

2.5 Data collection

Plant height was measured from the soil surface to the apical bud using a meter rule. Stem girth was measured at 2 cm point above the base of the plant. The number of fully expanded leaves was counted manually on each plant. The leaf area was measured using the leaf area meter (LI-COR 300 model). The number of branches produced per plant was counted manually. At harvest, plants were carefully uprooted, washed and separated into leaves, roots and stems. Root growth was determined by measuring the root length using a meter rule, and the number of roots was counted manually. Fresh weight was measured immediately after harvest, while dry weight was obtained after oven-drying at 80°C to constant weight, using Melter PC 180. Dry weight of plant parts (roots, stems, and leaves) was also measured. Yield in terms of fresh and dry mass of the fruit was also assessed using an electronic weighing balance.

2.6 Laboratory analysis of tomato fruits

Dried tomato fruits were ground into fine powder for analysis. Fiber content was determined by boiling the sample in 1.25% H₂SO₄ and 1.25% NaOH, followed by washing and drying. Other parameters of proximate composition were analyzed using the standard methods of AOAC (1985) in which the mixture was boiled until a clear solution was obtained, and allowed to cool at room temperature. The resulting solution was quantitatively transferred into a calibrated flask and completed to 25 ml with distilled water. Moisture, crude protein, crude fat, carbohydrate and ash contents were calculated using relevant formulas. N was analyzed using the macro Kjeldahl method, while P was determined using ammonium-vanadomolybdate reagent and a calibration curve. Potassium contents were assayed through flame emission photometry. calcium contents by Ethylenediaminetetraacetic acid (EDTA) titration.

2.7 Statistical analysis

All data collected were subjected to two-way Analysis of Variance (ANOVA) using SPSS (Version 27.0). Where significant differences were observed among treatment means, Tukey's Honest Significant Difference (HSD) test was used at 95% confidence level to perform post-hoc comparisons.

3 Results

3.1 Soil used for planting

The soil used for planting was a sandy soil with 5.60 pH, 6.19% clay, 4.29% silt, 89.7% sand, 2.89% C, 0.14% N, 9.02 mg/kg P, 6.24 mg/kg Ca, 1.84 mg/kg Mg, 0.34 mg/kg Na, 0.23 mg/100 K, 0.20 mg/kg H, and 8.86 mg/kg CEC. It had 1.12 mg/cm³ bulk density, 36.13% field capacity, and 19.08% permanent wilting point.

3.2 Effect of watering regime on percentage survival and growth of two genotypes of *Solanum lycopersicum*

Table 1 below shows the effects of different watering regime on the survival of two *Solanum lycopersicum* genotypes. Irrigation treatments T1 to T7, applied from twice daily up to once every six days, resulted in 100% survival. In contrast, T8, which involved constant waterlogging, led to total plant death. For plant height, Hortitom1 plants measured between 41.25±3.53 cm under T7 and 58.70±6.32 cm under T5, achieving notably taller growth in T5. Hortitom 3 produced taller plants overall than Hortitom 1, with heights from 53.50±0.65 cm in T2 to 62.50±0.65 cm in T5. Stem girth in Hortitom1 varied from 2.25±0.10 cm in T6 to 2.63±0.24 cm in T1, showing no significant differences between regimes. Hortitom 3 also maintained consistent stem girth across treatments, between 2.70±0.20 cm in T5 and 2.90±0.13 cm in T2. The number of leaves in Hortitom 1 rose significantly from 11.75±0.41 leaves under T1 to 31.13±0.47 leaves under T7. Hortitom 3 displayed the opposite trend, peaking at 33.50±0.65 leaves in T1 and dropping to lower values of 19.00±0.41 in T5. Leaf area in Hortitom 1 spanned 24.15±0.31 cm² in T7 to 26.48±0.40 cm² in T1 and T3, differing significantly from other treatments. Hortitom 3 had leaf areas from 26.35±0.64 cm² in T5 to 27.31±0.08 cm² in T3. Number of roots was greater in T5 (7.50±1.04) than T7 (4.00±0.41), while root length remained similar across all treatments.