

MAC City Block Trial, Lake Alfred

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MAC City Block Trial - Description

The MAC City-Block grove was established to demonstrate how a citrus grove can be brought into successful production in the presence of HLB, starting with clean plant material, routine scouting for pests, and effective Asian citrus psyllid control. Varieties include new scion rootstock combinations developed by the UF/IFAS CREC improvement program. Scions include: early oranges Hamlin and UF-Hamlin N13-32; late oranges include standard Valencia, newly selected UF-Valencia clones and UF-OLL (Orie & Louise Lee) clones; and the HLB-tolerant SugarBelle® (>70 scion/rootstock combinations in all). This project consists of 70 plus acres just north of UF/IFAS CREC, Lake Alfred and planted in summer 2017. Replicated plot size is 50 trees/plot (2 adjacent rows of 25 trees), with variable number of plots per scion/rootstock combination due to tree availability at the time of planting.

MAC City Block Trial - Summary

- **Location:** Lake Alfred, Polk county.
- **Scions:** standard Hamlin, UF-Hamlin N13-32; standard Valencia and UF-Valencia clones B3-42, B9-65, N7-3, N7-10, N10-13; UF-OLL (Orie & Louise Lee) clones 4,6,7,8 &10; and SugarBelle®.
- **Rootstocks:** large collection of new diploid and tetraploid rootstocks, x630 as the commercial control.
- **Date Planted:** 2017
- **Design:**
 - Replications: Variable per rootstock
 - Spacing: 10x20 ft.
- **Data:**
 - 2019/20 & 2020/21: Tree height and canopy volume.
 - 2019/20 and 2020/21: Evaluation of foliar symptoms, canopy color, canopy thickness and yield for Early and Late Oranges; SugarBelle® data for 2019/20.
 - 2020/21: juice quality for Early and Late Oranges.
 - 2020/21: tree survival for Early, Late Oranges and SugarBelle®.
- **Trial status:** ACTIVE.

Table 1. MAC City Block Trial – List of rootstocks: parentage and number of trees.

| Hamlin | | |
|-------------------------|--|-----------------|
| Rootstock | Parentage | Number of trees |
| 2247x2075-1-2 | Nova+HBP x Cleo+Swingle | 243 |
| 2247x6070-2-2 | Nova+HBP x sour orange+Flying Dragon | 200 |
| 46x20-04-31 | Hirado Buntan pummelo x Cleopatra | 207 |
| 46x20-04-32 | Hirado Buntan pummelo x Cleopatra mandarin | 199 |
| 46x20-04-42 | Hirado Buntan pummelo x Cleopatra | 185 |
| 46x20-04-48 | Hirado Buntan pummelo x Cleopatra | 151 |
| 46x20-04-9 | Hirado Buntan pummelo x Cleopatra | 136 |
| White 3 | [Nova+HBPummelo] x [Succari+Argentine trifoliate orange] | 193 |
| Green 3 | [Nova+HBPummelo] x [sour orange+Carrizo] | 176 |
| Murc+Rub | Murcott+Rubidoux | 167 |
| SO+50-7 | Sour orange+trifoliate orange 50-7 | 201 |
| UFR 6: Changsha+TF 50-7 | Changsha mandarin+trifoliate orange 50-7 | 200 |
| WGFT+50-7 | White grapefruit+trifoliate orange | 200 |
| White 1 | [Nova+HBPummelo] x [Succari+Argentine trifoliate orange] | 201 |
| x639 [control] | Cleopatra x Rubidoux TF | 200 |
| | | |
| H N13-32 | | |
| Rootstock | Parentage | Number of trees |
| UFR 16: 46x31-02-13 | Hirado Buntan (HB) pummelo x Shekwascha | 902 |
| UFR 17: Green 2 | [Nova+HBPummelo] x [sour orange+Carrizo] | 952 |
| UFR 3: Orange 15 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 706 |
| UFR 4: Orange 19 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 901 |

Table 1 (cont'd). MAC City Block Trial – List of rootstocks: parentage and number of trees.

| B3-42 | | |
|---------------------|--|-----------------|
| Rootstock | Parentage | Number of trees |
| UFR 3: Orange 15 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 150 |
| UFR 4: Orange 19 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 200 |
| B9-65 | | |
| Rootstock | Parentage | Number of trees |
| UFR 2: Orange 4 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 12 |
| N10-13 | | |
| Rootstock | Parentage | Number of trees |
| UFR 16: 46x31-02-13 | Hirado Buntan (HB) pummelo x Shekwasha | 100 |
| UFR 17: Green 2 | [Nova+HBPummelo] x [sour orange+Carrizo] | 150 |
| UFR 3: Orange 15 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 101 |
| UFR 4: Orange 19 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 200 |
| N7-10 | | |
| Rootstock | Parentage | Number of trees |
| UFR 16: 46x31-02-13 | Hirado Buntan (HB) pummelo x Shekwasha | 100 |
| UFR 17: Green 2 | [Nova+HBPummelo] x [sour orange+Carrizo] | 200 |
| UFR 3: Orange 15 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 150 |
| UFR 4: Orange 19 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 200 |

Table 1 (cont'd.). MAC City Block Trial – List of rootstocks: parentage and number of trees.

| N7-3 | | |
|-------------------------|---|-----------------|
| Rootstock | Parentage | Number of trees |
| UFR 16: 46x31-02-13 | Hirado Buntan (HB) pummelo x Shekwascha | 100 |
| UFR 17: Green 2 | [Nova+HBPummelo] x [sour orange+Carrizo] | 150 |
| UFR 3: Orange 15 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 50 |
| UFR 4: Orange 19 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 200 |
| OLL-10 | | |
| Rootstock | Parentage | Number of trees |
| 6058x2071-08-2 | [Sour orange+rangpur] x [Cleopatra+Argentine trifoliate orange] | 50 |
| Blue 1 | [Nova+HBPummelo] x [sour orange+Palestine sweet lime] | 241 |
| UFR 6: Changsha+TF 50-7 | Changsha mandarin+trifoliate orange 50-7 | 50 |
| Orange 16 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 50 |
| OLL-4 | | |
| Rootstock | Parentage | Number of trees |
| 2247x6056-01-7 | [Nova+HBP] x [sour orange+Palestine sweet lime] | 50 |
| Orange 14 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 250 |
| UFR 5: White 4 | [Nova+HBPummelo] x [Succari+Argentine trifoliate orange] | 50 |

Table 1 (cont'd). MAC City Block Trial – List of rootstocks: parentage and number of trees.

| OLL-6 | | |
|---------------------|---|-----------------|
| Rootstock | Parentage | Number of trees |
| 6058x2071-08-2 | [Sour orange+rangpur] x [Cleopatra+Argentine trifoliate orange] | 50 |
| Murc+Rub | Murcott+Rubidoux trifoliate orange | 50 |
| OLL-7 | | |
| Rootstock | Parentage | Number of trees |
| SO+FD | Sour orange x Flying Dragon trifoliate orange | 50 |
| WGFT+50-7 | White grapefruit+trifoliate orange | 100 |
| OLL-8 | | |
| Rootstock | Parentage | Number of trees |
| UFR 1: Orange 3 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 200 |
| UFR 15: 46x20-04-37 | Hirado Buntan pummelo x Cleopatra | 50 |
| UFR 16: 46x31-02-13 | Hirado Buntan (HB) pummelo x Shekwasna | 50 |
| UFR 17: Green 2 | [Nova+HBPummelo] x [sour orange+Carrizo] | 200 |
| UFR 4: Orange 19 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 49 |
| x639 [control] | Cleopatra x Rubidoux trifoliate orange | 100 |
| T1-56 | | |
| Rootstock | Parentage | Number of trees |
| UFR 3: Orange 15 | [Nova+HBPummelo] x [Cleopatra+Argentine trifoliate orange] | 100 |

Table 1 (cont'd). MAC City Block Trial – List of rootstocks: parentage and number of trees.

| Valencia | | |
|-------------------------|--|-----------------|
| Rootstock | Parentage | Number of trees |
| 2247x2075-1-2 | Nova+HBP x Cleo+Swingle | 200 |
| 2247x6070-2-2 | Nova+HBP x sour orange+Flying Dragon | 400 |
| 46x20-04-31 | Hirado Buntan pummelo x Cleopatra mandarin | 200 |
| 46x20-04-32 | Hirado Buntan pummelo x Cleopatra mandarin | 200 |
| 46x20-04-42 | Hirado Buntan pummelo x Cleopatra | 198 |
| 46x20-04-48 | Hirado Buntan pummelo x Cleopatra | 150 |
| 46x20-04-9 | Hirado Buntan pummelo x Cleopatra | 150 |
| Green3 | [Nova+HBPummelo] x [sour orange+Carrizo] | 200 |
| Murc+Rub | Murcott+Rubidoux | 250 |
| SO+50-7 | Sour orange+trifoliate orange 50-7 | 250 |
| UFR 15: 46x20-04-37 | Hirado Buntan pummelo x Cleopatra | 203 |
| UFR 6: Changsha+TF 50-7 | Changsha mandarin+trifoliate orange 50-7 | 400 |
| WGFT+50-7 | White grapefruit+trifoliate orange | 246 |
| White 3 | [Nova+HBPummelo] x [Succari+Argentine trifoliate orange] | 200 |
| White1 | [Nova+HBPummelo] x [Succari+Argentine trifoliate orange] | 200 |
| x639 [control] | Cleopatra x Rubidoux TF | 200 |

Table 1 (cont'd). MAC City Block Trial – List of rootstocks: parentage and number of trees.

| SugarBelle® | | |
|-----------------|--|-----------------|
| Rootstock | Parentage | Number of trees |
| 2247x2075-01-02 | Nova+HBP x sour orange+Flying Dragon | 169 |
| 3246x2071-05-6 | Amblycarpa+HBP x Cleo+Argentine trifoliate orange | 294 |
| UFR 5: White 4 | [Nova+HBPummelo] x [Succari+Argentine trifoliate orange] | 729 |
| UFR 17: Green 2 | [Nova+HBPummelo] x [sour orange+Carrizo] | 25 |
| x639 [control] | Cleopatra x Rubidoux trifoliate orange | 23 |

MAC City Block Trial - Interpretive Summary:

As expected, the data show a lot of variation in how the various scion/rootstocks grew off under heavy HLB pressure. By the end of year two, nearly all of the trees were HLB+, despite routine imidacloprid treatments.

Tree Growth: As expected, the commercial control rootstock x639 grew off vigorous and relatively healthy trees, but produced fruit with low quality. Other commercially available rootstocks growing trees off quickly, but with better fruit quality with late-season oranges were UFR-4, UFR-5 and UFR-17. UF-Hamlin N13-32 sweet orange produced larger trees than standard Hamlin, but were slower to bear. OLL-8 sweet orange produced the largest trees among the late oranges, significantly larger than the standard Valencia trees. This has been observed at multiple locations.

Fruit/Juice Quality: This past season, most trees had fruit, so we were able to begin fruit quality assessments. Fruit quality was a major issue across the entire Florida citrus production area during the 2020/2021 season, with the lowest soluble solids/box averages ever recorded. This was driven by low Brix and juice content, caused primarily by HLB, but also due to heavy rains and a lack of cold nights in the early fall. With so many new trees being planted in the state, there is now more focus on young tree juice quality. In this MAC trial, juice quality was highly variable, but was much better overall with the late oranges than with the early Hamlins. Rootstocks that promoted higher juice quality in both the earlies and lates were White 1 and UFR-5 (White 4), both tetraploid siblings from a cross of [(Nova + HBPummelo) x (Succari sweet orange + Argentine trifoliolate orange)]. Trees on these two rootstocks were also quite healthy overall, with medium-large tree sizes. UFR-5 is commercially available, and we hope to release White 1 in the near future. Use of these rootstocks should help with the young tree fruit/juice quality issue.

MAC City Block Trial - Interpretive Summary:

Best Performing Rootstocks for Hamlin: Hamlin trees on rootstocks UFR-4, x639 and UFR-17 grew the fastest (all 3 commercially available), quickly producing large trees with reasonably good health; however, the juice soluble solids in the first crop were poor (2.5-2.8 lbs. solids/box). Rootstocks showing medium vigor and tree size with good health, but producing first crop fruit with much higher soluble solids (3.9-4.3 lbs. solids/box) were White 1, 46x20-04-32, and 2247x6070-02-2. These latter 3 rootstocks are not commercially available, but all three are in the DPI-Parent Tree Program and can be made available for advanced trials.

Best Performing rootstocks for Valencia and OLLs: The fastest growing and largest trees were OLL oranges on rootstocks UFR-4, UFR-5, UFR 16 and x639 (all commercially available); however, among these, UFR-5 produced the highest lbs. solids/box of 5.5 with OLL-4 scion. OLL-7 on WGFT+50-7 produced a medium-sized tree with 5.7 lbs. solids/box. For Valencia, highest lbs. solids were from medium-sized trees on rootstocks 46x20-04-42 (5.9 lbs. solids/box), White 1 & UFR-4 (both 5.4 lbs. solids/box). Rootstocks WGFT+50-7, 46x20-04-42, and White 1 are not commercially available, but are in the DPI-Parent Tree Program and can be made available for advanced trials.

Best Performing rootstocks for SugarBelle®: SugarBelle® was planted on only 5 rootstocks, but among these rootstock UFR-5 had the best combination of uniform vigorous tree growth, canopy thickness, canopy color and least amount of foliar symptoms. Fruit quality was not assessed, but SugarBelle® on UFR-5 made very high quality fruit on young trees in a previous trial.

MAC City Block Trial - Interpretive Summary:

Unexpected Issues: The primary source of nutrition in this trial has been fertigation, using emerging optimized, commercially available, liquid fertilizers blends. However, the trial was set up with low-volume blue microjets that deliver 10.5 GPH. We have experienced a chronic problem with microjet clogging, and in some cases excessive sand buildup in the irrigation lines at the end of the rows, despite routine flushing. This problem has caused the loss of some trees, and also compromised others due to a lack of water and thus nutrition. During year 3, the trial was supplemented with a 12-month 12-4-8 CRF (controlled release fertilizer) product containing an enhanced micronutrient package. We have also discovered a soil pH problem, encountering pH values above 7.0 (with 5.5-6.5 being the optimum range). These problems are now being aggressively addressed. Microjet-clog preventatives are being considered, and the trial block will be treated with sulfur to correct the pH issue. This should significantly improve overall tree health as we move forward. However, we recommend using higher volume microjets in new plantings to help avoid the clogging issue.

Future nutrition: The CREC team of soil/nutrition experts is developing a new nutrition program as we move forward. We will continue to use fertigation from January until the summer rains begin, applying nutrient levels that match the tree nutrient-utilization curves; then switch to a hybrid blend of soluble dry and CRF fertilizers for the remainder of the year. This should allow us to maintain required nutrient thresholds year round with efficient economics, as to maximize tree health, yields and fruit/juice quality.

Early Oranges

Hamlin & H-N13-32

Canopy volume and Tree height

Table 2. MAC City Block Trial – Early oranges - Canopy volume [ft³] and Tree height [ft.] by scion and rootstock: mean + std. dev., 2019/20.

| Scion | Rootstock | Numbers of trees Evaluated | Canopy Volume | | Height | |
|----------|-------------------------|----------------------------|---------------|-----------|--------|-----------|
| | | | Mean | std. dev. | Mean | std. dev. |
| H N13-32 | UFR 4: Orange 19 | 140 | 114.4 | 41.1 | 5.7 | 0.7 |
| | UFR 17: Green 2 | 140 | 99.4 | 38.6 | 5.5 | 0.7 |
| | UFR 16: 46x31-02-13 | 140 | 77.9 | 35.2 | 5.2 | 0.7 |
| | UFR 3: Orange 15 | 140 | 73.0 | 33.9 | 5.0 | 0.8 |
| Hamlin | x639 [control] | 60 | 103.3 | 38.4 | 5.4 | 0.6 |
| | 46x20-04-31 | 80 | 90.3 | 41.0 | 5.2 | 0.8 |
| | 46x20-04-9 | 40 | 81.6 | 37.7 | 4.8 | 0.9 |
| | 46x20-04-32 | 30 | 75.6 | 28.6 | 5.2 | 0.8 |
| | UFR 6: Changsha+TF 50-7 | 60 | 73.5 | 32.1 | 4.9 | 0.6 |
| | 2247x6070-02-2 | 60 | 70.9 | 26.6 | 5.0 | 0.7 |
| | White 1 | 80 | 67.1 | 30.3 | 5.1 | 0.7 |
| | 46x20-04-42 | 80 | 65.8 | 35.9 | 4.9 | 0.8 |
| | Murc + Rub | 72 | 64.9 | 22.2 | 4.8 | 0.5 |
| | WGFT+50-7 | 58 | 60.6 | 18.7 | 4.8 | 0.4 |
| | 46x20-04-48 | 60 | 59.6 | 25.2 | 4.9 | 0.6 |
| | White 3 | 40 | 50.8 | 18.0 | 4.6 | 0.6 |
| | Green 3 | 60 | 40.8 | 26.3 | 4.3 | 0.8 |
| | SO+50-7 | 90 | 40.0 | 19.3 | 4.4 | 0.6 |
| | 2247x2075-1-2 | 60 | 36.9 | 16.8 | 4.4 | 0.6 |

Table 3. MAC City Block Trial – Early Orange - Canopy volume [ft³] and Tree height [ft.] by scion and rootstock: mean + std. dev., 2020/21.

| Scion | Rootstock | Numbers of trees Evaluated | Canopy Volume | | Height | |
|----------|-------------------------|----------------------------|---------------|-----------|--------|-----------|
| | | | Mean | std. dev. | Mean | std. dev. |
| H N13-32 | UFR 4: Orange 19 | 140 | 163.0 | 52.0 | 6.2 | 0.7 |
| | UFR 17: Green 2 | 160 | 138.7 | 49.2 | 5.9 | 0.7 |
| | UFR 16: 46x31-02-13 | 141 | 112.9 | 54.2 | 5.6 | 0.8 |
| | UFR 3: Orange 15 | 130 | 98.2 | 49.9 | 5.3 | 0.9 |
| Hamlin | x639 [control] | 40 | 146.1 | 46.4 | 6.0 | 0.7 |
| | 46x20-04-31 | 80 | 101.2 | 52.7 | 5.3 | 0.8 |
| | 46x20-04-32 | 53 | 93.6 | 56.8 | 5.1 | 1.1 |
| | 46x20-04-9 | 40 | 91.2 | 39.5 | 4.9 | 0.7 |
| | UFR 6: Changsha+TF 50-7 | 60 | 89.3 | 41.5 | 5.2 | 0.7 |
| | 2247x6070-02-2 | 60 | 80.6 | 30.7 | 5.2 | 0.6 |
| | WGFT+50-7 | 60 | 78.0 | 26.0 | 5.3 | 0.6 |
| | White 1 | 80 | 77.2 | 38.6 | 5.1 | 0.7 |
| | Murc+Rub | 72 | 70.3 | 21.7 | 4.9 | 0.5 |
| | 46x20-04-42 | 83 | 68.7 | 42.4 | 4.9 | 0.8 |
| | 46x20-04-48 | 60 | 64.5 | 32.0 | 4.9 | 0.6 |
| | SO+50-7 | 90 | 49.5 | 29.5 | 4.5 | 0.6 |
| | White 3 | 60 | 48.3 | 17.8 | 4.5 | 0.5 |
| | Green 3 | 70 | 47.3 | 30.2 | 4.4 | 0.8 |
| | 2247x2075-1-2 | 60 | 46.4 | 22.9 | 4.5 | 0.7 |

Fig. 1. MAC City Block Trial – Early orange - Tree canopy volume by scion and rootstock:
mean + std. dev. [ft³., 2019/20 & 2020/21].

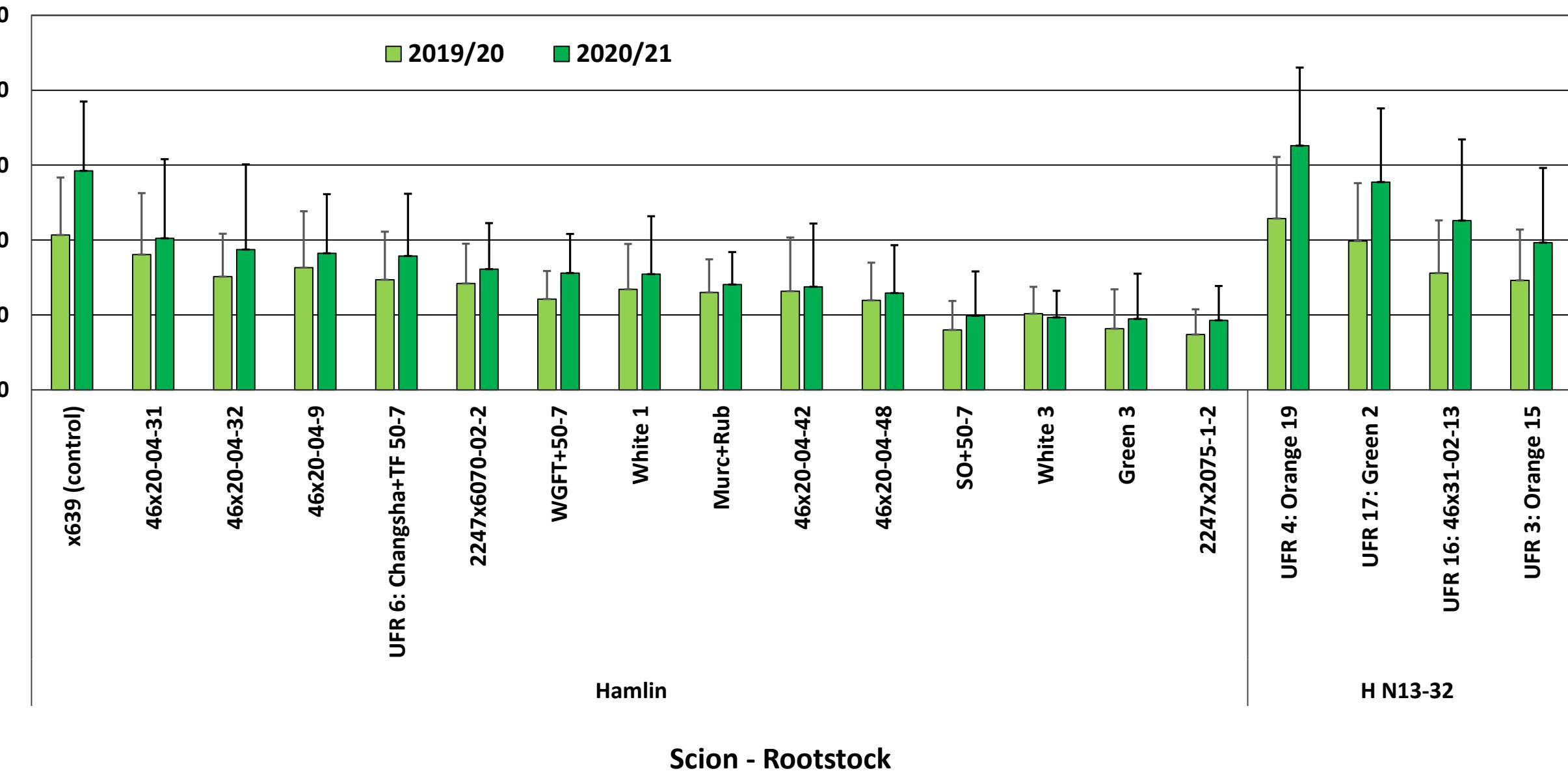
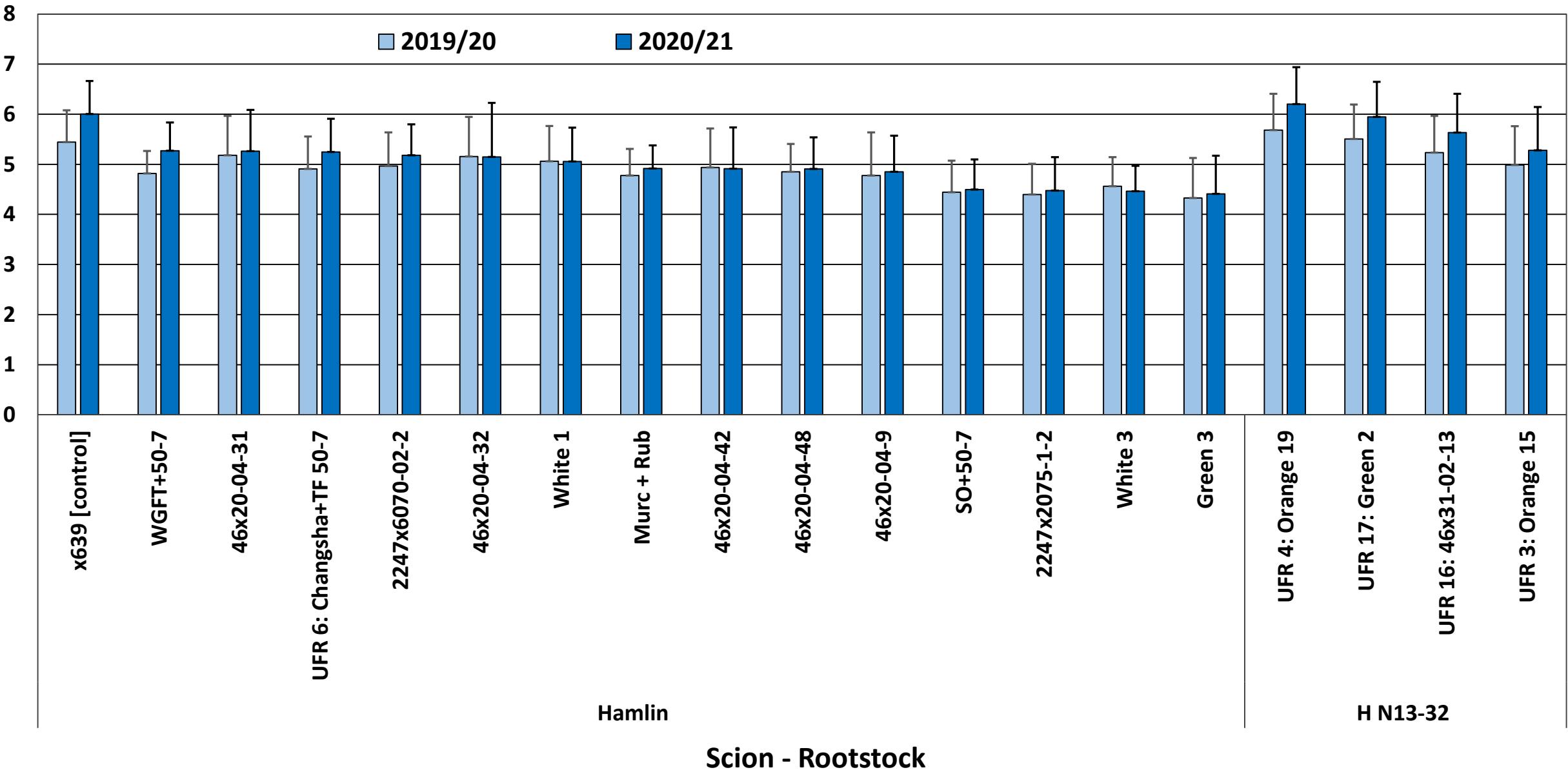


Fig. 2. MAC City Block Trial – Early orange - Tree height by scion and rootstock: mean + std. dev. [ft., 2019/20 & 2020/21].



Early Oranges

Hamlin & H-N13-32

Canopy thickness, foliar symptoms,
canopy color, yield and fruit drop

Table 4. MAC City Block Trial – Early orange - Evaluation of canopy thickness, foliar symptoms, canopy color, yield and fruit drop by scion and rootstock: mean + std. dev., 2019/20.

| Scion | Rootstock | Number of trees evaluated | Canopy Thickness | | Foliar Symptoms | | Canopy Color | | Yield | | Fruit Drop | |
|----------|-------------------------|---------------------------|------------------|-----------|-----------------|-----------|--------------|-----------|-------|-----------|------------|-----------|
| | | | Mean | std. dev. | Mean | std. dev. | Mean | std. dev. | Mean | std. dev. | Mean | std. dev. |
| H N13-32 | UFR 4: Orange 19 | 140 | 3.0 | 0.7 | 3.2 | 0.7 | 2.6 | 0.5 | 0.1 | 0.3 | 0.3 | 0.5 |
| | UFR 17: Green 2 | 160 | 2.8 | 0.6 | 3.3 | 0.6 | 2.4 | 0.5 | 0.7 | 0.8 | 0.9 | 0.7 |
| | UFR 3: Orange 15 | 160 | 2.7 | 0.5 | 3.3 | 0.7 | 2.4 | 0.4 | 0.3 | 0.5 | 0.7 | 0.6 |
| | UFR 16: 46x31-02-13 | 140 | 2.6 | 0.6 | 3.2 | 0.7 | 2.4 | 0.5 | 0.3 | 0.5 | 0.5 | 0.6 |
| Hamlin | 46x20-04-32 | 47 | 3.4 | 0.7 | 2.7 | 0.7 | 2.9 | 0.5 | 1.2 | 0.5 | 2.2 | 0.8 |
| | White 1 | 80 | 2.8 | 0.6 | 3.2 | 0.6 | 2.6 | 0.4 | 1.1 | 0.6 | 1.9 | 0.8 |
| | 46x20-04-9 | 40 | 2.8 | 0.8 | 3.4 | 0.5 | 2.5 | 0.4 | 1.2 | 0.5 | 1.8 | 0.7 |
| | 2247x2075-1-2 | 60 | 2.8 | 0.6 | 2.7 | 0.7 | 2.8 | 0.5 | 1.0 | 0.5 | 1.6 | 0.7 |
| | Murc+Rub | 72 | 2.8 | 0.5 | 3.2 | 0.6 | 2.6 | 0.4 | 0.8 | 0.5 | 1.7 | 0.8 |
| | 46x20-04-31 | 80 | 2.7 | 0.5 | 3.0 | 0.6 | 2.8 | 0.4 | 1.5 | 0.8 | 2.0 | 0.7 |
| | SO+50-7 | 90 | 2.7 | 0.5 | 2.8 | 0.6 | 2.9 | 0.6 | 0.8 | 0.5 | 1.2 | 0.6 |
| | x639 (control) | 60 | 2.7 | 0.6 | 3.5 | 0.8 | 2.4 | 0.4 | 1.5 | 0.8 | 2.2 | 0.7 |
| | 46x20-04-42 | 80 | 2.6 | 0.5 | 3.3 | 0.7 | 2.4 | 0.5 | 1.1 | 0.7 | 1.8 | 0.8 |
| | 46x20-04-48 | 60 | 2.6 | 0.6 | 3.3 | 0.5 | 2.4 | 0.4 | 1.3 | 0.8 | 1.8 | 0.7 |
| | 2247x6070-02-2 | 60 | 2.5 | 0.5 | 2.9 | 0.5 | 2.5 | 0.5 | 1.7 | 0.9 | 1.9 | 0.7 |
| | White 3 | 40 | 2.5 | 0.6 | 3.4 | 0.8 | 2.3 | 0.4 | 0.9 | 0.5 | 1.6 | 0.7 |
| | WGFT+50-7 | 60 | 2.5 | 0.6 | 2.9 | 0.5 | 2.7 | 0.4 | 2.0 | 0.9 | 1.6 | 0.6 |
| | Green 3 | 69 | 2.4 | 0.8 | 3.3 | 0.6 | 2.4 | 0.6 | 0.7 | 0.6 | 1.6 | 0.7 |
| | UFR 6: Changsha+TF 50-7 | 60 | 2.3 | 0.6 | 3.2 | 0.7 | 2.4 | 0.5 | 1.6 | 1.0 | 2.1 | 0.7 |

| Evaluation Scale | | | |
|------------------|-----------------------------|------------------|------------------|
| Foliar Symptoms | Canopy color | Canopy Thickness | Yield/Fruit Drop |
| 1 = none | 1 = very yellow/unhealthy | 1 = very thin | 1 = Low |
| 2 = <25% | 2 = yellow/unhealthy | 2 = thin | 2 = Medium |
| 3 = 25-50% | 3 = moderately healthy | 3 = medium | 3 = High |
| 4 = 50-75% | 4 = healthy/green | 4 = thick | |
| 5 = >75% | 5 = very healthy/dark green | 5 = very thick | |

Table 5. MAC City Block Trial – Early orange - Evaluation of canopy thickness, foliar symptoms, canopy color, yield and fruit drop by scion and rootstock: mean + std. dev., 2020/21.

| Scion | Rootstock | Number of trees evaluated | Canopy Thickness | | Foliar Symptoms | | Canopy Color | | Yield | | Fruit Drop | |
|---------|-------------------------|---------------------------|------------------|-----------|-----------------|-----------|--------------|-----------|-------|-----------|------------|-----------|
| | | | Mean | std. dev. | Mean | std. dev. | Mean | std. dev. | Mean | std. dev. | Mean | std. dev. |
| HN13-32 | UFR 4: Orange 19 | 140 | 3.1 | 0.6 | 3.0 | 0.7 | 2.6 | 0.6 | 0.7 | 0.7 | 0.9 | 0.8 |
| | UFR 17: Green 2 | 160 | 2.8 | 0.6 | 3.3 | 0.6 | 2.5 | 0.5 | 1.2 | 0.8 | 1.4 | 0.9 |
| | UFR 3: Orange 15 | 160 | 2.7 | 0.7 | 3.4 | 0.8 | 2.5 | 0.5 | 0.9 | 0.9 | 1.1 | 0.9 |
| | UFR 16: 46x31-02-13 | 140 | 2.7 | 0.6 | 3.5 | 0.9 | 2.3 | 0.5 | 0.7 | 0.8 | 0.6 | 0.7 |
| Hamlin | x639 (control) | 60 | 3.0 | 0.7 | 2.8 | 0.5 | 2.7 | 0.6 | 1.4 | 0.8 | 2.3 | 0.8 |
| | 46x20-04-32 | 47 | 2.7 | 1.0 | 3.4 | 0.8 | 2.5 | 0.7 | 1.8 | 1.0 | 1.7 | 0.9 |
| | WGFT+50-7 | 60 | 2.7 | 0.5 | 2.8 | 0.7 | 2.7 | 0.5 | 1.8 | 0.9 | 2.1 | 0.7 |
| | White 1 | 80 | 2.5 | 0.5 | 3.5 | 0.8 | 2.6 | 0.6 | 2.1 | 0.9 | 1.9 | 0.7 |
| | 2247x6070-02-2 | 60 | 2.5 | 0.4 | 2.5 | 0.4 | 2.6 | 0.4 | 1.4 | 0.9 | 2.4 | 0.6 |
| | 46x20-04-9 | 40 | 2.4 | 0.5 | 3.4 | 0.8 | 2.5 | 0.5 | 1.4 | 0.9 | 2.0 | 0.8 |
| | 46x20-04-31 | 80 | 2.4 | 0.4 | 3.7 | 0.6 | 2.5 | 0.4 | 1.9 | 0.8 | 2.4 | 0.7 |
| | SO+50-7 | 90 | 2.4 | 0.6 | 3.1 | 0.8 | 2.6 | 0.6 | 1.5 | 1.0 | 1.2 | 0.6 |
| | 2247x2075-1-2 | 60 | 2.4 | 0.6 | 3.3 | 0.6 | 2.4 | 0.5 | 1.9 | 0.8 | 1.4 | 0.8 |
| | UFR 6: Changsha+TF 50-7 | 60 | 2.4 | 0.5 | 2.5 | 0.4 | 2.5 | 0.5 | 1.1 | 0.7 | 2.1 | 0.8 |
| | Murc+Rub | 72 | 2.3 | 0.4 | 3.9 | 0.7 | 2.3 | 0.5 | 1.3 | 0.8 | 2.3 | 0.8 |
| | 46x20-04-42 | 80 | 2.3 | 0.6 | 3.3 | 1.1 | 2.4 | 0.7 | 1.4 | 1.0 | 1.4 | 0.8 |
| | White 3 | 40 | 2.3 | 0.6 | 3.9 | 0.7 | 2.2 | 0.6 | 1.7 | 0.9 | 1.6 | 0.8 |
| | Green 3 | 70 | 2.2 | 0.7 | 3.5 | 0.9 | 2.2 | 0.6 | 1.4 | 1.0 | 1.4 | 0.8 |
| | 46x20-04-48 | 60 | 2.0 | 0.5 | 4.6 | 0.5 | 1.9 | 0.5 | 1.3 | 0.9 | 1.9 | 0.8 |

| Evaluation Scale | | | |
|------------------|-----------------------------|------------------|------------------|
| Foliar Symptoms | Canopy color | Canopy Thickness | Yield/Fruit Drop |
| 1 = none | 1 = very yellow/unhealthy | 1 = very thin | 1 = Low |
| 2 = <25% | 2 = yellow/unhealthy | 2 = thin | 2 = Medium |
| 3 = 25-50% | 3 = moderately healthy | 3 = medium | 3 = High |
| 4 = 50-75% | 4 = healthy/green | 4 = thick | |
| 5 = >75% | 5 = very healthy/dark green | 5 = very thick | |

Fig. 3. MAC City Block Trial – Early orange - Canopy thickness evaluation: mean + std. dev. [2019/20 & 2010/21].

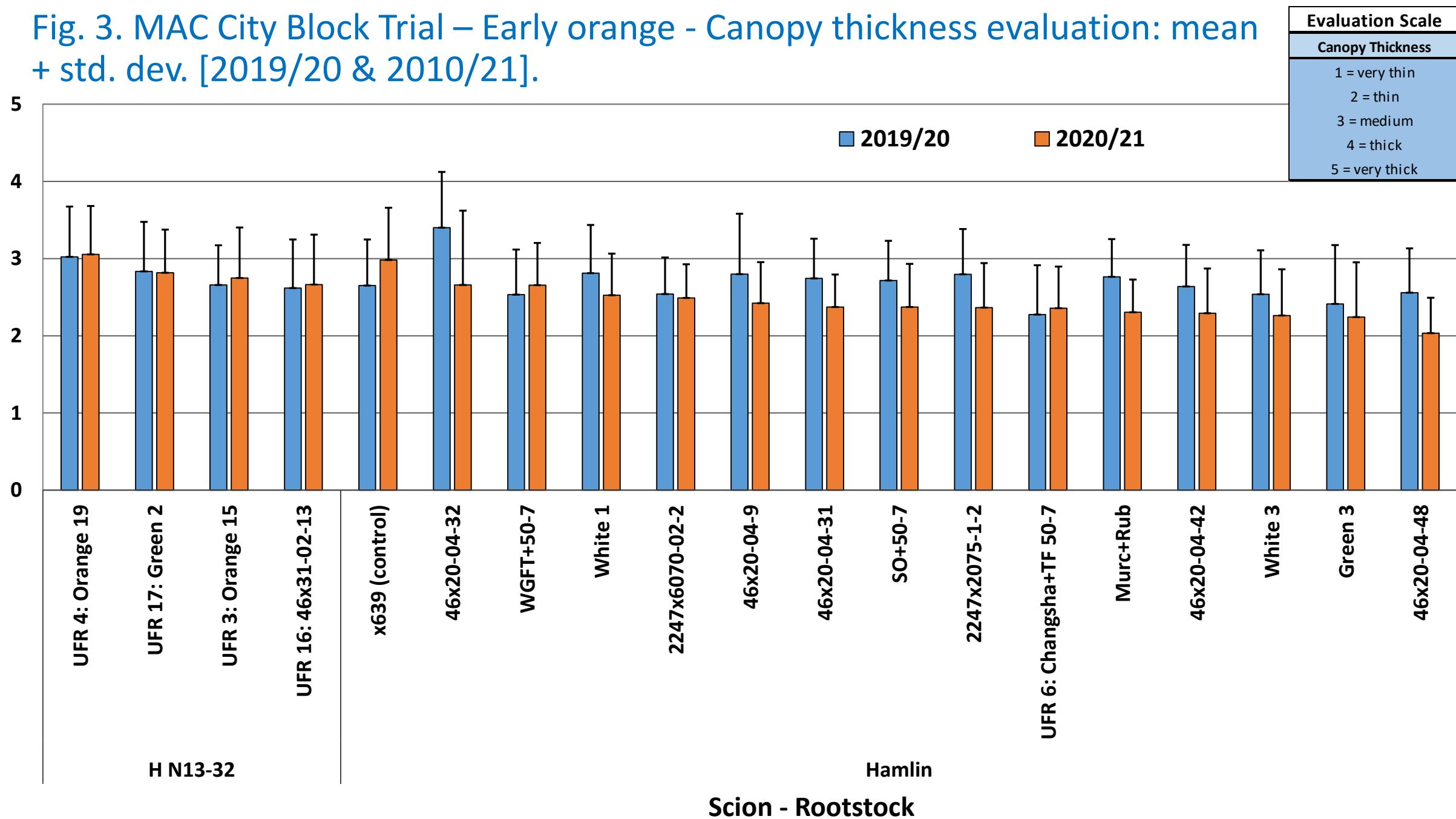


Fig. 4. MAC City Block Trial – Early orange - Foliar symptoms evaluation: mean + std. dev. [2019/20 & 2010/21].

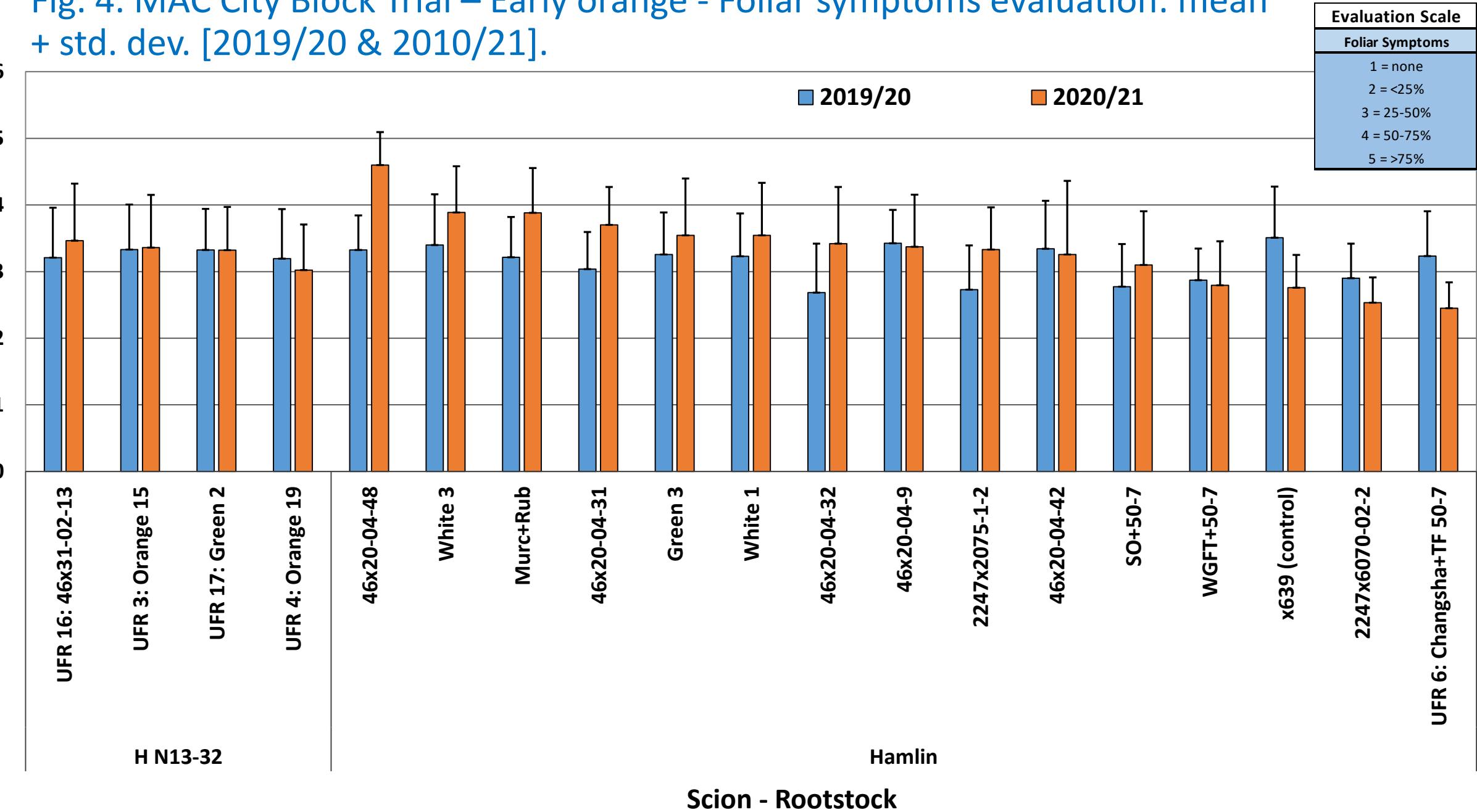


Fig. 5. MAC City Block Trial – Early orange - Canopy color evaluation: mean + std. dev. [2019/20 & 2010/21].

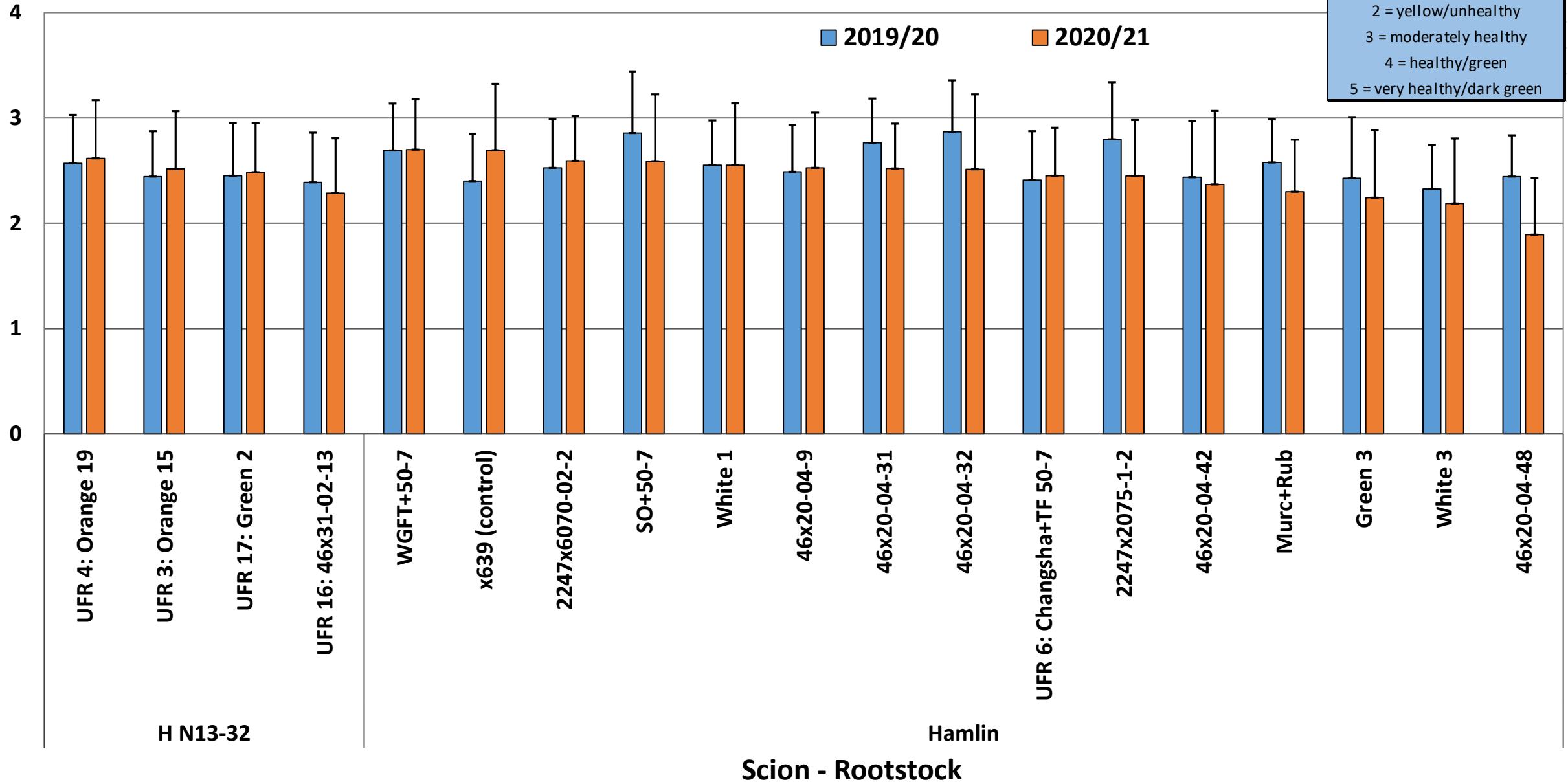


Fig. 6. MAC City Block Trial – Early orange - Yield evaluation: mean + std. dev., [2019/20 & 2010/21].

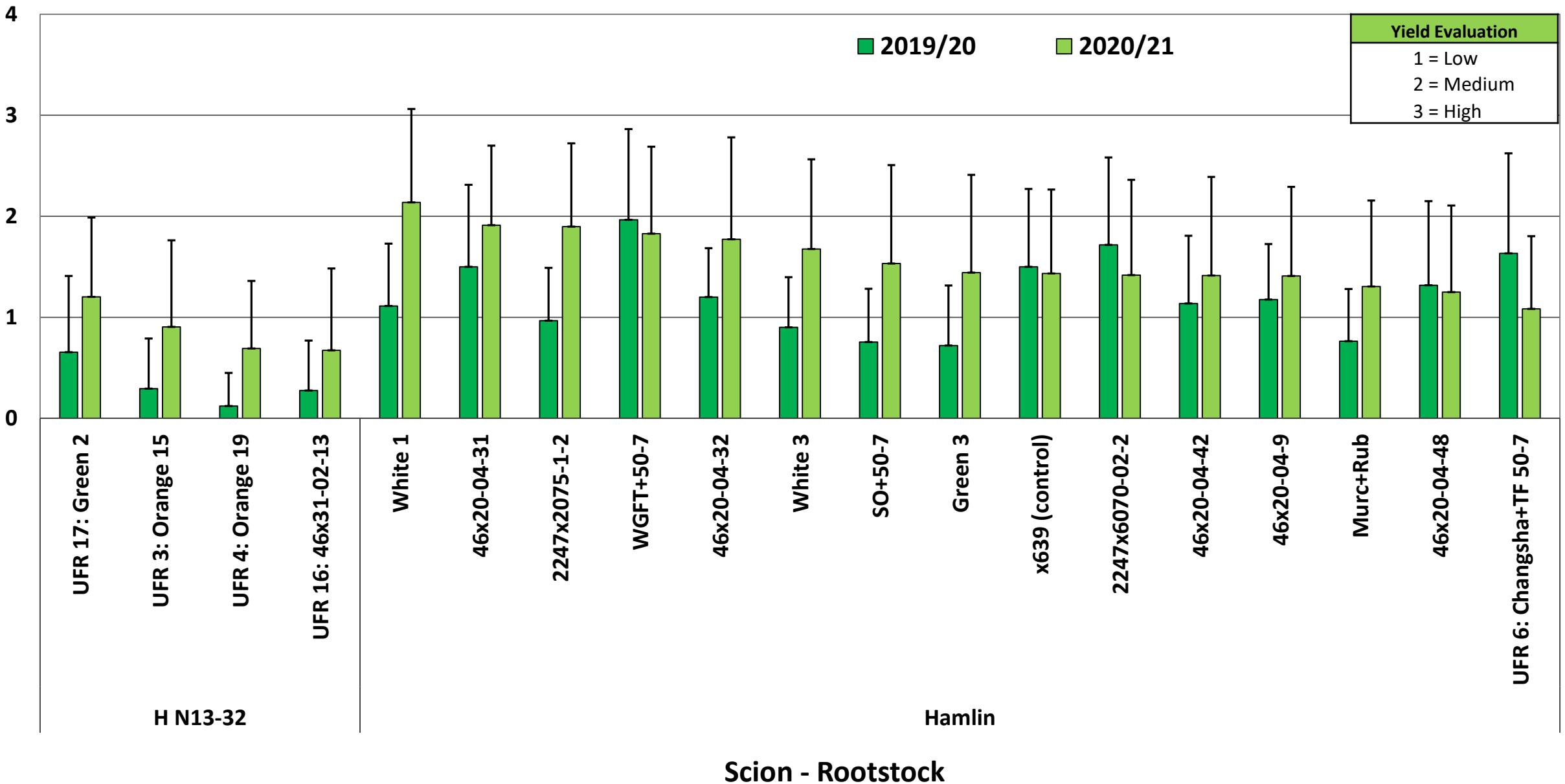
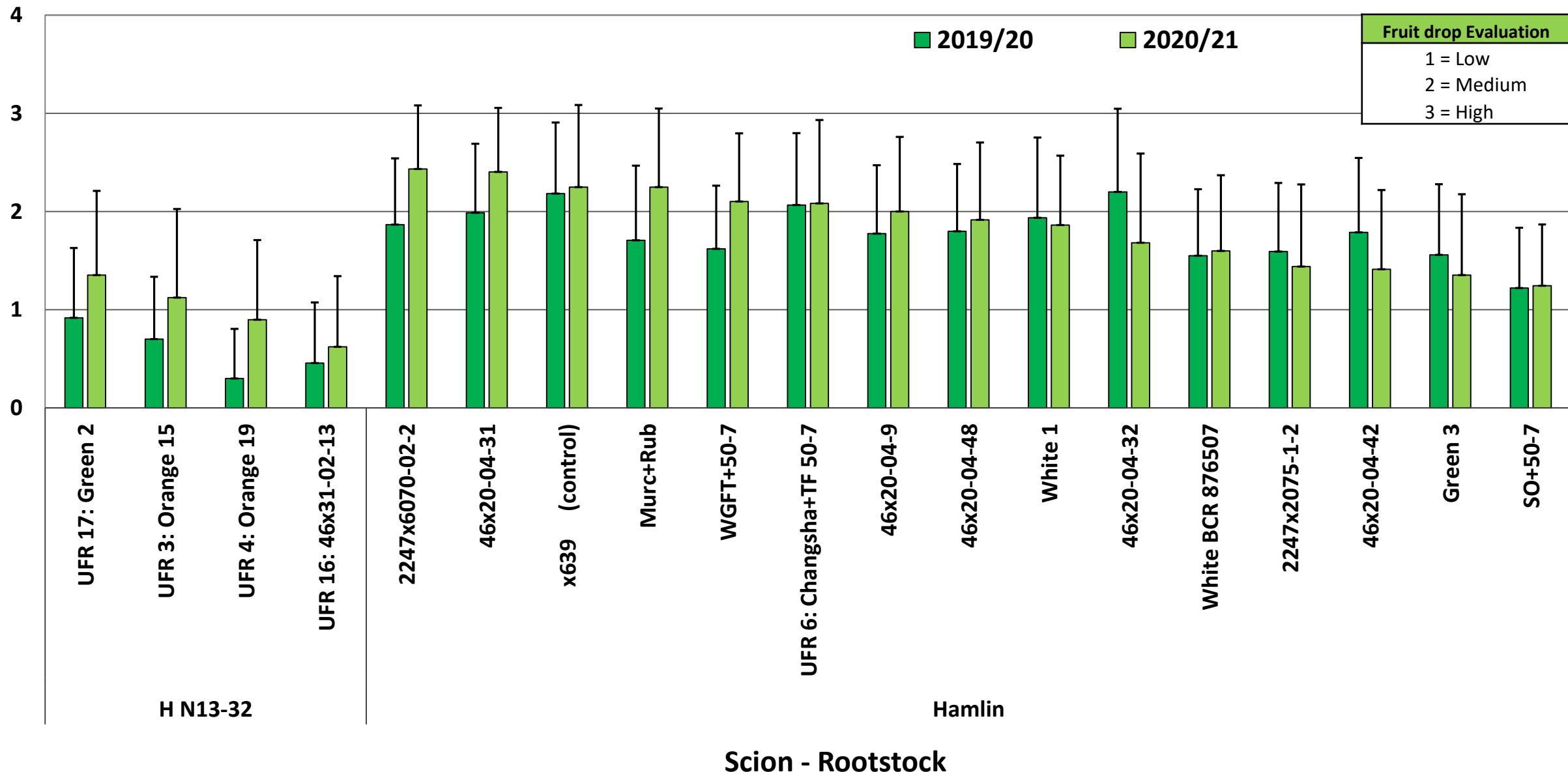


Fig. 7. MAC City Block Trial – Early orange – Fruit drop evaluation: mean + std. dev., [2019/20 & 2010/21].



Early Oranges

Hamlin & H-N13-32

Juice quality

Table 6. MAC City Block Trial - Juice quality for early oranges, 2020/21.

| Scion | Rootstock | PS/box | Brix | Acid | Ratio | Color |
|-----------------|-------------------------|--------|------|------|-------|-------|
| H N13-32 | UFR 17: Green 2 | 2.7 | 7.7 | 0.49 | 15.7 | 29.2 |
| | UFR 16: 46x31-02-13 | 2.6 | 8.2 | 0.51 | 16.1 | 29.1 |
| | UFR 4: Orange 19 | 2.5 | 8.0 | 0.48 | 16.6 | 29.1 |
| | UFR 3: Orange 15 | 2.2 | 7.5 | 0.48 | 15.6 | 29.0 |
| Hamlin | 2247x6070-02-2 | 4.3 | 9.3 | 0.58 | 16.1 | 31.3 |
| | White 1 | 4.3 | 9.2 | 0.51 | 18.0 | 29.1 |
| | SO+50-7 | 4.1 | 9.4 | 0.48 | 19.6 | 30.2 |
| | 46x20-04-32 | 3.9 | 8.7 | 0.44 | 19.7 | 30.9 |
| | Murc+Rub | 3.7 | 8.8 | 0.52 | 16.9 | 30.8 |
| | 46x20-04-42 | 3.7 | 8.7 | 0.47 | 18.6 | 31.2 |
| | Green 3 | 3.7 | 8.5 | 0.52 | 16.6 | 29.2 |
| | 46x20-04-48 | 3.7 | 8.5 | 0.42 | 20.2 | 29.4 |
| | 2247x2075-1-2 | 3.6 | 8.6 | 0.47 | 18.4 | 31.3 |
| | 46x20-04-9 | 3.6 | 8.4 | 0.47 | 17.9 | 28.9 |
| | WGFT+50-7 | 3.3 | 8.3 | 0.49 | 17.0 | 29.6 |
| | UFR 6: Changsha+TF 50-7 | 3.2 | 8.0 | 0.48 | 16.6 | 30.5 |
| | 46x20-04-31 | 3.0 | 7.8 | 0.39 | 19.9 | 31.2 |
| | x639 [control] | 2.8 | 8.0 | 0.45 | 17.9 | 30.0 |
| | White 3 | 2.2 | 7.8 | 0.46 | 17.0 | 27.7 |

Fig. 8. MAC City Block Trial - PS/box for early oranges, December 2020.

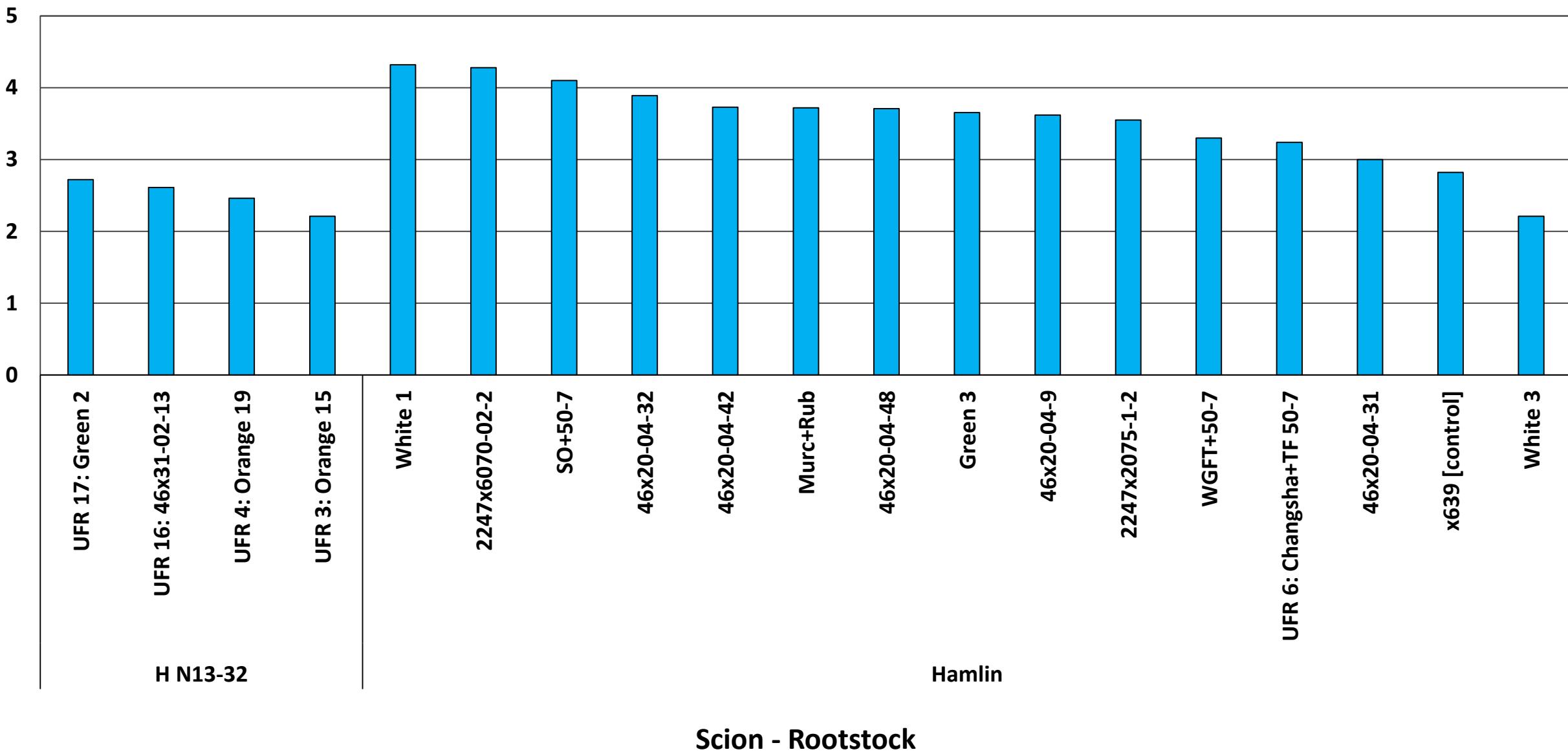


Fig. 9. MAC City Block Trial - Juice brix for early oranges, December 2020.

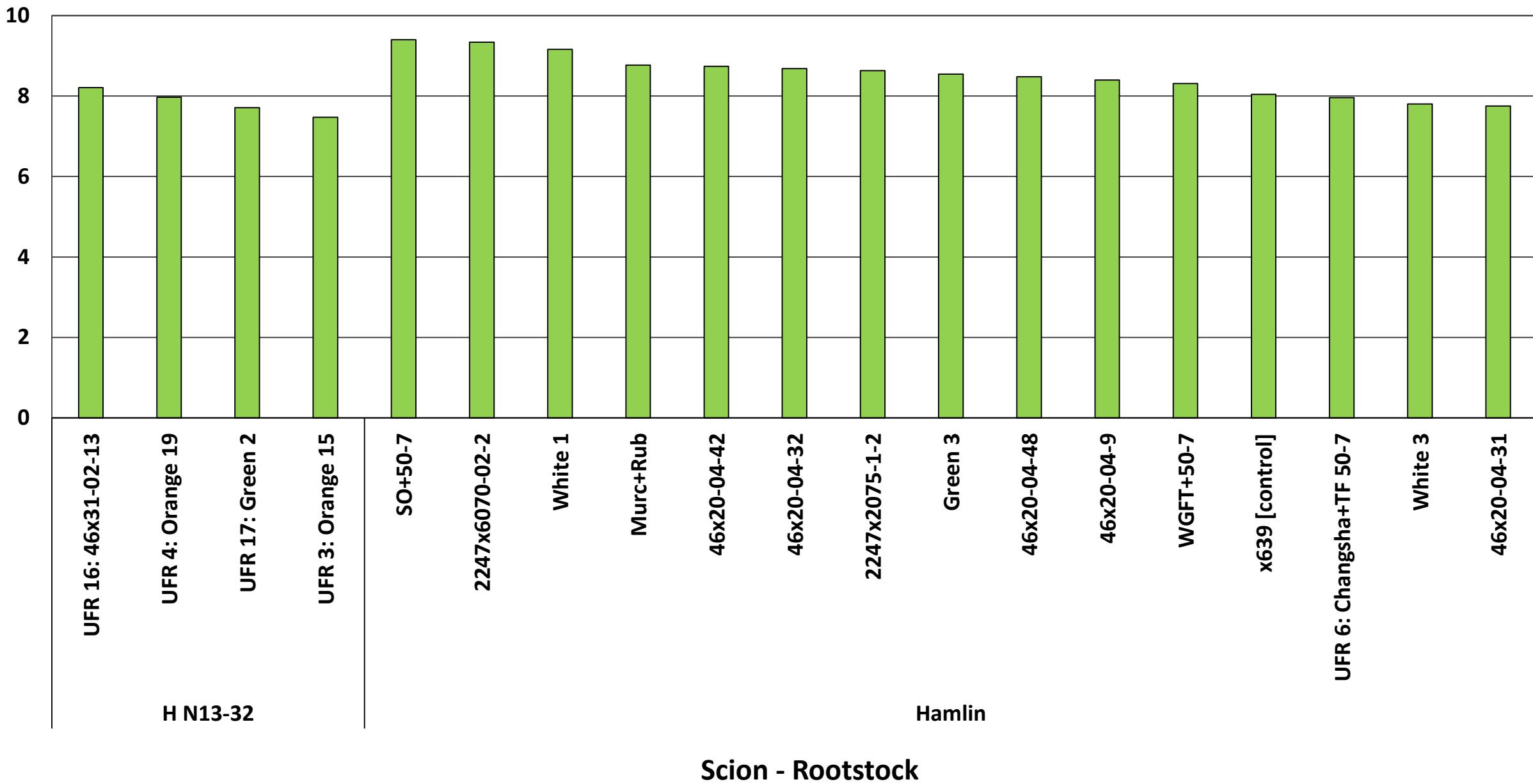


Fig. 10. MAC City Block Trial - Juice acid for early oranges, December 2020.

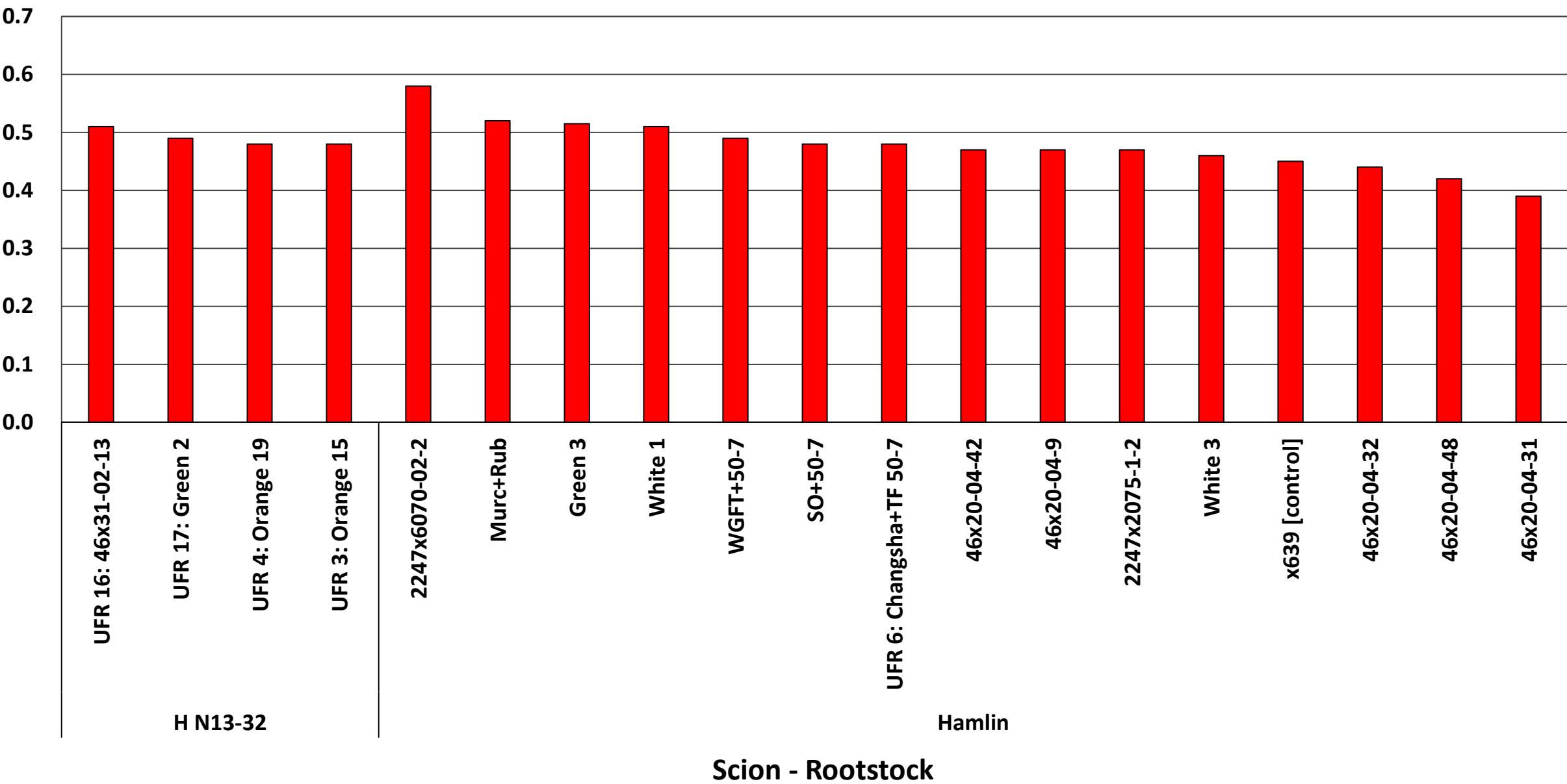


Fig. 11. MAC City Block Trial - Juice ratio for early oranges, December 2020.

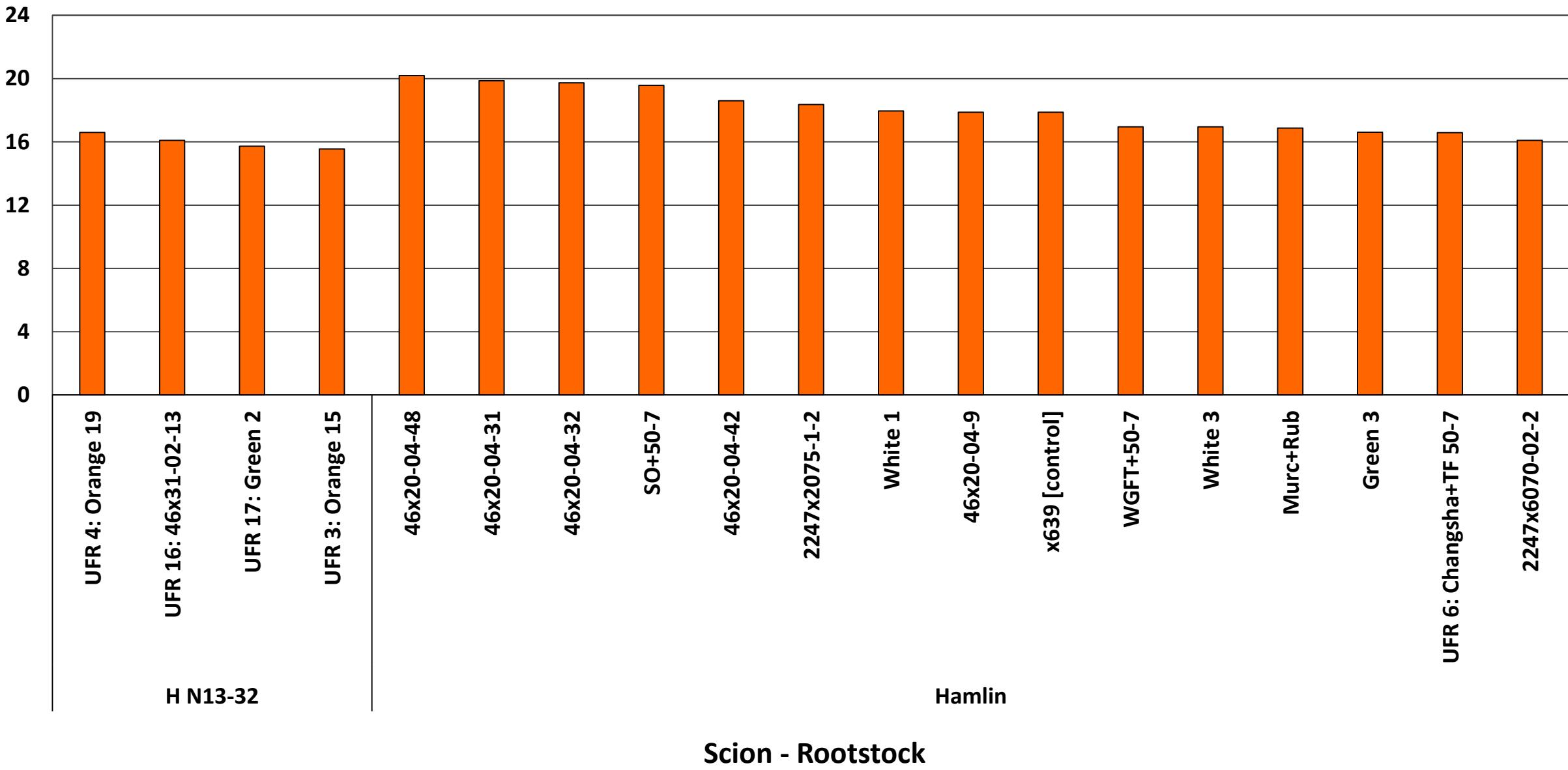


Fig. 12. MAC City Block Trial – Juice color for early oranges, December 2020.

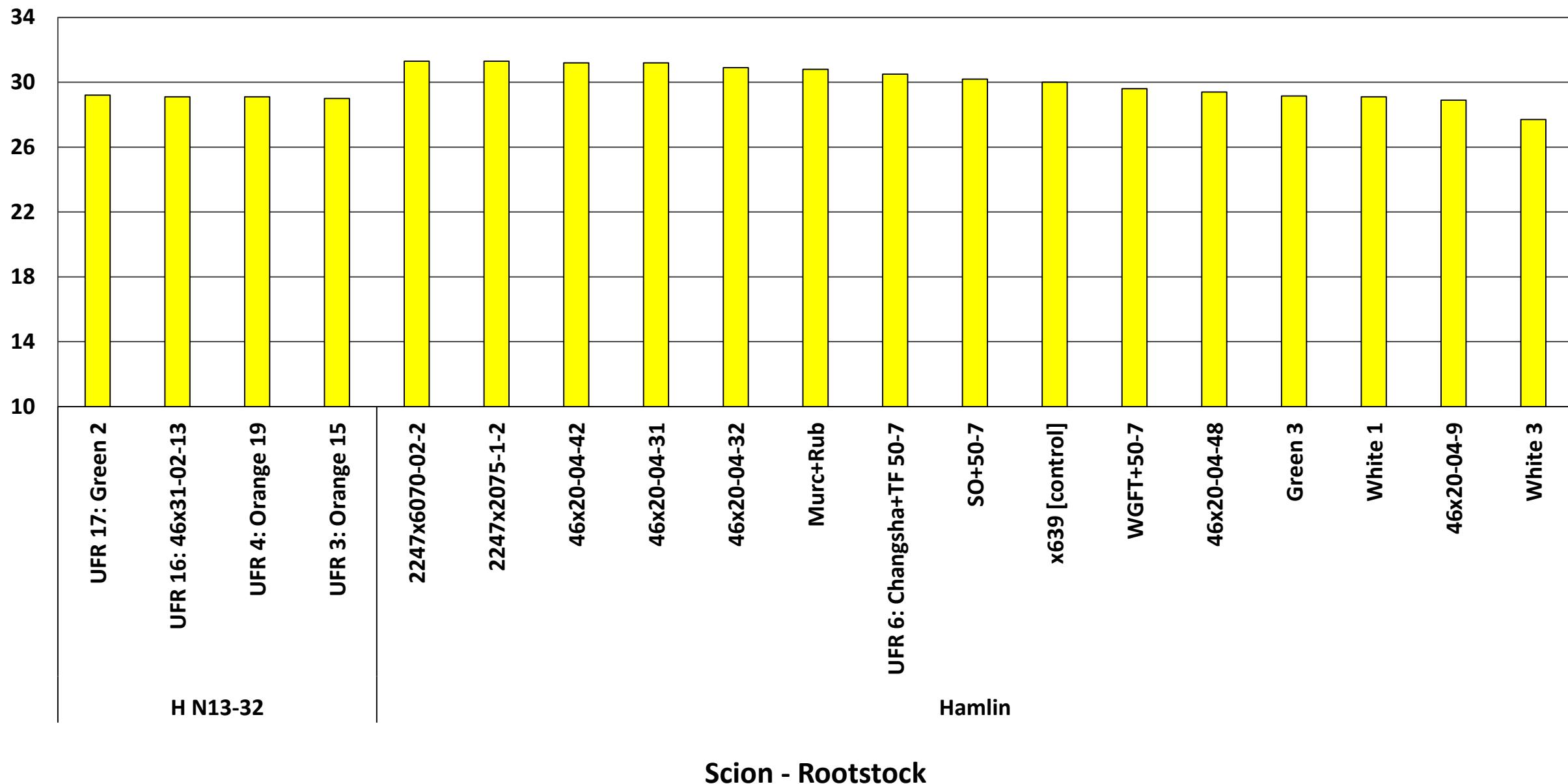


Table 7. MAC City Block Trial – Early oranges – Survival rate [%], 2020/21.

| Rootstock | Survival Rate [%] |
|-------------------------|-------------------|
| 2247x6070-02-2 | 100 |
| 46x20-04-48 | 100 |
| Murc + Rub | 100 |
| SO+50-7 | 100 |
| UFR 6: Changsha+TF 50-7 | 100 |
| White 1 | 100 |
| White 3 | 100 |
| x639 [control] | 100 |
| UFR 17: Green 2 | 99 |
| UFR 4: Orange 19 | 99 |
| 46x20-04-31 | 99 |
| 2247x2075-1-2 | 98 |
| UFR 3: Orange 15 | 98 |
| 46x20-04-9 | 98 |
| Green 3 | 97 |
| WGFT+50-7 | 97 |
| 46x20-04-42 | 96 |
| UFR 16: 46x31-02-13 | 96 |
| 46x20-04-32 | 89 |

Late Oranges

N7-3, N7-10, B3-42, N10-13, T1-56, OLLs and Valencia

Canopy volume and Tree height

Table 8. MAC City Block Trial – Late orange - Canopy volume [ft³] and tree height [ft.] by scion and rootstock: mean + std. dev., 2019/20.

| Scion | Rootstock | Number of trees evaluated | Canopy Volume | | Height | |
|--------|-------------------------|---------------------------|---------------|-----------|--------|-----------|
| | | | Mean | std. dev. | Mean | std. dev. |
| OLL-8 | UFR 4: Orange 19 | 30 | 188.9 | 60.9 | 6.5 | 0.8 |
| | UFR 16: 46x31-02-13 | 20 | 177.9 | 57.4 | 6.4 | 0.8 |
| | x639(control) | 40 | 163.3 | 35.3 | 5.9 | 0.5 |
| | UFR 15: 46x20-04-37 | 20 | 141.5 | 80.7 | 5.6 | 1.1 |
| | UFR 1: Orange 3 | 60 | 95.7 | 30.4 | 5.2 | 0.5 |
| OLL-6 | Murc+Rub | 20 | 134.6 | 25.9 | 5.7 | 0.4 |
| | 6058x2071-08-2 | 20 | 85.8 | 23.0 | 4.8 | 0.5 |
| OLL-4 | UFR 5: White 4 | 20 | 166.0 | 39.1 | 6.1 | 0.7 |
| | Orange14 | 80 | 86.1 | 35.5 | 5.0 | 0.7 |
| | 2247x6056-01-7 | 20 | 71.6 | 34.4 | 4.9 | 0.7 |
| OLL-10 | Blue 1 | 60 | 91.0 | 34.9 | 5.2 | 0.7 |
| | UFR 6: Changsha+TF 50-7 | 20 | 79.1 | 28.0 | 5.2 | 0.6 |
| | 6058x2071-08-2 | 20 | 67.6 | 15.3 | 4.8 | 0.5 |
| OLL-7 | SO+FD | 20 | 69.9 | 24.7 | 4.6 | 0.5 |
| | WGFT+50-7 | 40 | 68.3 | 21.1 | 4.8 | 0.5 |
| N7-3 | UFR 17: Green 2 | 30 | 80.2 | 26.4 | 4.8 | 0.6 |
| | UFR 4: Orange 19 | 60 | 75.5 | 25.7 | 4.7 | 0.6 |
| | UFR 16: 46x31-02-13 | 30 | 59.9 | 29.4 | 4.3 | 0.6 |
| | UFR 3: Orange 15 | 20 | 55.5 | 25.3 | 4.3 | 0.8 |
| N10-13 | UFR 3: Orange 15 | 20 | 72.9 | 20.9 | 4.8 | 0.5 |
| | UFR 4: Orange 19 | 60 | 66.1 | 18.8 | 4.4 | 0.5 |
| | UFR 17: Green 2 | 60 | 51.9 | 21.4 | 4.2 | 0.6 |

Table 8 (cont'd.). MAC City Block Trial – Late orange - Canopy volume [ft³] and tree height [ft.] by scion and rootstock: mean + std. dev., 2019/20.

| Scion | Rootstock | Number of trees evaluated | Canopy Volume | | Height | |
|----------|-------------------------|---------------------------|---------------|-----------|--------|-----------|
| | | | Mean | std. dev. | Mean | std. dev. |
| N7-10 | UFR 4: Orange 19 | 60 | 63.9 | 17.2 | 4.4 | 0.4 |
| | UFR 16: 46x31-02-13 | 40 | 63.5 | 38.0 | 4.4 | 0.9 |
| | UFR 17: Green 2 | 60 | 47.3 | 16.6 | 4.2 | 0.5 |
| | UFR 3: Orange 15 | 60 | 37.5 | 15.0 | 3.9 | 0.5 |
| Valencia | x639(control) | 60 | 88.3 | 34.3 | 4.8 | 0.6 |
| | 46x20-04-31 | 50 | 70.7 | 43.1 | 4.5 | 0.8 |
| | WGFT+50-7 | 80 | 54.9 | 15.8 | 4.4 | 0.5 |
| | 46x20-04-42 | 70 | 52.8 | 22.5 | 4.3 | 0.5 |
| | UFR 6: Changsha+TF 50-7 | 120 | 50.0 | 23.3 | 4.2 | 0.6 |
| | 46x20-04-32 | 80 | 49.4 | 30.4 | 4.3 | 0.7 |
| | White1 | 60 | 47.6 | 23.7 | 4.3 | 0.6 |
| | 2247x6070-02-2 | 130 | 46.1 | 23.3 | 4.0 | 0.6 |
| | Murc+Rub | 60 | 44.6 | 16.9 | 4.1 | 0.5 |
| | White 3 | 59 | 39.5 | 17.7 | 4.1 | 0.5 |
| | 46x20-04-9 | 58 | 37.9 | 28.7 | 3.6 | 0.9 |
| | 46x20-04-48 | 50 | 37.6 | 22.1 | 4.1 | 0.5 |
| | 2247x2075-01-2 | 60 | 35.7 | 9.1 | 4.1 | 0.4 |
| | SO+50-7 | 60 | 33.1 | 14.7 | 3.7 | 0.5 |
| | UFR 15: 46x20-04-37 | 60 | 23.2 | 22.7 | 3.5 | 0.8 |
| | Green3 | 60 | 22.5 | 14.0 | 3.7 | 0.5 |
| B3-42 | UFR 4: Orange 19 | 60 | 57.1 | 27.7 | 4.4 | 0.6 |
| | UFR 3: Orange 15 | 60 | 32.0 | 19.3 | 3.8 | 0.6 |
| T1-56 | UFR 3: Orange 15 | 40 | 24.8 | 13.0 | 3.5 | 0.5 |

Table 8 (cont'd). MAC City Block Trial – Late orange - Canopy volume [ft³] and tree height [ft.] by scion and rootstock: mean + std. dev., 2020/21.

| Scion | Rootstock | Number of trees evaluated | Canopy Volume | | Height | |
|--------|-------------------------|---------------------------|---------------|-----------|--------|-----------|
| | | | Mean | std. dev. | Mean | std. dev. |
| OLL-8 | UFR 16: 46x31-02-13 | 20 | 266.5 | 99.3 | 6.9 | 1.7 |
| | UFR 4: Orange 19 | 30 | 262.3 | 84.3 | 6.9 | 0.8 |
| | x639(control) | 40 | 235.0 | 51.1 | 6.7 | 0.6 |
| | UFR 15: 46x20-04-37 | 20 | 193.0 | 117.3 | 6.1 | 1.2 |
| | UFR 1: Orange 3 | 58 | 141.2 | 47.9 | 5.9 | 0.7 |
| OLL-6 | UFR 17: Green 2 | 60 | 133.5 | 79.4 | 5.7 | 1.0 |
| | Murc+Rub | 20 | 188.7 | 40.5 | 6.3 | 0.5 |
| OLL-4 | 6058x2071-08-2 | 20 | 124.1 | 37.5 | 5.6 | 0.5 |
| | UFR 5: White 4 | 20 | 235.0 | 67.6 | 6.6 | 0.5 |
| | Orange14 | 100 | 127.9 | 43.9 | 5.6 | 0.6 |
| OLL-10 | 2247x6056-01-7 | 20 | 109.8 | 42.0 | 5.6 | 0.8 |
| | Blue 1 | 60 | 120.1 | 51.6 | 5.8 | 0.7 |
| | UFR 6: Changsha+TF 50-7 | 20 | 96.5 | 32.5 | 5.6 | 0.7 |
| OLL-7 | 6058x2071-08-2 | 20 | 49.5 | 36.3 | 5.1 | 0.4 |
| | SO+FD | 20 | 111.3 | 28.3 | 5.5 | 0.5 |
| | WGFT+50-7 | 40 | 92.7 | 24.4 | 5.3 | 0.5 |
| N7-3 | UFR 17: Green 2 | 30 | 108.0 | 30.0 | 5.4 | 0.5 |
| | UFR 4: Orange 19 | 60 | 102.0 | 36.0 | 5.3 | 0.8 |
| | UFR 3: Orange 15 | 20 | 72.6 | 35.7 | 4.7 | 0.8 |
| | UFR 16: 46x31-02-13 | 30 | 66.9 | 41.5 | 4.5 | 0.7 |
| N10-13 | UFR 4: Orange 19 | 60 | 105.3 | 32.4 | 5.3 | 0.5 |
| | UFR 3: Orange 15 | 20 | 89.5 | 35.1 | 5.2 | 0.6 |
| | UFR 17: Green 2 | 60 | 64.6 | 28.3 | 4.7 | 0.5 |

Table 8 (cont'd). MAC City Block Trial – Late orange - Canopy volume [ft³] and tree height [ft.] by scion and rootstock: mean + std. dev., 2020/21.

| Scion | Rootstock | Number of trees evaluated | Canopy Volume | | Height | |
|----------|-------------------------|---------------------------|---------------|-----------|--------|-----------|
| | | | Mean | std. dev. | Mean | std. dev. |
| N7-10 | UFR 16: 46x31-02-13 | 40 | 84.1 | 48.0 | 4.8 | 1.0 |
| | UFR 4: Orange 19 | 60 | 78.5 | 18.6 | 4.8 | 0.4 |
| | UFR 17: Green 2 | 60 | 57.0 | 22.6 | 4.6 | 0.5 |
| | UFR 3: Orange 15 | 60 | 41.7 | 18.9 | 4.1 | 0.7 |
| Valencia | x639(control) | 60 | 126.9 | 48.4 | 5.6 | 0.7 |
| | 46x20-04-31 | 50 | 80.5 | 53.7 | 4.7 | 0.8 |
| | WGFT+50-7 | 80 | 73.1 | 22.2 | 4.8 | 0.4 |
| | UFR 6: Changsha+TF 50-7 | 140 | 72.8 | 32.7 | 4.9 | 0.7 |
| | 46x20-04-42 | 70 | 66.3 | 29.2 | 4.7 | 0.6 |
| | 46x20-04-32 | 80 | 62.5 | 43.0 | 4.6 | 0.8 |
| | White1 | 60 | 57.1 | 33.8 | 4.5 | 0.8 |
| | Murc+Rub | 60 | 57.0 | 21.5 | 4.5 | 0.5 |
| | White 3 | 60 | 55.6 | 24.2 | 4.6 | 0.6 |
| | 2247x6070-02-2 | 130 | 54.5 | 25.7 | 4.3 | 0.6 |
| | 46x20-04-9 | 58 | 54.4 | 39.8 | 4.1 | 0.9 |
| | SO+50-7 | 60 | 48.6 | 22.6 | 4.3 | 0.6 |
| | 2247x2075-01-2 | 60 | 44.9 | 13.0 | 4.4 | 0.4 |
| | 46x20-04-48 | 50 | 44.7 | 27.1 | 4.4 | 0.5 |
| | UFR 15: 46x20-04-37 | 60 | 32.0 | 30.7 | 3.8 | 0.9 |
| | Green3 | 60 | 30.3 | 19.2 | 4.0 | 0.6 |
| B3-42 | UFR 4: Orange 19 | 60 | 77.5 | 32.4 | 5.0 | 0.7 |
| | UFR 3: Orange 15 | 60 | 46.3 | 26.5 | 4.4 | 0.6 |
| T1-56 | UFR 3: Orange 15 | 40 | 29.0 | 14.7 | 3.8 | 0.5 |

Fig. 13. MAC City Block Trial – Late orange - Canopy volume by scion and rootstock: mean + std. dev. [ft³., 2019/20 & 2020/21].

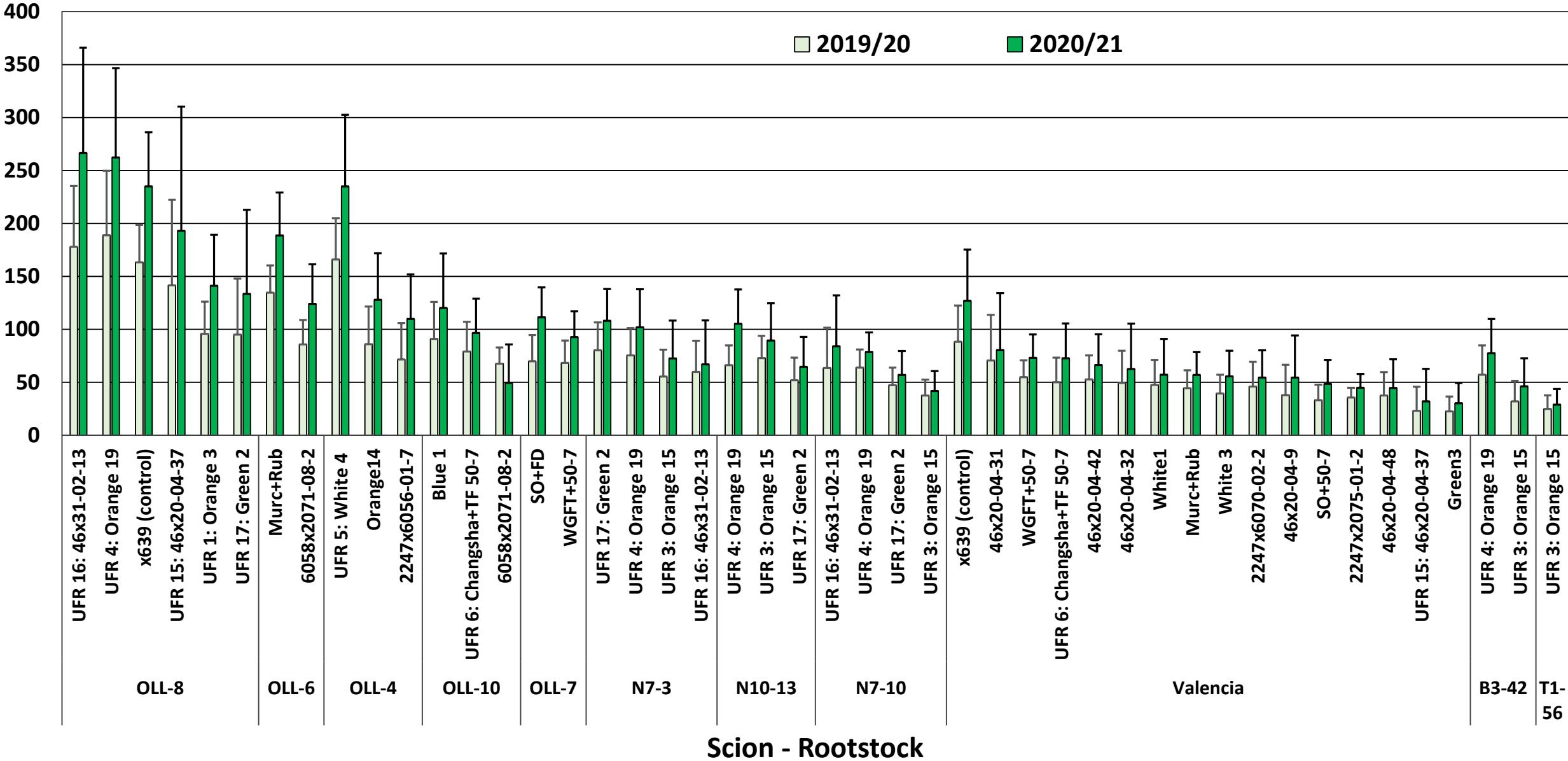
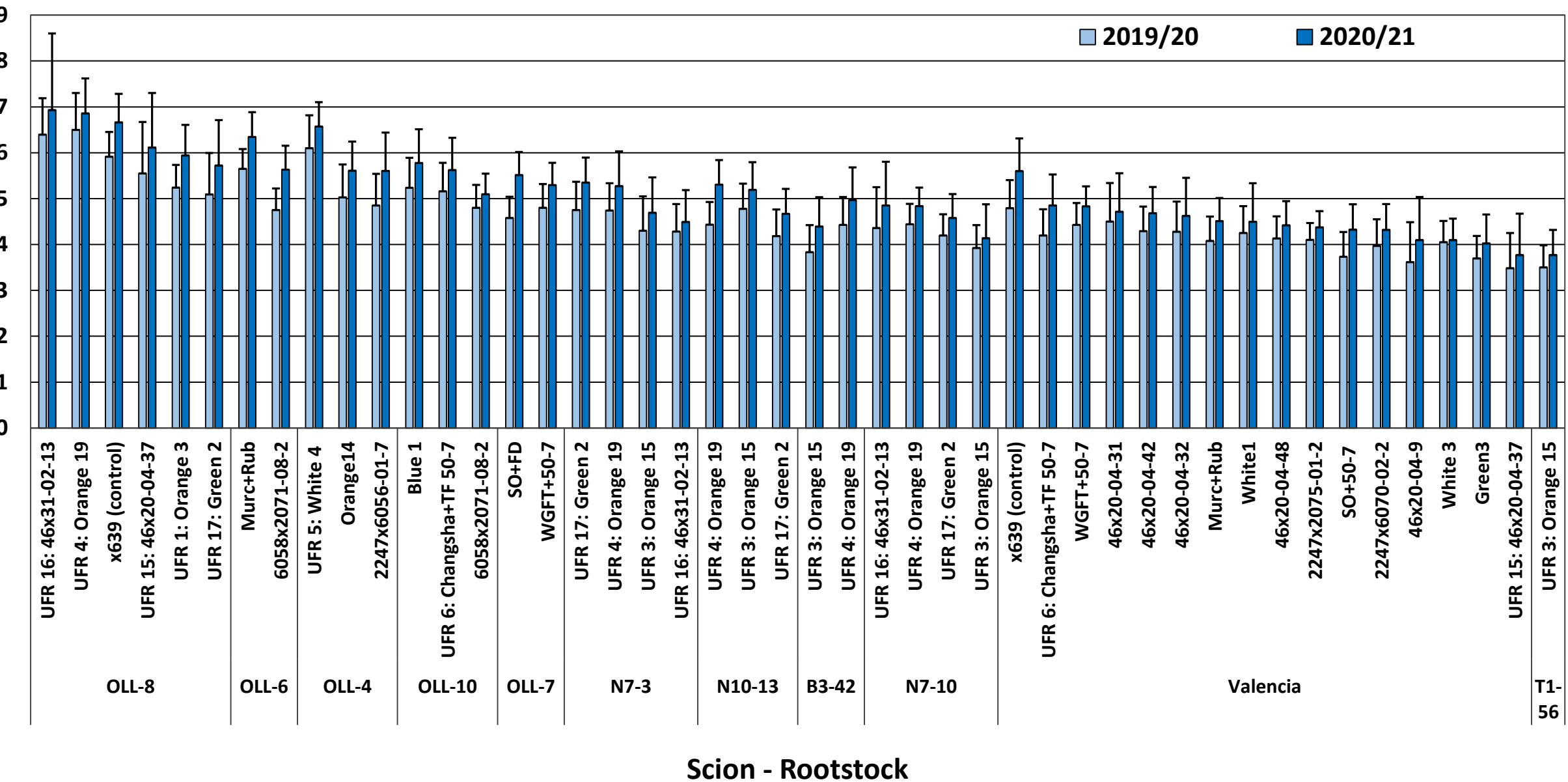


Fig. 14. MAC City Block Trial – Late orange - Tree height by scion and rootstock: mean + std. dev. [ft., 2019/20 & 2020/21].



Late Oranges

N7-3, N7-10, B3-42, N10-13, T1-56, OLLs and Valencia

Canopy color, foliar symptoms, canopy thickness, yield and fruit drop

Table 9. MAC City Block Trial – Late orange - Evaluation of canopy thickness, foliar symptoms, canopy color, yield and fruit drop by scion and rootstock: mean + std. dev., 2019/20.

| Scion | Rootstock | No. of trees evaluated | Canopy Thickness | | Foliar Symptoms | | Canopy Color | | No. of trees evaluated | Yield | | Fruit Drop | |
|---------------|-------------------------|------------------------|------------------|-----------|-----------------|-----------|--------------|-----------|------------------------|-------|-----------|------------|-----------|
| | | | Mean | std. dev. | Mean | std. dev. | Mean | std. dev. | | Mean | std. dev. | Mean | std. dev. |
| OLL-6 | Murc+Rub | 20 | 4.1 | 0.5 | 2.4 | 0.4 | 2.7 | 0.3 | 20 | 2.1 | 0.6 | 2.6 | 0.5 |
| | 6058x2071-08-2 | 20 | 3.5 | 0.4 | 2.1 | 0.2 | 3.1 | 0.4 | 20 | 2.5 | 0.6 | 2.7 | 0.5 |
| OLL-8 | x639 (control) | 40 | 4.3 | 0.6 | 2.2 | 0.4 | 3.0 | 0.3 | 40 | 1.2 | 0.5 | 1.7 | 0.6 |
| | UFR 4: Orange 19 | 30 | 4.1 | 0.5 | 2.6 | 0.4 | 2.4 | 0.4 | 30 | 1.7 | 0.6 | 1.9 | 0.6 |
| | UFR 16: 46x31-02-13 | 20 | 3.7 | 0.4 | 2.5 | 0.4 | 2.6 | 0.4 | 20 | 1.8 | 0.8 | 1.8 | 0.6 |
| | UFR 1: Orange 3 | 60 | 3.7 | 0.7 | 2.0 | 0.5 | 3.1 | 0.5 | 60 | 0.9 | 0.7 | 1.4 | 0.5 |
| | UFR 17: Green 2 | 60 | 3.4 | 0.7 | 2.4 | 0.5 | 2.9 | 0.6 | 60 | 1.4 | 0.8 | 1.8 | 0.8 |
| | UFR 15: 46x20-04-37 | 20 | 3.0 | 0.6 | 2.6 | 0.5 | 2.3 | 0.4 | 20 | 1.3 | 0.6 | 2.0 | 0.7 |
| OLL-7 | SO+FD | 20 | 3.7 | 0.6 | 2.0 | 0.3 | 3.2 | 0.5 | 20 | 2.2 | 0.7 | 2.3 | 0.6 |
| | WGFT+50-7 | 40 | 3.4 | 0.5 | 2.2 | 0.5 | 2.9 | 0.5 | 40 | 1.0 | 0.6 | 1.6 | 0.6 |
| OLL-4 | UFR 5: White 4 | 20 | 4.2 | 0.7 | 2.4 | 0.3 | 2.8 | 0.4 | 20 | 2.5 | 0.6 | 2.8 | 0.4 |
| | Orange 14 | 100 | 3.3 | 0.6 | 2.4 | 0.5 | 2.6 | 0.6 | 100 | 1.5 | 0.8 | 2.3 | 0.8 |
| | 2247x6056-01-7 | 20 | 3.0 | 0.9 | 2.3 | 0.4 | 2.4 | 0.5 | 20 | 1.5 | 0.8 | 1.9 | 0.7 |
| OLL-10 | Blue 1 | 60 | 3.6 | 0.7 | 2.3 | 0.5 | 2.8 | 0.5 | 60 | 1.2 | 0.8 | 1.9 | 0.7 |
| | UFR 6: Changsha+TF 50-7 | 20 | 3.3 | 0.6 | 2.5 | 0.4 | 2.5 | 0.5 | 20 | 1.5 | 0.8 | 2.0 | 0.7 |
| | 6058x2071-08-2 | 20 | 3.1 | 0.4 | 2.1 | 0.4 | 3.0 | 0.3 | 20 | 1.3 | 0.6 | 2.4 | 0.8 |
| | Orange 16* | | | | | | | | | | | | |
| N7-3 | UFR 4: Orange 19 | 60 | 3.4 | 0.8 | 1.9 | 0.5 | 3.0 | 0.5 | 60 | 0.9 | 0.6 | 1.0 | 0.4 |
| | UFR 17: Green 2 | 28 | 3.3 | 0.4 | 2.4 | 0.4 | 3.4 | 0.5 | 28 | 1.5 | 0.9 | 2.7 | 0.5 |
| | UFR 3: Orange 15 | 20 | 3.0 | 0.5 | 2.4 | 0.4 | 3.2 | 0.5 | 20 | 1.2 | 0.7 | 1.6 | 0.5 |
| | UFR 16: 46x31-02-13 | 29 | 2.8 | 0.3 | 2.5 | 0.5 | 2.6 | 0.4 | 29 | 1.2 | 0.6 | 2.3 | 0.7 |
| N10-13 | UFR 3: Orange 15 | 20 | 3.2 | 0.7 | 2.1 | 0.6 | 2.8 | 0.5 | 20 | 2.0 | 0.7 | 1.9 | 0.8 |
| | UFR 4: Orange 19 | 60 | 3.1 | 0.5 | 2.5 | 0.5 | 2.4 | 0.4 | 60 | 1.3 | 0.6 | 2.4 | 0.7 |
| | UFR 17: Green 2 | 60 | 2.8 | 0.5 | 2.5 | 0.6 | 2.6 | 0.5 | 60 | 1.0 | 0.7 | 2.0 | 0.7 |
| | UFR 16: 46x31-02-13* | | | | | | | | | | | | |

(*) – No data for this season

| Evaluation Scale | | | |
|------------------|-----------------------------|------------------|------------------|
| Foliar Symptoms | Canopy color | Canopy Thickness | Yield/Fruit Drop |
| 1 = none | 1 = very yellow/unhealthy | 1 = very thin | 1 = Low |
| 2 = <25% | 2 = yellow/unhealthy | 2 = thin | 2 = Medium |
| 3 = 25-50% | 3 = moderately healthy | 3 = medium | 3 = High |
| 4 = 50-75% | 4 = healthy/green | 4 = thick | |
| 5 = >75% | 5 = very healthy/dark green | 5 = very thick | |

Table 9 (cont'd). MAC City Block Trial – Late orange - Evaluation of canopy thickness, foliar symptoms, canopy color, yield and fruit drop by scion and rootstock: mean + std. dev., 2019/20.

| Scion | Rootstock | No. of trees evaluated | Canopy Thickness | | Foliar Symptoms | | Canopy Color | | No. of trees evaluated - | Yield | |
|----------|-------------------------|------------------------|------------------|-----------|-----------------|-----------|--------------|-----------|--------------------------|-------|-----------|
| | | | Mean | std. dev. | Mean | std. dev. | Mean | std. dev. | | Mean | std. dev. |
| Valencia | x639 (control) | 60 | 3.5 | 0.8 | 2.7 | 0.5 | 2.6 | 0.4 | 60 | 1.9 | 0.6 |
| | WGFT+50-7 | 80 | 3.3 | 0.7 | 2.2 | 0.5 | 3.0 | 0.6 | 80 | 1.9 | 0.7 |
| | Murc+Rub | 60 | 3.1 | 0.5 | 2.4 | 0.6 | 2.9 | 0.4 | 60 | 1.4 | 0.7 |
| | UFR 6: Changsha+TF 50-7 | 178 | 3.0 | 0.7 | 2.3 | 0.5 | 2.7 | 0.5 | 178 | 1.5 | 0.8 |
| | 2247x2075-01-2 | 60 | 3.0 | 0.5 | 2.4 | 0.5 | 2.8 | 0.4 | 60 | 1.6 | 0.8 |
| | White 1 | 60 | 3.0 | 0.8 | 2.2 | 0.5 | 2.6 | 0.5 | 60 | 1.6 | 0.9 |
| | 46x20-04-31 | 50 | 3.0 | 0.6 | 2.4 | 0.4 | 2.8 | 0.5 | 50 | 1.8 | 0.8 |
| | 46x20-04-42 | 70 | 2.9 | 0.6 | 2.3 | 0.5 | 2.7 | 0.6 | 70 | 1.6 | 0.9 |
| | 2247x6070-02-2 | 129 | 2.8 | 0.5 | 2.7 | 0.6 | 2.5 | 0.5 | 129 | 1.2 | 0.6 |
| | 46x20-04-32 | 80 | 2.8 | 0.7 | 2.6 | 0.6 | 2.5 | 0.5 | 80 | 1.7 | 0.9 |
| | White 3 | 60 | 2.8 | 0.6 | 2.2 | 0.3 | 2.7 | 0.6 | 60 | 1.3 | 0.8 |
| | 46x20-04-9 | 57 | 2.7 | 0.8 | 2.4 | 0.7 | 2.7 | 0.7 | 57 | 1.0 | 0.9 |
| | Green3 | 60 | 2.6 | 0.5 | 2.3 | 0.6 | 2.4 | 0.6 | 60 | 0.9 | 0.8 |
| | 46x20-04-48 | 48 | 2.5 | 0.6 | 2.3 | 0.5 | 2.6 | 0.6 | 48 | 1.3 | 0.8 |
| | UFR 15: 46x20-04-37 | 60 | 2.4 | 0.6 | 2.4 | 0.6 | 2.3 | 0.5 | 60 | 0.9 | 0.8 |
| | SO+50-7 | | | | | | | | | | |
| N7-10 | UFR 4: Orange 19 | 60 | 3.1 | 0.4 | 2.3 | 0.5 | 2.8 | 0.4 | 60 | 1.5 | 0.7 |
| | UFR 16: 46x31-02-13 | 39 | 2.8 | 0.7 | 2.4 | 0.6 | 2.5 | 0.5 | 39 | 0.6 | 0.7 |
| | UFR 3: Orange 15 | 59 | 2.7 | 0.6 | 2.6 | 0.5 | 2.5 | 0.5 | 59 | 1.1 | 0.7 |
| | UFR 17: Green 2 | 60 | 2.7 | 0.4 | 2.4 | 0.5 | 2.7 | 0.4 | 60 | 1.2 | 0.8 |
| B3-42 | UFR 4: Orange 19 | 60 | 2.9 | 0.7 | 2.4 | 0.6 | 2.6 | 0.5 | 60 | 1.2 | 0.9 |
| | UFR 3: Orange 15 | 60 | 2.6 | 0.5 | 2.5 | 0.6 | 2.6 | 0.5 | 60 | 1.2 | 0.8 |
| T1-56 | UFR 3: Orange 15 | 40 | 2.5 | 0.5 | 2.4 | 0.5 | 2.5 | 0.5 | 40 | 0.9 | 0.7 |

| Evaluation Scale | | | |
|------------------|-----------------------------|------------------|------------------|
| Foliar Symptoms | Canopy color | Canopy Thickness | Yield/Fruit Drop |
| 1 = none | 1 = very yellow/unhealthy | 1 = very thin | 1 = Low |
| 2 = <25% | 2 = yellow/unhealthy | 2 = thin | 2 = Medium |
| 3 = 25-50% | 3 = moderately healthy | 3 = medium | 3 = High |
| 4 = 50-75% | 4 = healthy/green | 4 = thick | |
| 5 = >75% | 5 = very healthy/dark green | 5 = very thick | |

Table 10. MAC City Block Trial – Late orange - Evaluation of canopy thickness, foliar symptoms, canopy color, yield and fruit drop by scion and rootstock: mean + std. dev., 2020/21

| Scion | Rootstock | No. of trees evaluated | Canopy Thickness Mean | std. dev. | Foliar Symptoms Mean | std. dev. | Canopy Color Mean | std. dev. | No. of trees evaluated | Yield Mean | std. dev. | Fruit Drop Mean | std. dev. |
|--------|-------------------------|------------------------|--------------------------|-----------|-------------------------|-----------|----------------------|-----------|------------------------|---------------|-----------|--------------------|-----------|
| OLL-8 | x639 [control] | 40 | 3.4 | 0.8 | 3.5 | 0.8 | 2.8 | 0.6 | 34 | 1.6 | 0.6 | 1.6 | 0.5 |
| | UFR 16: 46x31-02-13 | 20 | 3.0 | 0.6 | 2.9 | 0.4 | 2.8 | 0.3 | 20 | 1.7 | 0.6 | 1.7 | 0.7 |
| | UFR 4: Orange 19 | 30 | 2.9 | 0.6 | 3.7 | 0.6 | 2.5 | 0.5 | 30 | 2.1 | 0.9 | 1.1 | 0.3 |
| | UFR 1: Orange 3 | 70 | 2.7 | 0.5 | 3.3 | 0.8 | 2.5 | 0.4 | 70 | 1.2 | 0.8 | 0.9 | 0.5 |
| | UFR 15: 46x20-04-37 | 20 | 2.6 | 0.7 | 3.3 | 0.5 | 2.6 | 0.4 | 20 | 1.6 | 0.6 | 1.7 | 0.7 |
| | UFR 17: Green 2 | 69 | 2.4 | 0.6 | 3.9 | 0.9 | 2.4 | 0.6 | 70 | 1.6 | 0.8 | 1.4 | 0.7 |
| OLL-6 | 6058x2071-08-2 | 19 | 3.1 | 0.4 | 3.1 | 0.6 | 3.0 | 0.4 | 19 | 1.9 | 0.6 | 1.1 | 0.2 |
| | Murc+Rub | 20 | 2.6 | 0.3 | 3.6 | 0.4 | 2.5 | 0.4 | 20 | 2.0 | 0.7 | 1.0 | 0.0 |
| OLL-4 | UFR 5: White 4 | 20 | 3.0 | 0.4 | 3.2 | 0.6 | 2.8 | 0.5 | 20 | 2.5 | 0.7 | 1.2 | 0.4 |
| | 2247x6056-01-7 | 20 | 2.8 | 0.6 | 2.9 | 0.5 | 2.7 | 0.5 | 20 | 1.8 | 0.7 | 1.1 | 0.4 |
| | Orange 14 | 100 | 2.5 | 0.4 | 3.8 | 0.7 | 2.4 | 0.5 | 100 | 1.6 | 0.8 | 1.4 | 0.6 |
| OLL-7 | SO+FD | 20 | 2.9 | 0.4 | 3.2 | 0.4 | 3.0 | 0.4 | 20 | 2.5 | 0.6 | 1.0 | 0.4 |
| | WGFT+50-7 | 50 | 2.6 | 0.6 | 3.8 | 0.6 | 2.4 | 0.4 | 50 | 1.4 | 0.8 | 1.1 | 0.6 |
| N7-3 | UFR 17: Green 2 | 20 | 3.0 | 0.3 | 3.3 | 0.5 | 2.8 | 0.5 | 28 | 0.9 | 0.6 | 1.1 | 0.3 |
| | UFR 4: Orange 19 | 60 | 2.9 | 0.5 | 2.7 | 0.5 | 2.9 | 0.5 | 60 | 1.1 | 0.8 | 1.0 | 0.5 |
| | UFR 3: Orange 15 | 20 | 2.3 | 0.5 | 3.3 | 0.6 | 2.6 | 0.4 | 20 | 0.8 | 0.6 | 0.9 | 0.5 |
| | UFR 16: 46x31-02-13 | 29 | 2.2 | 0.5 | 3.6 | 0.6 | 2.2 | 0.6 | 29 | 1.2 | 0.5 | 1.3 | 0.6 |
| OLL-10 | Blue 1 | 80 | 2.9 | 0.7 | 3.6 | 0.8 | 2.4 | 0.5 | 80 | 1.2 | 0.7 | 1.1 | 0.6 |
| | Orange 16 | 20 | 2.6 | 0.6 | 3.6 | 0.5 | 1.7 | 0.4 | 20 | 0.5 | 0.5 | 0.4 | 0.5 |
| | 6058x2071-08-2 | 20 | 2.5 | 0.3 | 4.0 | 0.6 | 2.0 | 0.3 | | | | | |
| | UFR 6: Changsha+TF 50-7 | 20 | 2.3 | 0.6 | 4.2 | 0.6 | 1.8 | 0.3 | 20 | 1.5 | 0.5 | 1.7 | 0.6 |
| N10-13 | UFR 3: Orange 15 | 20 | 2.6 | 0.4 | 2.6 | 0.4 | 2.7 | 0.4 | 20 | 1.7 | 0.7 | 2.0 | 0.4 |
| | UFR 16: 46x31-02-13 | 20 | 2.6 | 0.5 | 2.7 | 0.6 | 2.6 | 0.5 | 20 | 1.2 | 0.4 | 1.7 | 0.7 |
| | UFR 4: Orange 19 | 60 | 2.5 | 0.5 | 3.4 | 0.6 | 2.4 | 0.4 | 60 | 1.4 | 0.8 | 1.7 | 0.8 |
| | UFR 17: Green 2 | 60 | 2.4 | 0.4 | 3.2 | 0.6 | 2.6 | 0.6 | 59 | 1.4 | 0.7 | 1.0 | 0.5 |

| Evaluation Scale | | | |
|------------------|-----------------------------|------------------|------------------|
| Foliar Symptoms | Canopy color | Canopy Thickness | Yield/Fruit Drop |
| 1 = none | 1 = very yellow/unhealthy | 1 = very thin | 1 = Low |
| 2 = <25% | 2 = yellow/unhealthy | 2 = thin | 2 = Medium |
| 3 = 25-50% | 3 = moderately healthy | 3 = medium | 3 = High |
| 4 = 50-75% | 4 = healthy/green | 4 = thick | |
| 5 = >75% | 5 = very healthy/dark green | 5 = very thick | |

Table 10 (cont'd). MAC City Block Trial – Late orange - Evaluation of canopy thickness, foliar symptoms, canopy color, yield and fruit drop by scion and rootstock: mean + std. dev., 2020/21

| Scion | Rootstock | No. of trees evaluated | Canopy Thickness | | Foliar Symptoms | | Canopy Color | | No. of trees evaluated | Yield | | Fruit Drop | |
|----------|-------------------------|------------------------|------------------|-----------|-----------------|-----------|--------------|-----------|------------------------|-------|-----------|------------|-----------|
| | | | Mean | std. dev. | Mean | std. dev. | Mean | std. dev. | | Mean | std. dev. | Mean | std. dev. |
| N7-10 | UFR 16: 46x31-02-13 | 40 | 2.5 | 0.8 | 2.8 | 0.5 | 2.5 | 0.5 | 44 | 0.6 | 0.7 | 0.4 | 0.5 |
| | UFR 4: Orange 19 | 50 | 2.3 | 0.4 | 3.7 | 0.9 | 2.3 | 0.4 | 50 | 1.7 | 0.7 | 1.6 | 0.8 |
| | UFR 17: Green 2 | 70 | 2.2 | 0.7 | 4.2 | 1.1 | 2.1 | 0.6 | 50 | 1.2 | 0.7 | 1.3 | 0.5 |
| | UFR 3: Orange 15 | 50 | 1.9 | 0.5 | 3.6 | 1.3 | 1.8 | 0.5 | 60 | 0.9 | 0.7 | 0.9 | 0.5 |
| Valencia | x639 (control) | 60 | 2.8 | 0.5 | 3.2 | 0.4 | 2.7 | 0.5 | 80 | 1.3 | 0.7 | 1.6 | 0.6 |
| | 46x20-04-42 | 70 | 2.4 | 0.5 | 3.5 | 0.7 | 2.5 | 0.6 | 70 | 1.7 | 0.8 | 1.2 | 0.6 |
| | UFR 6: Changsha+TF 50-7 | 199 | 2.4 | 0.5 | 3.2 | 0.7 | 2.5 | 0.6 | 200 | 1.3 | 0.7 | 1.3 | 0.7 |
| | White 3 | 60 | 2.3 | 0.6 | 3.8 | 0.9 | 2.4 | 0.6 | 50 | 1.0 | 0.5 | 1.0 | 0.4 |
| | WGFT+50-7 | 80 | 2.3 | 0.4 | 3.8 | 0.9 | 2.2 | 0.4 | 80 | 2.1 | 0.8 | 1.2 | 0.5 |
| | SO+50-7 | 20 | 2.3 | 0.4 | 4.0 | 0.6 | 2.0 | 0.4 | 20 | 1.6 | 0.5 | 1.8 | 0.5 |
| | Murc+Rub | 50 | 2.2 | 0.5 | 3.3 | 0.9 | 2.4 | 0.6 | 50 | 1.7 | 0.8 | 1.0 | 0.5 |
| | 2247x6070-02-2 | 119 | 2.2 | 0.5 | 3.7 | 0.9 | 2.2 | 0.5 | 119 | 1.3 | 0.7 | 1.0 | 0.6 |
| | 46x20-04-9 | 58 | 2.2 | 0.6 | 3.5 | 0.9 | 2.3 | 0.6 | 61 | 0.8 | 0.7 | 0.6 | 0.6 |
| | White 1 | 60 | 2.2 | 0.6 | 3.5 | 1.1 | 2.2 | 0.7 | 58 | 1.7 | 1.0 | 1.0 | 0.5 |
| | 46x20-04-31 | 70 | 2.2 | 0.5 | 4.2 | 0.8 | 2.0 | 0.5 | 70 | 1.7 | 0.8 | 1.1 | 0.5 |
| | 2247x2075-01-2 | 60 | 2.1 | 0.5 | 3.4 | 0.8 | 2.2 | 0.5 | 60 | 1.4 | 0.8 | 0.9 | 0.5 |
| | Green3 | 60 | 2.1 | 0.6 | 3.3 | 1.0 | 2.3 | 0.7 | 60 | 1.2 | 0.8 | 0.8 | 0.6 |
| | 46x20-04-32 | 80 | 2.0 | 0.5 | 4.2 | 0.7 | 2.0 | 0.5 | 82 | 1.3 | 0.9 | 1.1 | 0.7 |
| | 46x20-04-48 | 48 | 1.9 | 0.7 | 3.8 | 0.9 | 2.0 | 0.7 | 49 | 1.2 | 0.7 | 0.7 | 0.6 |
| | UFR 15: 46x20-04-37 | 62 | 1.9 | 0.6 | 4.0 | 1.0 | 1.9 | 0.7 | 52 | 0.8 | 0.8 | 0.8 | 0.6 |
| B3-42 | UFR 4: Orange 19 | 79 | 2.2 | 0.5 | 3.4 | 0.6 | 2.3 | 0.5 | 79 | 1.1 | 0.7 | 1.4 | 0.9 |
| | UFR 3: Orange 15 | 60 | 2.1 | 0.5 | 3.4 | 0.8 | 2.4 | 0.6 | 60 | 1.2 | 0.7 | 1.3 | 0.7 |
| T1-56 | UFR 3: Orange 15 | 40 | 1.9 | 0.4 | 3.8 | 1.1 | 2.0 | 0.6 | 40 | 0.8 | 0.6 | 0.8 | 0.5 |

| Evaluation Scale | | | |
|------------------|-----------------------------|------------------|------------------|
| Foliar Symptoms | Canopy color | Canopy Thickness | Yield/Fruit Drop |
| 1 = none | 1 = very yellow/unhealthy | 1 = very thin | 1 = Low |
| 2 = <25% | 2 = yellow/unhealthy | 2 = thin | 2 = Medium |
| 3 = 25-50% | 3 = moderately healthy | 3 = medium | 3 = High |
| 4 = 50-75% | 4 = healthy/green | 4 = thick | |
| 5 = >75% | 5 = very healthy/dark green | 5 = very thick | |

Fig. 15. MAC City Block Trial – Late orange – Canopy thickness evaluation: mean + std. dev. [2019/20 & 2010/21].

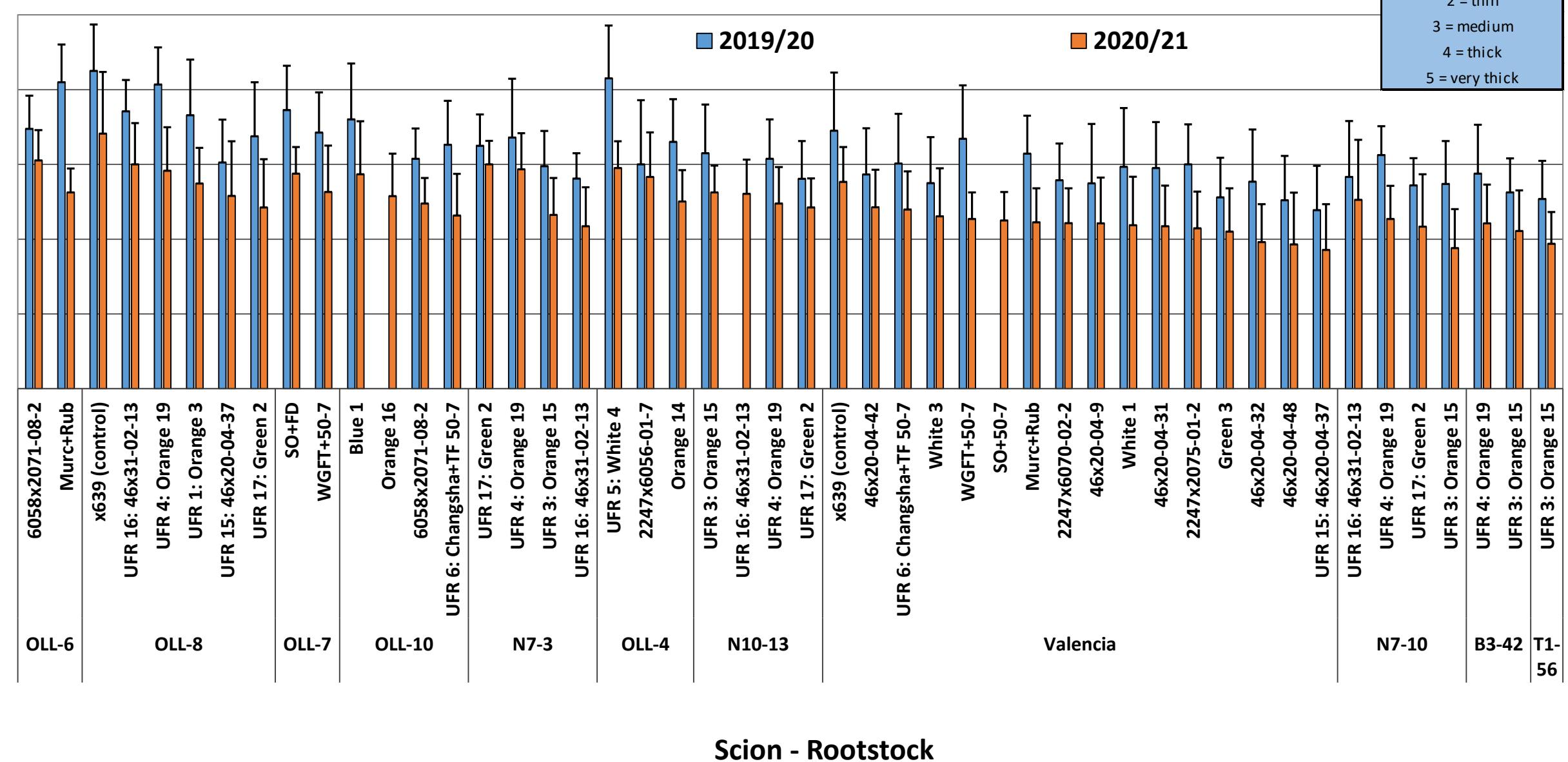


Fig. 16. MAC City Block Trial – Late orange - Foliar symptoms evaluation: mean + std. dev. [2019/20 & 2010/21].

| Evaluation Scale | |
|------------------|--|
| Foliar Symptoms | |
| 1 = none | |
| 2 = <25% | |
| 3 = 25-50% | |
| 4 = 50-75% | |
| 5 = >75% | |

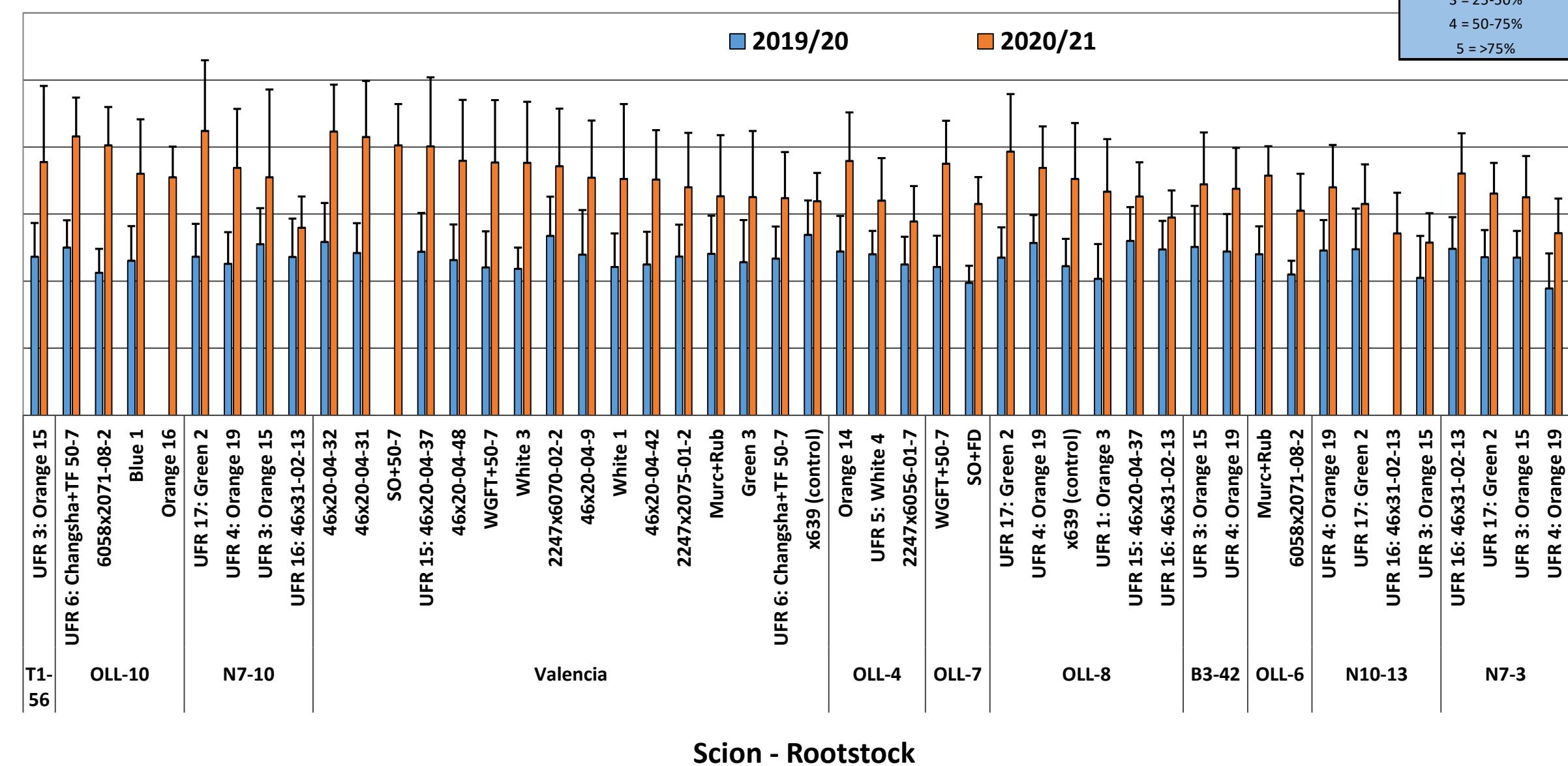


Fig. 17. MAC City Block Trial – Late orange – Canopy color evaluation: mean + std. dev. [2019/20 & 2010/21].

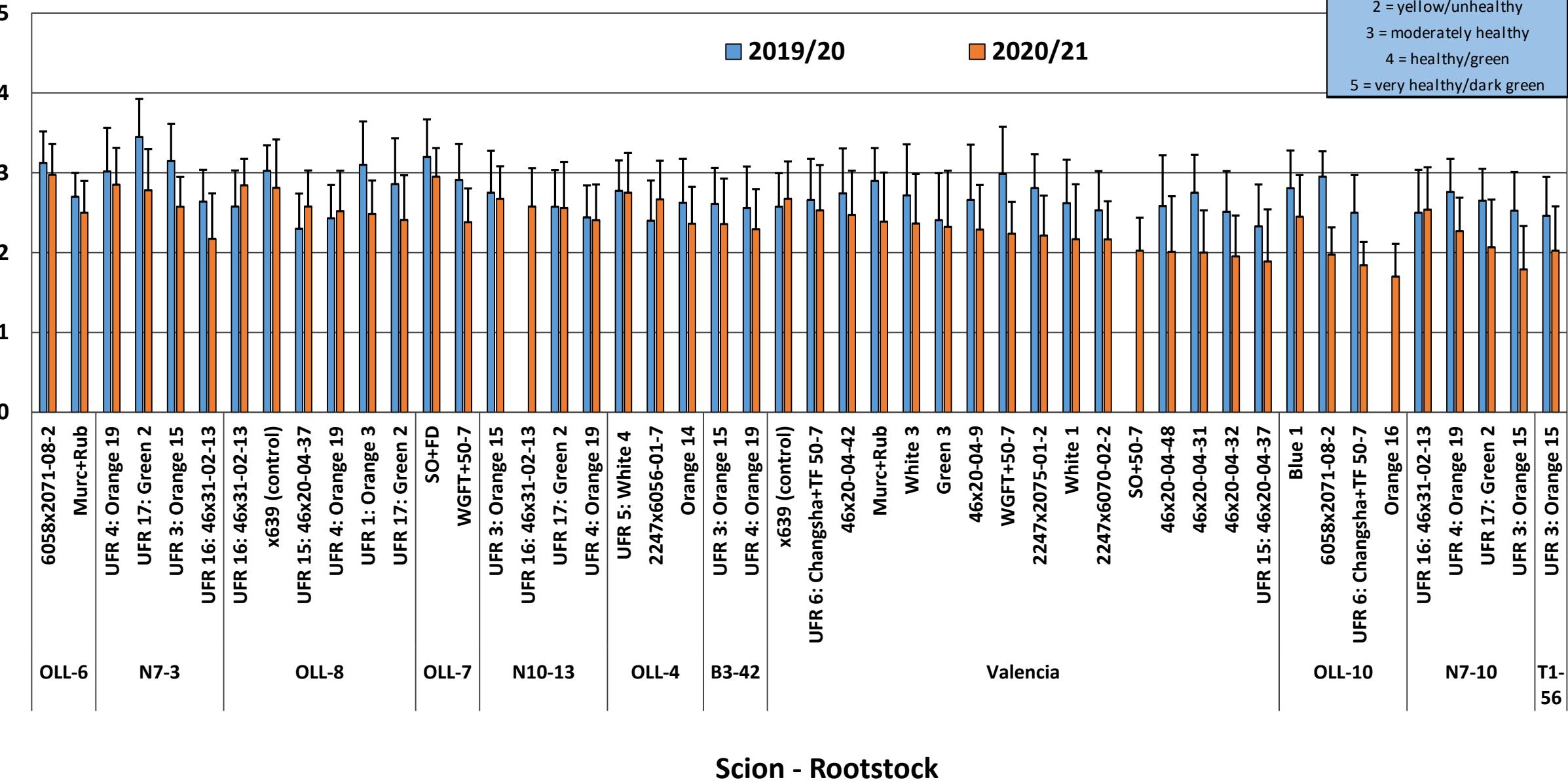


Fig. 18. MAC City Block Trial – Late orange - Yield evaluation: mean + std. dev. [2019/20 & 2010/21].

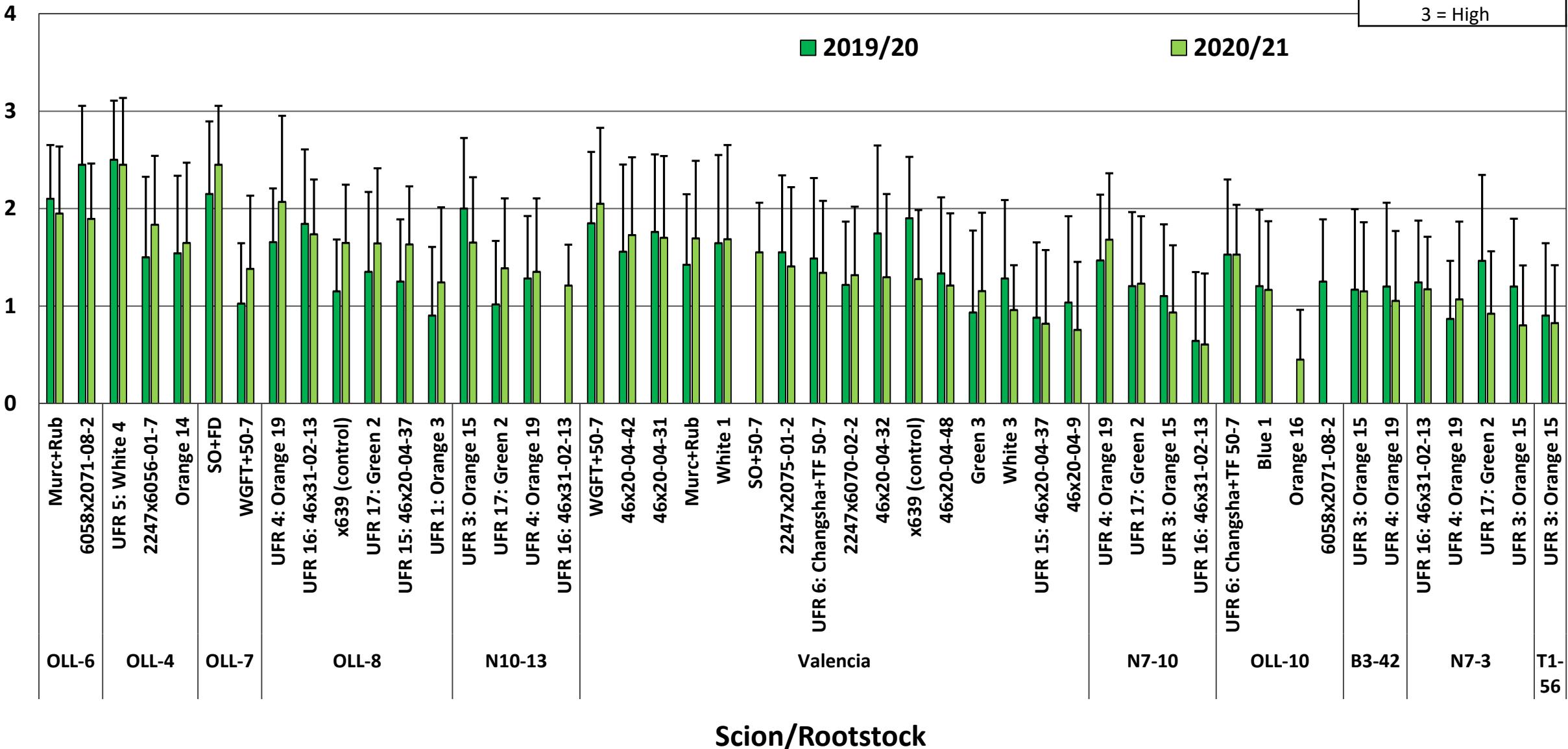


Fig. 19. MAC City Block Trial – Late orange – Fruit drop evaluation: mean + std. dev. [2019/20 & 2010/21].

| Fruit drop Evaluation | | |
|-----------------------|--------|------|
| 1 | 2 | 3 |
| Low | Medium | High |

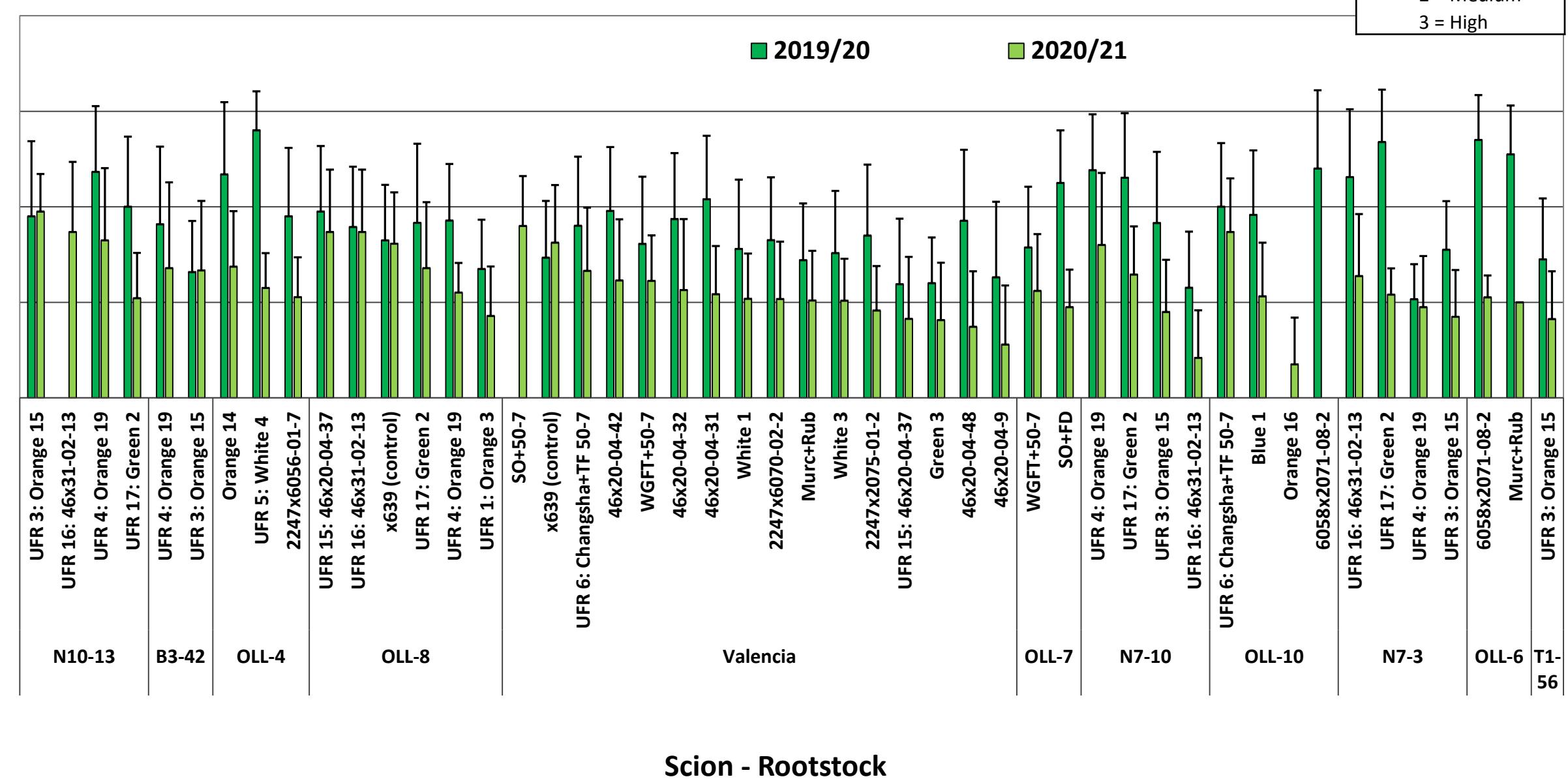


Table 11. MAC City Block Trial – Late orange – Survival rate [%], 2020/21.

| Rootstock | Survival Rate [%] |
|-------------------------|-------------------|
| 46x20-04-31 | 100 |
| 46x20-04-42 | 100 |
| 6058x2071-08-2 | 100 |
| SO+FD | 100 |
| UFR 1: Orange 3 | 100 |
| UFR 5: White 4 | 100 |
| WGFT+50-7 | 100 |
| x639(control) | 100 |
| UFR 4: Orange 19 | 100 |
| 2247x6070-02-2 | 99 |
| Orange14 | 99 |
| UFR 3: Orange 15 | 99 |
| Murc+Rub | 99 |
| 2247x2075-01-2 | 98 |
| Blue 1 | 98 |
| Green3 | 98 |
| White 3 | 98 |
| White1 | 98 |
| UFR 16: 46x31-02-13 | 98 |
| UFR 17: Green 2 | 98 |
| UFR 6: Changsha+TF 50-7 | 97 |
| SO+50-7 | 97 |
| 46x20-04-32 | 95 |
| 46x20-04-9 | 95 |
| UFR 15: 46x20-04-37 | 94 |
| 46x20-04-48 | 92 |
| 2247x6056-01-7 | 90 |

Late Oranges

N7-3, N7-10, B3-42, N10-13, T1-56, OLLs and Valencia

Juice quality

Table. 12. MAC City Block Trial - Juice quality for late oranges, 2020/21.

| Scion | Rootstock | PS/box | Brix | Acid | Ratio | Color |
|---------------|-------------------------|--------|------|------|-------|-------|
| B3-42 | UFR 3: Orange 15 | 5.5 | 11.1 | 0.63 | 17.6 | 36.2 |
| | UFR 4: Orange 19 | 4.8 | 9.8 | 0.60 | 16.4 | 36.2 |
| B9-65 | UFR 2: Orange 4 | 4.6 | 9.3 | 0.94 | 9.9 | 35.6 |
| N10-13 | UFR 4: Orange 19 | 5.3 | 10.6 | 0.59 | 17.9 | 36.9 |
| | UFR 3: Orange 15 | 5.2 | 10.2 | 0.60 | 17.0 | 35.9 |
| | UFR 16: 46x31-02-13 | 5.0 | 10.1 | 0.61 | 16.6 | 35.2 |
| | UFR 17: Green 2 | 3.7 | 9.1 | 0.57 | 15.9 | 35.2 |
| N7-10 | UFR 4: Orange 19 | 5.4 | 10.9 | 0.66 | 16.6 | 34.7 |
| | UFR 3: Orange 15 | 5.1 | 10.4 | 0.65 | 16.0 | 34.5 |
| | UFR 17: Green 2 | 4.6 | 9.4 | 0.62 | 15.2 | 34.8 |
| | UFR 16: 46x31-02-13 | 3.7 | 8.8 | 0.61 | 14.4 | 33.5 |
| N7-3 | UFR 16: 46x31-02-13 | 5.3 | 10.6 | 0.72 | 14.7 | 35.8 |
| | UFR 4: Orange 19 | 3.9 | 9.3 | 0.57 | 16.4 | 35.4 |
| | UFR 3: Orange 15 | 3.8 | 9.3 | 0.62 | 15.0 | 35.0 |
| | UFR 17: Green 2 | 3.7 | 9.0 | 0.54 | 16.6 | 35.4 |
| OLL-10 | Orange 16 | 5.1 | 10.2 | 0.58 | 17.6 | 37.5 |
| | UFR 6: Changsha+TF 50-7 | 4.9 | 10.3 | 0.56 | 18.4 | 37.3 |
| | 6058x2071-08-2 | 4.8 | 9.6 | 0.45 | 21.3 | 37.6 |
| | Blue 1 | 4.1 | 8.5 | 0.57 | 14.9 | 36.3 |
| OLL-4 | UFR 5: White 4 | 5.5 | 10.8 | 0.56 | 19.3 | 35.4 |
| | Orange 14 | 4.9 | 9.6 | 0.55 | 17.5 | 37.2 |
| | 2247x6056-01-7 | 4.8 | 9.8 | 0.52 | 18.8 | 34.5 |
| OLL-6 | Murc+Rub | 4.4 | 9.5 | 0.60 | 15.8 | 34.7 |
| | 6058x2071-08-2 | 4.0 | 9.0 | 0.46 | 19.7 | 35.5 |

Table 12 (cont'd.). MAC City Block Trial - Juice quality for late oranges, 2020/21.

| Scion | Rootstock | PS/box | Brix | Acid | Ratio | Color |
|-----------------|-------------------------|--------|------|------|-------|-------|
| OLL-7 | Wgft+50-7 | 5.7 | 11.4 | 0.61 | 18.7 | 37.9 |
| | SO+FD | 4.6 | 9.1 | 0.56 | 16.2 | 36.2 |
| OLL-8 | UFR 16: 46x31-02-13 | 4.7 | 9.8 | 0.58 | 16.9 | 34.7 |
| | UFR 1: Orange 3 | 4.6 | 9.4 | 0.62 | 15.2 | 36.5 |
| | x639 [control] | 4.5 | 9.7 | 0.59 | 16.4 | 34.6 |
| | UFR 4: Orange 19 | 4.5 | 9.3 | 0.74 | 12.6 | 35.7 |
| | UFR 15: 46x20-04-37 | 4.0 | 8.9 | 0.51 | 17.5 | 33.9 |
| | UFR 17: Green 2 | 3.8 | 8.3 | 0.59 | 14.0 | 34.8 |
| T1-56 | UFR 3: Orange 15 | 5.3 | 10.5 | 0.58 | 18.1 | 35.2 |
| Valencia | 46x20-04-42 | 5.9 | 11.3 | 0.58 | 19.5 | 36.2 |
| | White 1 | 5.4 | 10.7 | 0.66 | 16.2 | 35.4 |
| | Green 3 | 5.3 | 10.6 | 0.70 | 15.2 | 34.8 |
| | 46x20-04-31 | 5.3 | 10.4 | 0.64 | 16.3 | 36.0 |
| | UFR 6: Changsha+TF 50-7 | 5.2 | 10.1 | 0.67 | 15.0 | 35.8 |
| | 2247x6070-02-2 | 5.1 | 10.2 | 0.86 | 12.2 | 36.4 |
| | 2247x2075-01-2 | 5.1 | 10.1 | 0.69 | 14.6 | 36.0 |
| | Murc+Rub | 5.0 | 10.1 | 0.58 | 17.4 | 36.8 |
| | White 3 | 5.0 | 9.6 | 0.80 | 12.0 | 35.8 |
| | Wgft+50-7 | 4.8 | 9.7 | 0.55 | 17.7 | 36.5 |
| | 46x20-04-48 | 4.7 | 9.7 | 0.59 | 16.4 | 34.9 |
| | 46x20-04-32 | 4.4 | 9.1 | 0.63 | 14.5 | 34.5 |
| | UFR 15: 46x20-04-37 | 4.4 | 8.9 | 0.63 | 14.1 | 36.1 |
| | x639 (control) | 4.1 | 9.7 | 0.56 | 17.3 | 35.9 |
| | 46x20-04-9 | 3.8 | 8.6 | 0.59 | 14.6 | 35.4 |

Fig. 20. MAC City Block Trial - PS/box for late oranges, March 2021.

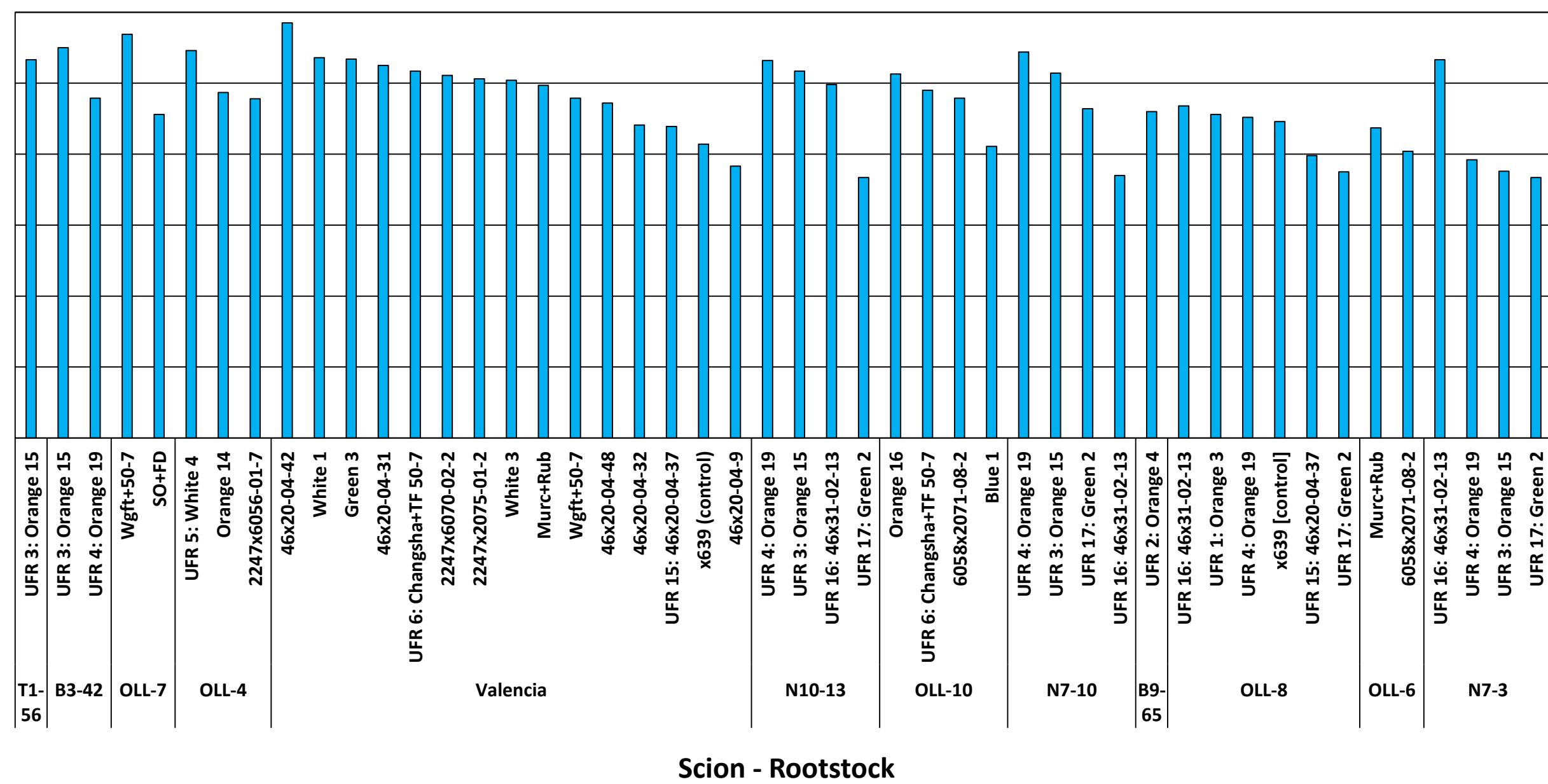


Fig. 21. MAC City Block Trial - Juice Brix for late oranges, March 2021

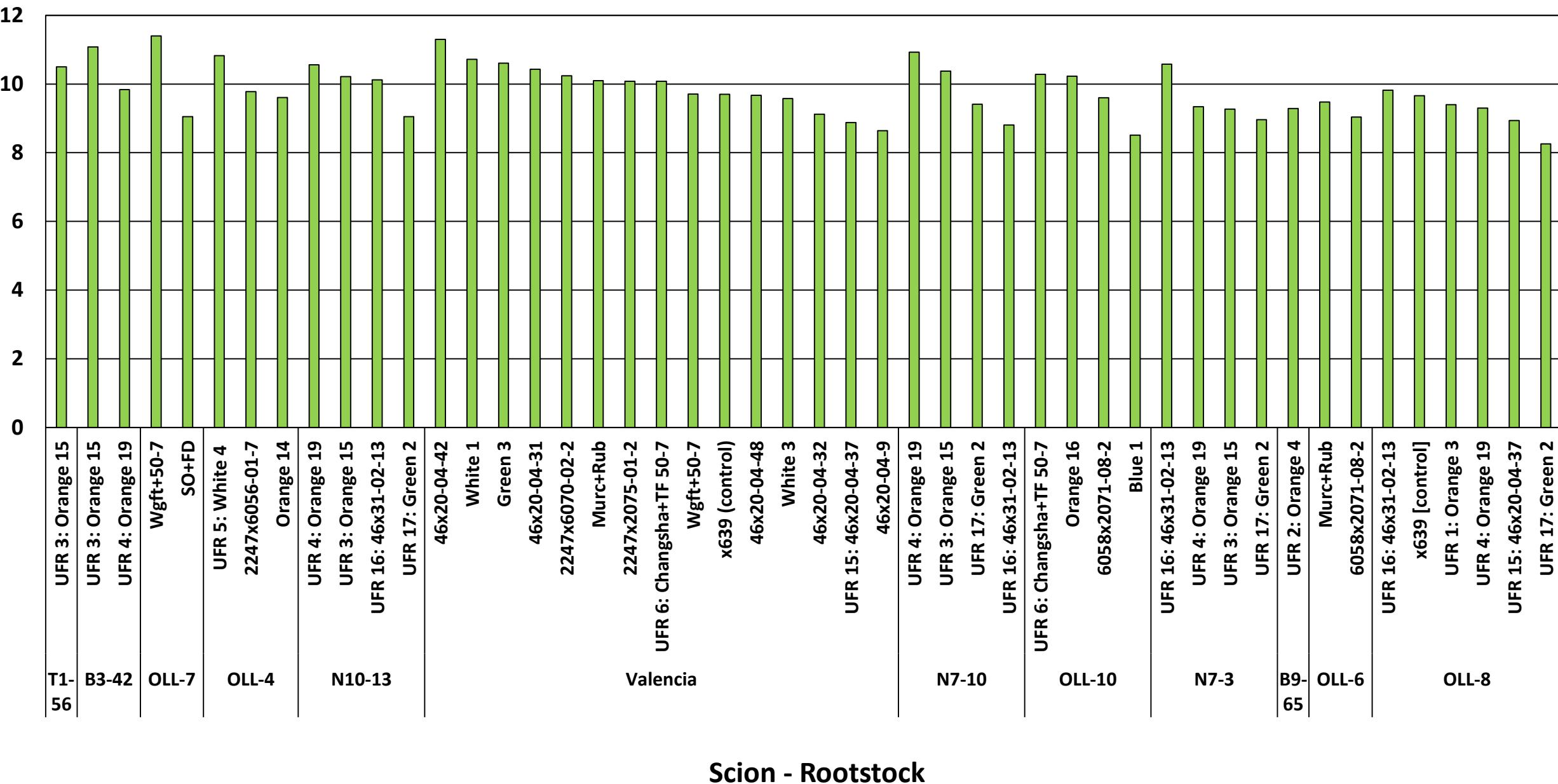


Fig. 22. MAC City Block Trial - Juice acid for late oranges, March 2021.

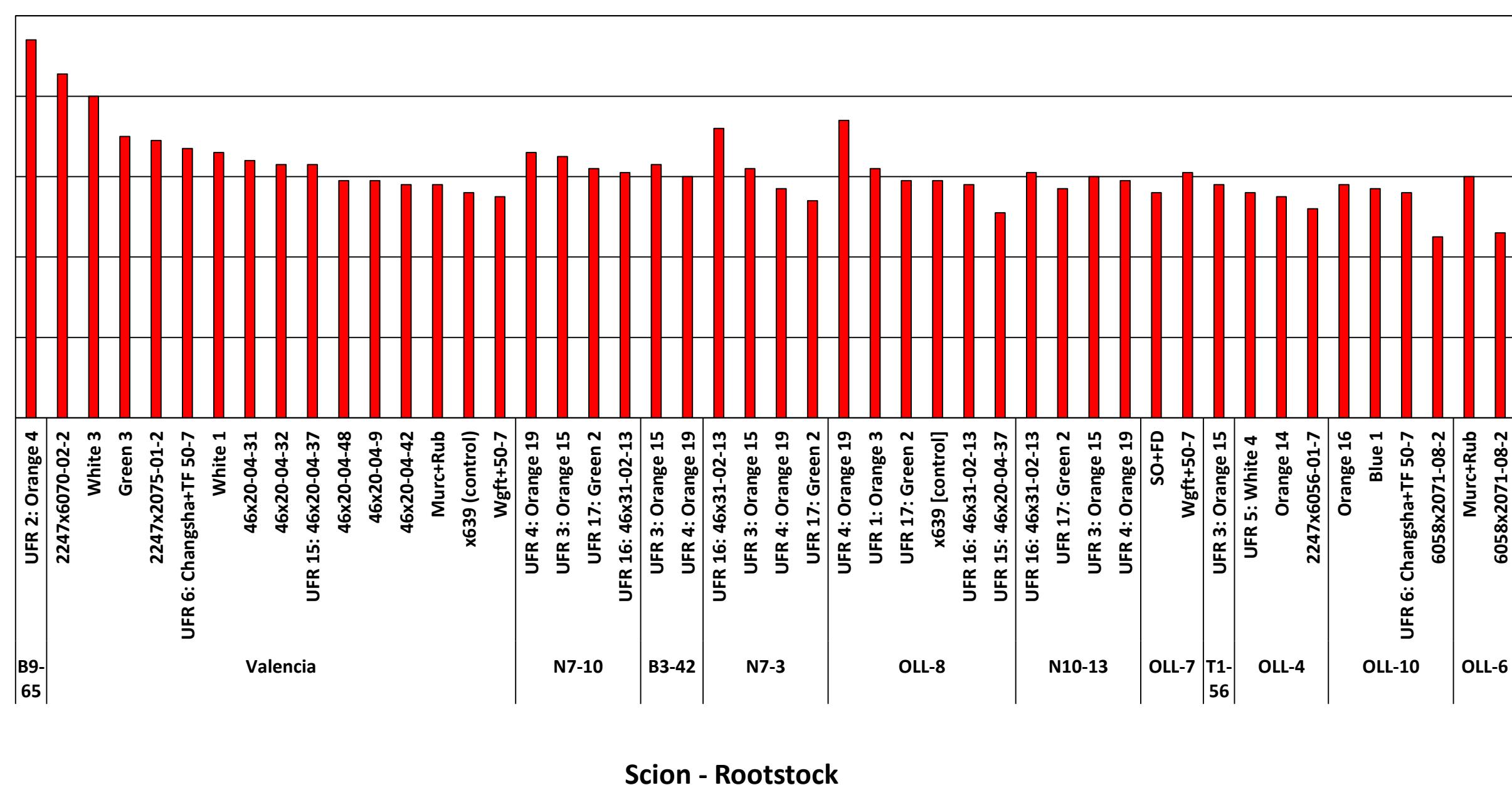


Fig. 23. MAC City Block Trial - Juice Ratio for late oranges, March 2021.

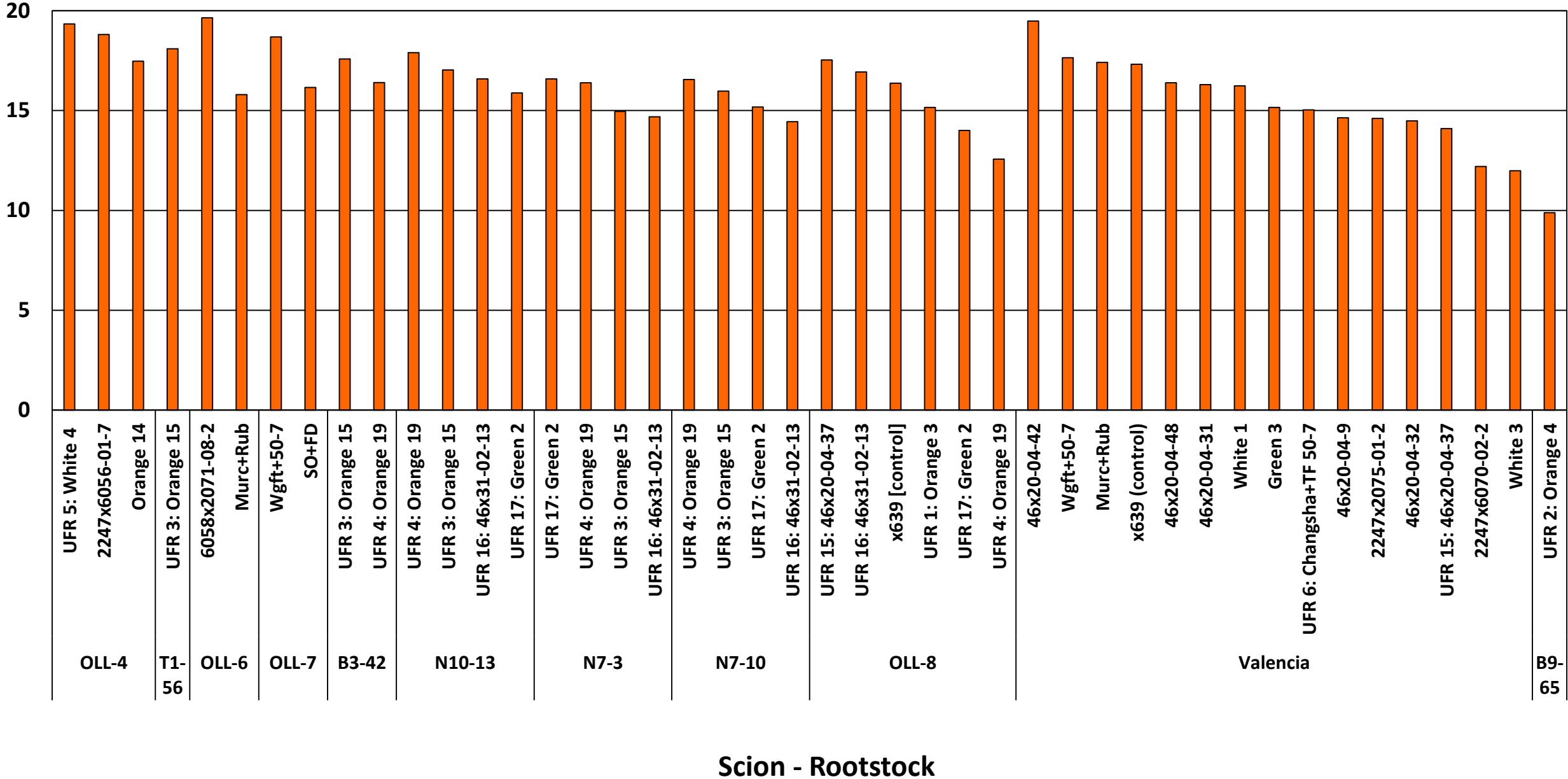
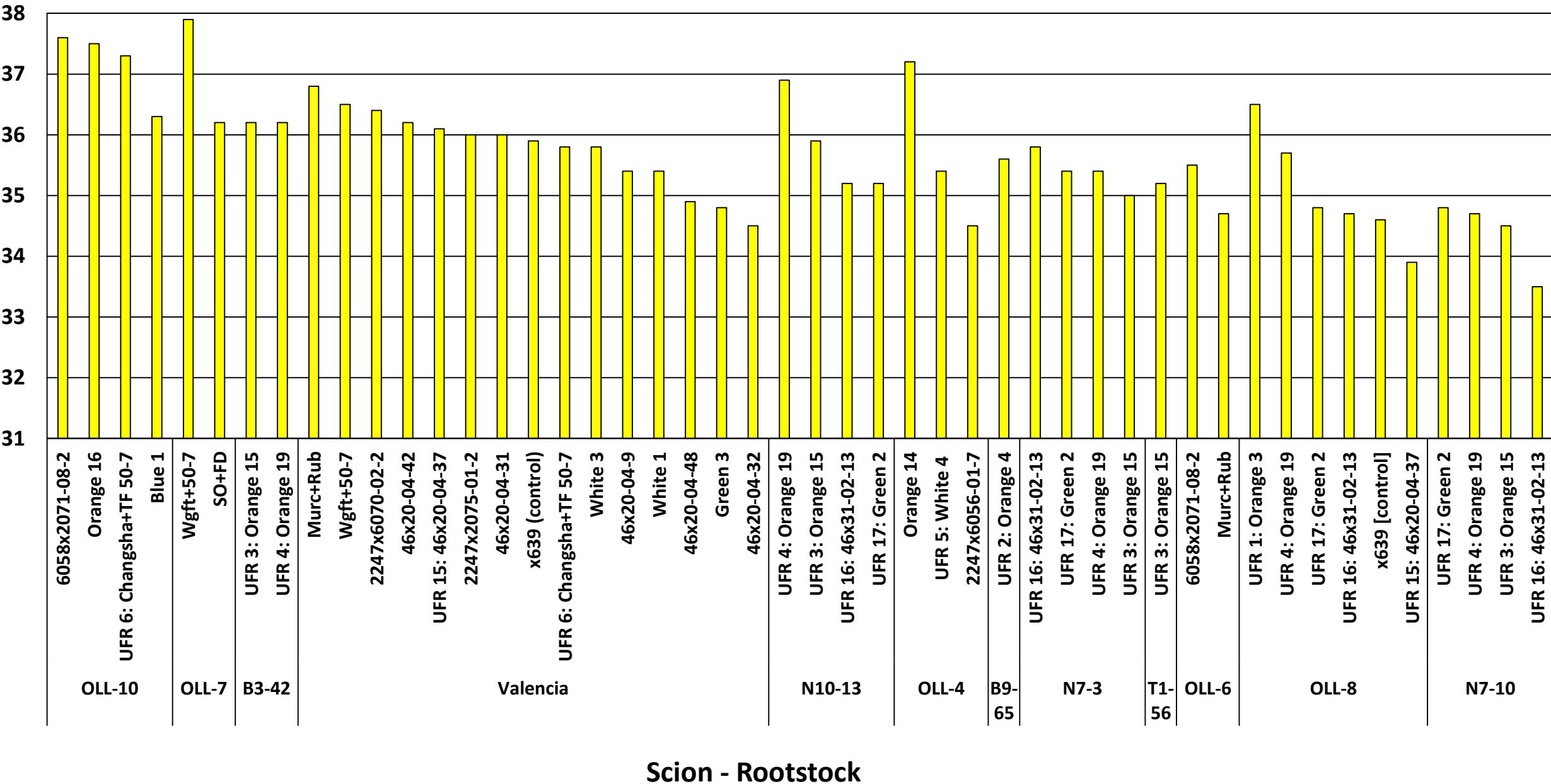


Fig. 24. MAC City Block Trial - Juice color for late oranges, March 2021.



SugarBelle®

Canopy volume and Tree height

Table 13. MAC City Block Trial – Canopy volume [ft³] and Tree height [ft.] by rootstock: mean + std. dev. [2019/20 & 2020/21].

| 2019/20 | | | | | |
|------------------|------------------------|---------------|-----------|-------------|-----------|
| Rootstock | No. of trees evaluated | Canopy Volume | | Tree Height | |
| | | Mean | std. dev. | Mean | std. dev. |
| UFR 5: White 4 | 79 | 222.8 | 83.2 | 7.0 | 0.7 |
| x639 | 10 | 174.5 | 41.5 | 6.5 | 0.6 |
| UFR 17: Green 2 | 10 | 139.9 | 45.6 | 6.2 | 0.7 |
| 2247 x 2075-01-2 | 70 | 117.7 | 46.9 | 5.8 | 0.8 |
| 3246 x 2071-05-6 | 67 | 64.2 | 29.6 | 4.9 | 0.9 |

| 2020/21 | | | | | |
|------------------|------------------------|---------------|-----------|-------------|-----------|
| Rootstock | No. of trees evaluated | Canopy Volume | | Tree Height | |
| | | Mean | std. dev. | Mean | std. dev. |
| UFR 5: White 4 | 59 | 338.1 | 103.5 | 7.5 | 0.8 |
| x639 | 10 | 273.2 | 54.7 | 7.1 | 0.6 |
| 2247 x 2075-01-2 | 60 | 206.9 | 67.2 | 6.6 | 0.7 |
| 3246 x 2071-05-6 | 34 | 115.3 | 52.3 | 5.4 | 0.7 |
| UFR 17: Green 2* | | | | | |

(*): no data available

Fig. 25. MAC City Block Trial – Canopy volume by rootstock: mean + std. dev. [ft³.], 2019/20 & 2020/21].

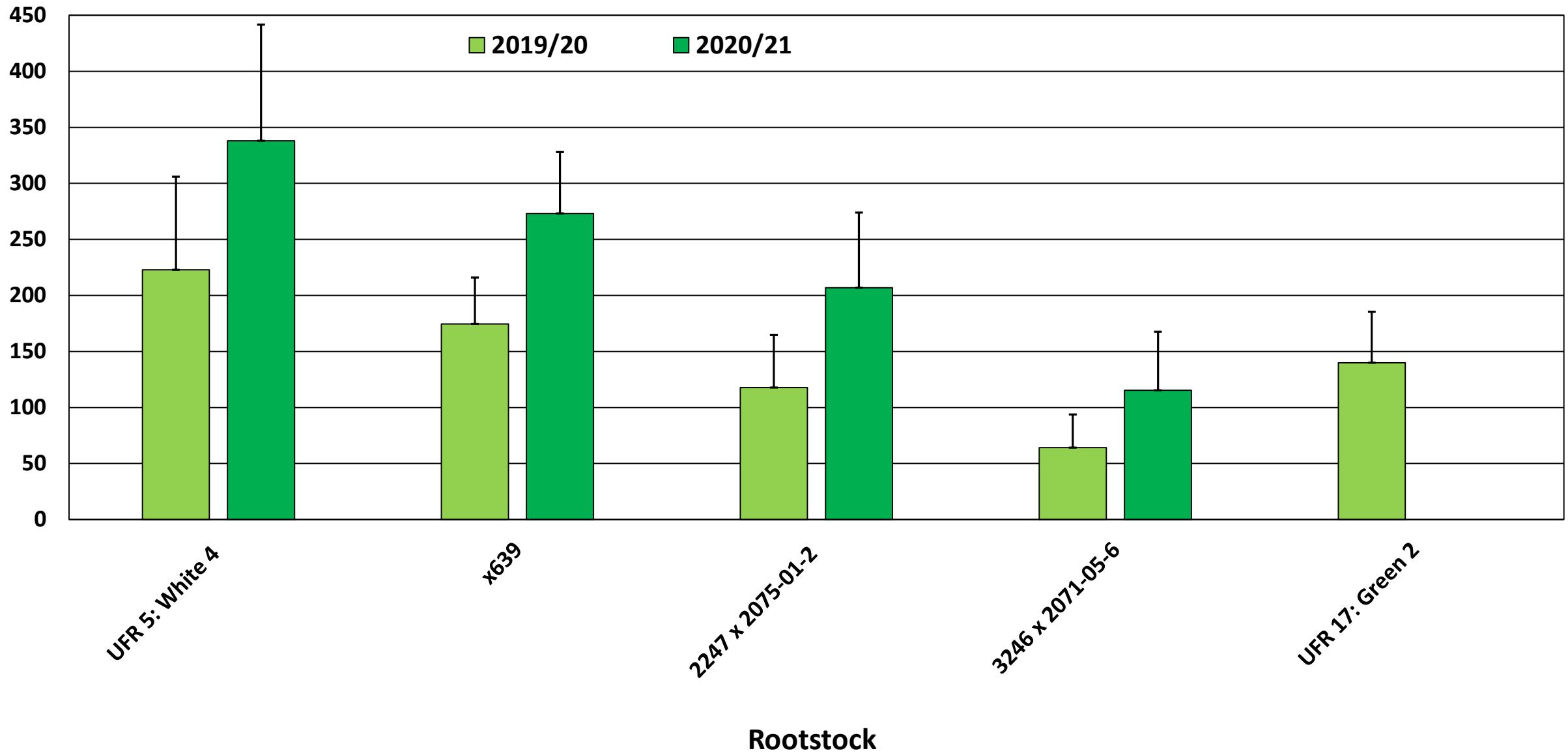
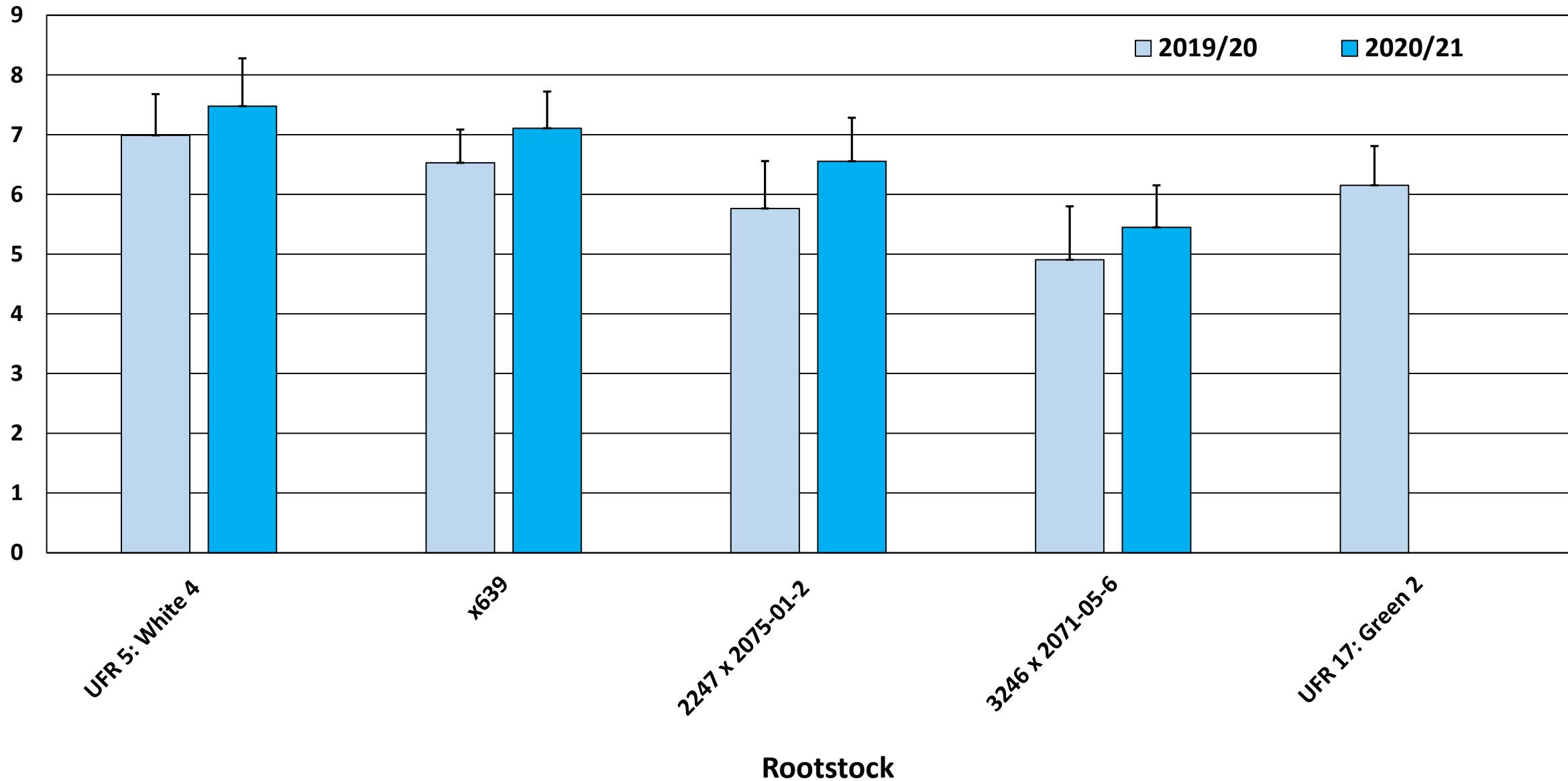


Fig. 26. MAC City Block Trial – Tree height by rootstock: mean + std. dev. [ft., July 2020 and July 2021].



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Canopy thickness, foliar symptoms and canopy color

Table 14. MAC City Block Trial – Evaluation of canopy thickness, foliar symptoms and canopy color: mean + std. dev. [2019/20].

| Rootstock | No. of Trees | Canopy Thickness | | Foliar Symptoms | | Canopy Color | |
|------------------|--------------|------------------|-----------|-----------------|-----------|--------------|-----------|
| | | Mean | std. dev. | Mean | std. dev. | Mean | std. dev. |
| UFR 17: Green 2 | 22 | 4.6 | 0.4 | 3.2 | 0.6 | 3.3 | 0.3 |
| UFR 5: White 4 | 77 | 4.6 | 0.5 | 2.5 | 0.5 | 3.7 | 0.6 |
| 2247x2075-01-02 | 70 | 4.2 | 0.7 | 2.6 | 0.6 | 3.3 | 0.7 |
| x639 | 10 | 4.2 | 0.5 | 2.9 | 0.7 | 3.5 | 0.7 |
| 3246 x 2071-05-6 | 68 | 3.7 | 1.0 | 2.5 | 0.6 | 2.8 | 0.7 |

| Evaluation Scale | | |
|------------------|-----------------------------|------------------|
| Foliar Symptoms | Canopy color | Canopy Thickness |
| 1 = none | 1 = very yellow/unhealthy | 1 = very thin |
| 2 = <25% | 2 = yellow/unhealthy | 2 = thin |
| 3 = 25-50% | 3 = moderately healthy | 3 = medium |
| 4 = 50-75% | 4 = healthy/green | 4 = thick |
| 5 = >75% | 5 = very healthy/dark green | 5 = very thick |

Fig. 27. MAC City Block Trial – Evaluation of canopy thickness, canopy color and foliar symptoms by rootstock: mean + std. dev., 2019/20.

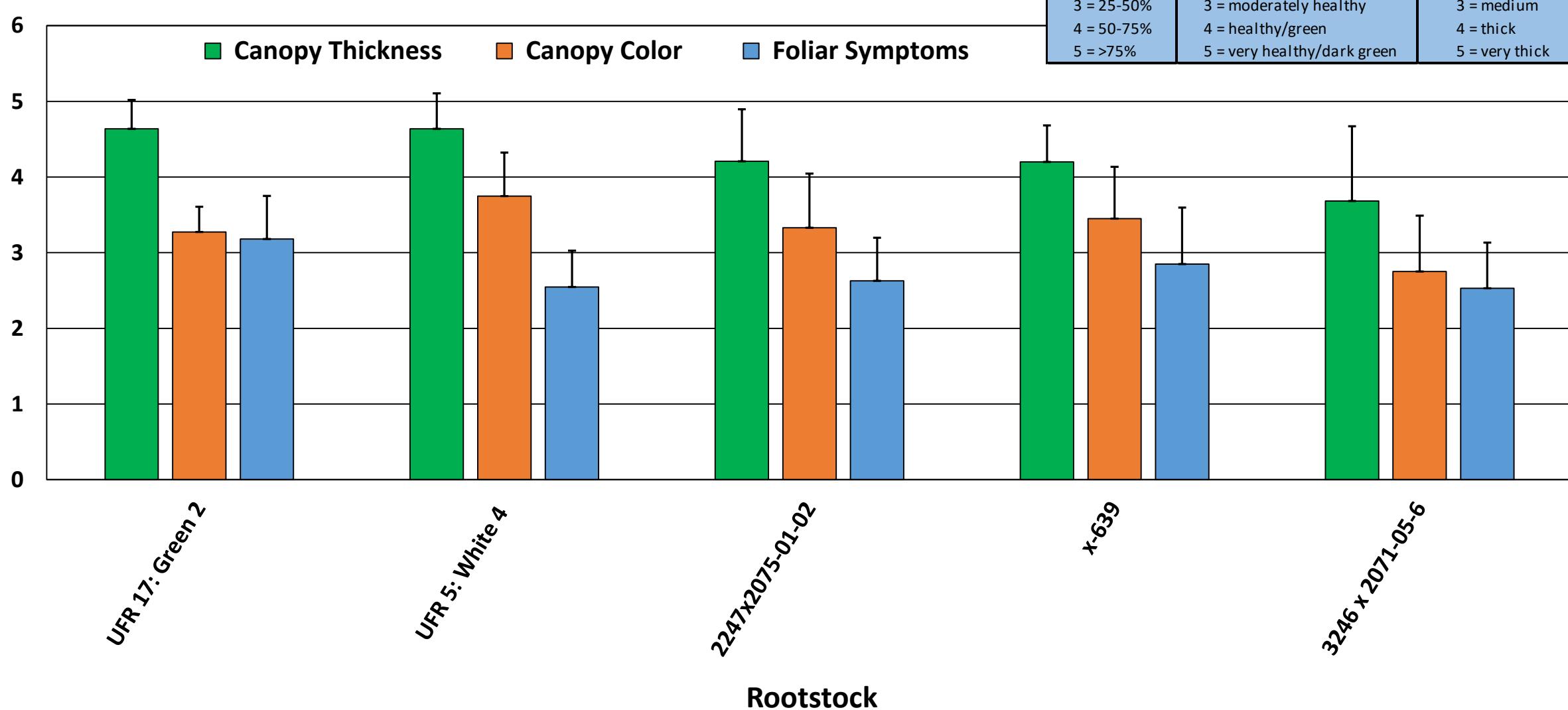


Table 15. MAC City Block Trial – SugarBelle® – Survival rate [%], 2020/21.

| Rootstock | Survival Rate [%] |
|------------------|--------------------------|
| 2247 x 2075-01-2 | 100 |
| x639 | 100 |
| UFR 5: White 4 | 98 |
| 3246 x 2071-05-6 | 50 |

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