

3.3 Effect of water stress on biomass

The impact of watering regimes on biomass components shown in (Table 2) in two *Solanum lycopersicum* genotypes, Hortitom 1 and Hortitom 3. In Hortitom 1, fresh and dry leaf weights remained consistent across treatments at about 9.00 g and 5.51 g, respectively, while root numbers were notably higher under T5 (7.50 ± 1.04) than T7 (4.00 ± 0.41), though root length, fresh root weight, and dry root weight showed no differences. Stem biomass decreased steadily with water restriction, with fresh stem weight falling from 15.43 ± 0.22 g in T1 to 10.38 ± 0.27 g in T7, and dry stem weight from 9.13 ± 0.43 g to 4.53 ± 0.28 g. For Hortitom 3, fresh leaf weight increased significantly under T7 (16.75 ± 2.10 g) compared to T1 (8.50 ± 2.06 g), but dry leaf weight stayed similar. Root numbers did not vary, root length peaked at T3 (6.88 ± 0.51 cm), and fresh root weight rose from 3.75 ± 0.48 g in T2 to 7.75 ± 0.48 g in T7, with dry root weight highest in T7 (4.92 ± 0.42 g). Stem fresh and dry weights declined gradually from T1 (17.05 ± 0.13 g and 10.03 ± 0.41 g) to T7 (13.88 ± 0.37 g and 5.70 ± 0.20 g).

3.4 Phenological and yield parameter

Table 3 outlines water regime impacts on days to first flowering and fruit yield parameters in *Solanum lycopersicum* genotypes Hortitom 1 and Hortitom 3. Watering regimes impacted days to first flowering in both genotypes: Hortitom 1 flowered soonest under T1 (39.75 ± 0.32 days), with delays increasing to 65.00 ± 2.42 days in T7. Hortitom 3 flowered later than Hortitom 1 in every case, starting at 47.50 ± 0.65 days in T1 and extending to 71.50 ± 0.65 days in T7. Hortitom 1 produced a steady 5.63 ± 0.13 to 6.50 ± 0.20 fruits per plant across treatments with no differences, alongside slightly reduced fresh fruit weights from 3.75 ± 0.63 g to 5.25 ± 0.32 g under drier conditions; notably, fruit length and breadth grew larger, from 16.25 ± 0.32 cm and 18.18 ± 0.38 cm in T1 to peaks of 19.50 ± 0.20 cm and 21.88 ± 0.13 cm in T6/T7. Hortitom 3 showed greater variability, with fruits numbering 3.00 ± 0.41 to 6.00 ± 0.41 (highest in T4), fresh weights climbing in T5-T7 to 7.75 ± 0.48 g in T7, and dry weights maximizing at 4.92 ± 0.42 g in T7 yet fruit length shrank from 42.35 ± 0.65 cm in T1 to 18.35 ± 0.65 cm in T7, while breadth fell from 75.28 ± 0.65 cm to 51.28 ± 0.65 cm.

3.5 Proximate and minerals composition

The results in Table 4 reveal the proximate and mineral compositions of *Solanum lycopersicum* genotypes; Hortitom 1 and Hortitom 3 across water regimes T1-T7. Hortitom 1 generally displayed higher and more variable proximate values than Hortitom 3. Moisture content in Hortitom 1 spanned $14.28 \pm 0.05\%$ (T3) to $19.00 \pm 0.13\%$ (T4), exceeding Hortitom 3's narrower $15.80 \pm 0.22\%$ (T6) to $18.71 \pm 0.04\%$ (T3). Fat remained stable and comparable, with Hortitom 1 at $0.87 \pm 0.01\%$ (T2) to $1.14 \pm 0.02\%$ (T5) versus Hortitom 3 from $0.83 \pm 0.00\%$ (T1) to $1.12 \pm 0.00\%$ (T2). Ash was broader in Hortitom 1 ($3.66 \pm 0.01\%$ at T6 to $5.08 \pm 0.04\%$ at T5) than Hortitom 3 ($3.56 \pm 0.01\%$ at T6 to $4.99 \pm 0.02\%$ at T7). Crude fiber showed Hortitom 1 ranging lower to higher ($5.01 \pm 0.00\%$ at T2 to $8.31 \pm 0.03\%$ at T6) compared to Hortitom 3 ($6.03 \pm 0.01\%$ at T1 to $8.27 \pm 0.05\%$ at T3). Crude protein was consistently superior in Hortitom 1 ($1.10 \pm 0.01\%$ at T2 to $2.06 \pm 0.05\%$ at T5) over Hortitom 3 ($1.05 \pm 0.01\%$ at T1 to $1.85 \pm 0.09\%$ at T4). Carbohydrates peaked much higher in Hortitom 1 ($67.37 \pm 0.23\%$ at T7 to $74.22 \pm 0.16\%$ at T2) than in Hortitom 3 ($66.41 \pm 0.08\%$ at T7 to $70.65 \pm 0.03\%$ at T2).

For minerals, patterns were more mixed but often favoured Hortitom 1 in range and peaks. Calcium in Hortitom 1 went from 15.85 ± 0.05 mg/kg (T2) to 22.55 ± 0.15 mg/kg (T6), closely matching Hortitom 3, ranging from 14.80 ± 0.10 mg/kg (T3) to 22.75 ± 0.25 mg/kg (T4), though the latter edged higher at its max. Potassium was notably higher in Hortitom 1 (25.60 ± 0.20 mg/kg at T6 to 35.95 ± 0.45 mg/kg at T1) versus Hortitom 3 (24.45 ± 0.15 mg/kg at T4 to 32.30 ± 0.20 mg/kg at T2). Magnesium spanned wider in Hortitom 1 (19.40 ± 0.10 mg/kg at T6 to 26.15 ± 0.15 mg/kg at T5) than Hortitom 3 (18.60 ± 0.10 mg/kg at T5 to 23.37 ± 0.04 mg/kg at T6). Iron reached a higher peak in Hortitom 1 (1.27 ± 0.00 mg/kg at T3 to 2.01 ± 0.00 mg/kg at T4) over Hortitom 3 (1.33 ± 0.00 mg/kg at T4 to 1.73 ± 0.01 mg/kg at T3). Phosphorus was similar, with Hortitom 1 at 8.92 ± 0.19 mg/kg (T4) to 14.04 ± 0.07 mg/kg (T2) and Hortitom 3 at 9.11 ± 0.12 mg/kg (T6) to 14.17 ± 0.05 mg/kg (T4). Nitrogen was marginally higher in Hortitom 1 (0.18 ± 0.00 mg/kg at T1/T2 to 0.33 ± 0.01 mg/kg at T5) than Hortitom 3 (0.17 ± 0.00 mg/kg at T1 to 0.30 ± 0.02 mg/kg at T4). These trends indicate Hortitom 1's superior nutritional profile under water stress variability.