

EFFECTS OF INCREASING TEMPERATURE ON QUALITY PARAMETERS OF FRESH TOMATO FRUITS GROWN IN DIFFERENT AGRO-CLIMATIC REGIONS IN SRI LANKA

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Increasing temperature of the growing season is important in view of the expected increases in air temperature as part of greenhouse gas-induced long-term climate change. The demand for tomato mainly depends on fruit quality attributes including sugar content, acidity and flavor. Therefore, a field experiment was conducted during *yala* 2013 at Rahangala, Peradeniya, Kundasale and Mahailuppallama to determine the response of the fruit quality of tomato (var.Thilina) with increasing temperature. Four locations represented a temperature gradient with standard recommended management practices in terms of fertilization and crop protection in a Randomized Complete Block Design with six replicates. The individual fruit weight, total soluble solids, titratable acidity, pH and TSS:TA ratio, were determined for ripened fruits, as indicated by 80% or more red coloured skin. In each location, water stresses were controlled by practicing supplementary irrigation.

The result showed that, individual fruit weight had second order polynomial relationship with increasing temperature. Individual fruit weight was significantly greater at the coolest location; Rahangala than the warmest location; Mahailuppallama. Total soluble solids, titratable acidity, pH and TSS:TA ratio had a significant second order polynomial relationship with mean location temperature. Total soluble solids increased with increasing mean location temperature. Estimated maximum total soluble solids achieved at a temperature of 28.6 °C. Titratable acidity decreased with increasing mean location temperature and minimum titratable acidity is estimated to be achieved at 27.6 °C, which is closer to Mahailuppallama. Reduction of titratable acidity with increasing temperature was paralleled with increase of pH. TSS:TA increased with increasing temperature due to increase of total soluble solids and decrease of titratable acidity.

Present study indicates that tomato fruits produced under highest temperature had high total soluble solids, high pH and high TSS:TA ratio than those grown under the lowest temperature. However, tomato grown at the lowest temperature recorded a greater fruit weight and the highest titratable acidity.

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