Supplementary Materials

S1: Total ascorbic acid assay

Plant tissue (5 g) was homogenized with 50 ml of 2% oxalic acid and centrifuged at 10,000×g for 30 min. The supernatant was subjected to ascorbic acid analysis using titrimetric method with 2,6-dichlorophenolindophenol. Briefly, 10 ml of the extract was immediately titrated with 2,6-dichlorophenolindophenol (Sigma-Aldrich, Steinheim, Germany) at the concentration 25 mg in 100 ml [1]. Vitamin C content was calculated based on a calibration curve prepared by titration of a series standards of ascorbic acid at the concentration of 0.1, 0.25, 0.5 and 1 mg/ml.

S2: Determination of Antioxidant Activity

The antioxidant activity was also determined using the DPPH (2,2-diphenyl-l-picryldrazyl) radical assay, based on the scavenging methods of Brand-Williams, Cuvelier, and Berset [2], slightly modified by Panich and Amatatongchai [3]. The stock solution was prepared by adding 50 mL of MeOH to 0.02 g DPPH. The solution was diluted again to the final concentration of the radical 0.04 mg/mL. The assay was performed by mixing 100 μL of the extract and 3 mL of DPPH solution and then storing in a dark place for 30 min. At the same time, a blank test was performed (the same amount of methanol instead of the extract). The absorbance at λ = 515 nm was then measured in a spectrophotometer. The quenching capacity of the DPPH radical was expressed as the amount of Trolox equivalent per unit volume from the calibration curve.

S3: Contents of Polyphenols

80 μl of H_2O, 25 μl of Folin-Ciocalteu reagent (Sigma-Aldrich, Steinheim, Germany) and 50 μl of 20% Na_2CO_3 were added to 20 μl of the extract. After 30 minutes of incubation in the dark, the absorbance of the solution was measured at 700 nm. Gallic acid solutions (Sigma-Aldrich, Steinheim, Germany) were used for calibration (0–0.25 mg ml -1 in methanol), and the results were expressed in milligrams of gallic acid equivalent (GAE) per 1 g of extract [4].

S4: Explanation of symbols for individual variants

-W1 i W2 variants of plants sprayed with hydrogen peroxide - only hydrogen peroxide sprays were used:
W1- 1% H_2O_2
W2- 3% H_2O_2,

-W3, W4 i W5 variants of ozonated plants - fumigation with ozone gas was carried out.
W3- 2 ppm 1 minute;
W4- 2 ppm 1.5 minutes;
W5- 2 ppm 3 minutes.

-W6, W7, W8, W9, W10, W11 variants of plants ozonated and sprayed with hydrogen peroxide - fumigation with ozone gas and hydrogen peroxide spraying were carried out.
W6- 2 ppm 1 minute and 1% H_2O_2;
W7- 2 ppm 1.5 minutes and 1% H_2O_2;
W8- 2 ppm 3 minutes and 1% H_2O_2;

W9- 2 ppm 1 minutes and 3% H_2O_2;
W10- 2 ppm 1.5 minutes and 3% H_2O_2;
W11- 2 ppm 3 minutes and 3% H_2O_2.

S5: Results of soil tests and fertilizer doses

Results of soil tests
1st year of field experiments

-pH in H_20 = 6,33 – suitable for tomato cultivation
-salinity = 0,47 NaCl g $\cdot l^{-1}$ – salinity normal
-N-NO_3 = 42,6 mg $\cdot l^{-1}$ – low content
-P (available phosphorus)= 108 mg $\cdot l^{-1}$ – very high content
-K (available potassium)= 57,5 mg $\cdot l^{-1}$ – very low content
-Mg (absorbable magnesium)= 109 mg $\cdot l^{-1}$ – high content
-Ca (absorbable calcium)= 2290 mg $\cdot l^{-1}$ – high content

Results of soil tests
2nd year of field experiments

-pH in H_20 = 6,49 – suitable for tomato cultivation
-salinity = 0,33 NaCl g $\cdot l^{-1}$ – salinity normal
-N-NO_3 = 49,6 mg $\cdot l^{-1}$ – low content
-P (available phosphorus)= 100,5 mg $\cdot l^{-1}$ – very high content
-K (available potassium)= 62,5 mg $\cdot l^{-1}$ – very low content
-Mg (absorbable magnesium)= 99 mg $\cdot l^{-1}$ – high content
-Ca (absorbable calcium)= 2190 mg $\cdot l^{-1}$ – high content

The following assumptions were made to develop fertilization for tomatoes:
-to produce 1 kg of fruit, the plant needs:
5g nitrogen, 1g phosphorus, 8g potassium, 5g calcium, 1g magnesium.

It was assumed that 1 plant would produce 8 kg of fruit during the growing season.
48 plants were planted in each tunnel. The theoretical yield was 384 kg of fruit from one tunnel (48 plants x 8 kg = 384 kg).

Before vegetation, the entire potassium dose and 50% of the nitrogen dose were applied. Phosphorus was not used because it was at a very high level in the soil. Potassium was used in the sulfate form because tomato reacts negatively to chlorine, thus no potassium salt was used. Nitrogen fertilizers were sown 10-14 days before planting the seedlings.

In the next stage of fertilization, the plants were supplied primarily with nitrogen. In nitrogen fertilization, the basic source of nitrogen was ammonium nitrate. This fertilizer was applied at the time of flowering of the first clusters, before loosening the inter-rows

Fertilization in the first and second year of research:

The following amounts of fertilizers were sown on the surface of one tunnel (8 m x 5 m):
-nitrogen: 1.9 kg of nitrogen per pure ingredient divided into two doses:
1st dose 14 days before planting seedlings: 0.95 kg of nitrogen (pure ingredient),
2nd dose in the flowering phase: 0.95 kg of nitrogen (pure ingredient).

-potassium: fertilization was applied in the autumn of the previous year at a dose of 3,1 kg of the pure ingredient on the surface of one tunnel.

During the period of intensive flowering and fruiting, sprays containing microelements (boron, copper, molybdenum) were used.
The same level of fertilization was used for each foil tunnel.

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3.Panich S., Amatatongchai M. A non-toxic approach to assess total antioxidant capacity (TAC) of exotic tropical fruits from Thailand. J. Food Sci. Technol. 2019;56:3547–3552. doi: 10.1007/s13197-019-03801-x .

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