height (18.33, 29.31, 39.30 and 52.30 cm) at 30 DAS, 45 DAS and 120 DAS was found in control ($T_1$).

### Days taken to first flowering

The data presented to days taken to first flowering as influenced by different treatments was observed that significantly maximum days taken to first flowering (43.35) was recorded in 3.5 t/h Ghanjeevamrit + Jeevamrit 30%). Which was statically at par with $T_8$.While lowest days taken to first flowering (31.32) was recorded in control.

### Flower per plant

The flower per plant was recorded significant maximum flower per plant (51.52) was recorded in treatment $T_9$ (3.5 t/h Ghanjeevamrit + Jeevamrit 30%). Minimum flower per plant (32.23) was found in control.

### Fruit per plant

The fruit per plant of tomato as influenced by different treatments. The fruit per plant of tomato differs significantly owing to different natural farming management treatments. The highest fruit per plant (38.25) obtained in $T_9$ (3.5 t/h Ghanjeevamrit + Jeevamrit 30%), the lowest fruit per plant obtained (16.32) in control plot ($T_1$) was significantly lower than the rest of the treatments.

### Fruit weight (g)

The fruit weight of tomato differs significantly owing to different natural farming management treatments. The highest fruit weight (39.42 g) obtained in $T_9$ (3.5 t/h Ghanjeevamrit + Jeevamrit 30%), the lowest fruit weight obtained (20.36 g) in control plot ($T_1$) was significantly lower than the rest of the treatments.

### Fruit yield kg/(plant)

The fruit yield per plant as influenced by different treatments are was observed that significantly maximum fruit yield (1.50 kg) was recorded in $T_9$ (3.5 t/h Ghanjeevamrit + Jeevamrit 30%), which was statically at par with $T_8$. While lowest fruit yield (0.331 kg) was recorded in control.

### TSS (Brix)

The significant differences in TSS of tomato fruit were recorded owing to different natural farming management treatments. Maximum TSS (4.85 $^0$Brix) was recorded in treatment $T_9$ (3.5 t/h Ghanjeevamrit + Jeevamrit 30%), Minimum TSS (4.01 $^0$Brix) was found in control.

### Ascorbic Acid (gm/100)

Natural farming management practices significant influenced ascorbic acid (gm/100) of tomato. The maximum ascorbic acid (24.73 g/100) was recorded under combined application of recommended dose of 3.5 t/h Ghanjeevamrit + Jeevamrit 30%, which was found at par with the application of 3.5 t/h Ghanjeevamrit + Jeevamrit 25% and 3.5 t/h Ghanjeevamrit + Jeevamrit 25% both these treatments significantly improved over rest of treatments, minimum ascorbic acid (22.13 g/100) was recorded in control.

### Titrable Acidity%

Natural farming management practices significant influenced titrable acidity of tomato. The maximum titraable acidity (0.68%) was recorded under combined application of recommended dose of 3.5 t/h Ghanjeevamrit + Jeevamrit 30%, which was found at par with the application of 3.5 t/h Ghanjeevamrit + Jeevamrit 25% and3.5 t/h Ghanjeevamrit + Jeevamrit 25% both these treatments significantly improved over rest of treatments.. minimum titrable acidity (0.50%)was recorded in control.

## Discussion

The vegetative growth and stored sufficient reserved photosynthates for differentiation of buds into flower buds and subsequently fruit growth and development, which eventually resulted in early harvest. The beneficial micro-organisms present in 3.5 t/h Ghanjeevamrit + Jeevamrit 30% may have increased the organic matter decomposition which resulted in the easy uptake of available nutrients by

the plants which led to better growth and increased number of branches per plant. These findings are in agreement with Adhikari *et al*. (2016) [1] who revealed that the use of Ghanjeevamrit + jeevamrit advanced days to first harvest in capsicum, rest of the treatments

The increased number of fruits may be due to the more availability of major macro and micro nutrients which are attributed towards the application of vermicompost. It may also be due to the beneficial effects of jeevamrit which was attributed to huge quantity of microbial population and growth hormones which might have enhanced the soil biomass thereby sustaining the availability and uptake of applied as well as native soil nutrients which ultimately resulted in better growth and yield. It might be attributed to the improved biological activities in the soil and increased nutrient availability to the crop with the application of Ghanjeevamrit + jeevamrit. The result was in accordance with those of Najar *et al*. (2015) [5] who revealed that the fruit weight of brinjal had significantly increased with the application of vermicompost.

Enhanced mobility of photosynthates from the source to the sink led to increase in the metabolism of carbohydrates, as predisposed by growth hormones might have resulted in higher total soluble solids content. This result was in conformity with the findings of Pal *et al*. (2015) [6], Meena *et al*. (2014) [4] reported maximum TSS with the application of vermicompost in tomato. The application of the Ghanjeevamrit and jeevamrit modified the nutrient uptake by the plants which led to increase in the ascorbic acid content. Another reason could be the increased efficacy of micro-organisms which led to secretion of various growth promoting substances that hastened the physiological processes like synthesis of carbohydrates and biochemical activities (Chattoo *et al*., 1997) [2].

**Table 1:** Effect of Natural Farming Approaches on plant growth of Tomato

| Treatments | Treatments combination | Plant height (cm) | | | |
|---|---|---|---|---|---|
| | | 30 DAT | 60 DAT | 90 DAT | 120 DAT |
| $T_1$ | Control | 18.33 | 29.31 | 39.30 | 52.30 |
| $T_2$ | 1.5 t/h Ghanjeevamrit + Jeevamrit 25% | 22.37 | 34.33 | 43.28 | 58.35 |
| $T_3$ | 1.5 t/h Ghanjeevamrit + Jeevamrit 30% | 23.40 | 34.77 | 45.55 | 61.46 |
| $T_4$ | 2 t/h Ghanjeevamrit + Jeevamrit 25% | 24.23 | 35.31 | 46.23 | 62.41 |
| $T_5$ | 2 t/h Ghanjeevamrit + Jeevamrit 30% | 24.85 | 36.32 | 47.67 | 63.71 |
| $T_6$ | 3 t/h Ghanjeevamrit + Jeevamrit 25% | 26.40 | 36.87 | 47.95 | 64.45 |
| $T_7$ | 3 t/h Ghanjeevamrit + Jeevamrit 30% | 26.51 | 38.36 | 49.67 | 66.32 |
| $T_8$ | 3.5 t/h Ghanjeevamrit + Jeevamrit 25% | 27.27 | 38.80 | 50.12 | 67.34 |
| $T_9$ | 3.5 t/h Ghanjeevamrit + Jeevamrit 30% | 29.29 | 39.20 | 52.38 | 70.20 |
| | Sem | 1.34 | 1.80 | 2.53 | 3.15 |
| | CD at 5% | 4.01 | 5.38 | 7.60 | 9.46 |
| | CV% | 9.36 | 8.66 | 9.35 | 8.68 |

**Table 2:** Effect of natural farming approaches on flowering and fruiting of tomato

| Treatments | Treatments combination | Days taken to first flowering | Flower per plant |
|---|---|---|---|
| T1 | Control | 31.32 | 32.23 |
| T2 | 1.5 t/h Ghanjeevamrit + Jeevamrit 25% | 38.58 | 38.21 |
| T3 | 1.5 t/h Ghanjeevamrit + Jeevamrit 30% | 38.84 | 39.31 |
| T4 | 2 t/h Ghanjeevamrit + Jeevamrit 25% | 39.26 | 42.46 |
| T5 | 2 t/h Ghanjeevamrit + Jeevamrit 30% | 40.28 | 42.85 |
| T6 | 3 t/h Ghanjeevamrit + Jeevamrit 25% | 41.34 | 45.74 |
| T7 | 3 t/h Ghanjeevamrit + Jeevamrit 30% | 42.67 | 48.64 |
| T8 | 3.5 t/h Ghanjeevamrit + Jeevamrit 25% | 43.22 | 49.33 |
| T9 | 3.5 t/h Ghanjeevamrit + Jeevamrit 30% | 43.35 | 51.52 |
| | S.E.m± | 1.94 | 1.92 |
| | CD at 5% | 5.83 | 5.75 |
| | CV% | 8.44 | 7.67 |

**Table 3:** Effect of natural farming approaches on yield of tomato

| Treatments | Treatments combination | Fruit weight (kg) | Fruit yield kg/(plant) |
|---|---|---|---|
| $T_1$ | Control | 20.36 | 0.331 |
| $T_2$ | 1.5 t/h Ghanjeevamrit + Jeevamrit 25% | 26.30 | 0.753 |
| $T_3$ | 1.5 t/h Ghanjeevamrit + Jeevamrit 30% | 28.44 | 0.834 |
| $T_4$ | 2 t/h Ghanjeevamrit + Jeevamrit 25% | 32.65 | 1.065 |
| $T_5$ | 2 t/h Ghanjeevamrit + Jeevamrit 30% | 36.46 | 1.222 |
| $T_6$ | 3 t/h Ghanjeevamrit + Jeevamrit 25% | 36.85 | 1.289 |
| $T_7$ | 3 t/h Ghanjeevamrit + Jeevamrit 30% | 37.99 | 1.334 |
| $T_8$ | 3.5 t/h Ghanjeevamrit + Jeevamrit 25% | 38.65 | 1.403 |
| $T_9$ | 3.5 t/h Ghanjeevamrit + Jeevamrit 30% | 39.42 | 1.506 |
| | S.E.m± | 1.53 | 0.05 |
| | CD at 5% | 4.58 | 0.15 |
| | CV% | 8.01 | 8.56 |

**Table 4:** Effect of natural farming approaches on quality of tomato

| Treatments | Treatments combination | TSS ($^0$Brix) | Titrable Acidity% | Ascorbic Acid (g/100) |
|---|---|---|---|---|
| T1 | Control | 4.01 | 0.50 | 22.13 |
| T2 | 1.5 t/h Ghanjeevamrit + Jeevamrit 25% | 4.12 | 0.52 | 23.30 |
| T3 | 1.5 t/h Ghanjeevamrit + Jeevamrit 30% | 4.15 | 0.55 | 23.44 |
| T4 | 2 t/h Ghanjeevamrit + Jeevamrit 25% | 4.38 | 0.57 | 23.58 |
| T5 | 2 t/h Ghanjeevamrit + Jeevamrit 30% | 4.55 | 0.59 | 24.07 |
| T6 | 3 t/h Ghanjeevamrit + Jeevamrit 25% | 4.74 | 0.61 | 24.29 |
| T7 | 3 t/h Ghanjeevamrit + Jeevamrit 30% | 4.80 | 0.62 | 24.53 |
| T8 | 3.5 t/h Ghanjeevamrit + Jeevamrit 25% | 4.81 | 0.64 | 24.66 |
| T9 | 3.5 t/h Ghanjeevamrit + Jeevamrit 30% | 4.85 | 0.68 | 24.73 |
| | S.E.m± | 0.22 | 0.03 | 1.27 |
| | CD at 5% | 0.67 | 0.09 | 3.80 |
| | CV% | 9.65 | 8.65 | 9.21 |

## Conclusion

It can be concluded that the recorded significantly higher growth yield and quality of tomato 3.5 t/h Ghanjeevamrit + Jeevamrit 30%, as compared to rest. A natural farming practices, application of 3.5 t/h Ghanjeevamrit + Jeevamrit 30% 5 through organic sources.

Future research should focus on the long-term impacts of these natural farming practices on growth yield and quality.

## References


1. Adhikari P, Khanal A, Subedi R. Effect of different sources of organic manure on growth and yield of sweet pepper. Adv Plant Agric Res. 2016;3:01-03.
2. Chattoo MA, Gandroo MY, Zargar MY. Effect of Azospirillum and Azotobacter on growth, yield and quality of knolkhol. Veg Sci. 1997;24:16-19.
3. Manickam S, Suganthy M, Ganesh R. Effect of different sources of nutrients on productivity, profitability, and quality of tomato (*Solanum lycopersicum* L.). Madras Agric J. 2022;109:1-11.
4. Meena RK, Kumar S, Maji S, Kumar D, Kumar M. Effect of organic manures and biofertilizers on growth, yield and quality of tomato cv. PusaSheetal. Int J Agric Sci. 2014;10(1):329-332.
5. Najar IA, Khan AB, Hai A. Effect of macrophyte vermicompost on growth and productivity of brinjal (*Solanum melongena* L.) under field conditions. Int J Recycl Org Waste Agric. 2015;4:73-83.
6. Pal A, Maji S, Kumawat GR, Kumar S, Meena DC. Efficacy of various sources of nutrients on growth, flowering, yield and quality of tomato (*Solanum lycopersicum* L.) cv. Azad T-6. Int Q J Life Sci. 2015;10:473-477.
7. Pathak RK, Ram RA. Indigenous technologies of organic agriculture: A review. Prog Hortic. 2013;50(1-2):70-81.