2016-2017 Michigan Regional Trial
Potatoes USA / SNAC International Storage Chip Quality

Michigan State University Montcalm Research Center
MPIC Demonstration Storage

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Objective: To assess the storability of 16 chipping varieties by evaluating sugar concentrations, chip color, and visual defects throughout the duration of storage.

Materials and Methods:
Sandyland Farms, LLC, in Howard City, MI planted seed on May 20, 2016 at 10" within row spacing and 34" between row spacing. Vines were killed on August 22, 2016. We harvested the potatoes on October 13, 2016 (2757 GDD_{40} from planting to vine kill) and collected storage samples.

Commercial Storage and Processing
Two, 40-pound samples per variety were stored at Sandyland Farms, LCC commercial storage and evaluated at Herr Foods, Nottingham, PA on January 12 and March 29, 2017. The pile temperature before processing was 50ºF on both dates. For sprout control, potatoes underwent an application of CIPC in November 2016.

Demonstration Storage and Monthly Evaluations
Eighteen samples of 30 tubers per variety were stored at the Michigan Potato Industry Commission's (MPIC) Cargill Potato Demonstrations Storage Facility in two separate bulk bin storages. One sample bag from each of the sixteen varieties was stored at approximately 48ºF and 54ºF for monthly evaluations from November 2016 through June 2017. Techmark, Inc. processed the MPIC samples for sucrose and glucose values (percent of fresh weight), SNAC color score, and undesirable chip color rating. We report the undesirable chip color rating as a percentage, by weight, of the total chips evaluated. For sprout control, potatoes underwent an application of CIPC in November 2016.

Results:

Commercial Storage and Processing
Herr Foods, Inc. ranked varieties relative to each other on January 12th and March 29th, 2017 (Table 1 and 2). On the first processing date, the top three varieties for chip quality were W6822-3, Lamoka, and Snowden (Table 1). On the second processing date, the top three varieties were and NY152, NY157, and W6822-3 (Table 2). CO07070-10W had the highest specific gravity at 1.083 in Januray (Table 1). Snowden had the highest Agtron color score of 62.1 (Table 1).

Table 1. 2016 SNAC Varity Trial January 12, 2017[1]

Rank[2]	Variety	Agtron Color[3]	SNAC Color[4]	Specific Gravity	Percent Chip Defects[5]			Comments
					Internal	External	Total	
8	AF4648-2	58.7	3	1.075	22.8	17.0	39.8	Minor internal color. Nice skin. Size: 2" - 4.25"
6	AF5040-8	58.6	3	1.079	10.3	12.5	22.8	Minor internal defects, small. Size: 1.5" - 2"
12	B2727-2	57.7	3	1.076	11.6	25.1	36.7	Minor Fusarium with minor internals. Oblong shape. Size: 2.5" - 4"
13	CO07070-10W	50.8	3	1.083	20.8	10.2	31.0	Scab and bruise present.
2	Lamoka	59.7	2	1.079	4.4	13.6	18.0	Nice skin. Size: 2.5" - 3"
14	MSR127-2	52.6	4	1.080	17.9	13.0	30.9	Nice skin, a lot of internal color. Size: 1.75" - 4.5"
5	MSW485-2	56.1	3	1.081	8.9	12.7	21.6	Some scab and minor bruise, nice skin.
9	NC0349-3	58.6	3	1.075	14.9	15.8	30.7	A lot of deep scab. Size: medium to large
15	NDA081453CAB-2C	50.2	4	1.075	60.7	22.6	83.3	A lot of internal color. Nice skin with minor scab.
10	NDTX081648CB-13W	59.6	4	1.081	20.8	10.2	31.0	Nice size. A lot of internal color.
7	NY152	59.5	2	1.076	13.9	23.2	37.1	Some scab, medium in size.
4	NY157	59.4	2 to 3	1.074	3.4	19.1	22.5	Some scab, nice round potatoes. Size: 3" - 3 .5"
3	Snowden	62.1	2	1.080	5.9	22.5	28.4	Some bruise and deep scab. Good size.
11	TX09396-1W	56.3	3	1.077	6.8	27.5	34.3	Edge color. Large, too big in size.
1	W6822-3	54.3	2 to 3	1.082	4.7	7.5	12.2	Scaly looking skin with good size.
16	W8822-1	50.1	4	1.078	36.1	35.7	71.8	Stem end with a lot of color internally. A lot of color, minor scab.

[1]Samples collected at harvest on October 13, 2017 and processed by Herr Foods, Inc., Nottingham, PA on January 12, 2017.
[2]Rank: ranked by Herr Foods, Inc. 1 = highest chip quality, 16 = lowest chip quality
[3]Agtron Color: using Agtron M Series II
[4]SNAC Color: 1 = lightest, 5 = darkest
[5]Percent Chip Defects: percentage based on weight of the total sample; comprised of undesirable color, greening, internal and external defects

Table 2. 2016 SNAC Varity Trial March 29, 2017[1]

Rank[2]	Variety	Agtron Color[3]	SNAC Color[4]	Specific Gravity	Percent Chip Defects[5]			Comments
					Internal	External	Total	
4	AF4648-2	NA	2	1.070	0.0	9.7	9.7	Minor defects. Size 2" - 3"
13	AF5040-8	NA	4	1.069	17.3	19.4	36.7	A lot of color. A lot of scab. Size: 1.5" to 4"
10	B2727-2	NA	3	1.067	9.8	8.0	17.8	A lot of scab. Bruising. Oblong. Size: 2.5" - 4.5"
6	CO07070-10W	NA	2	1.075	7.9	8.9	16.8	Minor edge defects and scab. Size: 1.75" - 4"
5	Lamoka	NA	3	1.080	10.0	6.7	16.7	Some internal color. Size: 2" - 3.5"
15	MSR127-2	NA	4	1.078	45.8	7.5	53.3	A lot of internal color. Size: 3" - 4"
8	MSW485-2	NA	3	1.078	11.0	3.0	14.0	Minor internals. Minor scab. Size: 1.75" - 3.5"
12	NC0349-3	NA	3	1.062	24.7	17.8	42.5	Some internal color. Scab and a lot of hollow heart. Unacceptable gravity. Size: 2" - 3.5"
16	NDA081453CAB-2C	NA	5	1.071	63.5	3.8	67.3	Too much color. Size: 2" to 3"
9	NDTX081648CB-13W	NA	2	1.072	8.7	5.9	14.6	Some internal color. Size: 1.25" - 2.5"
1	NY152	NA	2	1.072	0.0	14.3	14.3	Minor bruising. Size: 3" - 4"
2	NY157	NA	2	1.074	6.9	8.3	15.2	Minor shading. Minor scab. Size 2" - 3"
7	Snowden	NA	3	1.080	1.6	15.6	17.2	Minor scab, bruising. Size: 2" - 3"
11	TX09396-1W	NA	3	1.080	0.8	37.2	38.0	Bruising with some color on edges. Size: 1.75" - 4"
3	W6822-3	NA	2	1.077	0.0	4.9	4.9	Too many that were too small. Couldn't get a good sample Size: 1.25" - 3"
14	W8822-1	NA	4	1.077	28.8	18.0	46.8	A lot of internal color with stem end. Yellow flesh. Size: 2" - 3"

[1]Samples collected at harvest on October 13, 2017 and processed by Herr Foods, Inc., Nottingham, PA on March 29, 2017.
[2]Rank: ranked by Herr Foods, Inc. 1 = highest chip quality, 16 = lowest chip quality
[3]Agtron Color: using Agtron M Series II
[4]SNAC Color: 1 = lightest, 5 = darkest
[5]Percent Chip Defects: percentage based on weight of the total sample; comprised of undesirable color, greening, internal and external defects

Demonstration Storage and Monthly Evaluations
Below, we compared the Techmark Inc. assessments of each variety to Lamoka and Snowden. These samples were stored at 48ºF and 54ºF in the MPIC Demonstration Storage facility and evaluated monthly from November 2016 through June 2017. We listed the varieties in alphabetical order. For yield and raw tuber quality data at harvest, please see the 2016 field trial results.

Conclusions:

Based on the processing results from both commercial and demonstration storage, NY152 and W6822-3 appear to be the most promising lines for commercialization. Both of these varieties were ranked highly by Herr Foods, Inc. (Tables 1 and 2). Compared to Lamoka, NY152 and W6822-3 had similar or lower sugar concentrations and defects (Figures 37-40, 49-52). Both varieties had excellent chip quality throughout storage (Tables 13 and 17; Figures 40 and 52).

AF4648-2: From December to April, AF4648-2 had higher glucose concentrations than Lamoka or Snowden (Figure 1), but sucrose levels were similar to Lamoka throughout storage (Figure 2). Compared to the check varieties, AF4648-2 had a higher percentage of defects from November to April (Figure 3), due to increased glucose levels during this time. SNAC color scores had a rating of 0.5-1.0 higher than the check varieties from December to March (Figure 4). We would recommend storing AF4648-2 at a warmer temperature because the potatoes stored at 54°F had better chip quality during the middle months of storage with 10-40% fewer defects (Table 3 and Figures 3-4).

Table 3. AF4648-2 monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

February		
March		
April		
May		
June		

Figure 1. AF4648-2 glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

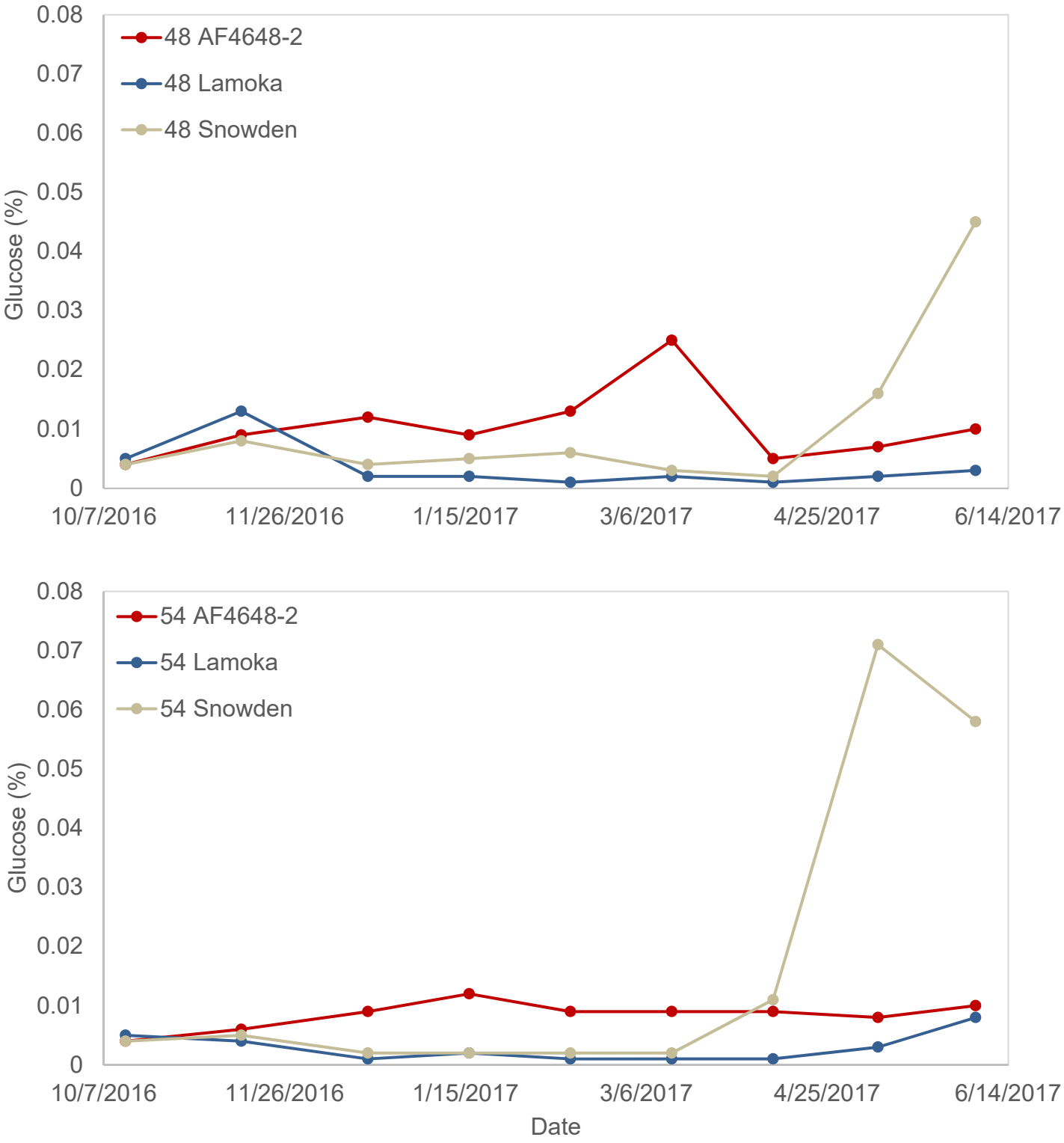


Figure 2. AF4648-2 sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

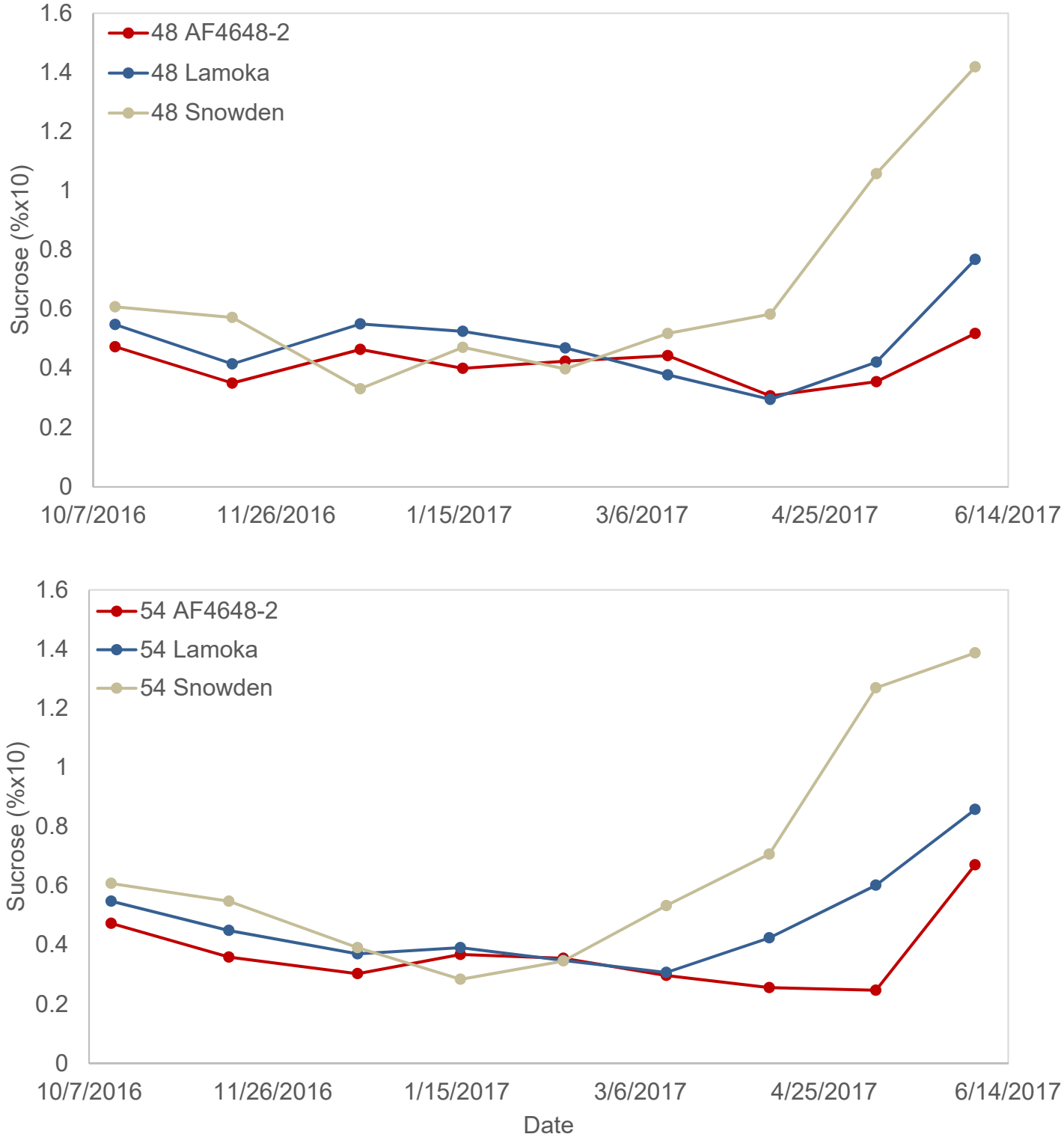


Figure 3. AF4648-2 percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

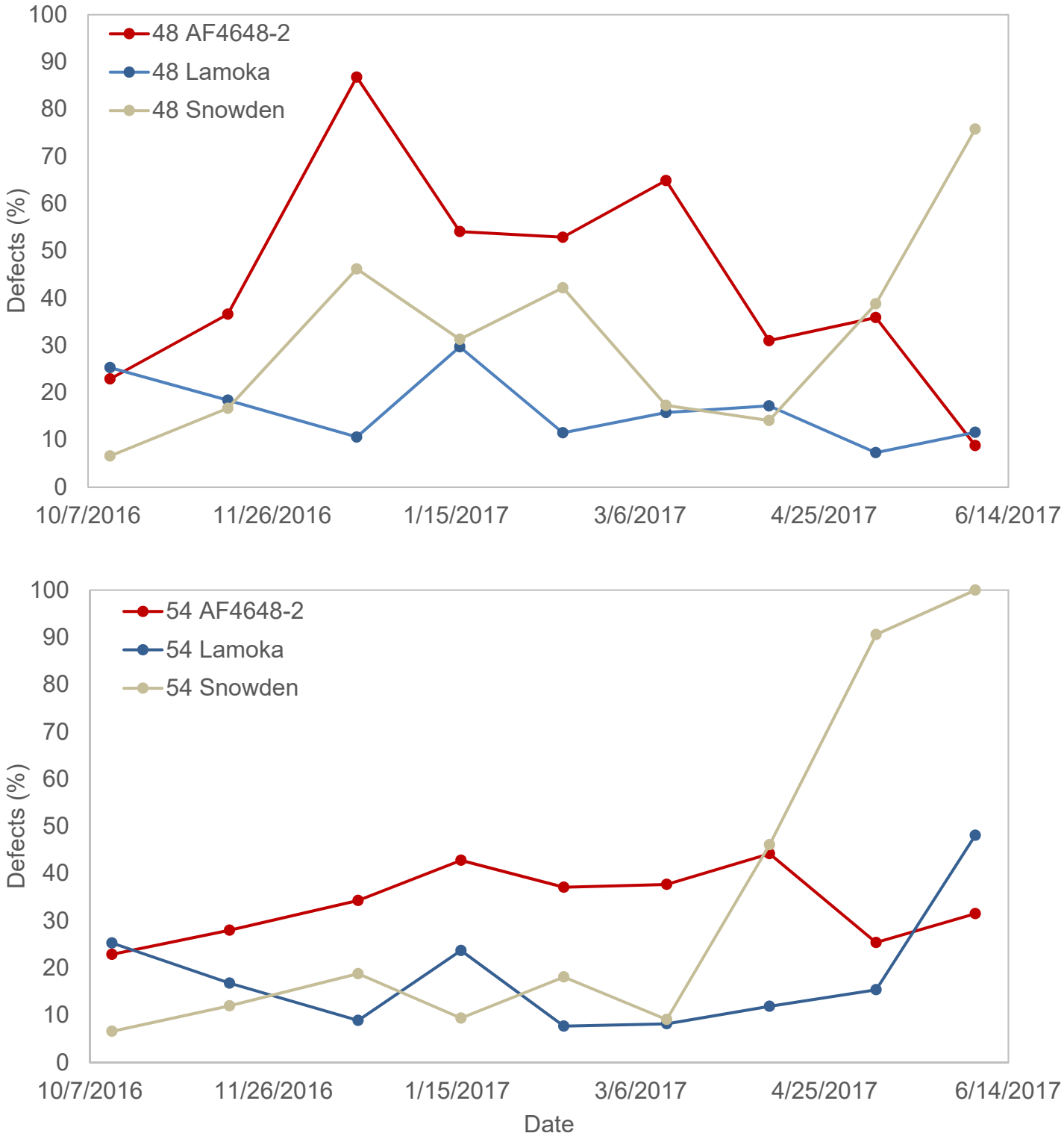
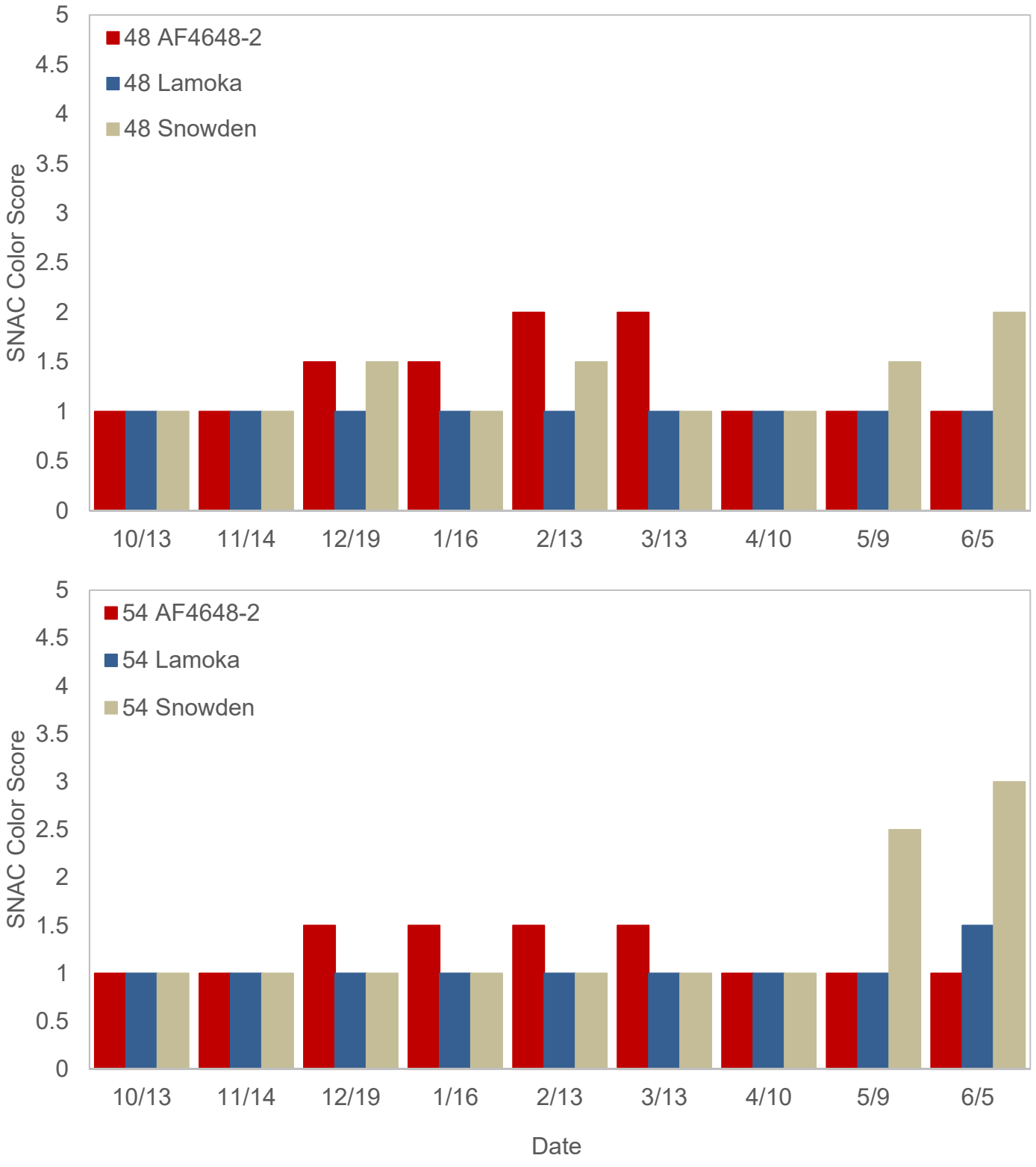


Figure 4. AF4648-2 SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



AF5040-8: With the exception of the 54°F treatment in May-June, AF5040-8 had similar glucose levels compared to Lamoka throughout storage (Figure 5). AF5040-8 had small peaks in sucrose in January and February; otherwise, it was also comparable to Lamoka through April (Figure 6). Percentage of chip defects was higher than both check varieties at both temperatures (Figure 7). AF5040-8 also took longer to clean up in storage with SNAC ratings ranging from 0.5-1.0 higher than either check variety (Figure 8). Chip quality for this variety appeared be similar at both 48° and 54°F through April, but late storage samples had better quality at 48°F.

Table 4. AF5040-8 monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

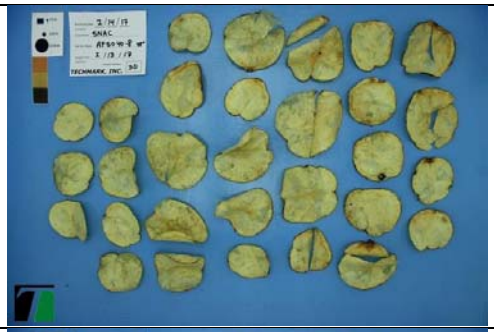
February		
March		
April		
May		No Image Available
June		

Figure 5. AF5040-8 glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

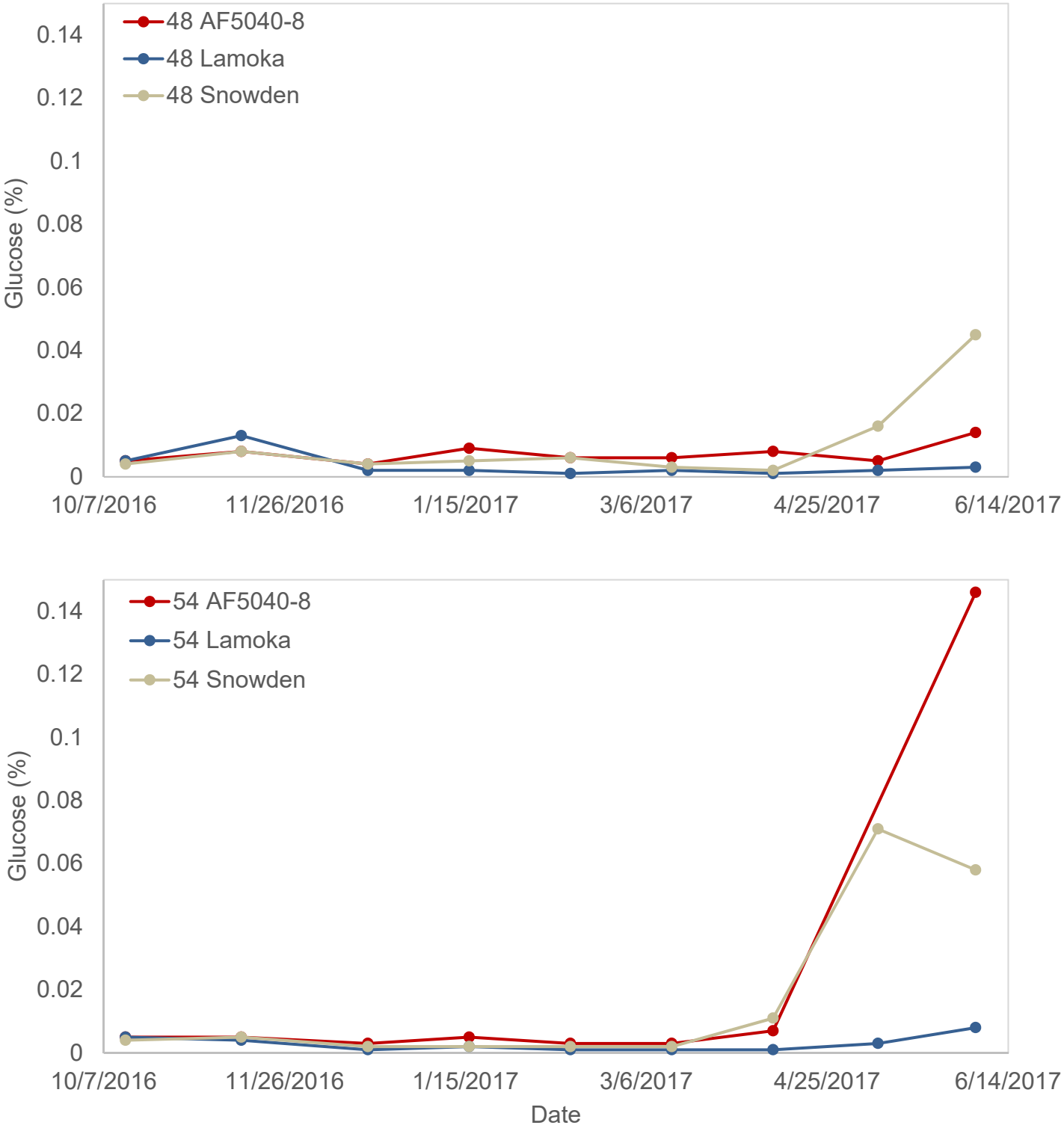


Figure 6. AF5040-8 sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

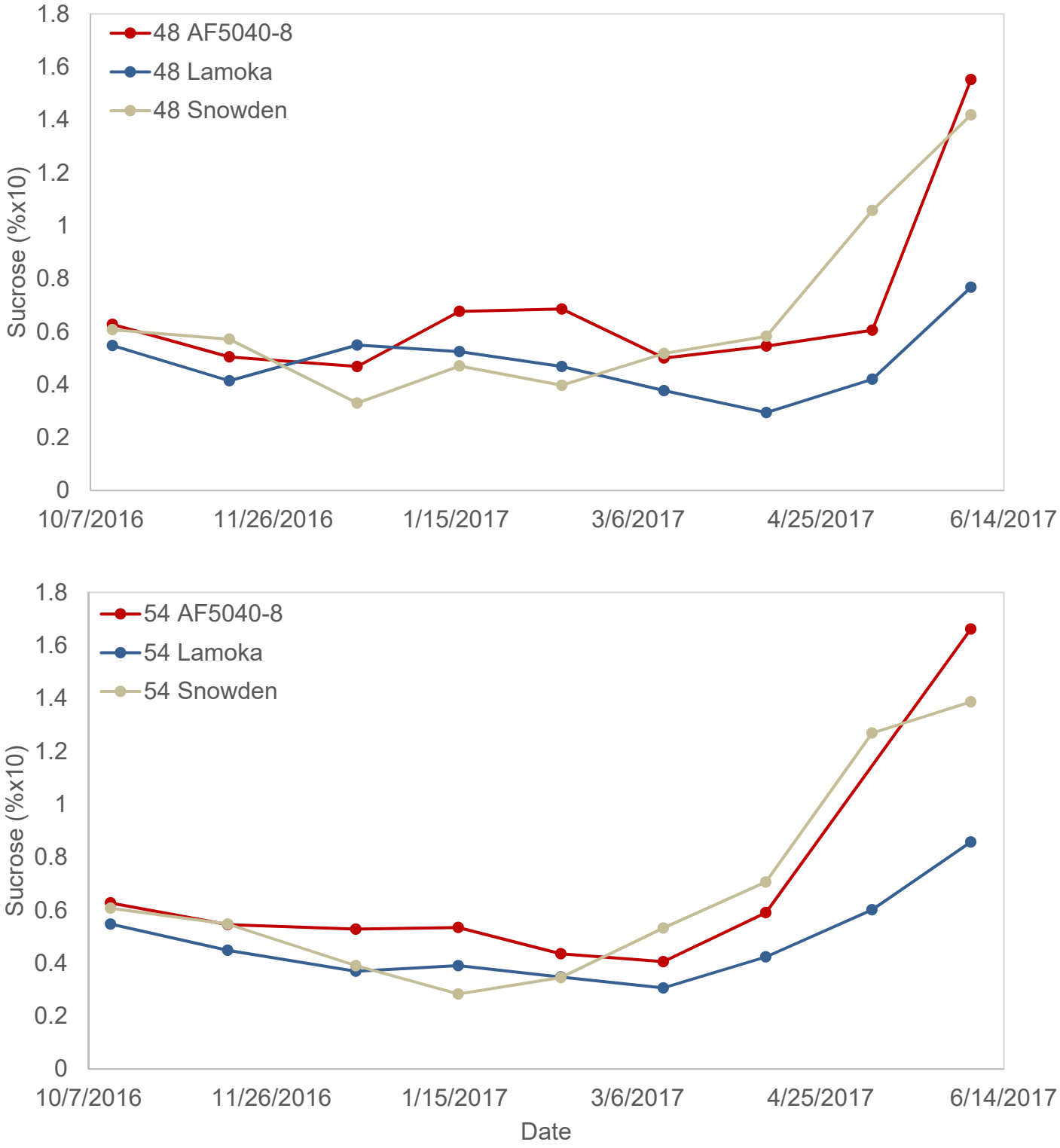


Figure 7. AF5040-8 percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

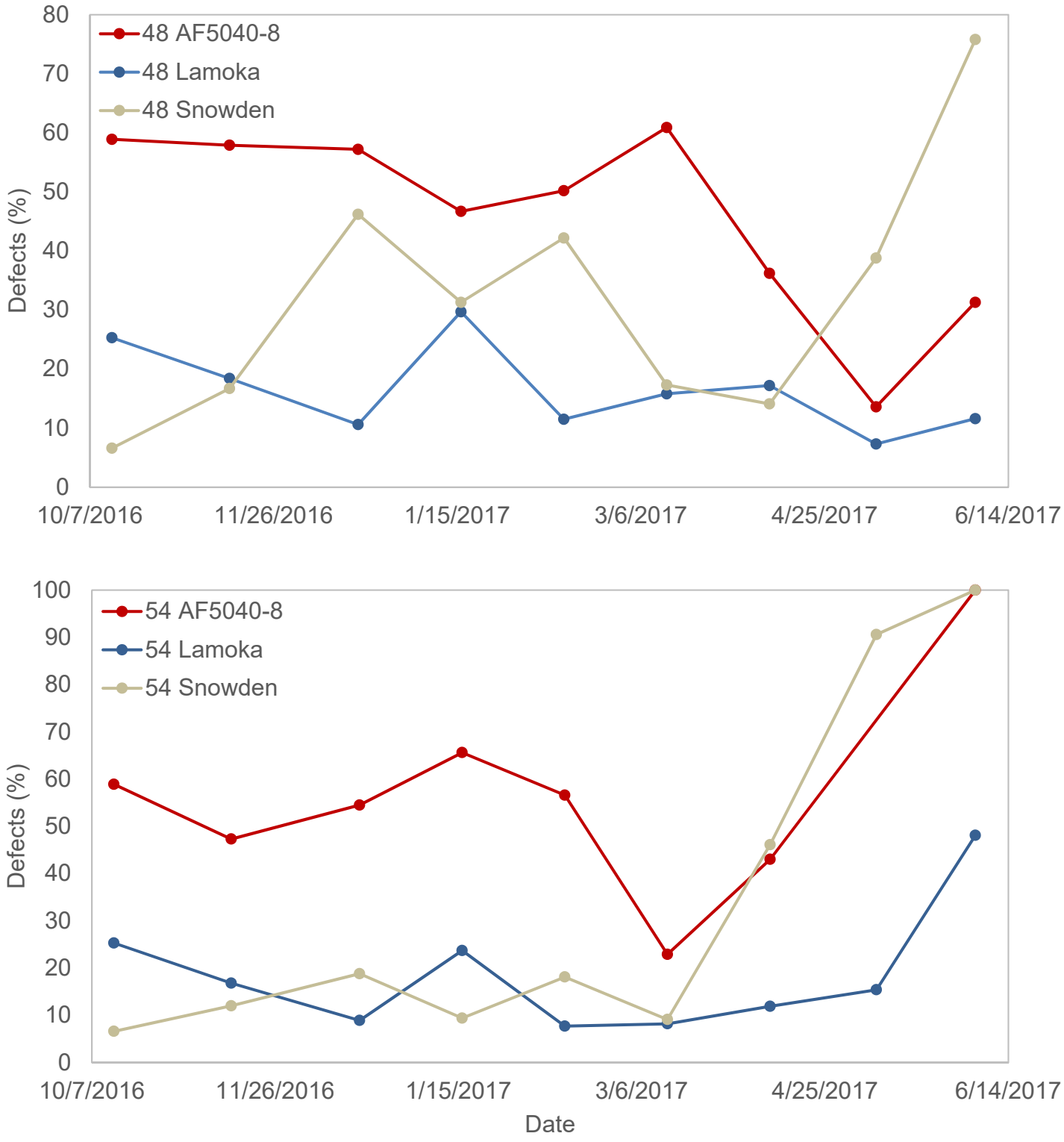
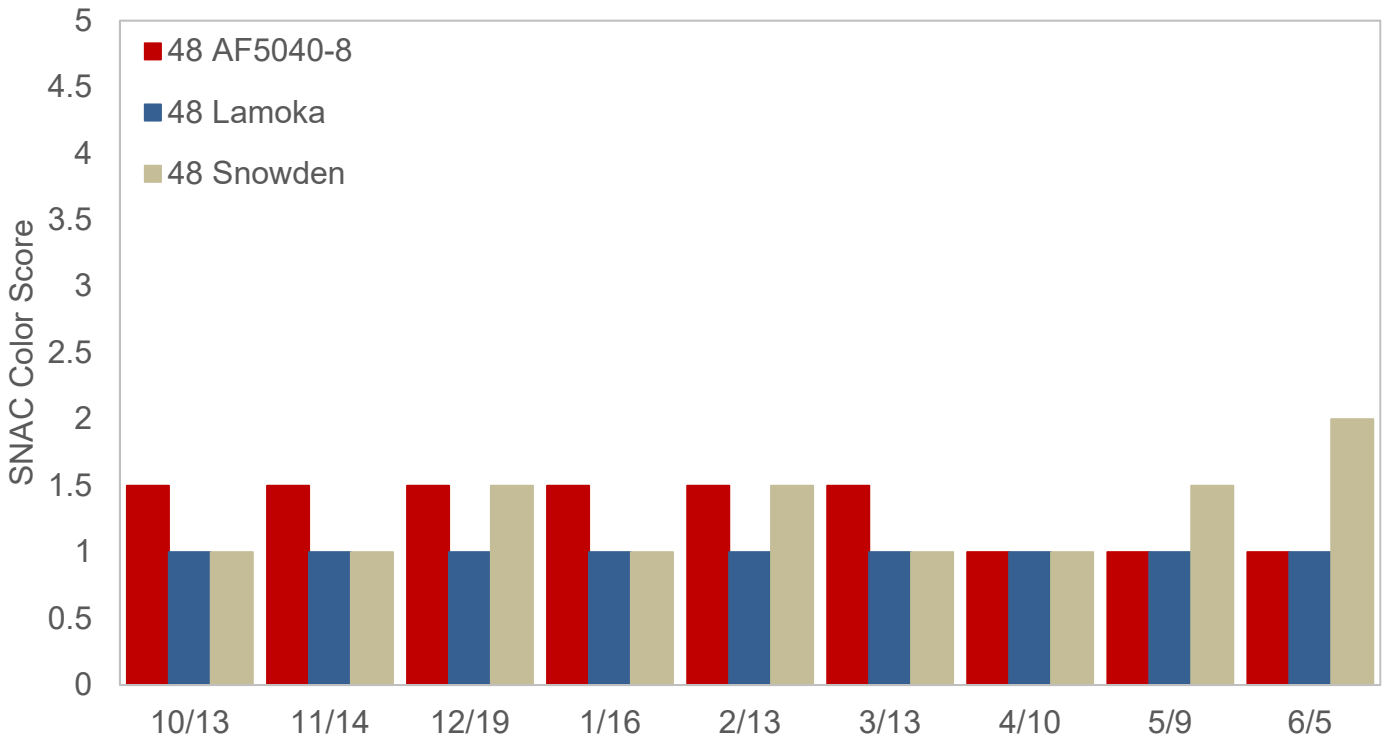
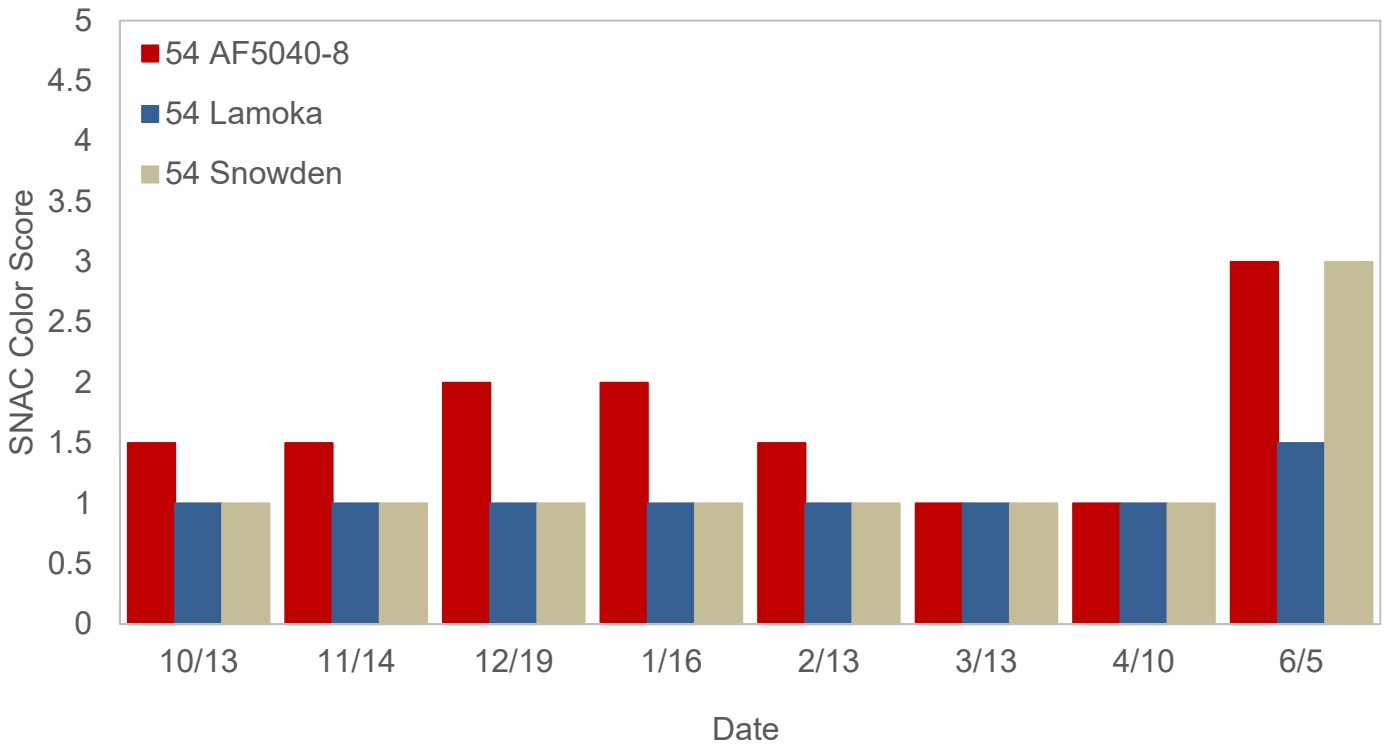


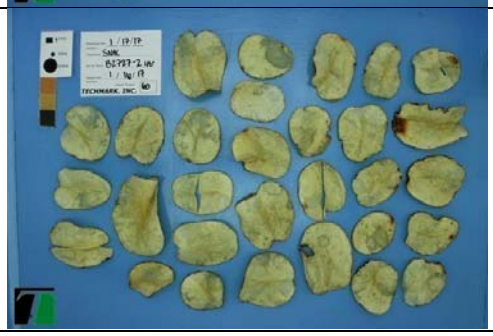
Figure 8. AF45040-8 SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.


48 AF5040-8
48 Lamoka
48 Snowden
SNAC Color Score
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
10/13
11/14
12/19
1/16
2/13
3/13
4/10
5/9
6/5


54 AF5040-8
54 Lamoka
54 Snowden
SNAC Color Score
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
10/13
11/14
12/19
1/16
2/13
3/13
4/10
6/5
Date

B2727-2: With the exception of the 54°F treatment in May-June, B2727-2 had similar glucose and sucrose levels compared to Lamoka throughout storage (Figures 9-10). Despite higher defects compared to the check varieties (Figure 11), B2727-2 maintained a 1-1.5 SNAC color score through May (Figure 12). Chip quality for this variety appeared to be similar at both 48° and 54°F through April, but late storage samples had better quality at 48°F (Table 5 and Figures 11-12).

Table 5. B2727-2 monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

February		
March		
April		
May		
June		

Figure 9. B2727-2 glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

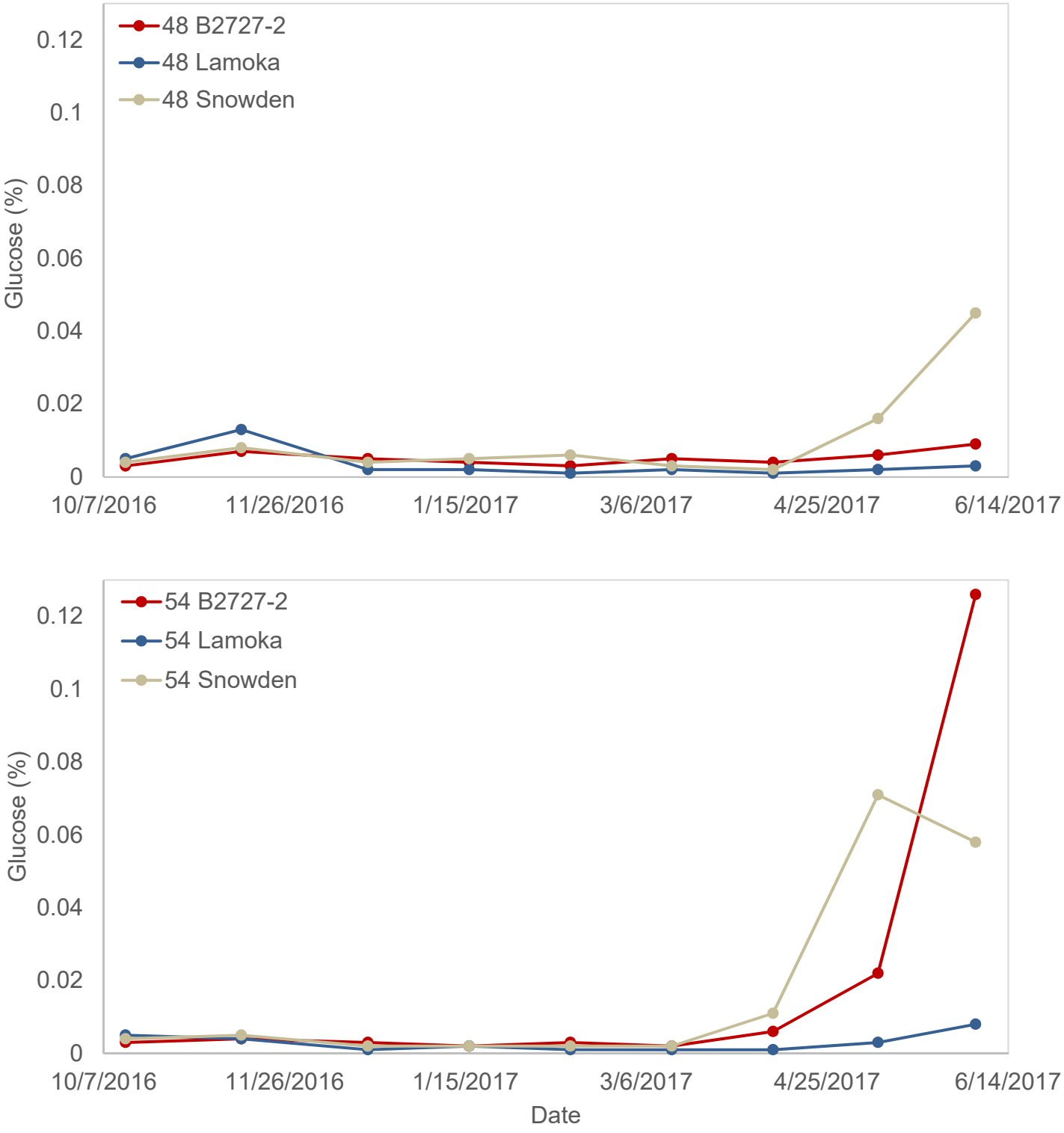


Figure 10. B2727-2 sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

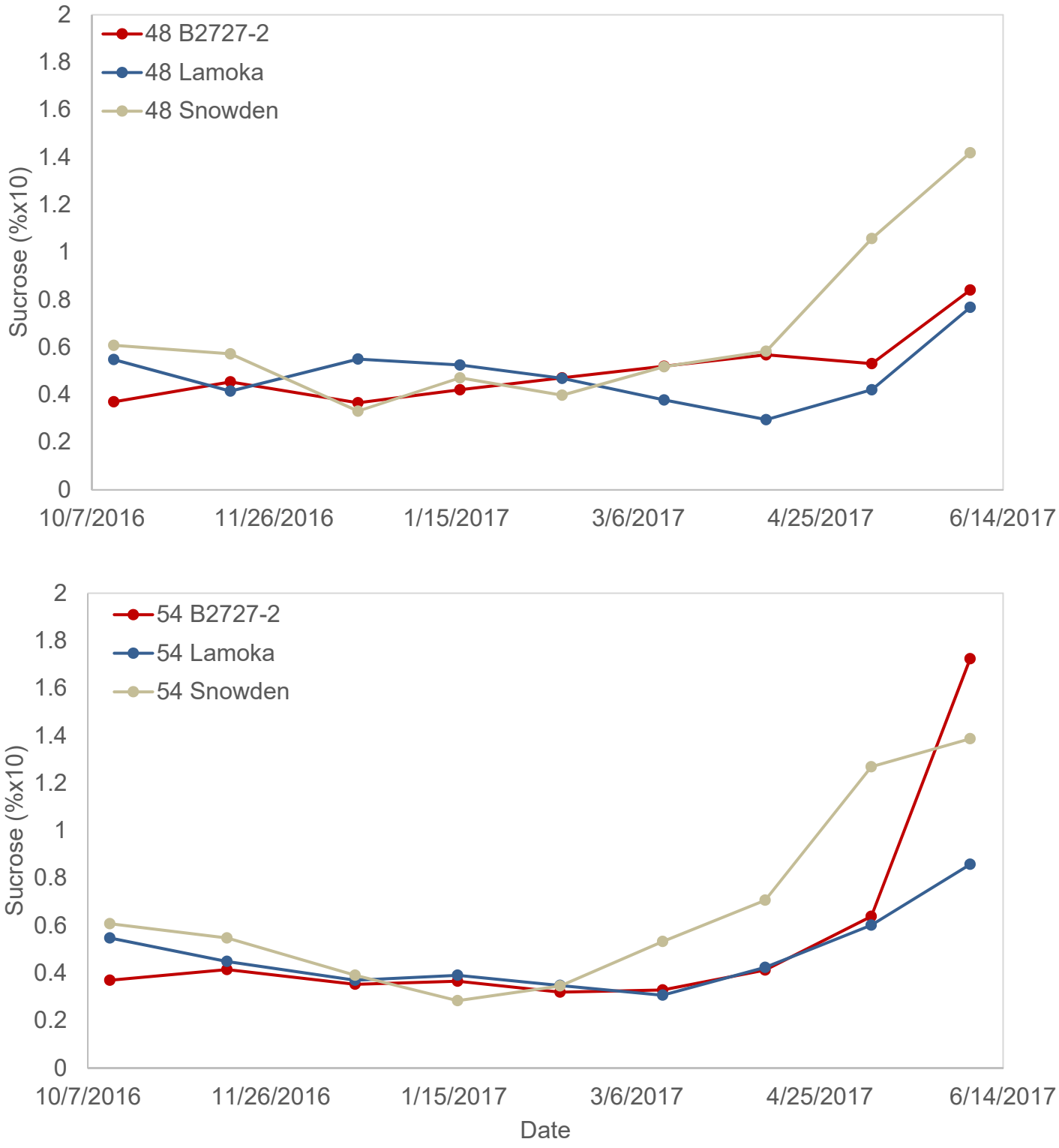


Figure 11. B2727-2 percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

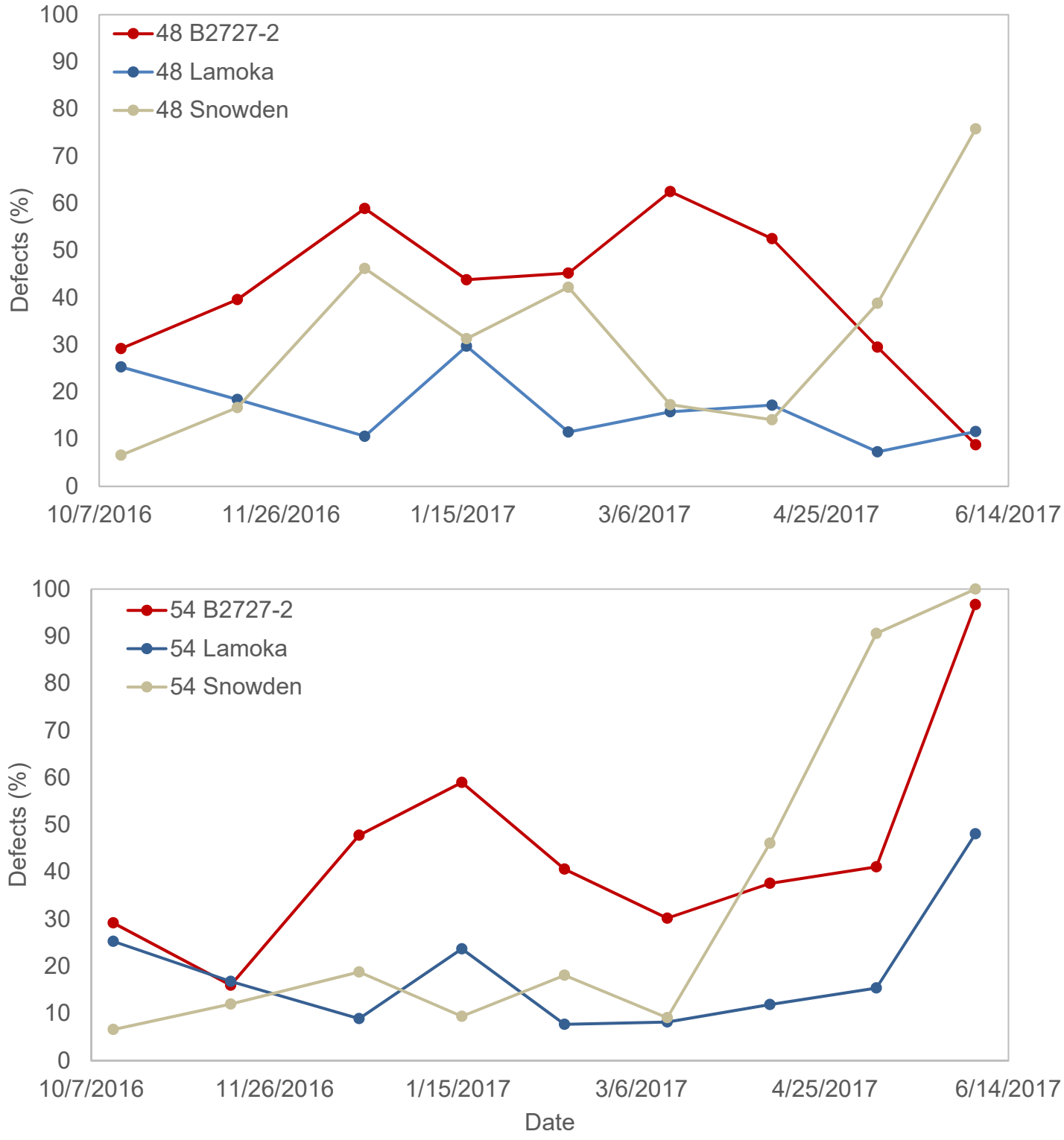
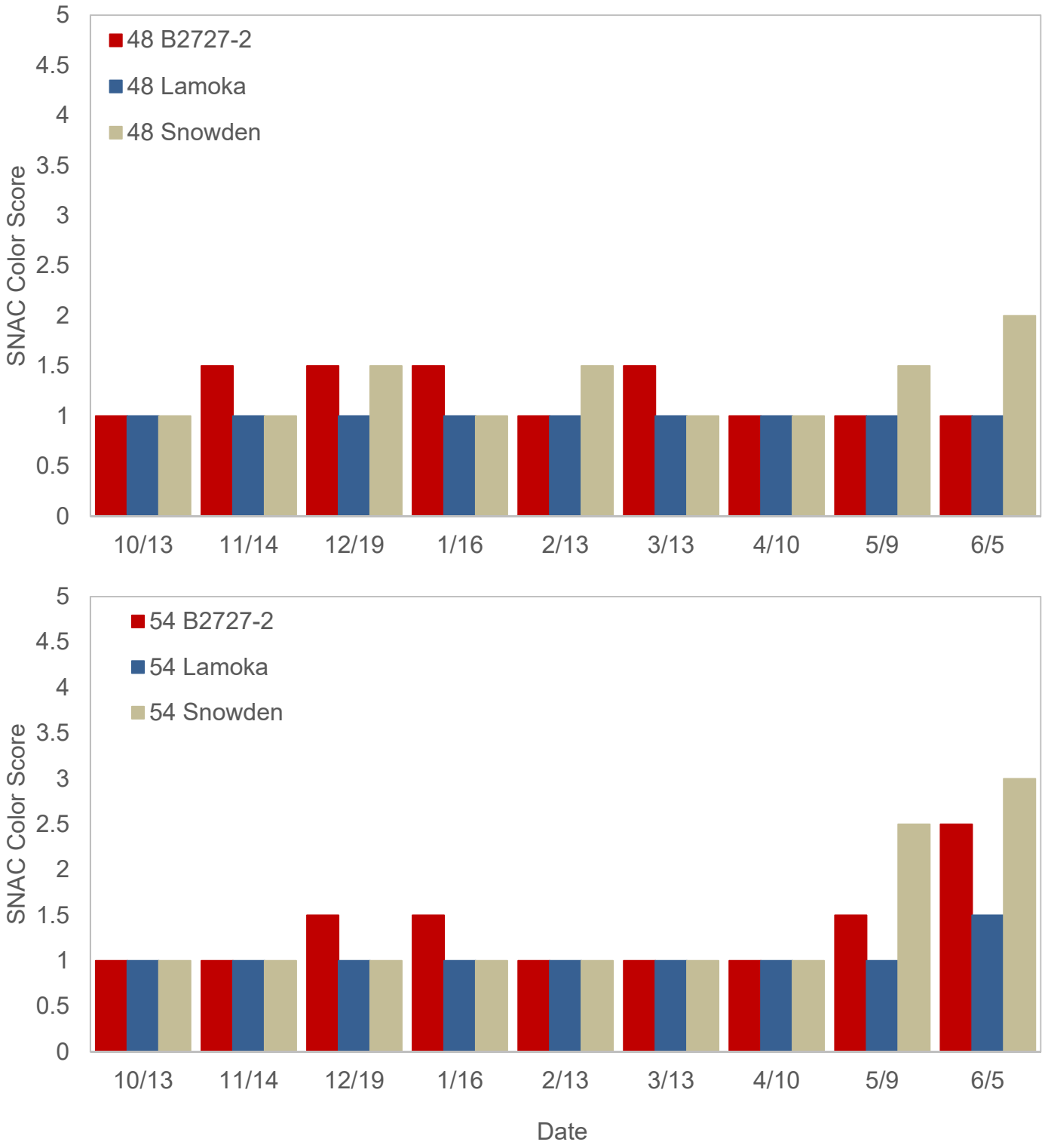
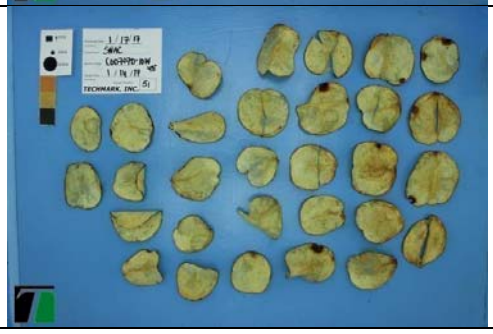


Figure 12. B2727-2 SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



CO07070-10W: Compared to Lamoka and Snowden, glucose levels were slightly higher in CO07070-10W until April when sugar concentrations spiked in Snowden (Figure 13). Sucrose concentrations were most similar to Lamoka throughout storage through April (Figure 14). Defects fluctuated throughout storage and usually trended higher than either check variety (Figure 15). SNAC color scores were 0.5-1.0 ratings higher in the 48°F treatment, but were usually similar to Lamoka at 54°F (Figure 16). CO07070-10W appears to have better chip quality at 54°F than 48°F (Figures 15-16).

Table 6. CO07070-10W monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

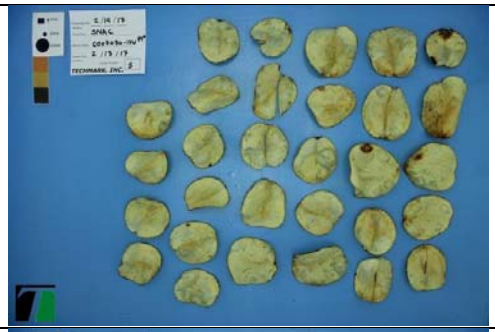
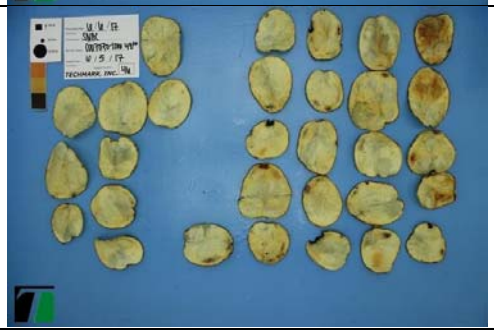
February		
March		
April		
May		
June		

Figure 13. CO07070-10W glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

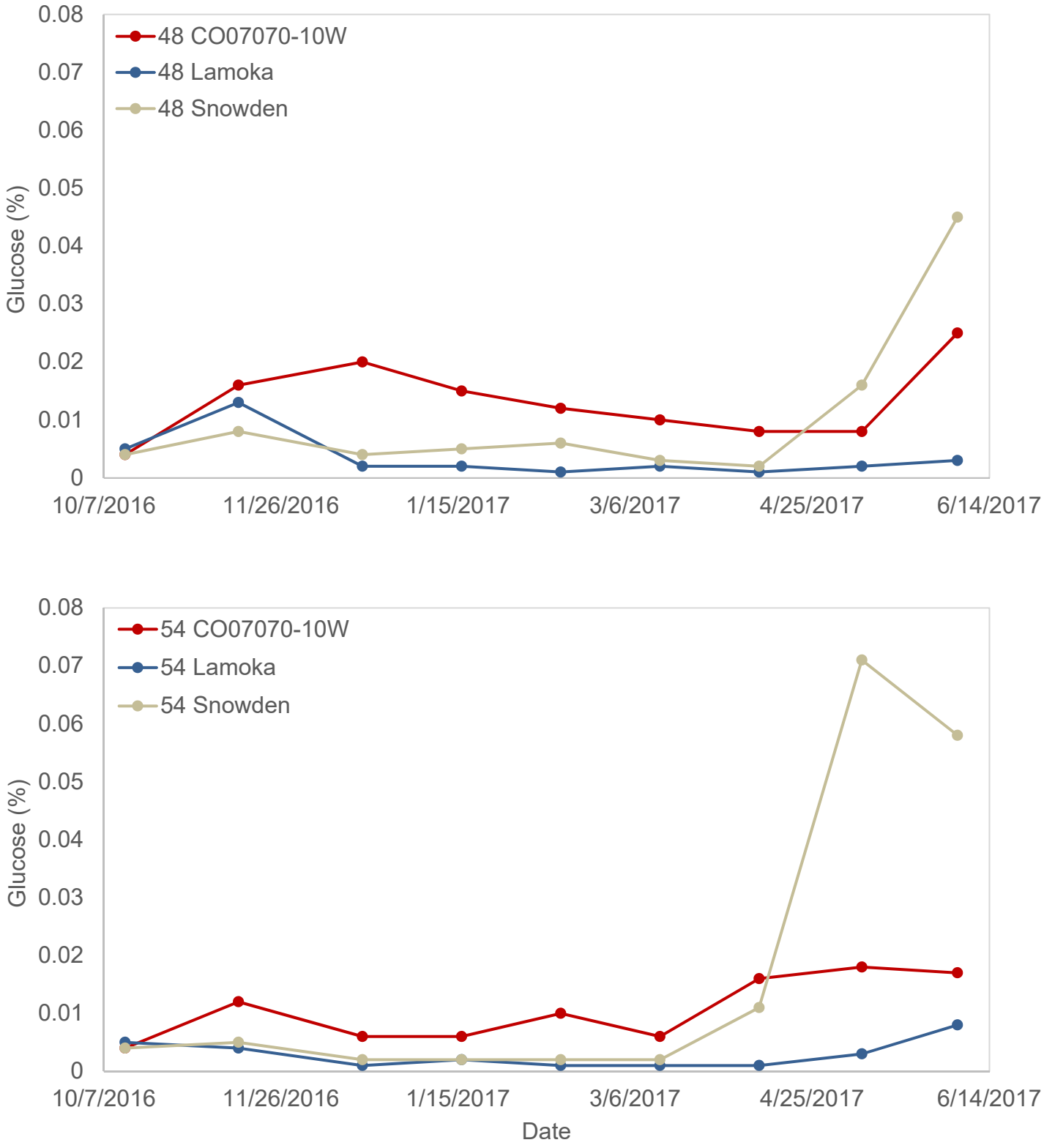


Figure 14. CO07070-10W sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

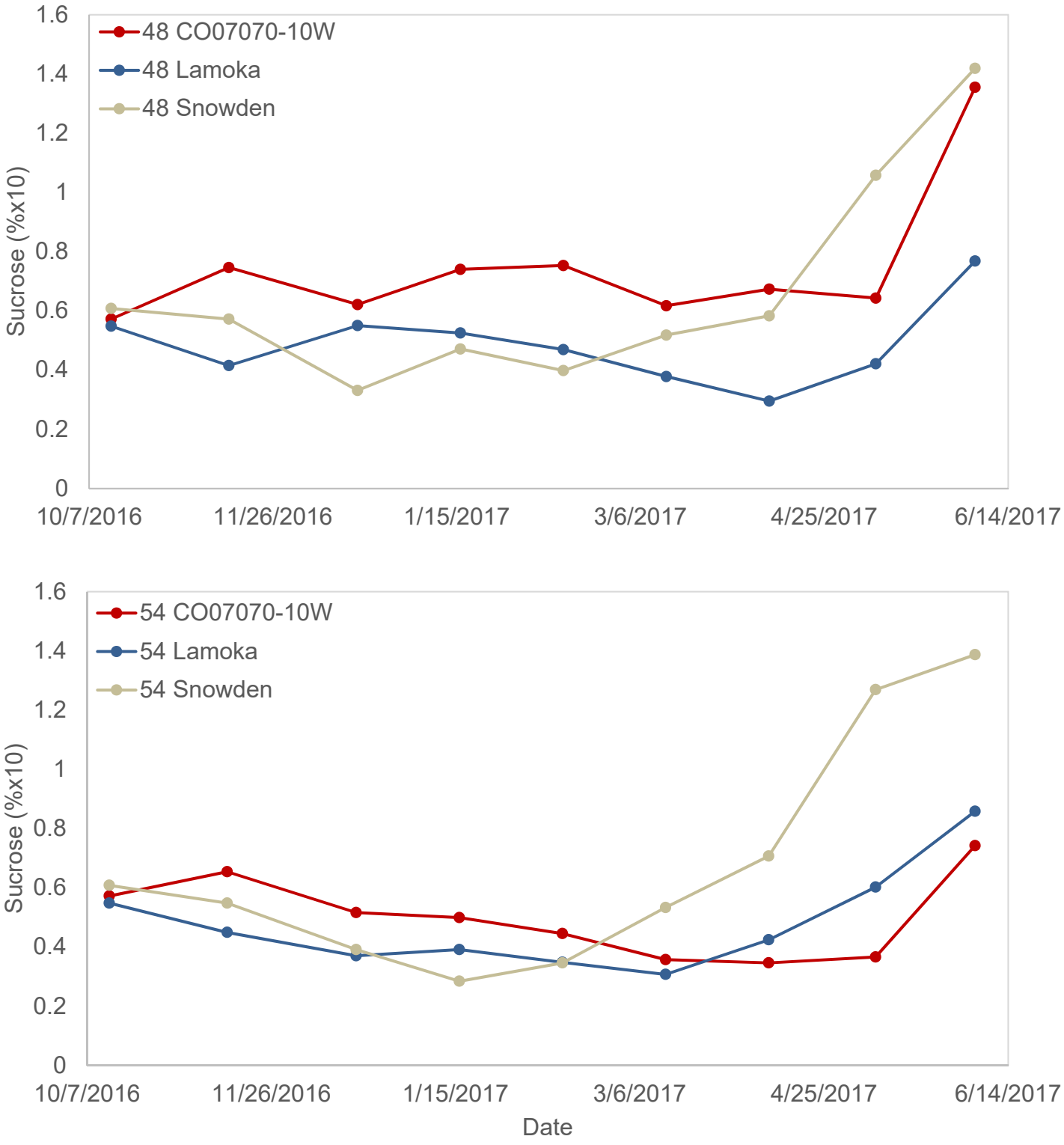


Figure 15. CO07070-10W percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

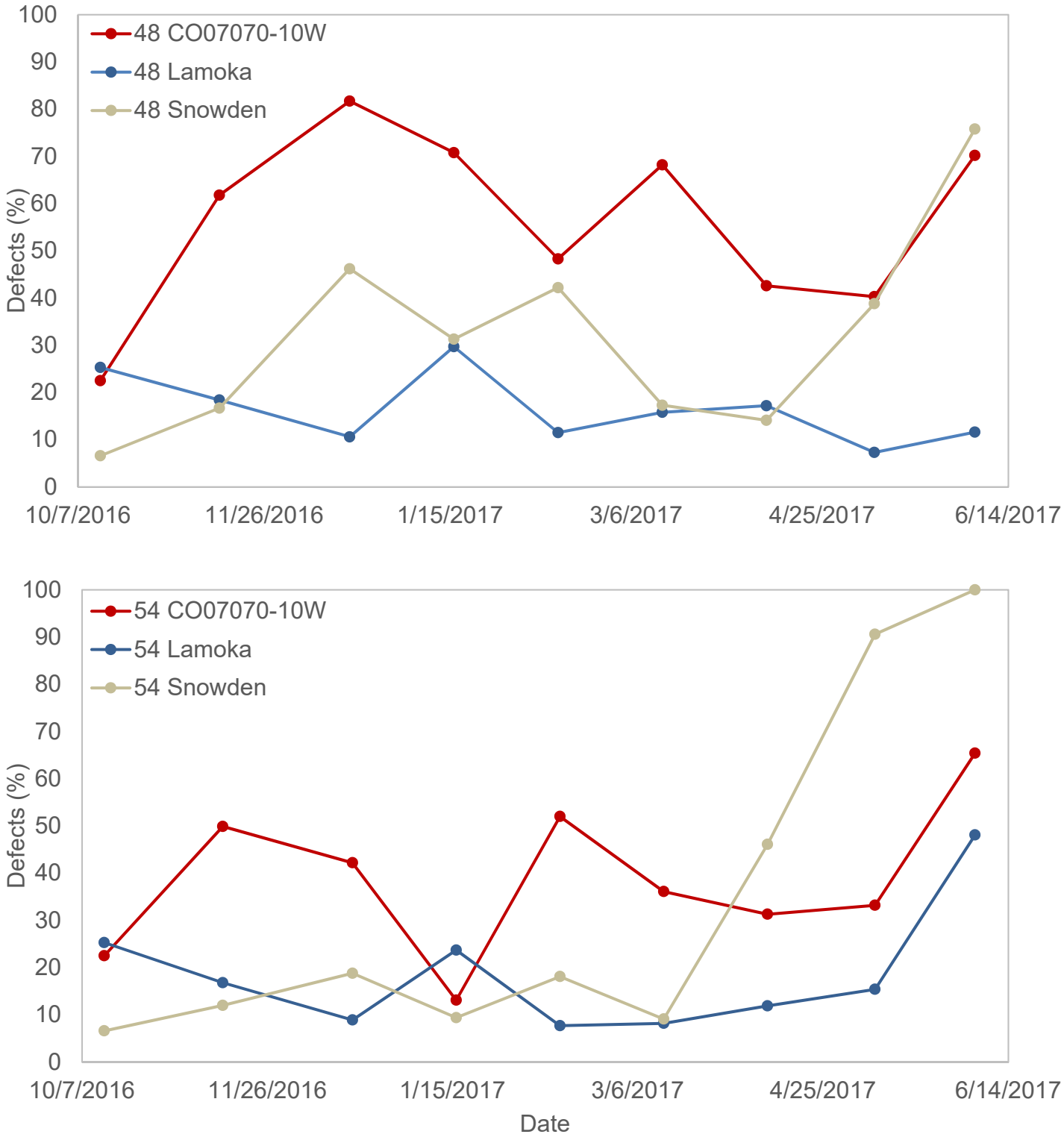
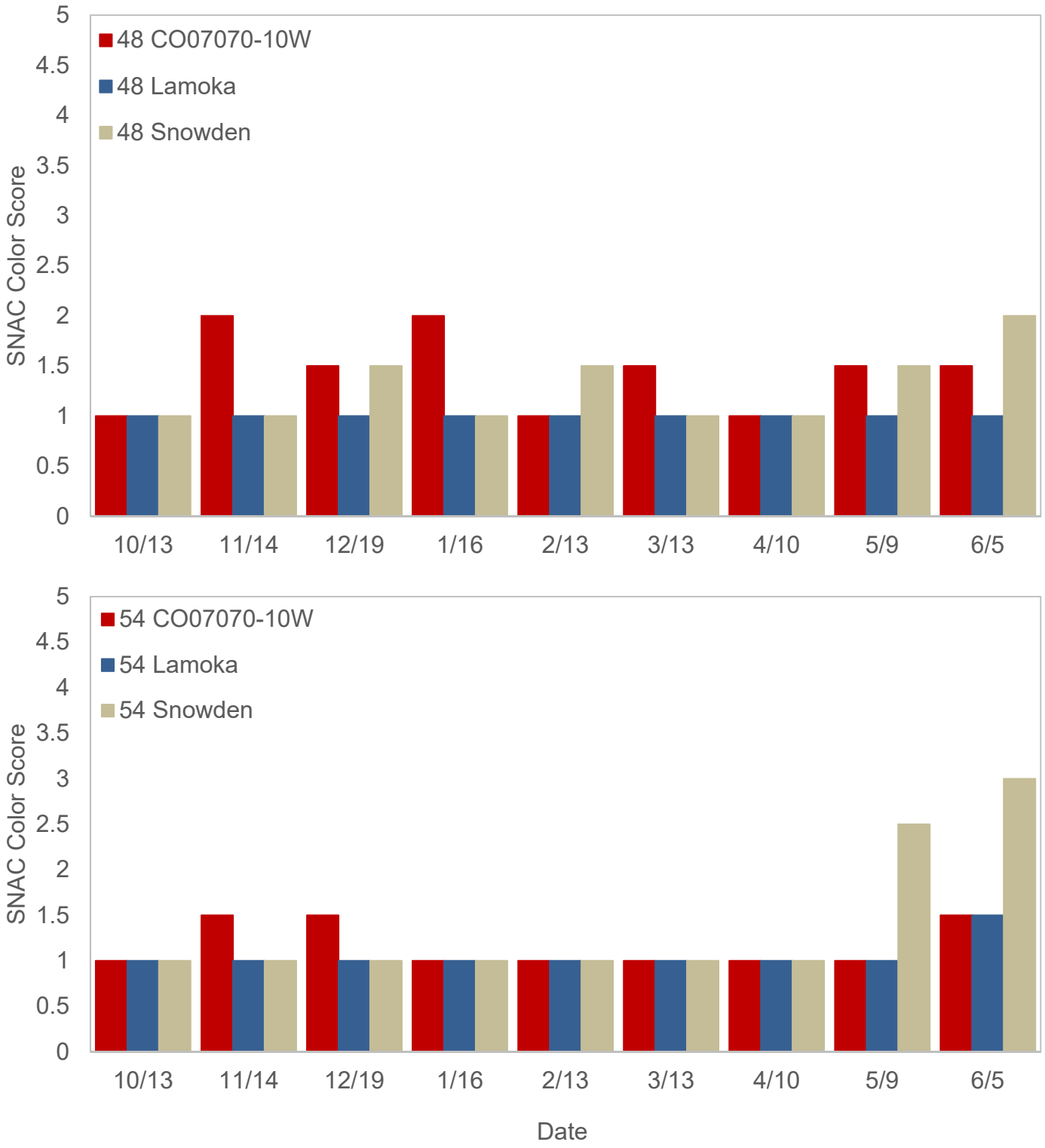


Figure 16. CO07070-10W SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



Lamoka: This check variety can store through June with excellent chip quality. See individual varieties for comparisons on sugar, defects, and SNAC color scores.

Table 7. Lamoka monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

February		
March		
April		
May		
June		

MSR127-2: This variety had similar glucose concentrations to Snowden throughout storage with lower glucose levels from April to June (Figure 17). Compared to both check varieties, MSR127-2 had lower sucrose concentrations through February, with similar sucrose levels to Lamoka from April to June (Figure 18). Both defects and SNAC color scores were similar to Snowden (Figures 19 and 20). From October to March, MSR127-2 had better chip quality at 54°F (Figures 19 and 20).

Table 8. MSR127-2 monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

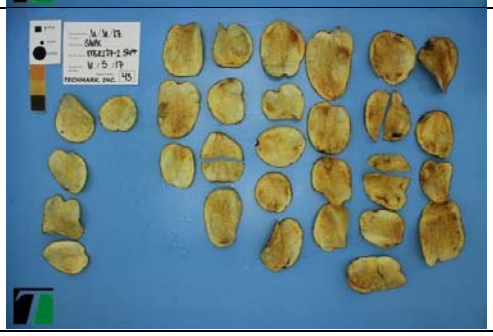
February		
March		
April		No Image Available
May		
June		

Figure 17. MSR127-2 glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

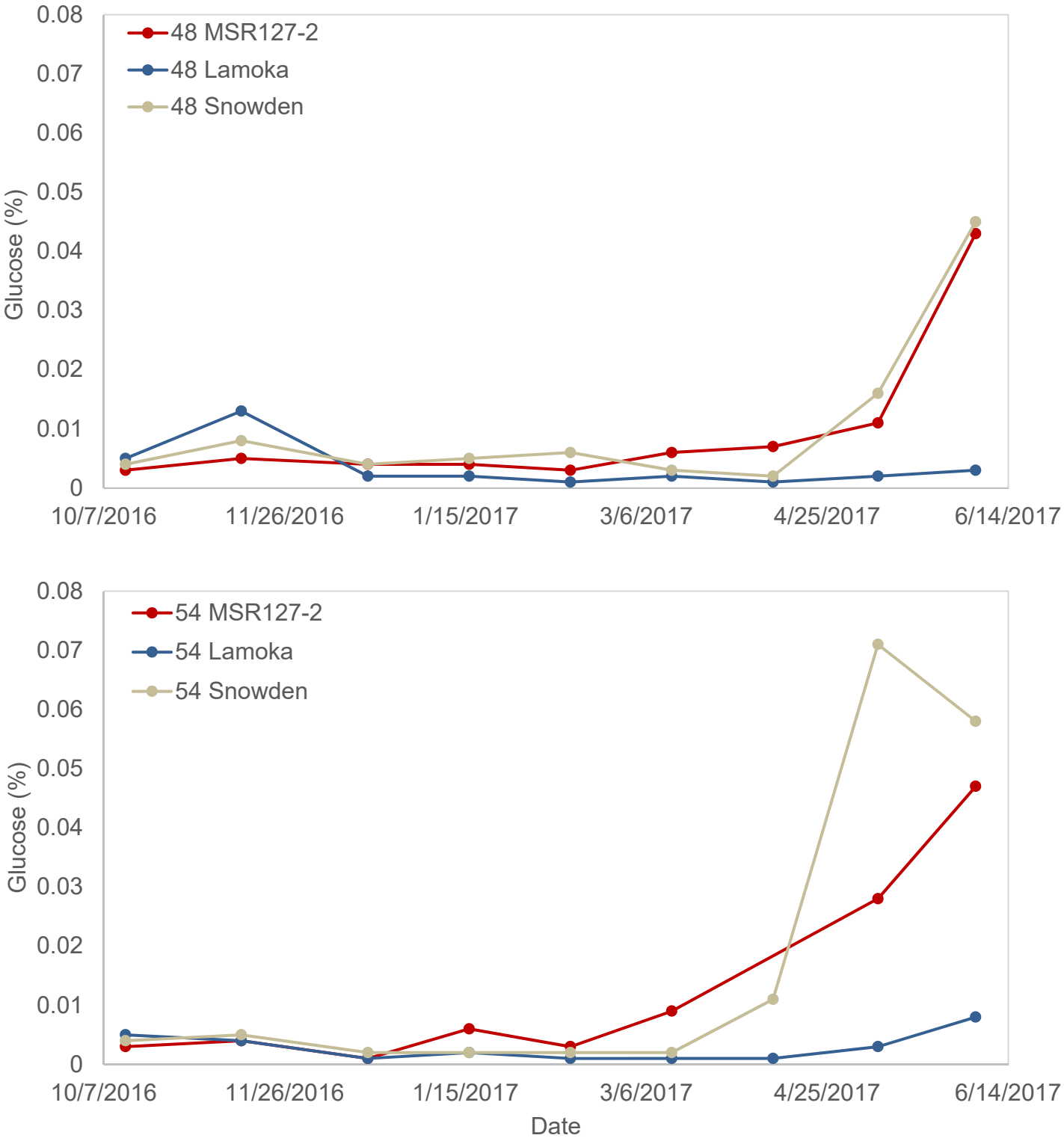


Figure 18. MSR127-2 sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

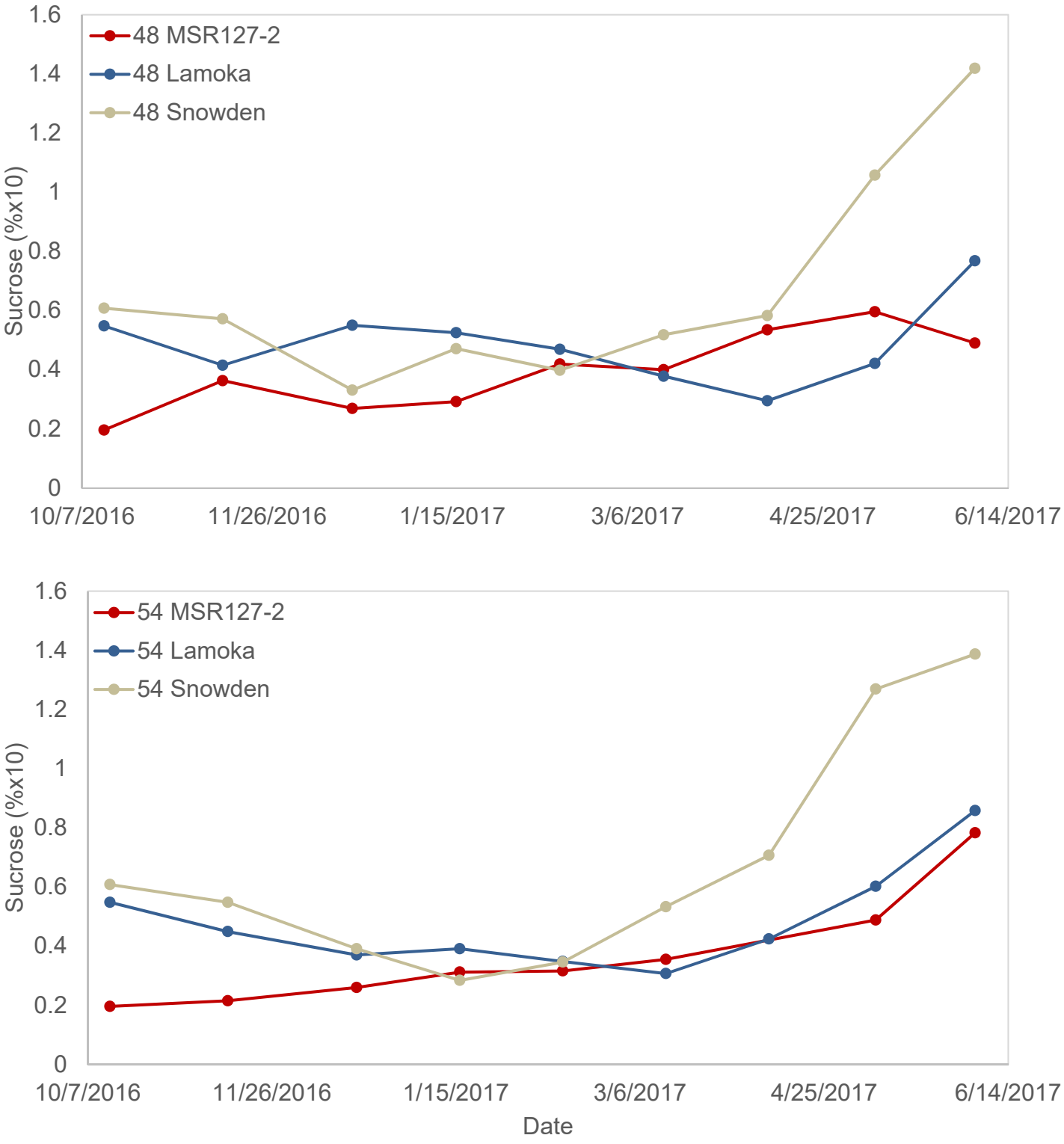


Figure 19. MSR127-2 percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

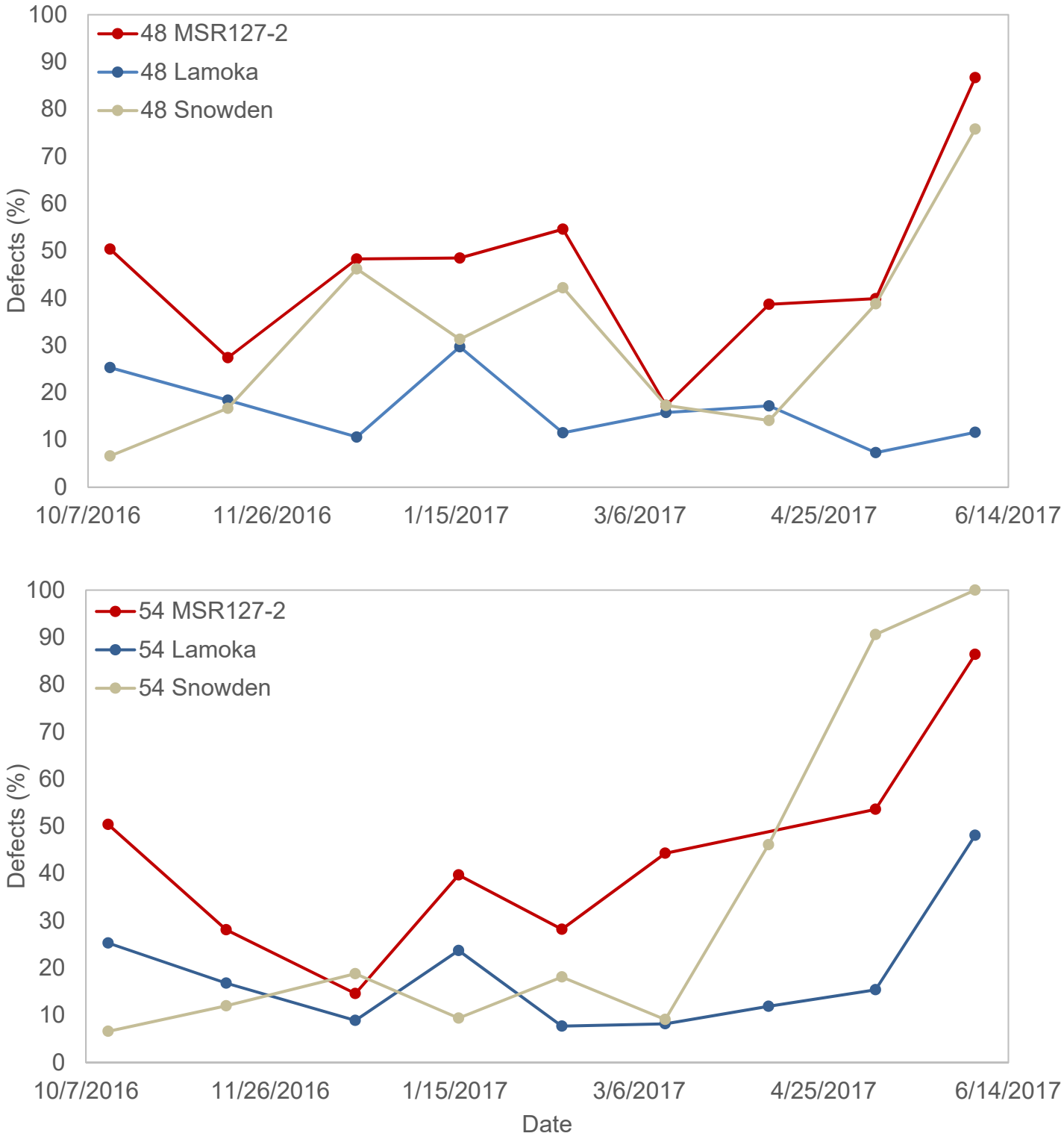
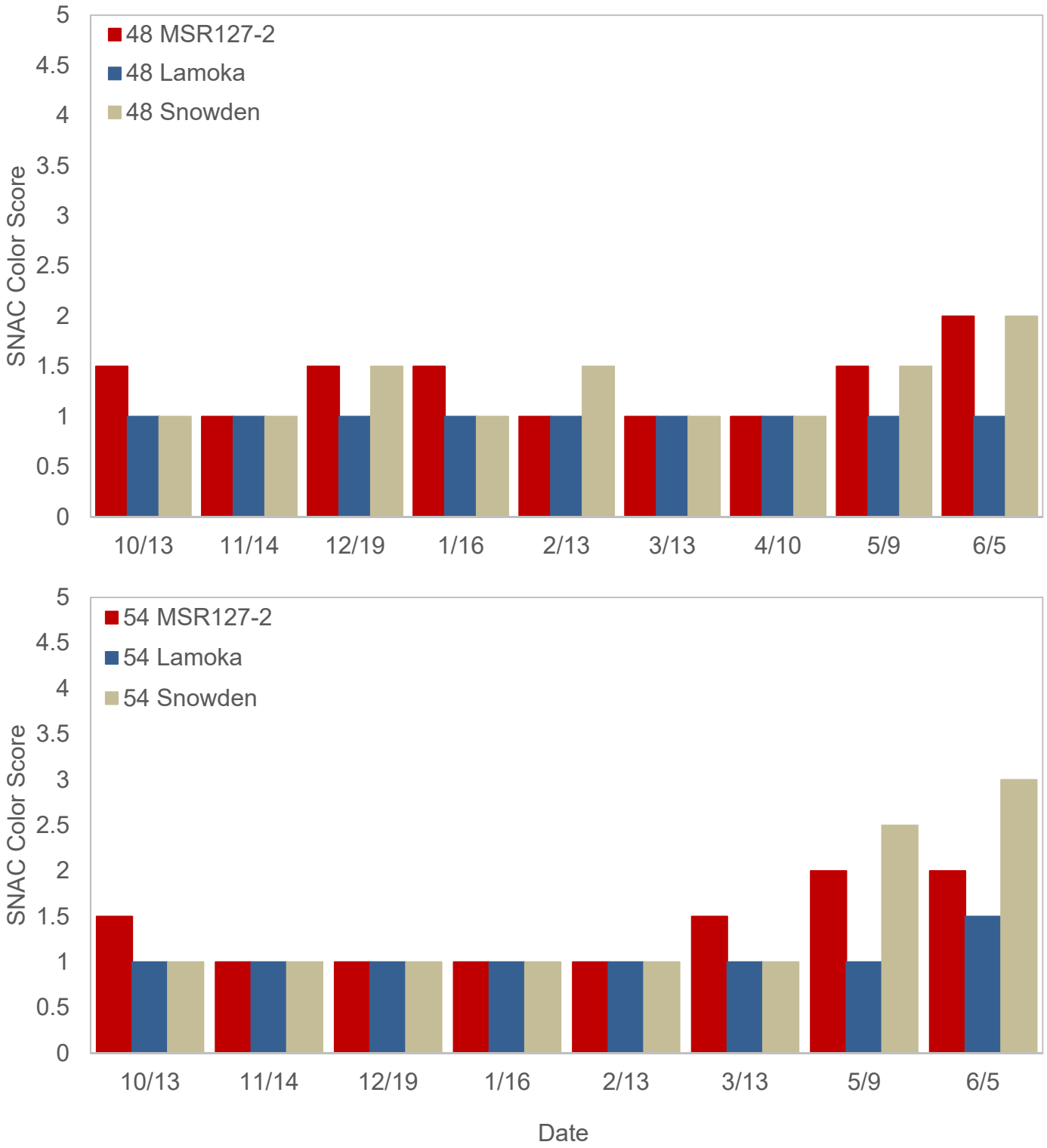
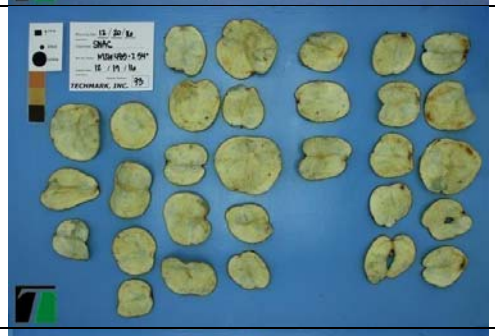
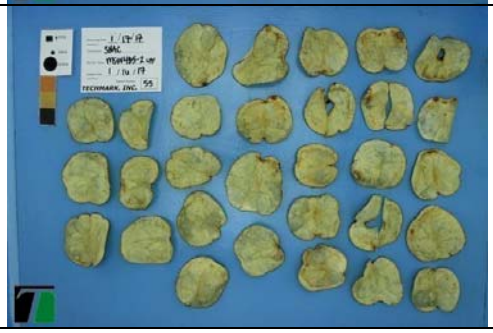


Figure 20. MSR127-2 SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



MSW485-2: Compared to Snowden, MSW485-2 had similar glucose and sucrose concentrations through April (Figures 21-22). At 48°F, MSW485-2 had lower sugar concentrations than Snowden in May and June, but at 54°F, concentrations were higher in MSW485-2 (Figures 21-22). At 48°F, MSW485-2 had similar chip defects and SNAC color scores compared to Snowden (Figures 23-24). At 54°F, MSW485-2 had higher chip defects and SNAC color scores (Table 9 and Figures 23-24). Overall, MSW485-2 appeared to perform better at 48°F than 54°F, especially towards the end of storage (Table 9 and Figures 21-24).

Table 9. MW485-2 monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

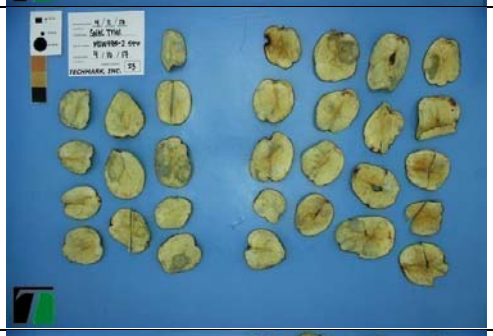
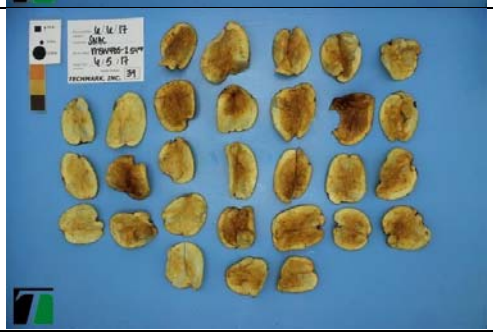
February		
March		
April		
May		
June		

Figure 21. MW485-2 glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

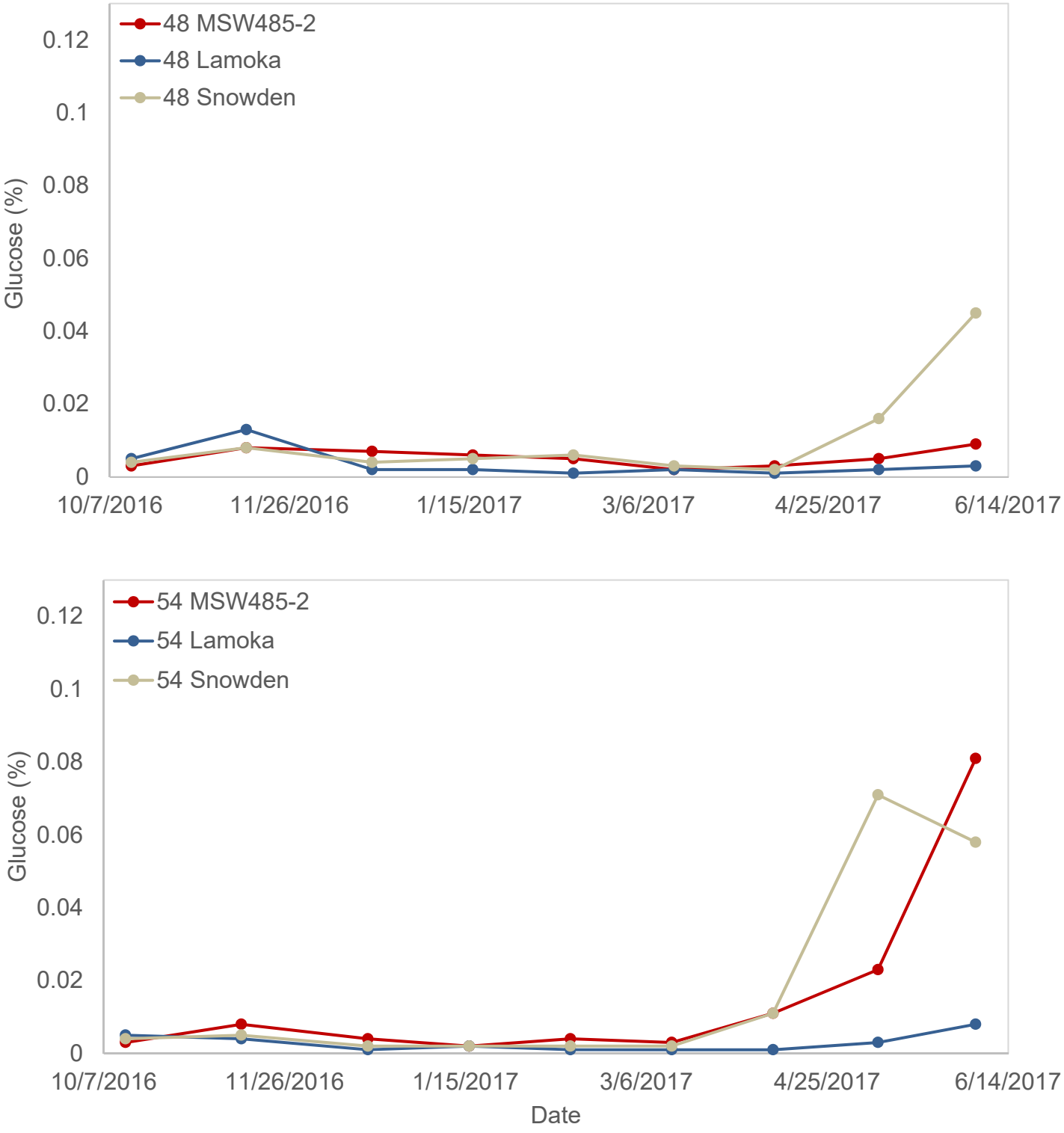


Figure 22. MW485-2 sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

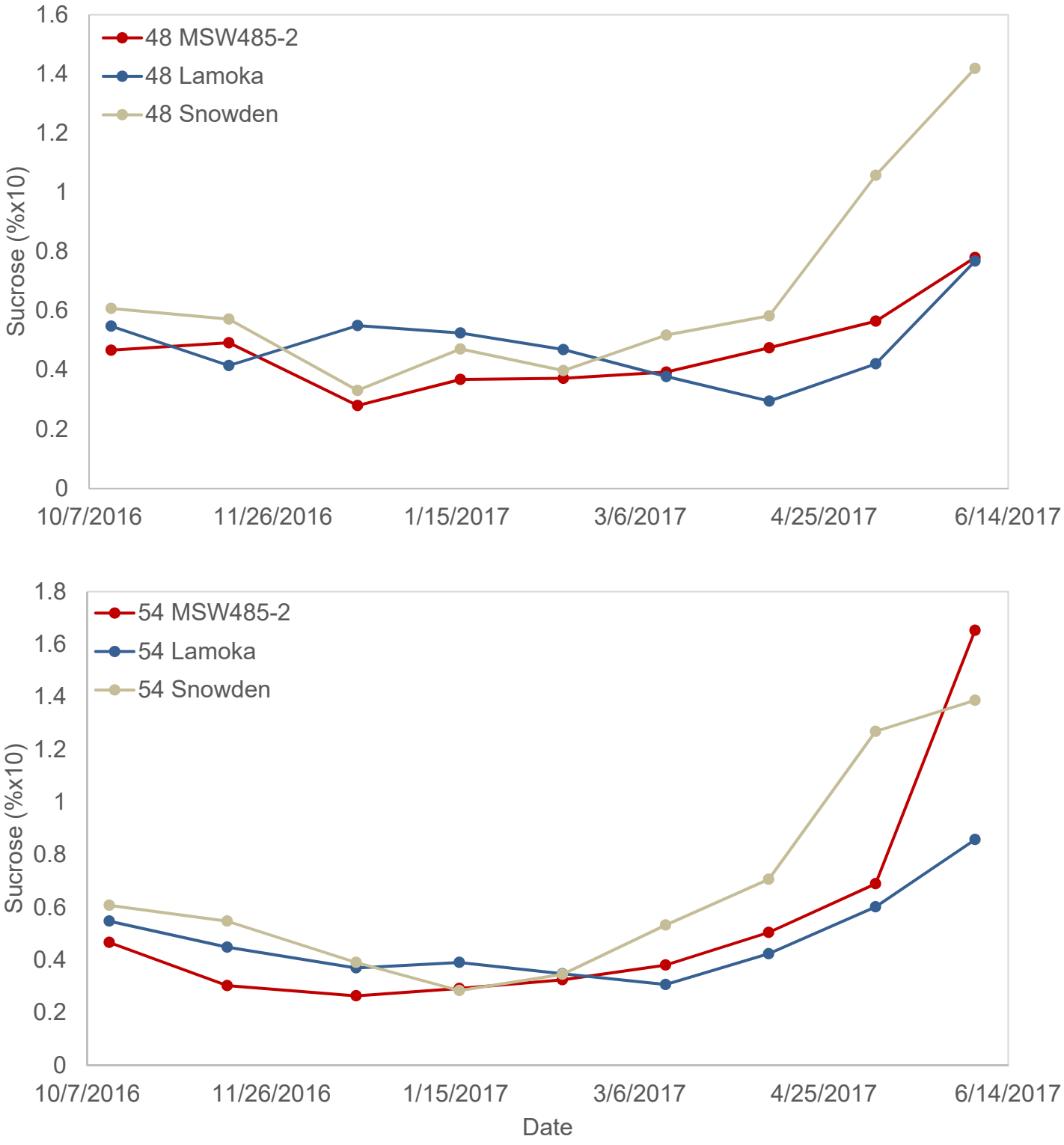
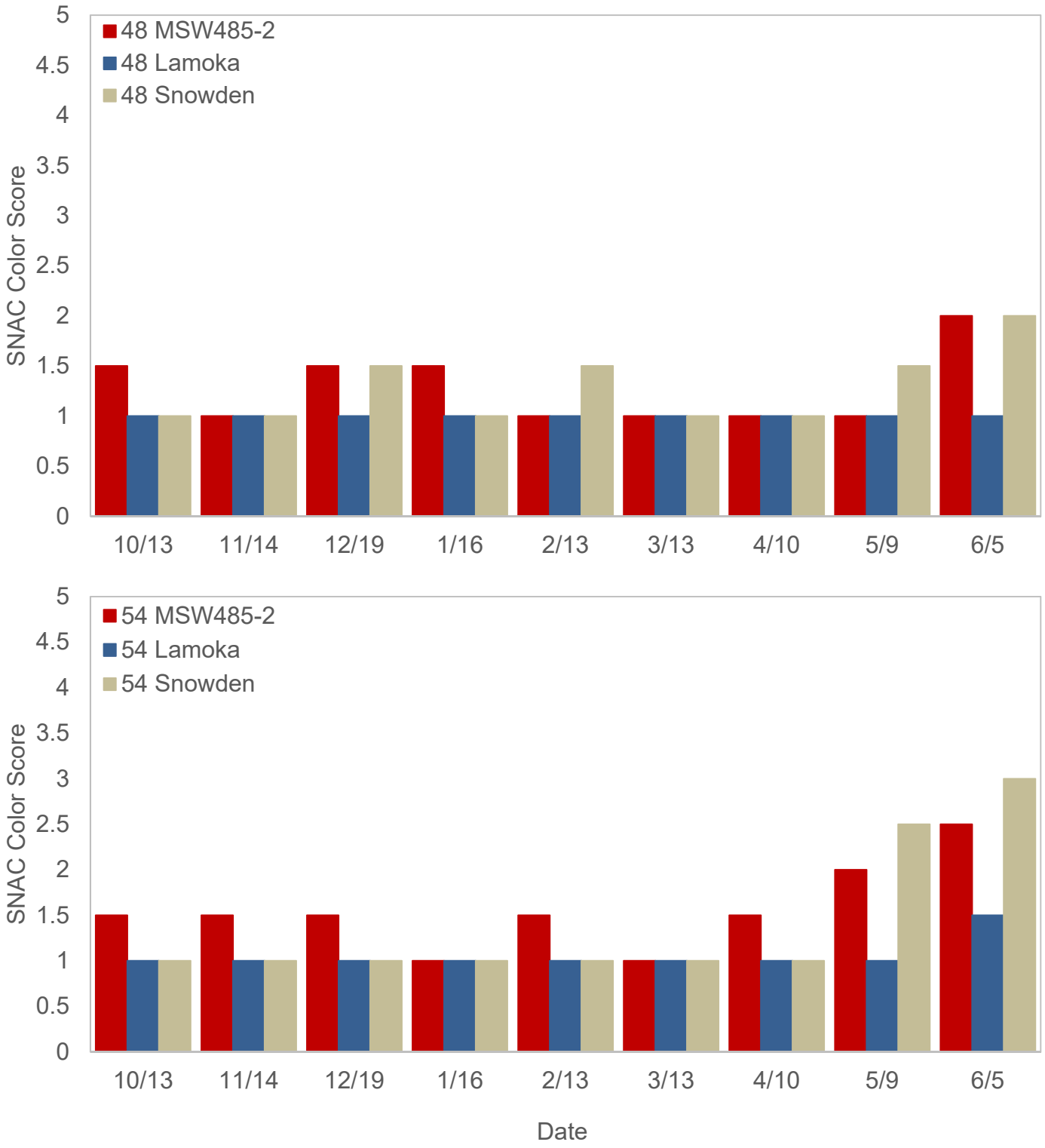


Figure 23. MW485-2 percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

Figure 24. MW485-2 SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



NCO349-3: This variety is comparable to Lamoka for both glucose and sucrose concentrations (Figures 25-26). NCO349-3 had higher defects and SNAC color scores compared to either check variety (Figures 27-28). Temperature treatments did not appear to affect NCO349-3 (Table 10 and Figures 25-28).

Table 10. NCO349-3 monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

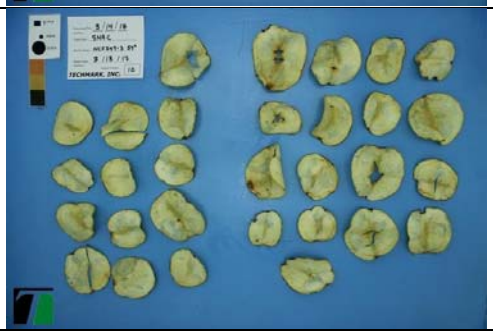
February		
March		
April		No image available
May		
June		

Figure 25. NCO349-3 glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

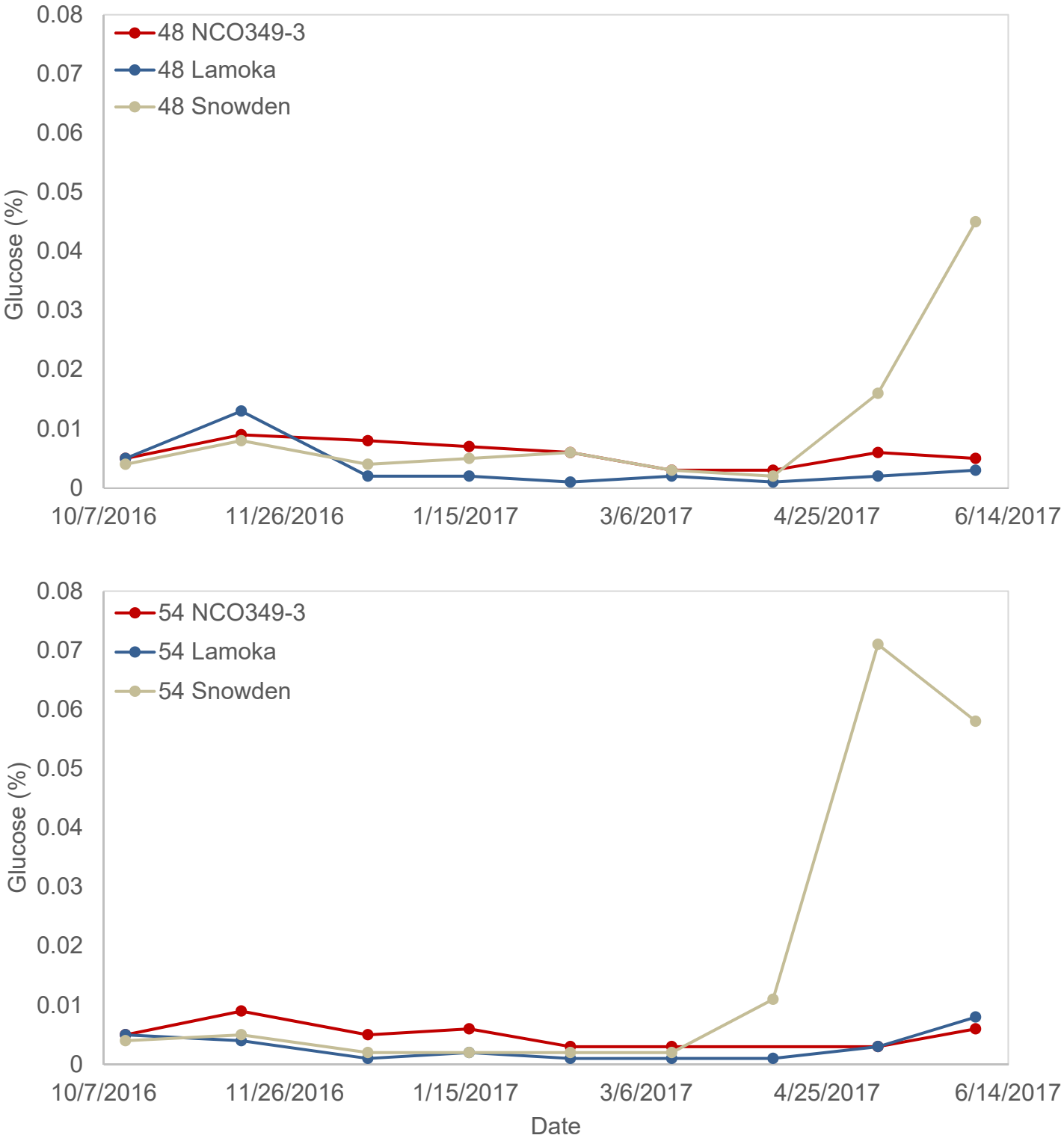


Figure 26. NCO349-3 sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

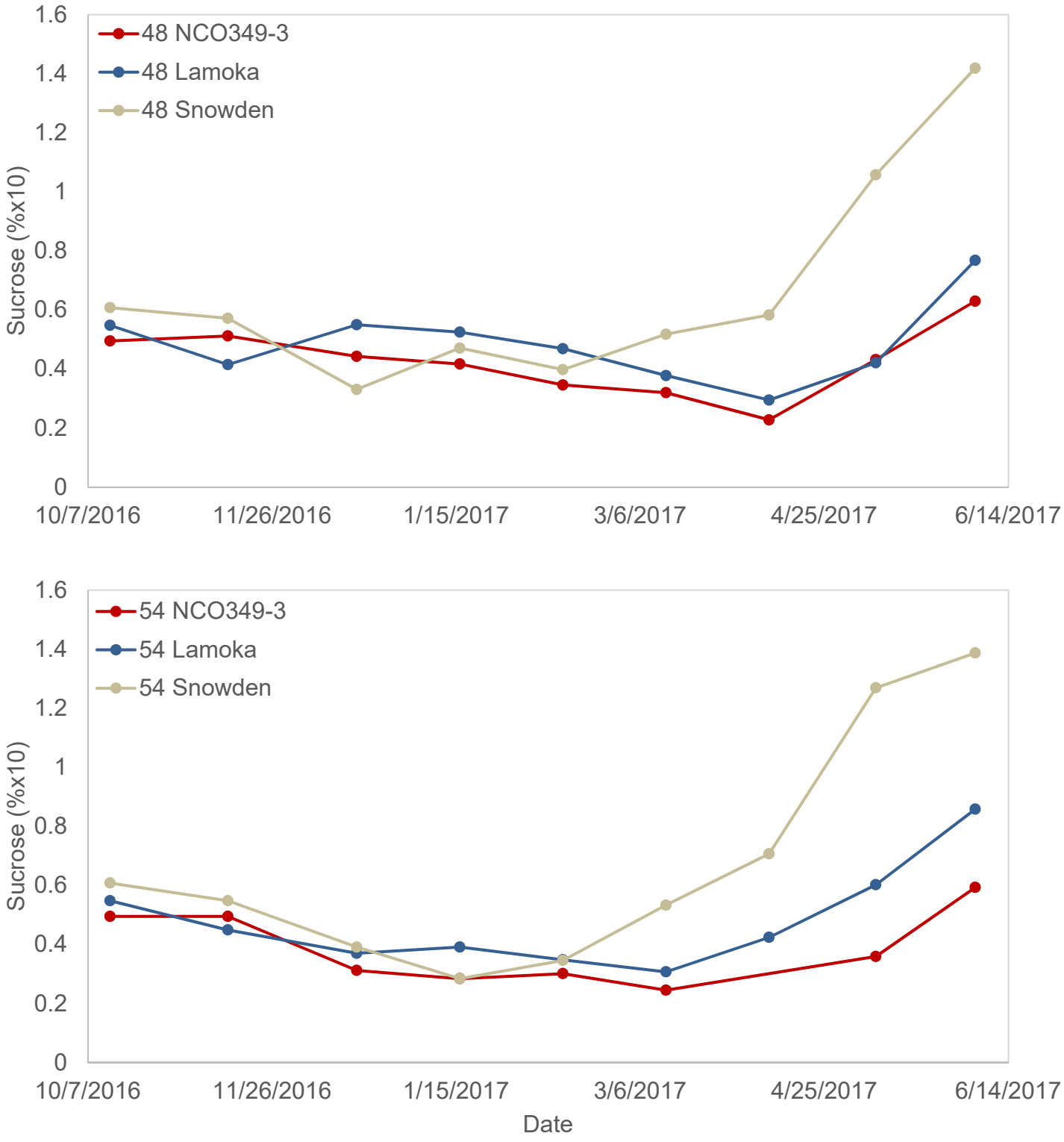


Figure 27. NCO349-3 percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

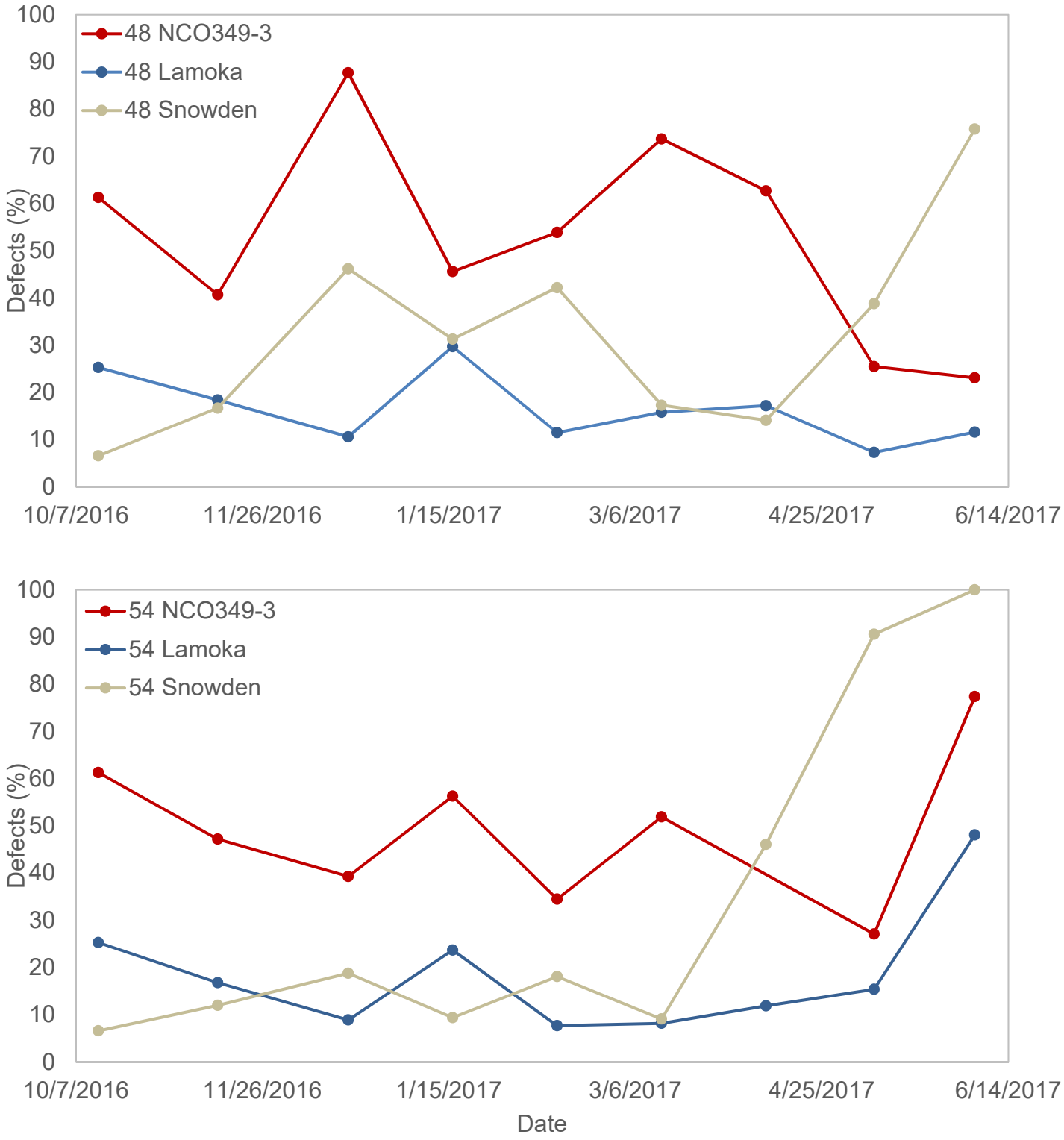
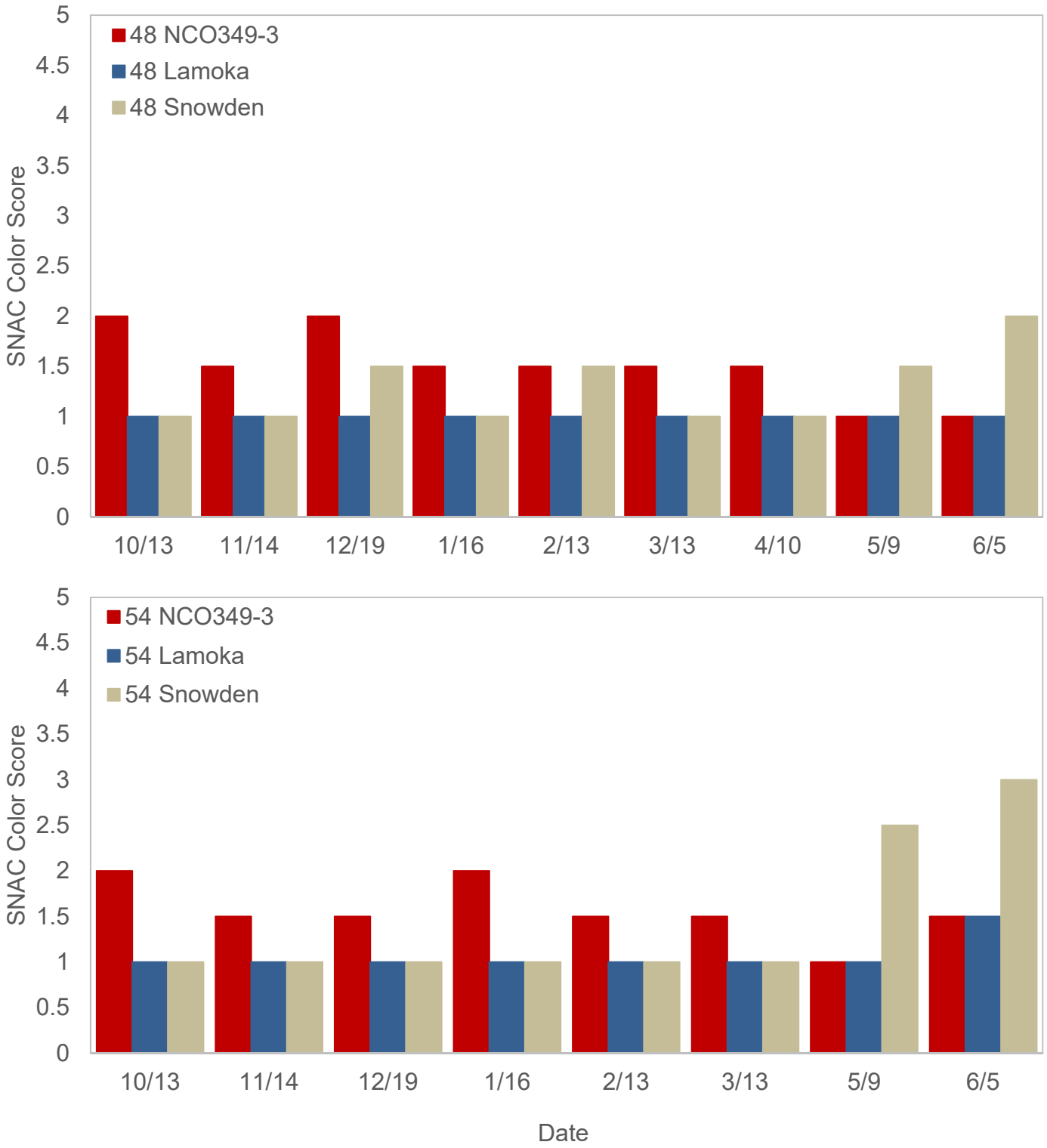


Figure 28. NCO349-3 SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



NDA081453CAB-2C: Except for mid to late storage at 54°F, NDA081453CAB-2C had similar glucose and sucrose concentrations compared to Snowden (Figure 29-30). Defects were initially lower in the 54°F treatment compared to 48°F, but by the middle of storage, defects quickly increased at 54°F (Figure 31). SNAC color scores followed a similar trend mating Lamoka and Snowden with 1.0 color scores from October to February at 54°F before trending higher than the check varieties (Figure 32). At 48°F, NDA081453CAB-2C had 1.5-2.0 color scores throughout storage (Figure 32). NDA081453CAB-2C appeared to store better at 54°F than 48°F until March. We do not recommend this variety for long storage periods.

Table 11. NDA081453CAB-2C monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

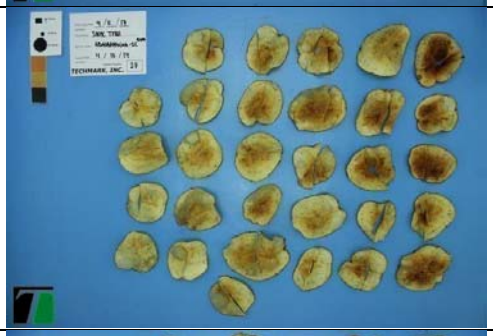
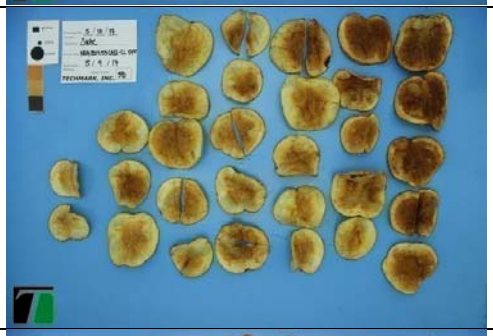
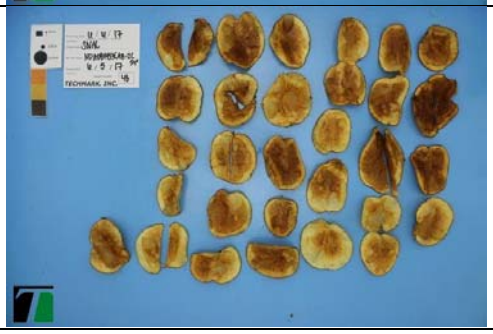
February		
March		
April		
May		
June		

Figure 29. NDA081453CAB-2C glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

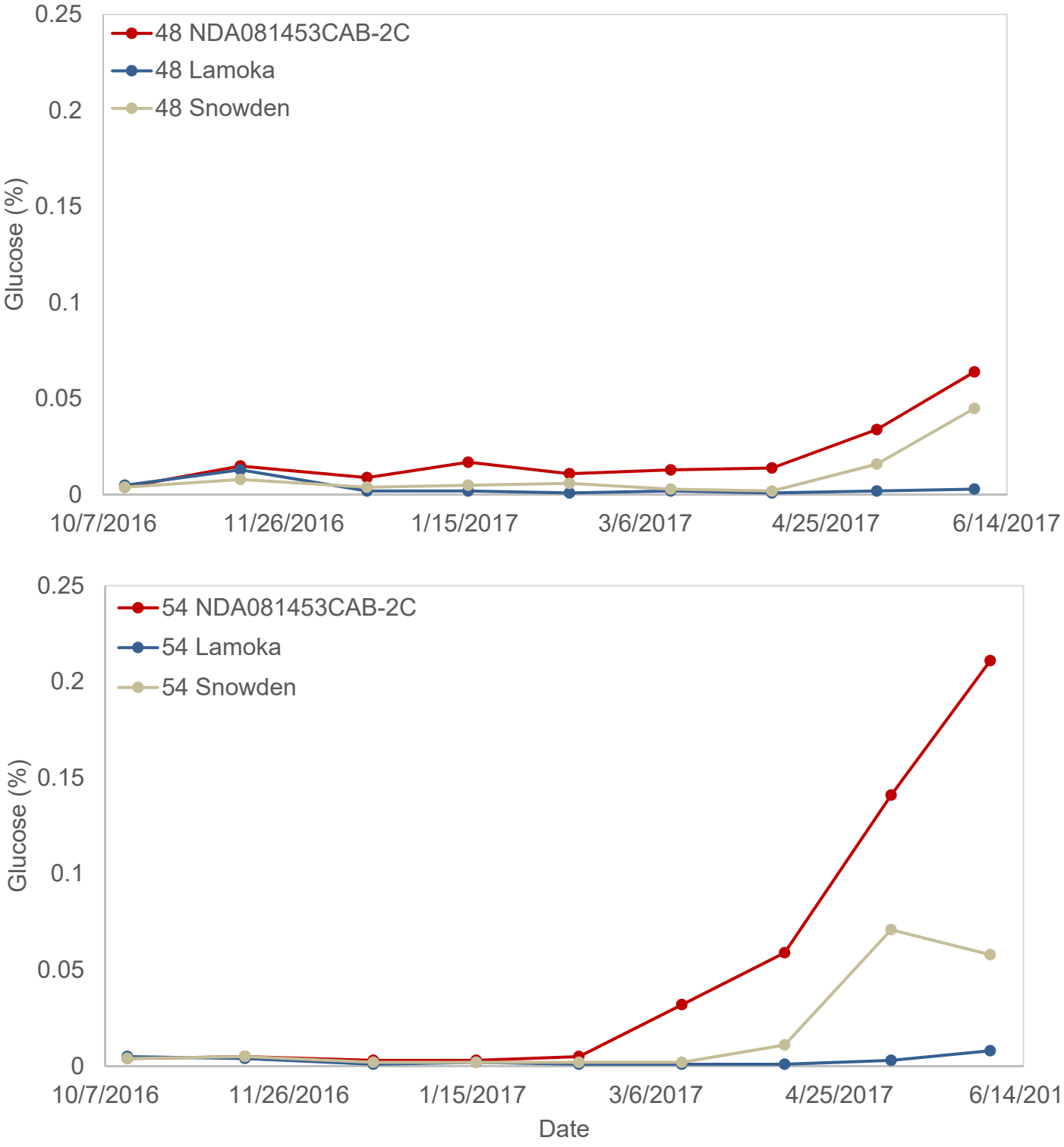


Figure 30. NDA081453CAB-2C sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

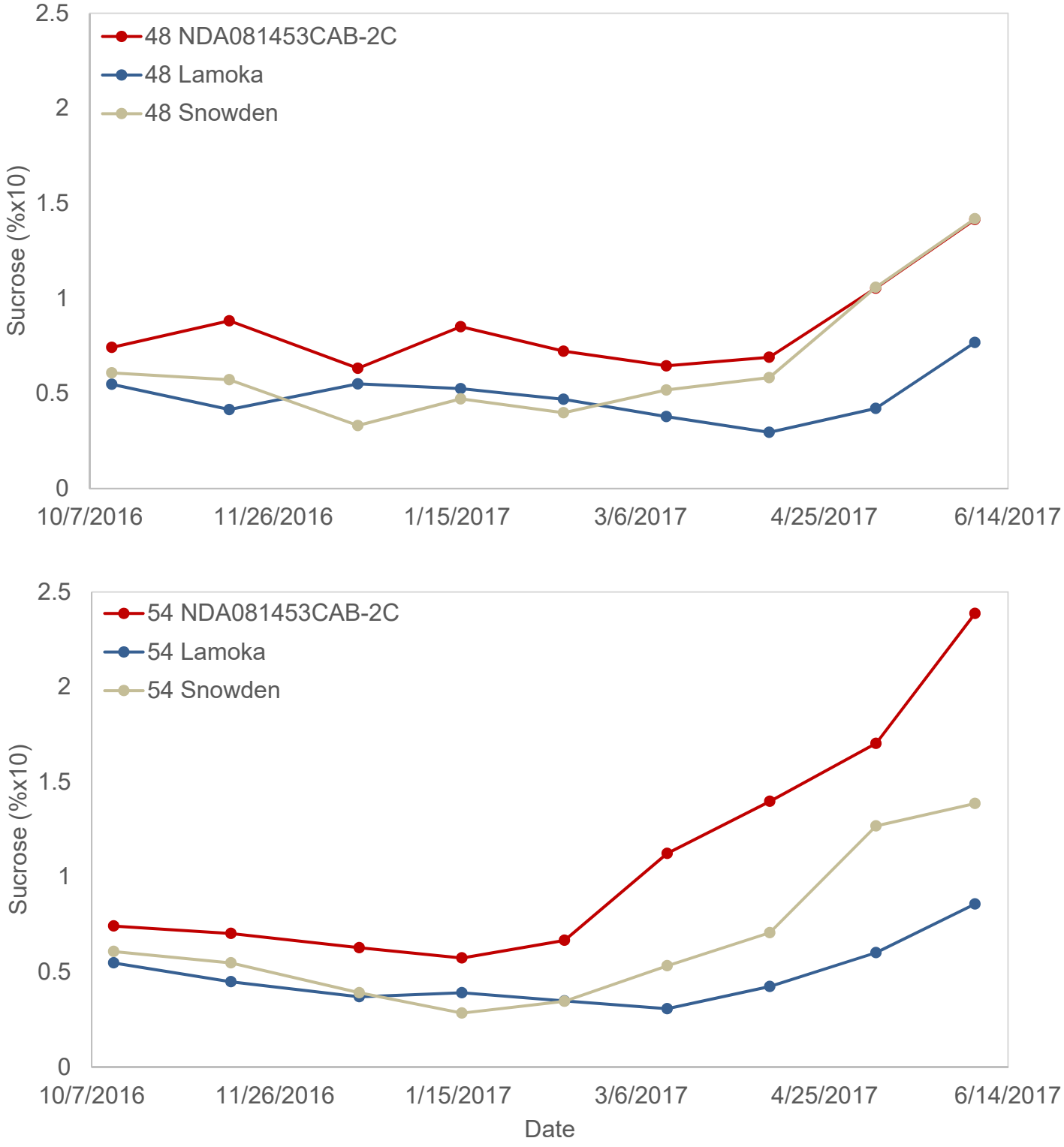


Figure 31. NDA081453CAB-2C percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

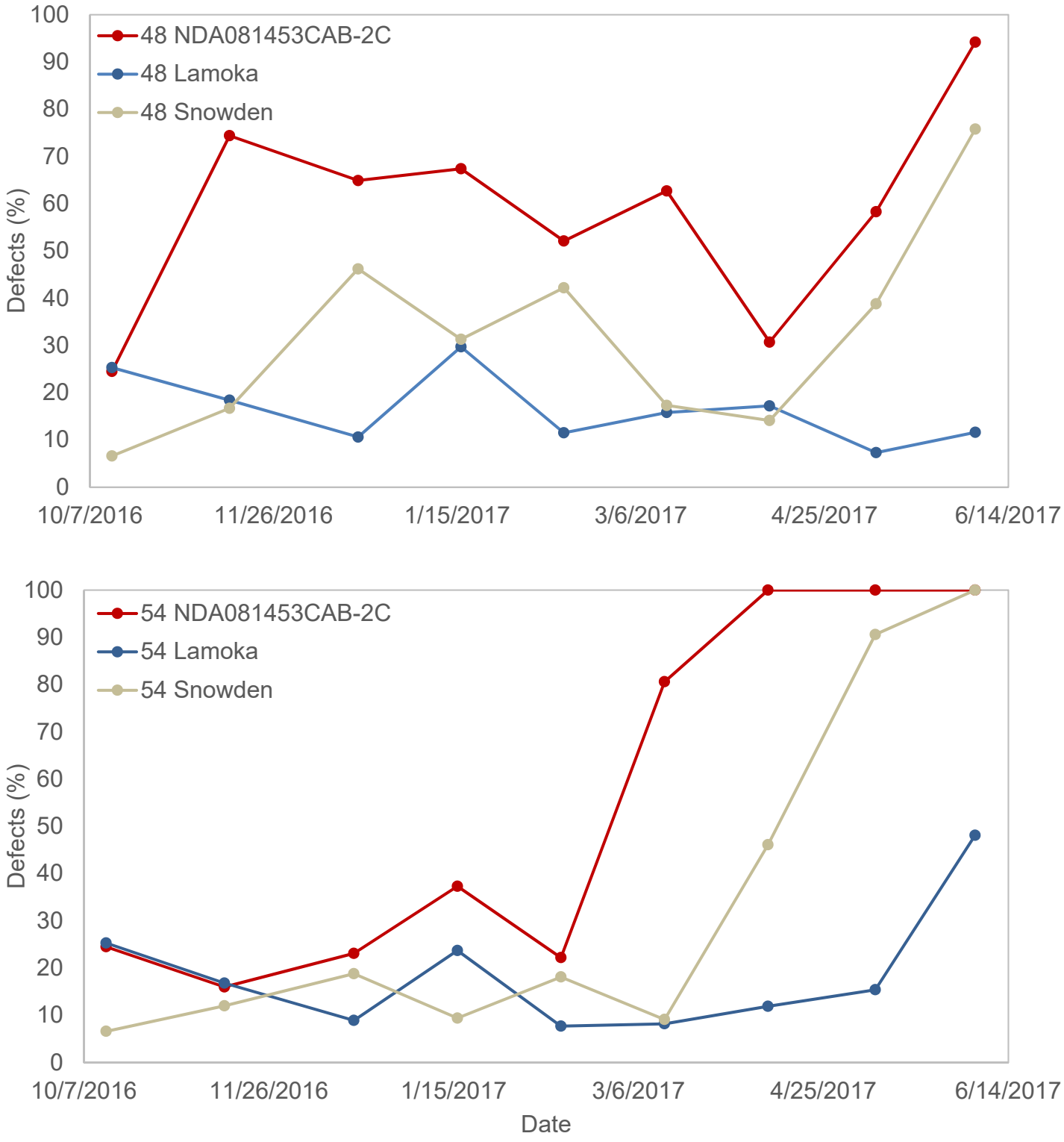
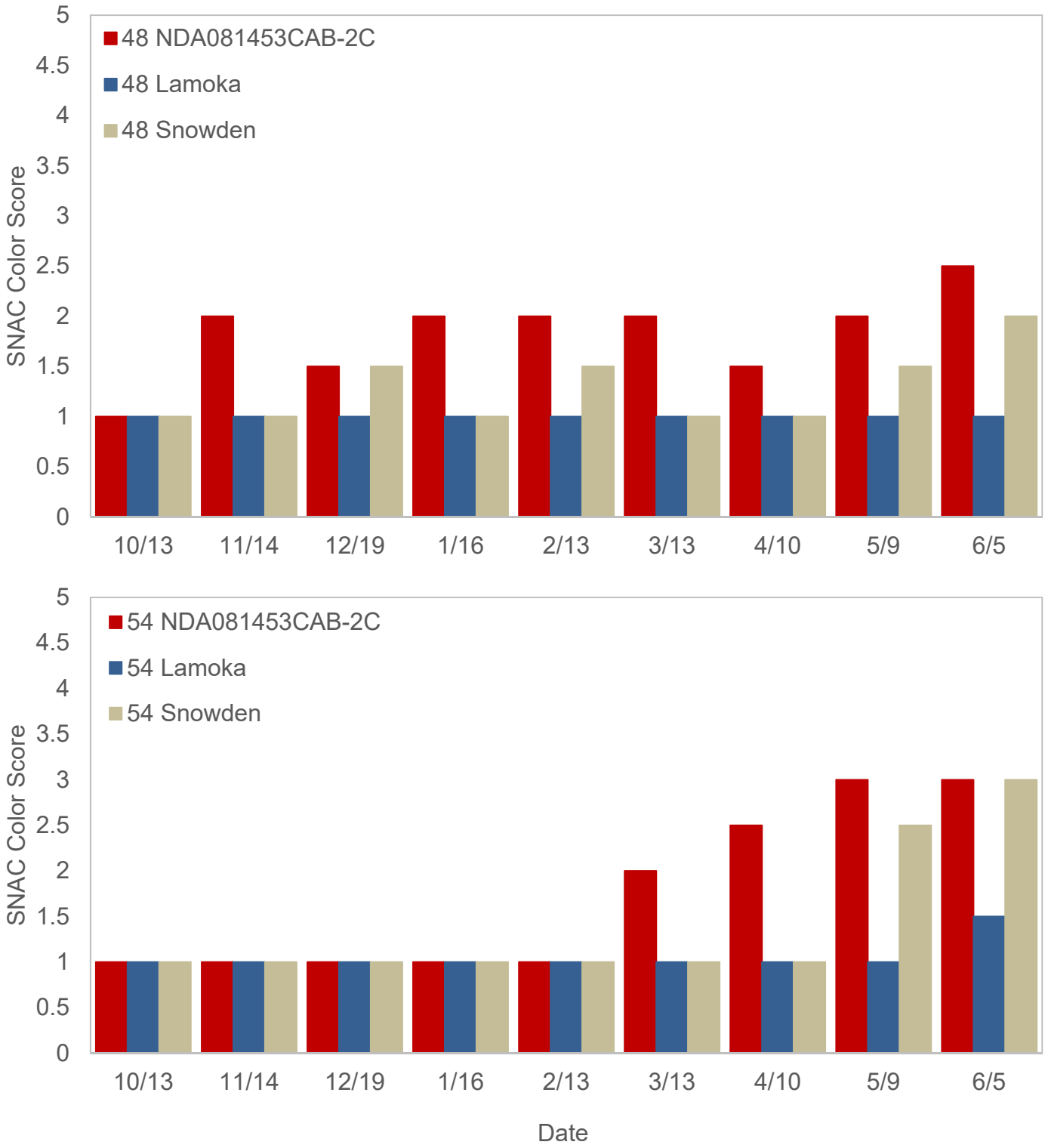


Figure 32. NDA081453CAB-2C SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



NDTX081648CB-13W: With the exception of glucose peaks from December to February, NDTX081648CB-13W had similar sugar concentrations compared to Snowden (Figures 33-34). Defects at 48°F were also similar to Snowden while the early to mid-storage defects at 54°F were about 15-20% higher than Snowden (Figure 35). SNAC color scores at both temperatures were very similar to Snowden (Figure 36). Overall, NDTX081648CB-13W had better chip quality later in storage at 48°F (Table 12 and Figures 33-36).

Table 12. NDTX081648CB-13W monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

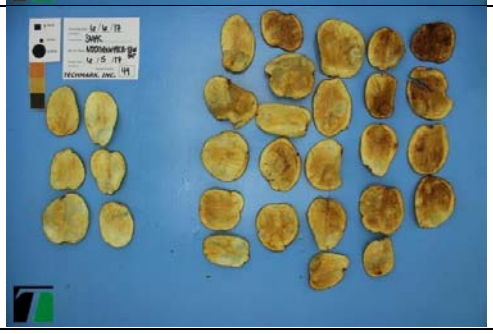
February		
March		
April		No image available
May		
June		

Figure 33. NDTX081648CB-13W glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

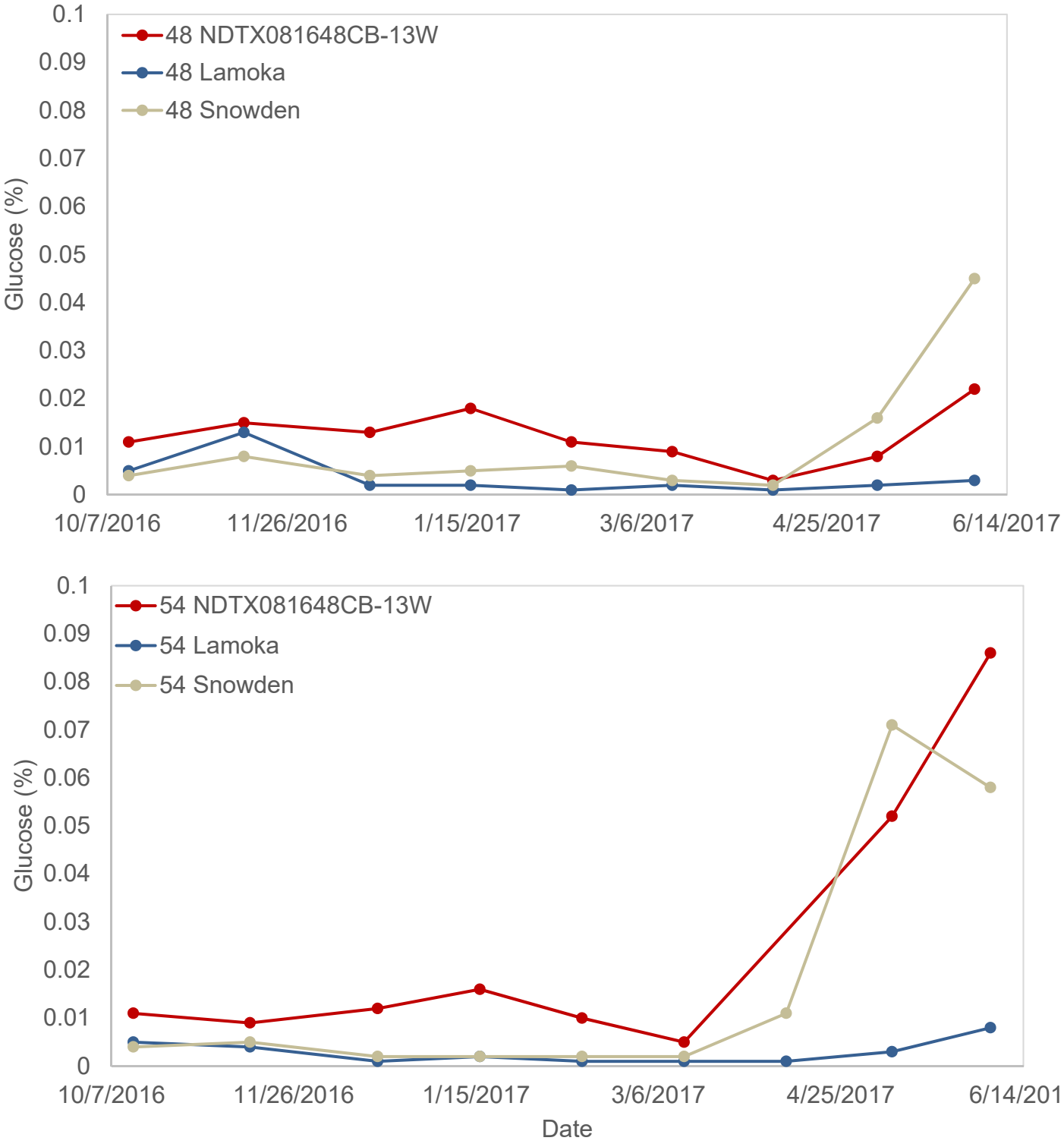
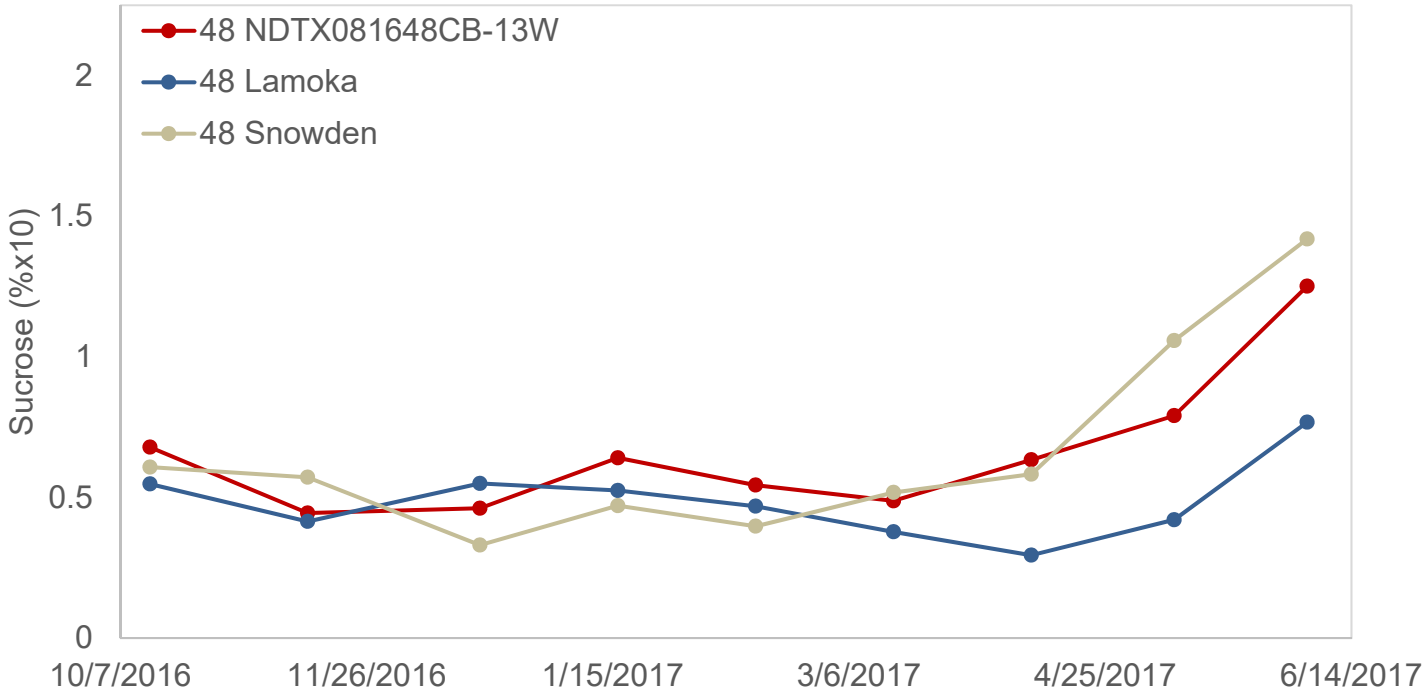


Figure 34. NDTX081648CB-13W sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.


48 NDTX081648CB-13W
48 Lamoka
48 Snowden
Sucrose (%x10)
2
1.5
1
0.5
0
10/7/2016
11/26/2016
1/15/2017
3/6/2017
4/25/2017
6/14/2017

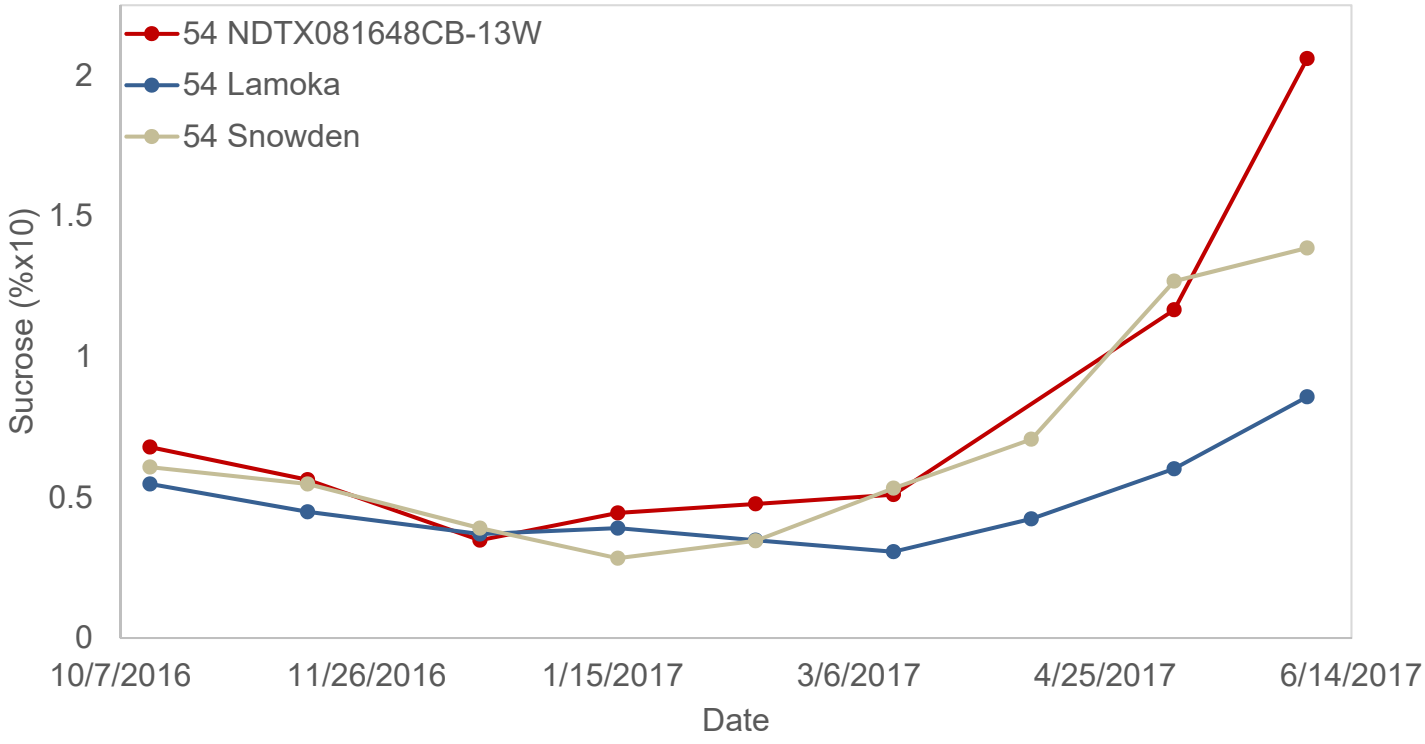

54 NDTX081648CB-13W
54 Lamoka
54 Snowden
Sucrose (%x10)
2
1.5
1
0.5
0
10/7/2016
11/26/2016
1/15/2017
3/6/2017
4/25/2017
6/14/2017
Date

Figure 35. NDTX081648CB-13W percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

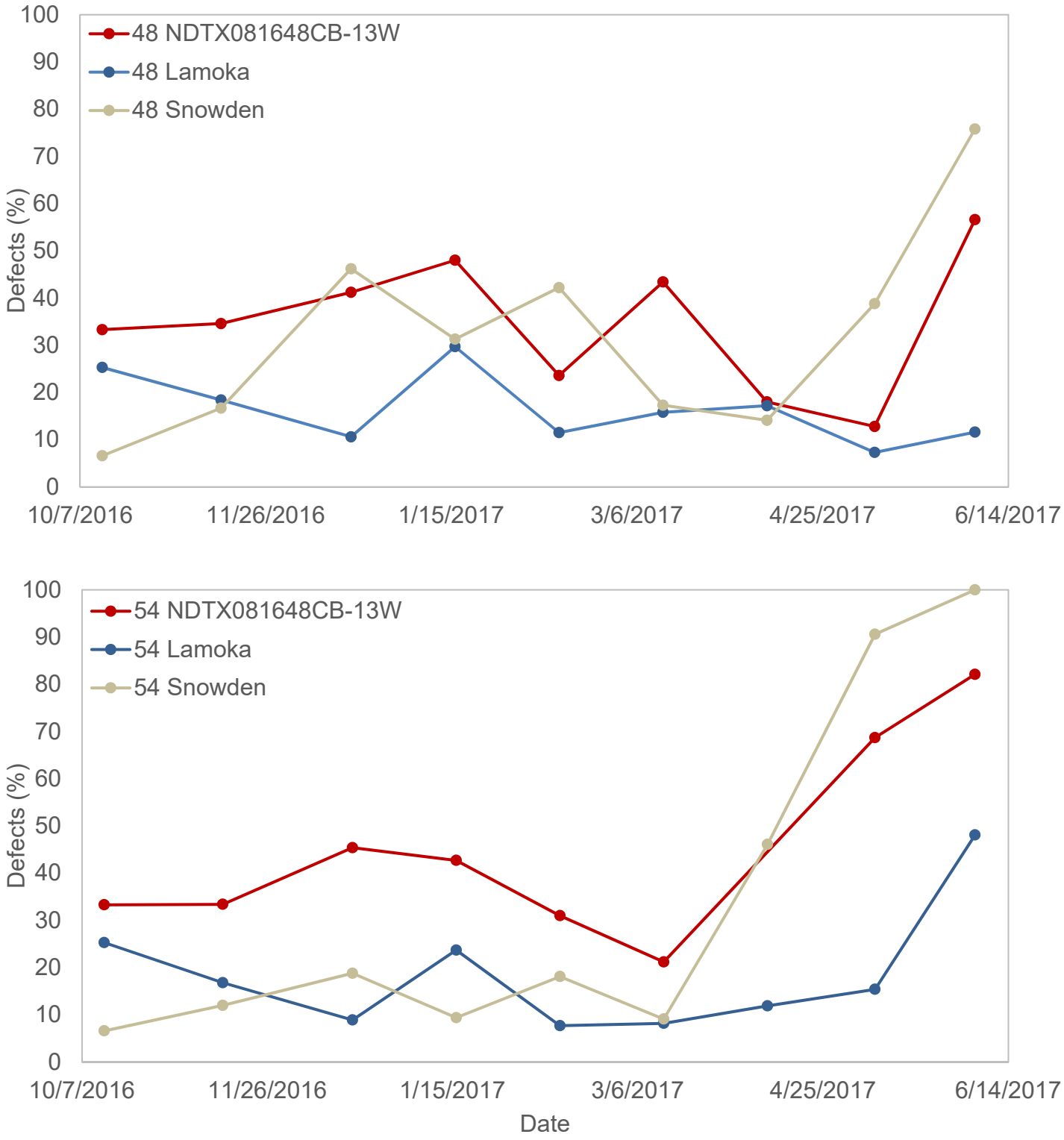
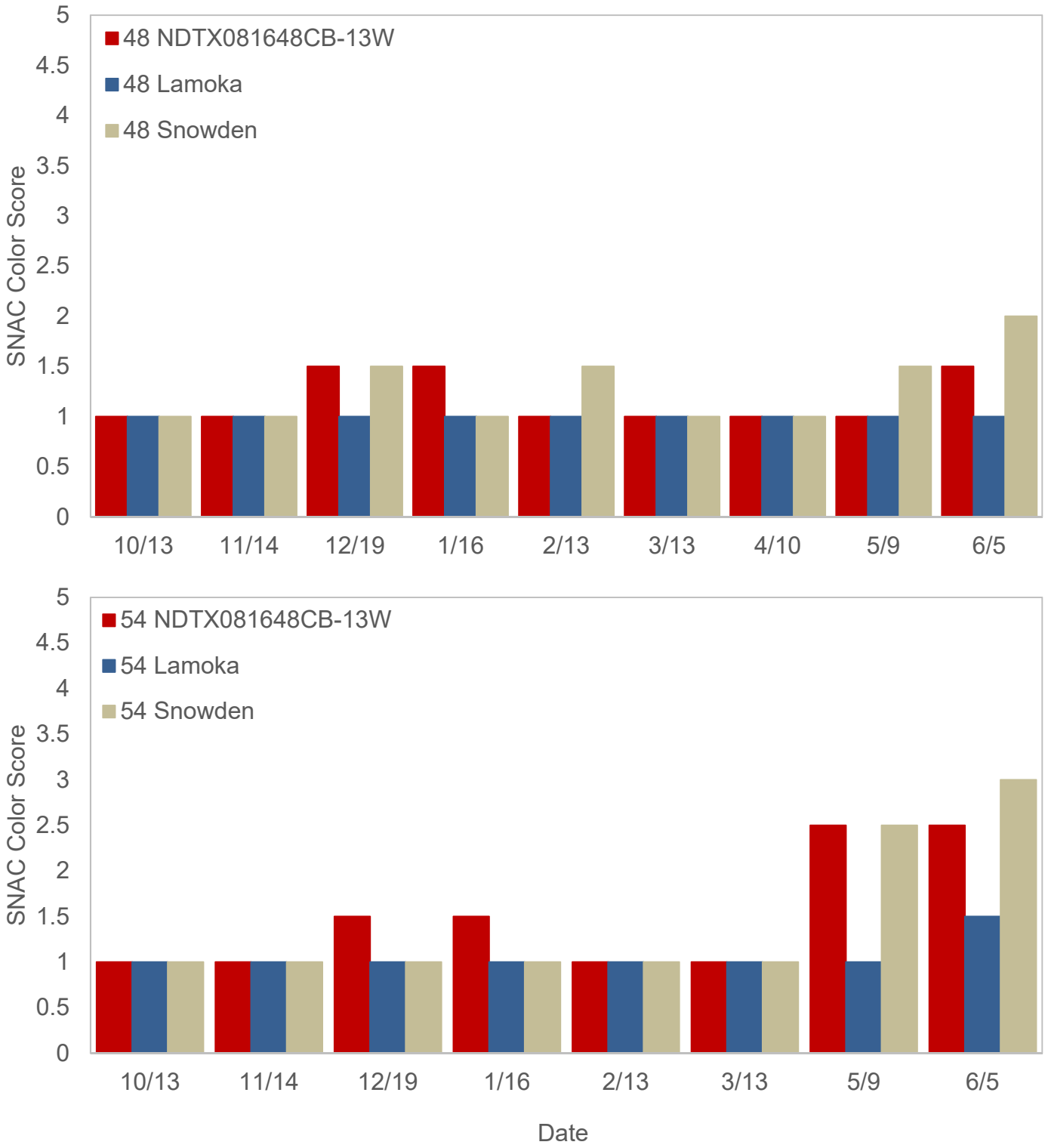


Figure 36. NDTX081648CB-13W SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



NY152: Compared to Lamoka, NY152 had similar or lower sugar concentrations (Figures 37-38). With the exception of a peak in total defects for the 54°F treatment in February, NY152 had similar percentages of defects compared to Lamoka throughout storage (Figure 39). SNAC color scores were consistently a rating of 1.0 and matched Lamoka for the storage duration (Figure 40). NY152 stored slightly better at 48°F compared to 54°F by the end of storage (Table 13 and Figures 37-40). NY152 continues to be a promising line for long-term storability and chip quality.

Table 13. NY152 monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

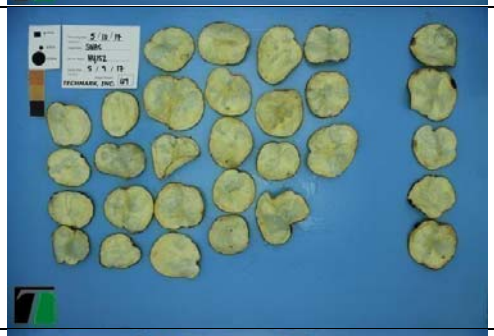
February		
March		
April		
May		
June		

Figure 37. NY152 glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

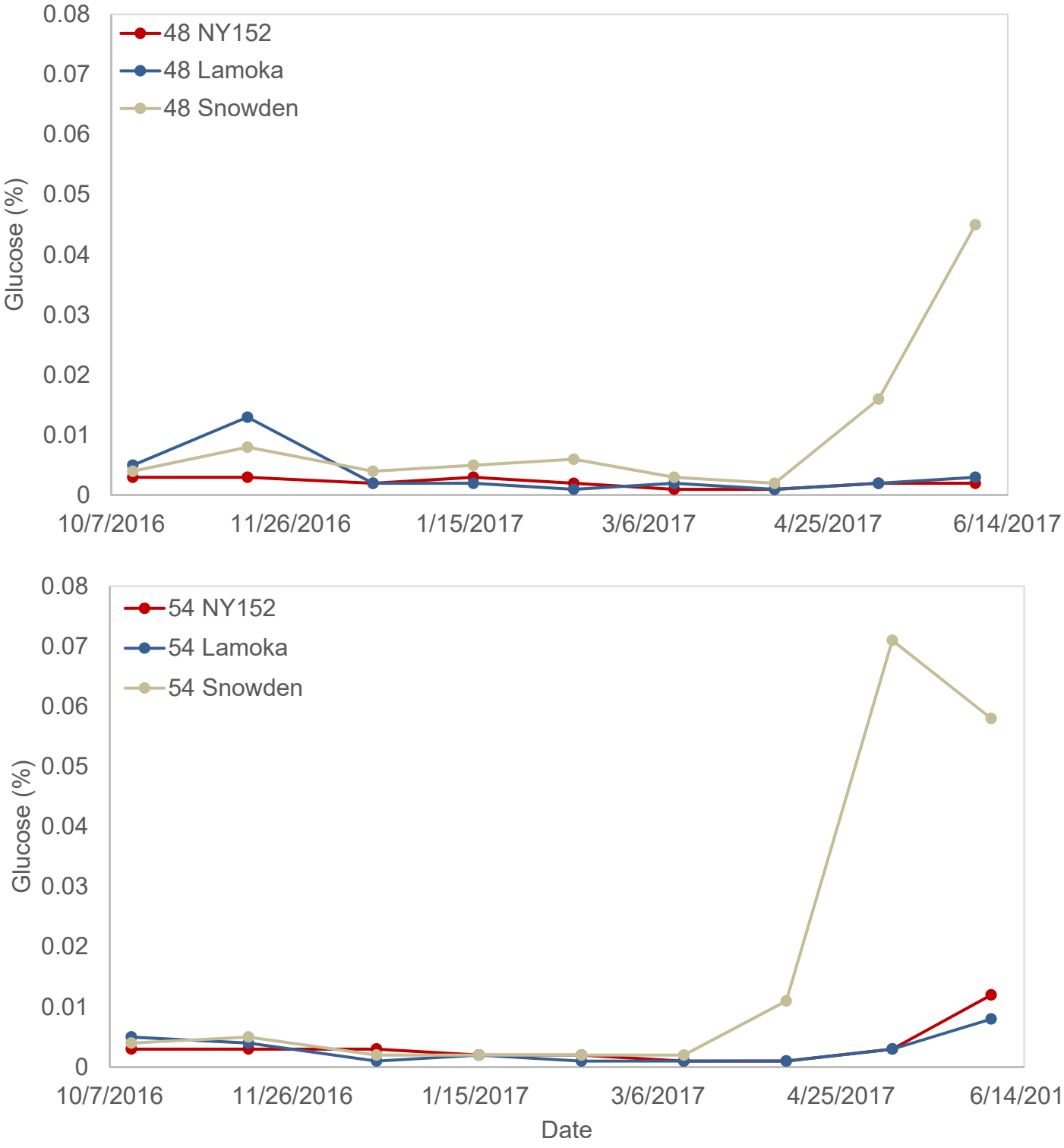


Figure 38. NY152 sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

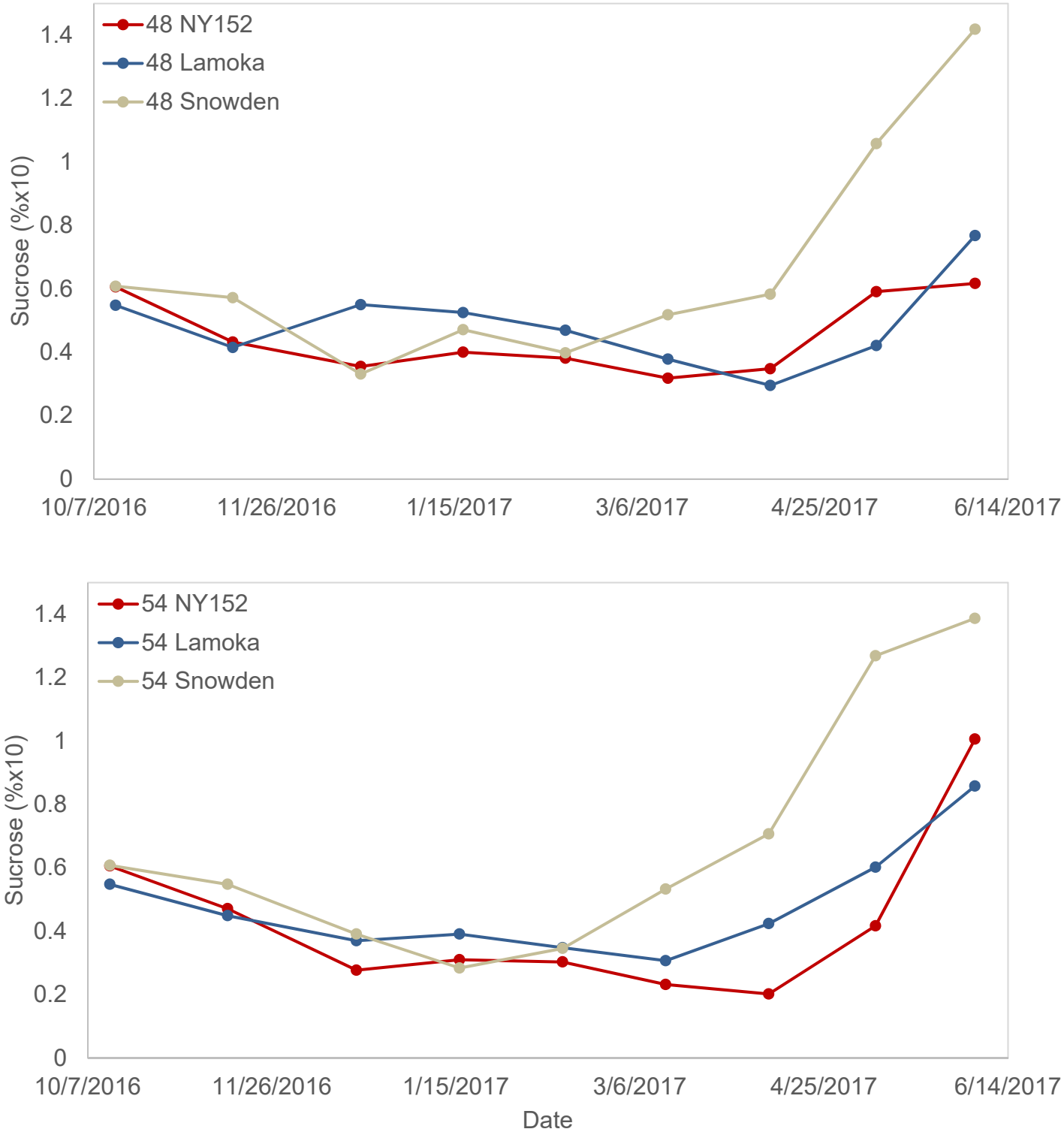


Figure 39. NY152 percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

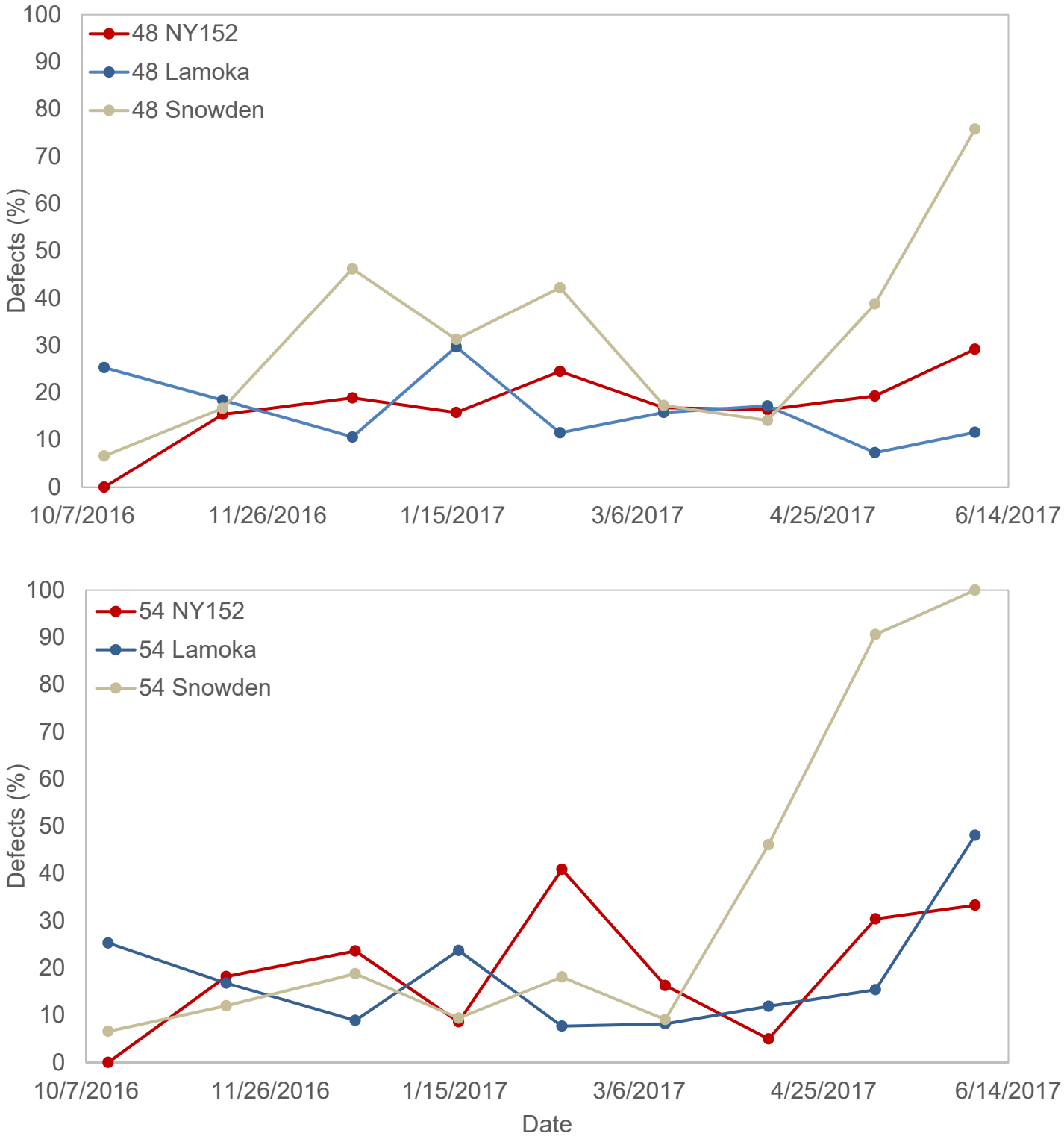
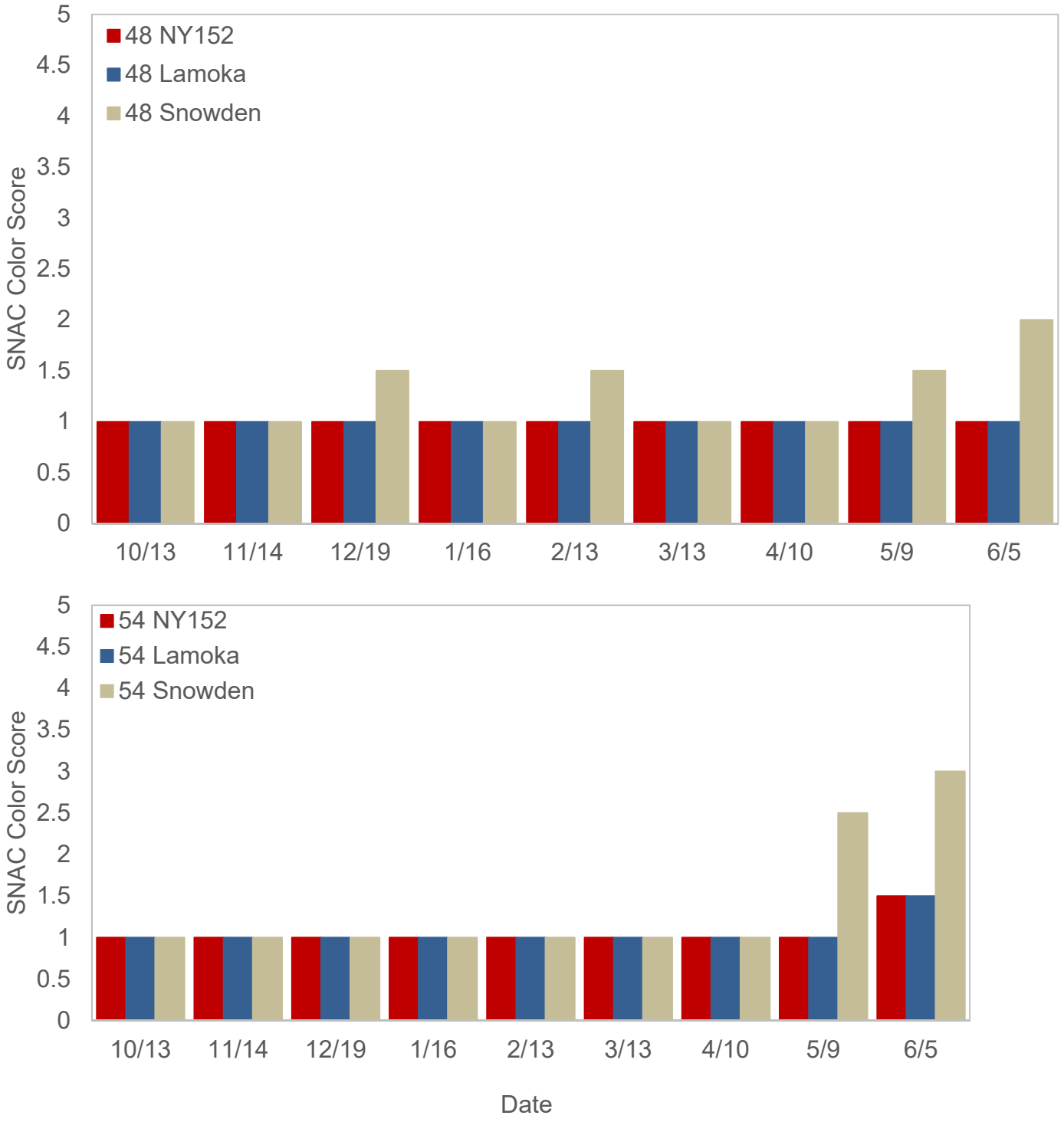


Figure 40. NY152 SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



NY157: With the exception of glucose and sucrose peaks from April to June, NY157 had similar sugar concentrations compared to Lamoka (Figures 41-42). Defects at 48°F were higher than at 54°F, but were usually similar to Snowden (Figure 43). SNAC color ratings were similar to Snowden and Lamoka (Figure 44). NY157 appears to store better early in the season at 54°F, but by April, stored better at 48°F (Table 14 and figures 43-44).

Table 14. NY157 monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

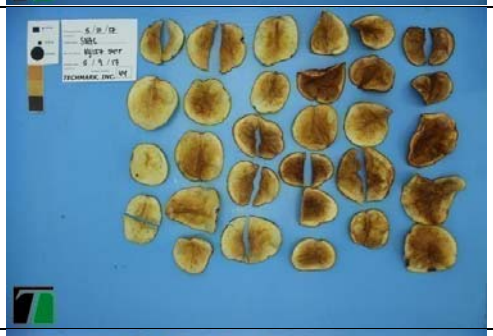
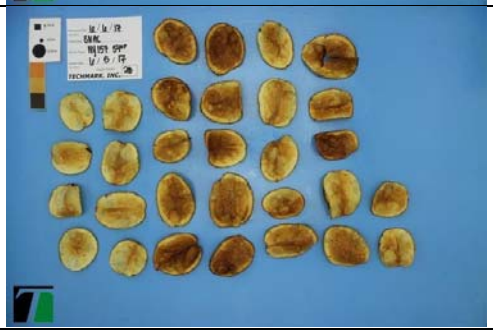
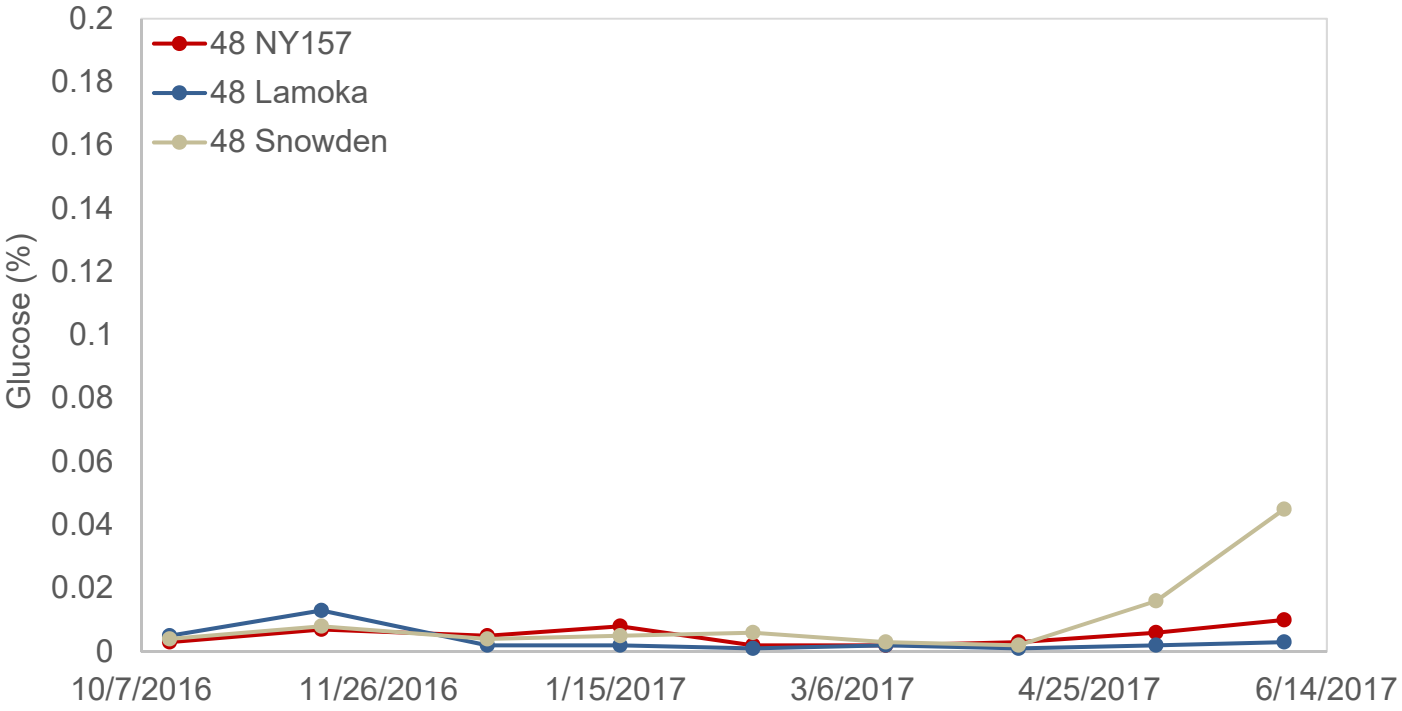
February		
March		
April		
May		
June		

Figure 41. NY157 glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



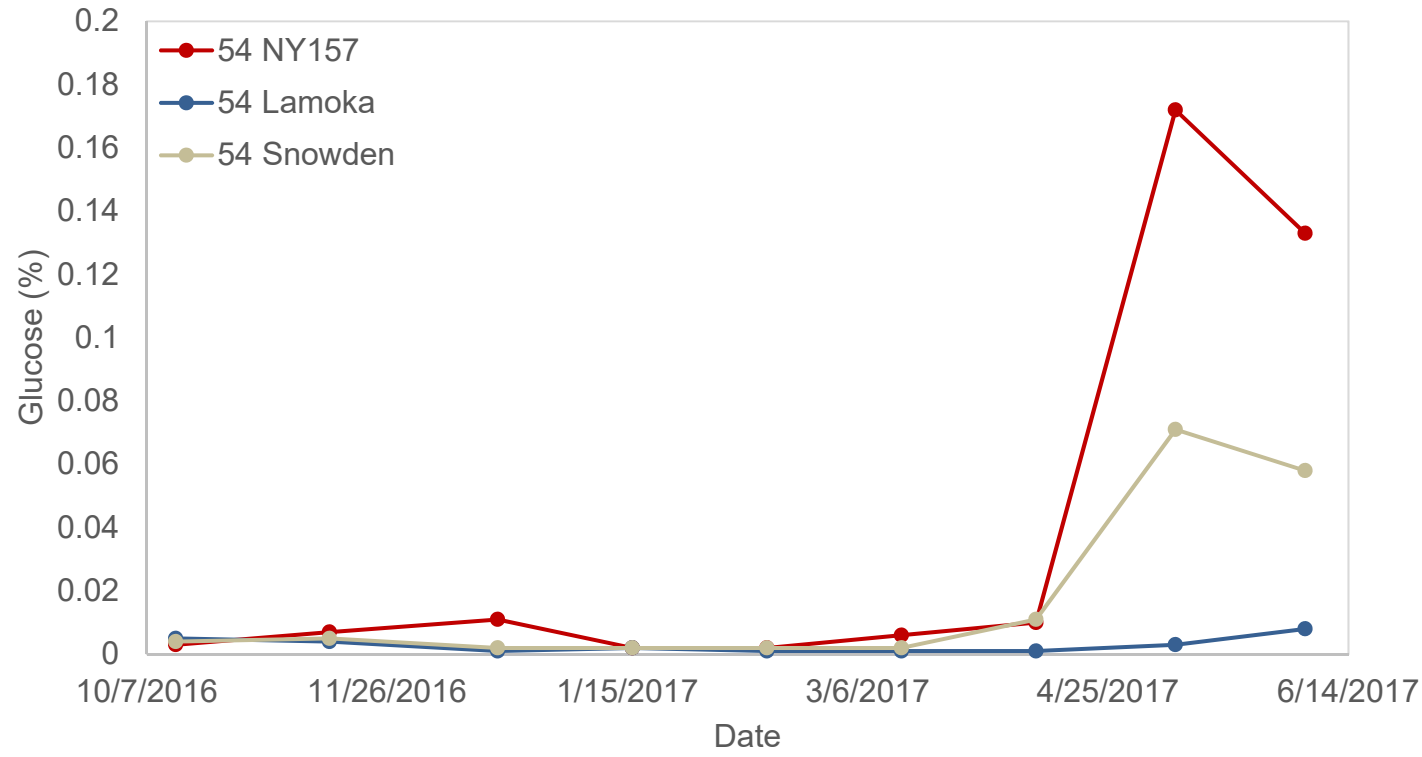
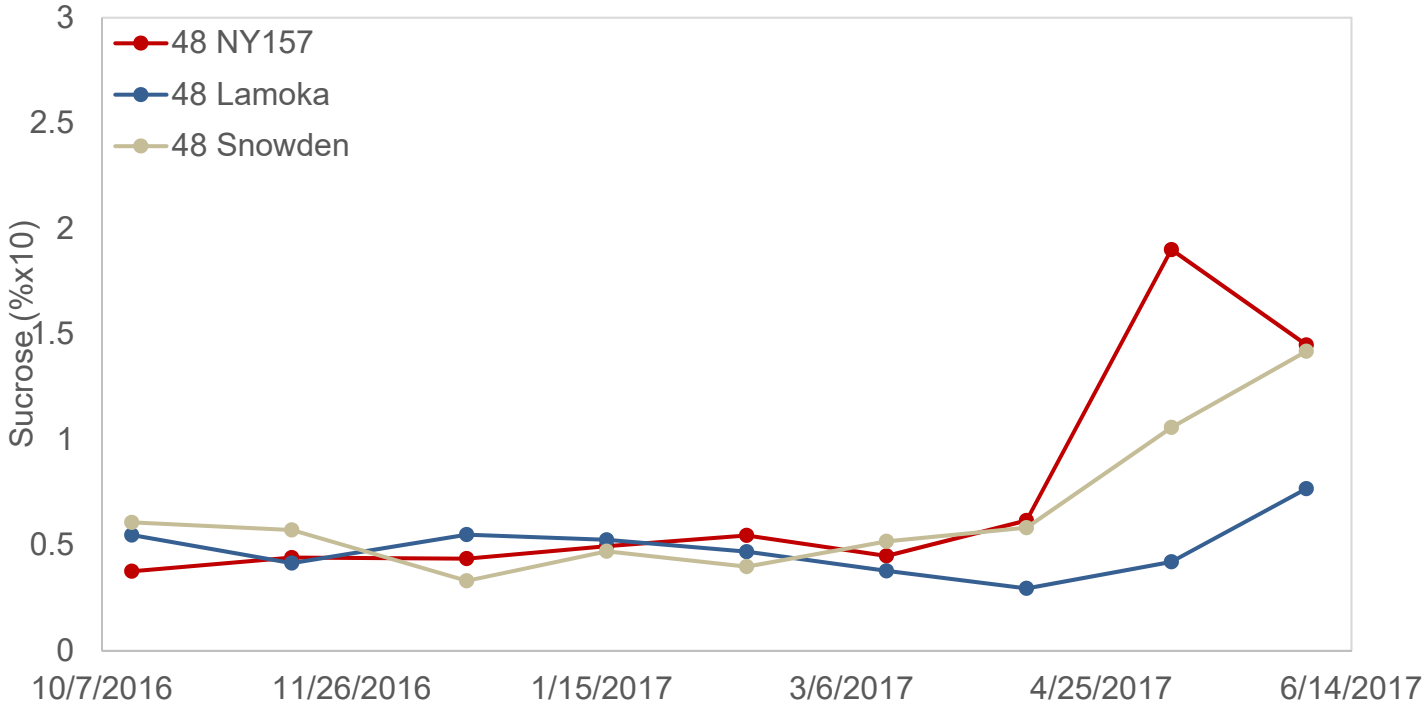


Figure 42. NY157 sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



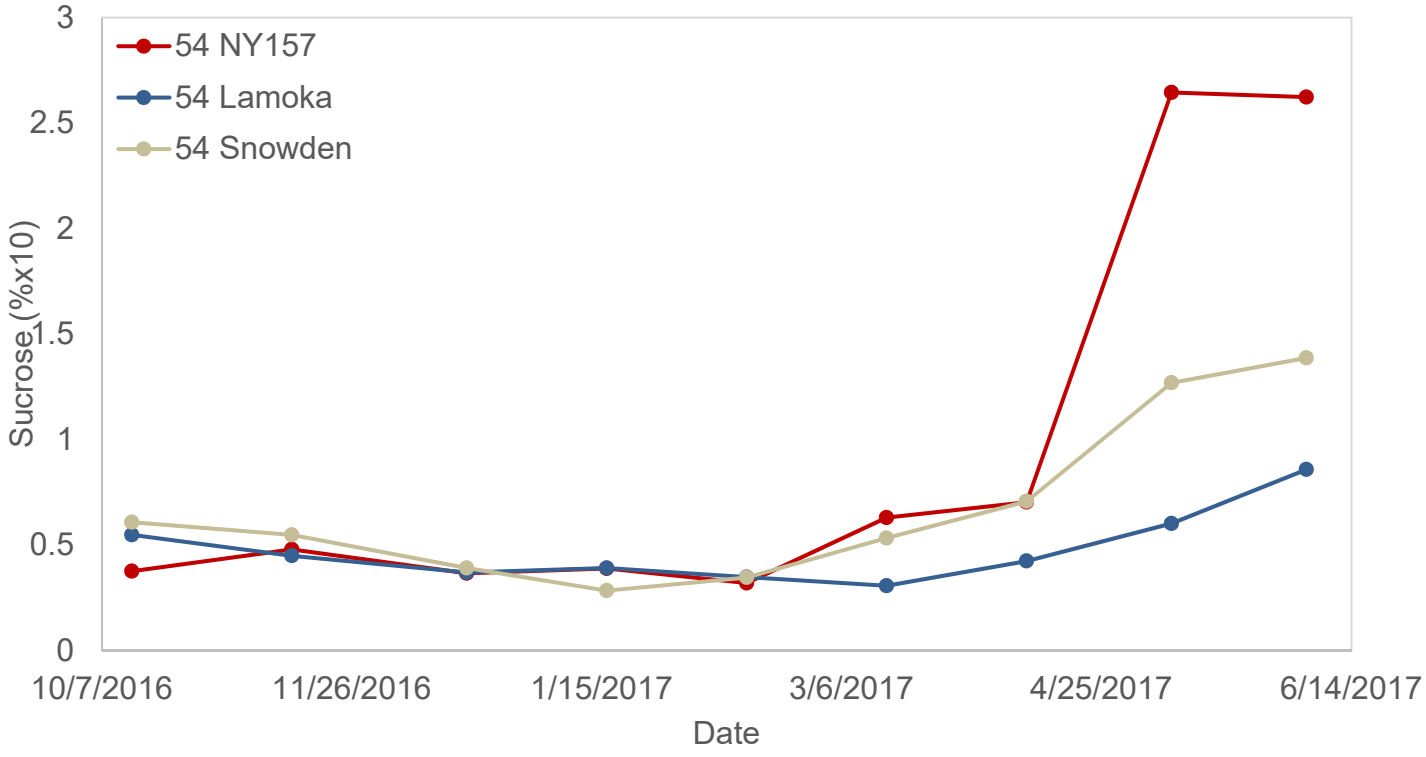


Figure 43. NY157 percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

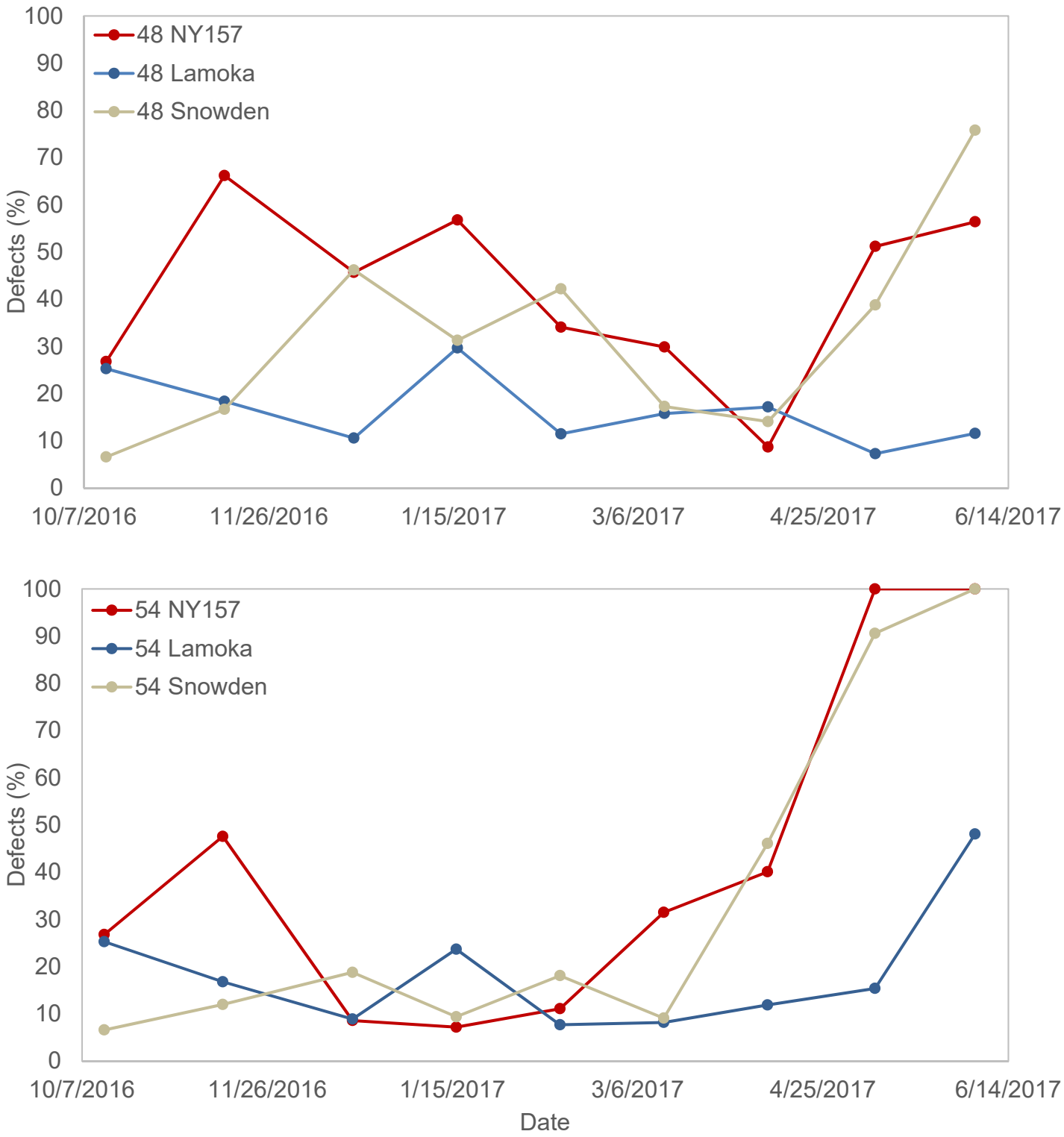
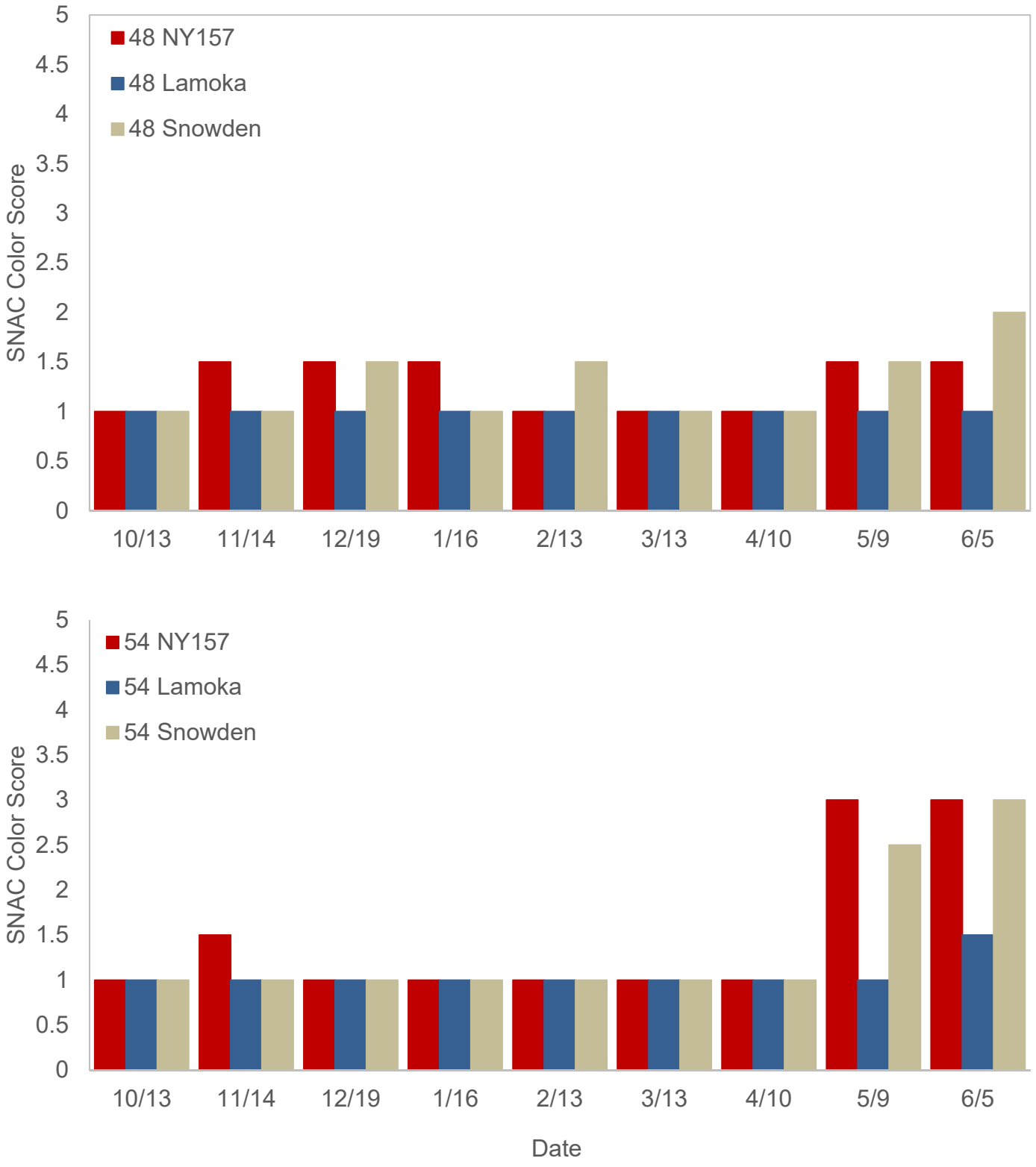


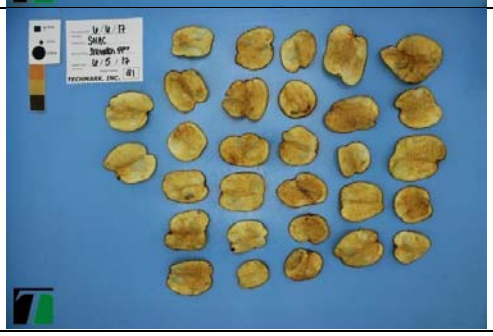
Figure 44. NY157 SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



Snowden: This variety has good chip quality through mid-storage. See individual varieties for comparisons on sugar, defects, and SNAC color scores.

Table 15. Snowden monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

February		
March		
April		
May		
June		

TX09396-1W: With the exception of a glucose peak in January to February, TX09396-1W exhibited sugar concentrations similar to Snowden in early storage and between Snowden and Lamoka middle to late storage (Figures 45-46). Defects were quite high, hovering around or above 50% for the majority of storage (Figure 47). SNAC color scores were similar to or higher than Snowden for the majority of storage (Figure 48).

Table 16. TX09396-1W monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

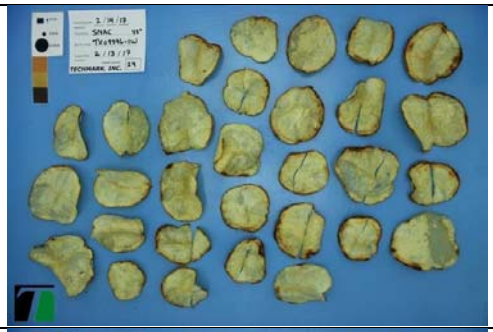
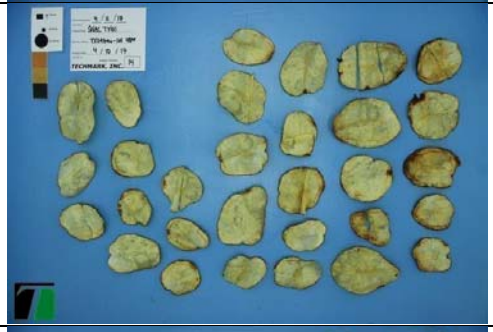
February		
March		
April		No Image Available
May		
June		

Figure 45. TX09396-1W glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

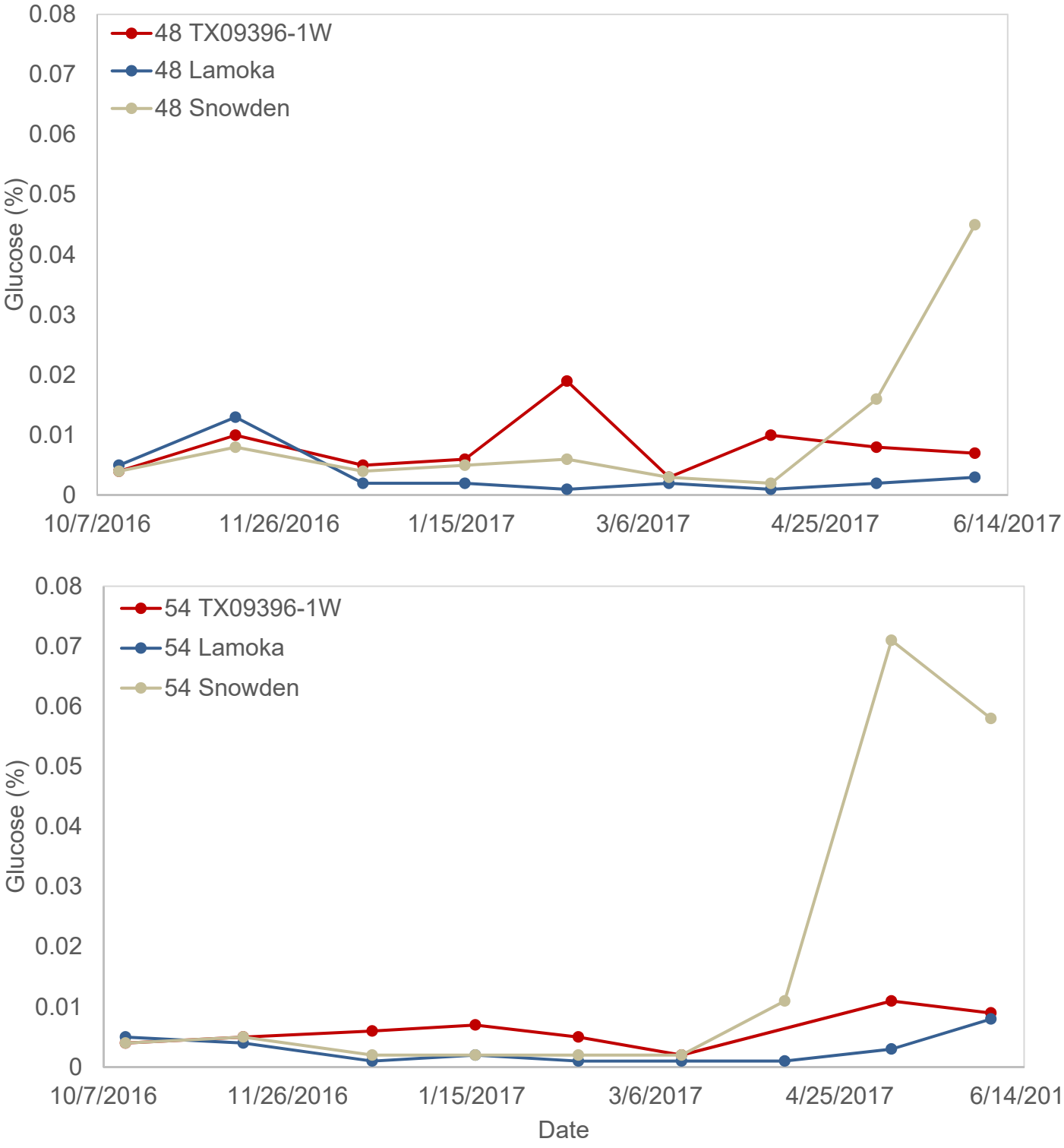


Figure 46. TX09396-1W sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

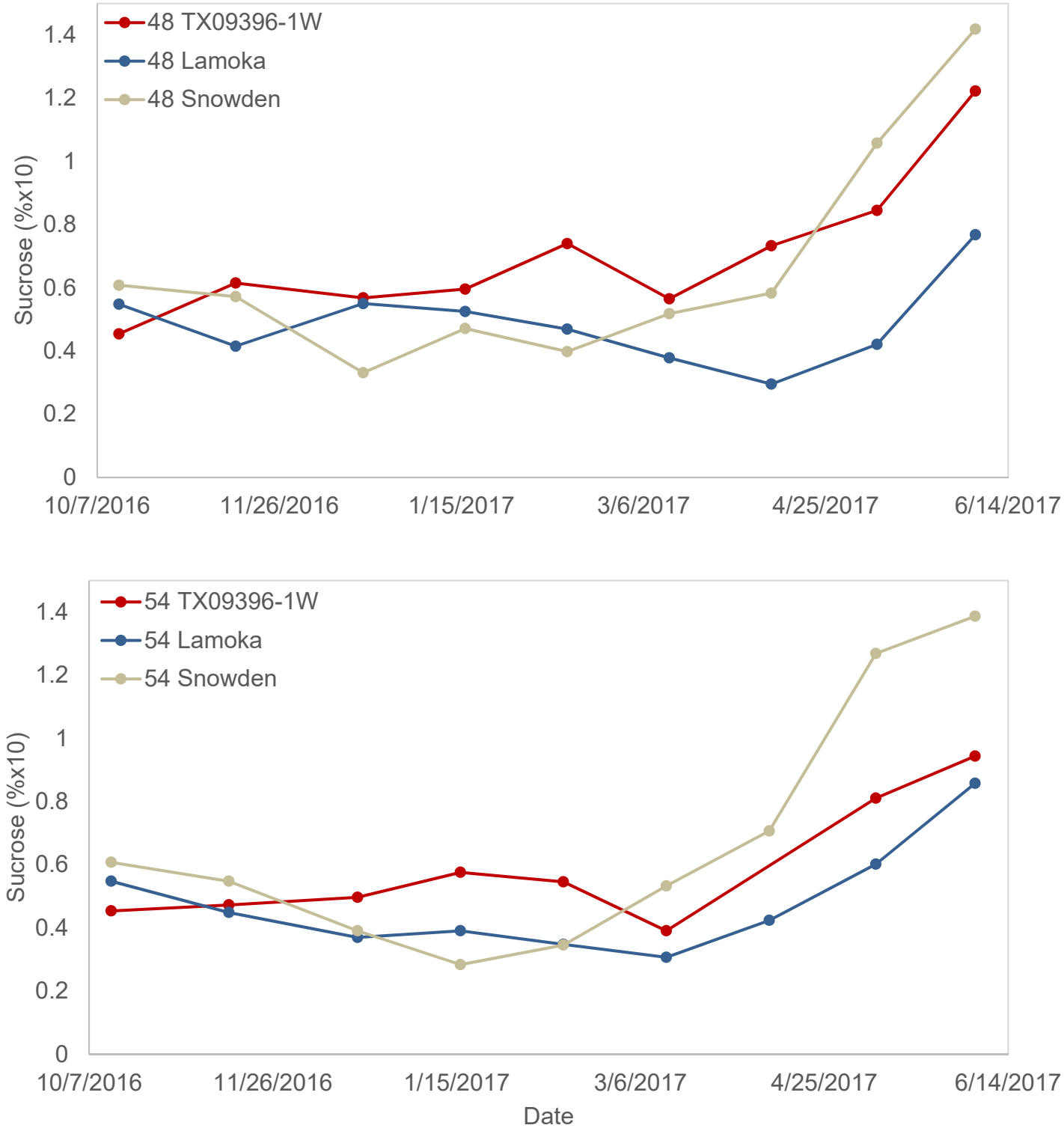


Figure 47. TX09396-1W percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

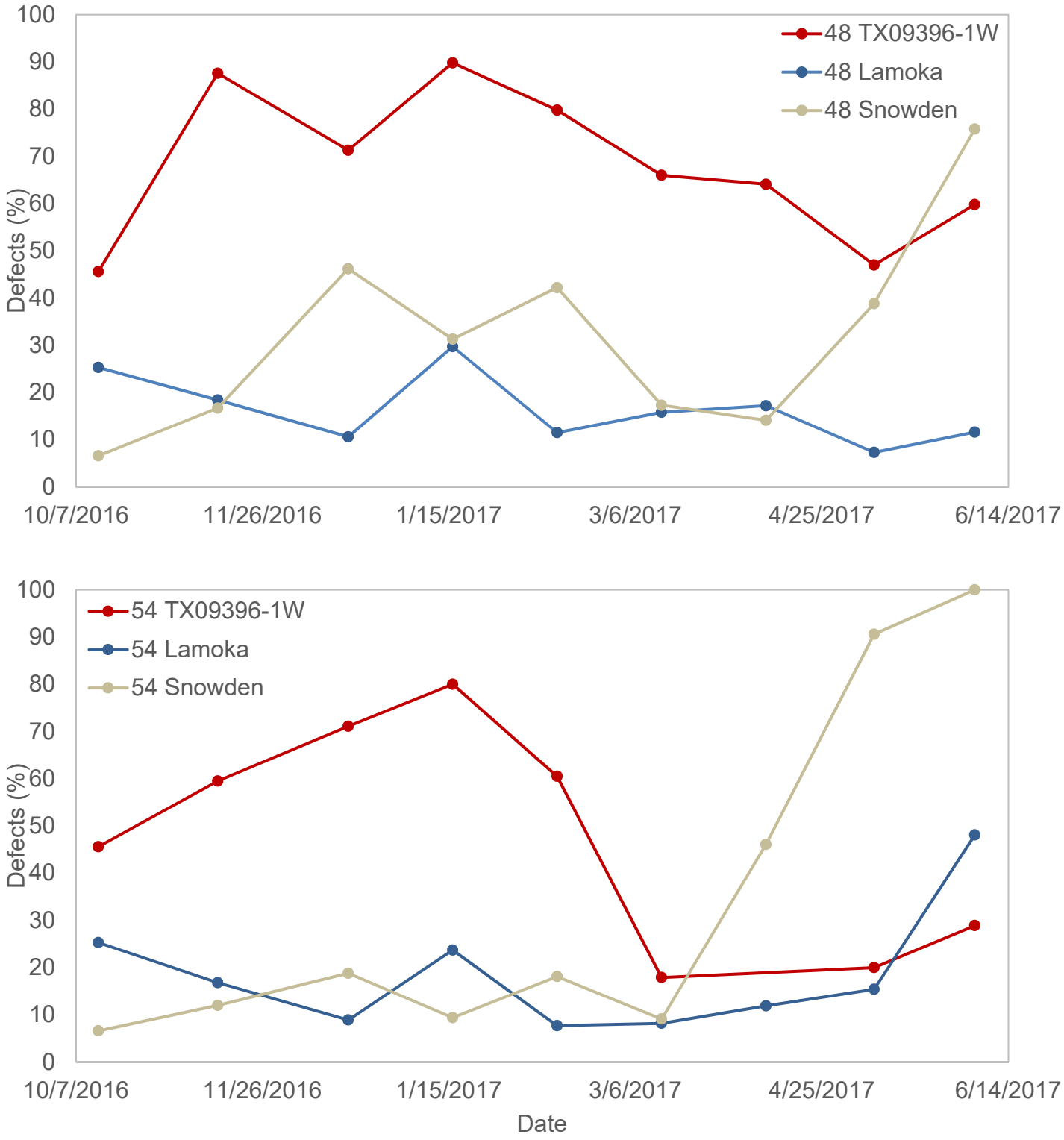
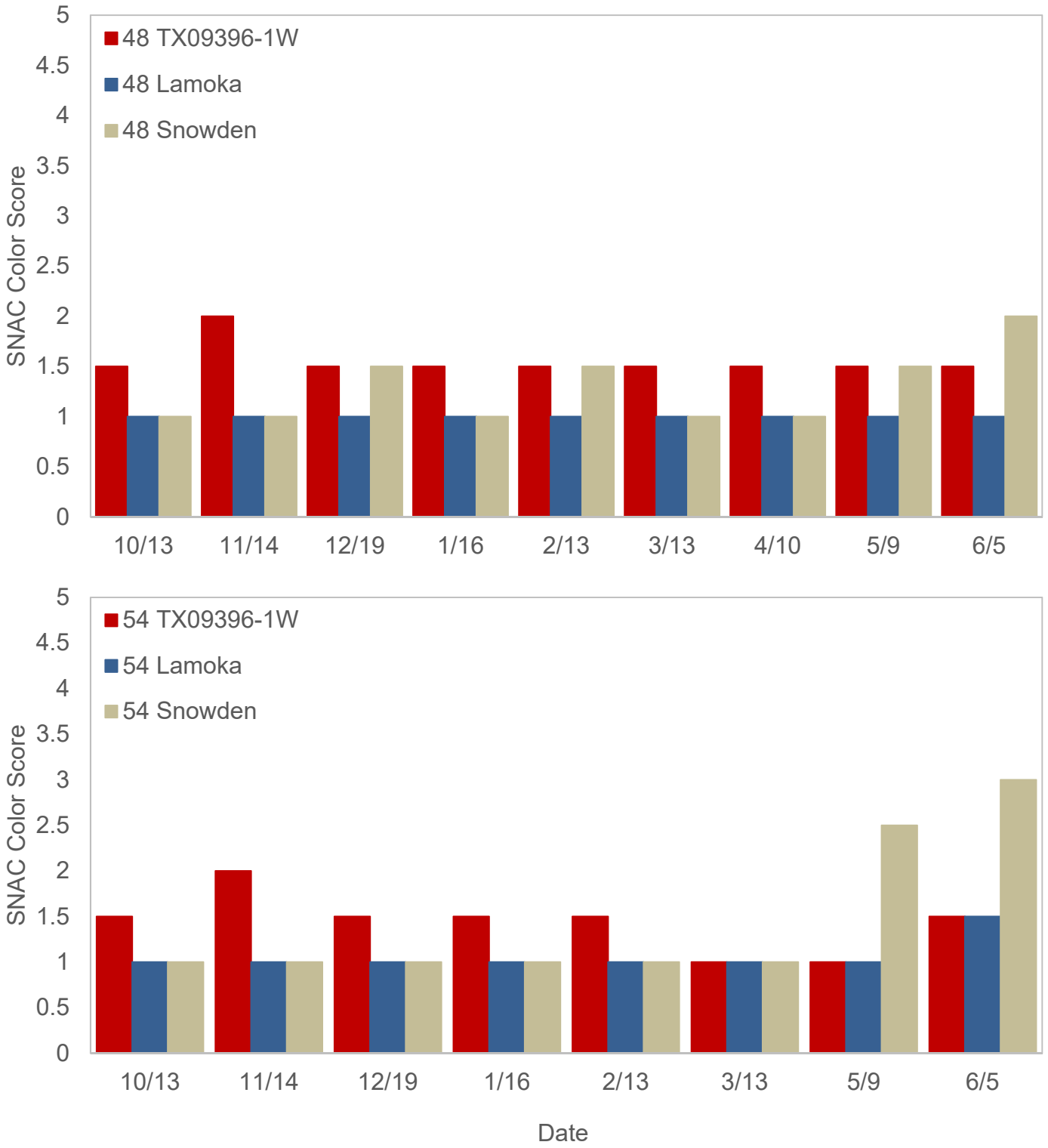


Figure 48. TX09396-1W SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



W6822-3: Compared to Lamoka, W6822-3 had similar or lower glucose concentrations throughout storage (Figure 49). For sucrose, W6822-3 had similar to moderate concentrations compared to both check varieties (figure 50). Defects in W5822-3 were comparable to Lamoka and usually trended lower (Figure 51). SNAC color scores for this variety consistently stayed at 1.0 except for the last two sample dates at 48°F at 1.5 (Figure 52). This variety exhibited excellent chip quality throughout the duration of storage and has great potential for commercialization.

Table 17. W6822-3 monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

February		
March		
April		
May		
June		

Figure 49. W6822-3 glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

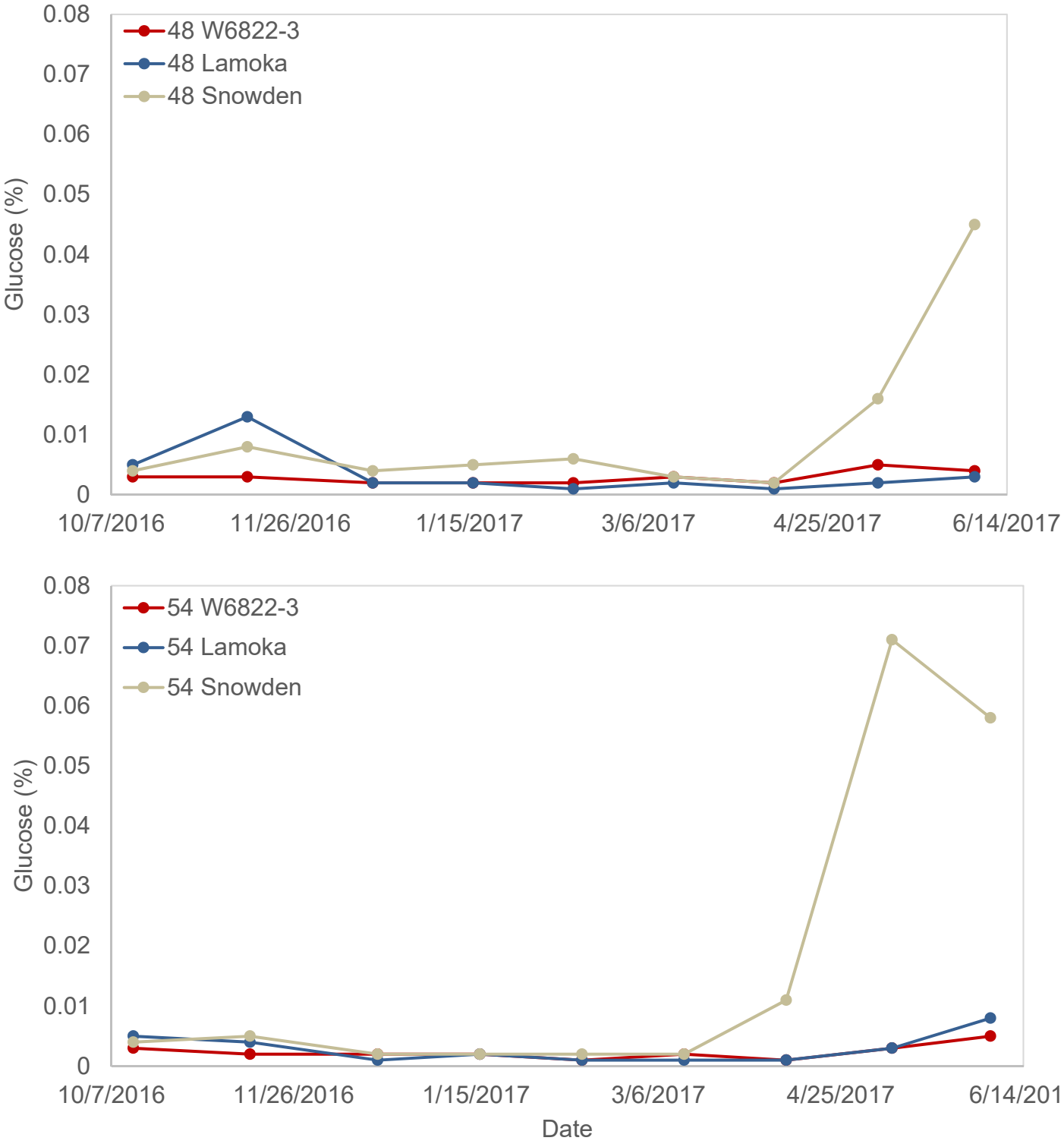


Figure 50. W6822-3 sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

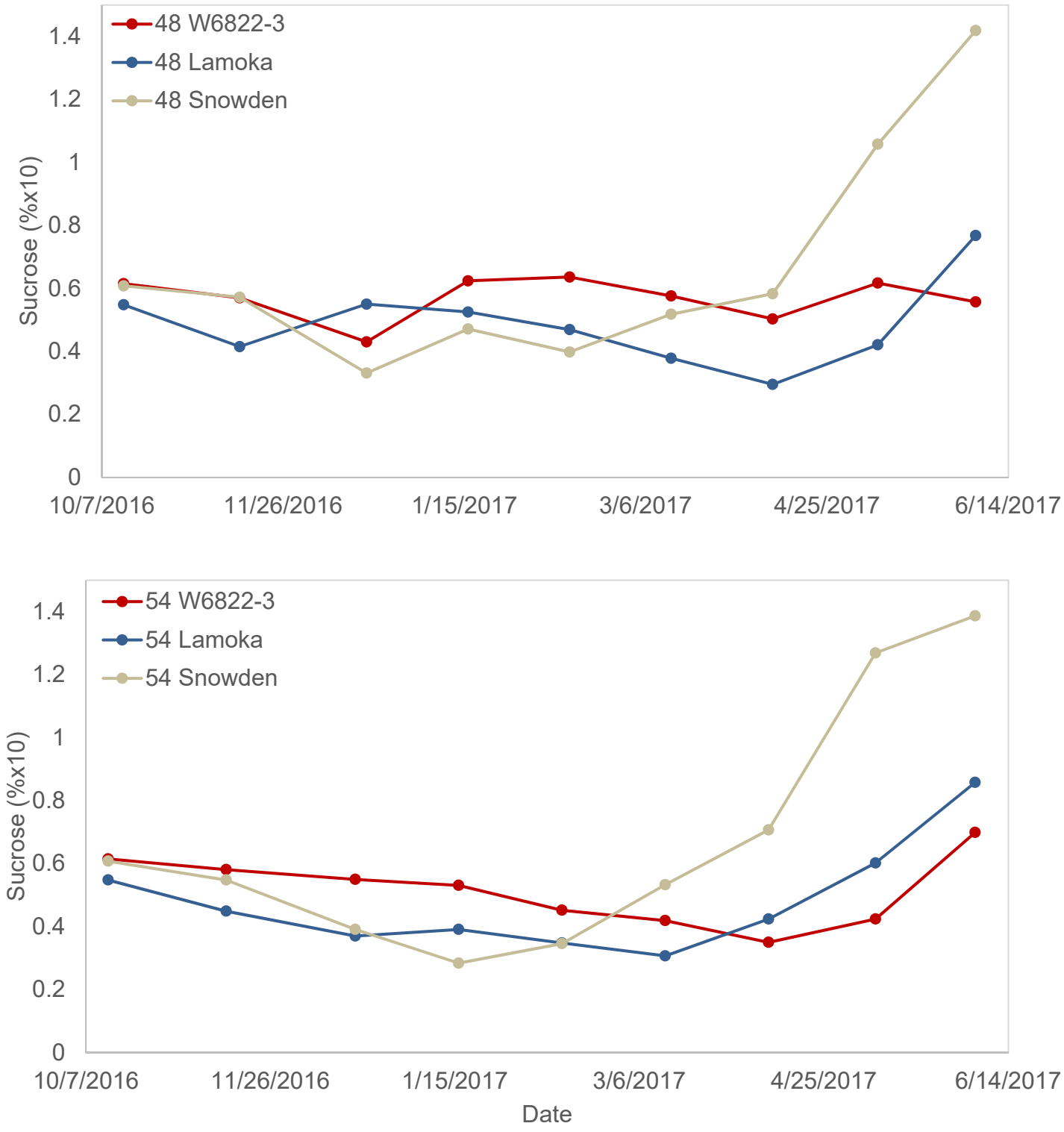


Figure 51. W6822-3 percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

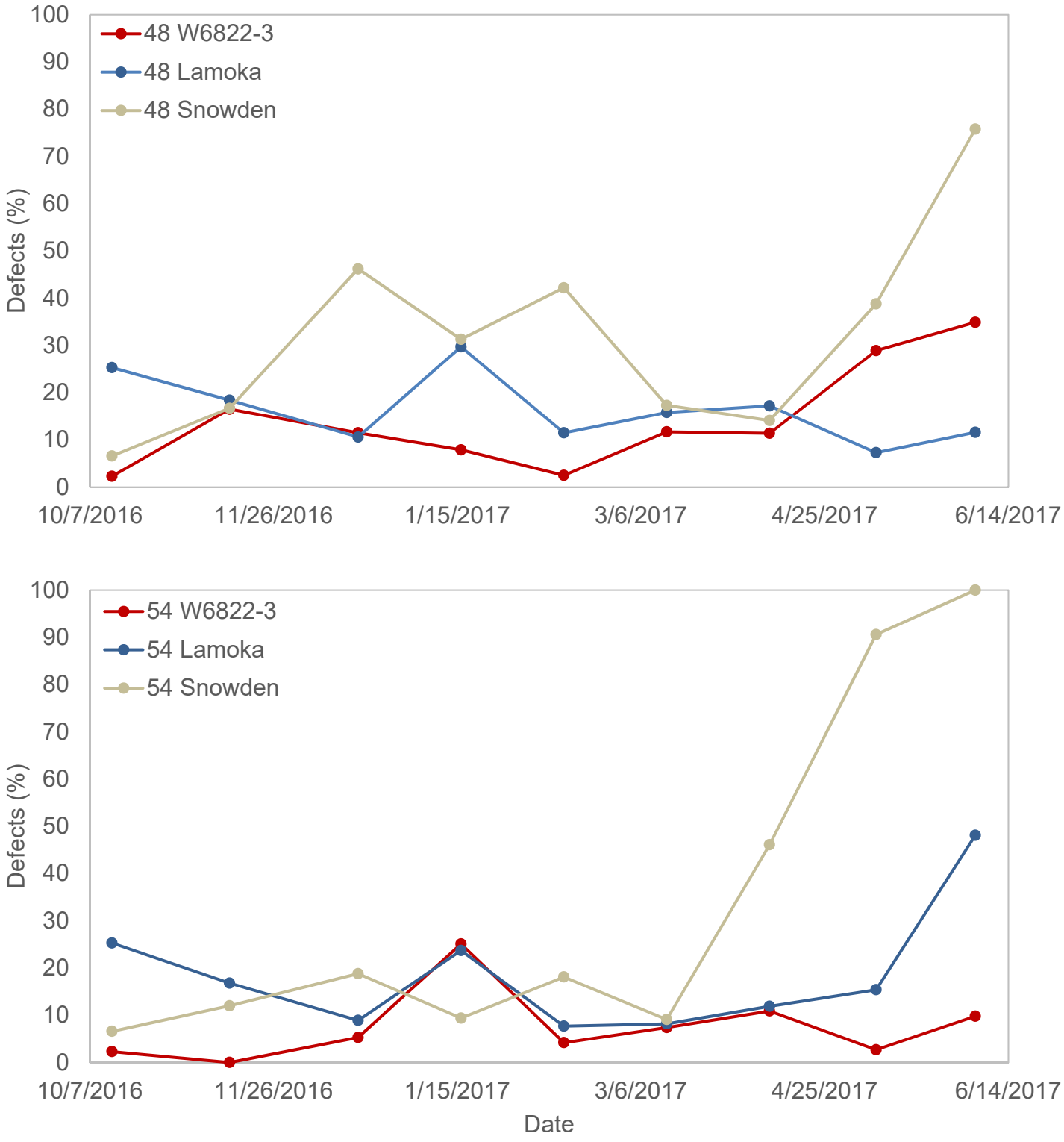
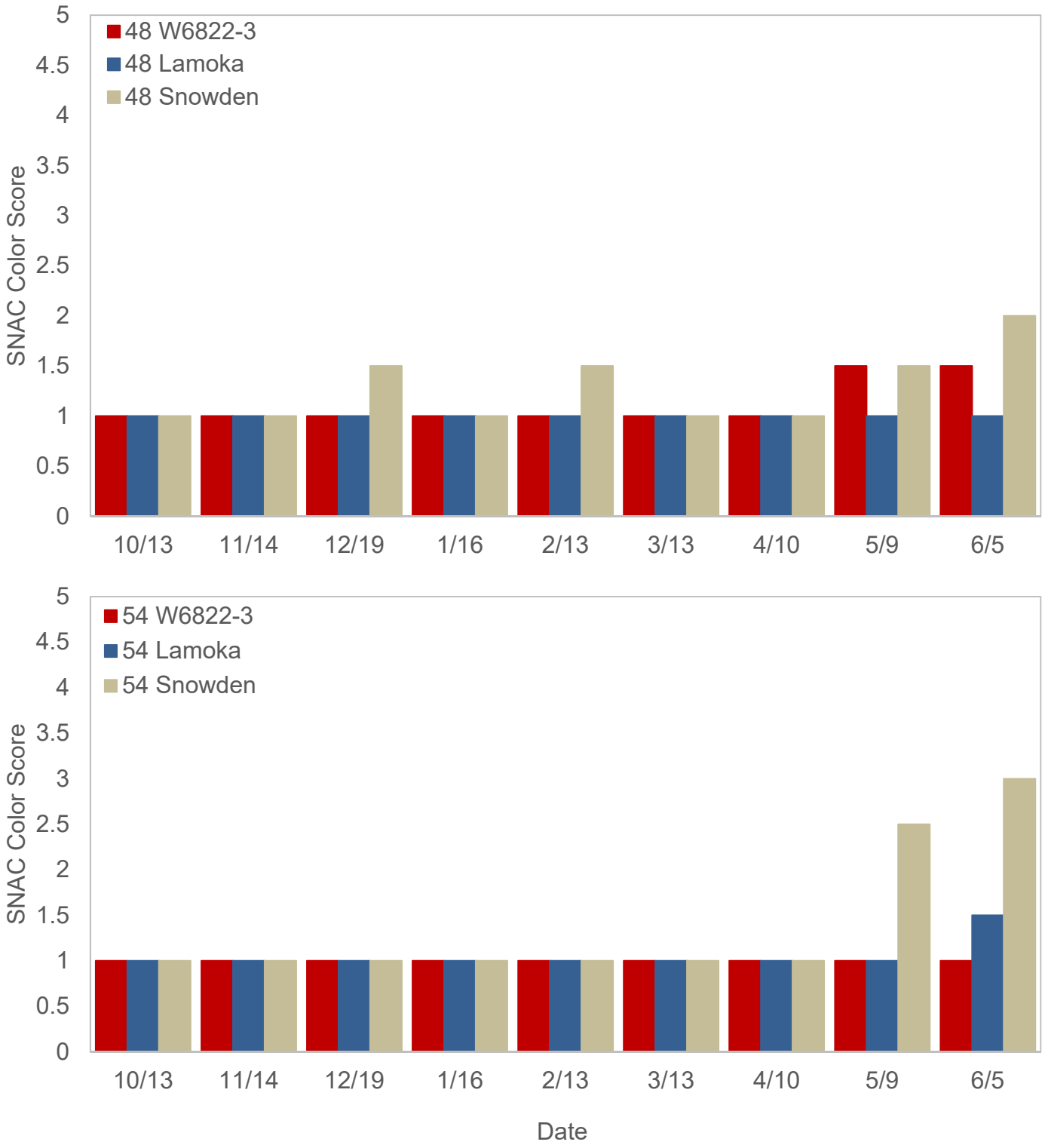


Figure 52. W6822-3 SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.



W8822-1: Compared to both check varieties, W8822-1 tended to have higher glucose concentrations, but similar or lower sucrose concentrations throughout storage (Figures 53-54). Defects trended above 40% and were higher than either check variety until the end of storage when Snowden defects surpassed W8822-1 (Figure 55). W8822-1 SNAC color scores were consistently a 0.5 rating higher than Snowden and Lamoka (Figure 56). This variety stored similarly at both temperature treatments.

Table 18. W8822-1 monthly chip quality pictures from Techmark Inc.

Month	48°F	54°F
October		
November		
December		
January		

February		
March		
April		
May		
June		

Figure 53. W8822-1 glucose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

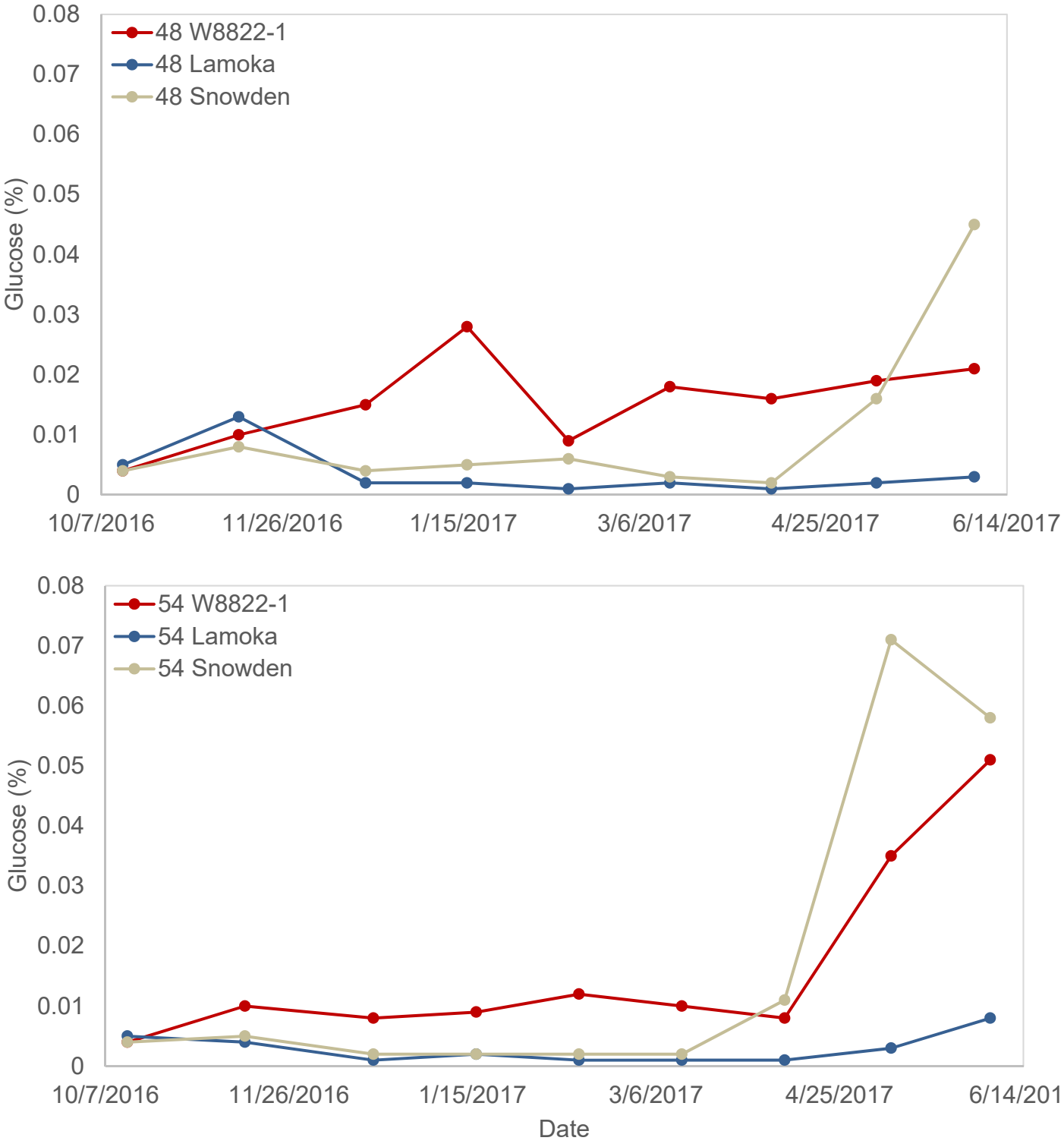


Figure 54. W8822-1 sucrose concentrations for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

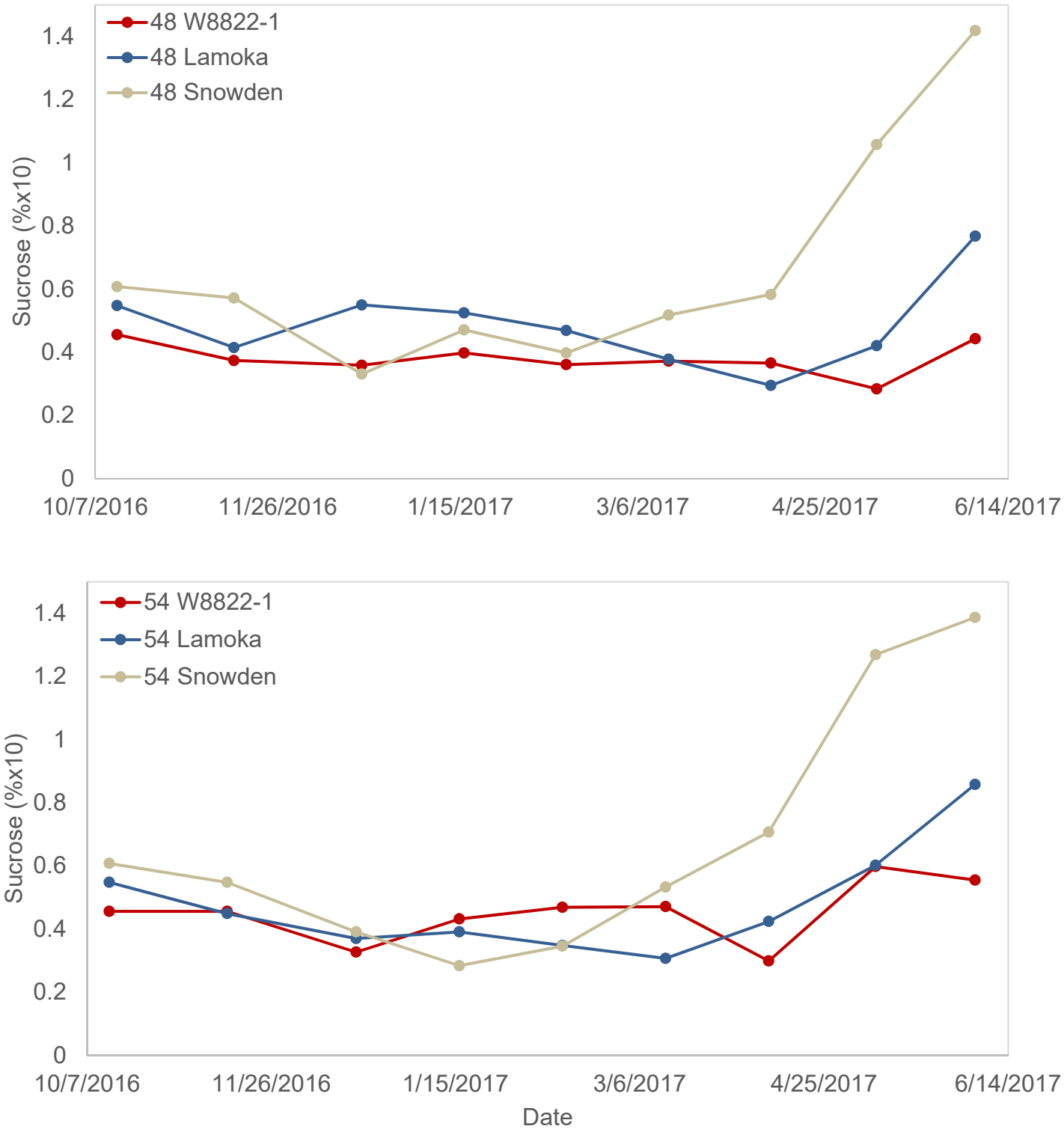


Figure 55. W8822-1 percent defects for the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.

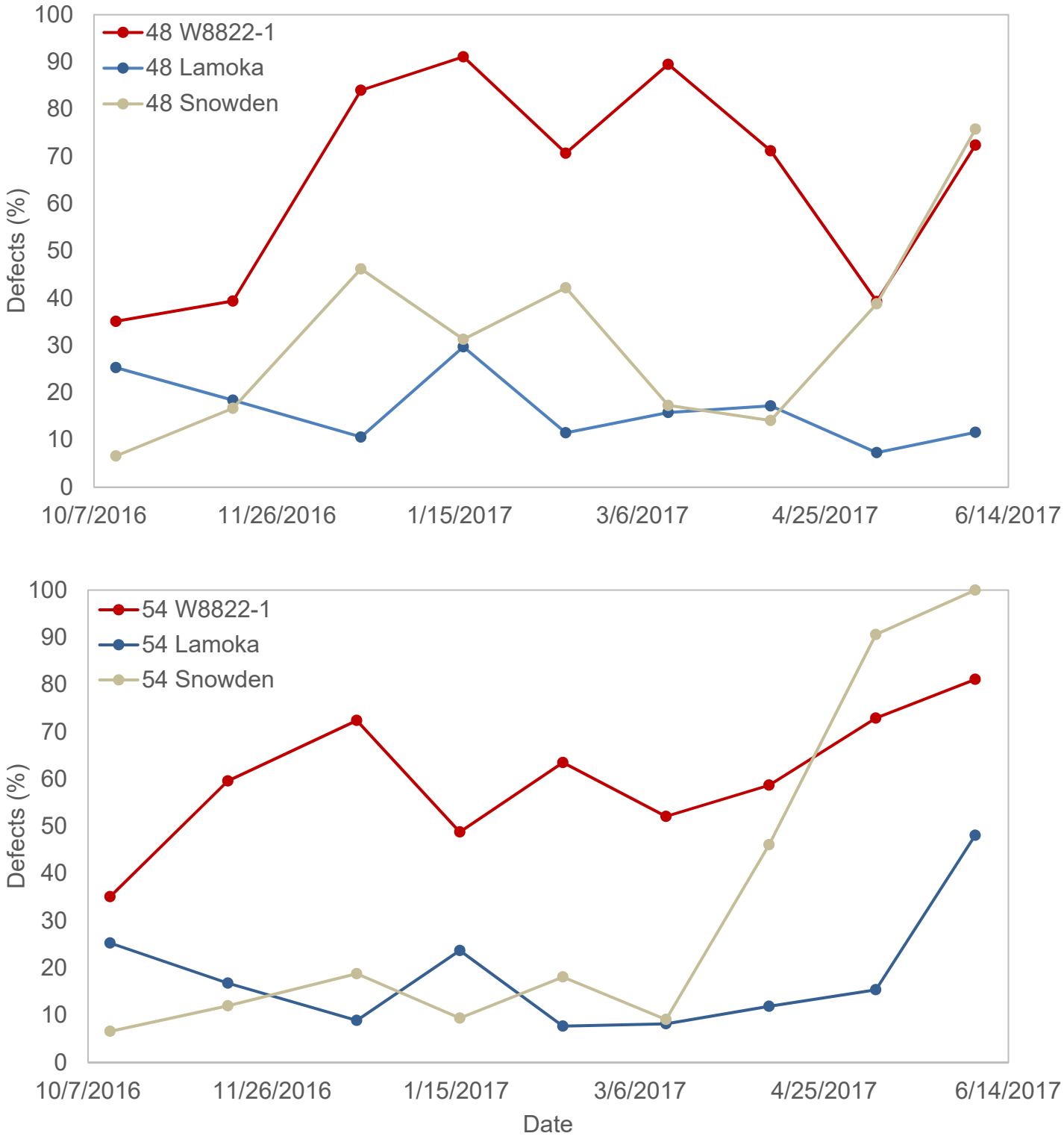


Figure 56. W8822-1 SNAC Color Score (1 = lightest, 5 = darkest) the 2016-2017 storage duration at 48°F (top) and 54°F (bottom) compared to Lamoka and Snowden.