



ORIGINAL RESEARCH PAPER

Horticulture

ASSESS THE QUALITY PARAMETERS IN TOMATO (*LYCOPERSICON ESCULENTUM* MILL.) CROP

KEY WORDS: GA3 20 ppm, lycopene, ascorbic acid, brix and

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ABSTRACT

An experiment conducted at experimental field Eklavya University, Damoh, Madhya Pradesh. The highest T.S.S. reading (4.33 brix) was recorded by treatment T7-GA3 50 ppm which was at par with treatment T1-Shanmukha 1.0 g/l, T3-NAA 20 ppm and T4-NAA 40 ppm, whereas the lowest TSS reading (3.33 brix) was recorded by treatment T8-Control. The highest ascorbic acid reading (27.67 mg) was recorded by treatment T7-GA3 50 ppm which was at par with treatment T5-GA3 20 ppm and T6-GA3 40 ppm, whereas the lowest ascorbic acid reading (3.33 mg) was recorded by treatment T8-Control. The highest lycopene content reading (7.00 mg/100 g of fruit) was recorded by treatment T7-GA3 50 ppm which was at par with treatment T3-NAA 20 ppm, whereas the lowest lycopene content reading (5.33 mg/100 g of fruit) was recorded by treatment T8-Control.

INTRODUCTION

The tomato, *Lycopersicon esculentum* Mill., 1978, is a significant open self-pollinated crop that is a member of the subgenus *Eulycopersicon* and belonging to the family Solanaceae. The term Tomato is originated from a Spanish word "Tomate" which means "The swelling fruit". It originated in tropical America (Salunkhe et al., 1987), which includes the Andean regions of Bolivia, Peru, and Ecuador (Kallo, 1986), and was introduced to India in the 16th century by Portuguese explorers. It is one of the most widely consumed salad ingredients. In canneries, large amounts of fruit are frequently used to make soups, preserves, pickles, ketchup, sauces, juices, and other products. The tomato enhances the flavour of meals and has a wealth of health benefits (Uddain et al., 2009). Due to its abundant quantity of lycopene, vitamins, minerals, and -carotene, which are antioxidants and support good health, it plays a crucial function in human nutrition (Bose and Som, 1990; Gupta and Naik, 2008). A well-ripe tomato has 94.1% water, 23 calories of energy, 1.0 g of calcium, 7.0 mg of magnesium, 1000 IU of vitamin A, 22 mg of ascorbic acid, 0.09 mg of thiamin, 0.03 mg of riboflavin, and 0.8 mg of niacin per 100g of edible portion. Additionally, it contains organic acids like citric, malic, and acetic acids, which encourage gastric secretion, purify the blood, and act as an antiseptic for the intestines (Pruthi, 1993). According to estimates, India's tomato production, area, and productivity are 789 thousand ha, 19759 thousand MT, and 25.04 MT/ha, respectively. It is mostly grown in the districts of Jhabua, Barwani, Khargone, and Khandwa in Madhya Pradesh. According to NHB (2019), the acreage, production, and productivity of tomatoes in M.P. are estimated to be 84.53 thousand ha, 2419.28 thousand MT and 28.62 MT/ha. Keeping the above facts in view, the present investigation is being proposed to enhance the Tomato productivity on sustainable basis under the Agro- climatic conditions of Damoh (M.P.).

MATERIAL AND METHODS

The field experiments were conducted during winter seasons 2021-22 at the Research Farm, School of Agriculture, Eklavya University, Damoh (M.P.). Damoh district of Madhya Pradesh state is located between 23° 50'20.59" North and 79°26' 27.69" East. It is at an average elevation of 595 meters (1,952 ft). The experiment was laid out in Randomized Block Design (RBD) with three replications and each replication consisted of twenty one treatments.

Five healthy fruits at the full maturity stage from each replication were selected treatment-wise for qualitative

analysis. To get rid of the dirt and dust, all of the fruit samples were cleaned by running water from the faucet. After smashing the fruits, a homogeneous sample was created. The quality characteristics were ascertained using this sample.

Total Soluble Solid (° Brix): A hand refractometer was used for direct determination of total soluble solids from fresh juice of fully ripened fruits. Mean of at least 5 samples, read directly from a brix scale superimposed over refractive index scale.

Reducing sugar (%): Reducing sugar (%) = (0.25/Burette reading) × 100

Non-reducing sugar (%): Non-reducing sugar (%) = Total sugars (%) - Reducing sugar (%)

Ascorbic Acid/Vitamin C (mg/100 g of fruit): (Harris and Ray, 1935)

Statistical analysis

All the observations obtained from the field and laboratory were compiled and tabulated and put to statistical treatments-wise for the presentation and interpretation of results. The classical statistical procedure as given by Panse and Sukhatme (1978).

RESULTS AND DISCUSSION

Quality parameters

It was observed from the data that the plant growth promoters had insignificant influence on total soluble solids. The highest T.S.S. reading (4.33 brix) was recorded by treatment T₇-GA3 50 ppm which was at par with treatment T₁-Shanmukha 1.0 g/l, T₃-NAA 20 ppm and T₄-NAA 40 ppm, whereas the lowest TSS reading (3.33 brix) was recorded by treatment T₈-Control.

It was observed from the data that the plant growth promoters had insignificant influence on ascorbic acid. The highest ascorbic acid reading (27.67 mg) was recorded by treatment T₇-GA3 50 ppm which was at par with treatment T₅-GA3 20 ppm and T₆-GA3 40 ppm, whereas the lowest ascorbic acid reading (3.33 mg) was recorded by treatment T₈-Control.

It was observed from the data that the plant growth promoters had in significant influence on lycopene content (mg/100 g of fruit). The highest lycopene content reading (7.00 mg/100 g of fruit) was recorded by treatment T₇-GA3 50 ppm which was at par with treatment T₃-NAA 20 ppm, whereas the lowest lycopene content reading (5.33 mg/100 g of fruit) was

recorded by treatment T₆-Control.

The significant impact of quality attributes such as lycopene content could be partially explained by less dense canopy cover of crops under limited nitrogen rates, which led to an increase in light transmittance and exposure of tomato to solar radiation, affecting the rate of sugar biosynthesis and accumulation in fruits. The findings of Pundir and Yadav (2001), Kishan et al. (2001), Rai et al. (2002), Renuka et al. (2001), Haque et al. (2011), Brahma et al. (2010), Singandhupeet et al. (2005), Togun et al. (2004), Warner et al. (2004) and Singh et al. (2005) are all in agreement with these findings.

CONCLUSIONS

Among the maximum T.S.S. (4.33°brix), ascorbic acid (27.67 mg), lycopene content (7.00 mg/100 g of fruit) was recorded by treatment T₇-GA3 50 ppm.

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