Final Report

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Mango Cultivar Evaluation – Phase II
Postharvest Performance

Co-Principal Investigators:

Dr. Jeffrey K. Brecht, Dr. Steven A. Sargent, and Dr. Pavlos Tsouvaltzis
Horticultural Sciences Department
University of Florida, IFAS
Gainesville, FL

Dr. Charles Sims
Food Science & Human Nutrition Department
University of Florida, IFAS
Gainesville, FL

Dr. Jonathan Crane
Tropical Research and Education Center
University of Florida, IFAS
Gainesville, FL

ABSTRACT (Executive Summary)

Mango fruit from 19 varieties were harvested in southern Florida in 2019 and 2021, transferred within the same day to the Postharvest facilities of the University of Florida in Gainesville and placed at 12°C/54°C for 12 hours. Control fruit were placed directly at 20°C/68°C and 95% relative humidity (RH) while fruit assigned to quarantine hot water treatment (HWT) were first immersed in water at 46.1°C/115°C for 90 minutes; other fruit were stored for 1, 2 or 3 weeks at 7°C/44.6°C and 95% RH or 12°C and 95% RH, then all fruit were held for 1 week at 20°C and 95% RH to simulate shelf life and for evaluation of HW injury, chilling sensitivity, and storage potential, respectively. Subsamples of all cultivars for consumer sensory evaluation were taken from those fruit ripened directly at 20°C and taken to the Sensory Analysis Lab in the Food Science & Human Nutrition Department. The mangos were presented to the panelists as cut pieces without peel. Tommy Atkins was assessed both in 2019 and 2021 and according to the sensory results, no significant differences were found between the two harvests with regard to the taste panel perception. For the Day 0 measurements, the fruit were not HW-treated. Color, NIR reflectance spectra, and digital photographic images were taken of both sides of each fruit before firmness measurements. All fruit were subjectively evaluated for chilling injury

(CI), heat injury, and anthracnose development while dry matter (DM), SSC, pH, and TA were determined in frozen samples.

According to the results, in terms of consumer acceptability (overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity) the cultivars were classified as follows (from high to low rank):

1. Edward (23.8) > 2. Rosigold (22.3) ≈ Palmer (22.1) > 4. Kensington Pride (21.5) ≈ Ott (21.4) ≈ Glenn (21.2) > 7. Valencia Pride (19.7) ≈ Young = Malika (19.6) > 10. Espada (19.1) > 11. Southern Blush (18.8) > 12. Rapoza = Rosa (17.9) ≈ Tommy Atkins (17.8) ≈ Duncan (17.8) > 16. Maha Chinook (17.1) > 17. Nam D°C Mai (15.4) ≈ Cogshall (15.3) > 19. Vallenato (13.6).

The cultivars that were most resistant to hot water treatment were Palmer (-1.1) ≈ Rapoza (-1.2) > Nam D°C Mai (-1.5) ≈ Cogshall (-1.7) ≈ Rosa (-1.8) ≈ Espada (-1.9) and Tommy Atkins 2021 (-1.9), while the most sensitive were Kensington Pride (-5.0), Young (-4.9), Duncan (-4.6), and Ott (-4.5).

The cultivars that were most resistant to CI were Ott (-1.0) and Rapoza (-1.3), followed by Edward (-1.5), Glenn = Southern Blush (-1.7) and Cogshall (-1.9) ≈ Valencia Pride (-2.0), while the most sensitive were Espada (-4.6) ≈ Young (-4.5) and Nam D°C Mai (-4.2) and Kensington Pride (-4.2).

In terms of storage potential, all of the cultivars were affected by ripening development, with the greatest deterioration in fruit condition observed with Cogshall, Kensington Pride, Maha Chinook, Ott, and Young, receiving a score of 3.0 out of 5 and able to withstand only a 2-week storage period at 12°C +1 week at shelf life conditions (20°C), in comparison to the rest that could be stored up to 3 weeks at low temperature + 1 week at 20°C.

In terms of anthracnose development, all of the cultivars were strongly or severely affected, with the lowest severity of disease symptoms observed on Rapoza (-3.0) and Tommy Atkins fruit (-3.0 to -3.5).

While external and internal color changes (Lightness, a*, b*, chroma and hue angle values) of ripe fruit were not significantly affected by prior storage temperature (7 or 12°C), fruit firmness (compression and puncture) declined faster in fruit of most cultivars stored at 12°C, while it was not different at 7 and 12°C in Cogshall, Espada, Palmer, Rosa, and Vallenato. However, after transfer to 20°C (shelf life conditions) for 1 week, all quality changes in color and firmness °Ccurred at a higher rate.

Dry matter was unaffected by storage temperature (7 or 12°C), storage duration, and shelf life. The initial content at the time of harvest was maintained during storage in all cultivars.

Similarly, pH was not affected by storage at 7 or 12°C or by storage duration, but contrary to the dry matter, the shelf life period resulted in pH increase in most of the mango cultivars.

With the exception of Cogshall, Espada, Rosa, and Tommy Atkins, for which the SSC did not substantially change during storage at 7 or 12°C or after 1 week of shelf life, it was observed that the higher storage temperature (12°C) resulted in higher SSC of fruit than storage at 7°C.

The transfer of fruit for 1 week at 20°C did not induce any further SSC increase in 13 or 20 cultivars, especially after storage at the low (7°C) temperature; the exceptions were Duncan, Glenn, Mallika, Nam D°C Mai, Rapoza, Southern Blush, and Valencia Pride.

Similarly to pH values, the TA of fruit was unaffected by storage at 7 or 12°C, as well as by storage duration. Indeed, significant reduction in TA after shelf life was only observed in 7 of the 19 cultivars (Duncan, Glenn, Mallika, Rapoza, Southern Blush, Tommy Atkins, and Valencia Pride) and remained unchanged in the rest of the cultivars.

Although minimal differences were observed in the SSC/TA ratio for fruit stored at 7 or 12°C, there were significant increases in SSC/TA after 1 week of shelf life at 20°C in 17 out of 20 of the cultivars, with the exceptions being Cogshall, Espada, and Rosa. However, significant differences in SSC/TA were observed between the mango cultivars even after only 1 week of ripening at 20°C after harvest, with the highest levels observed in Young (85), followed by Maha Chinook (70) and Vallenato (65), and the lowest in Cogshall (12) and Mallika (15).

Combing the tolerance of fruit to hot water quarantine treatment, CI, and decay incidence, the 19 cultivars were ranked (high to low) as follows: 1. Edward > 2. Palmer > 3. Glenn > 4. Rapoza = Ott > 6. Southern Blush > 7. Rosigold > 8. Tommy Atkins = Valencia Pride = Mallika ≈ Rosa = Kensington Pride > 13. Espada > 14. Cogshall > 15. Maha Chinook > 16. Young > 17. Duncan > 18. Nam D°C Mai > 19. Vallenato.

In conclusion, there were seven mango cultivars that appeared almost without exception among the uppermost ranked cultivars in all of the tested categories: 1. Edward, 2. Palmer, 3. Glenn, 4. Rapoza and Rosigold, 6. Mallika, and 7. Southern Blush. We consider these cultivars to be the best candidates for further testing by the National Mango Board.

MATERIALS & METHODS

Nineteen mango cultivars from southern Florida (UF-IFAS Tropical Research & Education Center, Homestead; Fairchild Farm/Fairchild Tropical Botanical Gardens, Homestead; Miami-Dade County Fruit and Spice Park, Homestead; USDA-ARS Subtropical Horticultural Research Station, Germplasm Collection, Miami; or Erickson Farm, a l°Cal commercial orchard, in Canal Point near Lake Okeechobee) were harvested at the typical commercial export maturity stage (stage 2 out of 5 based on flesh color development) in 2019 or 2021. Tommy Atkins was used as the reference (control) cultivar and was harvested and evaluated both in 2019 and in 2021, since it is the mango cultivar imported by the US in the greatest volume. The cultivars and harvest dates are shown in Table 1.

Table 1. The mango cultivars evaluated and their harvest dates in 2019 and 2021.

2019			
June 6	*June 18*	*June 24*	*July 2*
Glenn	**Kensington Pride**	**Mallika**	**Valencia Pride**
Maha Chinook	**Duncan**	**Tommy Atkins**	**Rapoza**

Edward	**Young**	**Southern Blush**
	Nam D°C Mai	
	Ott	

2021		
June 4	*June 29*	*July 7*
Rosigold	**Cogshall**	**Palmer**
Rosa	**Tommy Atkins**	
Vallenato	**Espada**	

All fruit were transferred on the day of harvest to the Postharvest facilities at the Horticultural Sciences Department, University of Florida in Gainesville and were placed at 12°C/54°F for 12 hours (overnight).

Unripe fruit were left to ripen at 20°C and 95% relative humidity (RH) for up to 1 week before being sent to the Food Science & Human Nutrition Department, in order to be subjectively evaluated in consumer taste panel sessions to assess acceptability in terms of overall liking, flavor liking, texture liking, and "just-about-right" sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity.

Fruit for the postharvest performance evaluations that were performed in the Horticultural Sciences Department were washed, sorted in groups of 10 fruit, and either assigned to HWT (46.1°C/115°F) for 90 minutes or held at 20°C/68°F and 95% RH as untreated controls. After HWT, the fruit were held at room temperature (25°C/77°F) for 30 minutes and then hydr°Cooled (i.e., placed under running water at 25°C) for 15 minutes. The fruit were then drained and transferred to 12°C and 95% RH for another 12 hours. Control fruit were directly transferred to 20°C and 95% RH without being subjected to HWT, while after holding overnight at 12°C and 95% RH the HW-treated fruit were transferred to 20°C and 95% RH for evaluation of HW injury over the next week.

Additional HW-treated fruit were labeled and groups of fruit were stored for 1, 2 or 3 weeks at 7°C/44.6°F or 12°C and 95% RH, as well as for an additional week at 20°C and 95% RH to simulate shelf life. Storage at 7°C was used to evaluate cultivar susceptibility to CI (CI) while storage at 12°C was used to evaluate other aspects of storage potential, including changes in firmness, color and composition, as well as susceptibility to anthracnose and other decays. Evaluations of HW injury and CI were done on whole fruit.

Subsamples of all cultivars for consumer sensory evaluation were ripened at 20°C and 95% RH before being taken to the Sensory Analysis Lab in the Food Science & Human Nutrition Department. The fruit used for sensory analysis were not HWT. The mangos were presented to the panelists as cut pieces without peel.

For the Day 0 measurements, the fruit were not HWT. Color, NIR reflectance spectra, and digital photographic images were taken of both sides of each fruit before firmness measurements. All

fruit were evaluated in terms of CI, HW injury, and anthracnose development before objective determinations of their quality.

For each cultivar included in the postharvest performance trials there were 15 groups of 10 fruit:

1. No HWT and no storage (Day 0 group)
2. No HWT and storage at 20°C for 1 week
3. HWT and storage at 20°C for 1 week
4. HWT and storage at 7°C for 1 week
5. HWT and storage at 7°C for 1 week, plus 1 week at 20°C
6. HWT and storage at 7°C for 2 weeks
7. HWT and storage at 7°C for 2 weeks, plus 1 week at 20°C
8. HWT and storage at 7°C for 3 weeks
9. HWT and storage at 7°C for 3 weeks, plus 1 week at 20°C
10. HWT and storage at 12°C for 1 week
11. HWT and storage at 12°C for 1 week, plus 1 week at 20°C
12. HWT and storage at 12°C for 2 weeks
13. HWT and storage at 12°C for 2 weeks, plus 1 week at 20°C
14. HWT and storage at 12°C for 3 weeks
15. HWT and storage at 12°C for 3 weeks, plus 1 week at 20°C

Color was measured with a Konica Minolta CR-400 chromameter on two opposite sites on the equatorial zone of the skin of each fruit, avoiding the red blush area, if present, as well as on the flesh after peeling using the CIE L*a*b* color space; Chroma (C*) and Hue angle (H°) values were calculated as Chroma= $(a^{*2}+b^{*2})^{1/2}$ and $H^{o}= \tan^{-1}(b^{*}/a^{*})$. Digital images were captured on both sides of each fruit longitudinally with a Nikon D3000 camera, using the same lightning conditions and distance from the fruit surfaces.

Spectral reflectance was captured on the same surface areas as for color measurements in the 310-1200 nm electromagnetic region with a Felix 750 spectroradiometer.

Firmness was determined using a TA.HDPlus Texture Analyzer (Hamilton, Massachusetts), either nondestructively (by fruit compression) or destructively (by fruit penetration), twice on opposite cheeks of each fruit. A whole fruit was nested in a concave device designed to ensure that the fruit remained immobile during compression. Firmness was measured via compression using a 50 kg load cell and a 17.5 mm diameter stainless-steel probe. After establishing zero-force contact between the probe and the horizontally positioned fruit, specimens were compressed 2.5 mm at the equatorial region of each fruit. The maximum force (N) generated during the probe travel was used for data analysis. Firmness was also measured via puncture using a 50 kg load cell and an 8 mm diameter stainless-steel probe. After establishing zero-force contact between the probe and the horizontally positioned fruit, specimens were punctured at a 15 mm distance at the equatorial region of each fruit. At each measurement interval, 10 mango fruit from each treatment were measured.

Chilling injury, heat injury and disease (anthracnose) incidence were subjectively evaluated on a 1-5 scale, relative to the injured or infected area of the skin (peel) of the fruit. In particular, a score of 1 corresponds to 0% area, 2= 1-5% area, 3= 6-10% area, 4= 11-25% area and 5= >25% area. In the tables, the CI sensitivity score that was assigned for each cultivar was the lowest score that the cultivar received upon 1 week of shelf life during the 3 weeks of storage. Heat injury sensitivity was the lowest score that the cultivar received upon 2 weeks of storage at 7 or 12°C, because during shelf life at 20°C the heat injury symptoms were not easily distinguished from the decay development. Disease incidence sensitivity was the lowest score that the cultivar received upon 1 week of shelf life during the 3 weeks of storage.

Fruit were halved and one half was immediately used for dry matter determination, while the other part was frozen at -30°C for no more than 1 month, in order to determine SSC, pH and titratable acidity (TA).

Dry matter was determined after drying raw, chopped fruit samples at 72°C for 3 days.

Frozen samples were thawed and then homogenized and centrifuged at 10,000 ×gn for 20 minutes at 4°C. The supernatant was filtered through four layers of cheesecloth and the resulting clear juice was used to assess the SSC, pH, and TA.

SSC was determined by dripping small amounts of fruit juice on the prism of a refractometer (Model r2i300 Compact Digital, Reichert Technologies, Ametek, USA) and reported as percent.

The pH and TA were determined using the same auto-titrator instrument (Metrohm, Model 814 USB Sample Pr°Cessor, Herisau, Switzerland). Aliquots of 3 mL of mango juice were diluted with 50 mL distilled water and pH was first recorded before starting the titration with 0.1 N sodium hydroxide (NaOH) to an endpoint of pH 8.2, for the TA determination. The TA was expressed as percent citric acid. The SSC/TA ratio was subsequently calculated.

RESULTS

The objective measurements, namely fruit firmness (compression, maximum puncture force, and force at 15 mm below the peel), as well as color measurements (lightness, a*, b* chroma and hue angle) on the skin/peel and in the flesh, the peel reflectance in the 310-1230 nm region, the dry matter, SSC, TA and SSC/TA ratio of the flesh and the subjective evaluations such as CI, HW injury, and anthracnose development and consumer acceptability (overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity) are presented for each cultivar in alphabetical order, with the exception of Tommy Atkins, which was considered the control cultivar and is therefore presented first.

- **Tommy Atkins (2019)**:

Objective quality measurements

Tommy Atkins was evaluated both in 2019 and 2021 without significant differences between the two harvest periods, with the exception of some specific traits. In particular, between harvest and 1 week of storage at 20°C the following changes were observed:

Fruit firmness (compression), namely the force that was required to nondestructively compress the fruit at 2.5 mm distance, was reduced from 13.6 to 4.4 kg, while fruit firmness in terms of maximum puncture force was reduced from 9.4 to 1.0 kg, lightness of fruit peel (skin) color slightly increased from 47.8 to 51.7, peel (skin) a* color parameter increased from 9.7 to 15.2, peel (skin) b* color parameter increased from 23.3 to 27.3, peel (skin) C* color parameter increased from 29.5 to 34.1, peel (skin) H° color parameter slightly but not significantly reduced from 66.2 to 60.5, fruit flesh lightness (L*) color was reduced from 79.5 to 69.3, flesh a* color parameter increased from -1.8 to 2.6, flesh b* color parameter increased from 52.4 to 54.1, flesh C* color parameter increased from 52.5 to 54.1 and flesh H°C color parameter was reduced from 92.1 to 87.2.
Dry matter content of fruit was slightly reduced from 14.7 to 13.8 %, pH increased from 3.8 to 4.4, SSC was significantly increased from 8.9 to 13.3 %, the TA of fruit flesh was significantly reduced from 0.84 to 0.39 %, while the ratio SSC/TA of fruit flesh was significantly increased from 11.9 to 37.2.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the higher lightness (L*) and chroma values of the flesh in HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness, peel b* and chroma and flesh L* color parameters). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from significant heat injury during storage (score of 3.2 out of 5) and from moderate anthracnose incidence (3.0/5), while the ones that were stored at 7°C also suffered from significant CI (CI; score of 4.1/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C .In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Tommy Atkins fruit harvested in 2019 received scores of 39, 30, 45, 38, 51, -8, -5, -29, 27, 30, and 43, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 17.8.
In total, the general aggregate score, which is the result of the subjective postharvest storage and taste panel evaluations was equal to 12.5 classifying Tommy Atkins (2019) in the 12th place of the 19 cultivars ranking.

- **Tommy Atkins (2021)**:

Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 16.2 to 6.2 kg, while fruit firmness in terms of maximum puncture force was reduced from 7.7 to 1.8 kg, lightness of fruit peel (skin) color slightly decreased from 53.0 to 50.9, peel (skin) a* color parameter increased from 3.4 to 26.8, peel (skin) b* color parameter decreased from 28.5 to 27.1, peel (skin) C* color parameter increased from 31.0 to 41.2, peel (skin) H° color was significantly reduced from 82.0 to 44.7, fruit flesh lightness (L*) color was reduced from 80.4 to 72.3, flesh a* color parameter increased

from -3.9 to 2.1, flesh b* color parameter increased from 54.8 to 60.2, flesh C* color parameter increased from 55.2 to 60.3 and flesh H° color parameter was reduced from 94.9 to 88.0.
Dry matter content of fruit was slightly increased from 14.0 to 15.0 %, pH decreased from 3.5 to 3.3, SSC was increased from 11.3 to 11.8 %, the TA of fruit flesh was significantly reduced from 1.01 to 0.67 %, while the ratio SSC/TA of fruit flesh was significantly increased from 11.1 to 17.6.
No significant differences were observed after 1 week of storage between hot-water-treated and non-heat-treated fruit, with the exception of the higher L*, b* and chroma values on the peel, as well as the higher L* of the flesh in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and firmness, peel b* and chroma color parameters, SSC and SSC/TA ratio). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from moderate heat injury during storage (score of 1.9 out of 5) and from moderate anthracnose incidence (3.0/5), while the ones that were stored at 7°C also suffered from moderate CI (score of 3.0/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity. Tommy Atkins fruit harvested in 2021 received scores of 38, 28, 38, 42, 37, -14, -14, -12, 31, 41, and 44, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer aCeptability score of 17.8, the same as Tommy Atkins fruit harvested in 2019. According to the sensory results, no significant differences were found between the two harvesting periods (2019 and 2021), in regard to the taste panel perception (Fig. 1).
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 14.4 classifying Tommy Atkins (2021) in the 7th place of the 19 cultivars ranking.

- **Cogshall**:

Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 2.7 to 1.4 kg, while fruit firmness in terms of maximum puncture force was reduced from 0.6 to 0.3 kg, implying that fruit were harvested soft enough at an advanced ripeness stage. The lightness of fruit peel (skin) color slightly decreased from 54.8 to 48.5, peel (skin) a* color parameter increased from -5.8 to 20.7, peel (skin) b* color parameter decreased from 34.2 to 33.6, peel (skin) C* color parameter increased from 36.1 to 43.0, peel (skin) H° color was significantly reduced from 95.7 to 56.3, fruit flesh lightness (L*) color was reduced from 73.6 to 61.1, flesh a* color parameter increased from 0.6 to 10.9, flesh b* color parameter increased from 61.3 to 61.7, flesh C* color parameter increased from 61.4 to 62.8 and flesh H° color parameter was reduced from 89.6 to 80.1.
Dry matter content of fruit was slightly decreased from 18.5 to 18.2 %, pH increased from 3.4 to 3.3, SSC was decreased from 16.2 to 14.2 %, the TA of fruit flesh was significantly reduced from 1.29 to 1.17 %, while the ratio SSC/TA of fruit flesh increased from 11.4 to 12.2.

No significant differences were observed after 1 week of storage between hot-water-treated and non-heat-treated fruit, with the exception of the lower a* and higher hue angle values on the peel, as well as the higher L* and hue angle and the lower a* values of the flesh in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness and SSC/TA ratio). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from slight heat injury during storage (score of 1.7 out of 5) and from severe anthracnose incidence (5.0/5), while the ones that were stored at 7°C also suffered from slight CI (score of 1.9/5). This cultivar received a score of 3.0 out of 5, in terms of storage potential, as fruit were able to withstand only 2 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Cogshall fruit received scores of 30, 46, 38, 40, 28, -11, -4, -17, 21, 39, and 37, respectively, on a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 15.3.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 9.7 classifying Cogshall in the 16th place of the 19 cultivars ranking.

- **Duncan**:

Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 18.8 to 2.9 kg, while fruit firmness in terms of maximum puncture force was reduced from 12.3 to 0.7 kg, implying that fruit were harvested hard enough at an early ripening stage. The lightness of fruit peel (skin) color increased from 61.1 to 71.4, peel (skin) a* color parameter increased from -13.3 to -2.4, peel (skin) b* color parameter increased from 29.6 to 42.3, peel (skin) C* color parameter increased from 33.3 to 42.7, peel (skin) H° color was significantly reduced from 117.3 to 93.7, fruit flesh lightness (L*) color was reduced from 74.3 to 64.5, flesh a* color parameter increased from -8.1 to 5.1, flesh b* color parameter increased from 41.5 to 47.7, flesh C* color parameter increased from 42.4 to 48.1 and flesh H° color parameter was reduced from 101.3 to 84.0.
Dry matter content of fruit was slightly increased from 14.7 to 15.9 %, pH increased from 3.3 to 4.5, SSC was increased from 6.0 to 13.1 %, the TA of fruit flesh was significantly reduced from 2.38 to 0.37 %, while the ratio SSC/TA of fruit flesh increased from 2.6 to 44.6.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the lower a* and higher hue angle values on the peel, as well as the higher L* and hue angle and the lower a* values of the flesh in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness, peel L*, b* and chroma color parameters and SSC. However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from severe heat injury during storage (score of 4.6 out of 5) and from severe anthracnose incidence (4.5/5), while the ones that were stored at 7°C also suffered from moderate CI (score of 3.2/5). This cultivar received a score of 5.0 out of 5 in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Duncan fruit received scores of 45, 39, 33, 29, 42, -15, -5, -10, 23, 35, and 38, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 17.6.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 10.3 classifying Duncan in the 15th place of the 19 cultivars ranking.

- **Edward**:

Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 19.6 to 3.1 kg, implying that fruit were harvested hard enough at an early ripening stage. The lightness of fruit peel (skin) color increased from 58.2 to 67.8, peel (skin) a* color parameter increased from -15.8 to -4.3, peel (skin) b* color parameter increased from 30.2 to 43.2, peel (skin) C* color parameter increased from 34.3 to 44.2, peel (skin) H° color was significantly reduced from 117.6 to 83.9, fruit flesh lightness (L*) color decreased from 77.0 to 66.0, flesh a* color parameter increased from -5.5 to 6.3, flesh b* color parameter increased from 33.6 to 56.9, flesh C* color parameter increased from 34.1 to 56.9 and flesh H° color parameter was reduced from 99.7 to 83.7.
Dry matter content of fruit was slightly increased from 16.9 to 19.3 %, pH increased from 3.0 to 4.4, SSC was increased from 8.2 to 16.1 %, the TA of fruit flesh was significantly reduced from 3.12 to 0.83 %, while the ratio SSC/TA of fruit flesh increased from 2.8 to 22.2.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit with the exception of the higher hue angle values on the peel, as well as the pH and the ratio SSC/TA in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression firmness). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from moderate heat injury during storage (score of 2.1 out of 5) and from significant anthracnose incidence (4.0/5), while the ones that were stored at 7°C suffered from only slight CI (score of 1.5/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Edward fruit received scores of 50, 54, 40, 30, 41, -10, -5, -20, 29, 34, and 49, respectively, in

a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 23.8.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 21.2 classifying Edward in the 1st place of the 19 cultivars ranking.

- **Espada**:

Objective quality measurements

Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 6.5 to 2.0 kg, while fruit firmness in terms of maximum puncture force was reduced from 3.4 to 0.6 kg, implying that fruit were harvested hard enough at an early ripening stage. The lightness of fruit peel (skin) color increased from 58.8 to 62.0, peel (skin) a* color parameter increased from -13.6 to -1.3, peel (skin) b* color parameter increased from 37.2 to 49.2, peel (skin) C* color parameter increased from 39.8 to 49.4, peel (skin) H° color was significantly reduced from 110.5 to 92.0, fruit flesh lightness (L*) color was reduced from 75.3 to 63.2, flesh a* color parameter increased from -3.2 to 6.1, flesh b* color parameter was maintained to 61.0, as well as flesh C* color parameter (61.1-61.3) and flesh H° color parameter was reduced from 93.2 to 84.3.
Dry matter content of fruit was slightly reduced from 18.8 to 18.2 %, pH increased from 3.9 to 4.4, SSC was increased from 12.8 to 16.7 %, the TA of fruit flesh was significantly reduced from 0.56 to 0.29 %, while the ratio SSC/TA of fruit flesh increased from 23.9 to 57.3.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the lower a* and b* and the higher hue angle values on the peel, as well as the lower a* and higher hue angle values of the flesh and the lower SSC/TA ratio in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of SSC. However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)

Fruit that were HWT suffered from moderate to significant heat injury during storage (score of 1.9 out of 5) and from significant anthracnose incidence (4.0/5), while the ones that were stored at 7°C also suffered from severe CI (score of 4.6/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Espada fruit received scores of 32, 48, 25, 29, 48, -11, -5, -13, 23, 42 and 41, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 19.1.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 13.6 classifying Espada in the 11th place of the 19 cultivars ranking.

- **Glenn**:

Objective quality measurements

Between harvest and 1 week of storage at 20°C the following changes were observed:

Fruit firmness (compression), was reduced from 17.5 to 3.5 kg, implying that fruit were harvested hard enough at an early ripening stage. The lightness of fruit peel (skin) color increased from 57.8 to 59.2, peel (skin) a* color parameter increased from -7.2 to 9.6, peel (skin) b* color parameter increased from 30.2 to 38.6, peel (skin) C* color parameter increased from 33.1 to 41.9, peel (skin) H° color was significantly reduced from 100.2 to 75.5, fruit flesh lightness (L*) color was reduced from 75.6 to 67.2, flesh a* color parameter increased from -4.4 to 6.9, flesh b* color parameter increased from 46.0 to 56.0, flesh C* color parameter increased from 46.0 to 57.0 and flesh H° color parameter was reduced from 96.1 to 83.1.
Dry matter content of fruit was slightly increased from 15.5 to 15.9 %, pH increased from 3.8 to 4.6, SSC was increased from 11.2 to 13.9 %, the TA of fruit flesh was significantly reduced from 1.05 to 0.49 %, while the ratio SSC/TA of fruit flesh increased from 7.4 to 34.4.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of lower compression, the higher L* and b* values on the peel, as well as the lower dry matter and higher SSC/TA ratio in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression firmness, peel a* and hue angle as well as flesh L*color parameters, SSC, and SSC/TA ratio). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from moderate heat injury during storage (score of 2.5 out of 5) and from significant anthracnose incidence (4.0/5), while the ones that were stored at 7°C suffered from only slight CI (score of 1.7/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Glenn fruit received scores of 49, 35, 19, 46, 43, -8, -4, -13, 22, 39 and 42, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 21.2.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 18.0 classifying Glenn in the 3rd place of the 19 cultivars ranking.

- **Kensington Pride**:

Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 9.8 to 1.8 kg, while fruit firmness in terms of maximum puncture force was reduced from 4.8 to 0.5 kg, implying that fruit were harvested moderate hard at an advanced ripening stage. The lightness of fruit peel (skin) color increased from 67.3 to 71.4, peel (skin) a* color parameter increased from -9.5 to -7.3, peel (skin) b* color parameter increased from 41.6 to 48.4, peel (skin) C* color parameter increased from 43.2 to 49.5, peel (skin) H° color was significantly reduced from 102.2 to 81.2, fruit flesh lightness (L*) color was reduced from 77.4 to 66.6, flesh a* color parameter increased from -2.8 to 3.5, flesh b* color parameter increased from 51.1 to 52.0, flesh C* color parameter increased from 51.3 to 52.1 and flesh H° color parameter was reduced from 93.3 to 86.2.

Dry matter content of fruit was slightly increased from 13.4 to 15.7 %, pH increased from 3.3 to 4.6, SSC was increased from 8.0 to 12.6 %, the TA of fruit flesh was significantly reduced from 2.16 to 0.35 %, while the ratio SSC/TA of fruit flesh increased from 4.2 to 42.4.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the lower L*, b* and chroma values on the peel, as well as the lower pH in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from severe heat injury during storage (score of 5.0 out of 5) and from severe anthracnose incidence (5.0/5), while the ones that were stored at 7°C also suffered from severe CI (score of 4.2/5). This cultivar received a score of 3.0 out of 5, in terms of storage potential, as fruit were able to withstand only 2 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Kensington Pride fruit received scores of 31, 49, 47, 52, 41, -11, -4, -29, 28, 31 and 49, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 21.5.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 10.3 classifying Kensington Pride in the 15th place, same as Duncan, of the 19 cultivars ranking.

- **Maha Chinook**:

Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 20.6 to 4.1 kg, implying that fruit were harvested hard enough at an early ripening stage. The lightness of fruit peel (skin) color increased from 58.9 to 63.8, peel (skin) a* color parameter increased from -10.7 to 17.3, peel (skin) b* color parameter increased from 31.0 to 42.1, peel (skin) C* color parameter increased from 33.7 to 47.8, peel (skin) H° color was significantly reduced from 107.2 to 66.3, fruit flesh lightness (L*) color was reduced from 71.9 to 64.4, flesh a* color parameter increased from -0.3 to 8.3, flesh b* color parameter increased from 52.5 to 54.4, flesh C* color parameter increased from 52.5 to 55.1, and flesh H° color parameter was reduced from 90.4 to 81.4.
Dry matter content of fruit was slightly increased from 20.0 to 20.5 %, pH increased from 3.2 to 4.9, SSC was increased from 10.4 to 17.3 %, the TA of fruit flesh was significantly reduced from 2.02 to 0.30 %, while the ratio SSC/TA of fruit flesh increased from 5.5 to 70.0.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the lower compression firmness and the higher L* values of the flesh in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression firmness, flesh L* color parameter and SSC. However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from significant heat injury during storage (score of 2.1 out of 5) and from severe anthracnose incidence (5.0/5), while the ones that were stored at 7°C also suffered from slight to moderate CI (score of 2.4/5). This cultivar received a score of 3.0 out of 5, in terms of storage potential, as fruit were able to withstand 2 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Maha Chinook fruit received scores of 47, 29, 14, 28, 40, -16, -8, -13, 31, 35 and 51, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 17.1.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 10.6 classifying Maha Chinook in the 14th place of the 19 cultivars ranking.

- **Mallika**:

Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 21.4 to 4.2 kg, while fruit firmness in terms of maximum puncture force was reduced from 13.6 to 1.6 kg, implying that fruit were harvested hard enough at an early ripening stage. The lightness of fruit peel (skin) color increased from 59.3 to 65.1, peel (skin) a* color parameter increased from -13.6 to -3.4, peel (skin) b* color parameter increased from 31.1 to 40.6, peel (skin) C* color parameter increased from 34.7 to 41.1, peel (skin) H° color was significantly reduced from 116.4 to 95.3, fruit flesh lightness (L*) color was reduced from 82.6 to 70.9, flesh a* color parameter increased from -2.1 to 6.0, flesh b* color parameter increased from 36.7 to 43.7, flesh C* color parameter increased from 37.1 to 44.1 and flesh H° color parameter was reduced from 98.9 to 82.2.
Dry matter content of fruit was slightly decreased from 16.7 to 16.2 %, pH increased from 3.2 to 3.9, SSC was increased from 7.7 to 15.2 %, the TA of fruit flesh was significantly reduced from 8.25 to 1.18 %, while the ratio SSC/TA of fruit flesh increased from 0.9 to 15.0.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness, peel L*, b*, chroma and hue angle, as well as flesh L* color parameters and titratable acidity). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from moderate heat injury during storage (score of 2.3 out of 5) and from significant anthracnose incidence (4.0/5), while the ones that were stored at 7°C also suffered from slight to moderate CI (score of 2.3/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Mallika fruit received scores of 46, 49, 45, 37, 43, -6, -3, -21, 15, 35 and 35, respectively, in a

scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 19.6.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 16.0 classifying Mallika in the 5th place of the 19 cultivars ranking.

- **Nam D°C Mai**:

Objective quality measurements

Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 24.2 to 5.2 kg, while fruit firmness in terms of maximum puncture force was reduced from 9.4 to 2.2 kg, implying that fruit were harvested hard enough at an early ripening stage. The lightness of fruit peel (skin) color was maintained at 56.0-56.8, peel (skin) a* color parameter increased from -15.7 to -12.8, peel (skin) b* color parameter was maintained at 27.2-27.7, peel (skin) C* color parameter decreased from 31.4 to 30.7, peel (skin) H° color was significantly reduced from 120.2 to 115.3, fruit flesh lightness (L*) color was reduced from 71.6 to 64.3, flesh a* color parameter increased from -11.7 to 1.2, flesh b* color parameter increased from 39.0 to 51.3, flesh C* color parameter increased from 40.8 to 51.4 and flesh H° color parameter was reduced from 106.9 to 89.0.
Dry matter content of fruit increased from 17.0 to 19.2 %, pH increased from 4.0 to 4.4, SSC was increased from 8.8 to 17.4 %, the TA of fruit flesh was significantly reduced from 1.53 to 0.48 %, while the ratio SSC/TA of fruit flesh increased from 6.1 to 44.9.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the higher L* values on the peel, as well as the lower pH, SSC and SSC/TA ratio in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness, flesh L* color parameter, SSC and SSC/TA ratio). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)

Fruit that were HWT suffered from moderate heat injury during storage (score of 1.5 out of 5) and from significant anthracnose incidence (4.0/5), while the ones that were stored at 7°C also suffered from significant CI (score of 4.2/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Nam D°C Mai fruit received scores of 37, 40, 25, 48, 41, -10, -8, -16, 26, 26 and 39, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 15.4.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 10.7 classifying Nam D°C Mai in the 13th place of the 19 cultivars ranking.

- **Ott**:

Objective quality measurements

Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 12.3 to 2.2 kg, while fruit firmness in terms of maximum puncture force was reduced from 15.5 to 1.4 kg, implying that fruit were harvested moderate hard enough at an advanced ripening stage. The lightness of fruit peel (skin) color increased from 42.9 to 54.0, peel (skin) a* color parameter increased from -5.5 to 5.2, peel (skin) b* color parameter increased from 26.9 to 36.6, peel (skin) C* color parameter increased from 31.9 to 40.1, peel (skin) H° color was significantly reduced from 93.5 to 78.3, fruit flesh lightness (L*) color was reduced from 79.0 to 65.6, flesh a* color parameter increased from -3.4 to 4.4, flesh b* color parameter increased from 46.1 to 56.8, flesh C* color parameter increased from 46.2 to 57.0 and flesh H° color parameter was reduced from 94.6 to 85.1.
Dry matter content of fruit was maintained at 16.0-16.3 %, pH increased from 3.5 to 4.5, SSC was increased from 7.3 to 15.8 %, the TA of fruit flesh was significantly reduced from 1.73 to 0.35 %, while the ratio SSC/TA of fruit flesh increased from 4.3 to 49.0.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the lower L*, b*, chroma and hue angle values on the peel, as well as the higher L* and hue angle and the lower a*, b* and chroma values of the flesh in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression firmness). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from severe heat injury during storage (score of 4.5 out of 5) and from significant anthracnose incidence (4.0/5), while the ones that were stored at 7°C suffered minimally from CI (score of 1.0/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand only 2 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Ott fruit received scores of 47, 32, 31, 49, 50, -7, -3, -31, 20, 42 and 44, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 21.4.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 13.9 classifying Ott in the 10th place of the 19 cultivars ranking.

- **Palmer**:

Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 23.0 to 1.4 kg, while fruit firmness in terms of maximum puncture force was reduced from 13.8 to 2.7 kg, implying that fruit were harvested hard enough at an early ripening stage. The lightness of fruit peel (skin) color increased from 48.0 to 59.4, peel (skin) a* color parameter slightly increased from 11.9 to 12.6, peel (skin) b* color parameter increased from 18.2 to 37.3, peel (skin) C* color parameter increased from 25.8 to 39.8, peel (skin) H° color was significantly increased from 55.2 to 71.3, fruit flesh lightness (L*) color was reduced from 79.2 to 70.8, flesh a* color parameter increased from -12.0 to -2.6,

flesh b* color parameter increased from 45.2 to 52.3, flesh C* color parameter increased from 45.4 to 52.4 and flesh H° color parameter was reduced from 104.8 to 92.9.
Dry matter content of fruit decreased from 16.3 to 15.3 %, pH increased from 3.8 to 4.4, SSC was increased from 7.2 to 13.4 %, the TA of fruit flesh was significantly reduced from 0.91 to 0.32 %, while the ratio SSC/TA of fruit flesh increased from 7.9 to 42.9.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the lower chroma* and higher hue angle values on the peel, as well as the higher L* and hue angle and the higher a*, b*, chroma and the lower hue angle values of the flesh in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness, peel b* and chroma color parameters, flesh L*, SSC and SSC/TA ratio). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from slight to moderate heat injury during storage (score of 1.1 out of 5) and from significant anthracnose incidence (4.0/5), while the ones that were stored at 7°C suffered from slight to moderate CI (score of 2.5/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Palmer fruit received scores of 50, 44, 48, 43, 35, -9, -6, -16, 30, 37 and 36, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 22.1.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 19.5 classifying Palmer in the 2nd place of the 19 cultivars ranking.

- **Rapoza**:

Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 10.8 to 3.1 kg, while fruit firmness in terms of maximum puncture force was reduced from 6.1 to 0.6 kg, implying that fruit were harvested hard enough at an early ripening stage. The lightness of fruit peel (skin) color increased from 47.3 to 54.4, peel (skin) a* color parameter increased from 6.7 to 25.8, peel (skin) b* color parameter increased from 24.4 to 35.4, peel (skin) C* color parameter increased from 29.4 to 46.8, peel (skin) H° color was significantly increased from 73.0 to 52.9, fruit flesh lightness (L*) color was reduced from 76.7 to 66.8, flesh a* color parameter increased from -2.9 to -4.8, flesh b* color parameter increased from 45.2 to 53.5, flesh C* color parameter increased from 45.3 to 53.7 and flesh H° color parameter was reduced from 93.7 to 84.9.
Dry matter content of fruit was maintained at 14.6-14.7 %, pH increased from 3.7 to 4.3, SSC was increased from 11.1 to 13.5 %, the TA of fruit flesh was significantly reduced from 0.90 to 0.36 %, while the ratio SSC/TA of fruit flesh increased from 6.9 to 44.0.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the lower compression firmness in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of

compression and puncture firmness, flesh L* color parameter and SSC. However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from slight heat injury during storage (score of 1.2 out of 5) and from moderate anthracnose incidence (3./5), while the ones that were stored at 7°C suffered from minimal CI (score of 1.3/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Rapoza fruit received scores of 43, 31, 44, 25, 39, -8, -4, -17, 21, 37 and 43, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 11.4.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 17.4 classifying Rapoza in the 4th place of the 19 cultivars ranking, similar to Ott.

- **Rosa**:

Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 8.5 to 2.9 kg, while fruit firmness in terms of maximum puncture force was reduced from 7.3 to 1.1 kg, implying that fruit were harvested moderate soft at an advanced ripening stage. The lightness of fruit peel (skin) color slight decreased from 69.2 to 68.7, peel (skin) a* color parameter increased from 8.7 to 13.9, peel (skin) b* color parameter increased from 42.5 to 44.1, peel (skin) C* color parameter increased from 45.8 to 47.4, peel (skin) H° color decreased from 78.6 to 72.3, fruit flesh lightness (L*) color was reduced from 78.9 to 69.3, flesh a* color parameter increased from 3.4 to 5.6, flesh b* color parameter decreased from 63.2 to 61.3, flesh C* color parameter decreased from 63.4 to 61.6 and flesh H° color parameter was reduced from 87.1 to 84.8.
Dry matter content of fruit increased from 15.6 to 16.2 %, pH increased from 3.7 to 4.2, SSC was increased from 13.1 to 14.6 %, the TA of fruit flesh was significantly reduced from 0.92 to 0.35 %, while the ratio SSC/TA of fruit flesh increased from 14.3 to 41.5.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the higher compression and puncture firmness, as well as the higher L* and lower a* values of the flesh and the lower pH and SSC/TA ration in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from moderate to significant heat injury during storage (score of 1.8 out of 5) and from significant anthracnose incidence (4.0/5), while the ones that were stored at 7°C suffered from moderate CI (score of 3.1/5). This cultivar received a score of 5.0 out of 5,

in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Rosa fruit received scores of 49, 41, 36, 27, 41, -26, -6, -12, 28, 32 and 45, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 17.9.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 14.0 classifying Rosa in the 9th place of the 19 cultivars ranking.

- **Rosigold** :

Objective quality measurements

Between harvest and 1 week of storage at 20 °C the following changes were observed:
Fruit firmness (compression), was reduced from 14.8 to 2.9 kg, while fruit firmness in terms of maximum puncture force was reduced from 13.2 to 1.6 kg, implying that fruit were harvested moderate soft at an advanced ripening stage. The lightness of fruit peel (skin) color slight increased from 60.0 to 66.1, peel (skin) a* color parameter increased from -9.4 to 4.9, peel (skin) b* color parameter increased from 39.2 to 47.3, peel (skin) C* color parameter increased from 40.9 to 48.2, peel (skin) H° color decreased from 102.3 to 83.8, fruit flesh lightness (L*) color was reduced from 81.4 to 69.3, flesh a* color parameter increased from -6.7 to 1.0, flesh b* color parameter increased from 54.3 to 59.2, flesh C* color parameter increased from 54.8 to 59.3 and flesh H° color parameter was reduced from 97.4 to 89.2.
Dry matter content of fruit was maintained at 15.5-15.6 %, pH increased from 3.4 to 3.9, SSC was increased from 7.5 to 13.5 %, the TA of fruit flesh was significantly reduced from 1.10 to 0.44 %, while the ratio SSC/TA of fruit flesh increased from 6.9 to 30.8.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the lower compression firmness, as well as the lower pH and SSC/TA ratio in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness, peel b* and chroma color parameter, flesh L* and SSC. However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)

Fruit that were HWT suffered from significant heat injury during storage (score of 2.0 out of 5) and from severe anthracnose incidence (5.0/5), while the ones that were stored at 7°C suffered from significant CI (score of 3.9/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 week of storage + 1 weeks of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Rosigold fruit received scores of 45, 42, 32, 47, 44, -32, -4, -17, 25, 42 and 51, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 22.3.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 16.4 classifying Rosigold in the 4th place of the 19 cultivars ranking.

- **Southern Blush**:

  Objective quality measurements

  Between harvest and 1 week of storage at 20°C the following changes were observed:
  Fruit firmness (compression), was reduced from 13.4 to 3.2 kg, while fruit firmness in terms of maximum puncture force was reduced from 10.8 to 1.0 kg, implying that fruit were harvested moderate soft at an advanced ripening stage. The lightness of fruit peel (skin) color increased from 49.6 to 54.5, peel (skin) a* color parameter increased from -6.7 to 7.6, peel (skin) b* color parameter increased from 22.9 to 33.6, peel (skin) C* color parameter increased from 25.6 to 37.5, peel (skin) H° color decreased from 100.3 to 74.9, fruit flesh lightness (L*) color was reduced from 75.3 to 67.5, flesh a* color parameter increased from -5.1 to 5.7, flesh b* color parameter increased from 39.3 to 56.9, flesh C* color parameter increased from 39.8 to 57.2 and flesh H° color parameter was reduced from 97.9 to 84.3.
  Dry matter content of fruit was increased from 13.9 to 14.4 %, pH increased from 3.7 to 4.6, SSC was increased from 6.1 to 14.4 %, the TA of fruit flesh was significantly reduced from 1.05 to 0.34 %, while the ratio SSC/TA of fruit flesh increased from 6.1 to 43.6.
  No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the lower L* and higher a* values of the flesh in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness, peel L* and chroma color parameters, flesh L*, b* and chroma, as well as SSC and SSC/TA ratio). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

  Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)

  Fruit that were HWT suffered from slight to moderate heat injury during storage (score of 2.2 out of 5) and from significant anthracnose incidence (4.0/5), while the ones that were stored at 7°C suffered from slight CI (score of 1.7/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Southern Blush fruit received scores of 39, 45, 31, 39, 37, -9, -8, -12, 27, 34 and 43, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 18.8.
  In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 15.9 classifying Southern Blush in the 6th place of the 19 cultivars ranking.

- **Valencia Pride**:

  Objective quality measurements

  Between harvest and 1 week of storage at 20°C the following changes were observed:
  Fruit firmness (compression), was reduced from 11.3 to 3.9 kg, while fruit firmness in terms of maximum puncture force was reduced from 9.2 to 1.0 kg, implying that fruit were harvested moderate soft at an advanced ripening stage. The lightness of fruit peel (skin) color increased from 65.5 to 67.2, peel (skin) a* color parameter increased from 3.0 to 5.5, peel (skin) b* color parameter increased from 34.1 to 36.6, peel (skin) C* color parameter increased from 35.8 to

39.3, peel (skin) H° color decreased from 88.3 to 79.6, fruit flesh lightness (L*) color was reduced from 79.2 to 69.8, flesh a* color parameter increased from -3.5 to 1.3, flesh b* color parameter increased from 36.4 to 46.8, flesh C* color parameter increased from 36.6 to 46.9 and flesh H° color parameter was reduced from 94.6 to 88.4.
Dry matter content of fruit was increased from 13.9 to 15.2 %, pH increased from 3.7 to 4.0, SSC was increased from 8.8 to 14.7 %, the TA of fruit flesh was significantly reduced from 0.99 to 0.71 %, while the ratio SSC/TA of fruit flesh increased from 9.1 to 21.1.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the higher puncture firmness, as well as the lower a*, b*, chroma and the higher hue angle values of the flesh in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness, peel a*, b* and hue color parameters). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from severe heat injury during storage (score of 4.4 out of 5) and from significant anthracnose incidence (4.0/5), while the ones that were stored at 7°C suffered from slight CI (score of 2.0/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C.
In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Valencia Pride fruit received scores of 30, 30, 40, 47, 27, -7, -2, -10, 37, 36 and 39, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 19.7.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 14.3 classifying Valencia Pride in the 8th place of the 19 cultivars ranking.

- **Vallenato**:

Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 9.9 to 2.1 kg, while fruit firmness in terms of maximum puncture force was reduced from 2.8 to 0.3 kg, implying that fruit were harvested moderate soft at an advanced ripening stage. The lightness of fruit peel (skin) color increased from 47.9 to 57.9, peel (skin) a* color parameter increased from 3.9 to 11.5, peel (skin) b* color parameter increased from 16.0 to 36.8, peel (skin) C* color parameter increased from 18.8 to 40.3, peel (skin) H° color increased from 69.5 to 72.3, fruit flesh lightness (L*) color was reduced from 77.1 to 66.4, flesh a* color parameter increased from -8.4 to 3.0, flesh b* color parameter increased from 54.2 to 61.5, flesh C* color parameter increased from 55.1 to 61.6 and flesh H° color parameter was reduced from 99.2 to 87.3.
Dry matter content of fruit was maintained at 15.1-15.3 %, pH increased from 3.7 to 4.9, SSC was increased from 10.3 to 14.0 %, the TA of fruit flesh was significantly reduced from 0.77 to 0.22 %, while the ratio SSC/TA of fruit flesh increased from 13.2 to 64.5.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the higher a* and the lower L*, b*, chroma and hue angle

values on the peel, as well as the lower b* and chroma values of the flesh and the lower pH in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness, peel b*, chroma and hue angle color parameters, as well as SSC. However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)
Fruit that were HWT suffered from moderate to significant heat injury during storage (score of 3.3 out of 5) and from severe anthracnose incidence (4.5/5), while the ones that were stored at 7°C suffered from significant CI (score of 4.1/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand 3 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Vallenato fruit received scores of 27, 24, 26, 43, 42, -9, -6, -11, 15, 36 and 41, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 13.6.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 6.7 classifying Vallenato in the 18th place of the 19 cultivars ranking.

- **Young**:
Objective quality measurements
Between harvest and 1 week of storage at 20°C the following changes were observed:
Fruit firmness (compression), was reduced from 10.5 to 2.8 kg, while fruit firmness in terms of maximum puncture force was reduced from 12.9 to 1.2 kg, implying that fruit were harvested moderate soft at an advanced ripening stage. The lightness of fruit peel (skin) color increased from 60.1 to 65.4, peel (skin) a* color parameter increased from 15.4 to 5.1, peel (skin) b* color parameter increased from 33.7 to 42.4, peel (skin) C* color parameter increased from 37.1 to 42.8, peel (skin) H° color decreased from 114.7 to 83.4, fruit flesh lightness (L*) color was reduced from 74.9 to 64.8, flesh a* color parameter increased from -3.0 to 7.5, flesh b* color parameter increased from 47.2 to 48.9, flesh C* color parameter increased from 47.3 to 49.5 and flesh H° color parameter was reduced from 84.8 to 81.2.
Dry matter content of fruit was increased from 13.9 to 14.3 %, pH increased from 3.9 to 4.8, SSC was increased from 6.2 to 14.8 %, the TA of fruit flesh was significantly reduced from 0.90 to 0.17 %, while the ratio SSC/TA of fruit flesh increased from 16.5 to 85.4.
No significant differences were observed after 1 week of storage between HWT and non-heat-treated fruit, with the exception of the lower compression firmness and the lower L*, b* and chroma values on the peel, the higher b* and chroma values of the flesh, as well as the lower SSC in the HWT fruit. During storage, no significant differences were found between 12°C and 7°C (with the exception of compression and puncture firmness, peel L*, b*, chroma and hue color parameter, flesh L*, SSC and SSC/TA ratio). However, significant changes were observed after 1 week of storage at shelf life conditions (20°C) in most of the determined color, firmness, and compositional components, irrespective of the storage temperature.

Subjective quality evaluation (injuries/ disease susceptibility and sensory panel preferences)

Fruit that were HWT suffered from severe heat injury during storage (score of 4.9 out of 5) and from significant anthracnose incidence (4.0/5), while the ones that were stored at 7°C suffered from severe CI (score of 4.5/5). This cultivar received a score of 5.0 out of 5, in terms of storage potential, as fruit were able to withstand only 2 weeks of 12°C storage + 1 week of shelf life at 20°C. In terms of overall appearance, liking, overall liking, flavor liking, texture liking, sweetness, sourness, bitterness, fibrousness, firmness, juiciness, and flavor intensity, Young fruit received scores of 45, 42, 32, 29, 46, -8, -5, -17, 27, 30 and 45, respectively, in a scale of -100 to 100, which after being converted to a 1 to 5 scale resulted in an aggregate consumer acceptability score of 19.6.
In total, the general aggregate score, which is the resultant of the subjective postharvest storage and taste panel evaluations was equal to 8.2 classifying Young in the 17th place of the 19 cultivars ranking, similar to Maha Chinook.

Spectral reflectance on the peel:
In general, spectral reflectance followed the same pattern in all cultivars with significant differences between freshly harvested and stored fruit being observed at the visible 550- 680 nm region, due to the degradation of chlorophyll and the synthesis of pigments, such as carotenoids, during fruit ripening on skin. In particular, spectral reflectance on the peel of fruit at harvest was always lower comparing to reflectance after 1 week of storage at 20°C, without significant differences between the HWT or the non-heat-treated fruit, with the exception of Cogshall and Espada for which spectral reflectance was lower in HWT fruit, as well as of Glenn, Nam D°C Mai, Rosigold, and Tommy Atkins (2021) that were higher in the heat-treated fruit. Moreover, the higher temperature (12°C) and period of storage (1, 2 or 3 weeks) of storage resulted in a higher reflectance than storage at 7°C, which was further increased by an additional week of storage at 20°C.

DISCUSSION

The evaluations reported here were conducted in different years for different cultivars with the exception of the control cultivar, Tommy Atkins, which was evaluated both years, 2019 and 2021. It is notable that the performance of Tommy Atkins was almost the same in both years, supporting the validity of our comparing all of the cultivars despite them being tested in different seasons.

It should be noted that the disease incidence ratings may have been influenced by genetic predisposition or tolerance among different cultivars, by rainfall and RH differences among years and/or among the orchards from which the fruit were harvested, and the cultural practices employed to control anthracnose. For example, fruit harvested from UF-IFAS TREC were periodically treated with fungicides throughout the flowering and fruit development period. In contrast, little to no fungicides were applied to fruit harvested from the other sources of fruit. We therefore suggest that further testing and evaluation of fruit disease issues should be conducted.

Similarly, we had some issues with our hot water treatment system in 2019 that made maintenance of consistent water temperature difficult. This issue was resolved prior to the 2021 tests. It is notable that this was the only category in which Tommy Atkins showed a

significant difference between the two seasons. Thus, the hot water tolerance results for the cultivars tested in 2019 could possibly be considered questionable (i.e., the scores were possibly too severe) and thus may warrant further testing.

CONCLUSION

There were seven mango cultivars that appeared almost without exception among the uppermost ranked cultivars in all of the tested categories (Table 4): 1. Edward, 2. Palmer, 3. Glenn, 4. Rapoza and Rosigold, 6. Mallika, and 7. Southern Blush. We recommend these cultivars as being the best candidates to be considered for further testing by the National Mango Board.

Table 1. Firmness and external (peel) color changes in mango fruit from 20 cultivars at harvest and after 1 week of shelf life (20°C)

	Compression		Puncture		L* peel		a* peel		b* peel		Chroma peel		Hue angle peel	
Cultivars/ Days at SL	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**
Cogshall 21	2.7	1.4	0.6	0.3	54.0	48.5	-5.8	20.7	34.2	33.6	36.1	43.0	95.7	56.3
Duncan 19	18.8	2.9	12.3	0.7	61.1	71.4	-13.3	-2.4	29.6	42.3	33.3	42.7	117.3	93.7
Edward 19	19.6	3.1			58.2	67.8	-15.8	4.3	30.2	43.2	34.3	44.2	117.6	83.9
Espada 21	6.5	2.0	3.4	0.6	58.8	62.0	-13.6	-1.3	37.2	49.2	39.8	49.4	110.5	92.0
Glenn 19	17.5	3.5			57.8	59.2	-7.2	9.6	30.2	38.6	33.1	41.9	100.2	75.5
Kensington Pride 19	9.8	1.8	4.8	0.5	67.3	71.4	-9.5	7.3	41.6	48.4	43.2	49.5	102.2	81.2
Maha Chinook 19	20.6	4.1			58.9	63.8	-10.7	17.3	31.0	42.1	33.7	47.8	107.2	66.3
Mallika 19	1.4	4.2	13.6	1.6	59.3	65.1	-13.6	-3.4	31.1	40.6	34.7	41.1	116.4	95.3
Nam Doc Mai 19	24.4	5.2	9.4	2.2	56.8	56.0	-15.7	-12.8	27.2	27.7	31.4	30.7	120.2	115.3
Ott 19	12.3	2.2	15.5	1.4	53.0	58.0	-5.5	5.2	26.9	36.6	31.9	40.1	93.5	78.3
Palmer 21	23.0	1.4	13.8	2.7	48.0	59.4	11.9	12.6	18.2	37.3	25.8	39.8	55.2	71.3
Rapoza 19	10.8	3.1	6.1	0.6	47.3	54.4	6.7	25.8	24.4	35.4	29.4	46.8	73.0	52.9
Rosa 21	8.5	2.9	7.3	1.1	69.2	68.7	8.7	13.9	42.5	44.1	45.8	47.4	78.6	72.3
Rosigold 21	14.8	2.9	13.2	1.6	60.0	66.1	-9.4	4.9	39.2	47.3	40.9	48.2	102.3	83.8
Southern Blush 19	13.4	3.2	10.8	1.0	48.8	54.5	-6.7	7.6	22.9	33.6	25.6	37.5	100.3	74.9
Tommy Atkins 19	13.6	4.4	9.4	1.0	47.8	51.1	9.7	15.7	23.3	27.3	29.5	34.1	66.2	60.5
Tommy Atkins 21	16.2	6.2	7.7	1.8	53.0	50.9	3.4	26.8	28.5	27.1	31.0	41.2	82.0	44.7
Valencia Pride 19	11.3	3.9	9.2	1.0	65.5	67.2	3.0	5.5	34.1	36.6	35.8	39.3	88.3	79.6
Vallenato 21	9.9	2.1	2.8	0.3	47.9	57.9	3.9	11.5	16.0	36.8	18.8	40.3	69.5	72.3
Young 19	10.5	2.8	12.9	1.2	60.1	65.4	15.4	5.1	33.7	42.4	37.1	42.8	114.7	83.4

Table 2. Internal (flesh) color changes in mango fruit from 20 cultivars at harvest and after 1 week of shelf life (20°C)

	L* flesh		a* flesh		b* flesh		Chroma flesh		Hue angle flesh	
Cultivars/ Days at SL	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**
Cogshall 21	73.6	61.1	0.6	10.9	61.3	61.7	61.4	62.8	89.6	80.1
Duncan 19	74.3	64.5	-8.1	5.1	41.5	47.7	42.4	48.1	101.3	84.0
Edward 19	77.0	66.0	-5.5	6.3	33.6	56.9	34.1	56.9	99.7	83.7
Espada 21	75.3	63.2	-3.2	6.1	61.0	61.0	61.1	61.3	93.2	84.3
Glenn 19	75.6	67.2	-4.4	6.9	46.0	56.0	46.0	57.0	96.1	83.1
Kensington Pride 19	77.4	66.6	-2.8	3.5	51.1	52.0	51.3	52.1	93.3	86.2
Maha Chinook 19	71.9	64.4	-0.3	8.3	52.5	54.4	52.5	55.1	90.4	81.4
Mallika 19	82.6	70.9	-2.1	6.0	36.7	43.7	37.1	44.1	98.9	82.2
Nam Doc Mai 19	71.6	64.3	-11.7	1.2	39.0	51.3	40.8	51.4	106.9	89.0
Ott 19	79.0	65.6	-3.4	4.4	46.1	56.8	46.2	57.0	94.6	85.1
Palmer 21	79.2	70.8	-12.0	-2.6	45.2	52.3	45.4	52.4	104.8	92.9
Rapoza 19	76.7	66.8	-2.9	4.8	45.2	53.5	45.3	53.7	93.7	84.9
Rosa 21	78.9	69.3	3.4	5.6	63.2	61.3	63.4	61.6	87.1	84.8
Rosigold 21	81.4	69.3	-6.7	1.0	54.3	59.2	54.8	59.3	97.4	89.2
Southern Blush 19	75.3	67.5	-5.1	5.7	39.3	56.9	39.8	57.2	97.9	84.3
Tommy Atkins 19	75.9	69.3	-1.8	2.6	52.4	54.1	52.5	54.1	92.1	87.2
Tommy Atkins 21	80.4	72.3	-3.9	2.1	54.8	60.2	55.2	60.3	94.9	88.0
Valencia Pride 19	79.2	69.8	-3.5	1.3	36.4	46.8	36.6	46.9	94.6	88.4
Vallenato 21	77.1	66.4	-8.4	3.0	54.2	61.5	55.1	61.6	99.2	87.3
Young 19	74.9	64.8	-3.0	7.5	47.2	48.9	47.3	49.5	84.8	81.2

Table 3. Compositional changes in mango fruit from 20 cultivars at harvest and after 1 week of shelf life (20°C)

	Dry matter		pH		SSC		TA		SSC/TA	
Cultivars/ Days at SL	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**	**0**	**7**
Cogshall 21	18.5	18.2	3.4	3.3	16.2	14.2	1.29	1.17	11.4	12.2
Duncan 19	14.7	15.9	3.3	4.5	6.0	13.1	2.38	0.37	2.6	44.6
Edward 19	16.9	19.3	3.0	4.4	8.2	16.1	3.12	0.83	2.8	22.2
Espada 21	18.8	18.2	3.9	4.4	12.8	16.7	0.56	0.29	23.9	57.3
Glenn 19	15.5	15.9	3.8	4.6	11.2	13.9	1.05	0.49	7.4	34.4
Kensington Pride 19	13.4	15.7	3.3	4.6	8.0	12.6	2.16	0.35	4.2	42.4
Maha Chinook 19	20.0	20.5	3.2	4.9	10.4	17.3	2.02	0.30	5.5	70.0
Mallika 19	16.7	16.2	3.2	3.9	7.7	15.2	8.25	1.18	0.9	15.0
Nam Doc Mai 19	17.0	19.2	4.0	4.4	8.8	17.4	1.53	0.48	6.1	44.9
Ott 19	16.3	16.0	3.5	4.5	7.3	15.8	1.73	0.35	4.7	49.0
Palmer 21	16.3	15.3	3.8	4.4	7.2	13.4	0.91	0.32	7.9	42.9
Rapoza 19	14.7	14.6	3.7	4.3	11.1	13.5	0.90	0.36	6.9	44.0
Rosa 21	15.6	16.2	3.7	4.2	13.1	14.6	0.92	0.35	14.3	41.5
Rosigold 21	15.5	15.6	3.4	3.9	7.5	13.5	1.10	0.44	6.9	30.8
Southern Blush 19	13.9	14.4	3.7	4.6	6.1	14.4	1.05	0.34	6.1	43.6
Tommy Atkins 19	14.7	13.8	3.8	4.4	8.9	13.3	0.84	0.39	11.9	37.2
Tommy Atkins 21	14.0	15.0	3.5	3.3	11.3	11.8	1.01	0.67	11.1	17.6
Valencia Pride 19	13.9	15.2	3.7	4.0	8.8	14.7	0.99	0.71	9.1	21.1
Vallenato 21	15.1	15.3	3.7	4.9	10.3	14.0	0.77	0.22	13.2	64.5
Young 19	13.9	14.3	3.9	4.8	6.2	14.8	0.90	0.17	16.5	85.4

Table 4. Heat injury, disease incidence, chilling injury, aggregate scores and ranking of cultivars according to subjective evaluations

Cultivars[1]	HIS[2]	CIS[3]	DIS[4]	SR[5]	ACA[6]	GAS[7]	Rank[8]
Cogshall 21	-1.7	-1.9	-5	3.0	15.3	9.7	14
Duncan 19	-4.6	-3.2	-4.5	5.0	17.6	10.3	16
Edward 19	-2.1	-1.5	-4	5.0	23.8	21.2	1
Espada 21	-1.9	-4.6	-4	5.0	19.1	13.6	13
Glenn 19	-2.5	-1.7	-4	5.0	21.2	18.0	3
Kensington Pride 19	-5	-4.2	-5	3.0	21.5	10.3	11
Maha Chinook 19	-2.1	-2.4	-5	3.0	17.1	10.6	15
Mallika 19	-2.3	-2.3	-4	5.0	19.6	16.0	9
Nam Doc Mai 19	-1.5	-4.2	-4	5.0	15.4	10.7	17
Ott 19	-4.5	-1	-5	3.0	21.4	13.9	4
Palmer 21	-1.1	-2.5	-4	5.0	22.1	19.5	2
Rapoza 19	-1.2	-1.3	-3	5.0	17.9	17.4	4
Rosa 21	-1.8	-3.1	-4	5.0	17.9	14.0	10
Rosigold 21	-2	-3.9	-5	5.0	22.3	16.4	6
Southern Blush 19	-2.2	-1.7	-4	5.0	18.8	15.9	5
Tommy Atkins 19	-3.2	-4.1	-3	5.0	17.8	12.5	12
Tommy Atkins 21	-1.9	-3	-3.5	5.0	17.8	14.4	7
Valencia Pride 19	-4.4	-2	-4	5.0	19.7	14.3	8
Vallenato 21	-3.3	-4.1	-4.5	5.0	13.6	6.7	18
Young 19	-4.9	-4.5	-5	3.0	19.6	8.2	15

Rank	GAS	Cultivars
1	21.2	Edward 19
2	19.5	Palmer 21
3	18.0	Glenn 19
4	17.4	Rapoza 19
4	16.4	Rosigold 21
5	16.0	Mallika 19
6	15.9	Southern Blush 19
7	14.4	Tommy Atkins 21
8	14.3	Valencia Pride 19
9	14.0	Rosa 21
10	13.9	Ott 19
11	13.6	Espada 21
12	12.5	Tommy Atkins 19
13	10.7	Nam Doc Mai 19
14	10.6	Maha Chinook 19
15	10.3	Duncan 19
15	10.3	Kensington Pride 19
16	9.7	Cogshall 21
17	8.2	Young 19
18	6.7	Vallenato 21

[1] The cultivars (in alphabetical order) were evaluated in 2019 or 2021 growing season

[2] HIS= Heat injury sensitivity (-1: minimally injured, -5: severely injured)

[3] CIS= Chilling injury sensitivity (-1: minimally injured, -5: severely injured)

[4] DIS= Disease incidence sensitivity (-1: minimally infected, -5: severely infected)

[5] SR= Storage resistance (1: only 1 week at SL, 5: 3 weeks of storage at 7 or 12oC + 1 week SL)

[6] ACA= Aggregate consumer acceptability is the aggregate score of 8 desirable subjective traits (overall appearance liking, overall liking, texture liking, flavor liking, sweetness, firmness , juiciness, overall flavor intensity), as well as of 3 undesirable traits, such as sourness, bitterness and fibrousness (stringy/chewy material). All traits were evaluated on a scale -100 (strongest disliking) to +100 (strongest liking) and were later converted on a scale -5: strongest dislike to -1: slightly dislike or +1: slightly like to +5: strongest like)

[7] GAS= General aggregate score is the sum of HIS+CIS+DIS+ACA

[8] The ranking of the cultivars is relative to the GAS with the higher GAS corresponding to a higher position in the rank

Table 5a. Sensory evaluation scores

	Overall appearance liking	Score (1-5)[x,y]	Overall liking	Score (1-5)	Texture liking	Score (1-5)	Flavor liking	Score (1-5)	Sweetness	Score (1-5)	Sourness	Score (1-5)[z]	Bitterness	Score (1-5)
Maha Chinook 19	47	4.5	29	1.5	14	1.0	28	1.5	40	3.2	16	-2.5	8	-2.8
Rosigold 21	45	4.1	42	3.3	32	3.2	47	4.3	44	3.9	32	-5.0	4	-1.7
Edward 19	50	4.9	54	5.0	40	4.1	30	1.8	41	3.4	10	-1.6	5	-2.0
Kensington Pride 19	31	1.7	49	4.3	47	4.8	52	5.0	41	3.3	11	-1.7	4	-1.6
Young 19	45	4.1	42	3.3	32	3.1	29	1.6	46	4.2	8	-1.2	5	-1.8
Rosa 21	49	4.7	41	3.2	36	3.5	27	1.3	41	3.4	26	-4.0	6	-2.2
Tommy Atkins 21	38	2.9	28	1.5	38	3.9	42	3.6	37	2.7	14	-2.3	14	-5.0
Ott 19	47	4.4	32	2.0	31	3.0	49	4.6	50	4.8	7	-1.1	3	-1.3
Rapoza 19	43	3.7	31	1.9	44	4.5	25	1.0	39	3.0	8	-1.3	4	-1.6
Tommy Atkins 19	39	3.1	30	1.7	45	4.7	38	3.0	51	5.0	8	-1.3	5	-1.9
Southern Blush 19	39	3.0	45	3.7	31	3.0	39	3.1	37	2.8	9	-1.4	8	-2.9
Glenn 19	49	4.7	35	2.4	19	1.6	46	4.0	43	3.6	8	-1.3	4	-1.4
Vallenato 21	27	1.0	24	1.0	26	2.4	43	3.7	42	3.6	9	-1.4	6	-2.3
Espada 21	32	1.9	48	4.1	25	2.3	29	1.7	48	4.6	11	-1.8	5	-1.8
Nam Doc Mai 19	37	2.8	40	3.1	25	2.3	48	4.4	41	3.3	10	-1.6	8	-2.8
Valencia Pride 19	30	1.6	30	1.7	40	4.0	47	4.2	27	1.0	7	-1.1	2	-1.0
Duncan 19	45	4.0	39	3.0	33	3.3	29	1.6	42	3.6	15	-2.3	5	-2.0
Cogshall 21	30	1.6	46	3.9	38	3.8	40	3.2	28	1.2	11	-1.8	4	-1.7
Palmer 21	50	5.0	44	3.7	48	5.0	43	3.6	35	2.3	9	-1.5	6	-2.4
Mallika 19	46	4.2	49	4.3	45	4.6	37	2.8	43	3.8	6	-1.0	3	-1.4

[x] The liking or disliking scores from the -100 to +100 scale (SC) were converted into scores of a scale of 0 to 5 based on the equation:

$$y_x = 5 - \frac{4 \times (SC_{max} - SC_x)}{(SC_{max} - SC_{min})}$$

[y] Overall appearance liking, overall liking, texture liking, flavor liking, sweetness, firmness, juiciness and overall flavor intesity were calculated in a +1 to +5 scale, with +1 corresponding to slightly like and +5 to strongly like.

[z] Sourness, bitterness and fibrousness were calculated in a -5 to -1 scale, with -5 corresponding to strongly disklike and -1 to slightly dislike.

Table 5b. Sensory evaluation scores

	Fibrousness (stringy/chewy material)	Score (1-5)	Firmness	Score (1-5)	Juiciness	Score (1-5)	Overall flavor intensity	Score (1-5)	Aggregate Consumer Acceptability
Maha Chinook 19	13	-1.6	31	4.0	35	3.2	51	5.0	17.1
Rosigold 21	17	-2.3	25	2.8	42	5.0	51	4.8	22.3
Edward 19	20	-3.0	29	3.6	34	2.9	49	4.5	23.8
Kensington Pride 19	29	-4.5	28	3.4	31	2.2	49	4.4	21.5
Young 19	17	-2.3	27	3.3	30	2.0	45	3.4	19.6
Rosa 21	12	-1.4	28	3.3	32	2.6	45	3.3	17.9
Tommy Atkins 21	12	-1.4	31	4.0	41	4.7	44	3.2	17.8
Ott 19	31	-5.0	20	2.0	42	4.9	44	3.1	21.4
Rapoza 19	17	-2.3	21	2.1	37	3.8	43	3.0	17.9
Tommy Atkins 19	29	-4.5	27	3.3	30	2.1	43	2.9	17.8
Southern Blush 19	12	-1.5	27	3.3	34	3.1	43	2.8	18.8
Glenn 19	13	-1.7	22	2.2	39	4.2	42	2.8	21.2
Vallenato 21	11	-1.2	15	1.0	36	3.5	41	2.3	13.6
Espada 21	13	-1.7	23	2.6	42	5.0	41	2.3	19.1
Nam Doc Mai 19	16	-2.1	26	3.1	26	1.0	39	1.9	15.4
Valencia Pride 19	10	-1.1	37	5.0	36	3.5	39	1.8	19.7
Duncan 19	10	-1.0	23	2.6	35	3.2	38	1.5	17.6
Cogshall 21	17	-2.4	21	2.2	39	4.2	37	1.3	15.3
Palmer 21	16	-2.3	30	3.7	37	3.8	36	1.1	22.1
Mallika 19	21	-3.2	15	1.0	35	3.3	35	1.0	19.6

Figure 1. Aggregate consumer acceptability. All traits were evaluated on a scale -100 (strongest disliking) to +100 (strongest liking) and were later converted on a scale -5: strongest dislike to -1: slightly dislike or +1: slightly like to +5: strongest like) computed according to the relative scores of the cultivars within each subjectively evaluated trait.

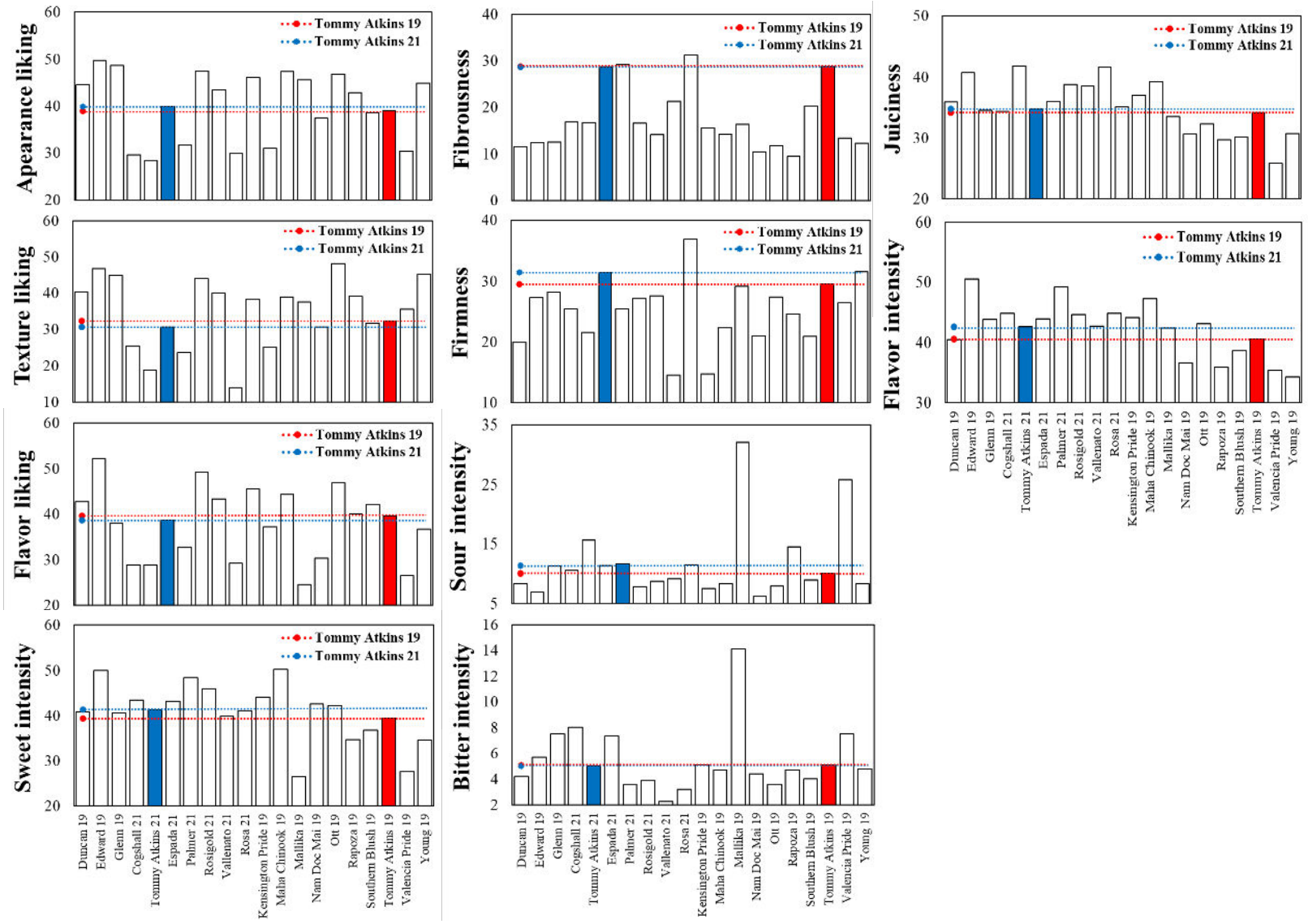

Figure 2. External (peel) lightness changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week of shelf life at 20°C (dotted line)

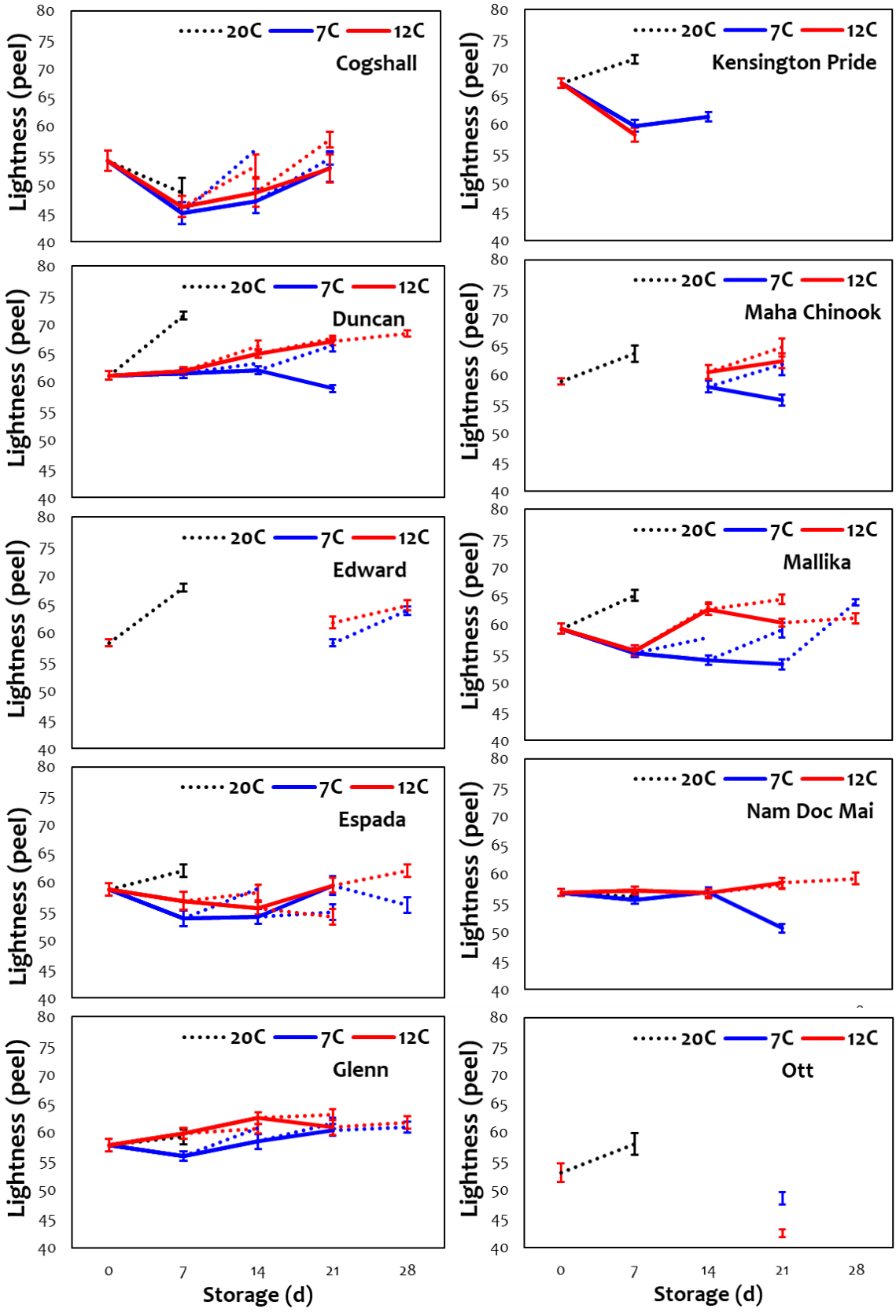

Figure 3. External (peel) lightness changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week of shelf life at 20°C (dotted line)

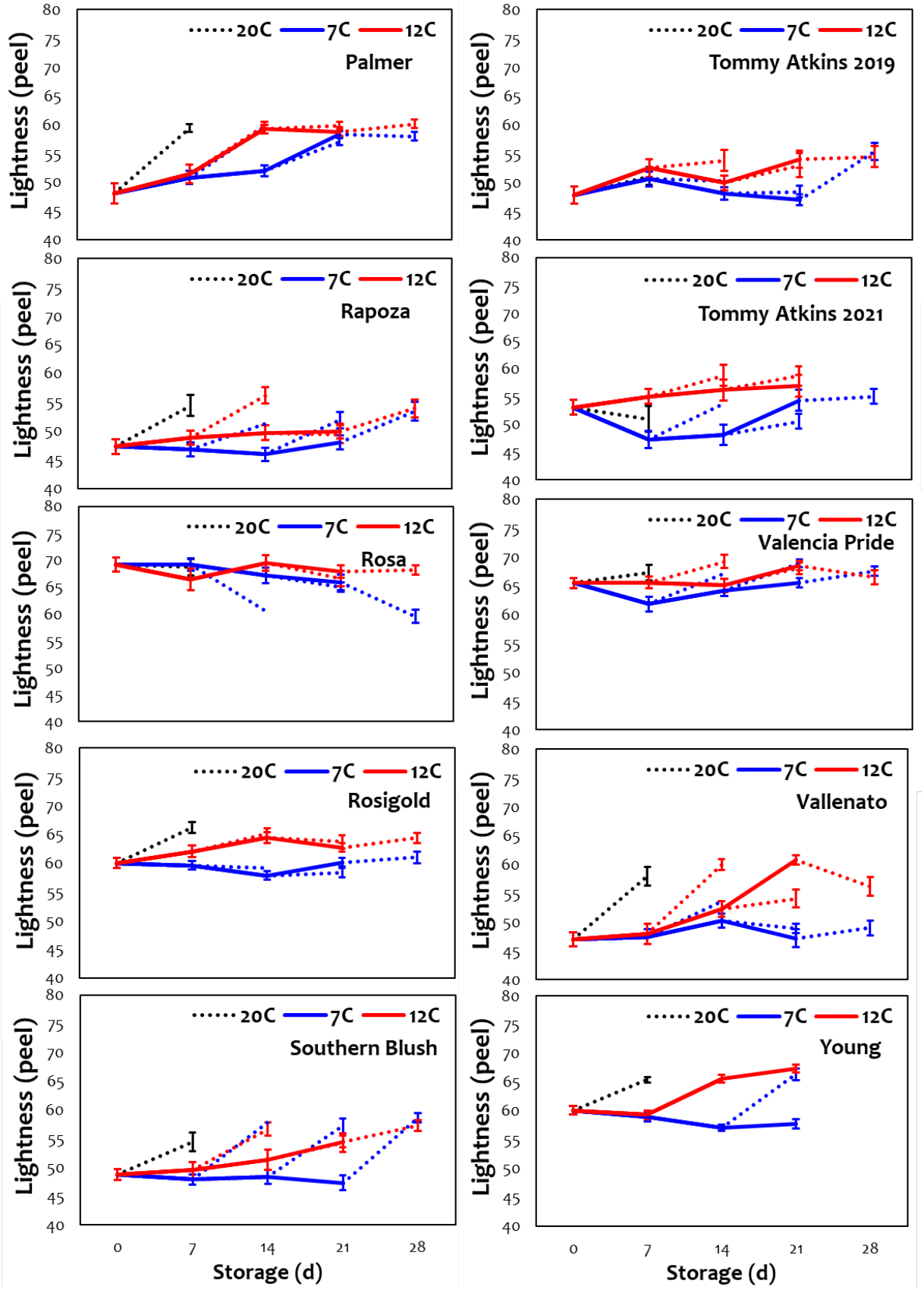

Figure 4. Hot water treatment effect on external (peel) lightness in mango fruit after 1 week at 20°C

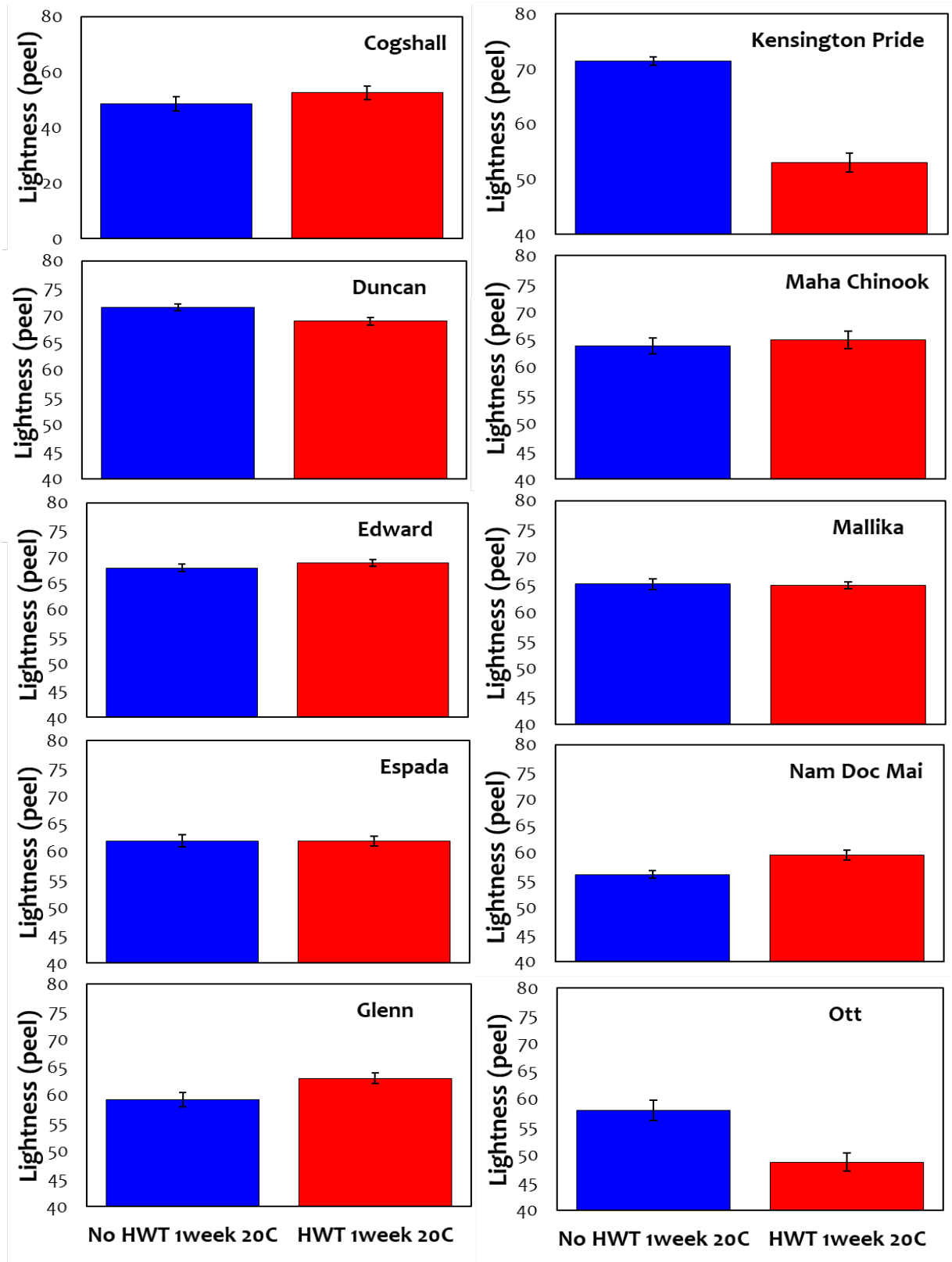

Figure 5. Hot water treatment effect on external (peel) lightness in mango fruit after 1 week at 20°C

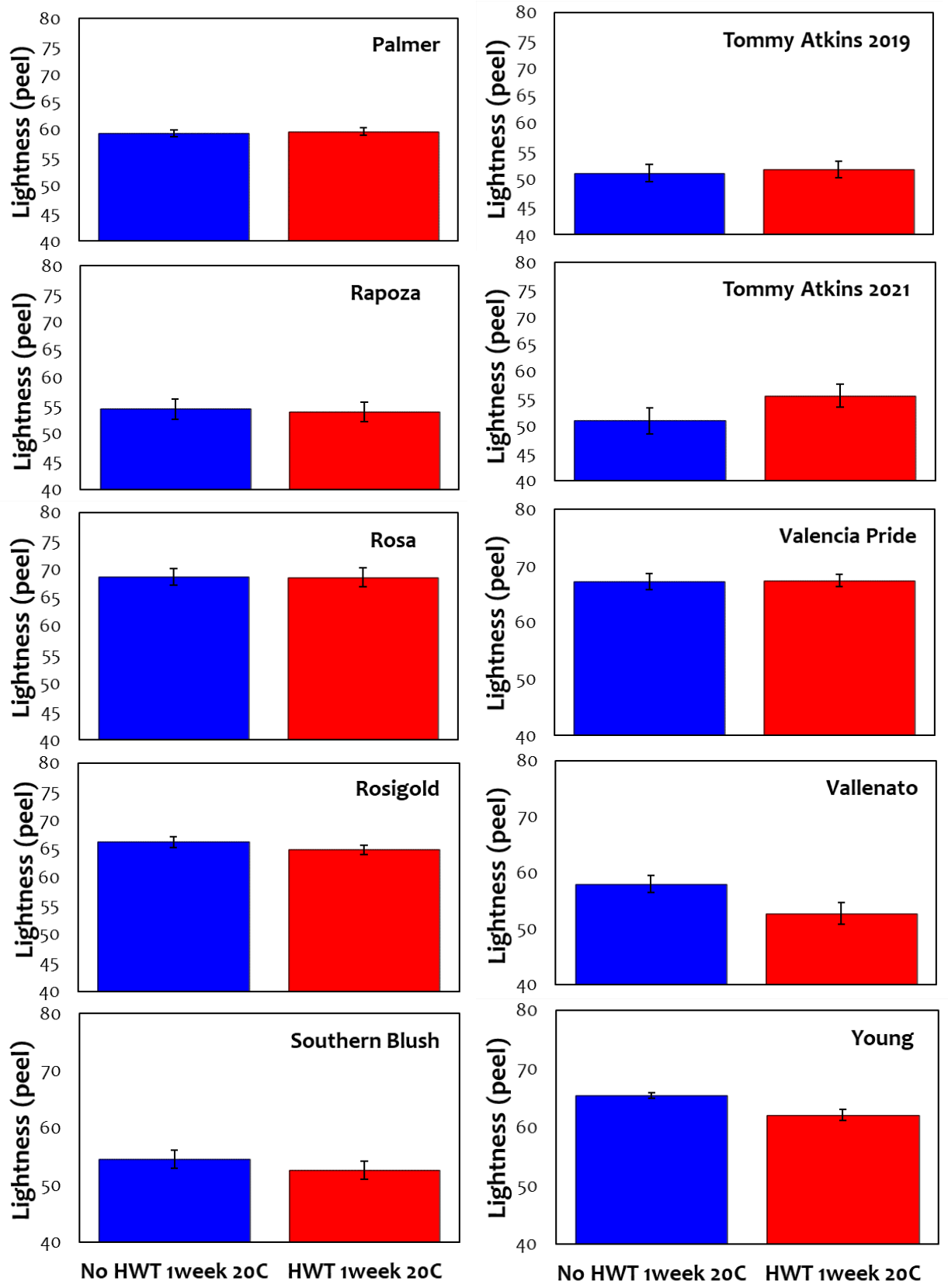

Figure 6. External (peel) a* value changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

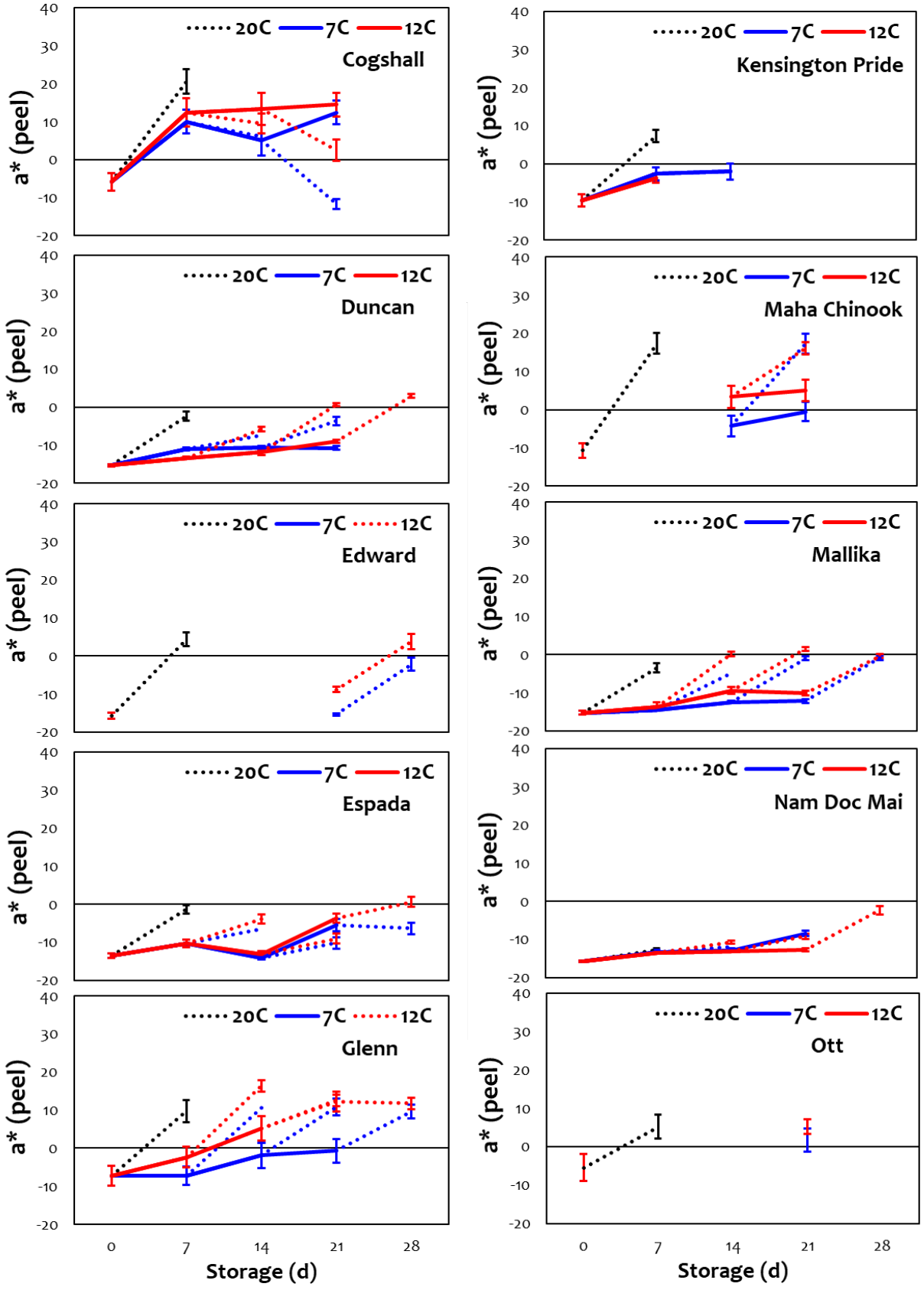

Figure 7. External (peel) a* value changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

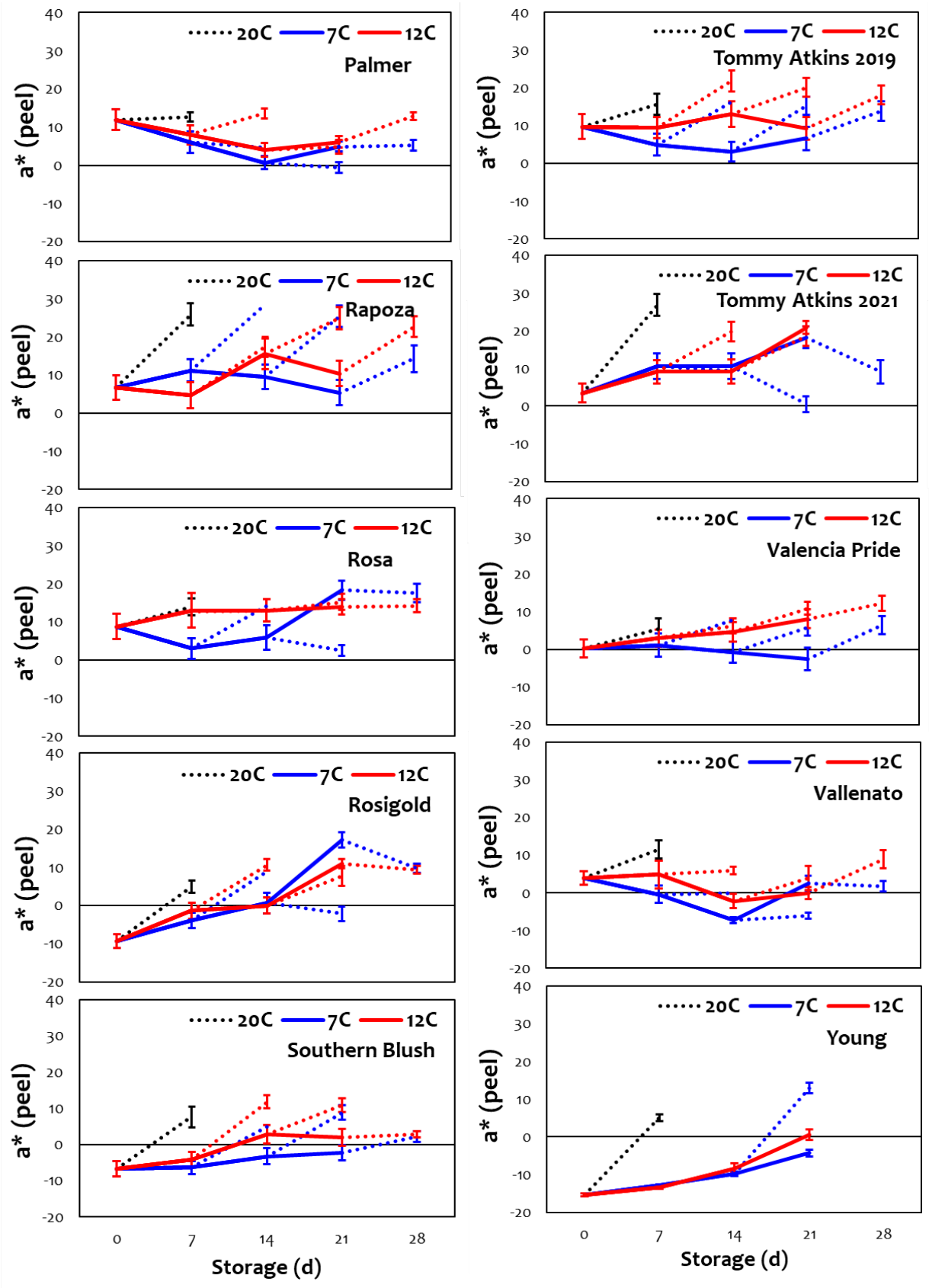

Figure 8. Hot water treatment effect on external (peel) a* value in mango fruit after 1 week at 20°C

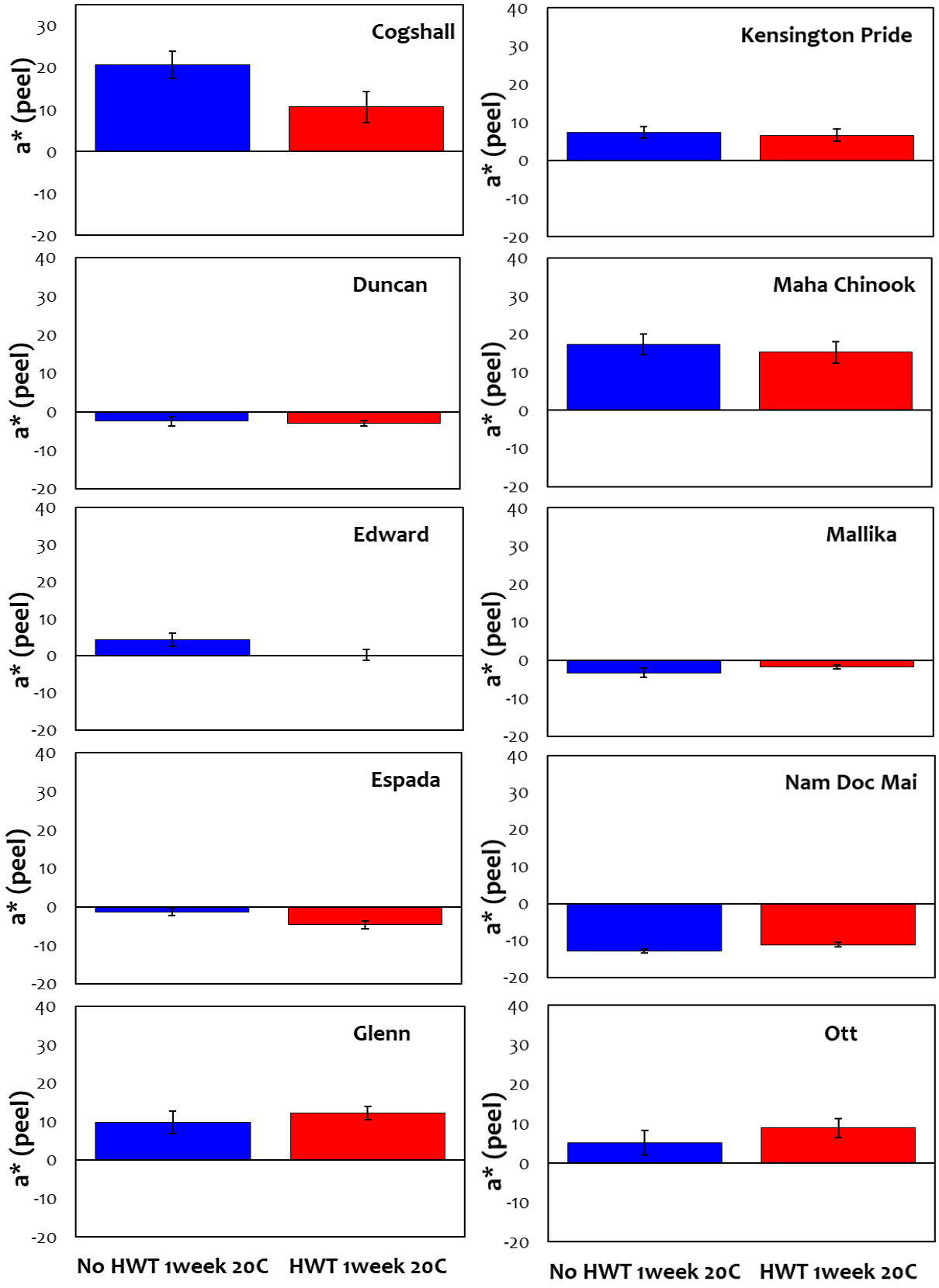

Figure 9. Hot water treatment effect on external (peel) a* value in mango fruit after 1 week at 20°C

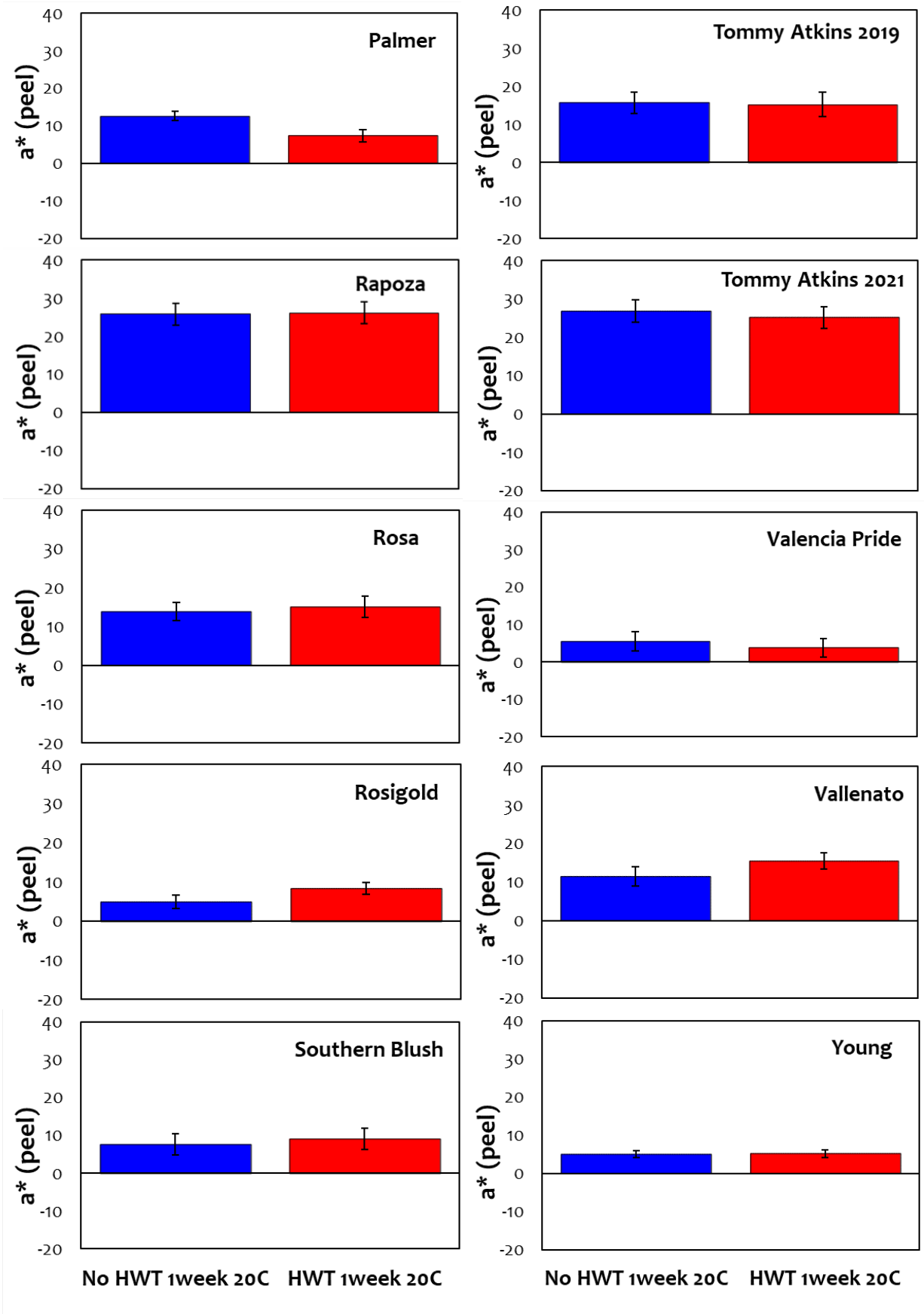

Figure 10. External (peel) b* value changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

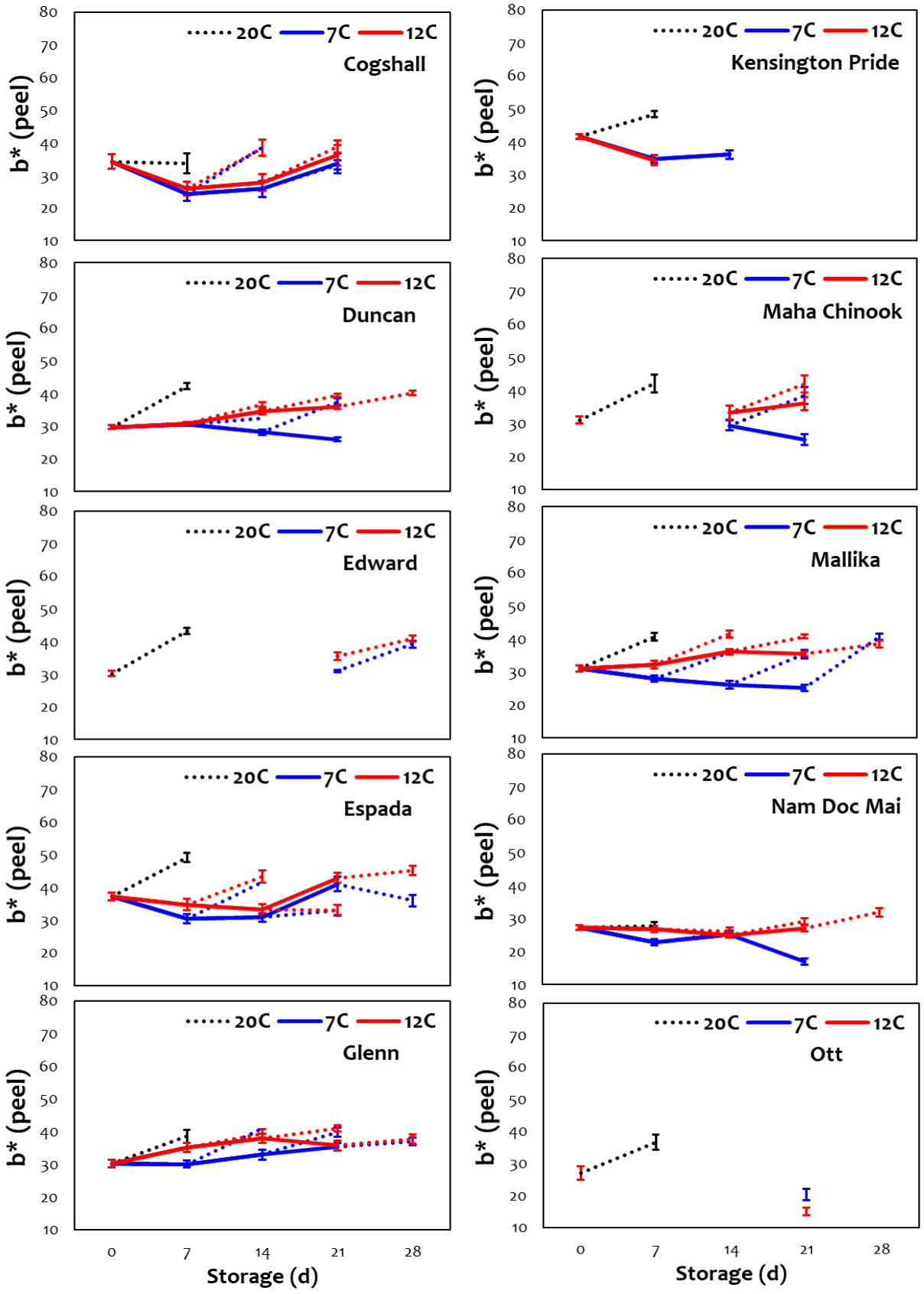

Figure 11. External (peel) b* value changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

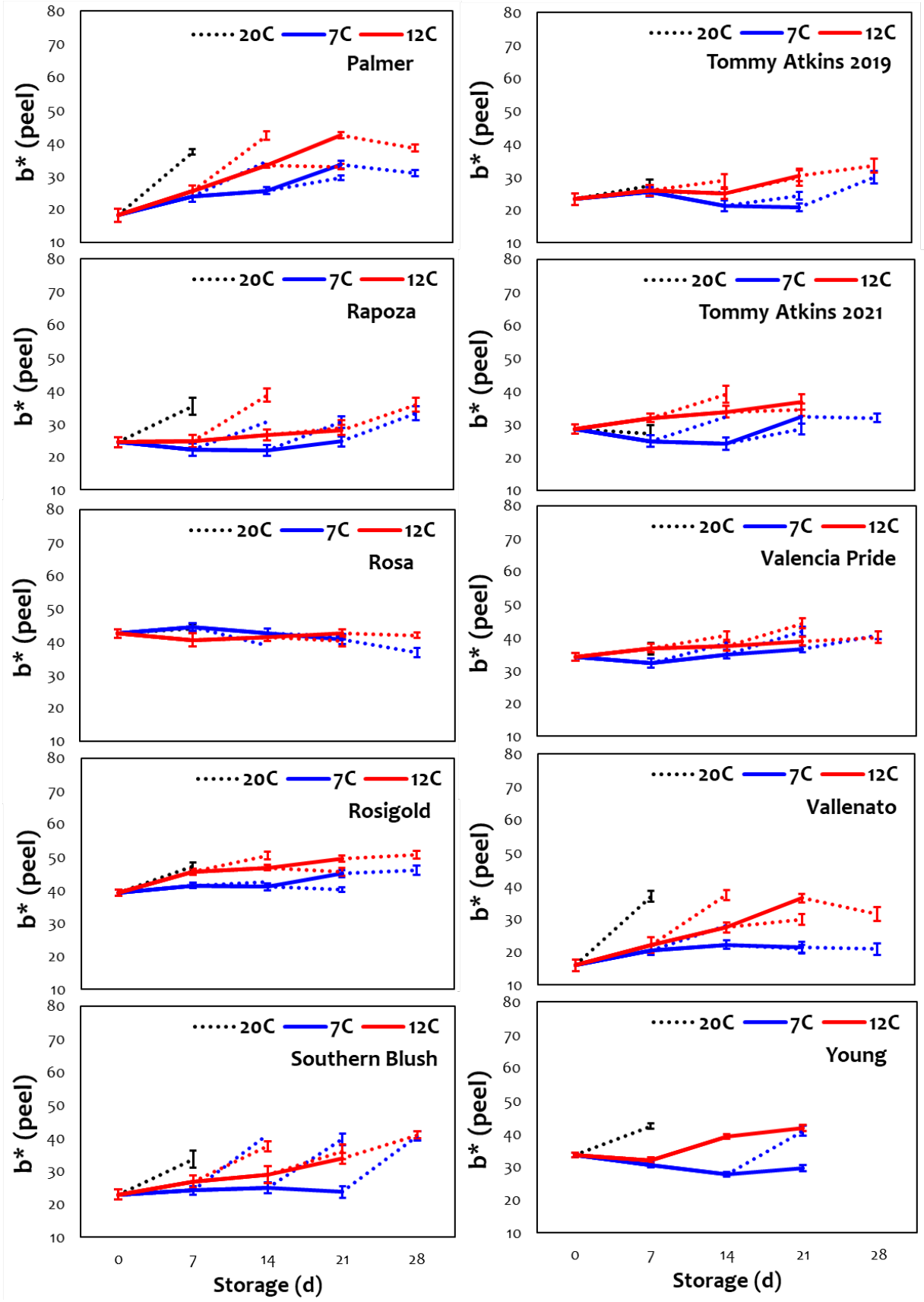

Figure 12. Hot water treatment effect on external (peel) b* value in mango fruit after 1 week at 20°C

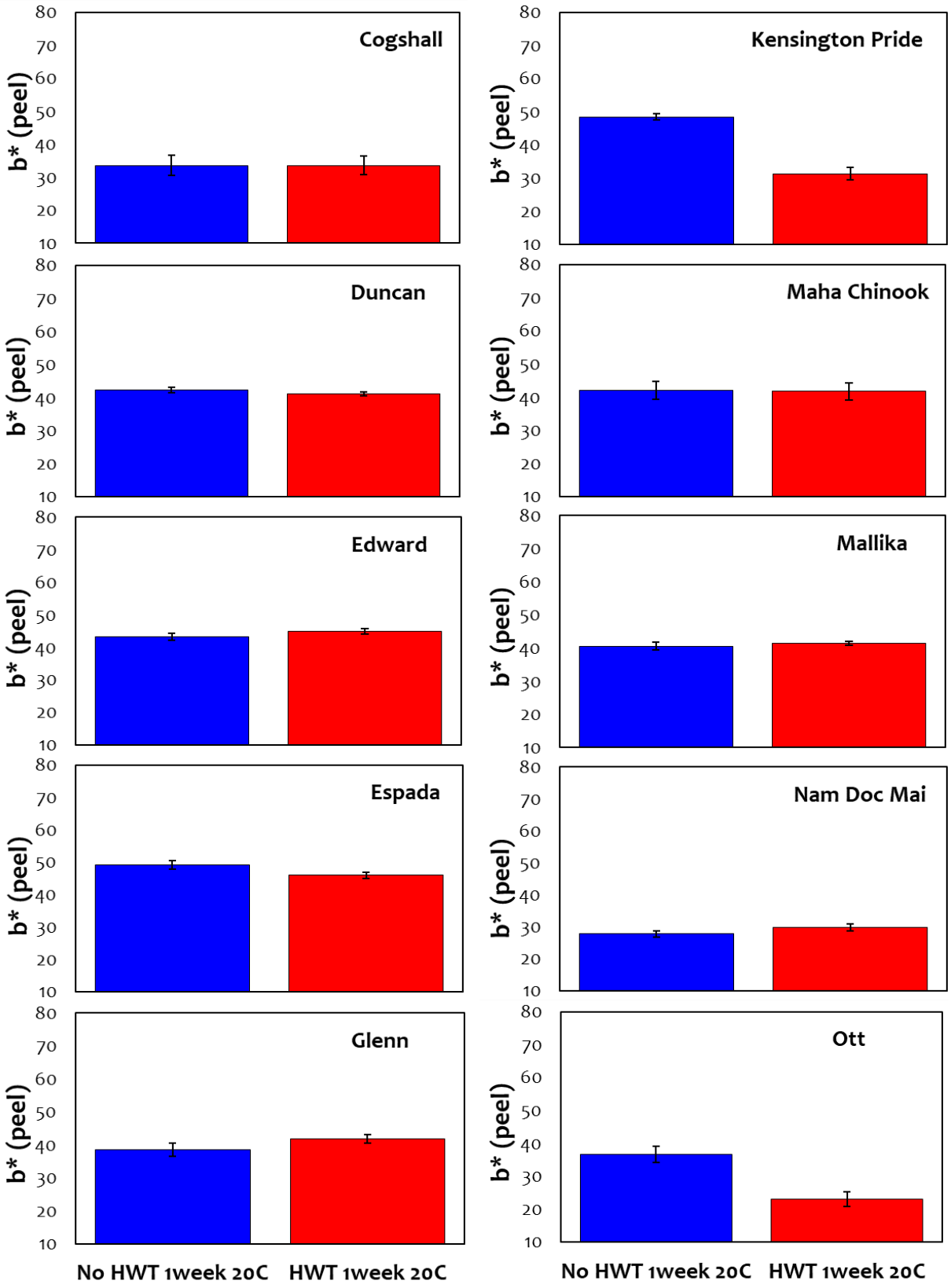

Figure 13. Hot water treatment effect on external (peel) b* value in mango fruit after 1 week at 20°C

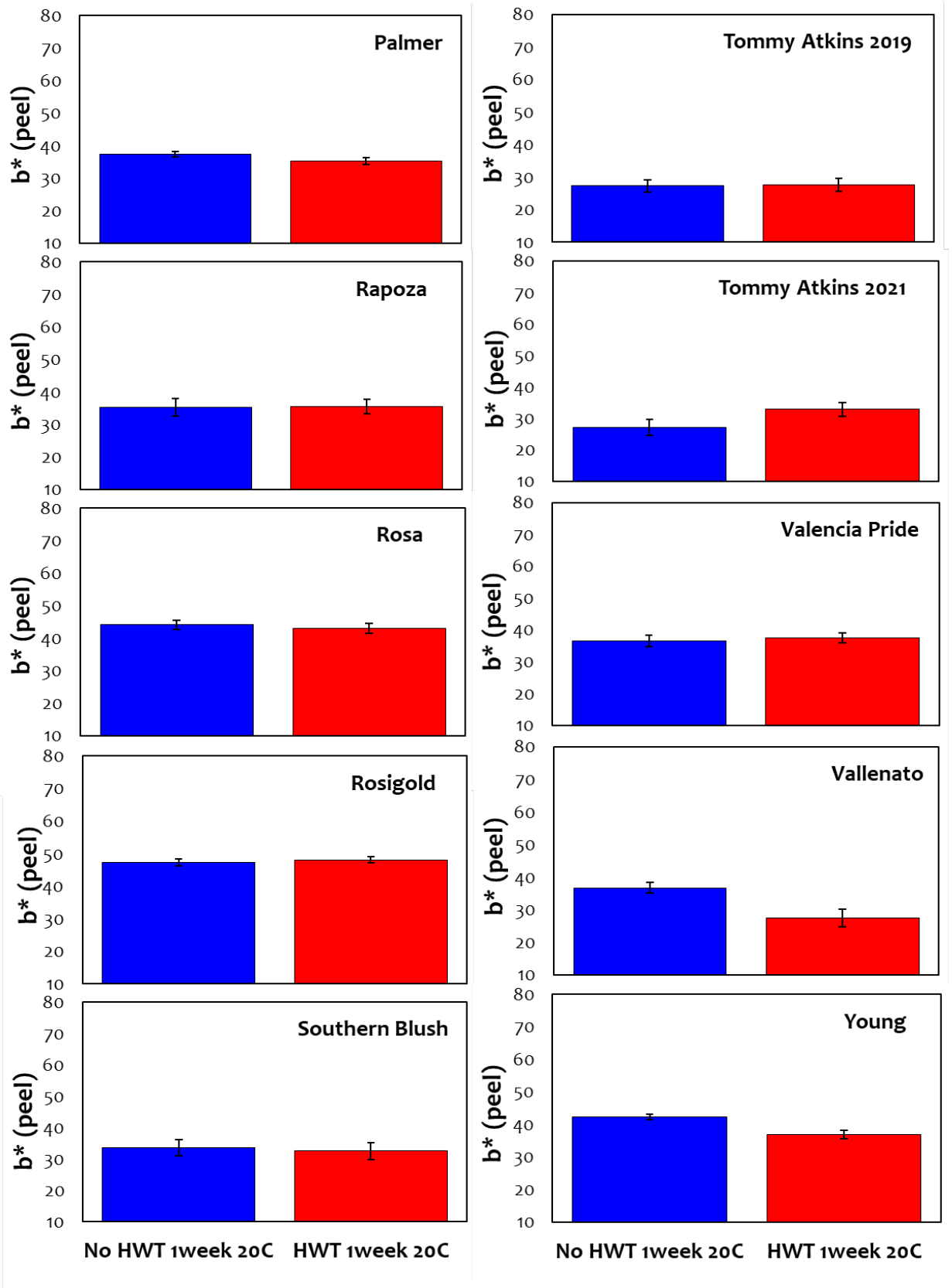

Figure 14. External (peel) chroma changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

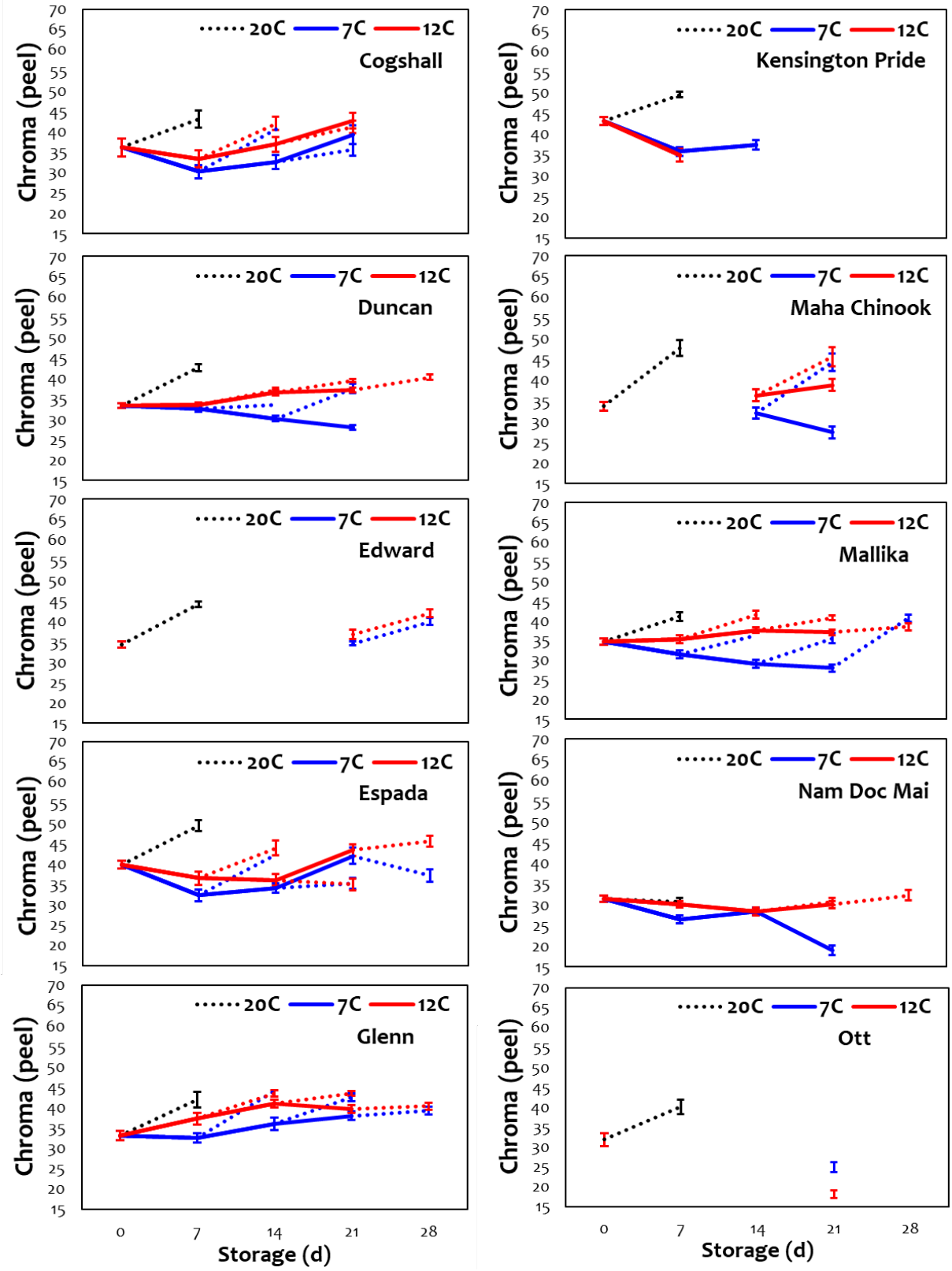

Figure 15. External (peel) chroma changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

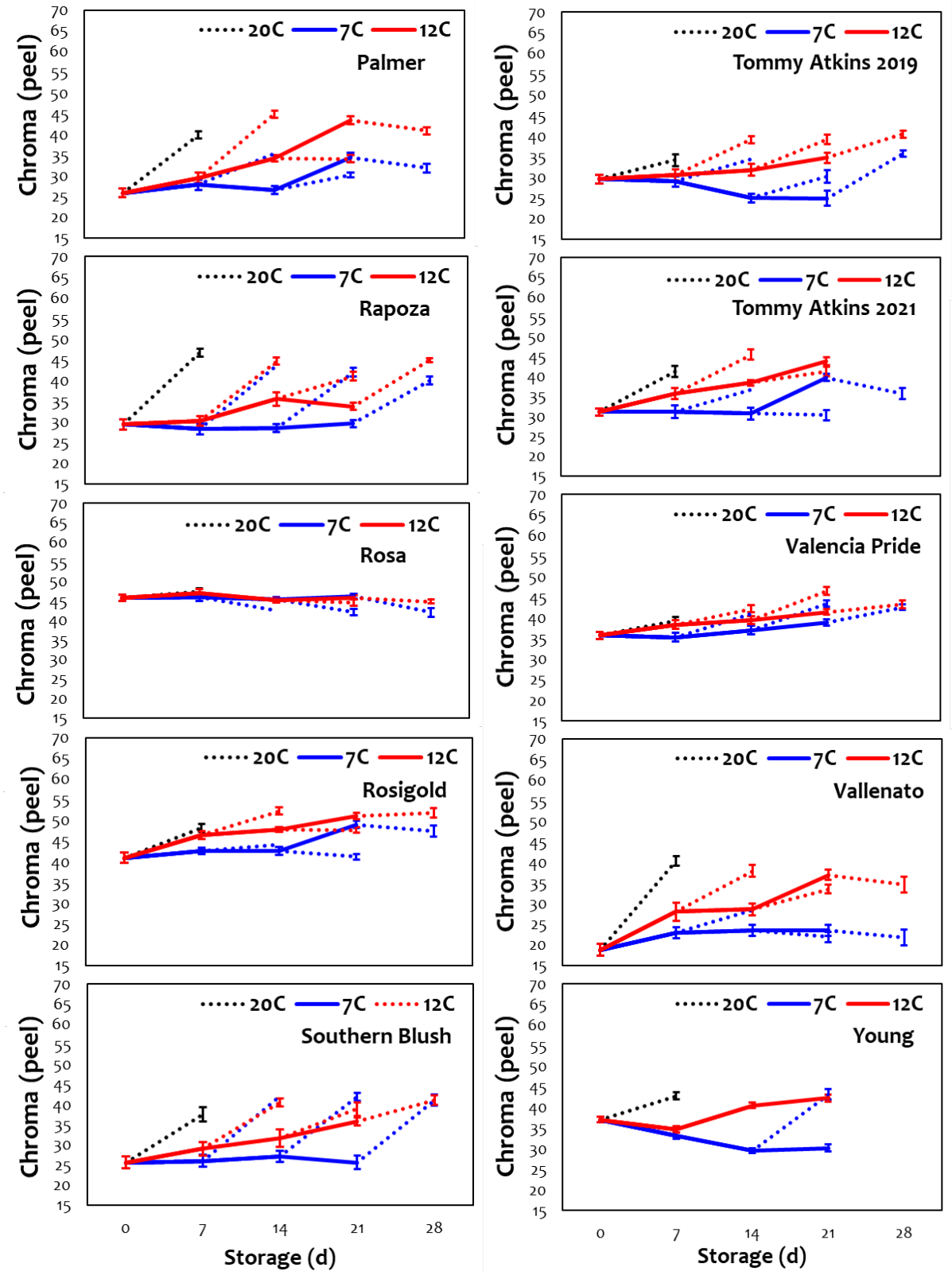

Figure 16. Hot water treatment effect on external (peel) chroma in mango fruit after 1 week at 20°C

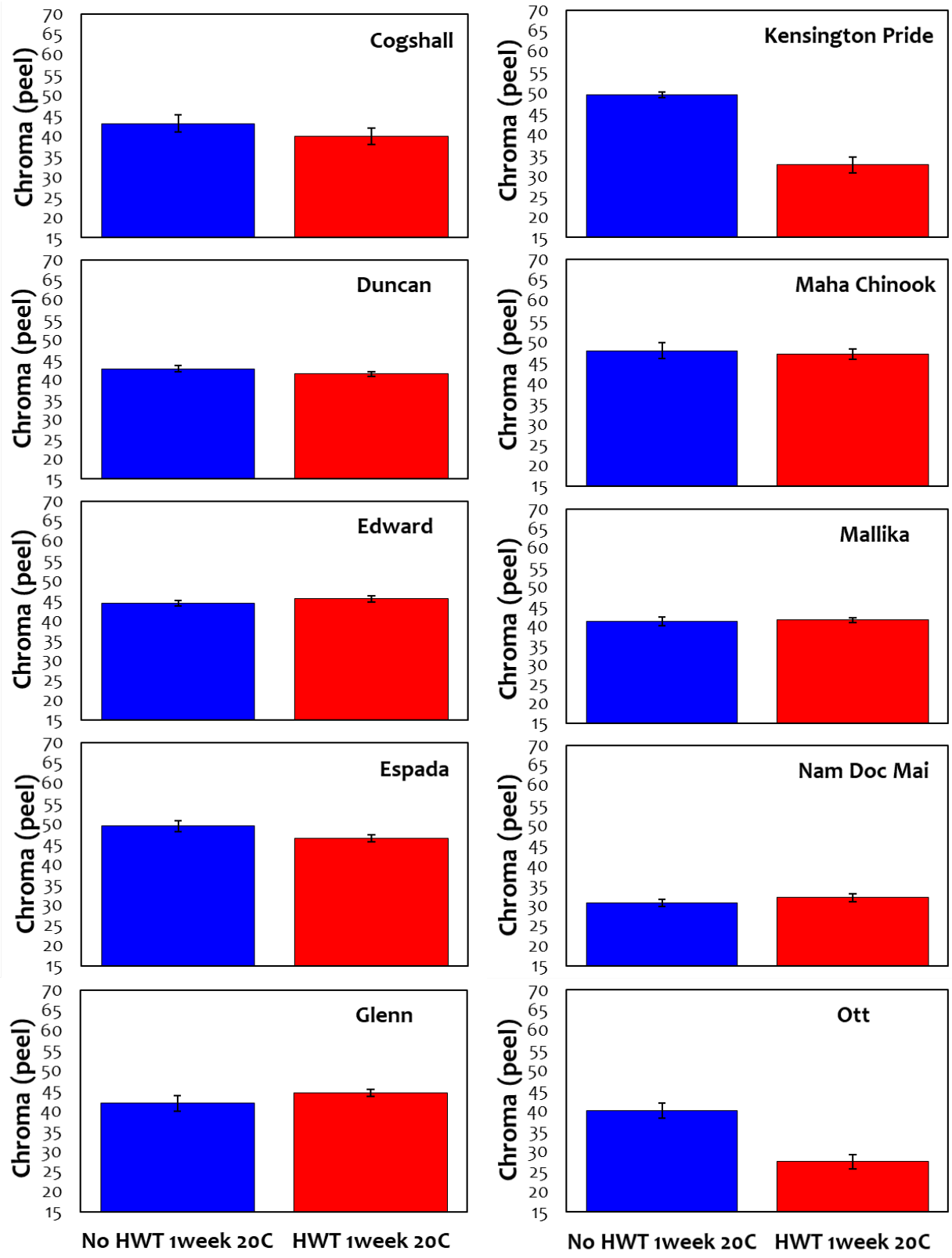

Figure 17. Hot water treatment effect on external (peel) chroma in mango fruit after 1 week at 20°C

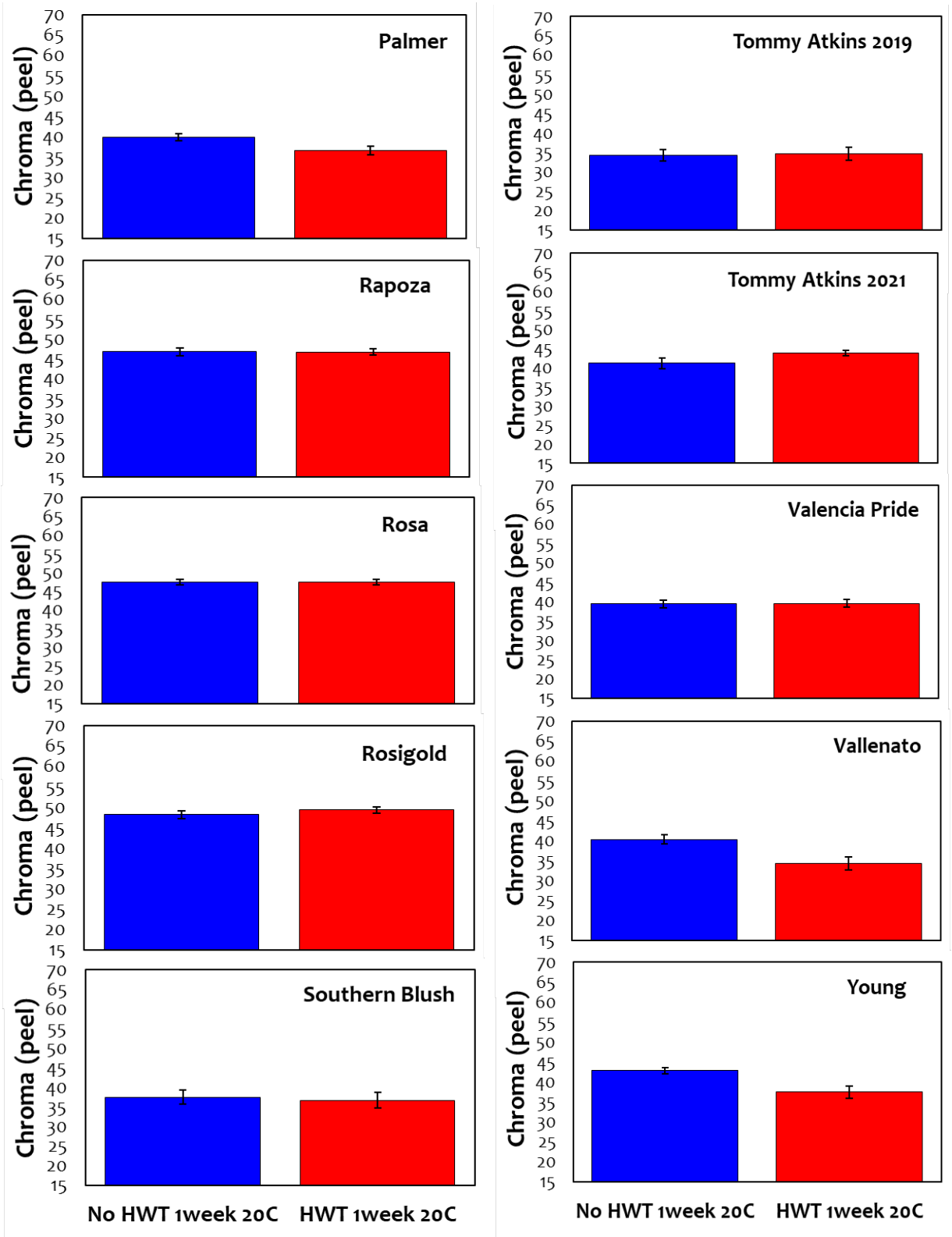

Figure 18. External (peel) hue angle changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

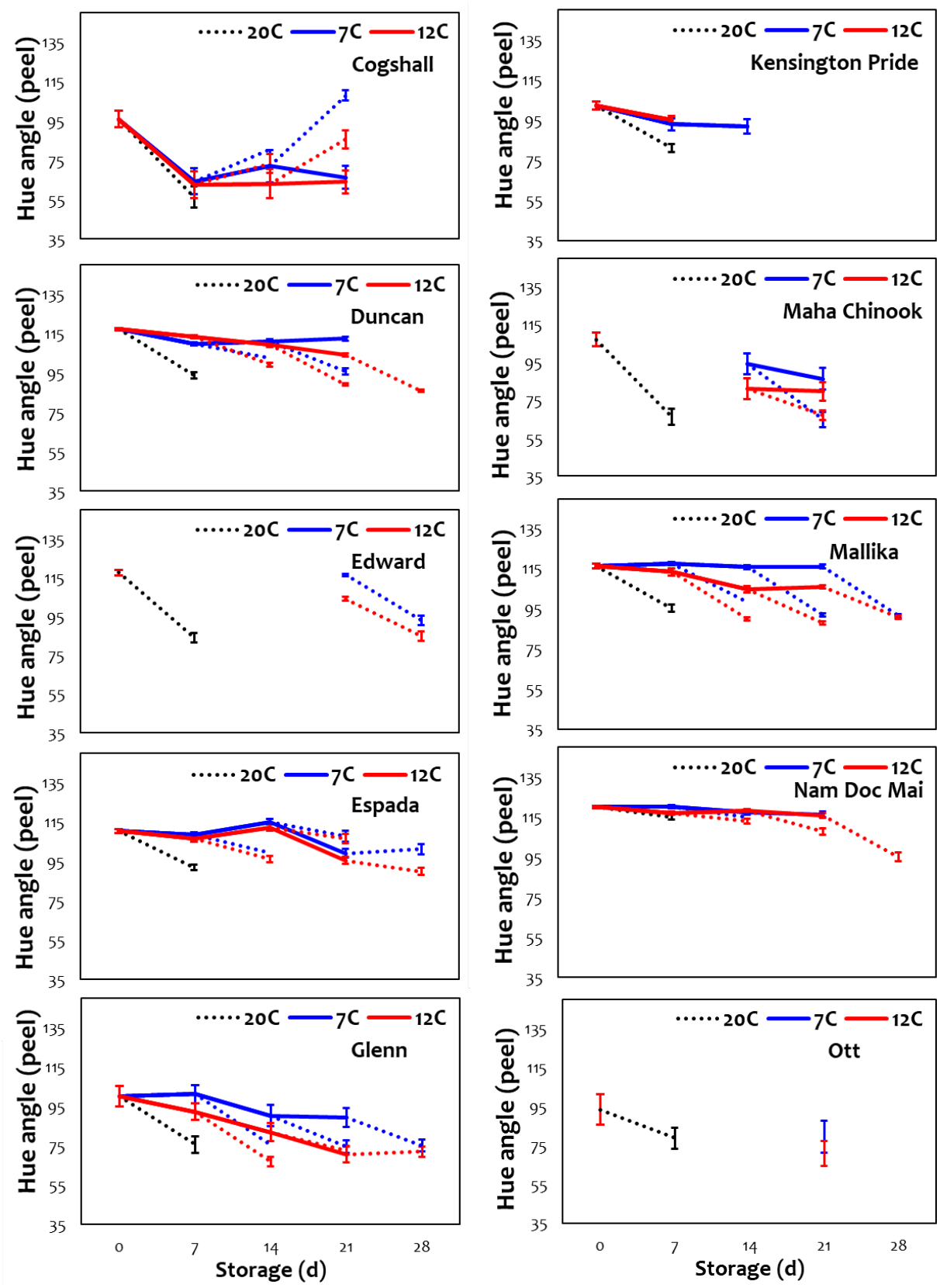

Figure 19. External (peel) hue angle changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

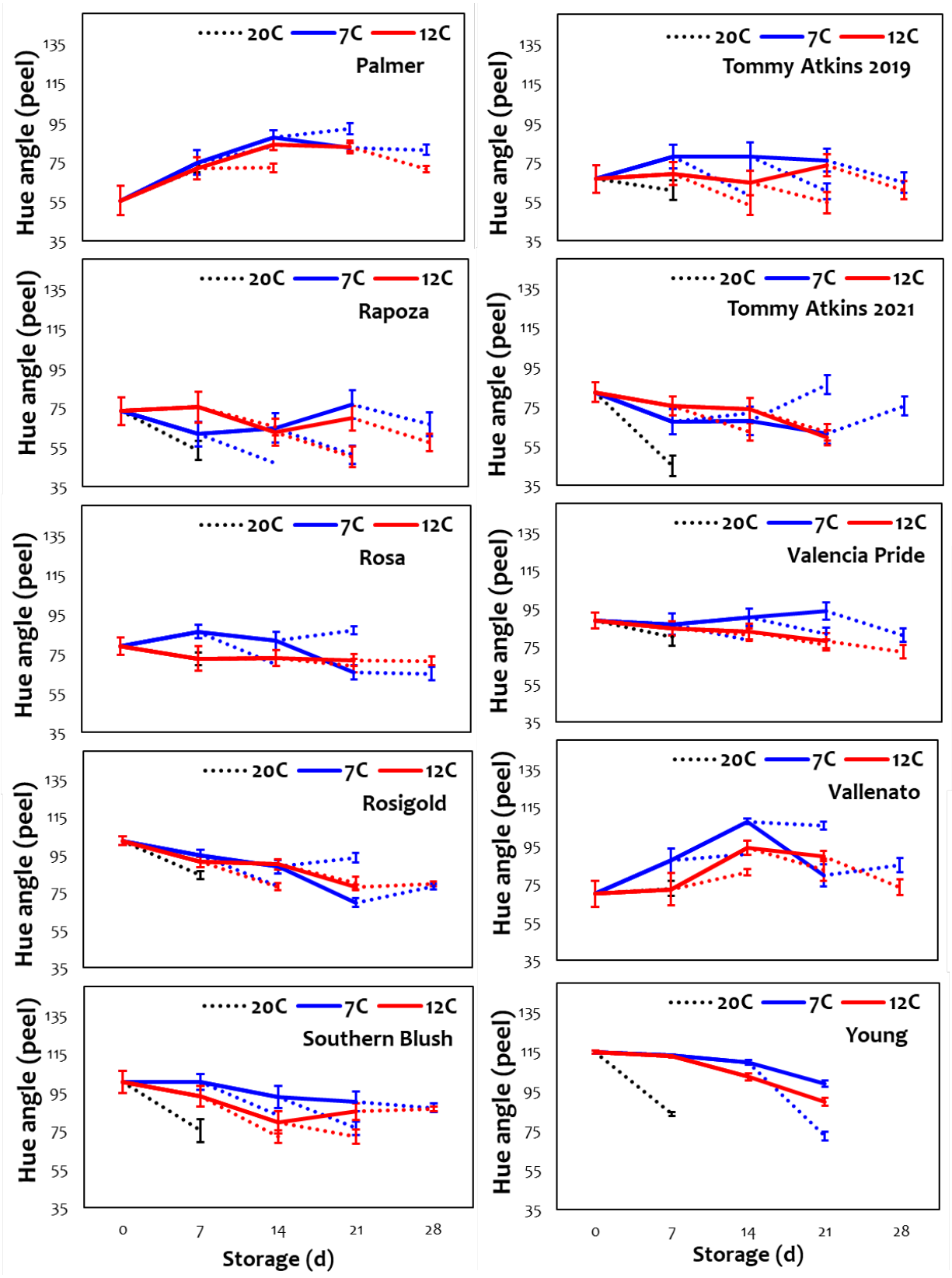

Figure 20. Hot water treatment effect on external (peel) hue angle in mango fruit after 1 week at 20°C

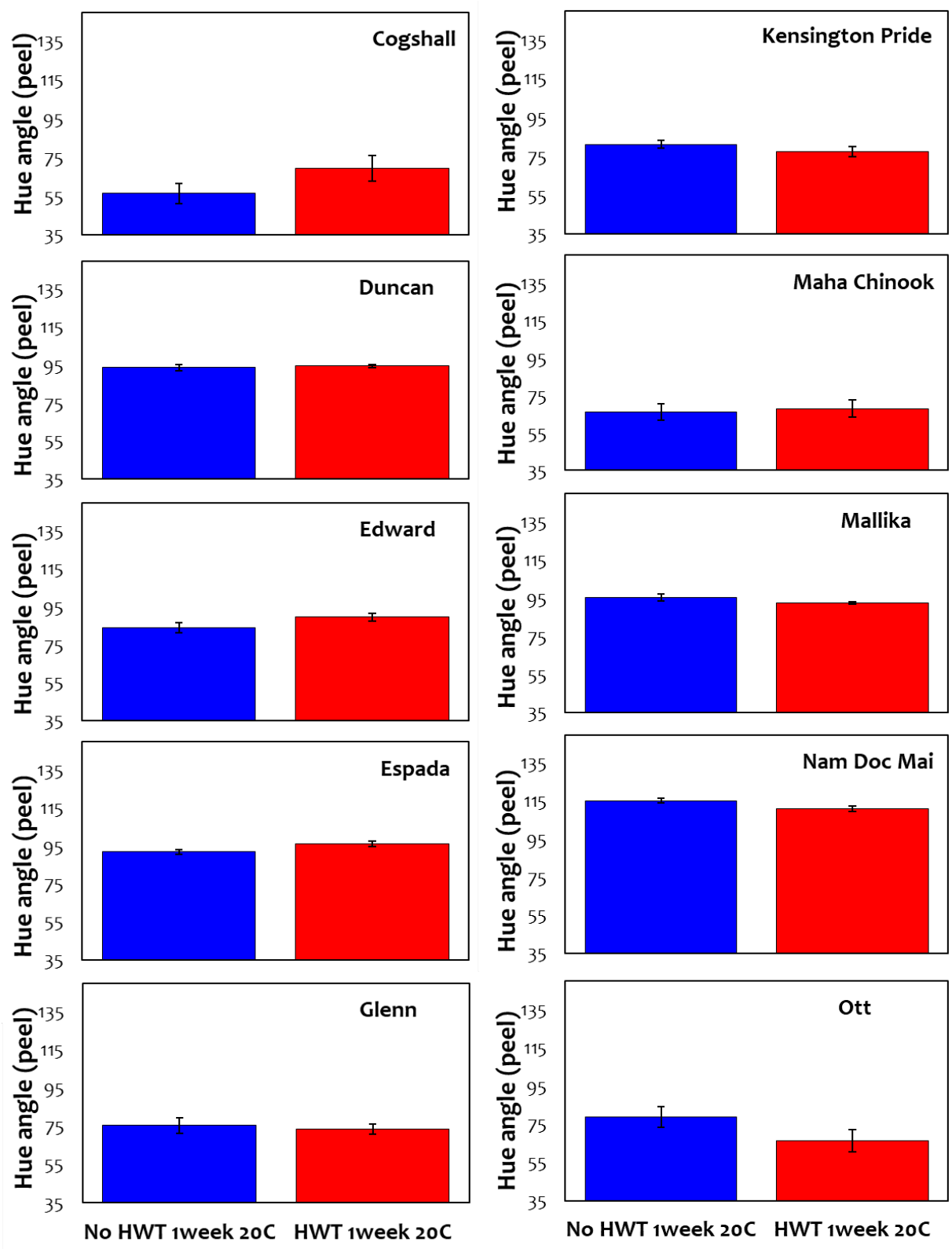

Figure 21. Hot water treatment effect on external (peel) hue angle in mango fruit after 1 week at 20°C

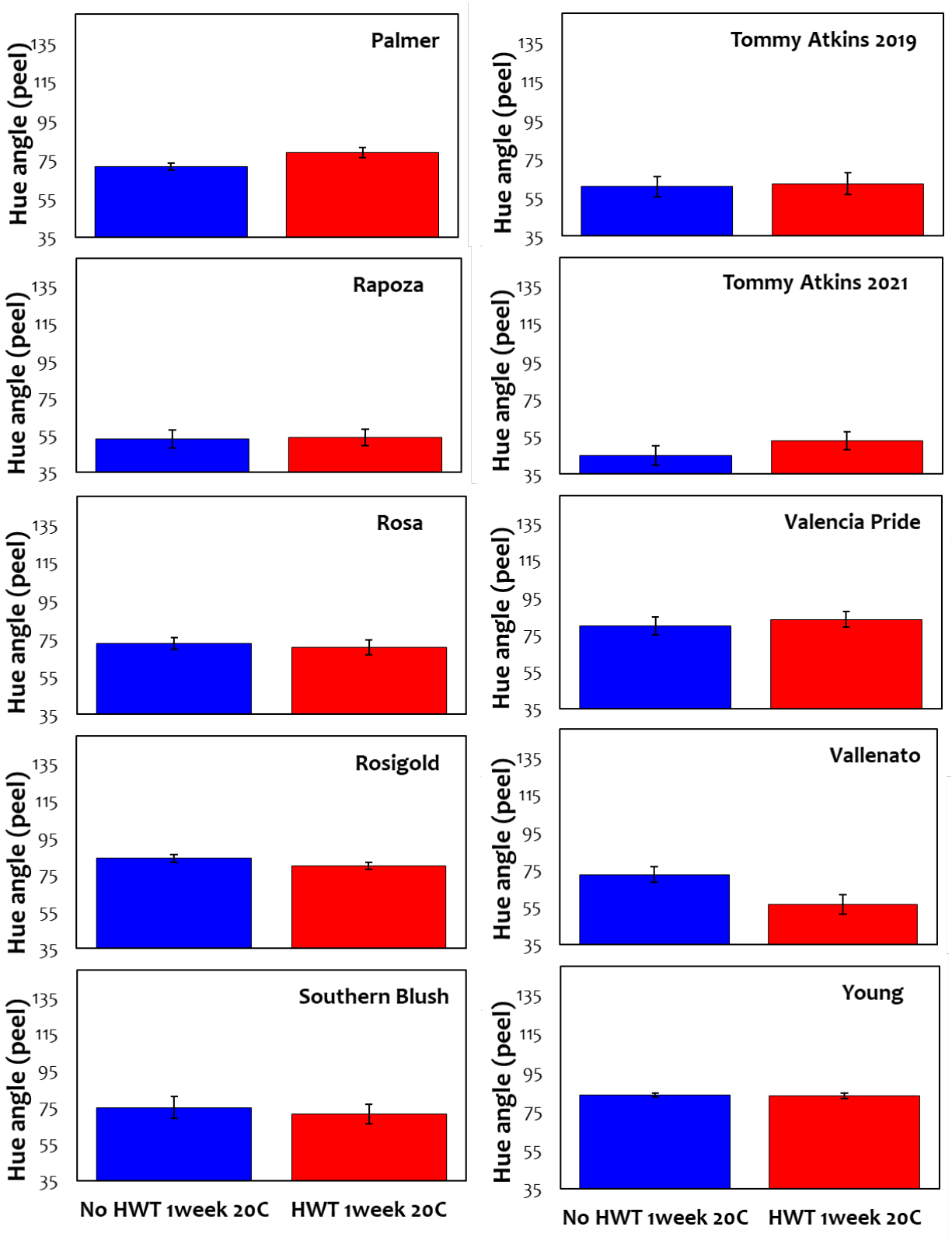

Figure 22. Firmness (compression) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

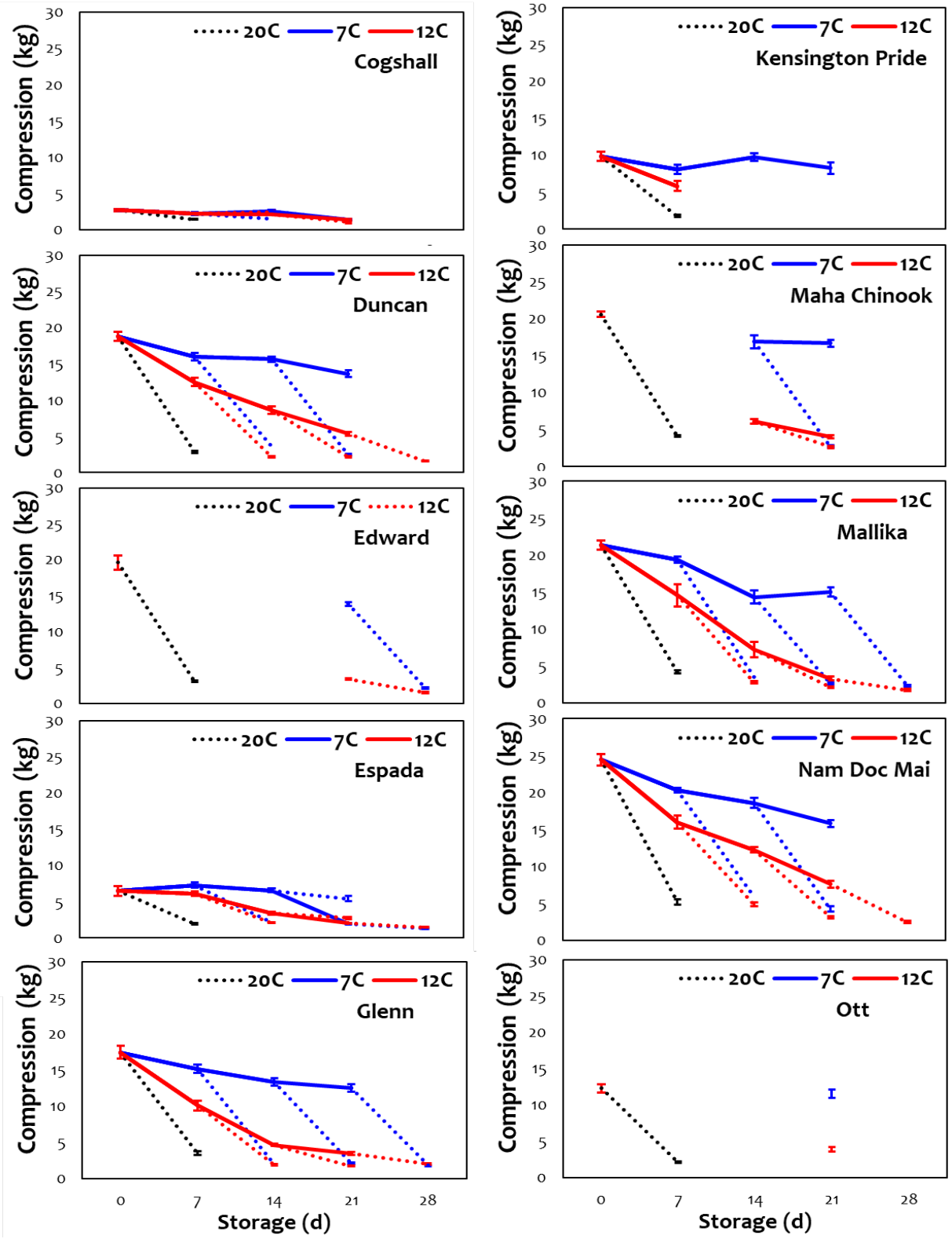

Figure 23. Firmness (compression) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

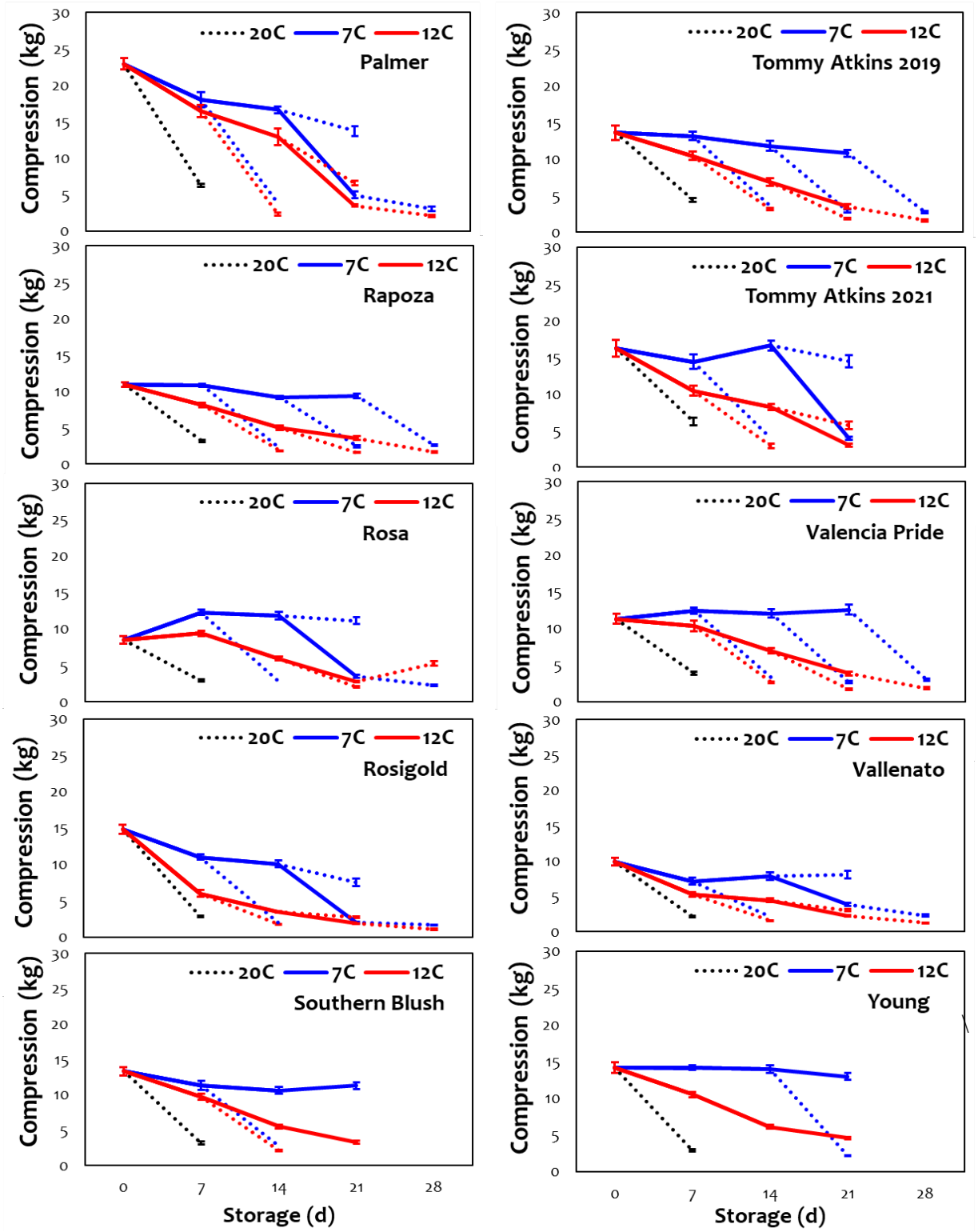

Figure 24. Hot water treatment effect on firmness (compression) in mango fruit after 1 week at 20°C

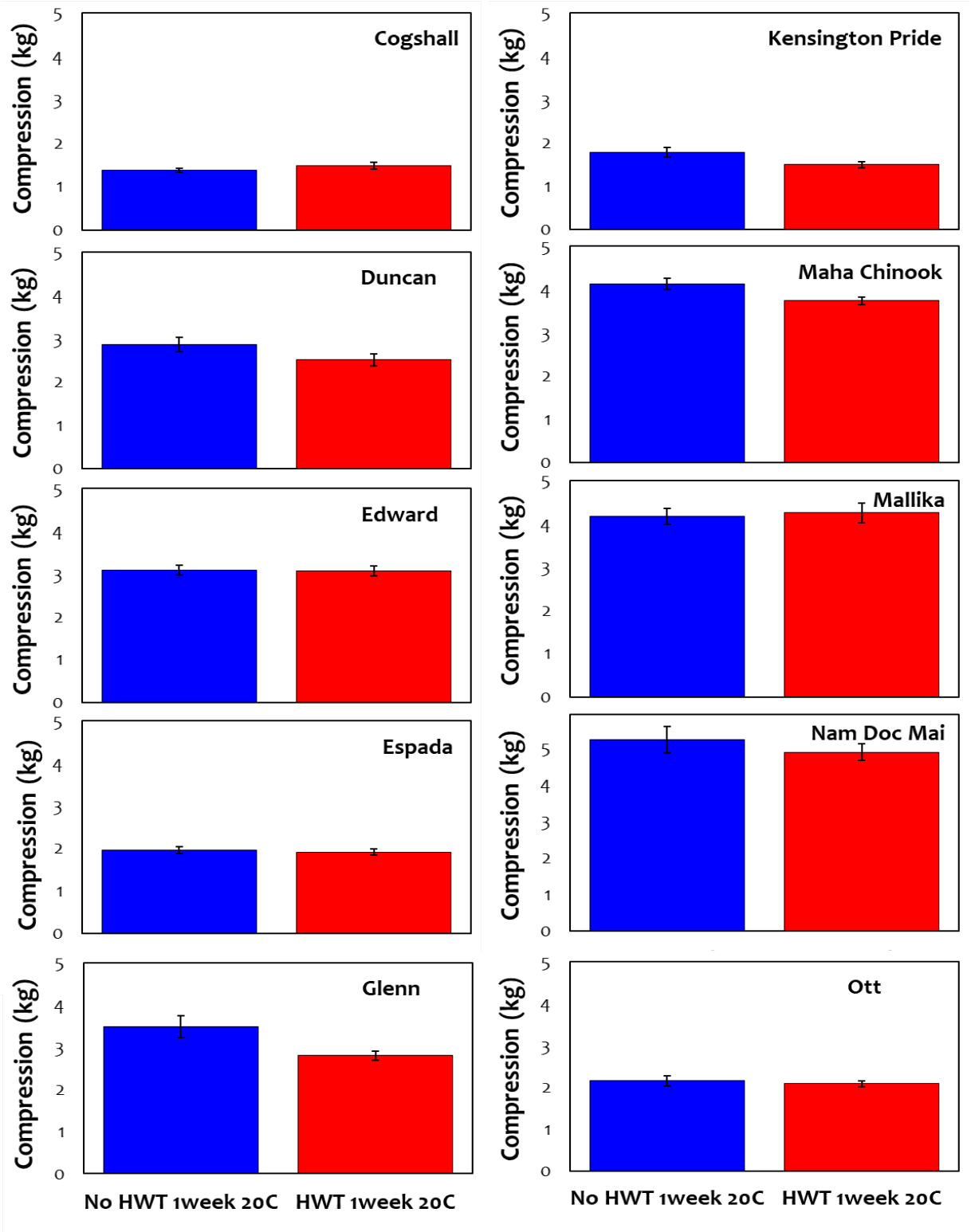

Figure 25. Hot water treatment effect on firmness (compression) in mango fruit after 1 week at 20°C

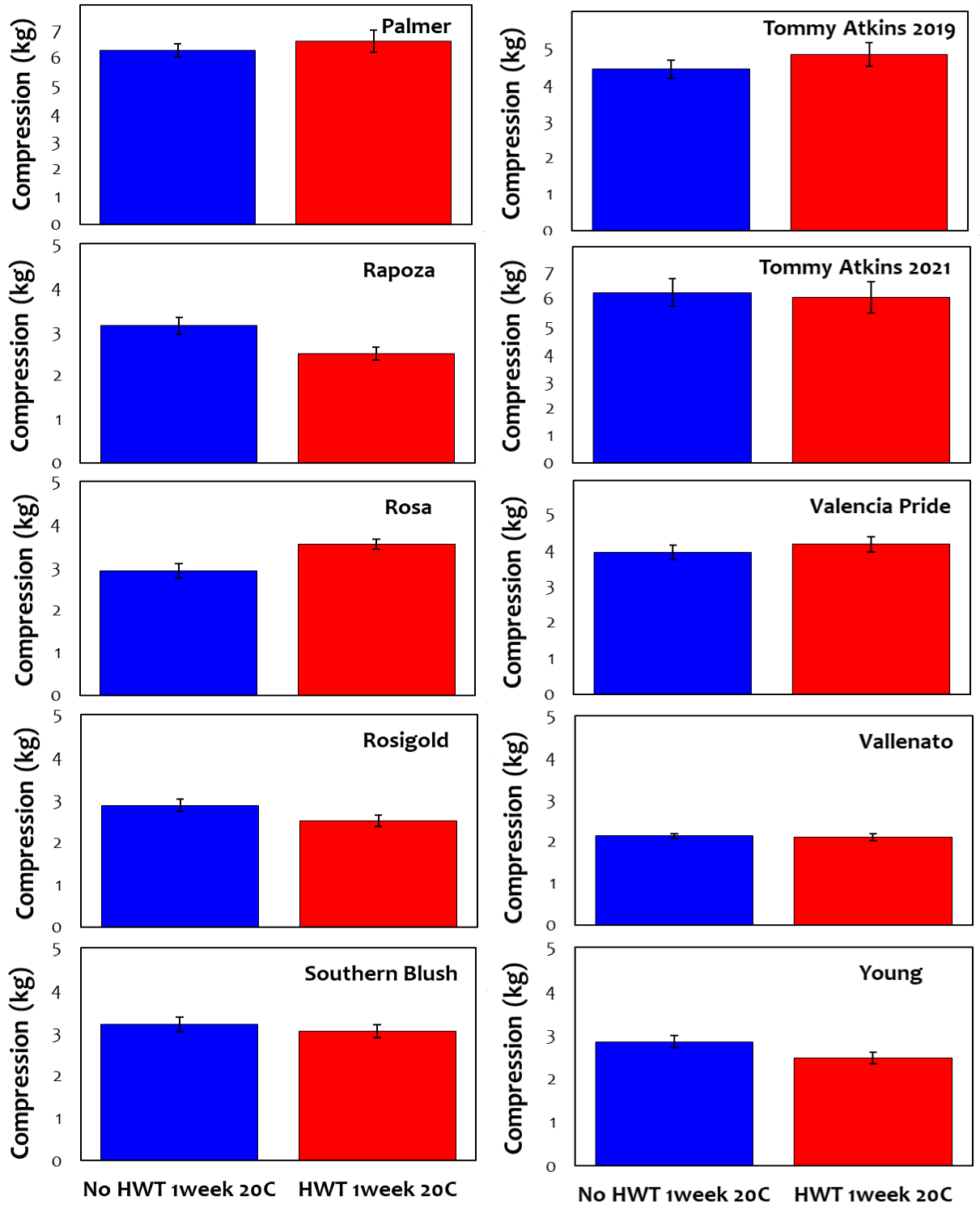

Figure 26. Firmness (puncture) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

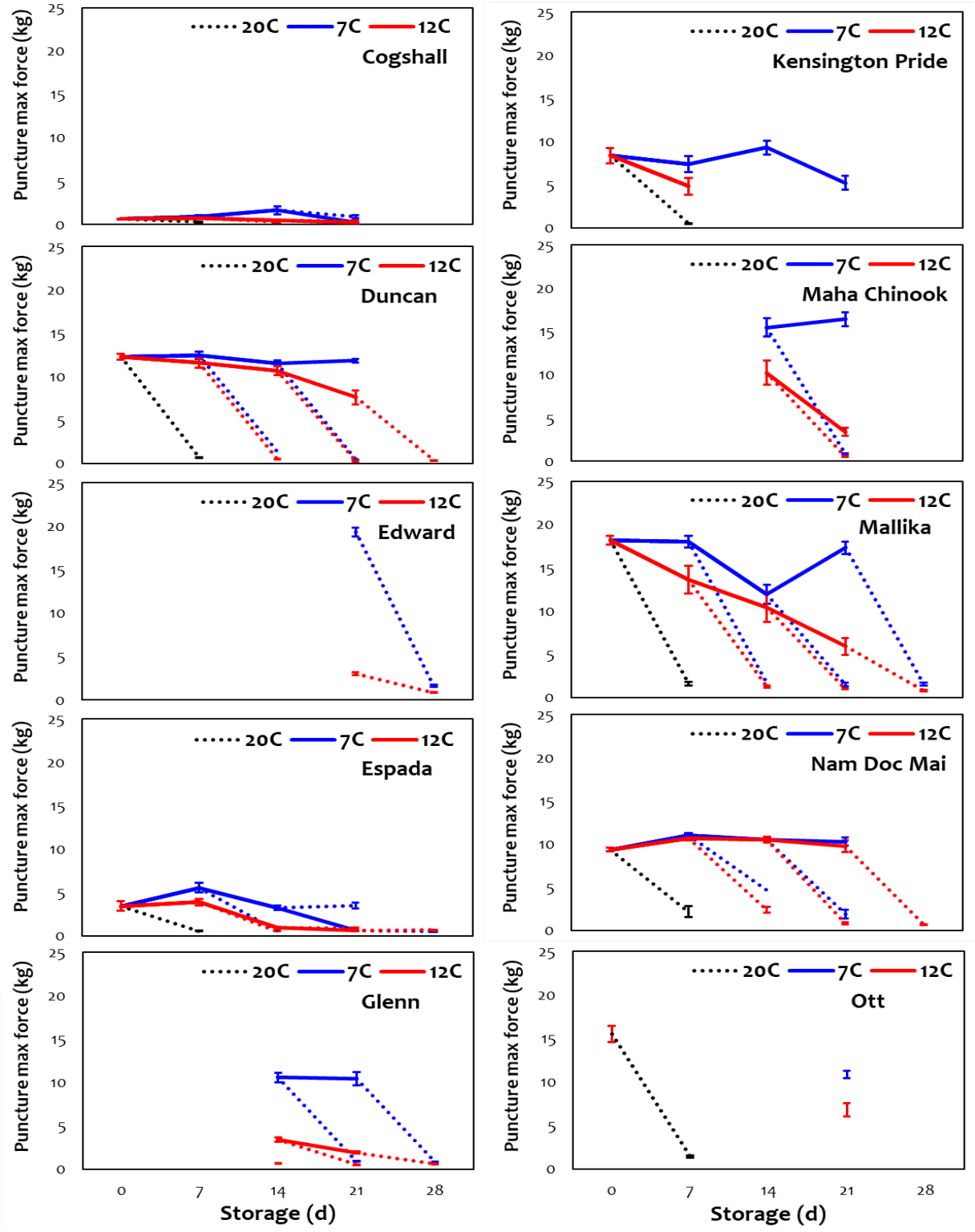

Figure 27. Firmness (puncture) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

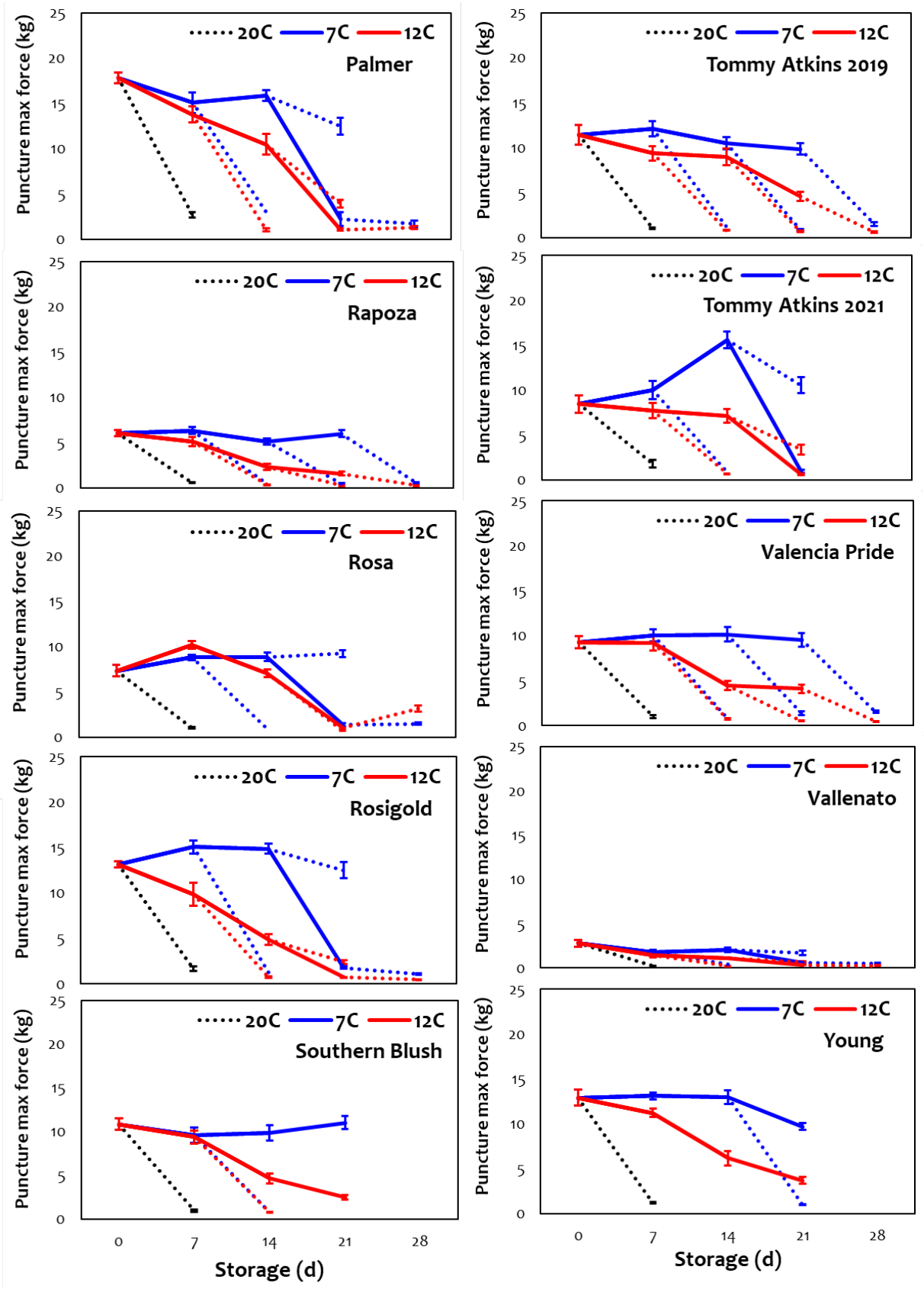

Figure 28. Hot water treatment effect on firmness (puncture) in mango fruit after 1 week at 20°C

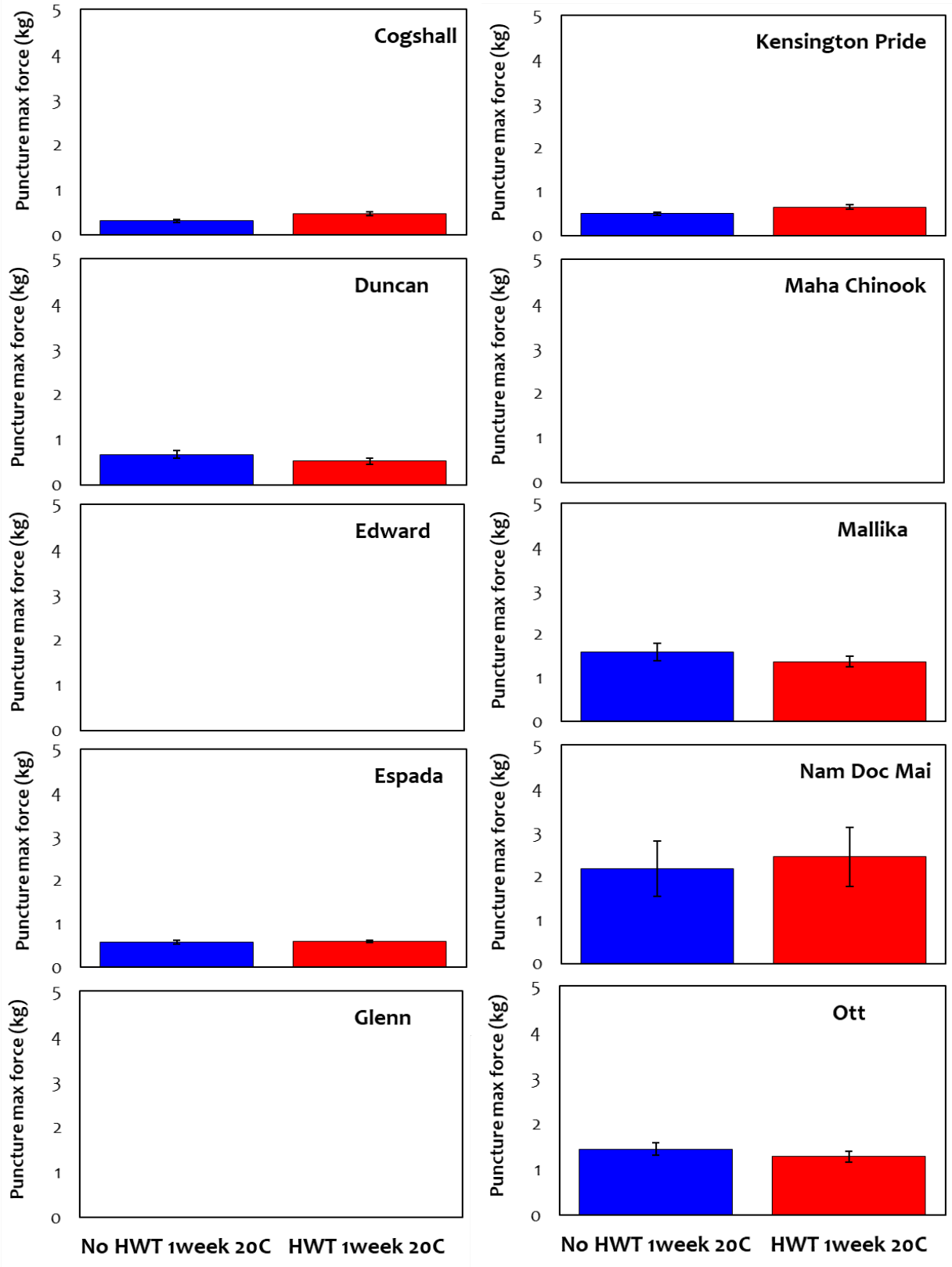

Figure 29. Hot water treatment effect on firmness (puncture) in mango fruit after 1 week at 20°C

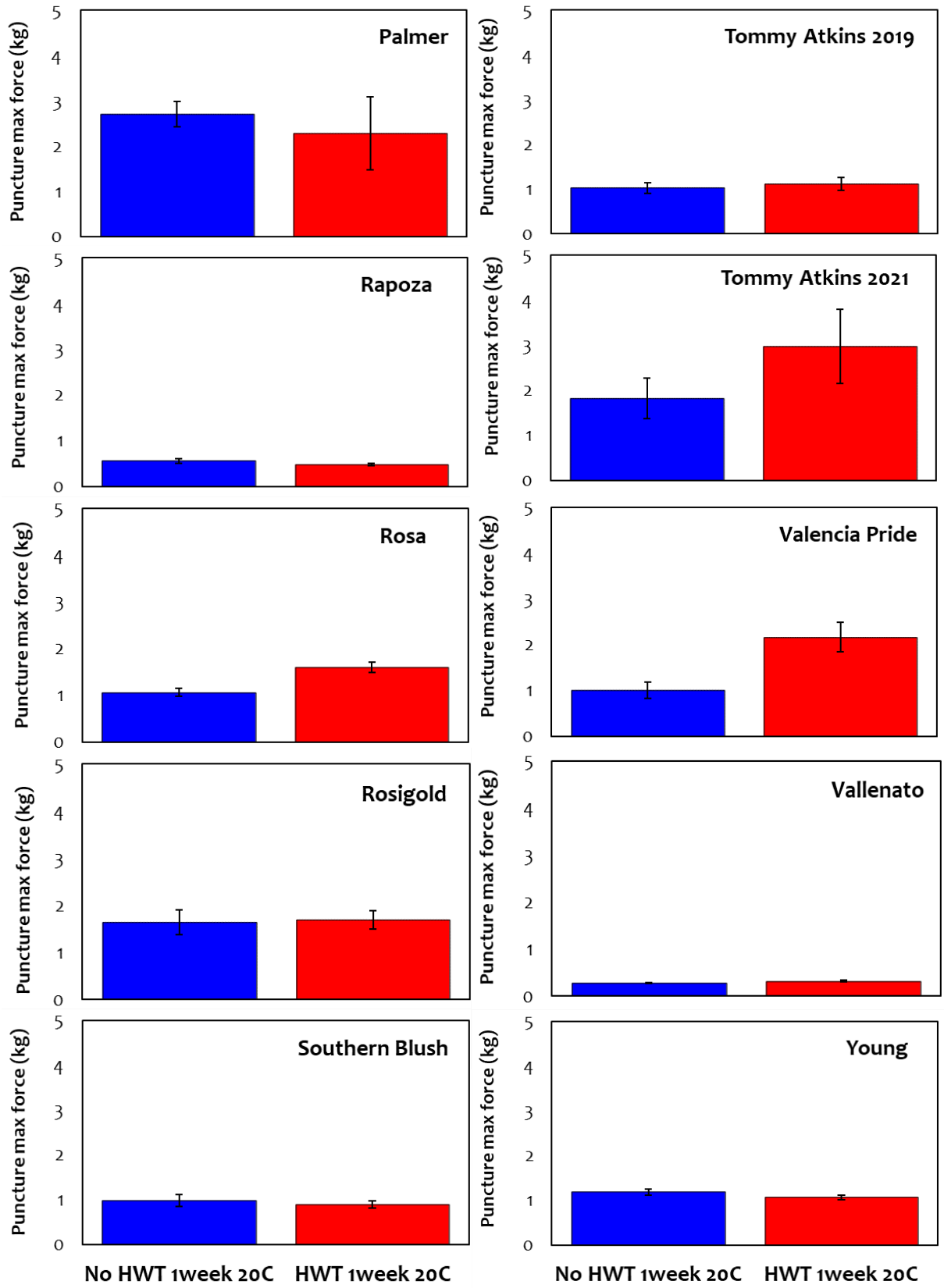

Figure 30. Percent chilling injury (CI) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

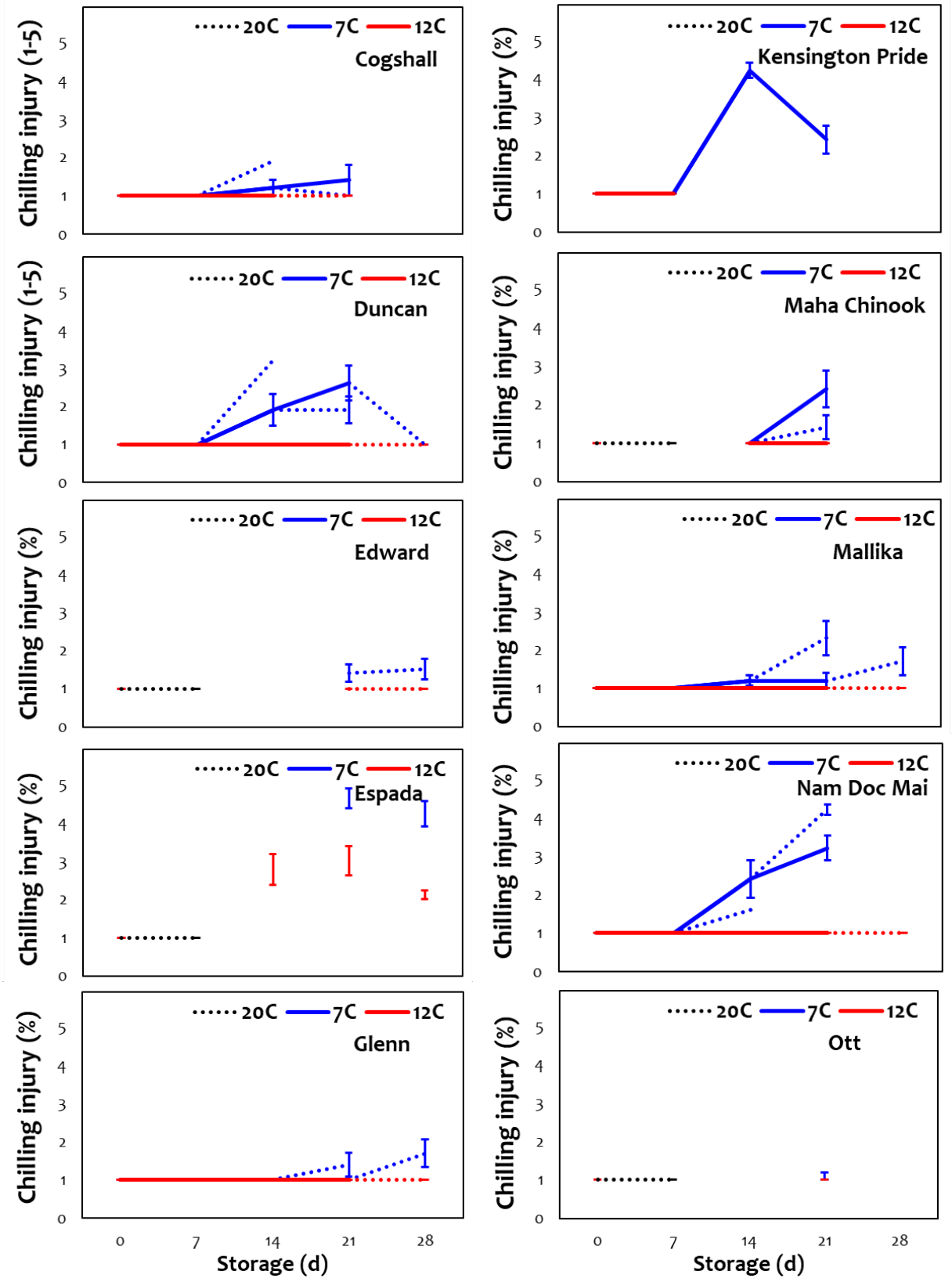

Figure 31. Percent chilling injury (CI) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

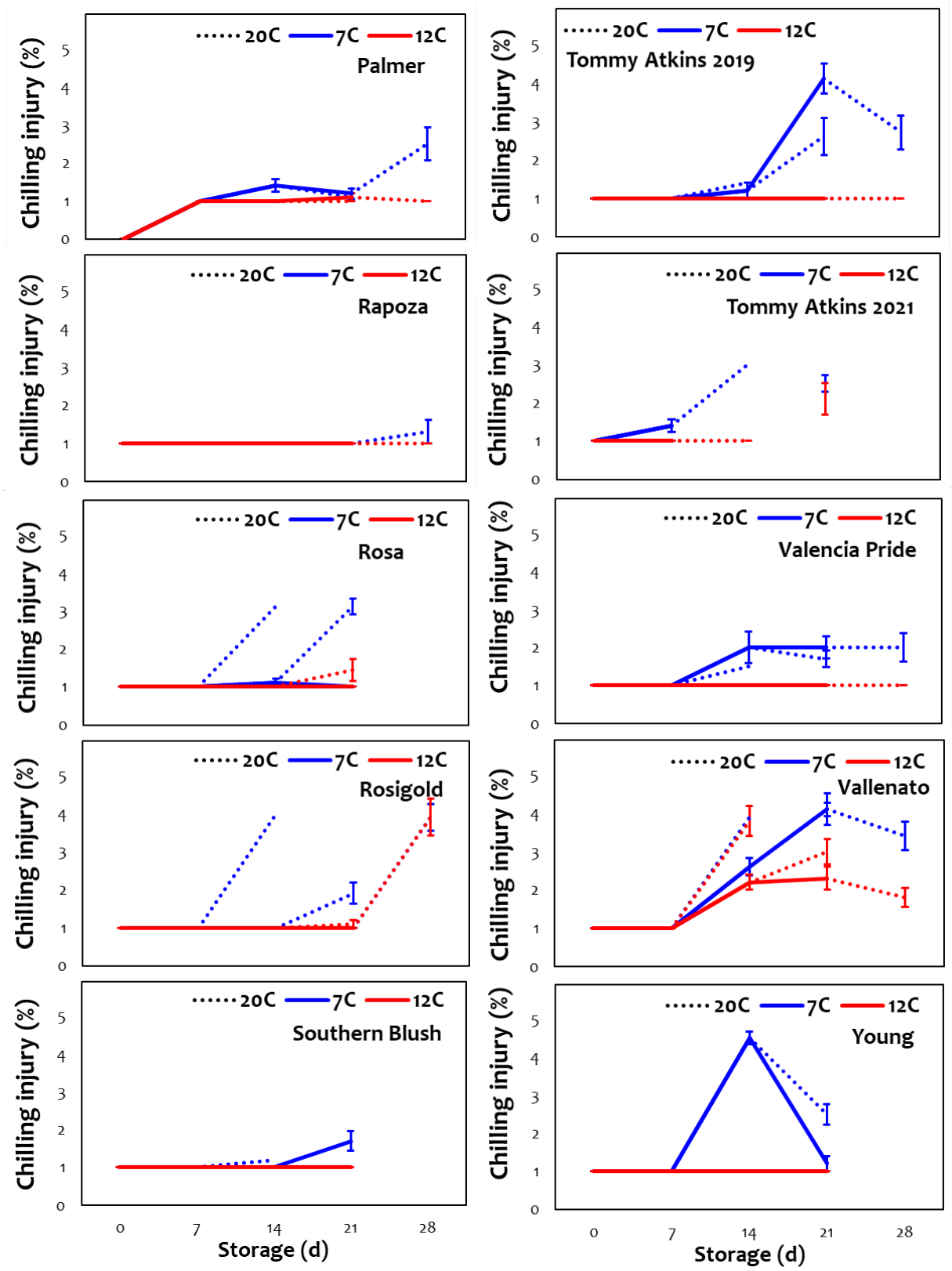

Figure 32. Percent disease incidence (DI) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

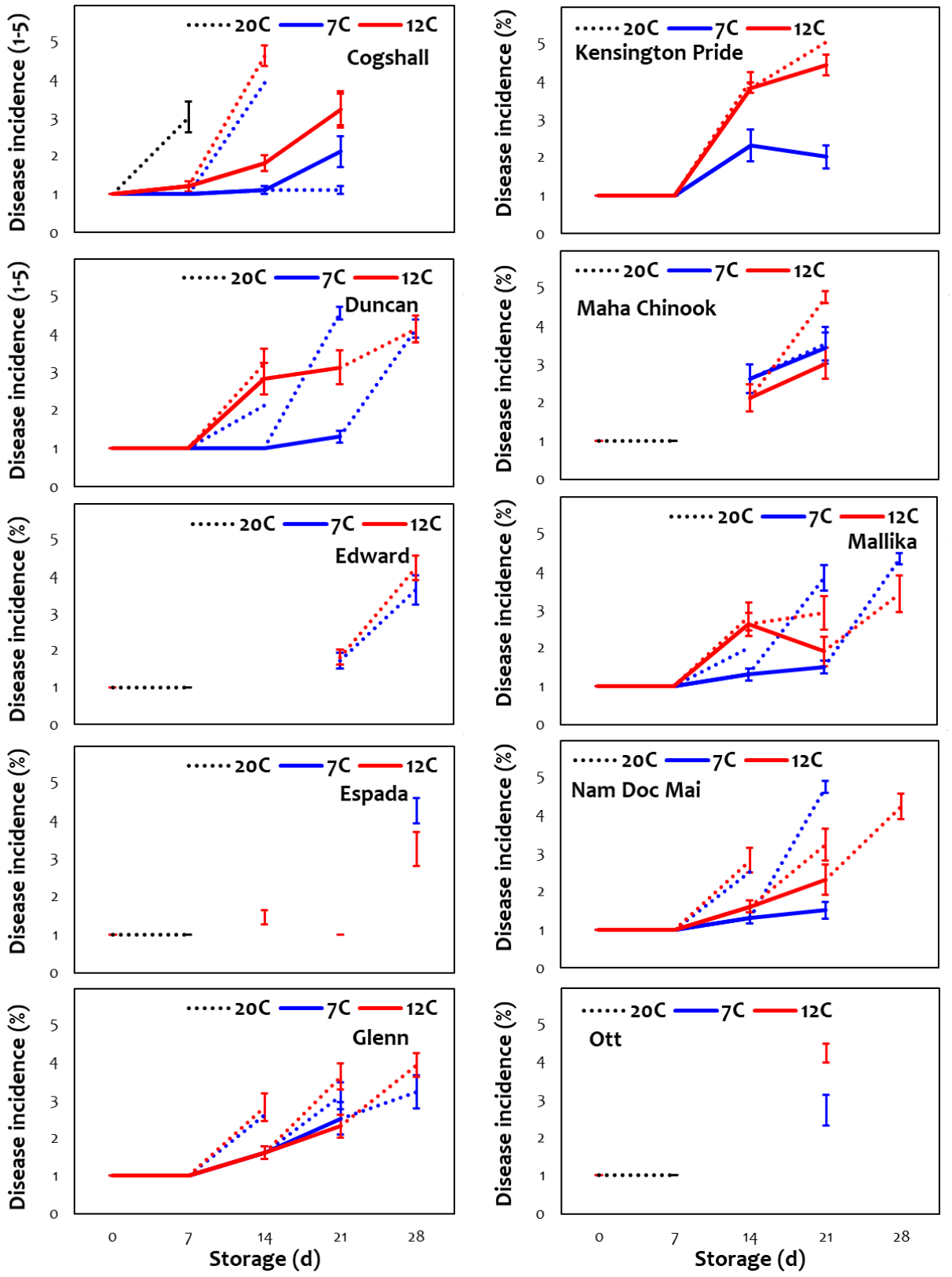

Figure 33. Percent disease incidence (DI) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

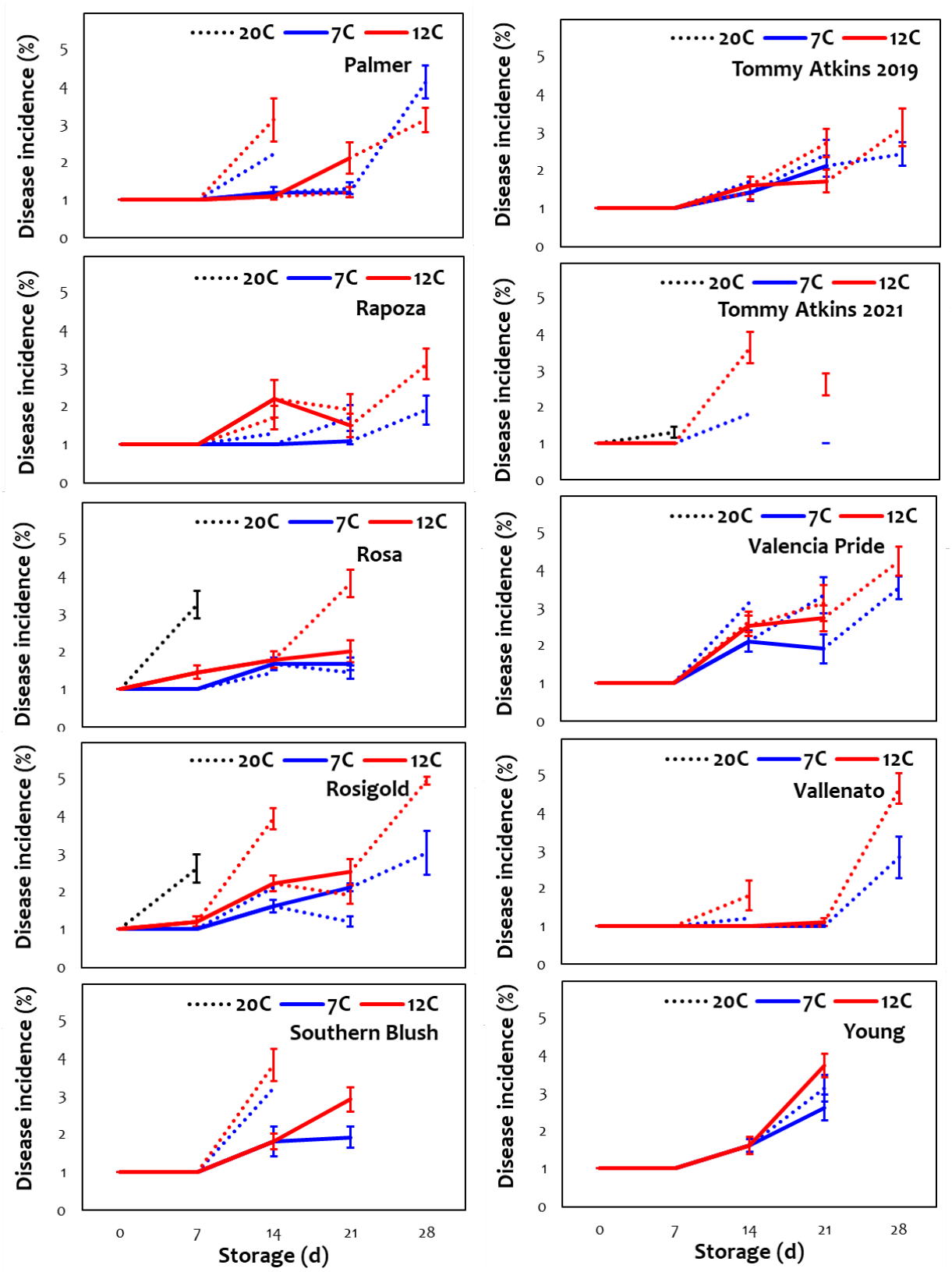

Figure 34. Percent heat injury (HI) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

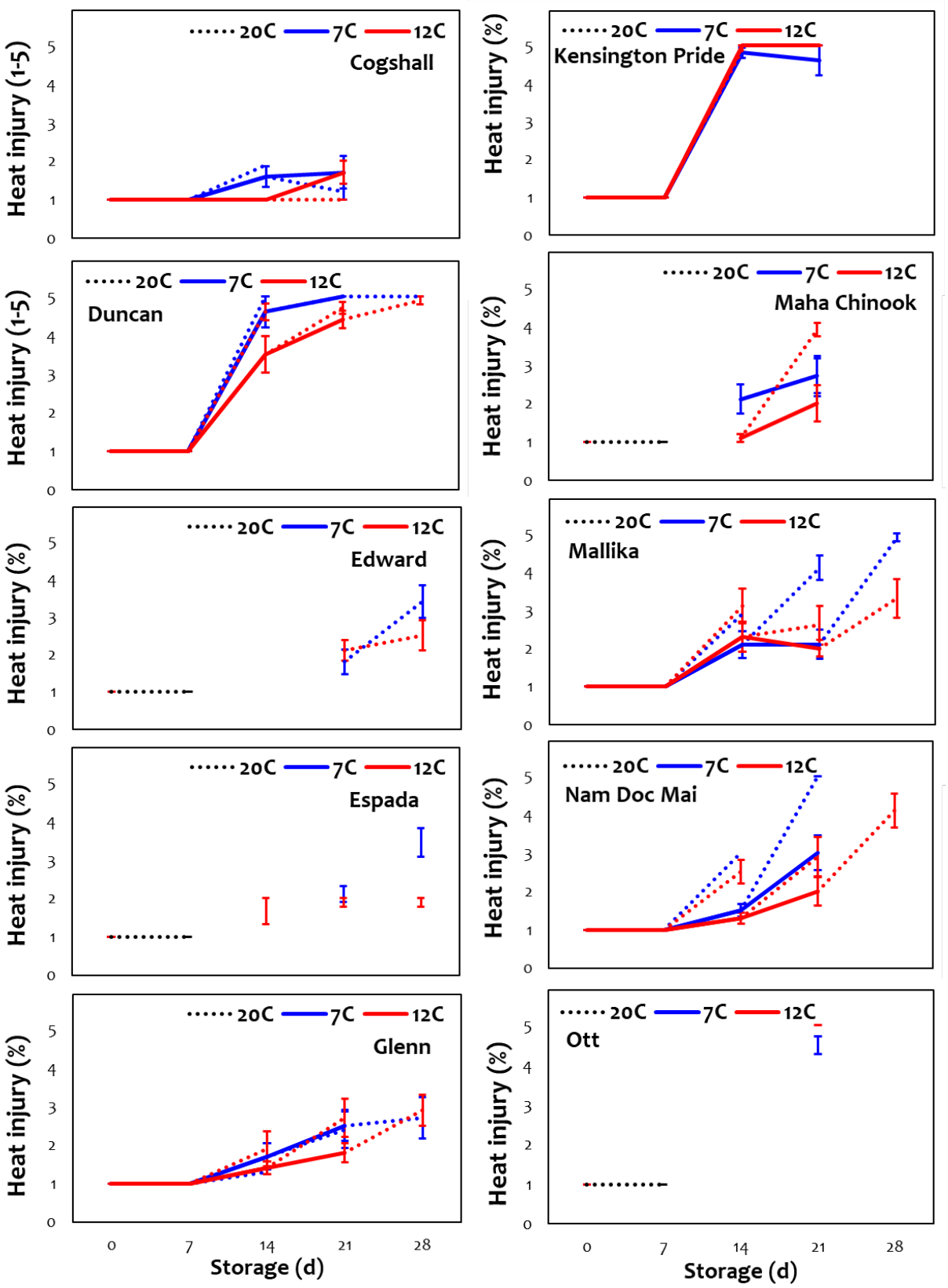

Figure 35. Percent heat injury (HI) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

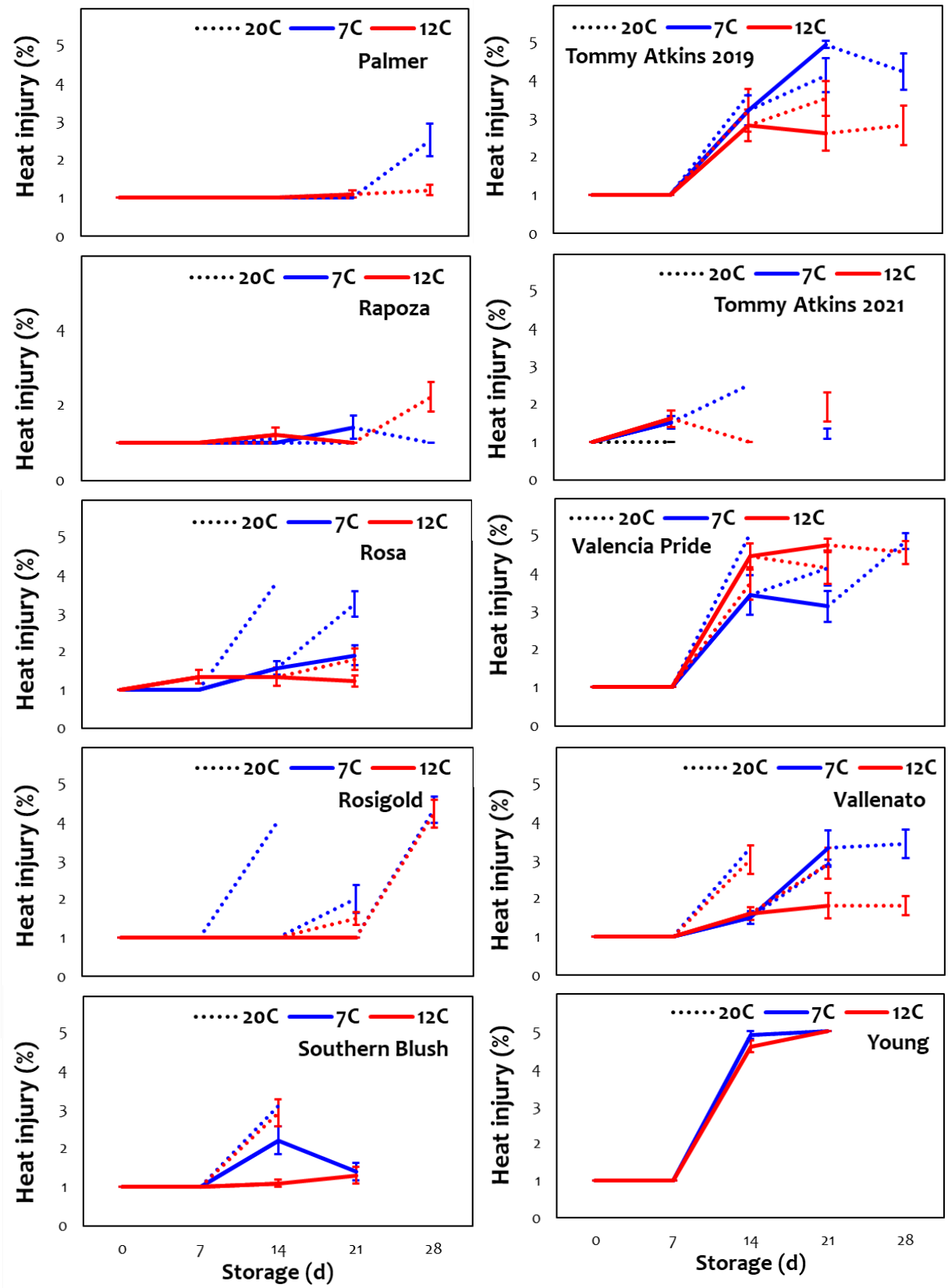

Figure 36. Internal (flesh) lightness changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

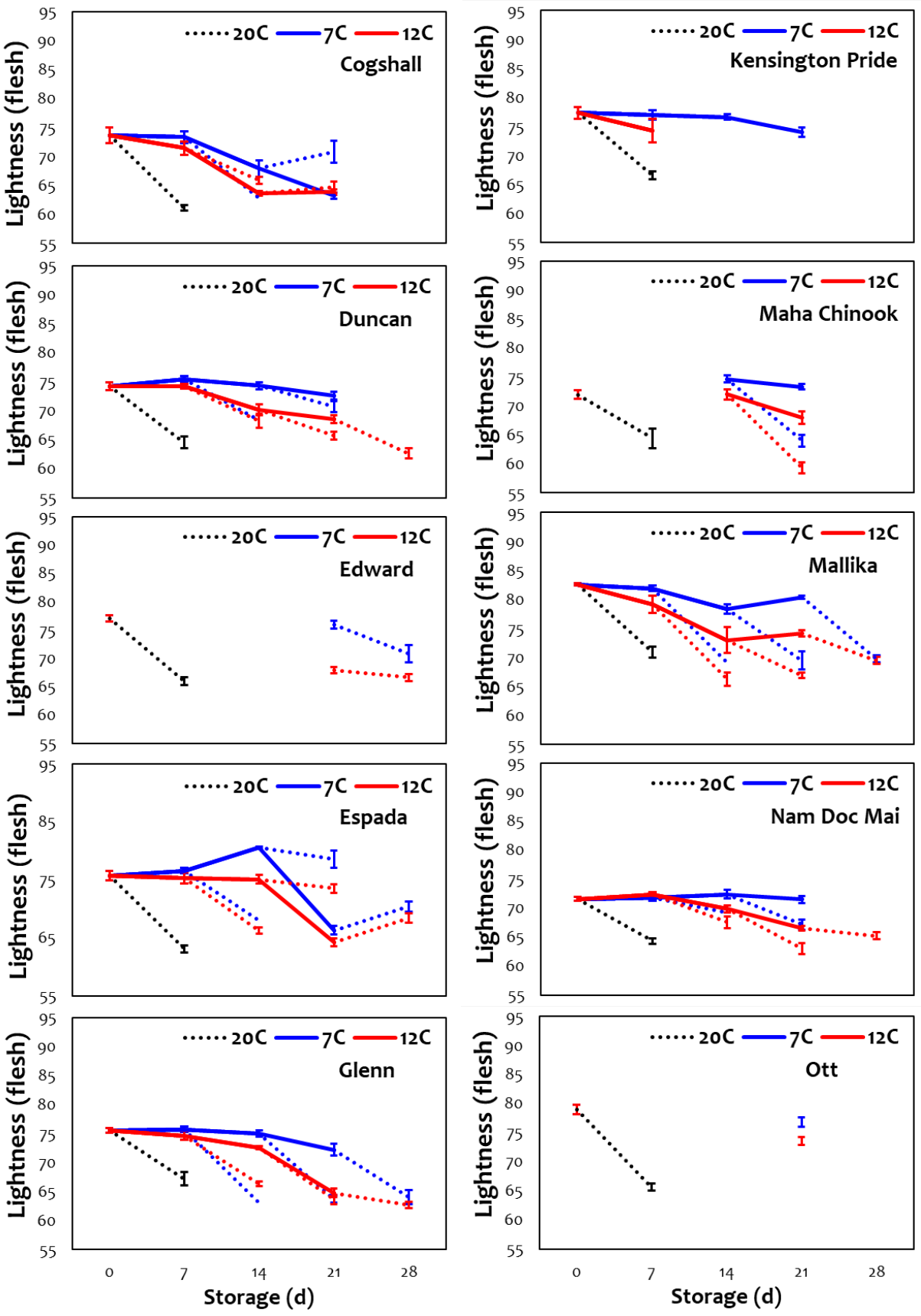

Figure 37. Internal (flesh) lightness changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

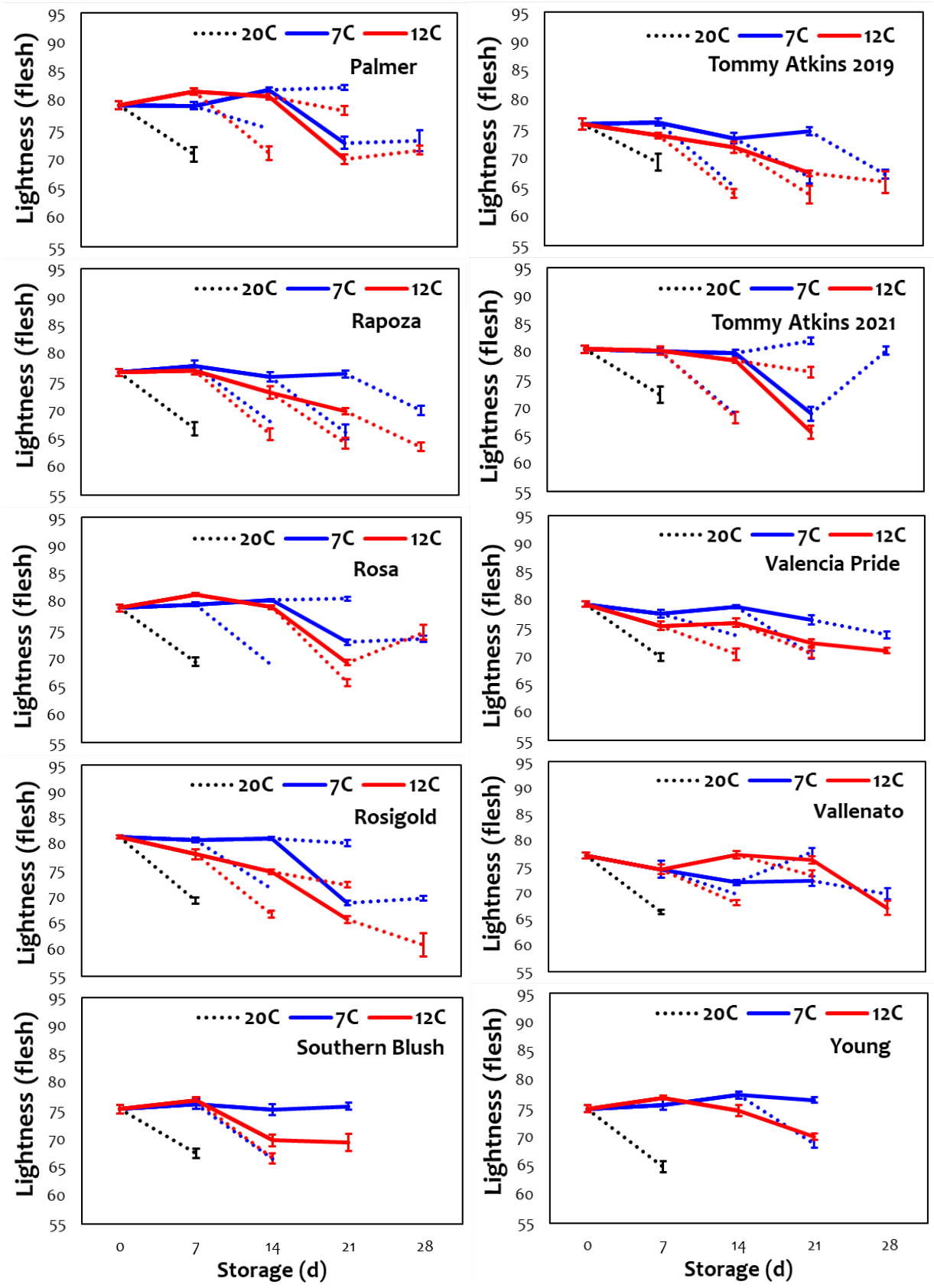

Figure 38. Internal (flesh) a* value changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

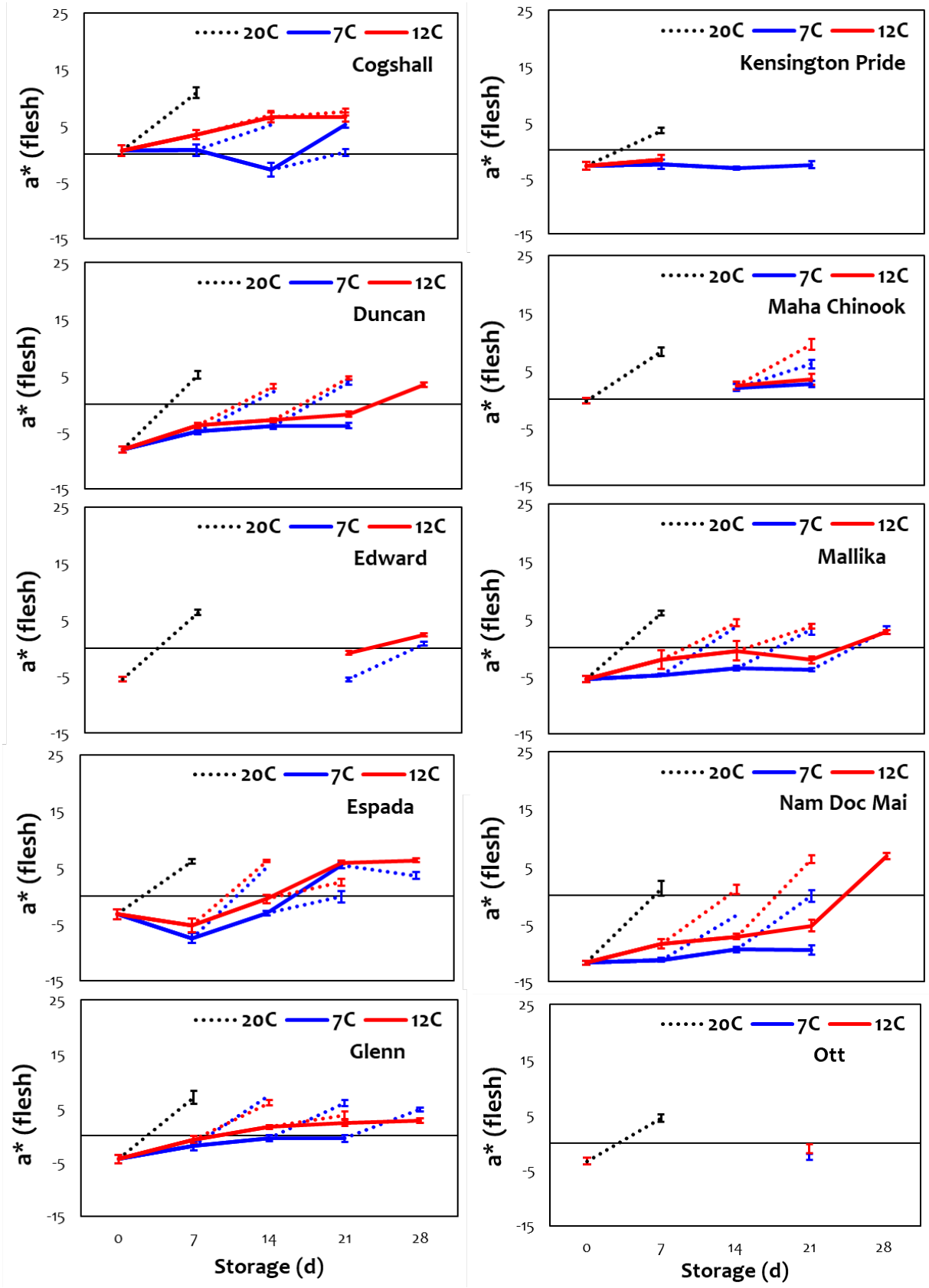

Figure 39. Internal (flesh) a* value changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

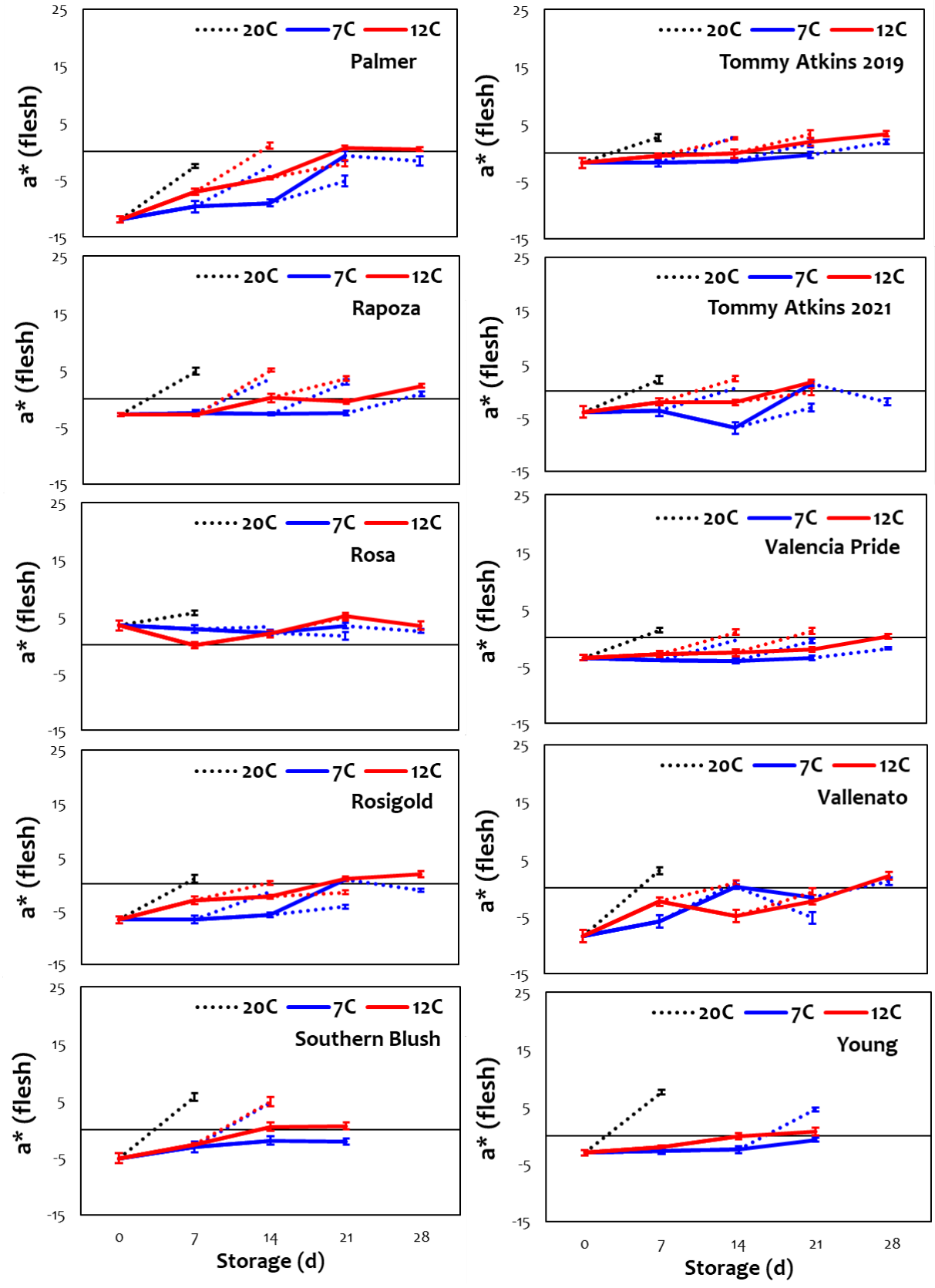

Figure 40. Hot water treatment effect on internal (flesh) a* value in mango fruit after 1 week at 20°C

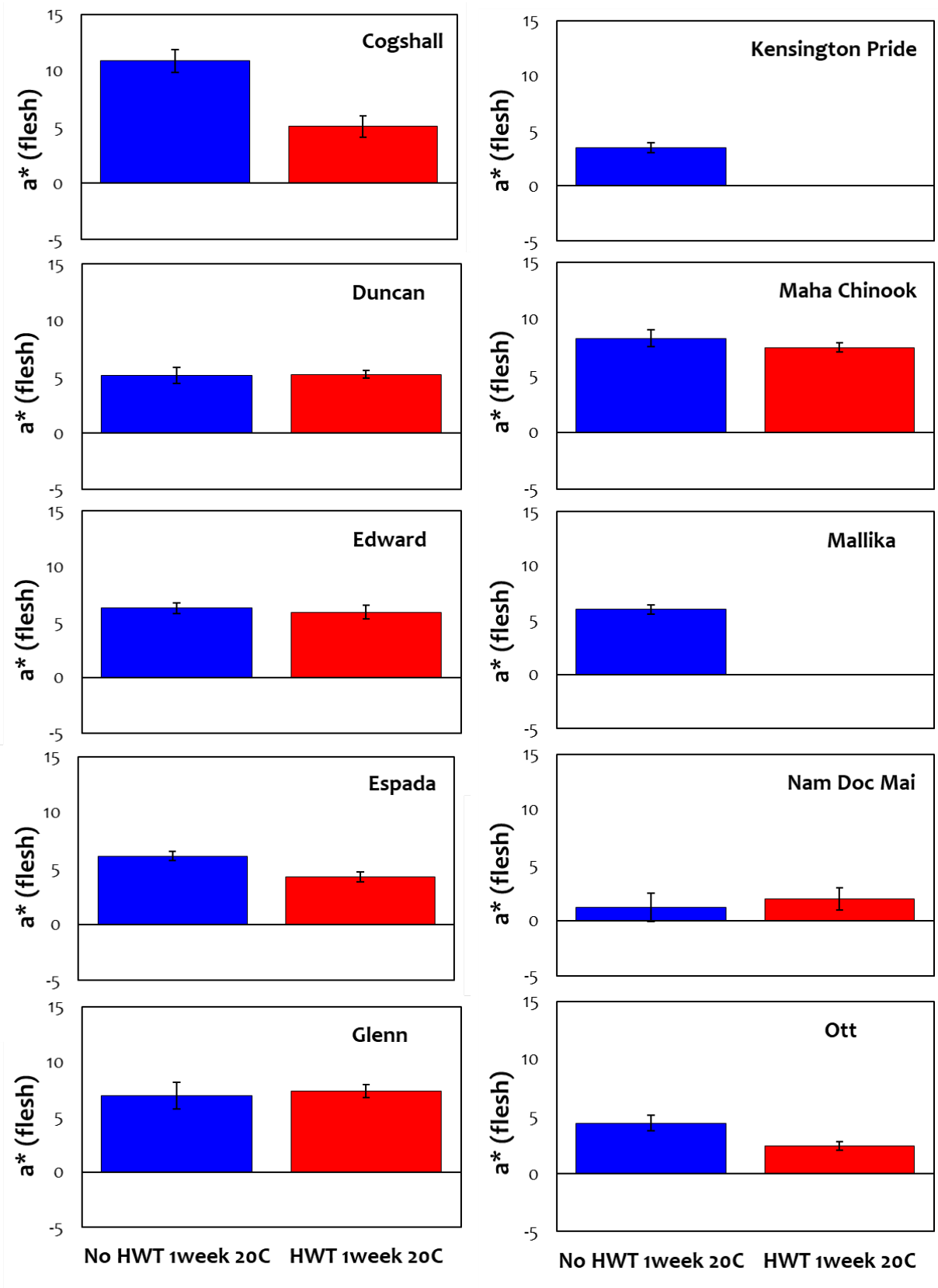

Figure 41. Hot water treatment effect on internal (flesh) a* value in mango fruit after 1 week at 20°C

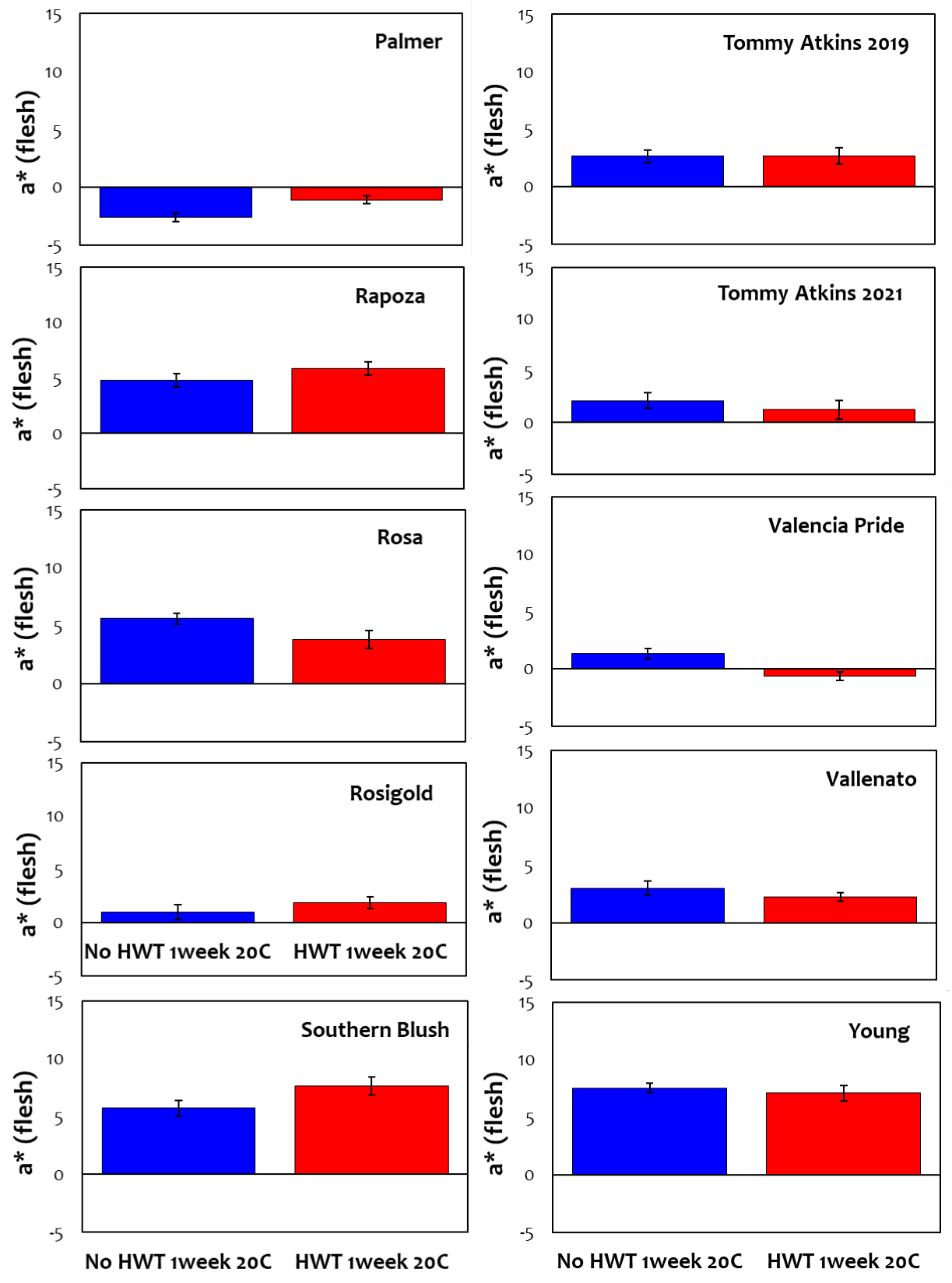

Figure 42. Internal (flesh) b* value changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

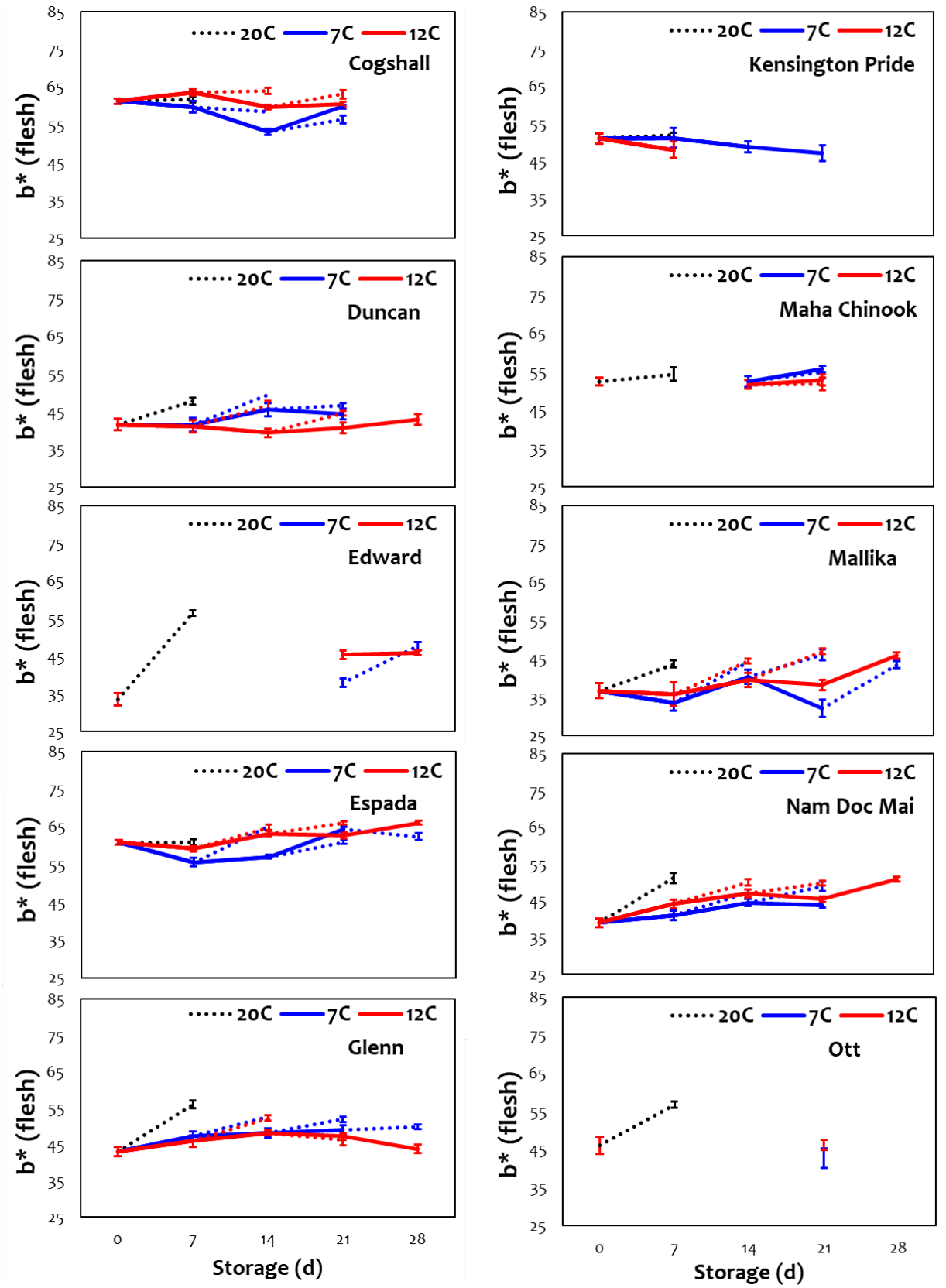

Figure 43. Internal (flesh) b* value changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

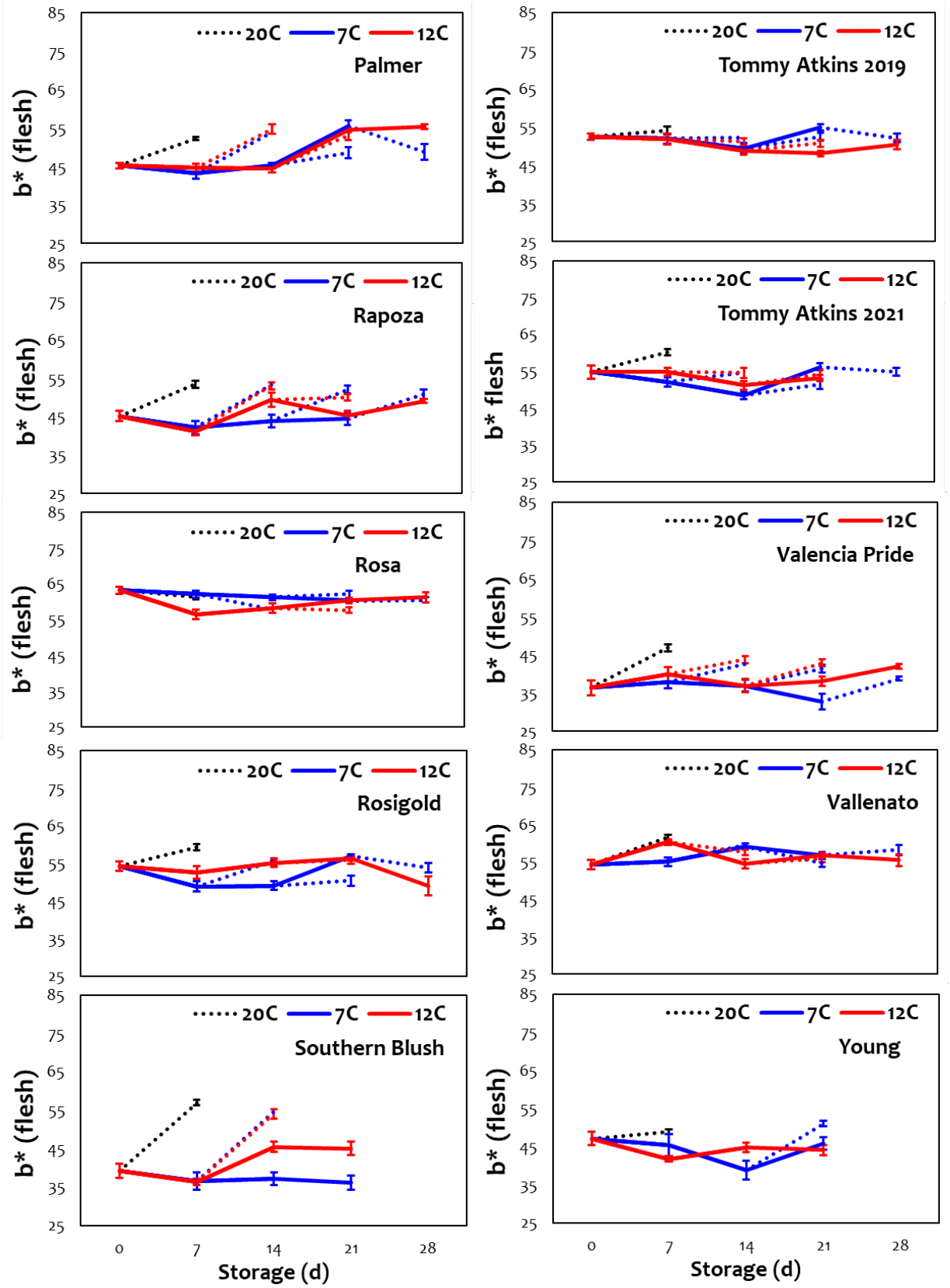

Figure 44. Hot water treatment effect on internal (flesh) b* value in mango fruit after 1 week at 20°C

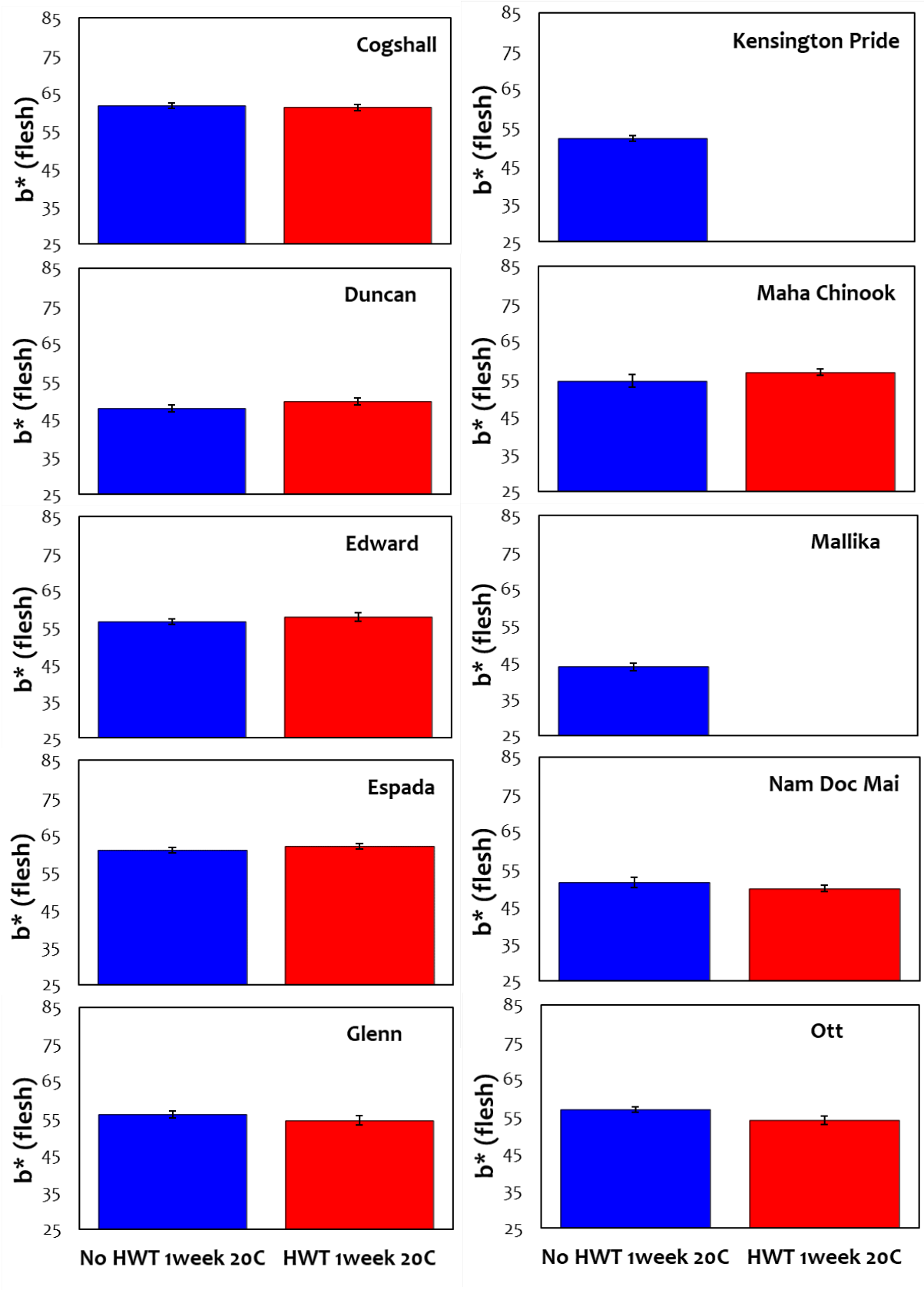

Figure 45. Hot water treatment effect on internal (flesh) b* value in mango fruit after 1 week at 20°C

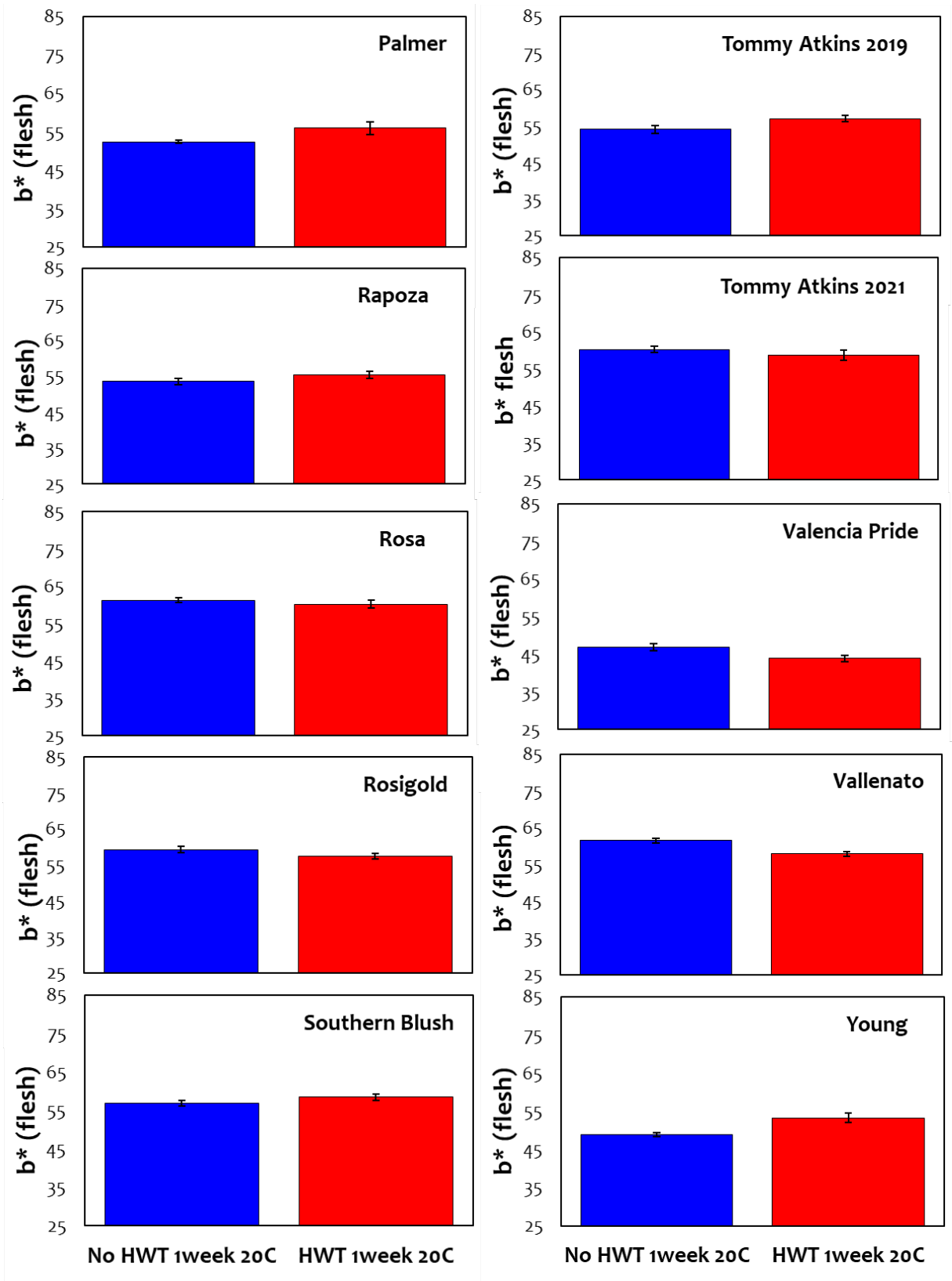

Figure 46. Internal (flesh) chroma value changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

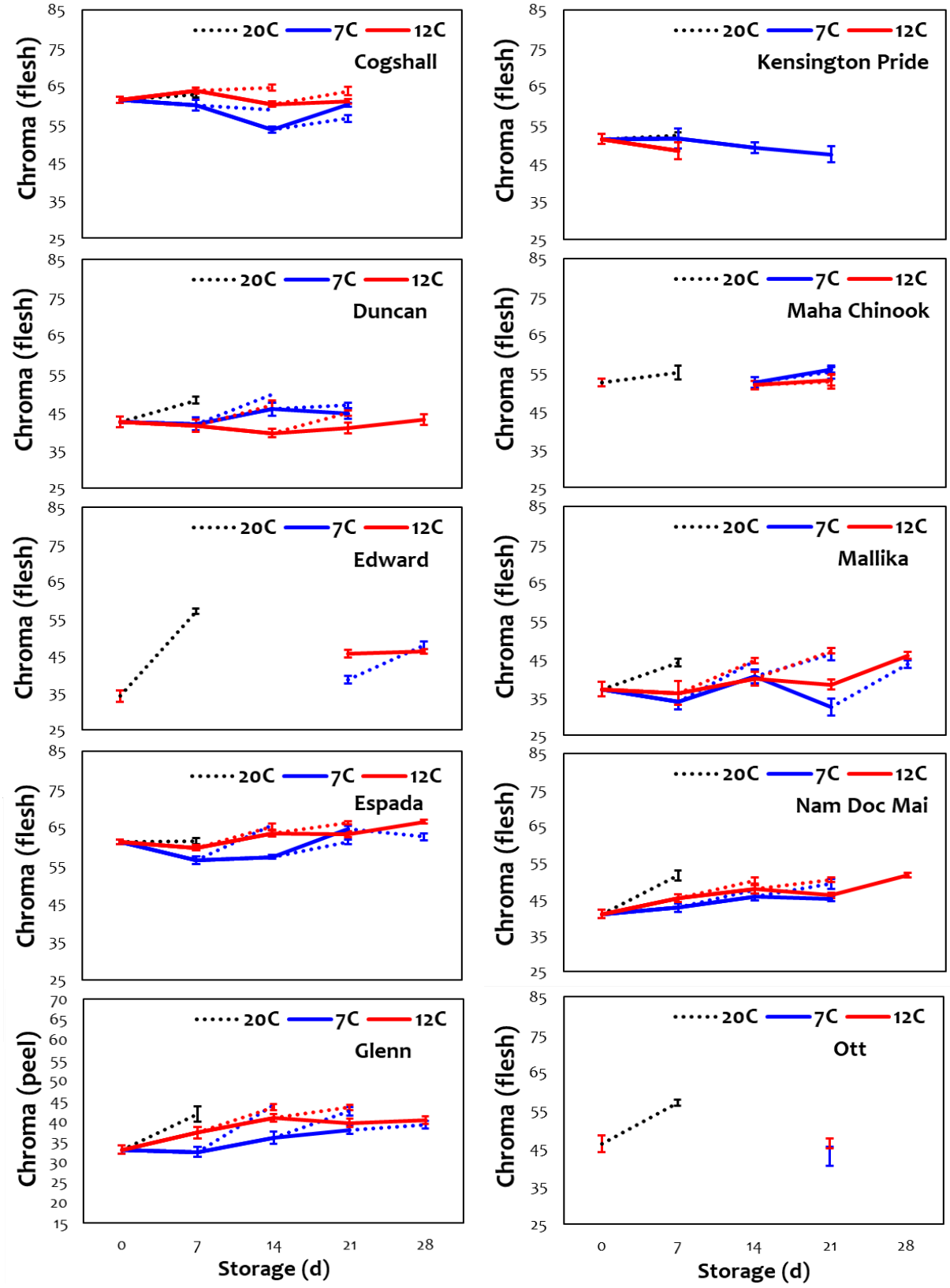

Figure 47. Internal (flesh) chroma value changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

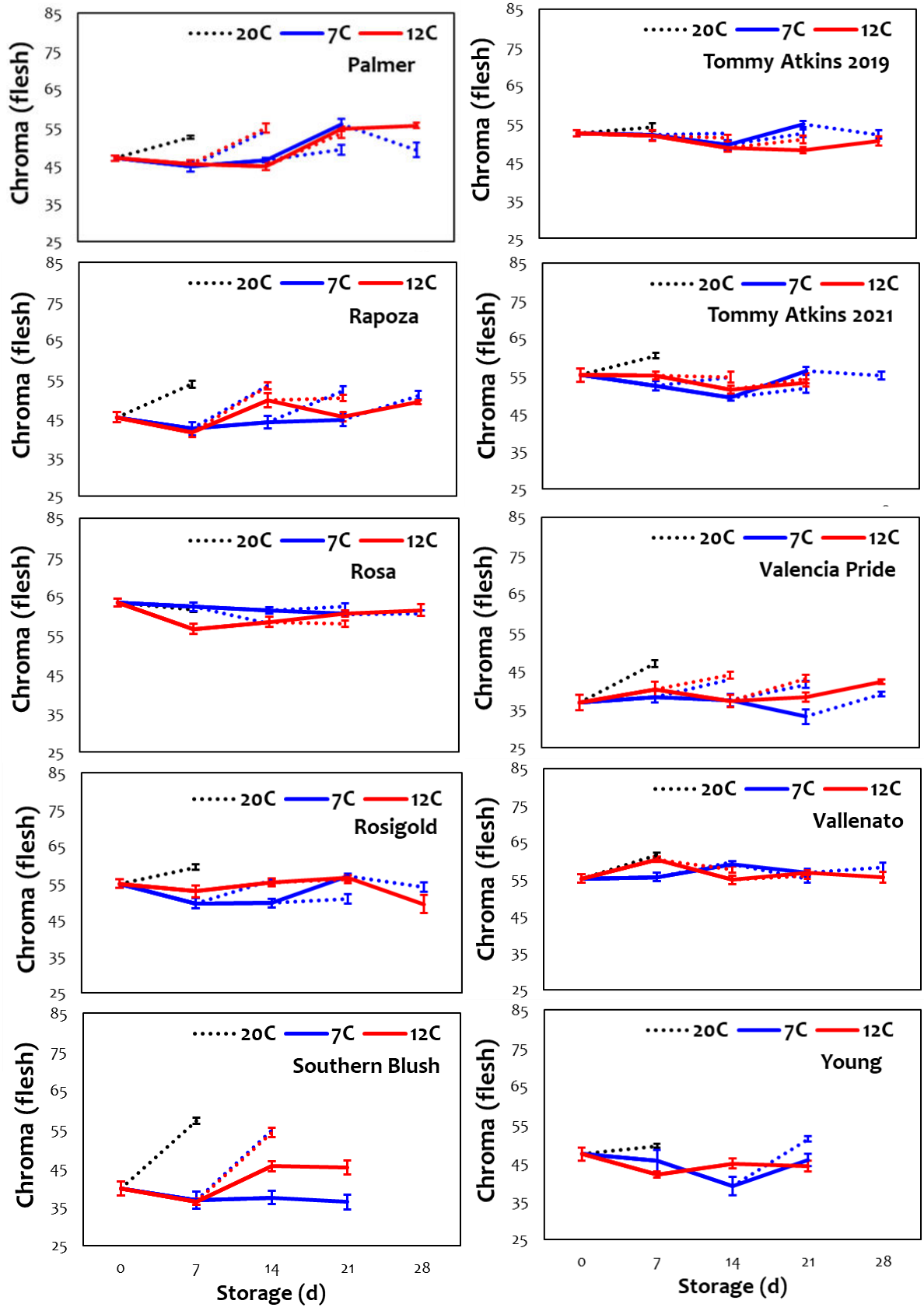

Figure 48. Hot water treatment effect on internal (flesh) chroma value in mango fruit after 1 week at 20°C

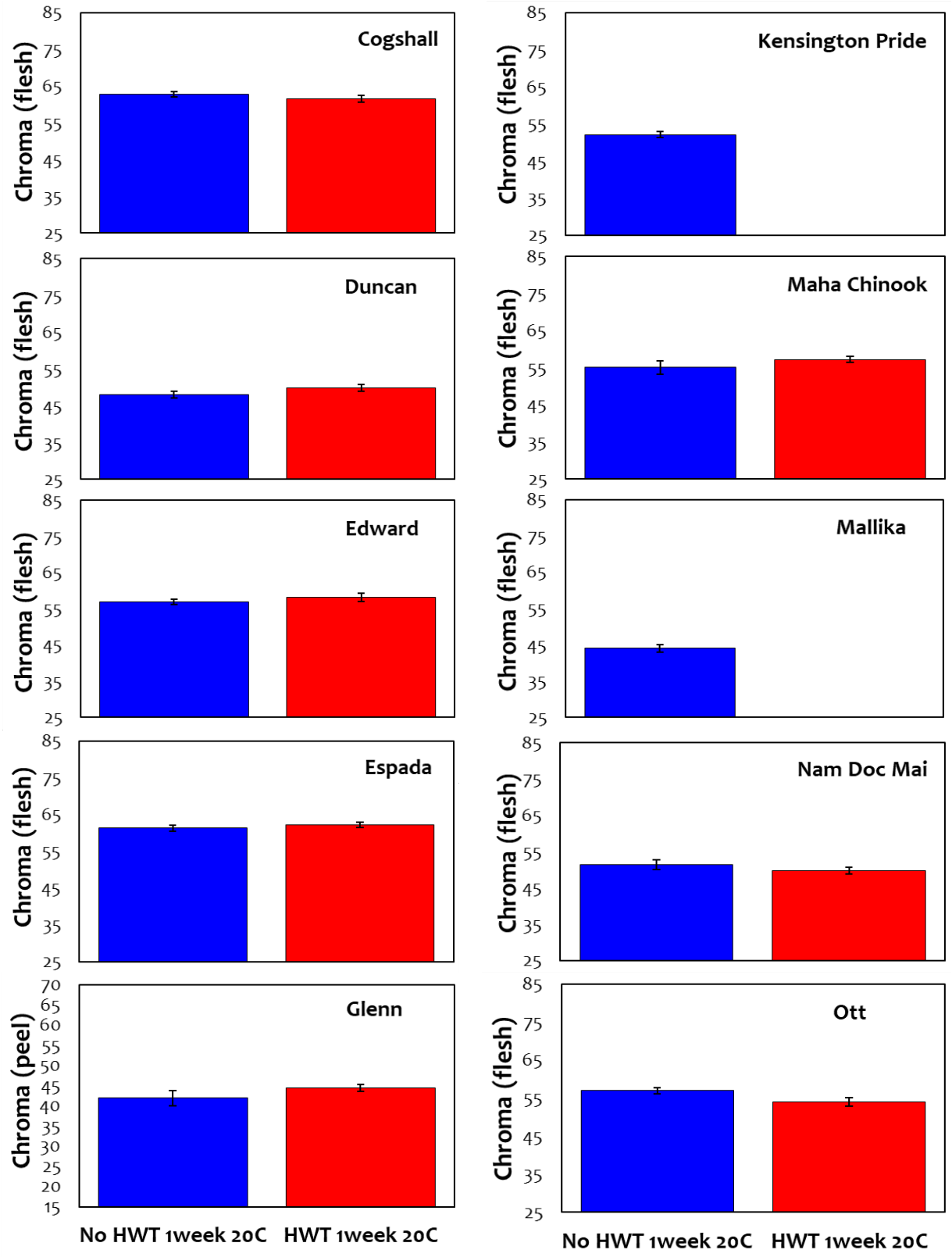

Figure 49. Hot water treatment effect on internal (flesh) chroma value in mango fruit after 1 week at 20°C

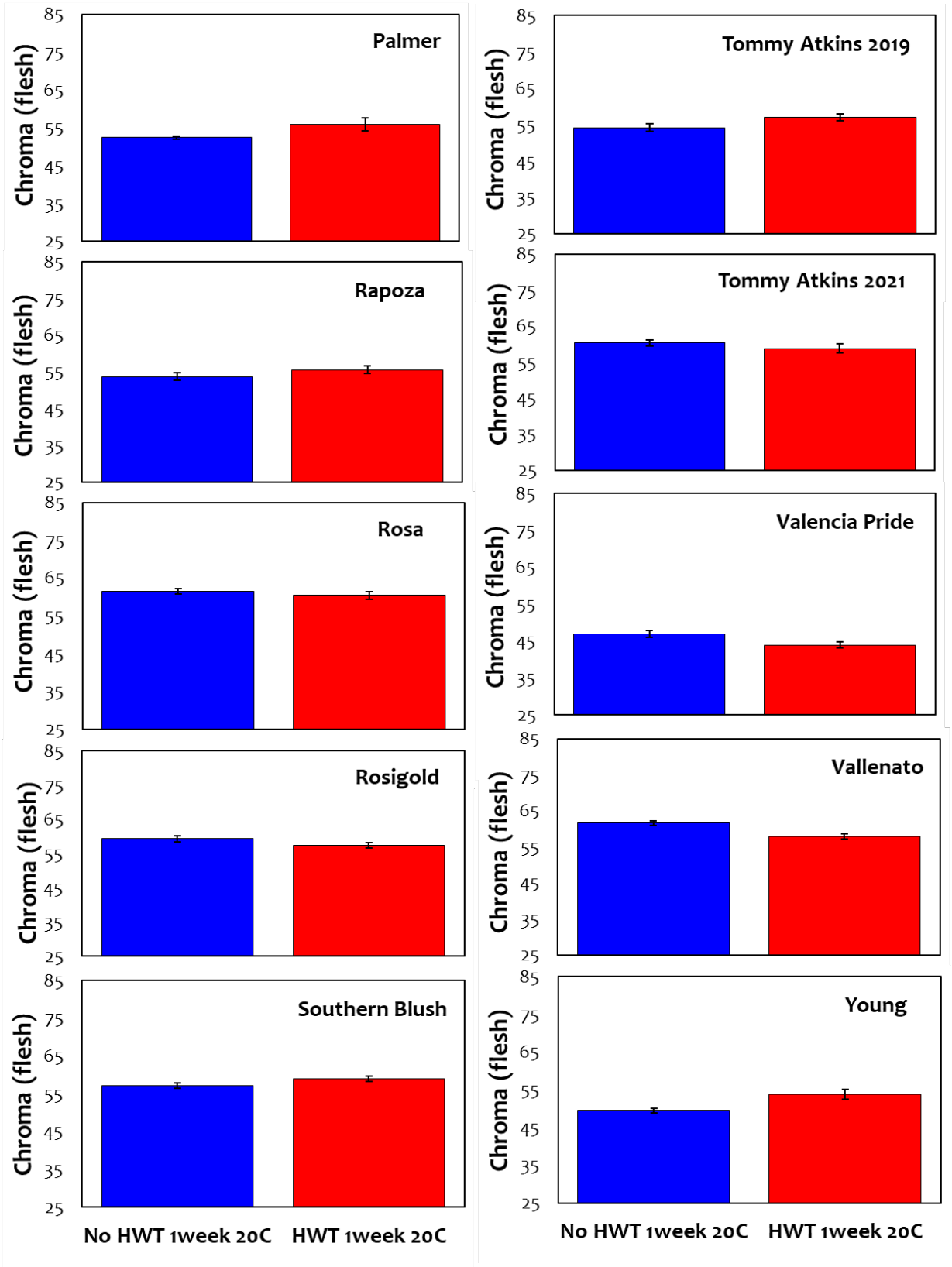

Figure 50. Internal (flesh) hue angle changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

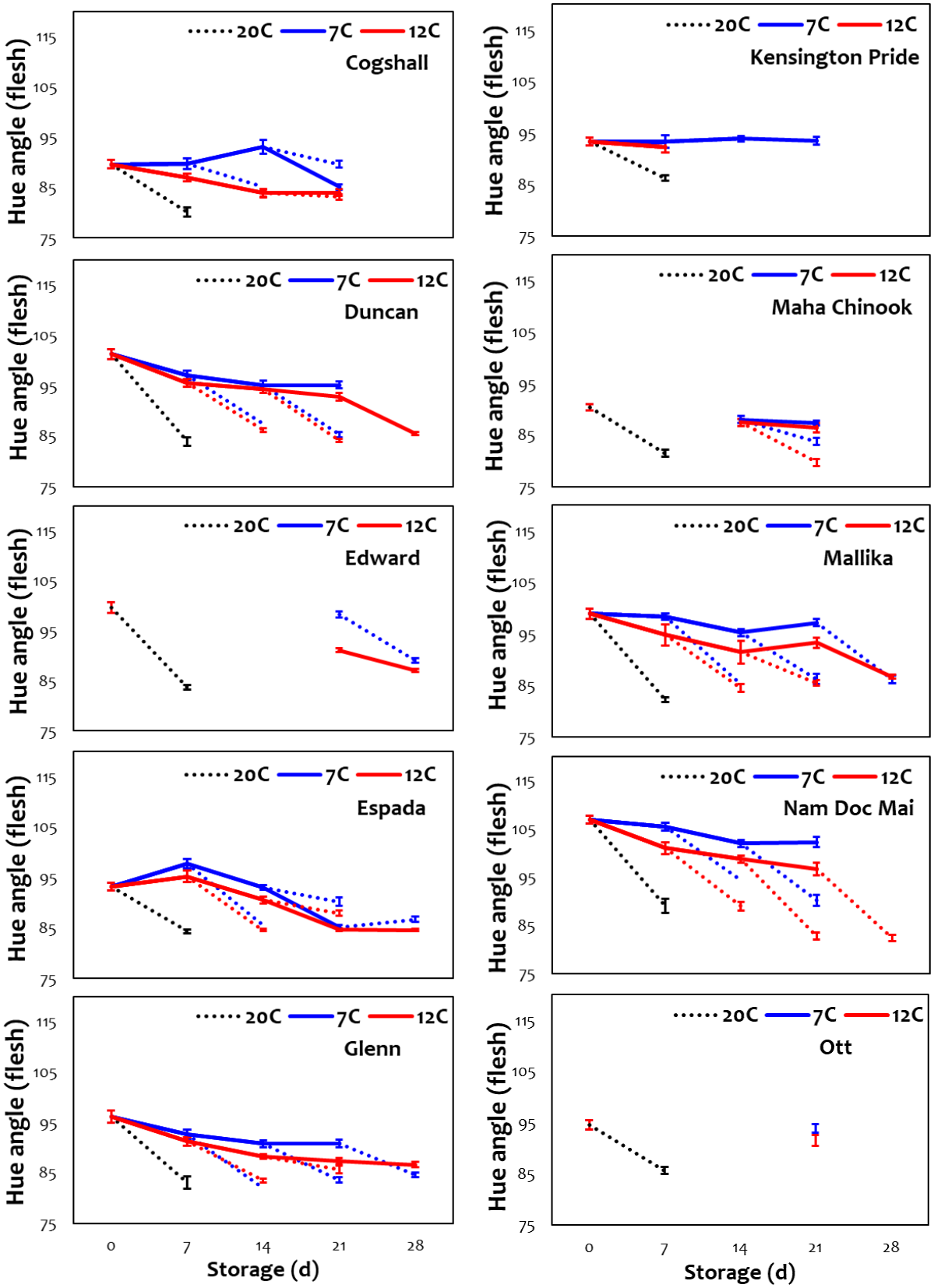

Figure 51. Internal (flesh) hue angle changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

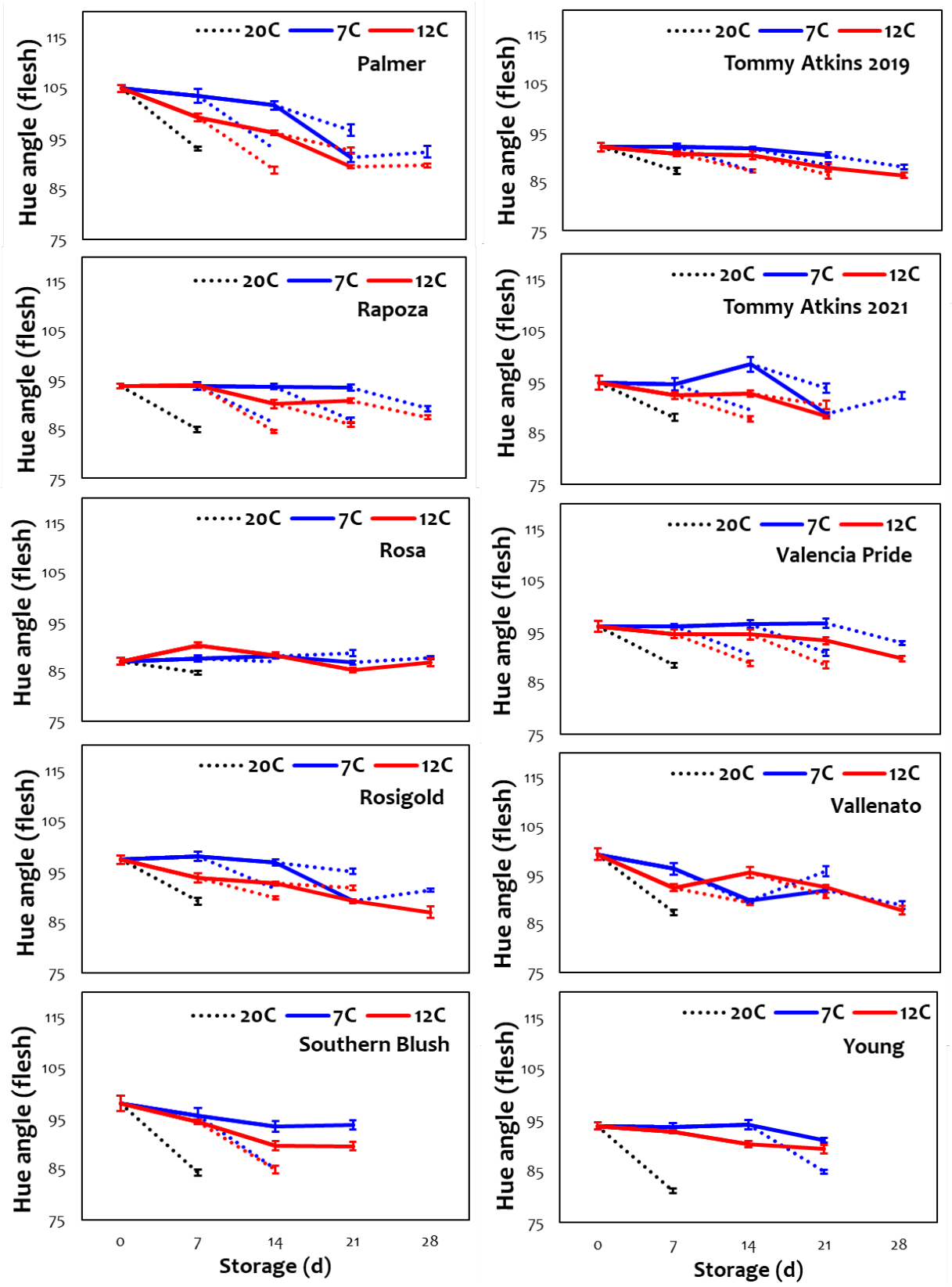

Figure 52. Hot water treatment effect on internal (flesh) hue angle in mango fruit after 1 week at 20°C

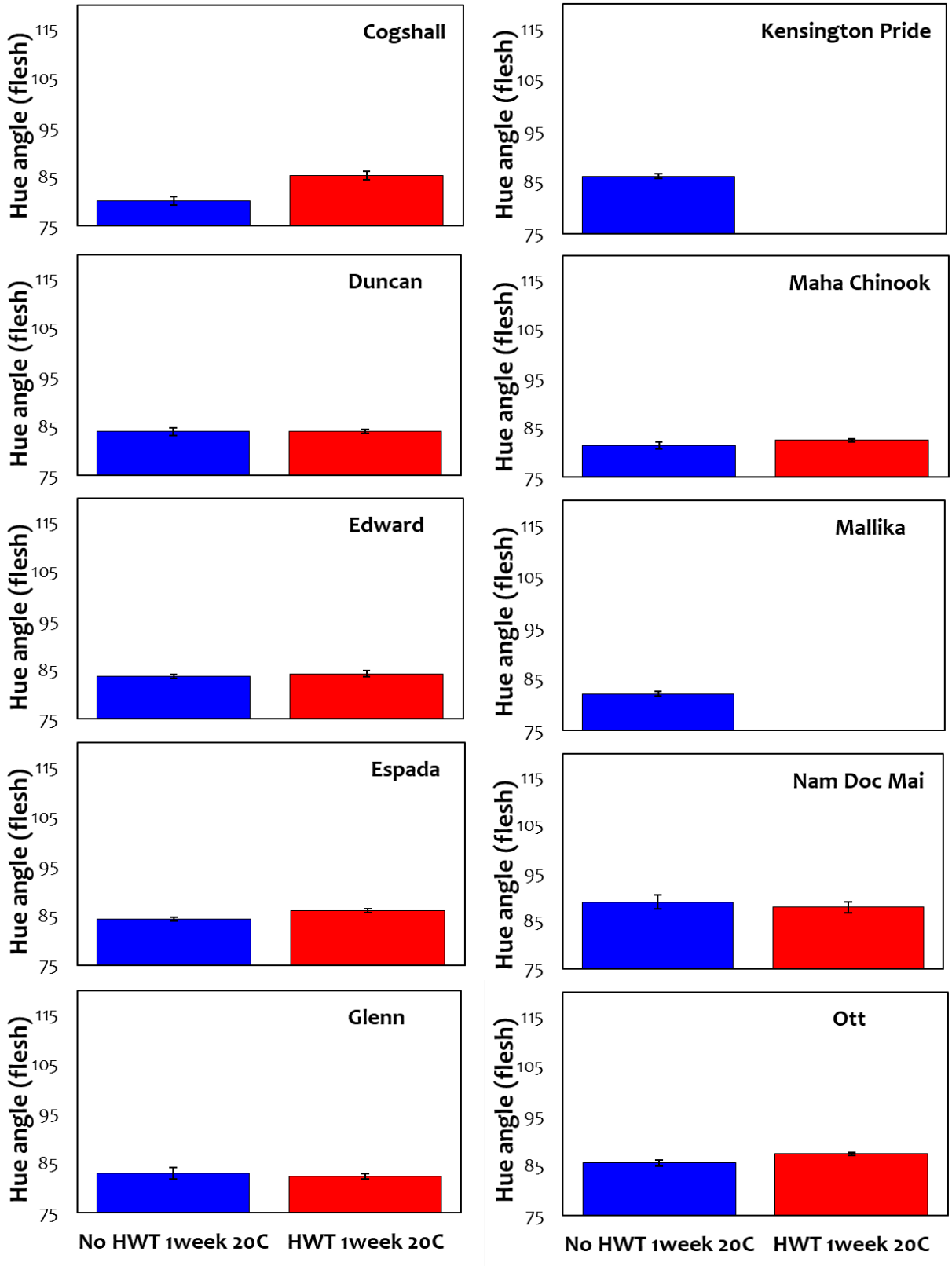

Figure 53. Hot water treatment effect on internal (flesh) hue angle in mango fruit after 1 week at 20°C

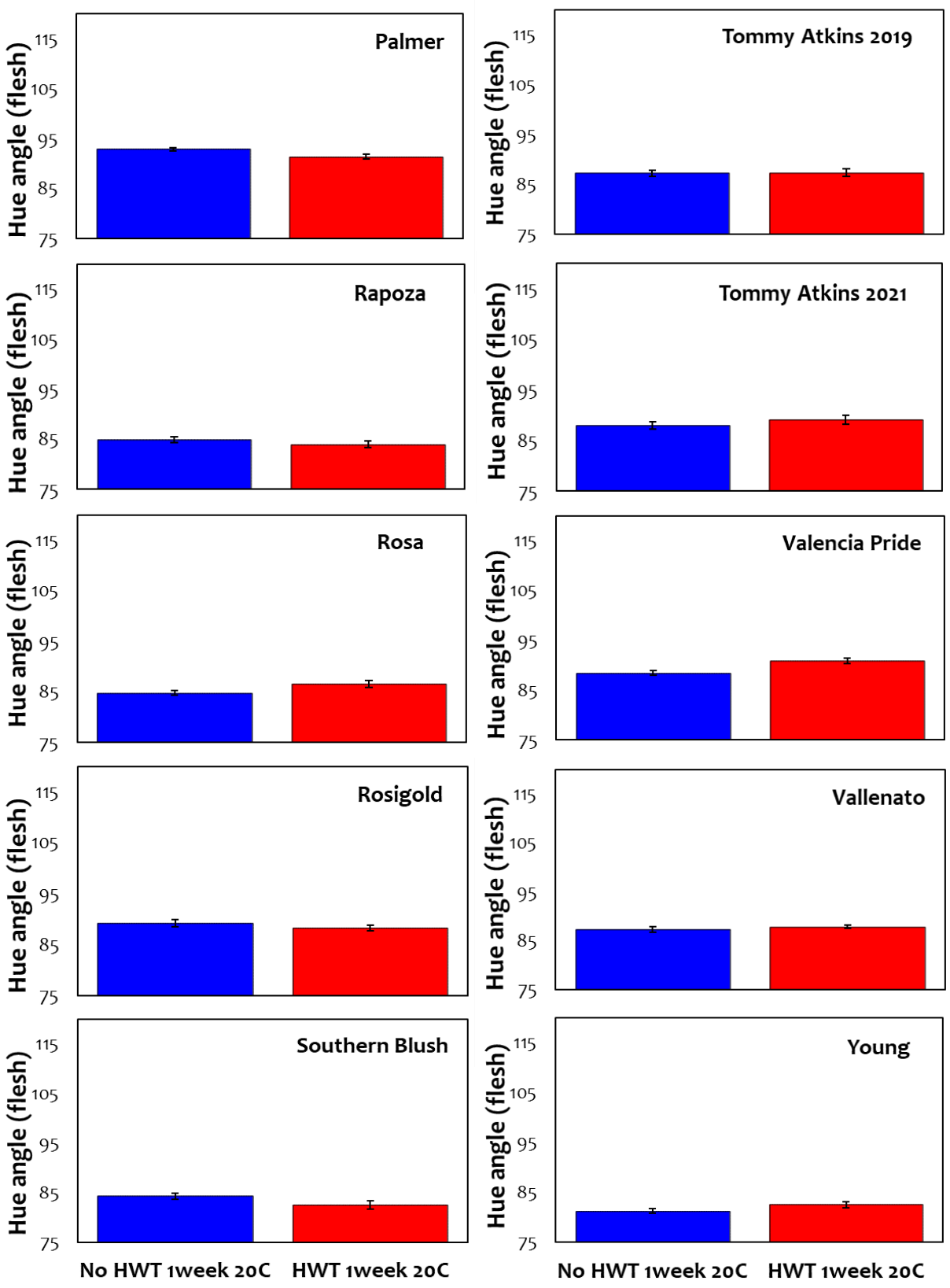

Figure 54. Dry matter changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

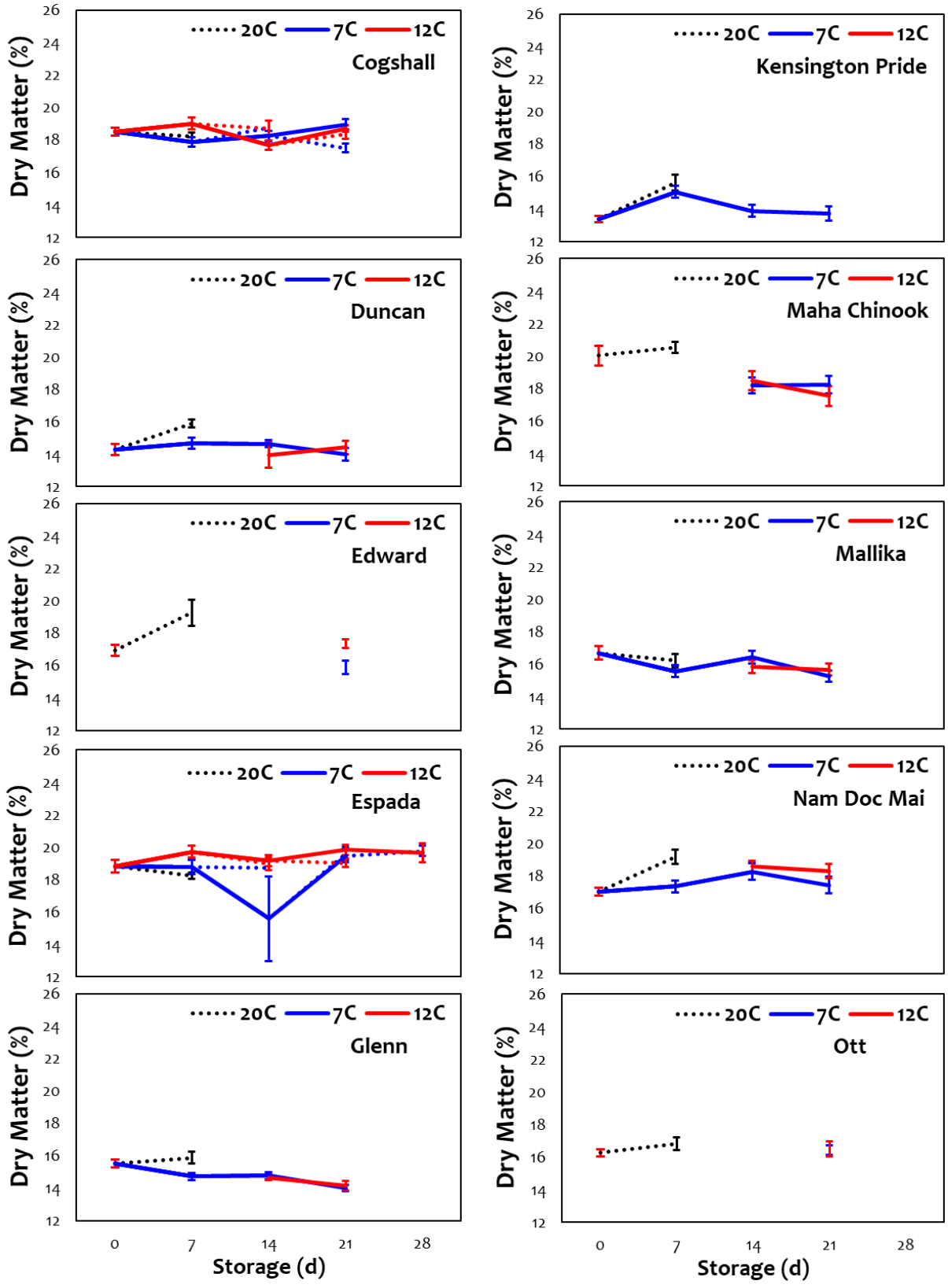

Figure 55. Dry matter changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

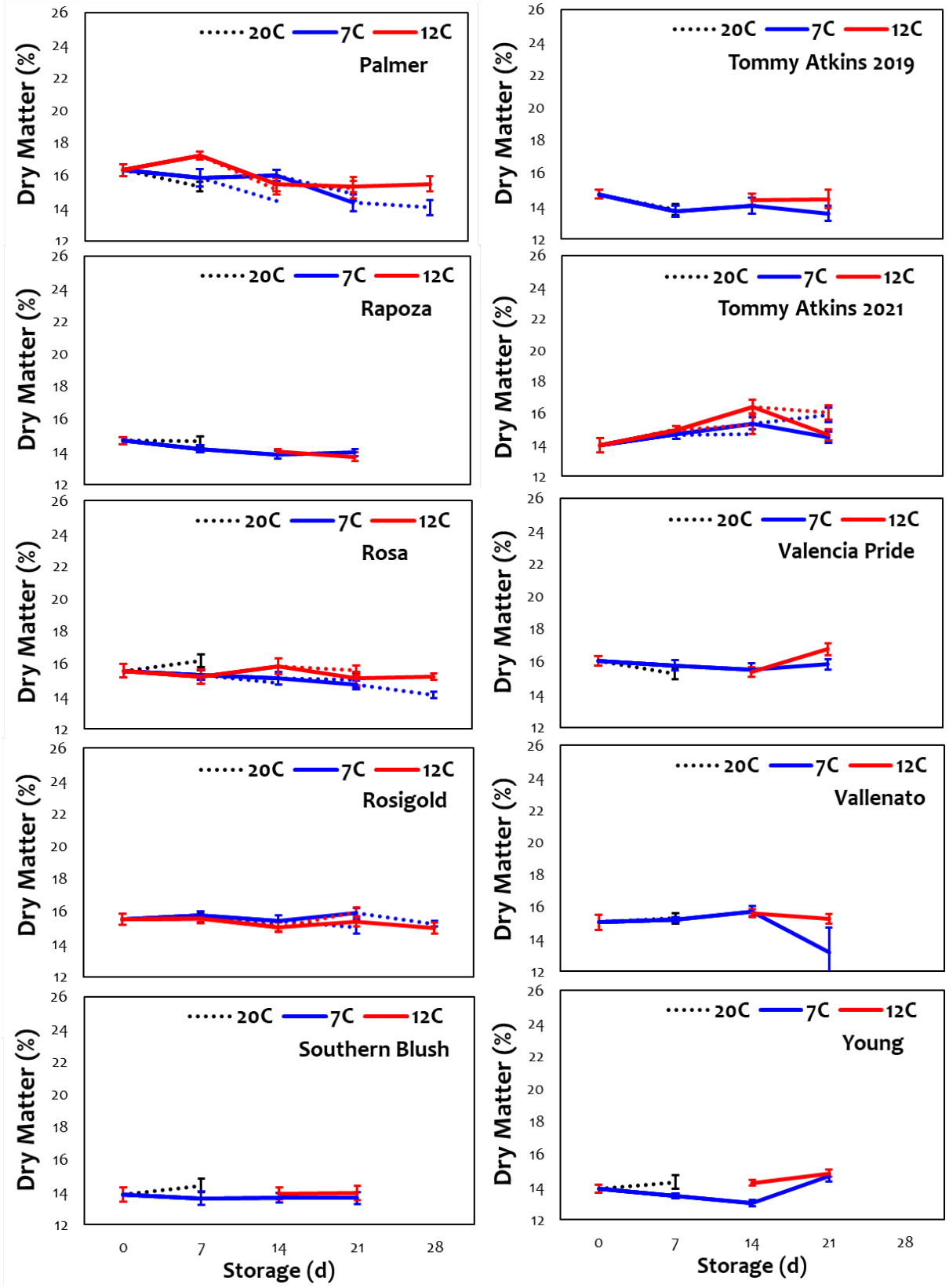

Figure 56. Hot water treatment effect on percent dry matter in mango fruit after 1 week at 20°C

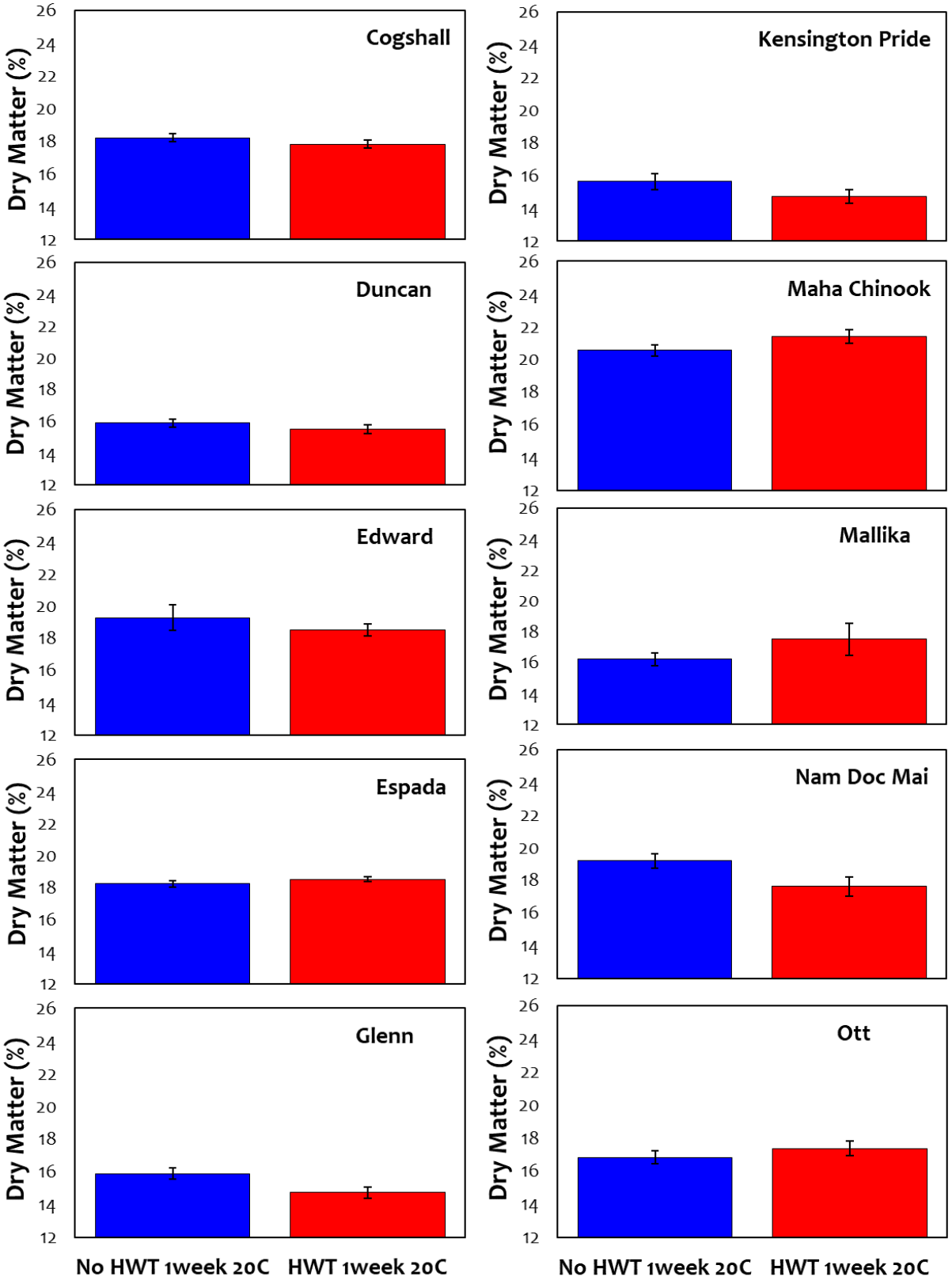

Figure 57. Hot water treatment effect on percent dry matter in mango fruit after 1 week at 20°C

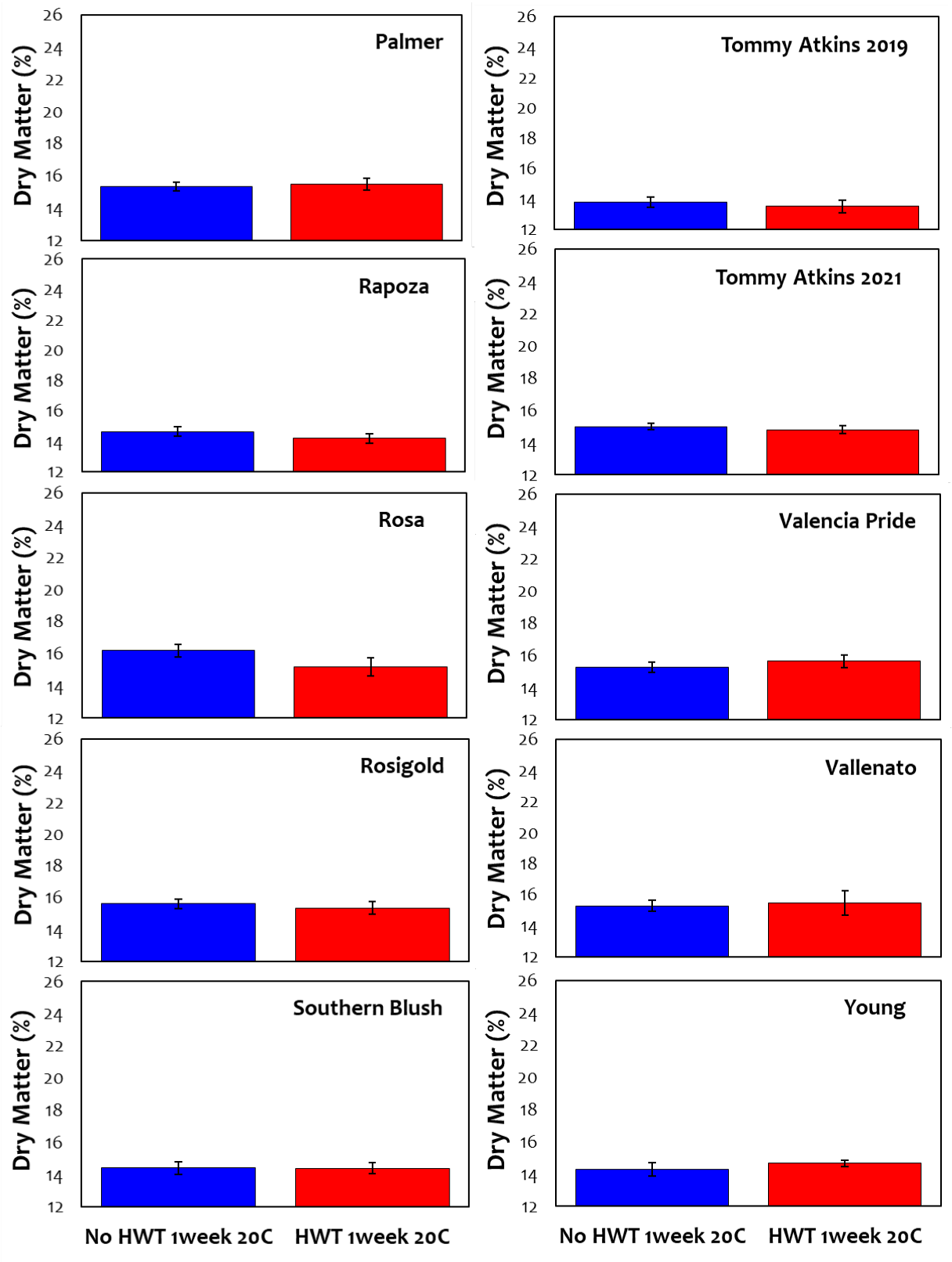

Figure 58. pH changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

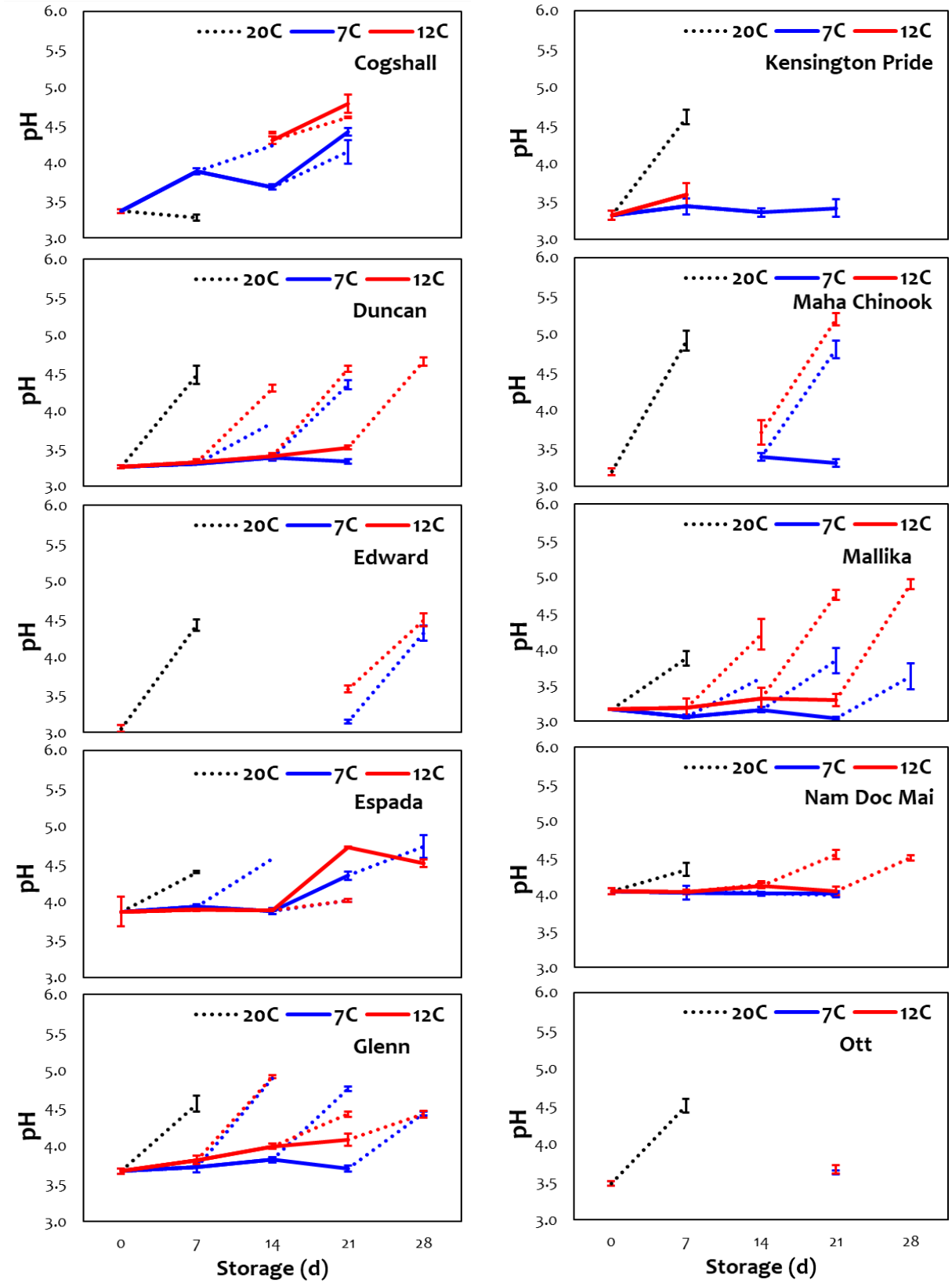

Figure 59. pH changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

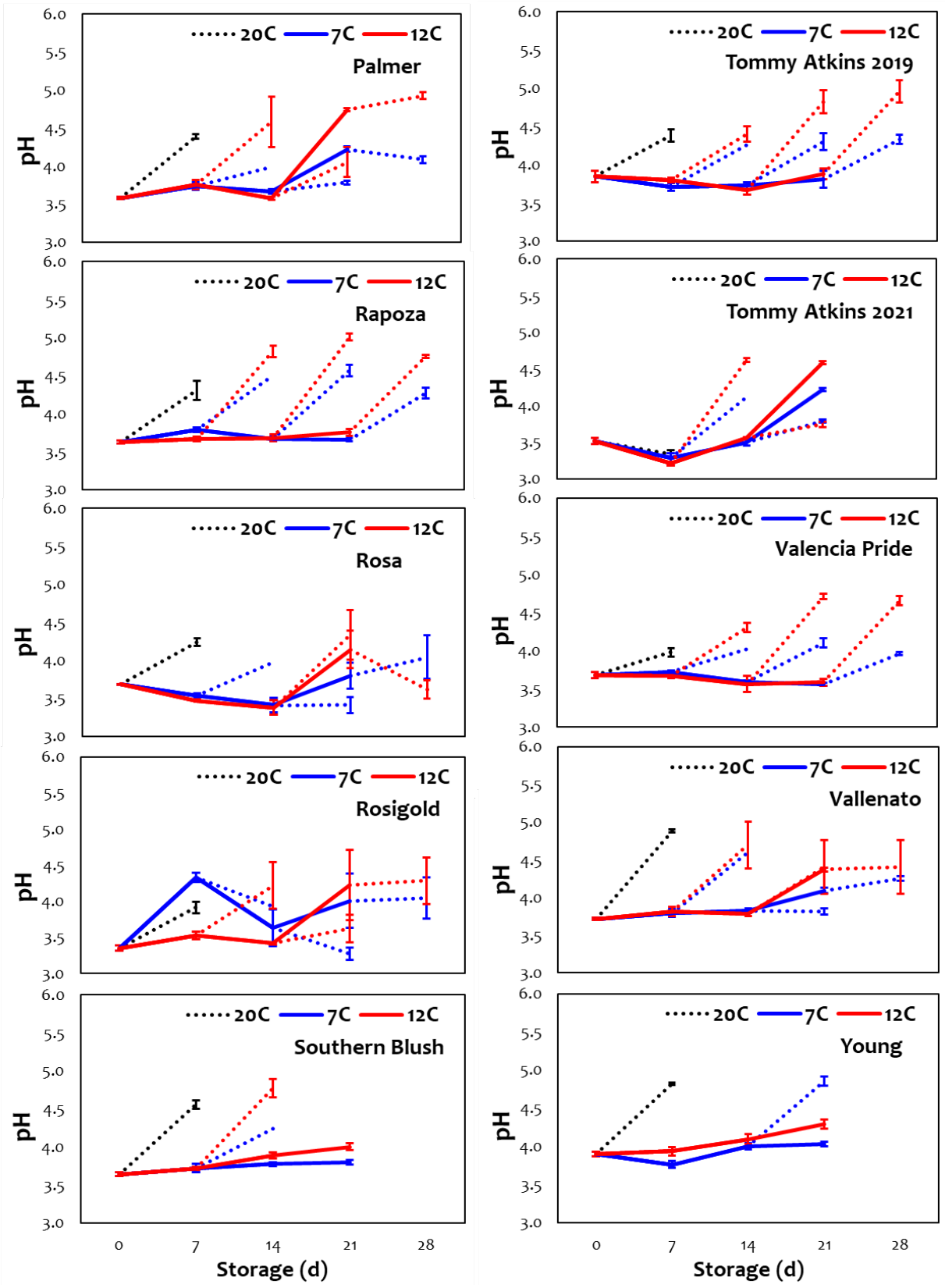

Figure 60. Hot water treatment effect on pH in mango fruit after 1 week at 20°C

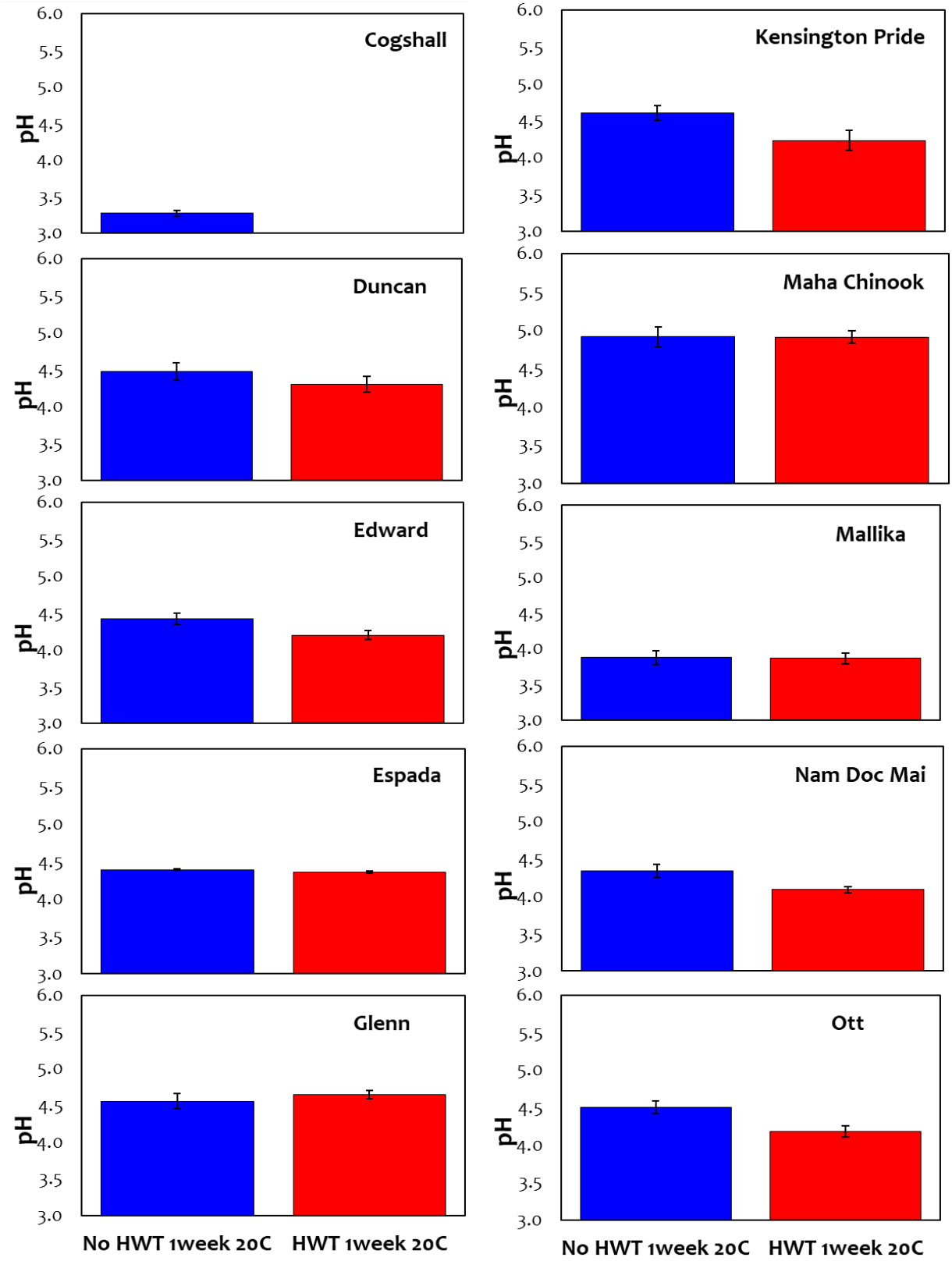

Figure 61. Hot water treatment effect on pH in mango fruit after 1 week at 20°C

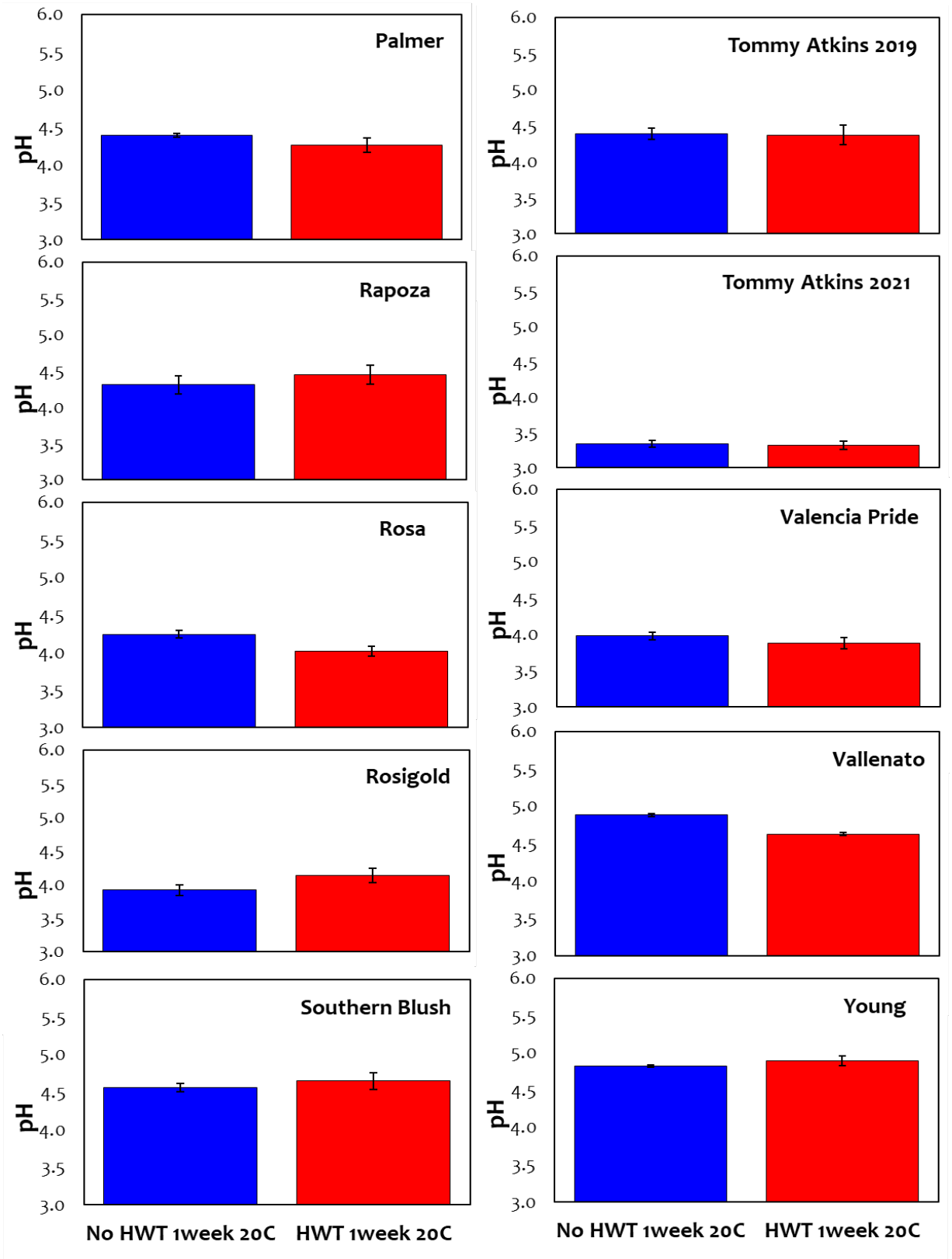

Figure 62. Soluble solid content (SSC) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

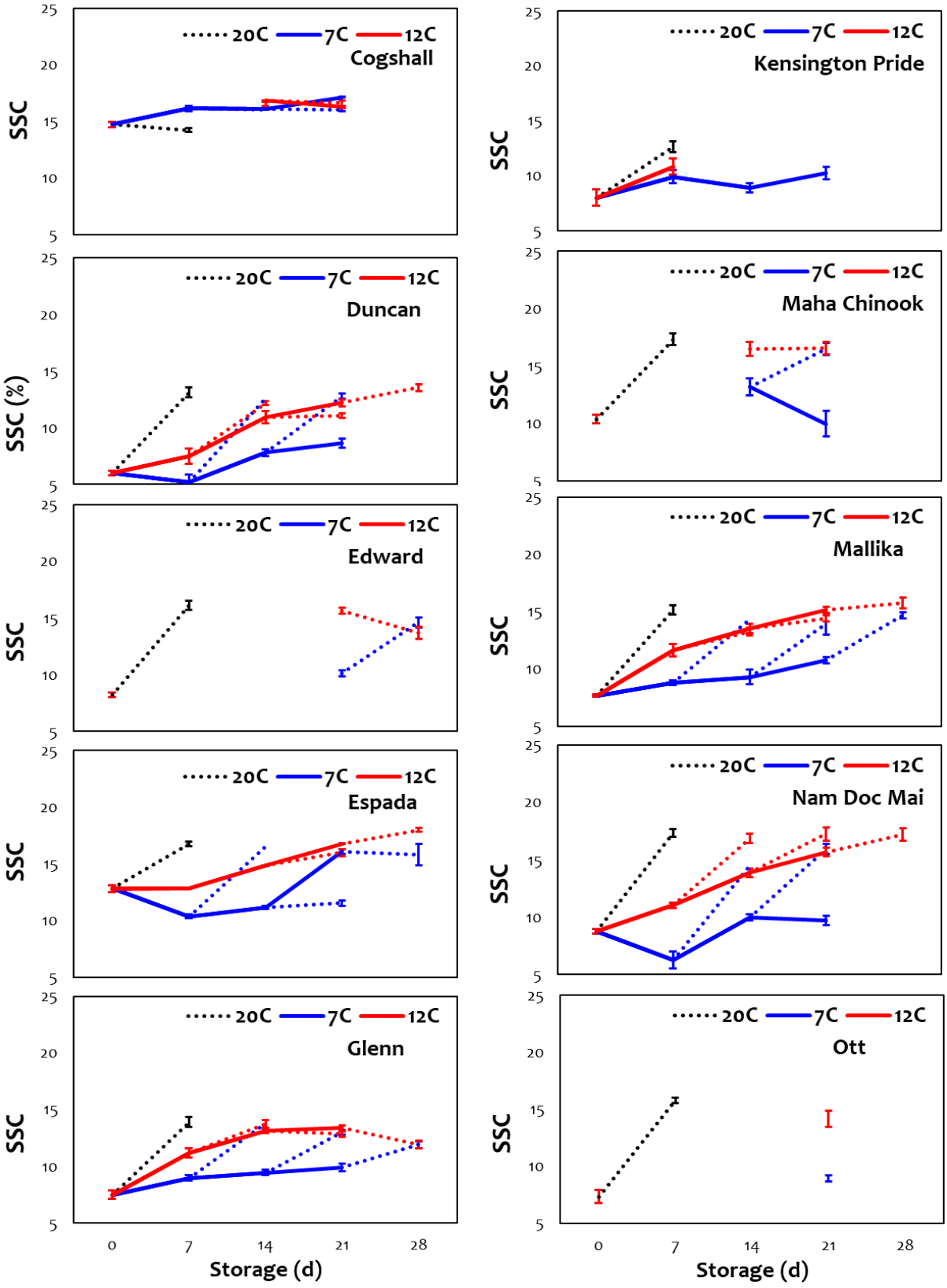

Figure 63. Soluble solid content (SSC) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

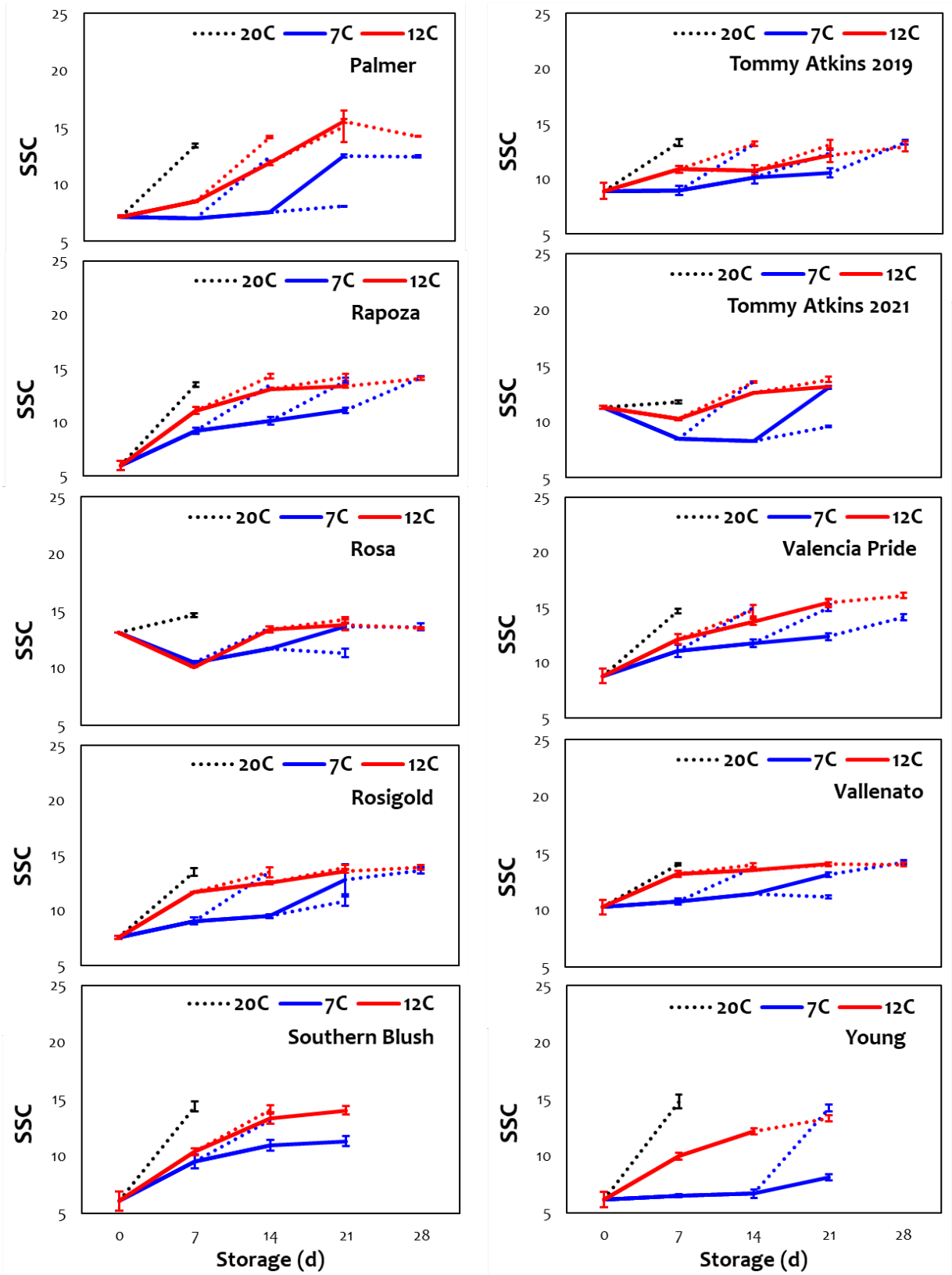

Figure 64. Hot water treatment effect on SSC in mango fruit after 1 week at 20°C

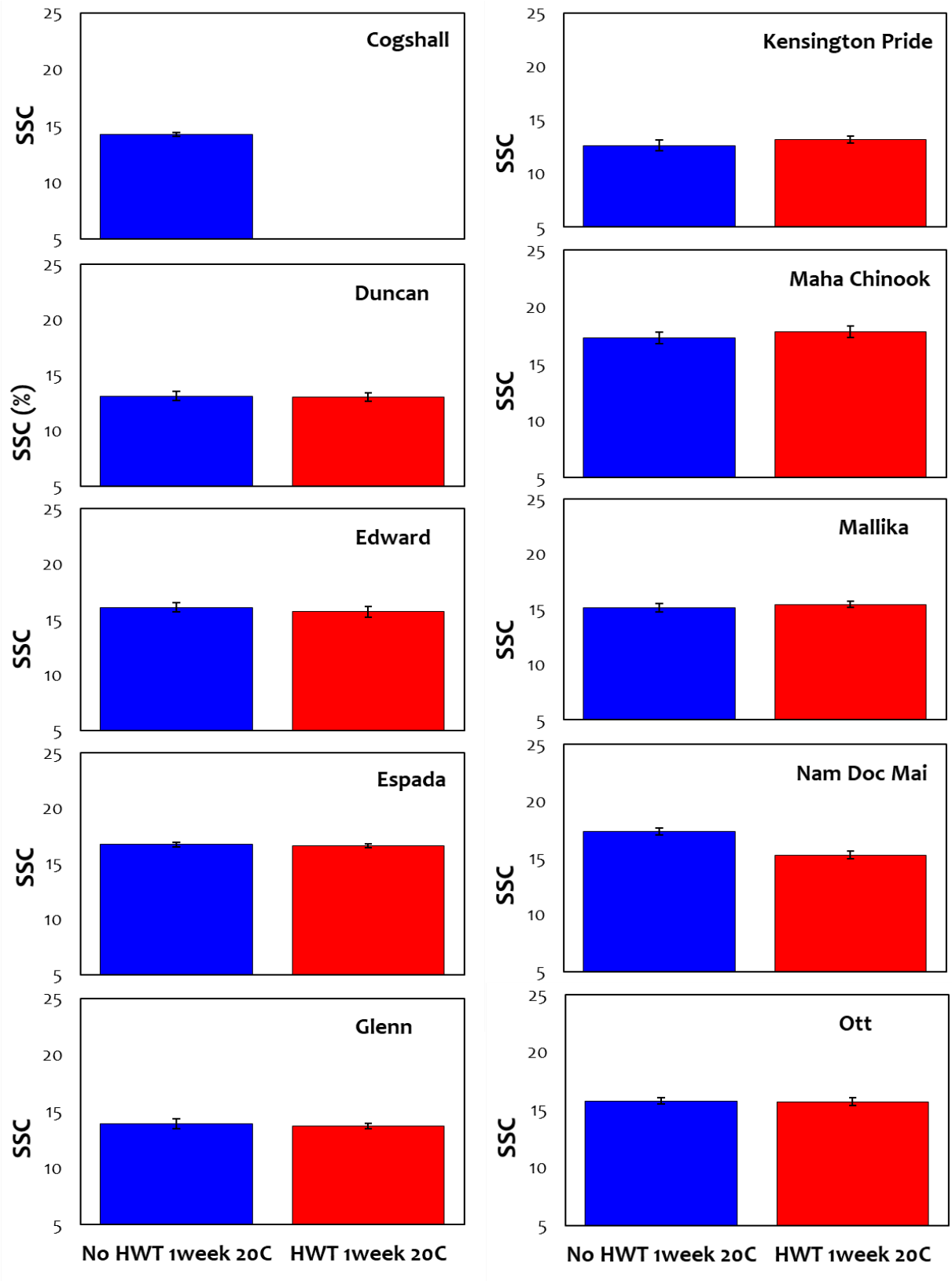

Figure 65. Hot water treatment effect on SSC in mango fruit after 1 week at 20°C

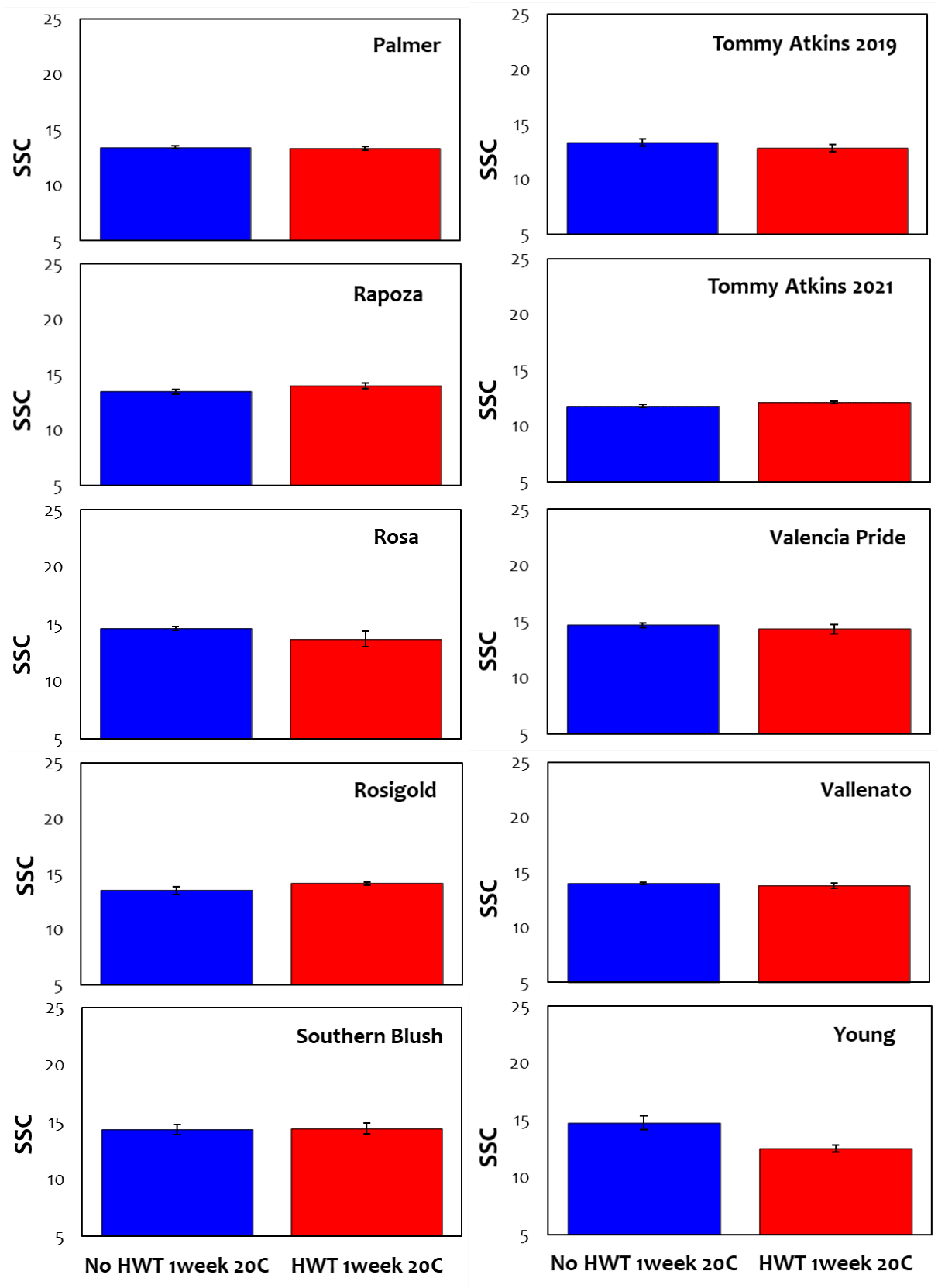

Figure 66. Titratable acidity (TA) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

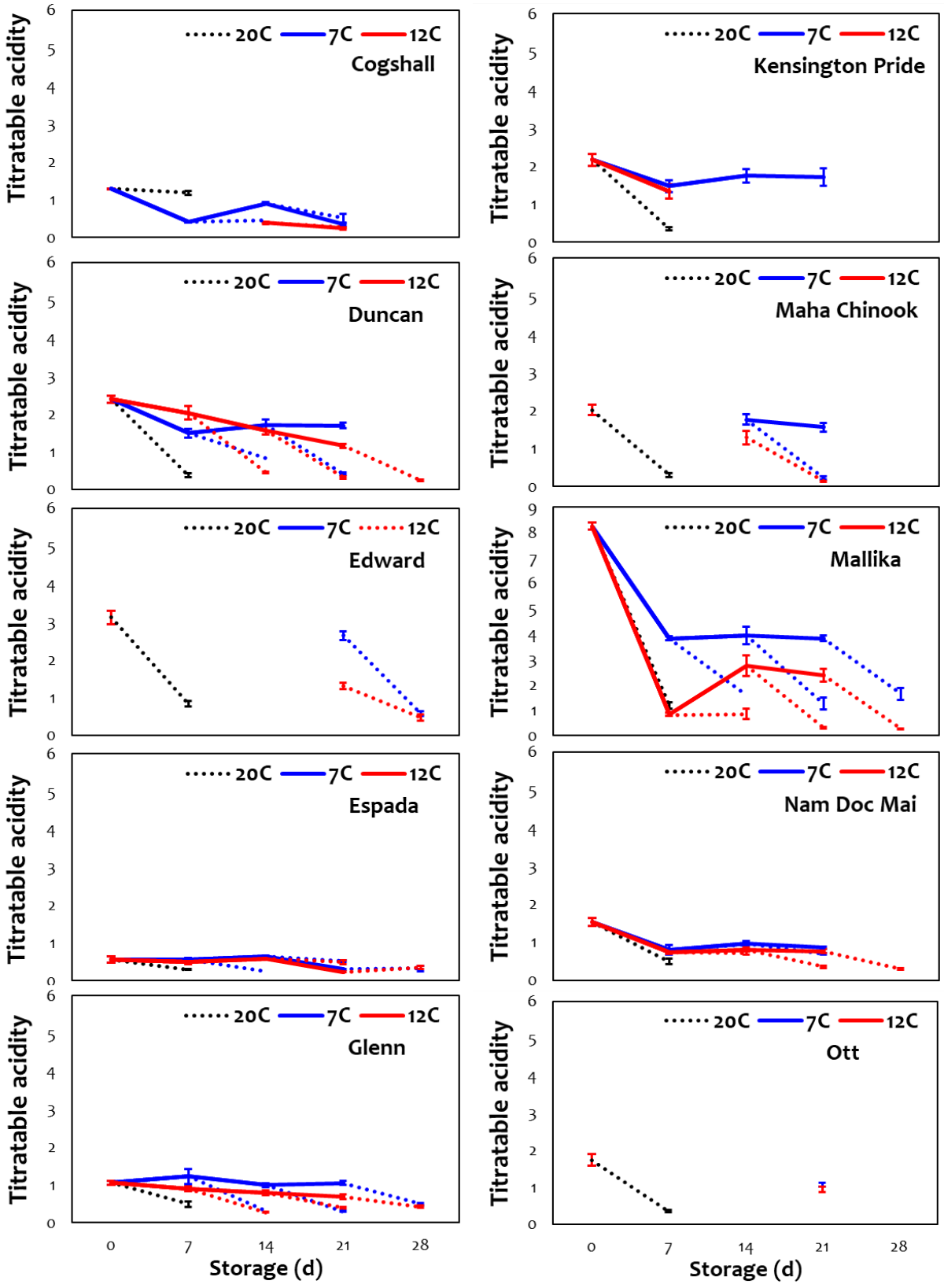

Figure 67. Titratable acidity (TA) changes in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

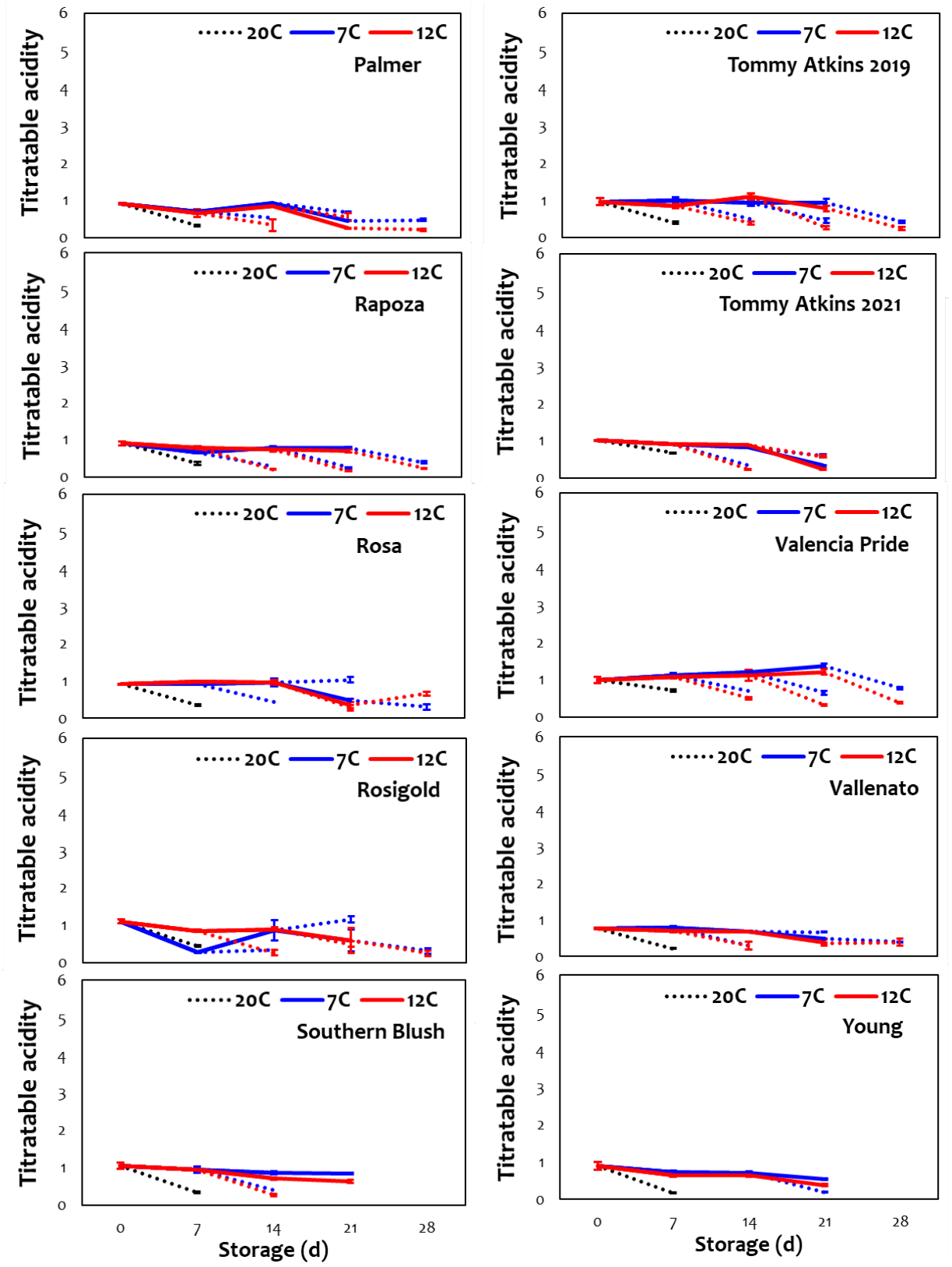

Figure 68. Hot water treatment effect on TA in mango fruit after 1 week at 20°C

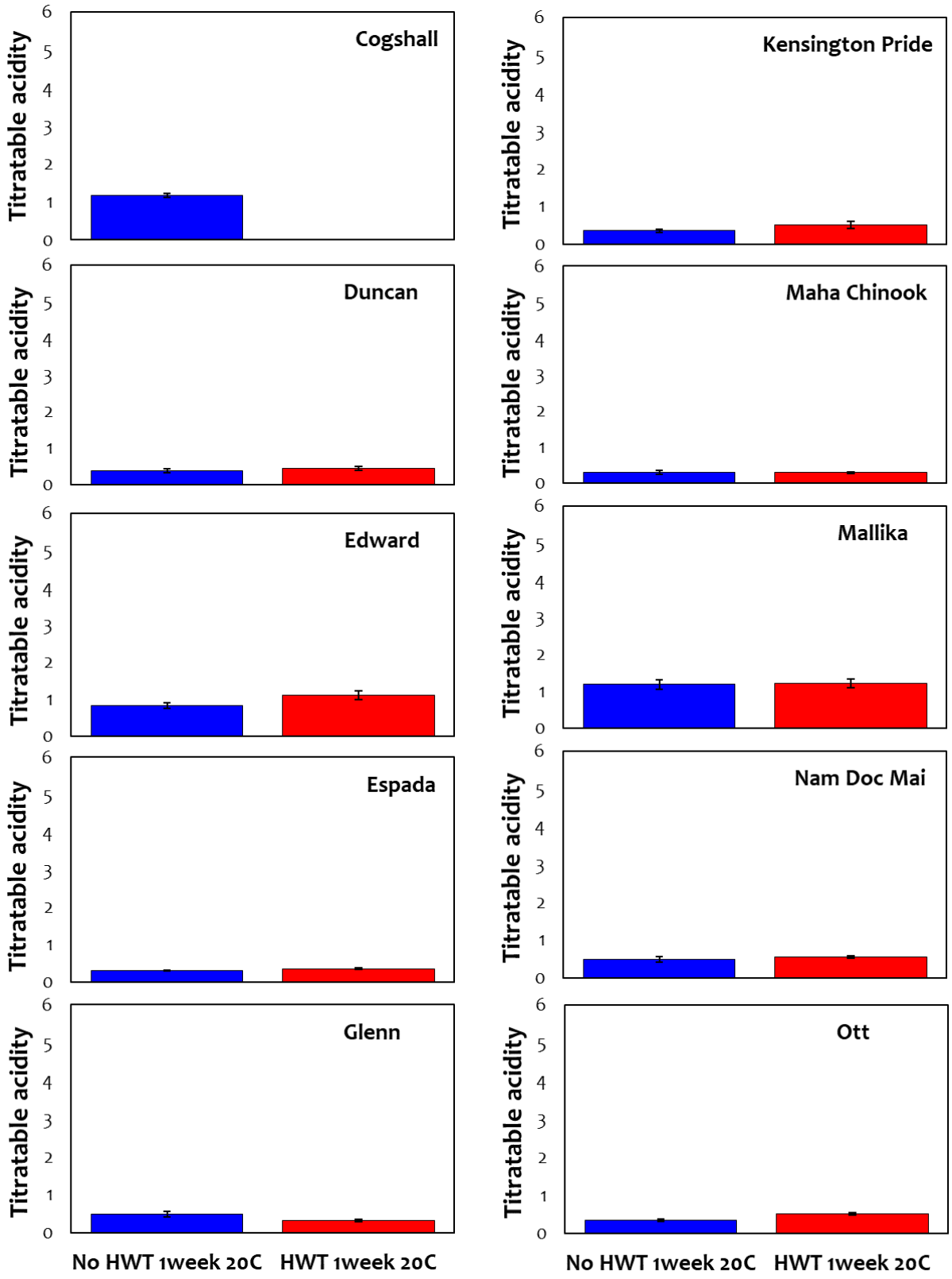

Figure 69. Hot water treatment effect on TA in mango fruit after 1 week at 20°C

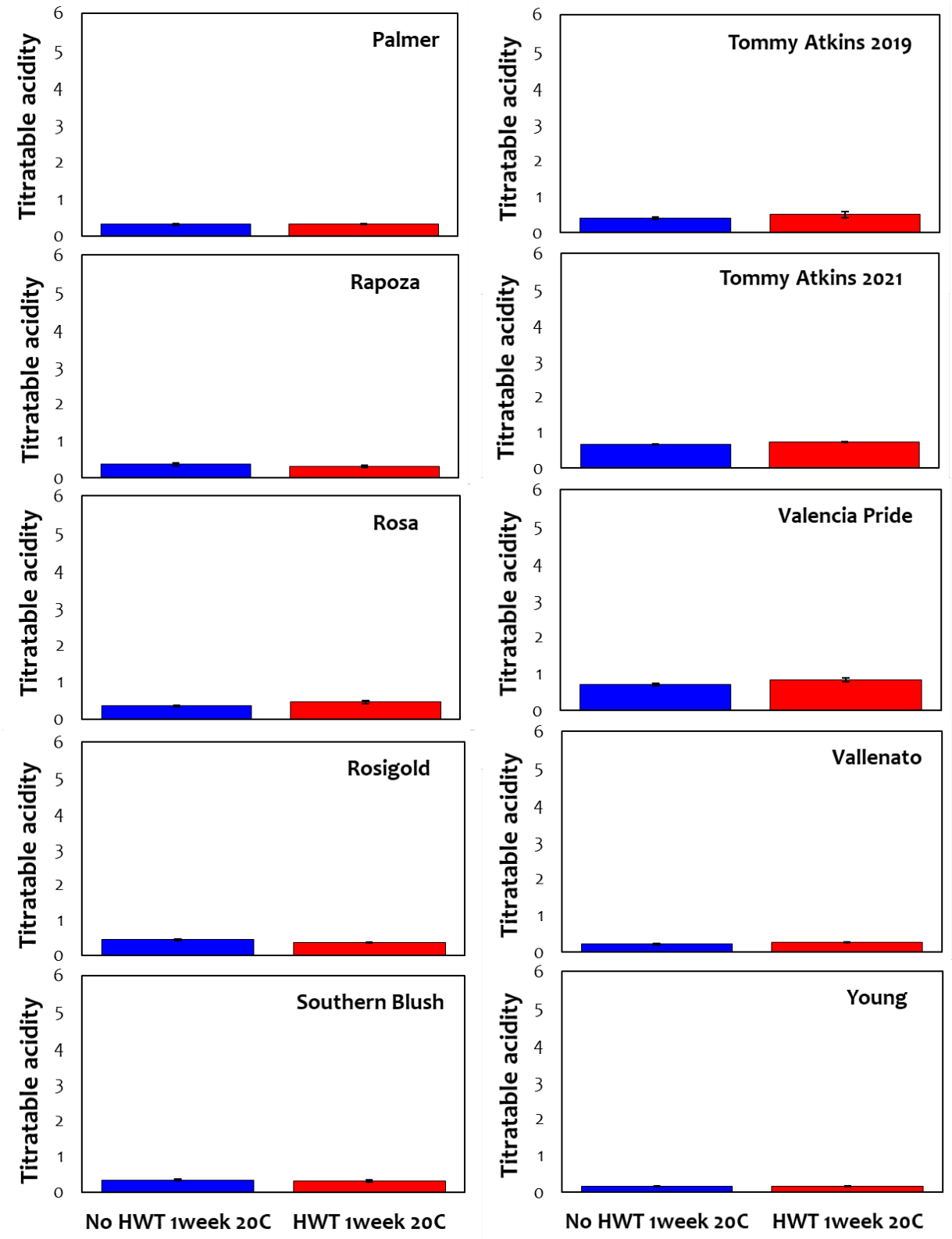

Figure 70. Changes in SSC/TA ratio in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

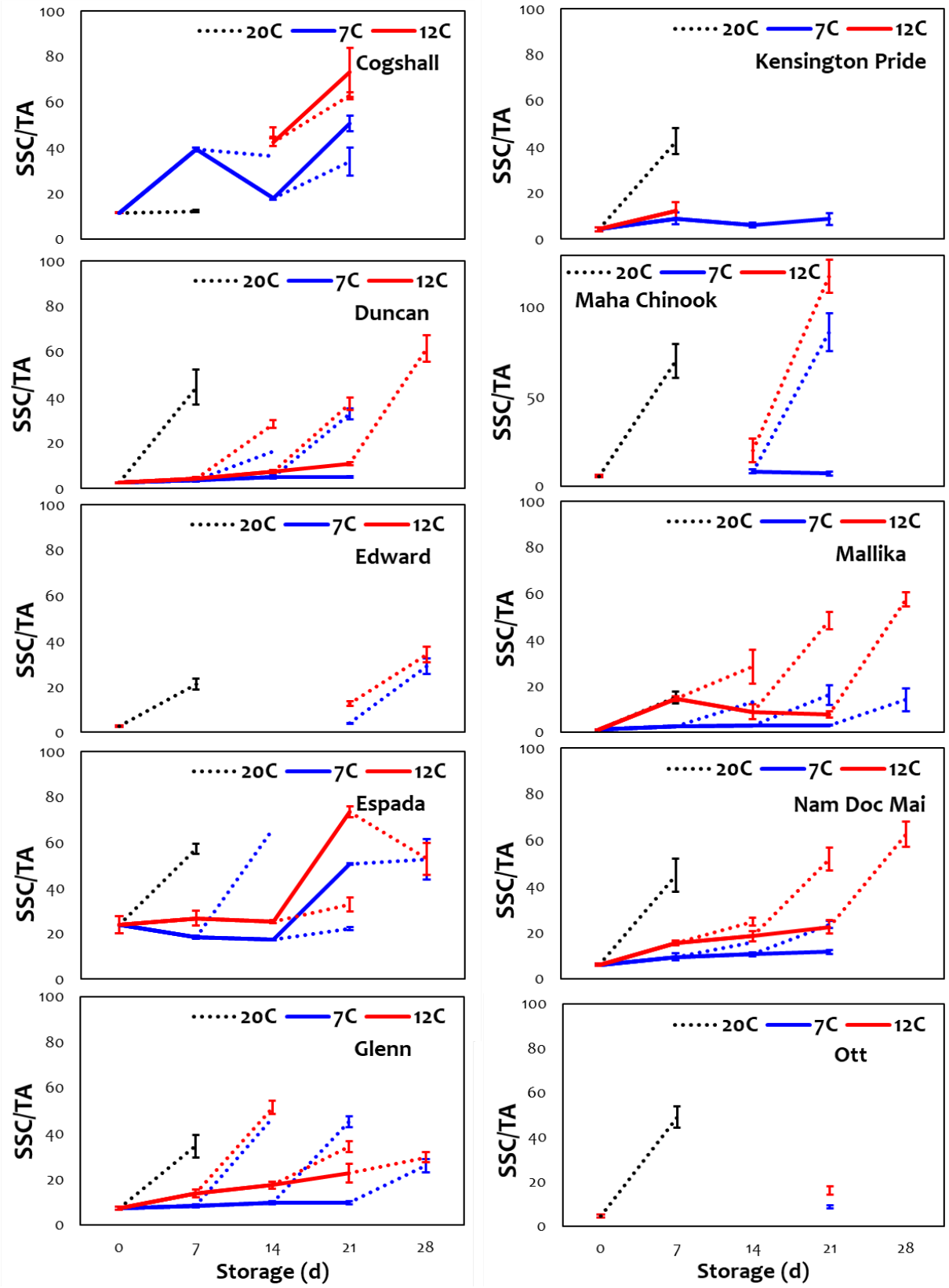

Figure 71. Changes in SSC/TA ratio in mango fruit from harvest to 3 weeks storage (at 7°C or 12°C) and 1 week at shelf life at 20°C (dotted line)

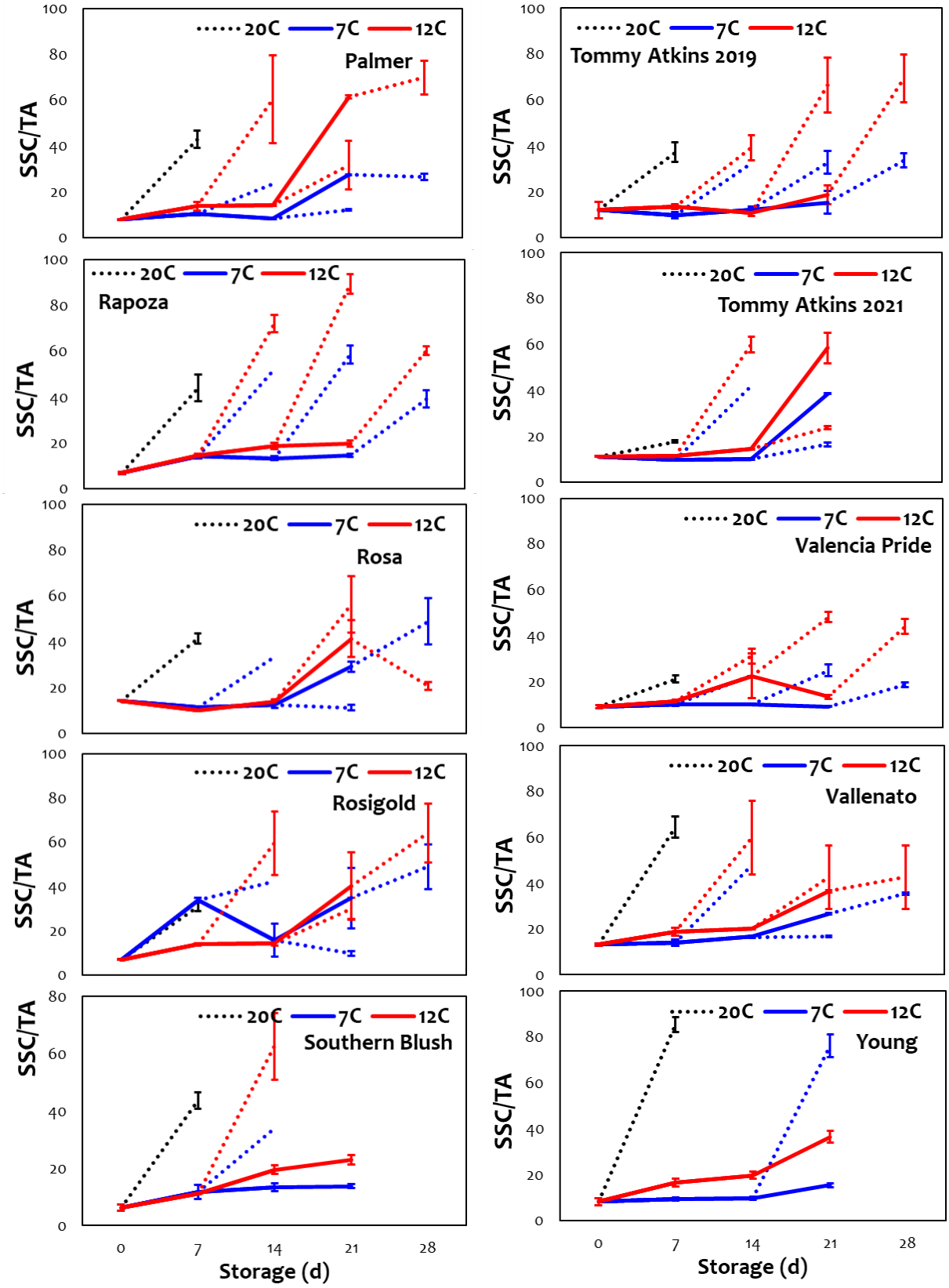

Figure 72. Hot water treatment effect on SSC/TA ratio in mango fruit after 1 week at 20°C

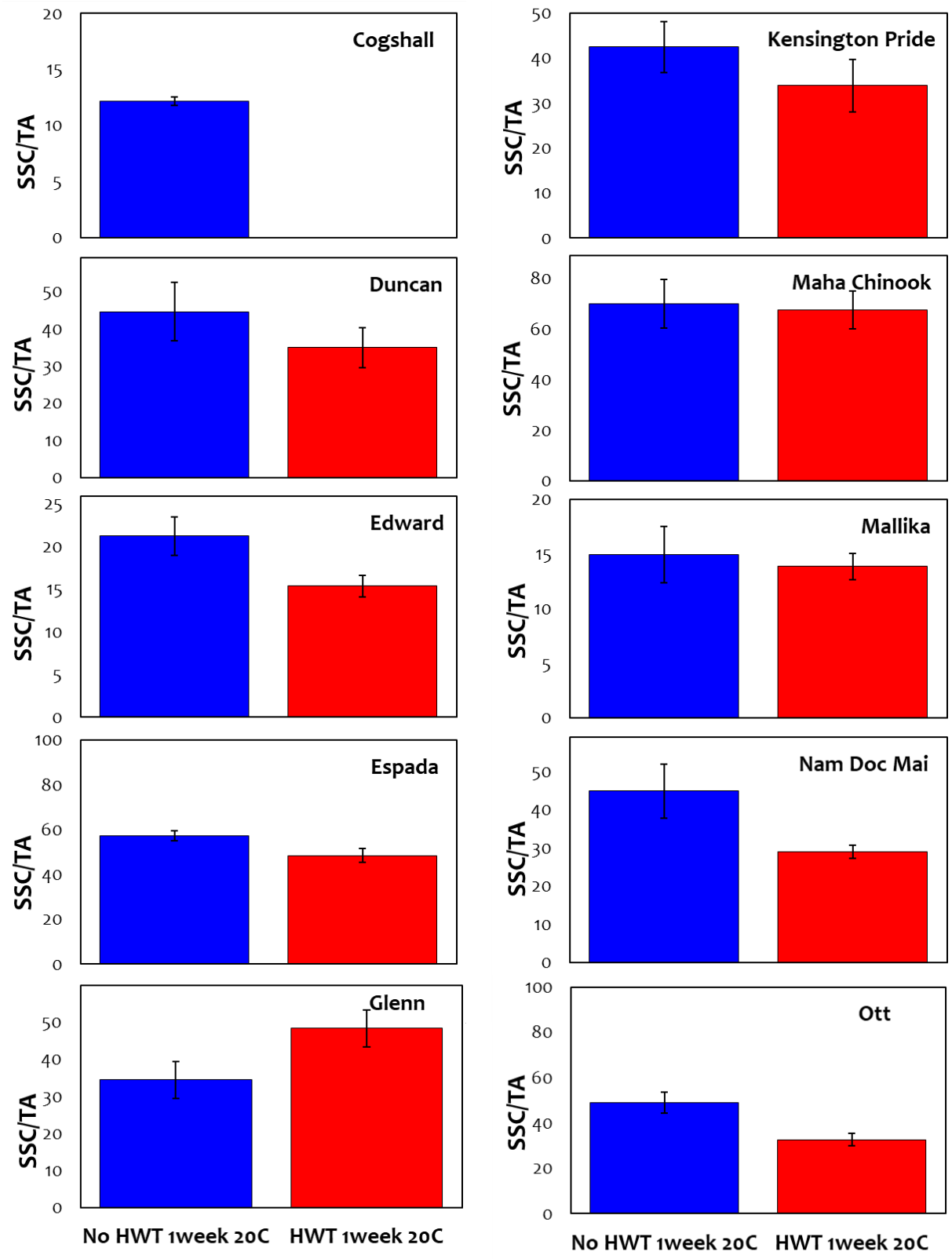

Figure 73. Hot water treatment effect on SSC/TA ratio in mango fruit after 1 week at 20°C

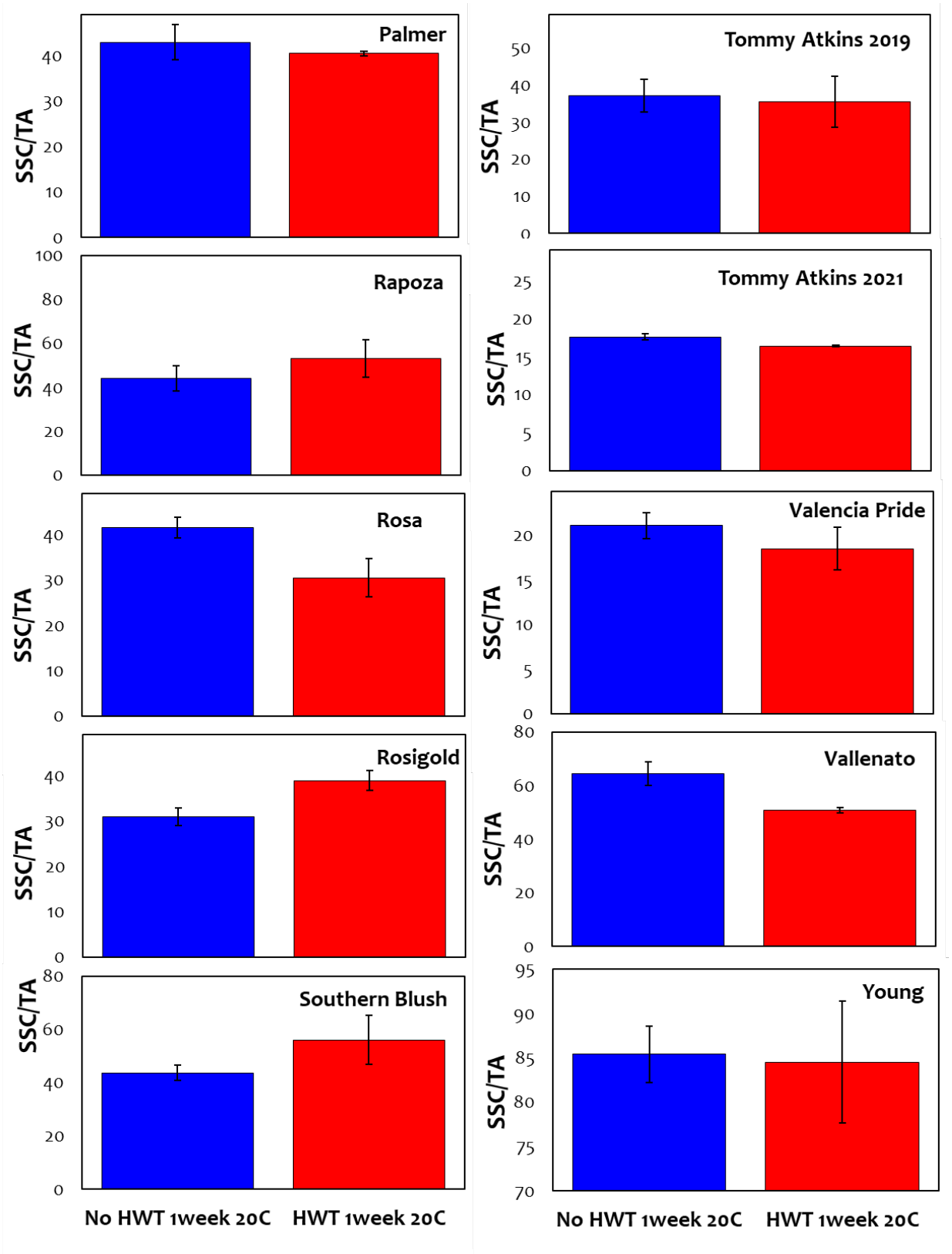

Figure 74. Hot water treatment effect on reflectance in mango fruit after 1 week at 20°C

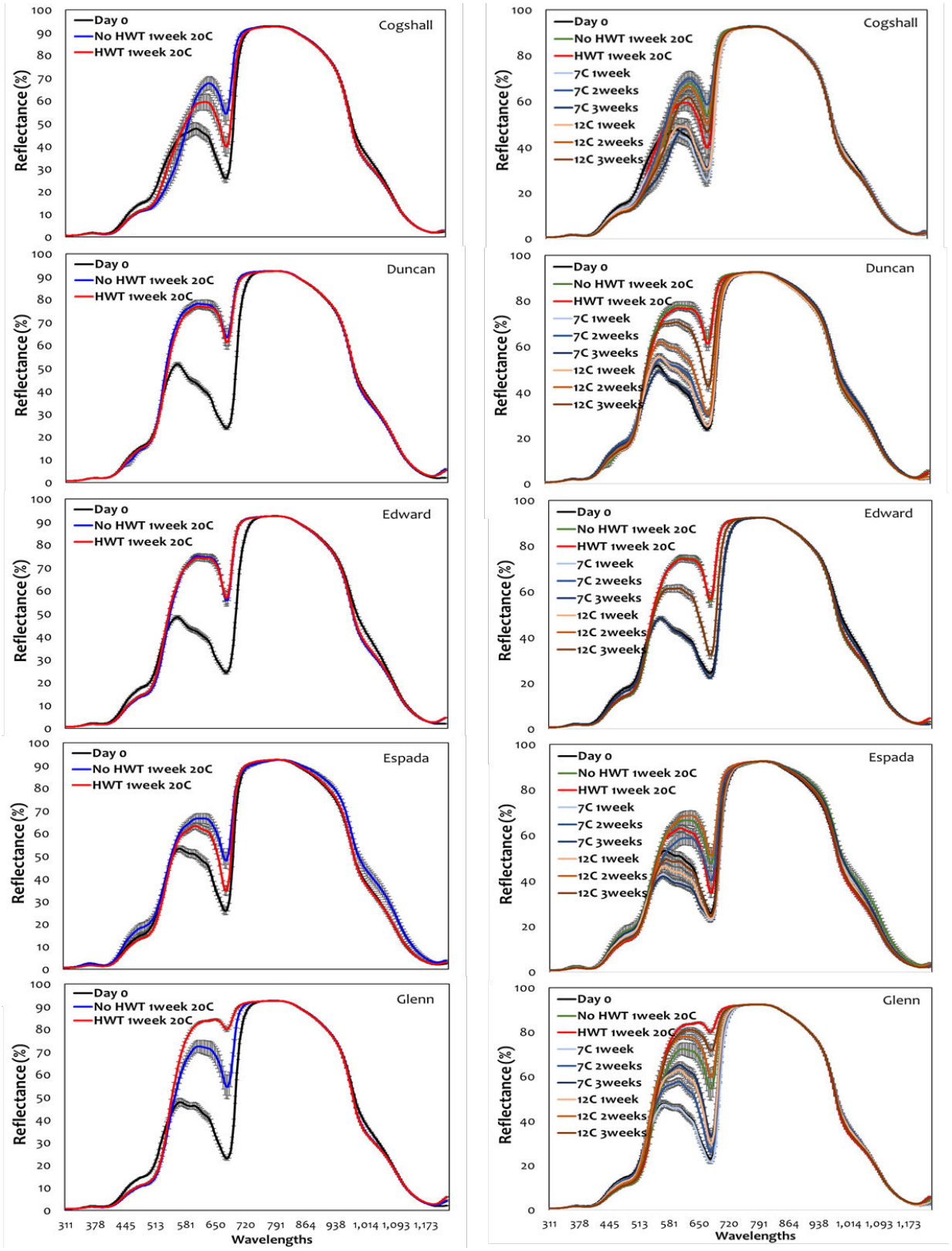

Figure 75. Hot water treatment effect on reflectance in mango fruit after 1 week at 20°C

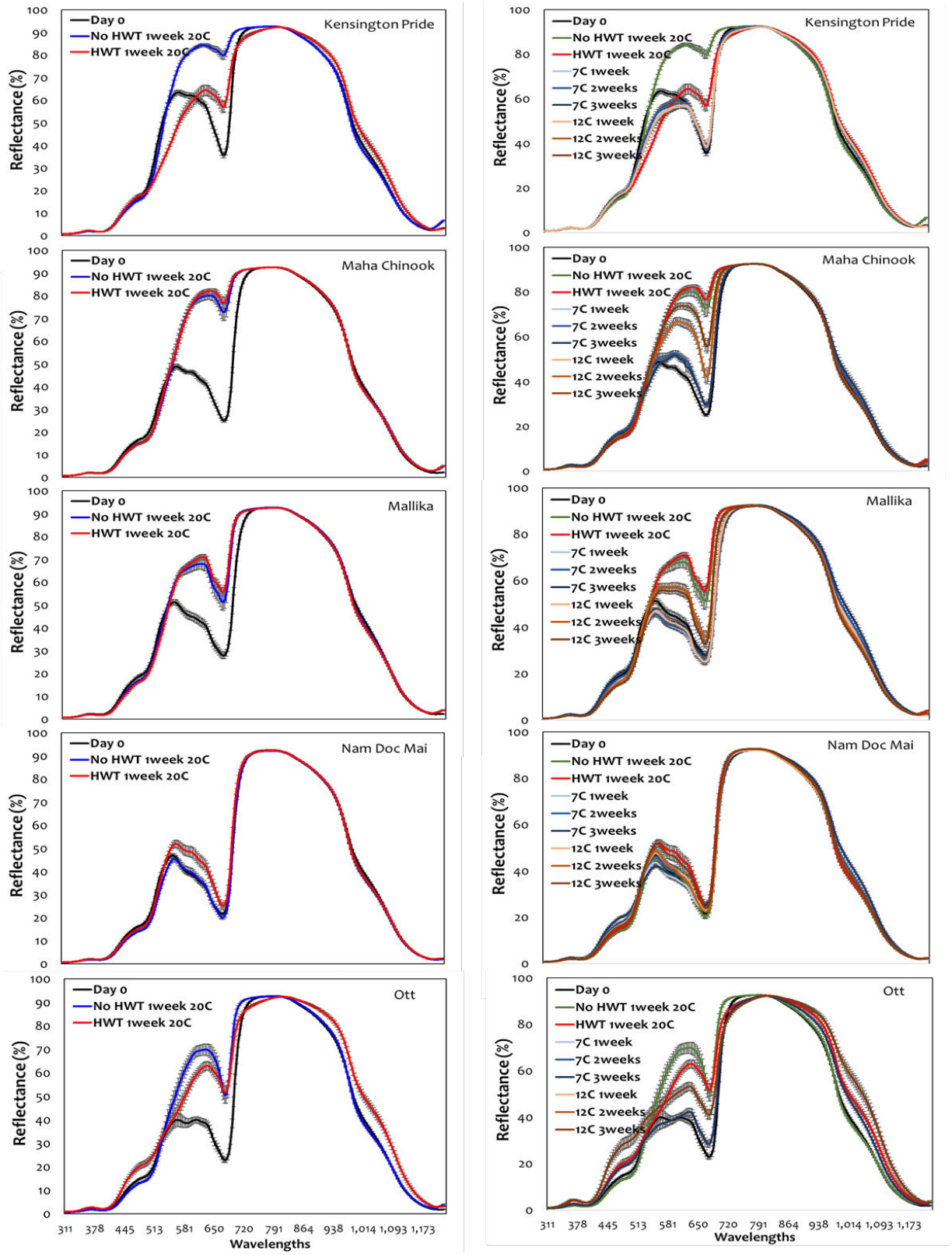

Figure 76. Hot water treatment effect on reflectance in mango fruit after 1 week at 20°C

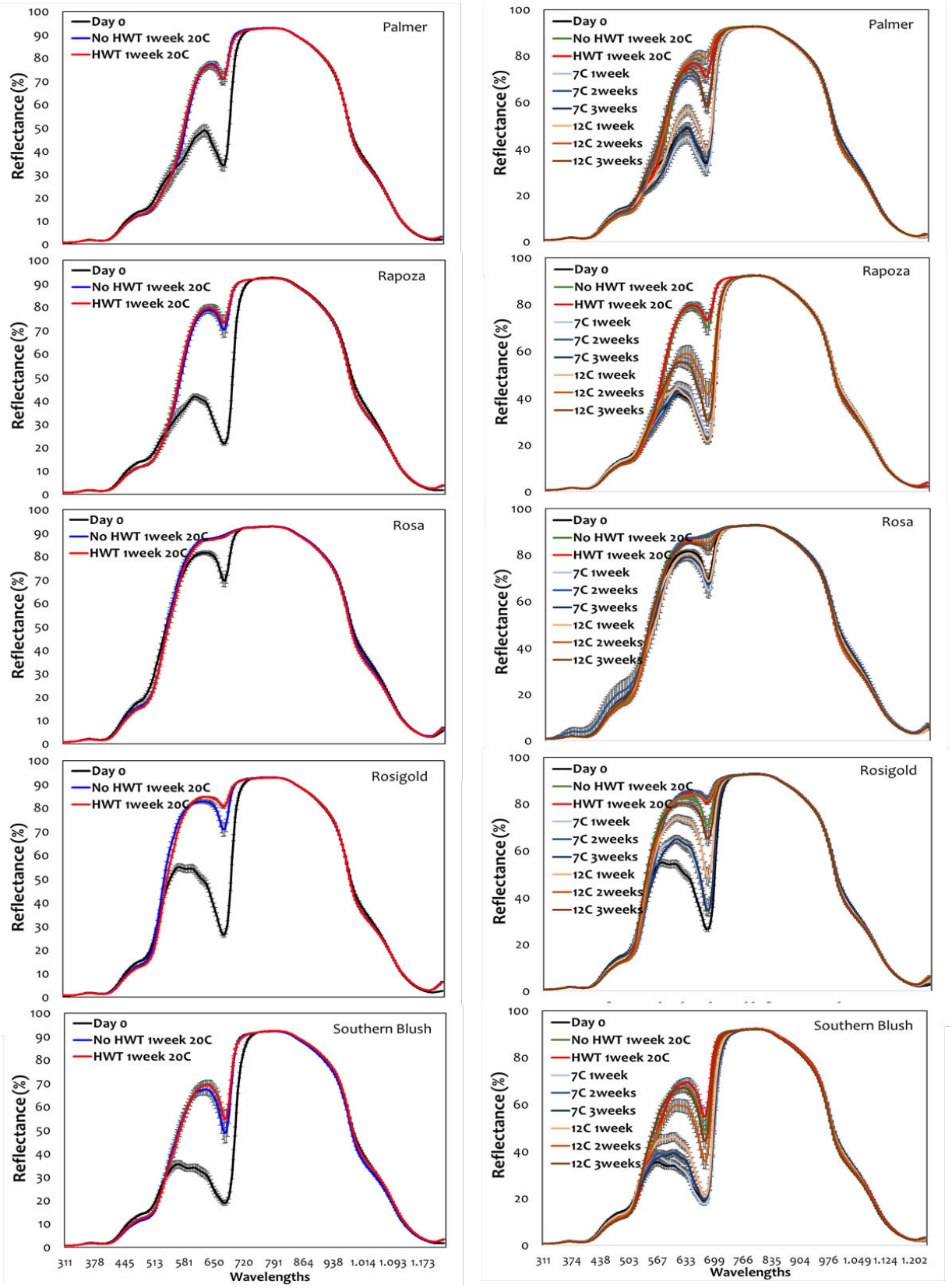

Figure 77. Hot water treatment effect on reflectance in mango fruit after 1 week at 20°C