**Figure S1:** Experimental layout of sweet melon cultivar trial in a non-temperature controlled plastic tunnel


**Figure S2:** Sweet melon cultivars used for postharvest storage. CV1 = Majestic; CV4 = Honey Brew; CV5 = Honey Star; CV6 = Cyclone; CV7 = MAB79001.

**Table S1**. Eigenvectors from principal component (PC) analysis based on the nutritional and phytochemical quality at harvest.

| Traits | PC1 | PC2 | PC3 | PC4 |
|---|---|---|---|---|
| K | 0.334 | -0.174 | -0.285 | 0.375 |
| P | 0.430 | 0.016 | -0.284 | 0.103 |
| Mg | 0.371 | 0.271 | 0.170 | -0.055 |
| Ca | 0.308 | 0.042 | 0.388 | 0.106 |
| Zn | 0.420 | 0.104 | 0.012 | 0.056 |
| β-Carotene | 0.371 | 0.181 | -0.371 | -0.100 |
| Vitamin C | 0.320 | -0.110 | 0.390 | -0.060 |
| Total phenolics | 0.050 | 0.374 | 0.504 | -0.129 |
| Flavonoids | 0.173 | -0.537 | 0.187 | -0.338 |
| FSA(M) | -0.074 | -0.204 | 0.280 | 0.808 |
| FSA(W) | -0.130 | 0.607 | -0.048 | 0.183 |
| Eigenvalue | 4.443 | 2.296 | 1.549 | 1.078 |
| Variability (%) | 40.394 | 20.877 | 14.081 | 9.796 |
| Cumulative variability (%) | 40.394 | 61.271 | 75.352 | 85.148 |

K = potassium; P = phosphorus; Mg = magnesium; Ca = calcium; Zn = zinc; FSA (W) = free radical scavenging activity of water extract; FSA (M) = free radical scavenging activity of 50% methanol extract

**Table S2**. Contribution (%) of each variable to the principal components.

| Traits | PC1 | PC2 | PC3 | PC4 |
|---|---|---|---|---|
| K | 11.184 | 3.029 | 8.103 | 14.049 |
| P | 18.474 | 0.025 | 8.056 | 1.051 |
| Mg | 13.730 | 7.350 | 2.886 | 0.305 |
| Ca | 9.465 | 0.178 | 15.049 | 1.116 |
| Zn | 17.674 | 1.085 | 0.013 | 0.313 |
| β-Carotene | 13.781 | 3.285 | 13.771 | 1.010 |
| Vitamin C | 10.215 | 1.216 | 15.179 | 0.364 |
| Total phenolics | 0.253 | 13.973 | 25.357 | 1.654 |
| Flavonoids | 3.002 | 28.881 | 3.501 | 11.458 |
| FSA(M) | 0.542 | 4.170 | 7.859 | 65.326 |
| FSA(W) | 1.679 | 36.809 | 0.226 | 3.353 |

K = potassium; P = phosphorus; Mg = magnesium; Ca = calcium; Zn = zinc; FSA (W) = free radical scavenging activity of water extract; FSA (M) = free radical scavenging activity of 50% methanol extract

**Table S3.** Changes (%) in total soluble solid and total phenolic contents as influenced by postharvest storage duration.

| Postharvest storage duration | Total soluble solid | Total phenolic content |
|---|---|---|
| 7 days | 4.2 | -27.8 |
| 14 days | 10.0 | -36.1 |

Positive and negative values indicate percentage increases and decreases, respectively.

**Table S4.** Changes (%) in fruit quality parameters, nutritional and phytochemical contents as influenced by postharvest storage duration.

| | Flavonoid | | Vitamin C | | β-Carotene | | FSA (W) | | FSA (M) | | Colour *L** | | pH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cultivar | 7 d | 14 d | 7 d | 14 d | 7 d | 14 d | 7 d | 14 d | 7 d | 14 d | 7 d | 14 d | 7 d | 14 d |
| Cyclone | 231.9 | 258.4 | -23.8 | -32.7 | -20.2 | -33.9 | 9.0 | 17.7 | 1.0 | 3.7 | 4.9 | 16.0 | 13.8 | 18.6 |
| Honey Brew | 382.0 | 362.9 | -2.9 | -4.2 | 0.0 | -1.4 | 6.6 | 41.5 | 1.9 | 2.0 | -1.8 | 4.7 | 4.9 | 25.8 |
| Honey Star | 212.1 | 328.2 | -44.2 | -46.0 | -10.8 | -42.5 | 2.2 | 28.9 | 2.4 | 3.7 | 7.0 | 6.3 | -9.6 | -3.1 |
| MAB79001 | 600.6 | 611.0 | -18.8 | -20.2 | -1.4 | -7.3 | 18.1 | 21.1 | 0.5 | -10.3 | 8.8 | 21.4 | 2.4 | 15.9 |
| Majestic | -5.1 | 3.6 | -23.4 | -24.6 | -14.6 | -31.0 | 12.6 | 12.8 | 1.0 | 5.2 | 9.7 | 13.9 | 4.3 | 4.2 |

Positive and negative values indicate percentage increases and decreases, respectively. FSA (W) = free radical scavenging activity of water extract; FSA (M) = free radical scavenging activity of 50% methanol extract; d = days.