

USPB / SFA OUT-OF-STORAGE CHIP QUALITY 2010-2011 MICHIGAN REGIONAL REPORT

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Procedure:

The 2010 USPB / SFA Chip Trial was harvested on October 8, 2010 at Sandyland Farms LLC, Howard City, MI. The crop experienced 3327 GDD, Base 40 from planting to vine kill. At harvest, several chip storage samples were collected from each variety. Two, 40 pound samples were collected from each entry and placed in the cooperating grower's commercial storage for evaluation in January and April of 2011 at Herr Foods, Nottingham, PA. The 40 pound tuber samples placed in the grower's commercial storage were removed from storage in mid-January 2011 with a pile temperature of 57 °F and in mid April 2011 with a pile temperature of 55 °F. For sprout control, CIPC was applied to the storage in November 2010.

Twenty-four, 30 tuber samples were also collected from each trial entry at harvest and stored in two bulk storages at the Michigan Potato Industry Commission's (MPIC), Cargill Potato Demonstration Storage Facility. One set of twelve samples were stored at approximately 54°F for monthly evaluation from October 2010 through June 2011. The remaining twelve, 30 tuber samples, were stored at approximately 50°F and evaluated from October 2010 to May 2011. These samples from the MPIC storage were processed at Techmark, Inc. for a glucose value (percent of fresh weight), a sucrose rating (percent of fresh weight X 10), an SFA color score and an undesirable chip color score. The undesirable chip color score was reported as a percentage, by weight, of the total chips that were evaluated. For sprout control, CIPC was applied in the MPIC storages in November 2010.

Results:

Tables 1 and 2 summarize the chip quality of the 40 pound samples after being processed at Herr Foods, Inc. on January 12th, 2011 and April 4th, 2011. The varieties are listed in yield order, high to low, top to bottom, based on the 2010 field trial data, not based on Herr's quality rankings. As seen in Table 1, NY139, Snowden and NY138 exhibited the least amount of chip defects. Snowden and NY138 had the best SFA chip score. Overall, Herr Foods ranked NY138 as the top performing variety in the January 12th fry test.

From Table 2, W2310-3 was selected by Herr's as being the best overall performer in the April 4th fry test. Ranking second in this same fry test was MSL292-A which boasts the lowest amount of total chip defects of any line tested at 11.1 percent. MSL292-A was followed by NY138 at 14.4 percent and W2310-3 at 17.2 percent.

Figures 1-48 summarize the 30 tuber chip quality samples collected at harvest from each entry and stored at the MPIC Demonstration Storage in the fall of 2010 at two temperatures. Two graphs are provided for each line at each temperature for a total of four graphs per line. The first graph in each temperature is the sugar concentration and average pile temperature curve, showing the relationship of the bin temperature on physiological age and sugar stability of each variety. The second graph shows the change in SFA chip color and sugar related color defects over time in storage at the given temperature regime. The comments about the varieties below are in yield order, high to low, top to bottom, based on the 2010 field trial results.

AF2291-10: AF2291-10 had an average to below average chip quality performance at Herr Foods on both processing dates (Tables 1-2). Glucose levels were the lowest for this variety at 54 °F between early February and mid April 2011 (Figure 3). This was also reflected in the low percent of color defects recorded in Figure 4 during this same period.

W5015-12: W5015-12 had an average chip quality at Herr Foods (Tables 1-2). The sucrose level declined steadily at both temperatures from October through mid-January (Figures 5, 7). Glucose levels remained stable from the middle of December to the middle of April. At the cooler storage temperature, the glucose level remained stable into mid-May. The sucrose levels did not remain stable for an extended period of time at either temperature, bringing into question the long-term dormancy of this line. W5015-12 appears to have a mid-season dormancy based on the sucrose values recorded.

Snowden: Snowden had an average to above average chip quality performance at Herr Foods on both processing dates (Tables 1-2). Snowden stored acceptably until mid-March 2011 at 50 °F (Figures 9-10). From Figures 10 and 12, the chip quality in this variety was best prior to mid-March or early April 2011.

MSL292-A: This variety was one of the top chip quality performing lines at Herr Foods for both evaluation dates (Tables 1-2). MSL292-A appeared to have stable simple sugars and chip quality at the cooler storage temperature (Figures 13-14). At the warmer storage temperature, dormancy break occurred in mid to late March with little apparent impact on chip quality in April, May and early June (Figures 15-16).

NY138: This variety was the highest ranked chipper at Herr's, January 2011, and placed third in the April 2011 quality evaluation (Tables 1-2). Sucrose levels from the 50 °F samples remained stable all season long with consistently low levels of glucose reported (Figure 17). The samples stored at 54 °F chipped acceptably through late April 2011 (Figures 19-20).

Atlantic: Atlantic provided a reference point for the varieties early in the storage trial. Herr's did not process Atlantic in January or April 2011 (Tables 1-2). Figures 21-24 represent this varieties' performance over a short storage period early in the season at two temperatures.

NY139: Similar in chip quality performance to NY138 and MSL292-A, NY139 chipped well at both dates at Herr Foods (Tables 1-2). Figures 25 and 26 show good chip quality for this variety until mid-May 2011, at 50 °F. Figure 25 shows a decrease in sucrose levels until late April, followed by an increase in sucrose concentration into mid-May 2011. Glucose levels remained relatively low throughout the storage season. The 54 °F samples showed much the

same sugar changes throughout the storage season (Figures 27-28). Sucrose stability appeared to decline in mid-February at the warmer storage temperature (Figure 27).

W2310-3: This variety performed below average on January 12th, at Herr Foods, but was identified as the top performer at the April 4th chip quality evaluation (Tables 1-2). Sucrose levels in the 50 °F storage samples appeared to be stable into mid-March followed by steady increases to the end of the storage season (Figure 29). Glucose levels remained very stable throughout this same period. This is clearly reflected in the good chip quality reported in Figure 30. At the warmer storage temperature, this variety lost sugar stability quite rapidly in late March 2011 (Figures 31-32).

W2978-3: W2978-3 was a marginal performing line at Herr Foods, ranking below average on both processing dates (Tables 1-2). Sucrose levels were stable throughout the majority of the season at 50 °F, but the glucose levels were elevated during this same time period, resulting in marginal chip quality (Figures 33-34). The variety appeared to have less free glucose at 54 °F, resulting in slightly better processing quality at the warmer storage temperature (Figures 35-36).

CO97065-7W: CO97065-7W had a below average performance at Herr Foods on both processing dates (Tables 1-2). Figures 37 and 38 show this varieties chip quality decline rapidly as it was cooled to 48 °F. The chip quality of this variety was best when the variety was maintained at a warm pile temperature and processed before mid-April 2011 (Figures 39-40). A higher pile storage temperature between 55-58 °F may be better for this varieties chip performance.

MSJ126-9Y: This variety was ranked average to below average for both processing dates at Herr Foods (Tables 1-2). The 50 °F storage samples showed the sucrose levels declining from October to late February and remained stable until late March 2011 (Figure 41). MSJ126-9Y performed well all season long when stored at 50 °F (Figure 42). Chip performance was acceptable from 54 °F storage until early April 2011 (Figure 44).

CO97043-14W: This variety exhibited above average chip quality at Herr Foods at the early processing date (Table 1). In April, Herr Foods ranked CO97043-14W last of twelve lines in chip quality performance (Table 2). The sucrose levels in the 50 °F samples were relatively stable throughout the storage season, with elevated glucose readings occurring later in the season, from mid-December 2010 until mid-May 2011 (Figure 45). The chip quality remained acceptable until early March with no major impact from the variable glucose levels (Figure 46). This variety had similar sucrose and glucose levels at 54 °F as were observed at 50 °F over the same time period (Figure 47). Similar chip quality was observed at both temperatures (Figures 46, 48).

W2717-5: There was no data for this variety from Herr's at the January 12th, 2011, processing date. W2717-5 ranked slightly below average on April 4th at Herr Foods. Sucrose levels declined steadily from October 2010 to mid-April 2011 with glucose values remaining low across this evaluation period (Figure 49). Chip quality appeared to be very good all season long for this variety at 50 °F (Figure 50). The sugar stability and consequently the chip quality declined in late March for this variety due to the warmer storage temperature (Figures 51-52).

Table 1. 2010-2011 Out-of-Storage Chip Quality, January 12, 2011, Sandyland Farms, LLC ¹.

Entry	Agtron	SFA ²	Specific	Percent Chip Defects ³			Comments
	Color	Color	Gravity	Internal	External	Total	
AF2291-10	54.3	4.0	1.075	31.6	3.7	35.3	Internals: Bruise showing on chips. Smooth skin, a few bruise. Oversize to 5".
W5015-12	58.2	3.0	1.070	4.4	19.3	23.7	Internals: Good chip color. Externals: A lot of scab, stem end rot.
Snowden	55.3	2.0	1.075	3.5	8.9	12.4	Internals: Nice chip color. Externals: Some scab. Good size.
MSL292-A	57.4	3.0	1.074	12.5	12.0	24.5	Internals: Light stem end. Externals: A few bruise, green.
NY138	58.0	2.0	1.069	13.3	1.4	14.7	Internals: Nice chip color. Nice externals, good skin. Oversize to 5".
NY139	61.2	3.0	1.071	5.4	5.2	10.6	Internals: One HH, light vascular. Good externals. Large grade up to 4".
W2310-3	59.5	3.0	1.081	9.8	9.2	19.0	Internals: A few HH. Externals: Some bruise, strach pockets, green. Oblong to 5".
W2978-3	56.5	3.0	1.058	17.6	10.8	28.4	Internals: Some light stem end color. Externals: Light bruise, nice skin. Good size, a few oblong 4".
CO97065-7W	53.5	4.0	1.063	16.8	7.7	24.5	Internals: Shading in chips. Externals: A few pitted scab, green. Good size.
MSJ126-9Y	57.2	4.0	1.062	27.9	4.5	32.4	Internals: Stem end color. Externals: Nice, no scab. Good size.
CO97043-14W	63.6	3.0	1.062	8.3	10.3	18.6	Internals: Nice chip color. Externals: A few small defects. Small size profile.

¹ Samples removed from 57 °F storage and processed by Herr Foods Inc., Nottingham, PA on January 12, 2011.

Chip defects are included in Agtron and SFA samples.

² SFA Color: 1= lightest, 5 = darkest

³ Percent Chip Defects are a percentage by weight of the total sample; comprised of undesirable color, greening, internal defects and external defects.

Table 2. 2010-2011 Out-of-Storage Chip Quality, April 4, 2011, Sandyland Farms, LLC ¹.

Entry	Agtron	SFA ²	Specific	Percent Chip Defects ³			Comments
	Color	Color	Gravity	Internal	External	Total	
AF2291-10	59.4	4.0	1.075	21.3	10.0	31.3	Internals: Stem end color in chips. Externals: A few light scab. Too oblong.
W5015-12	58.8	4.0	1.071	10.5	16.3	26.8	Internals: Some vascular, stem end, green on chips. Heavy external defects. Good size.
Snowden	62.7	3.0	1.075	11.3	9.0	20.3	Internals: A couple light shading, overall nice chip color. Externals: A few pitted scab. Nice size profile.
MSL292-A	62.2	2.0	1.066	4.3	6.8	11.1	Internals: Nice chip color. Externals: A few scab. Large grade.
NY138	63.4	3.0	1.065	8.6	5.8	14.4	Internals: A few with light shading in center. Nice externals. Large grade.
NY139	63.2	2.0	1.062	6.3	16.4	22.7	Internals: 1 HH, nice chip color. Nice externals.
W2310-3	60.8	3.0	1.075	11.1	6.1	17.2	Internals: Nice chip color. Externals: A few light scab, nice grade overall. Large size to 4".
W2978-3	63.9	4.0	1.059	13.7	25.0	38.7	Internals: Stem end and vascular color in chips. Externals: Lesions, scab. Nice size.
CO97065-7W	52.6	5.0	1.065	19.1	9.7	28.8	Internals: Poor chip color, a lot of shading. Externals: Some pitted scab.
MSJ126-9Y	59.5	3.0	1.062	19.2	6.7	25.9	Internals: A few light stem end, overall nice chip color. Externals: A few pitted scab. Nice size profile.
CO97043-14W	61.5	5.0	1.068	18.2	13.2	31.4	Internals: Hollow heart, some rot, poor chip color. Externals: Pitted scab. Large grade.
W2717-5	59.3	4.0	1.072	14.0	25.4	39.4	Internals: Fusarium dry rot, some vascular blotching. Externals: heavy pitted and surface scab. Good size.

¹ Samples removed from 55 °F storage and processed by Herr Foods Inc., Nottingham, PA on April 4, 2011.

Chip defects are included in Agtron and SFA samples.

² SFA Color: 1=lightest, 5=darkest

³Percent Chip Defects are a percentage by weight of the total sample; comprised of undesirable color, greening, internal defects and external defects.

Figure 1.

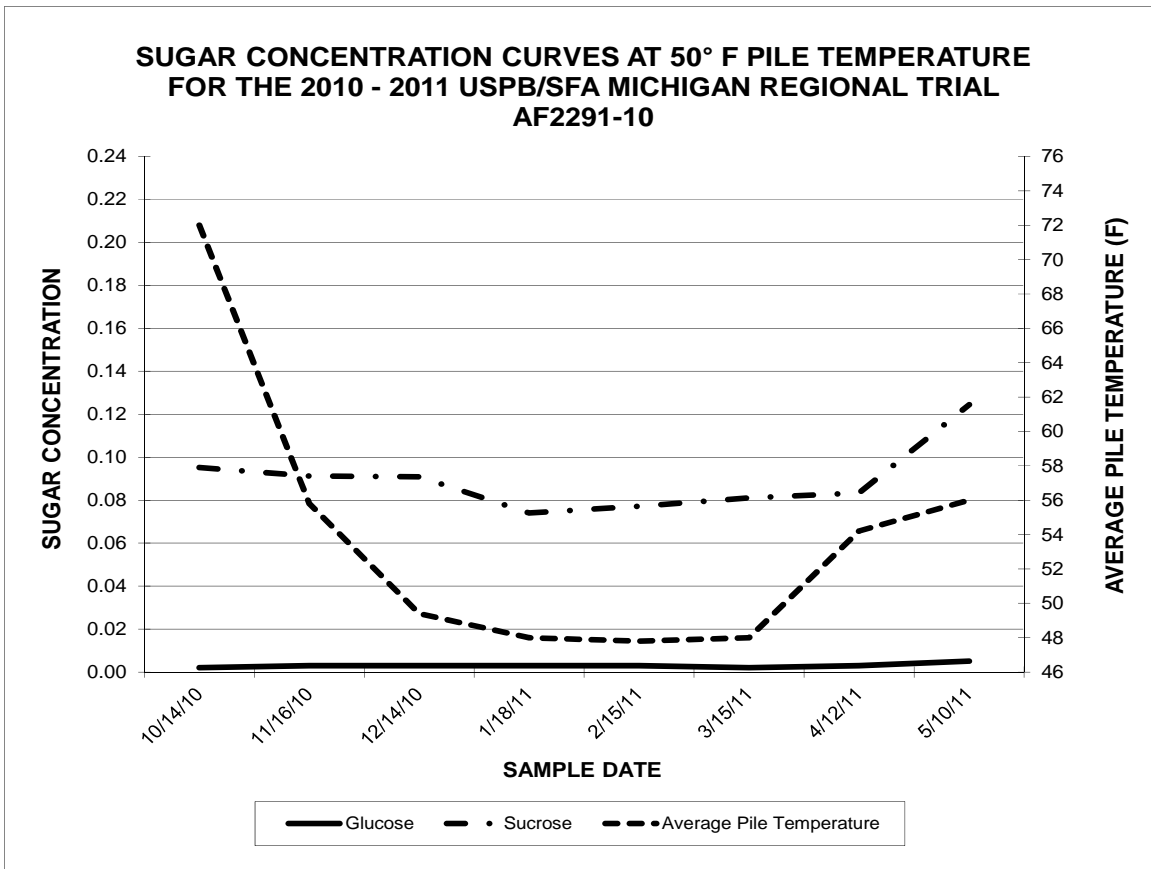


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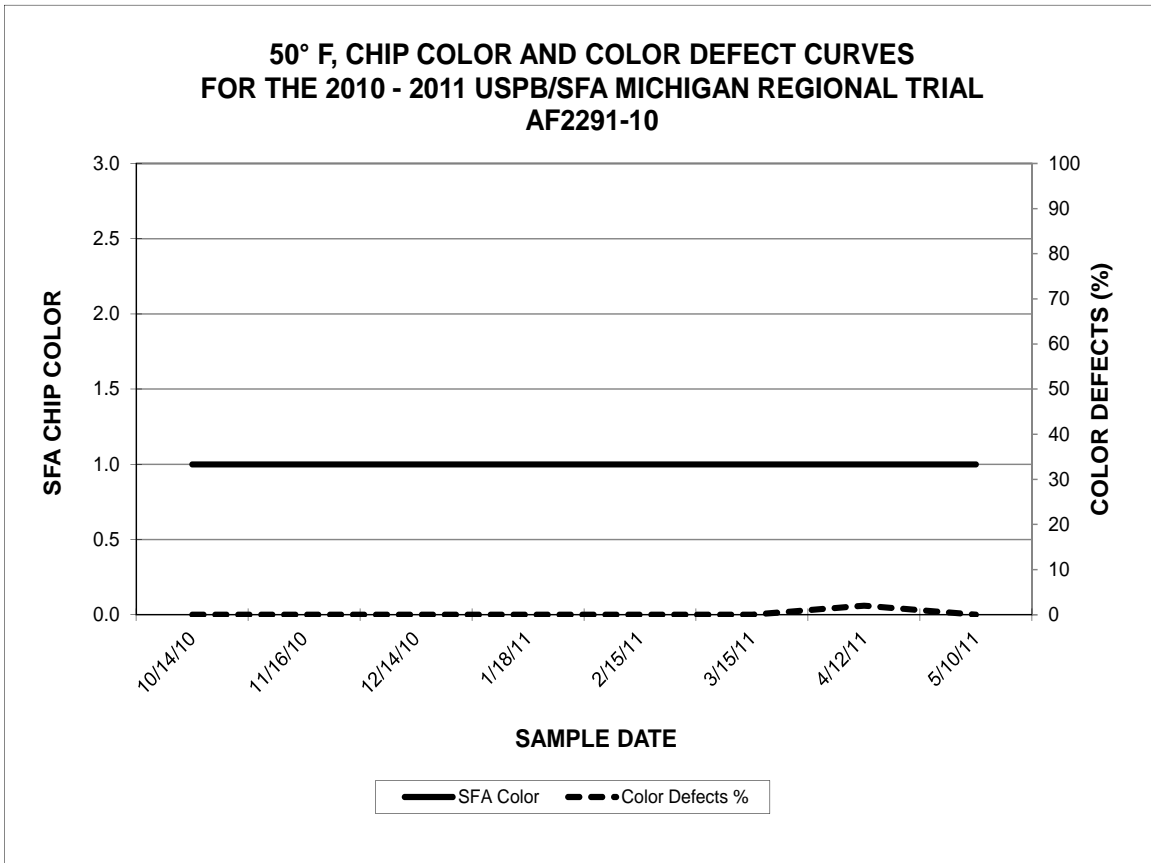


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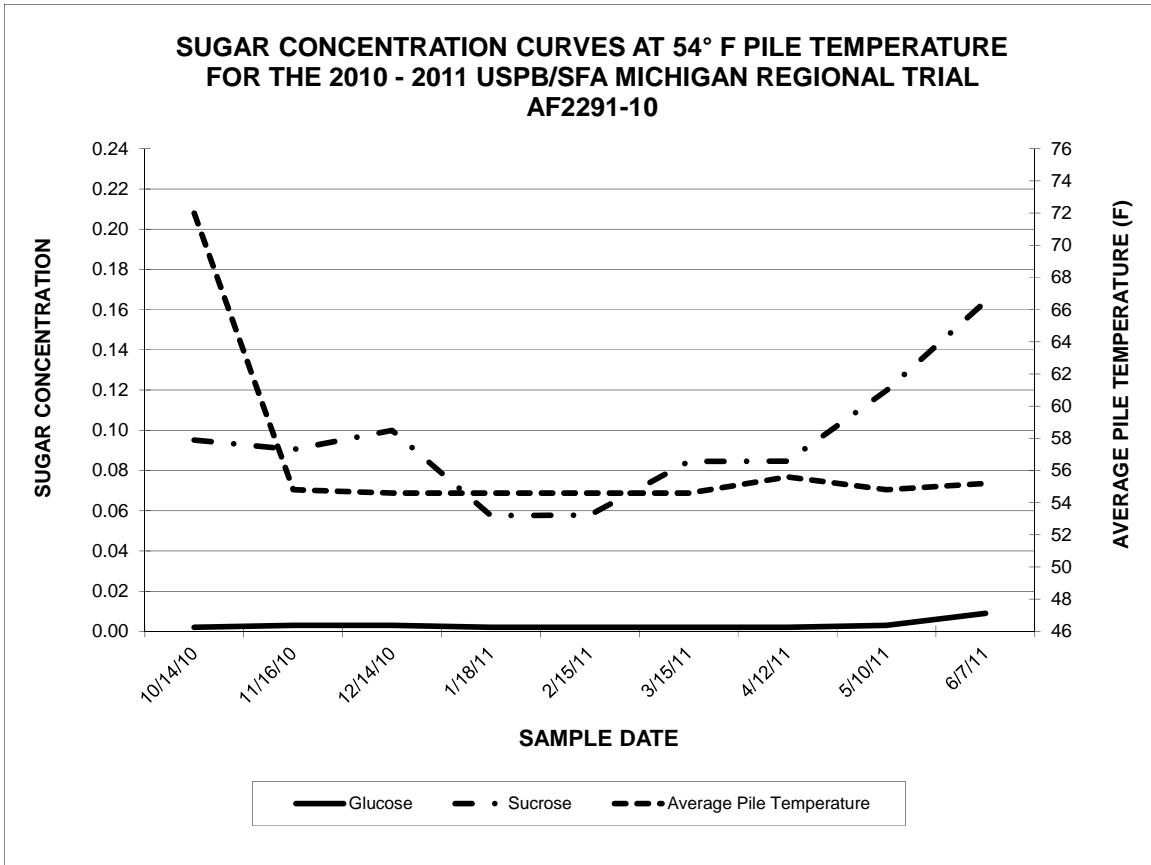


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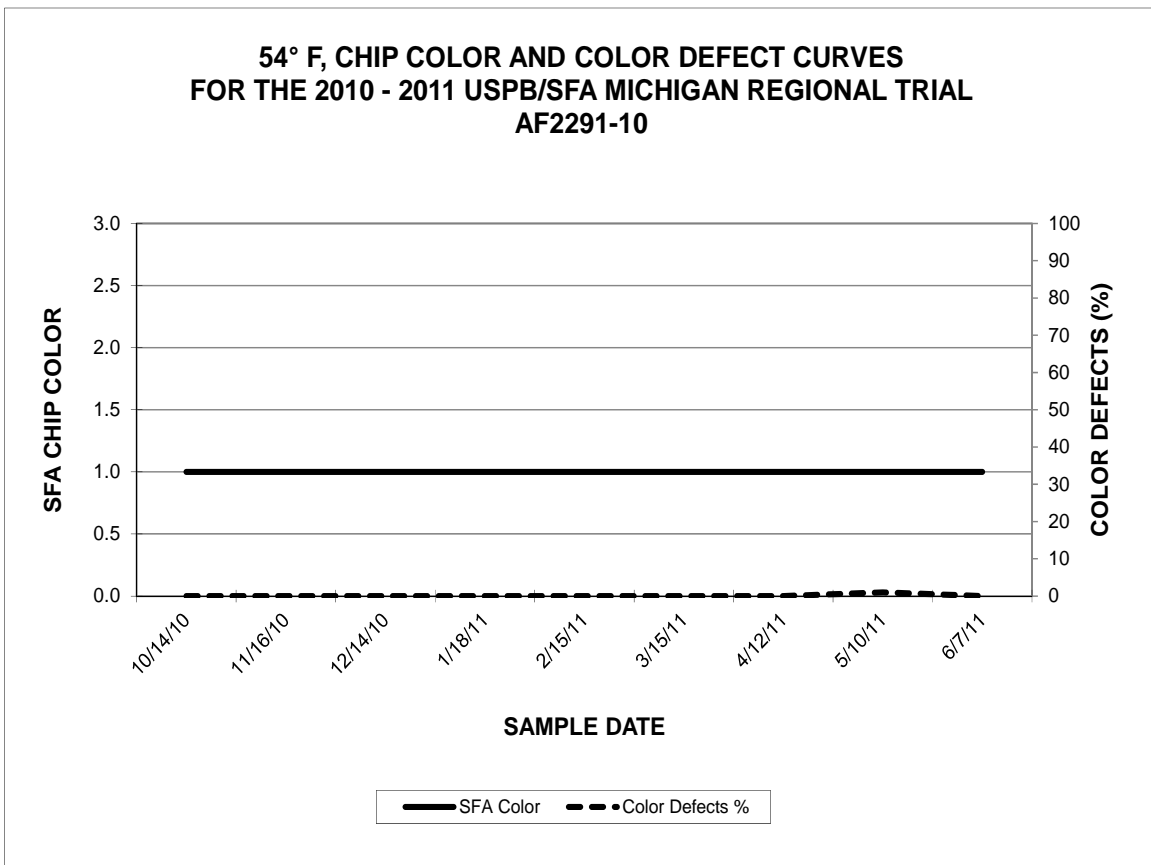


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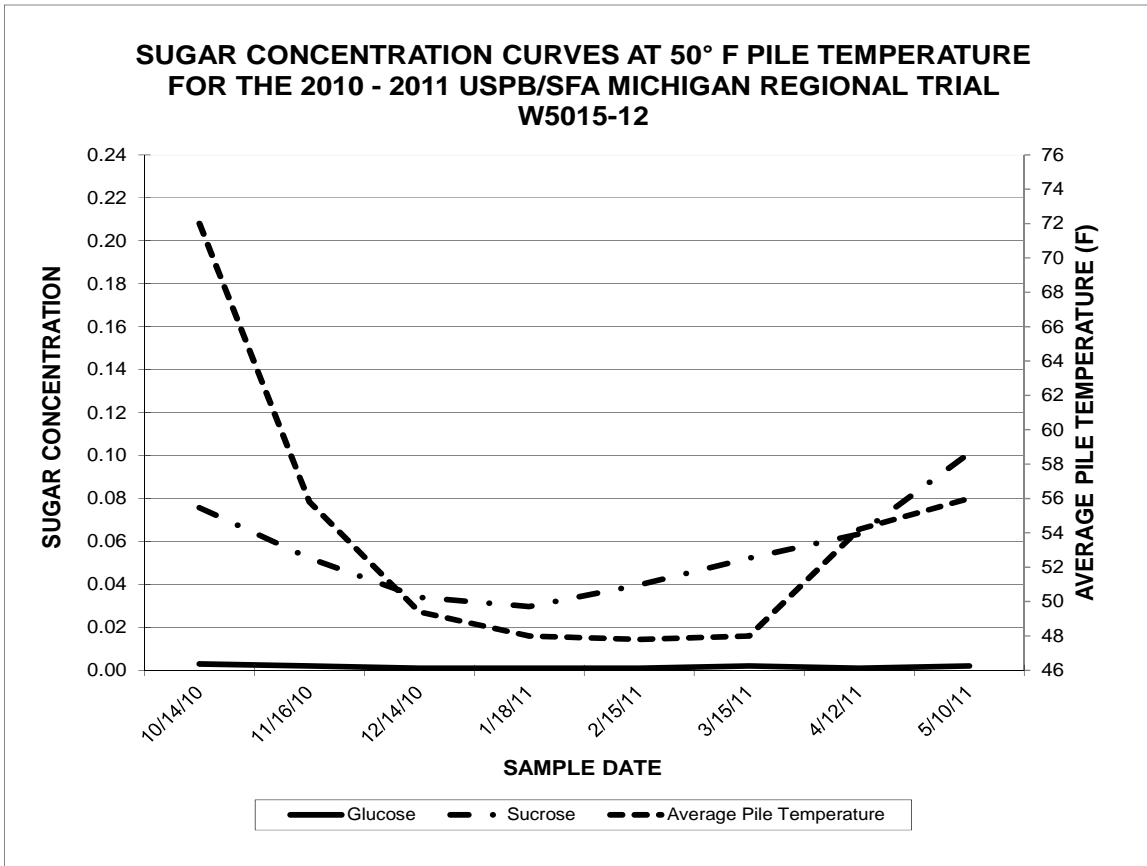


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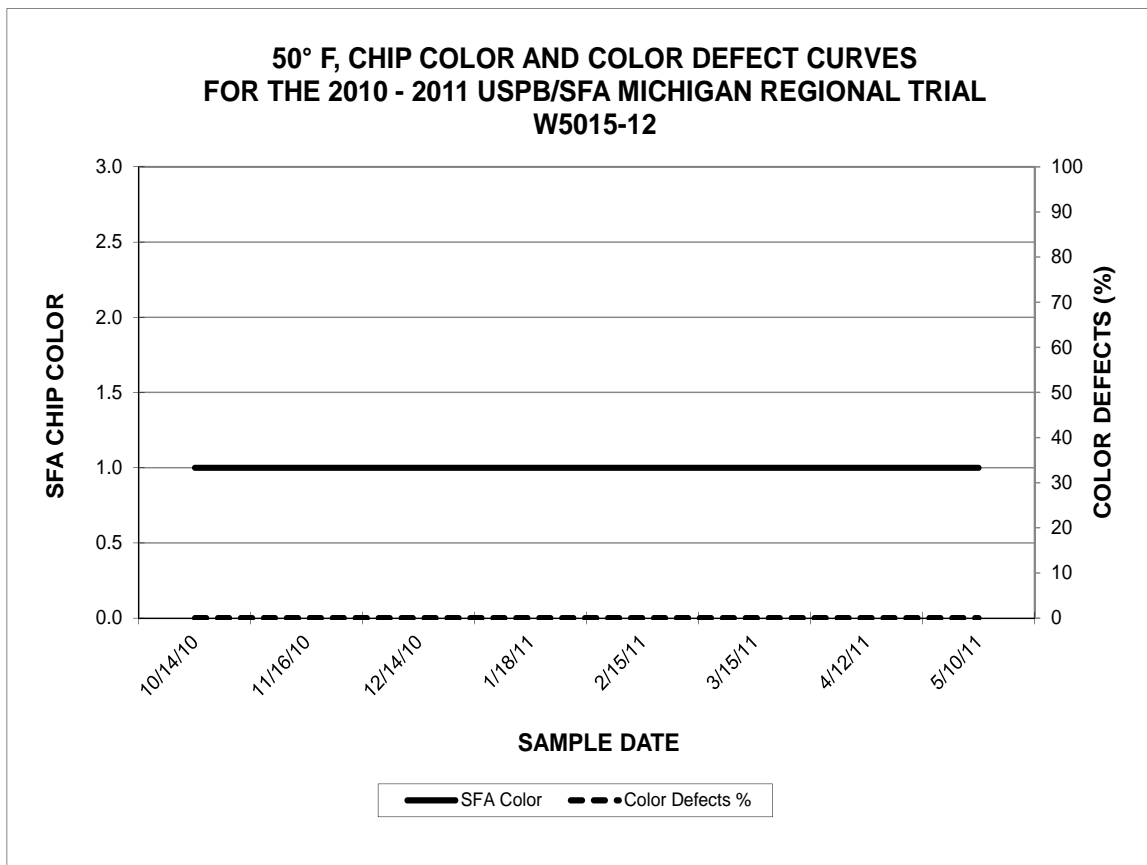


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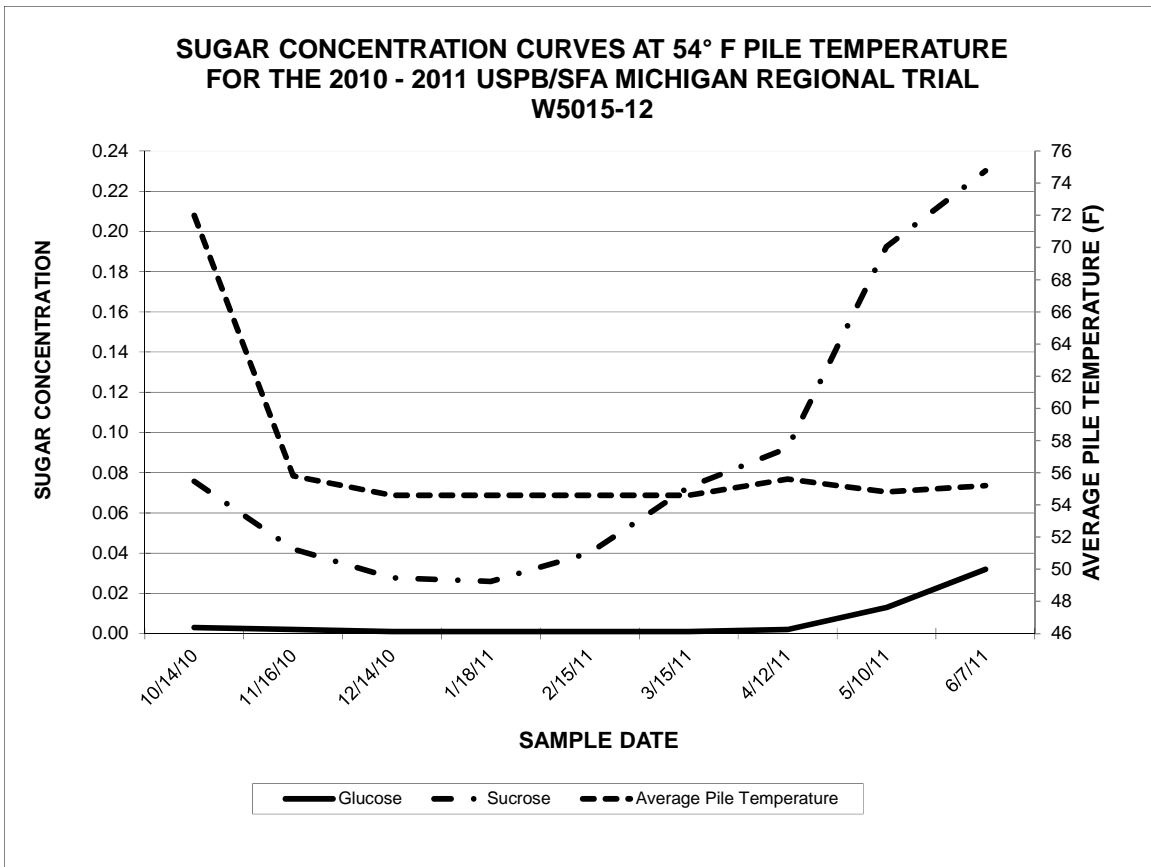


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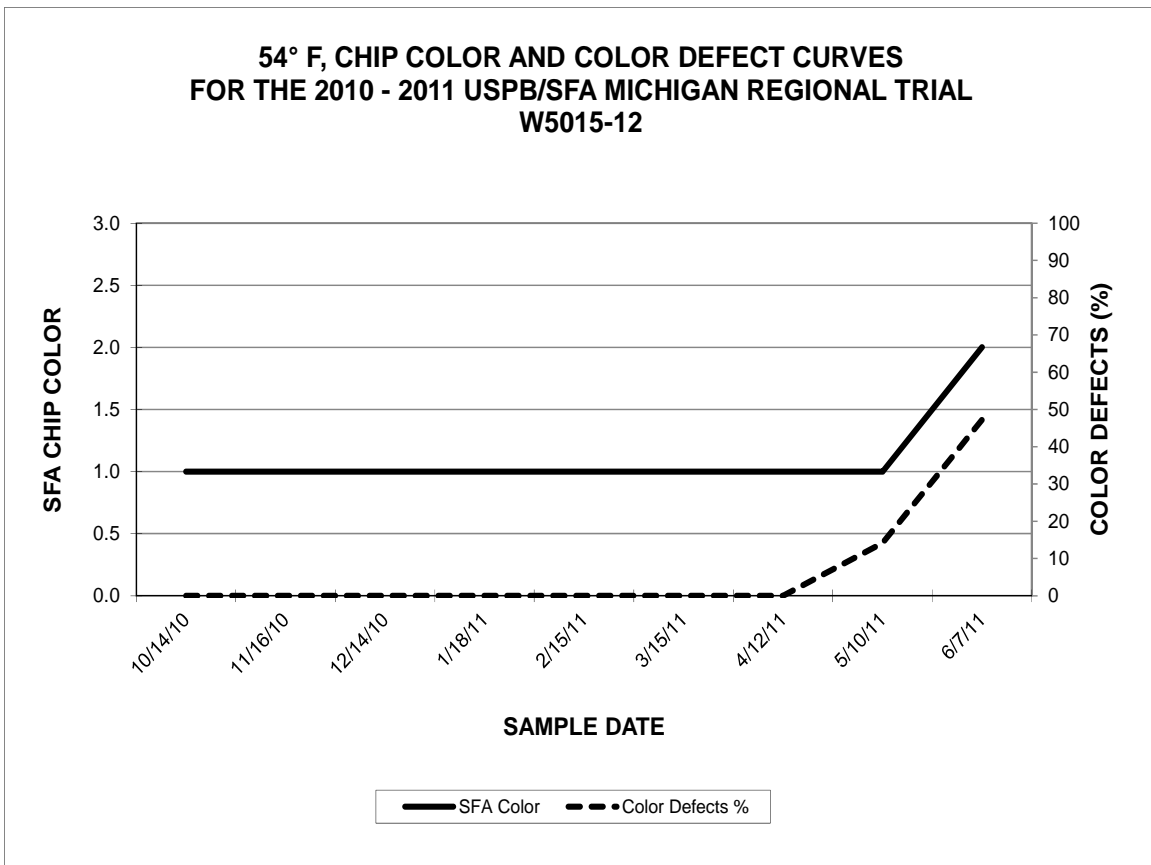


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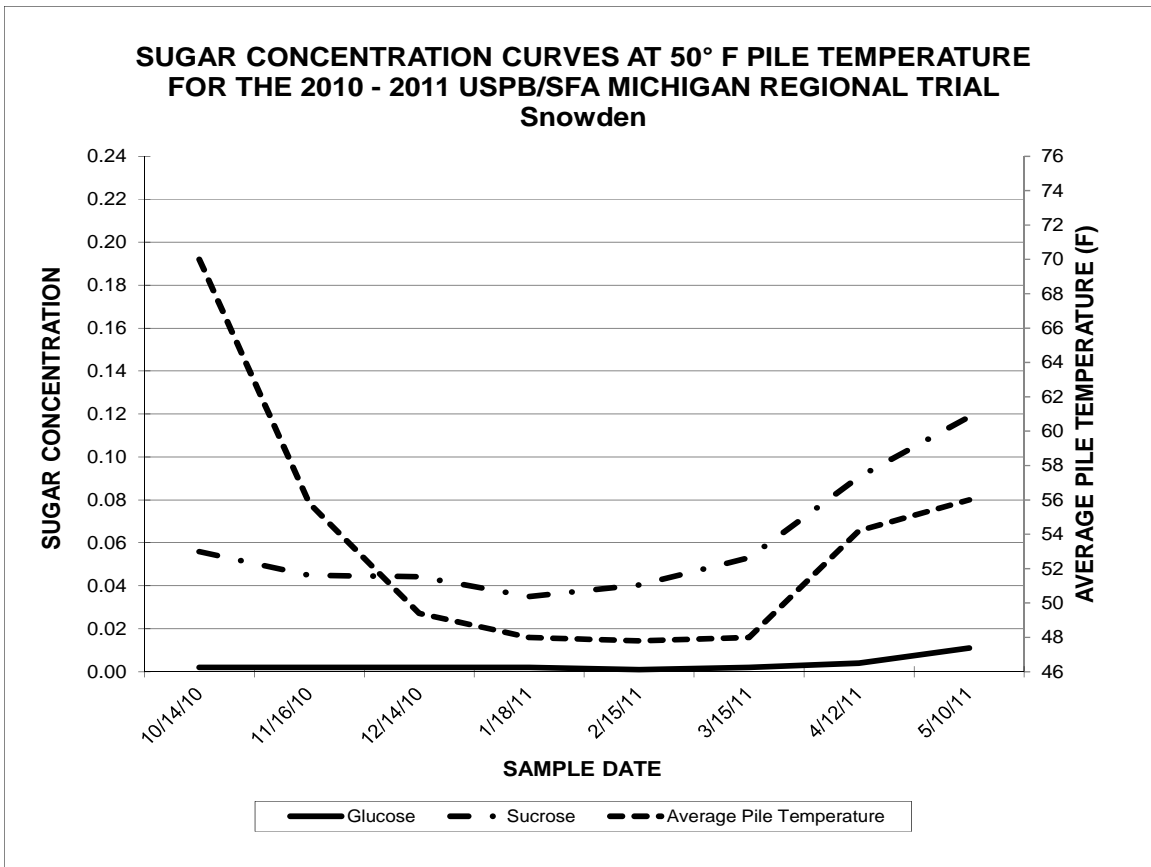


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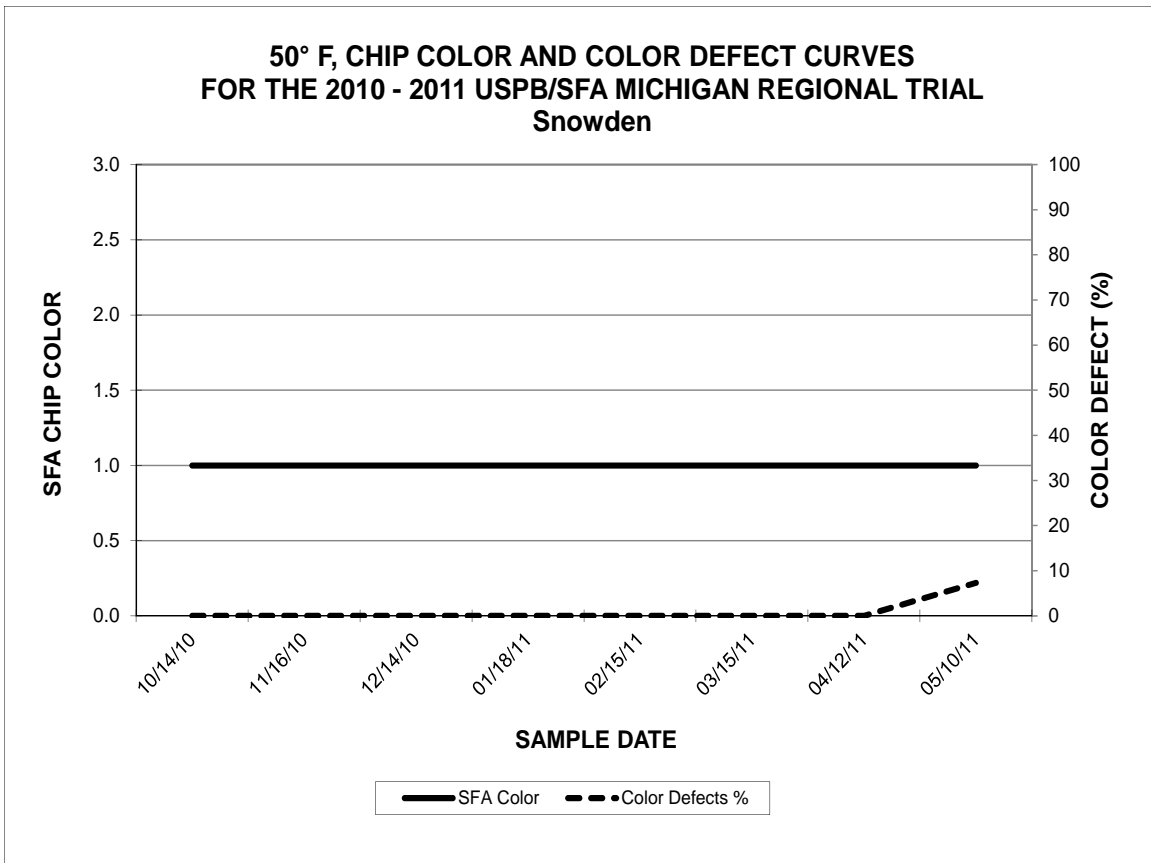


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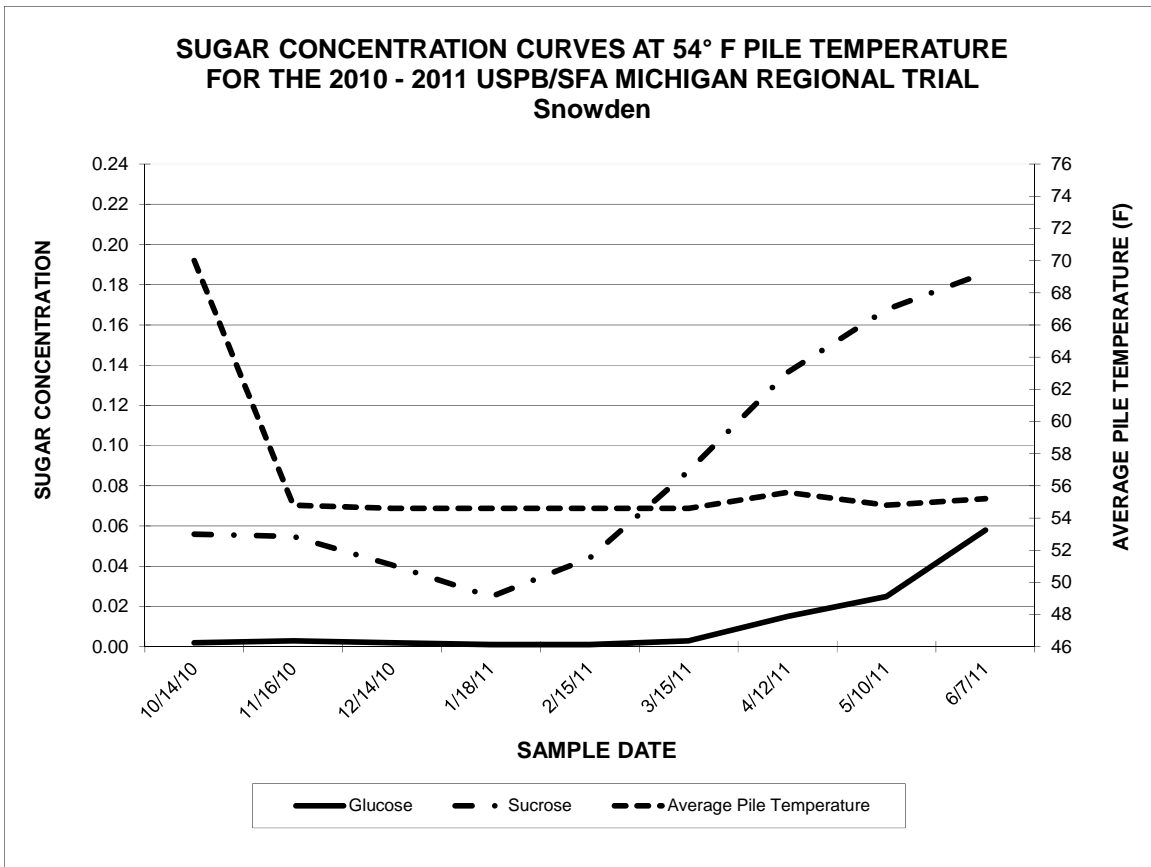


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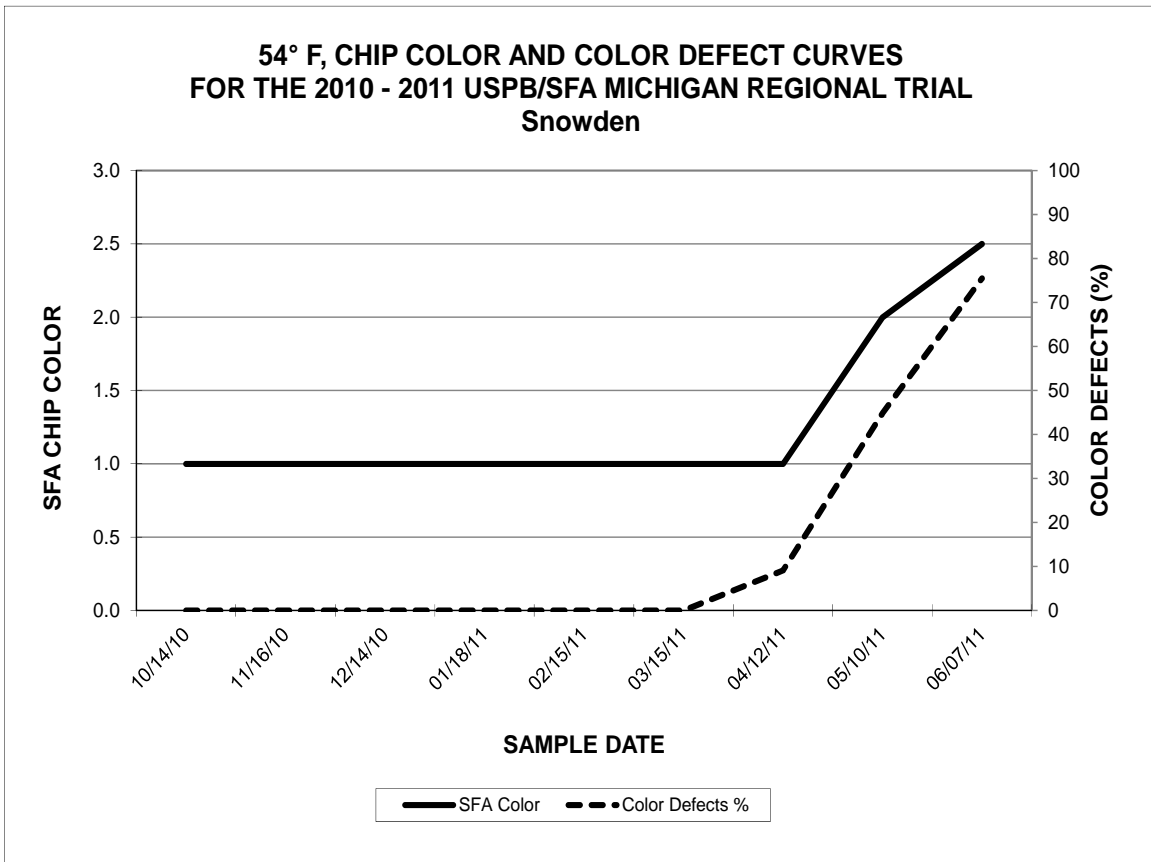


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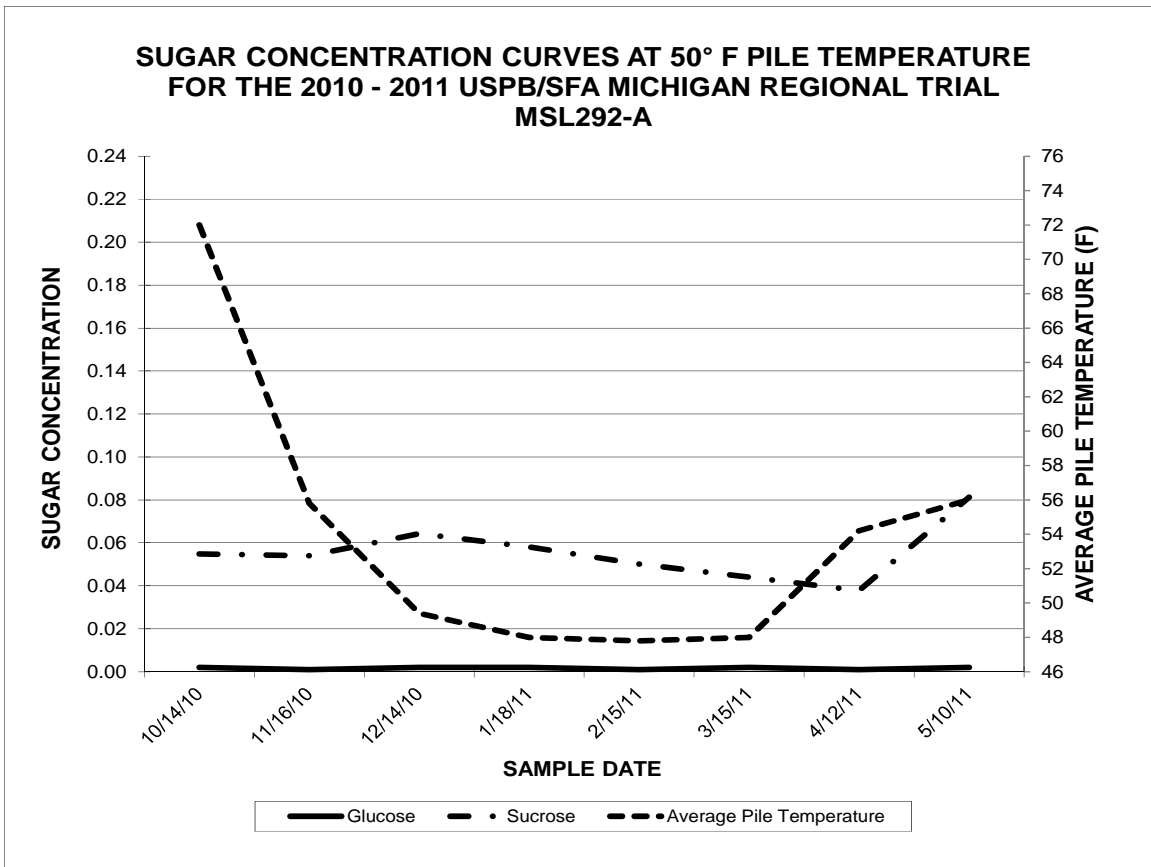


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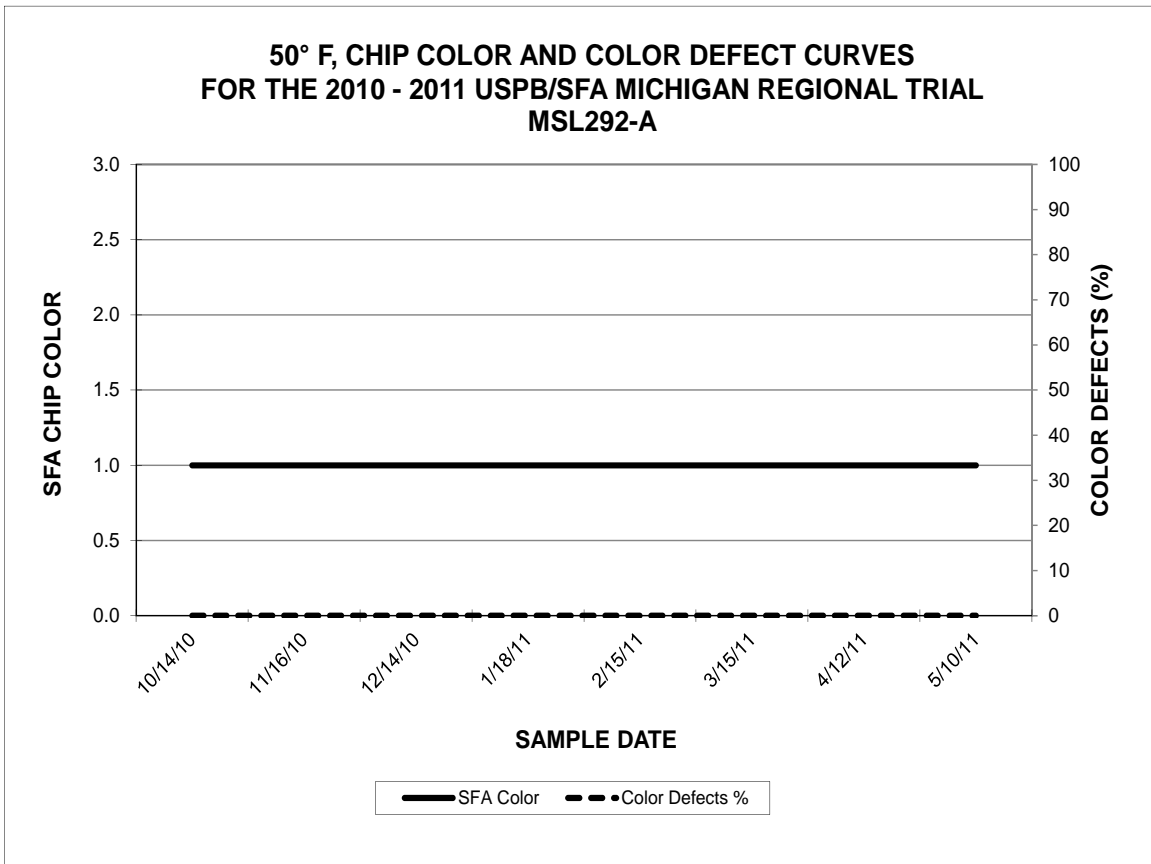


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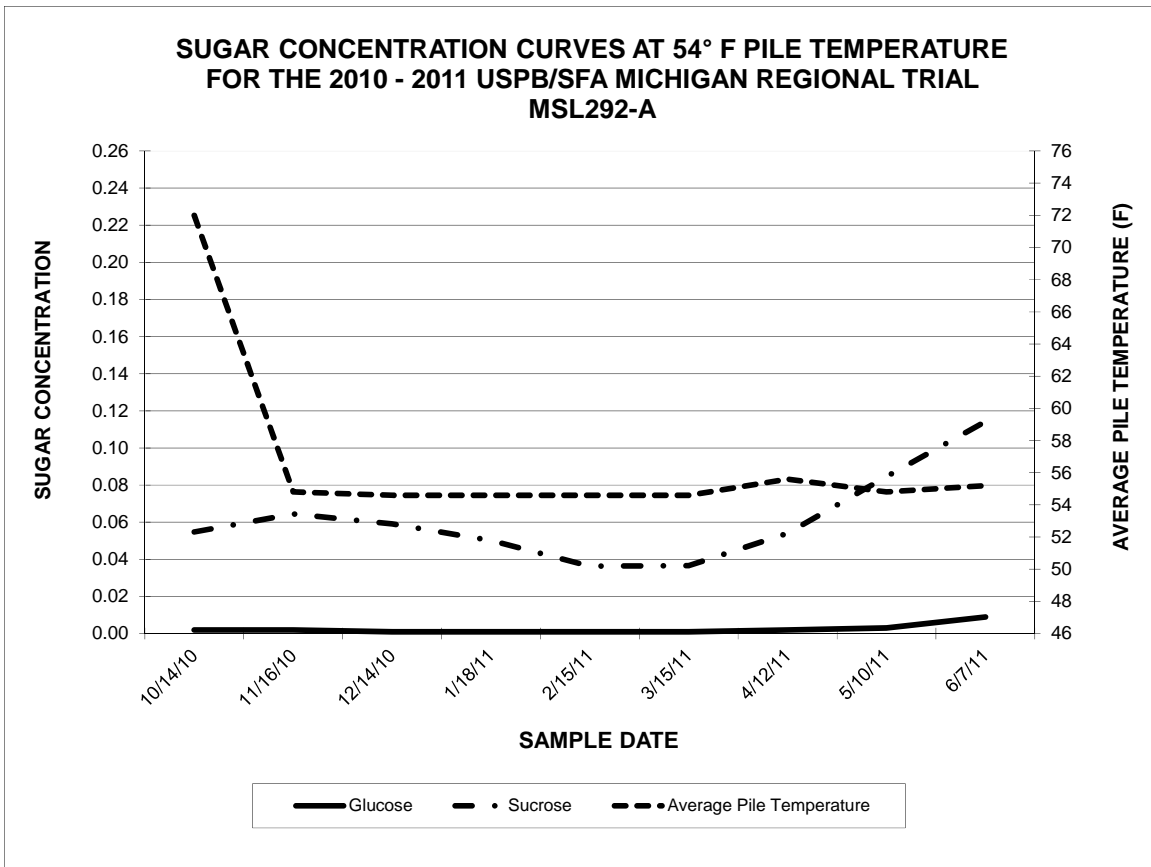


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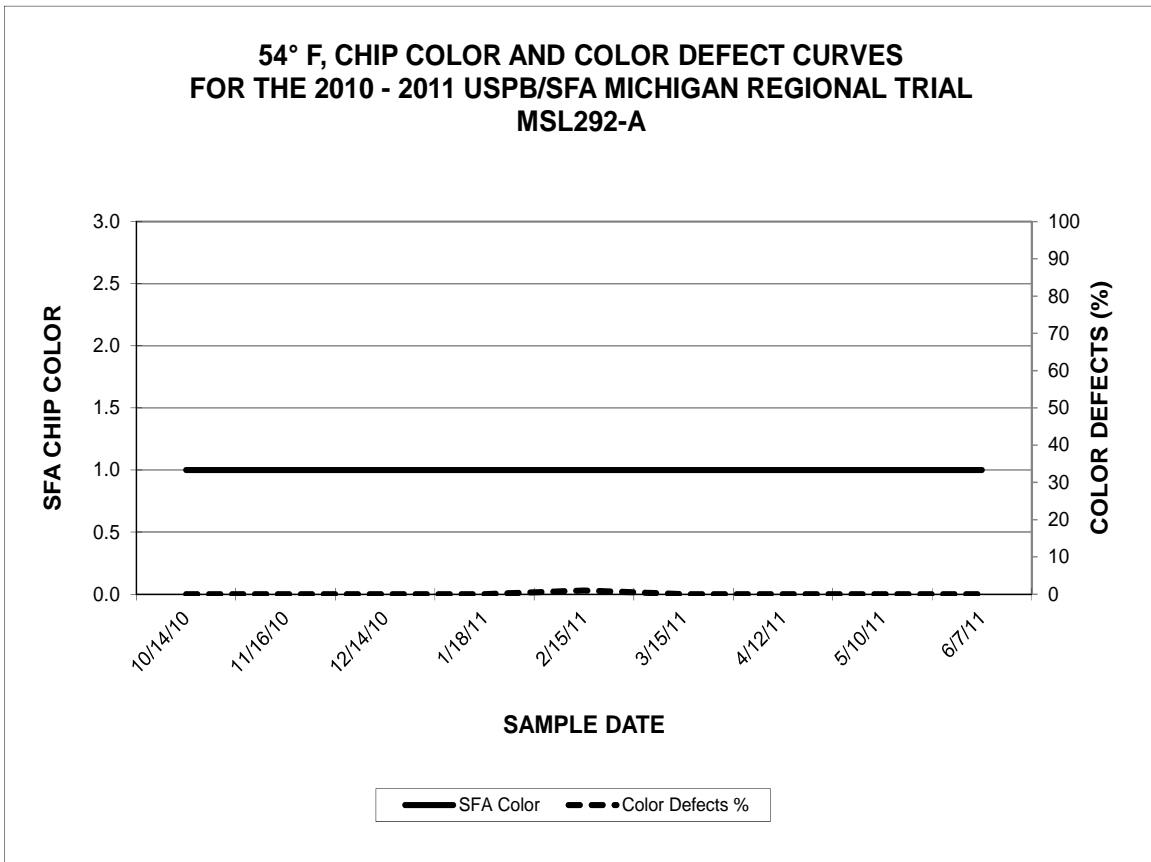


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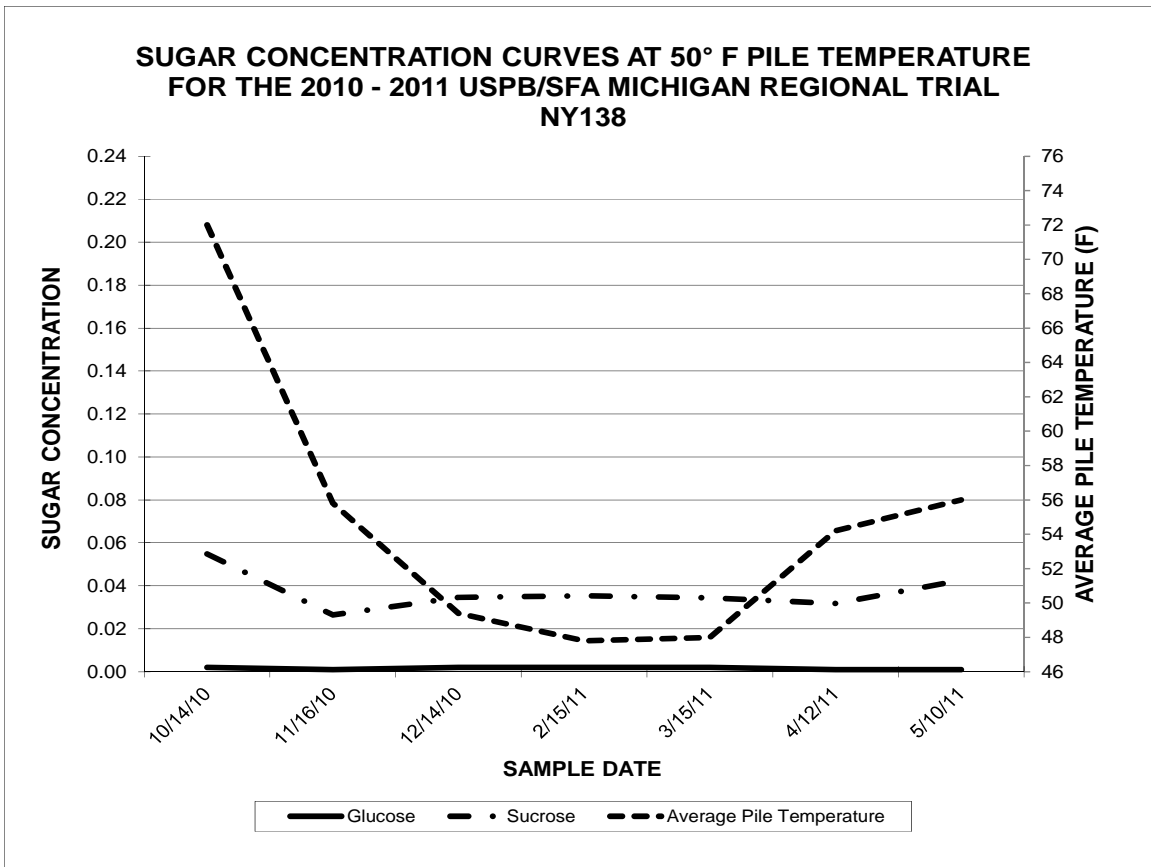


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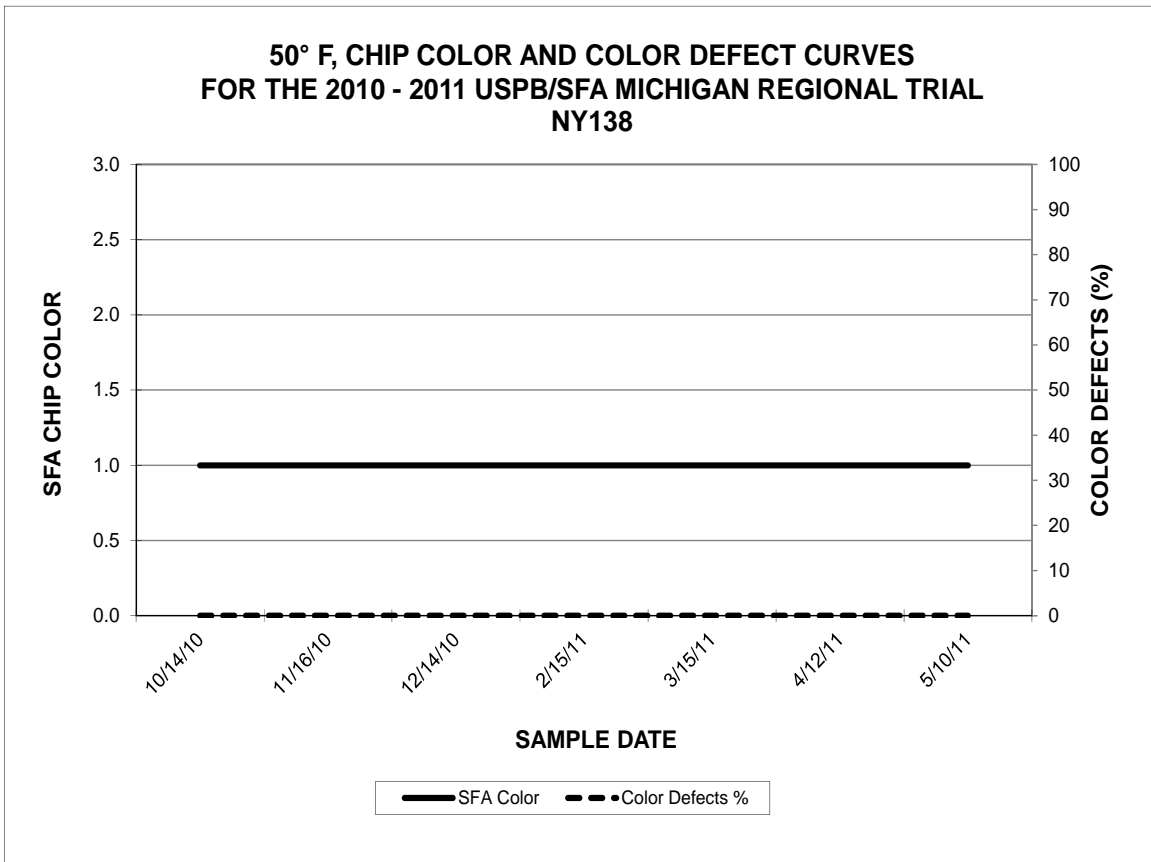


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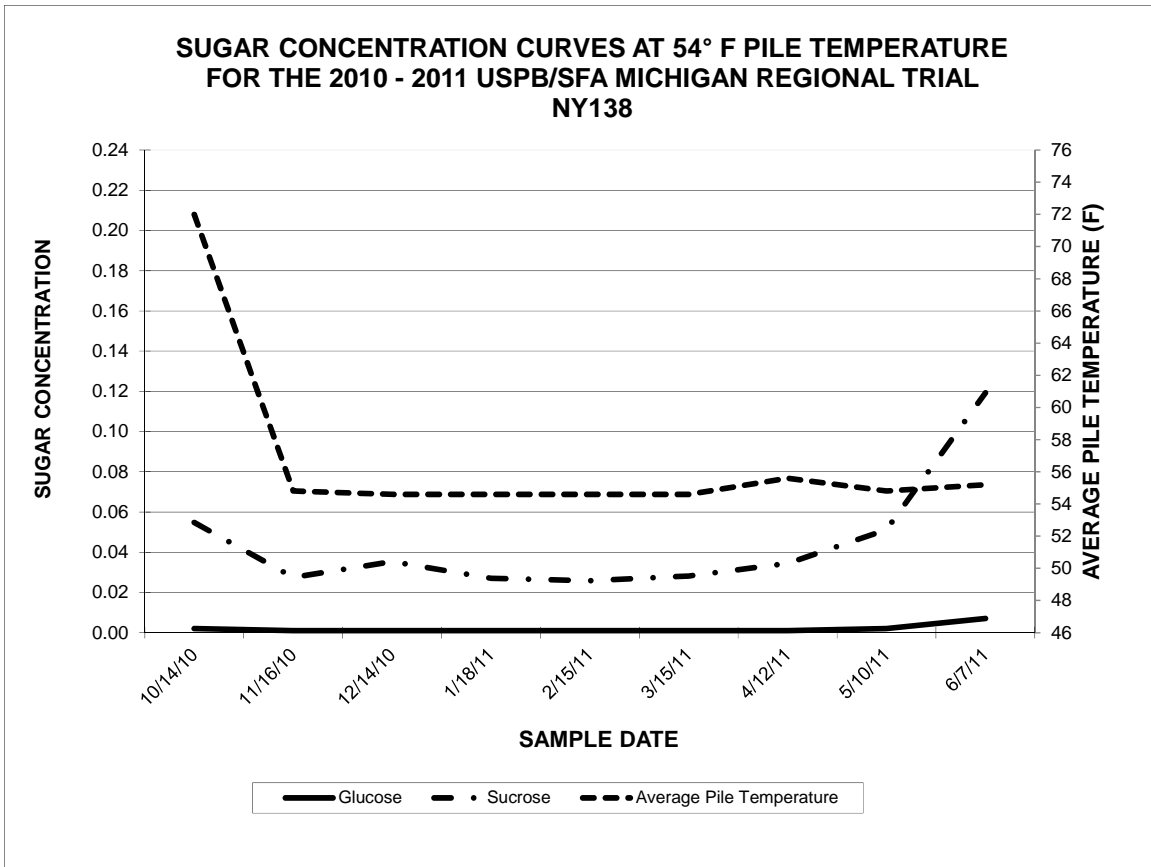


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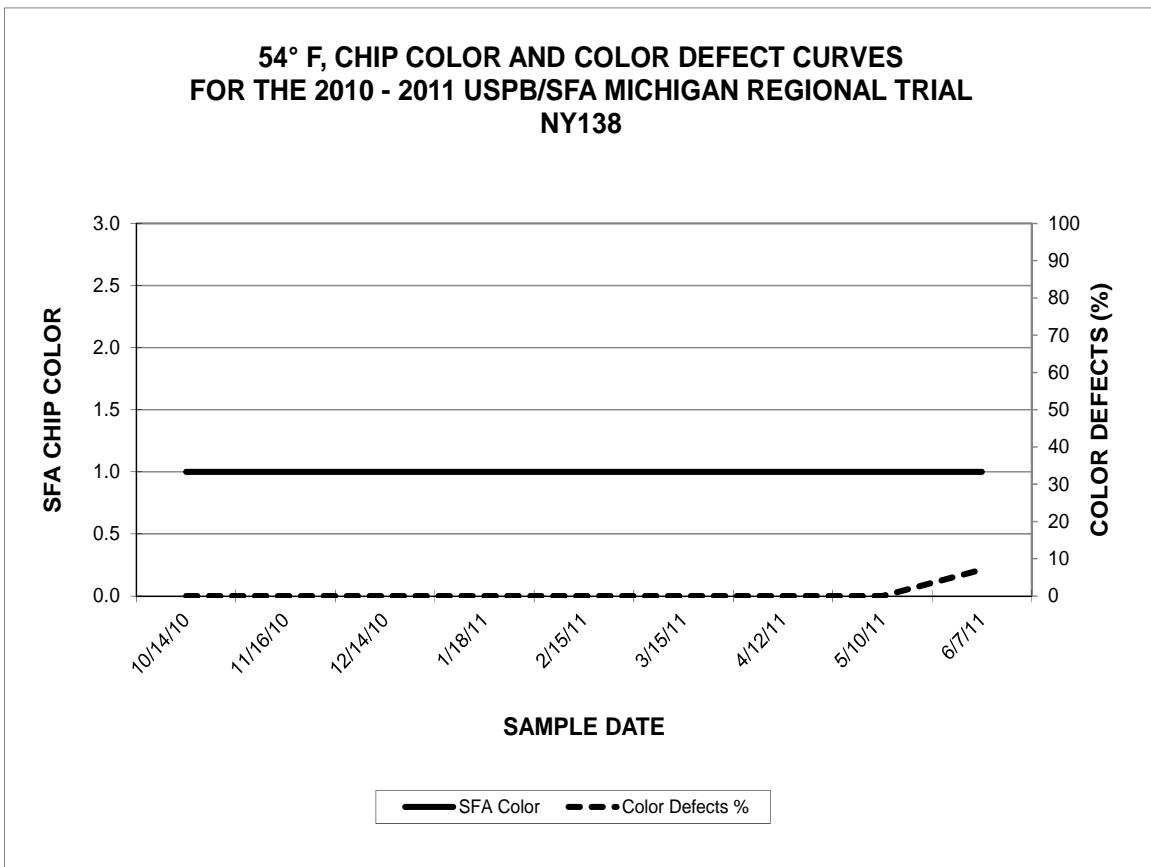


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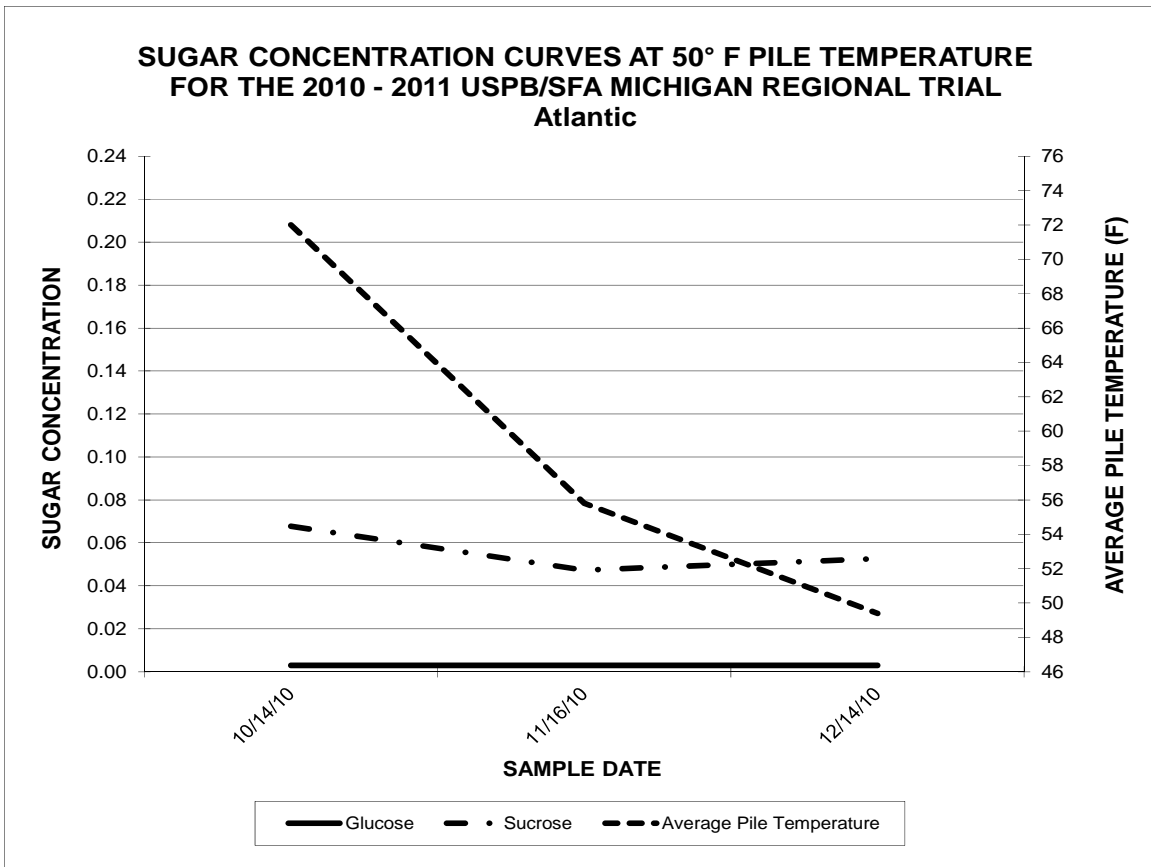


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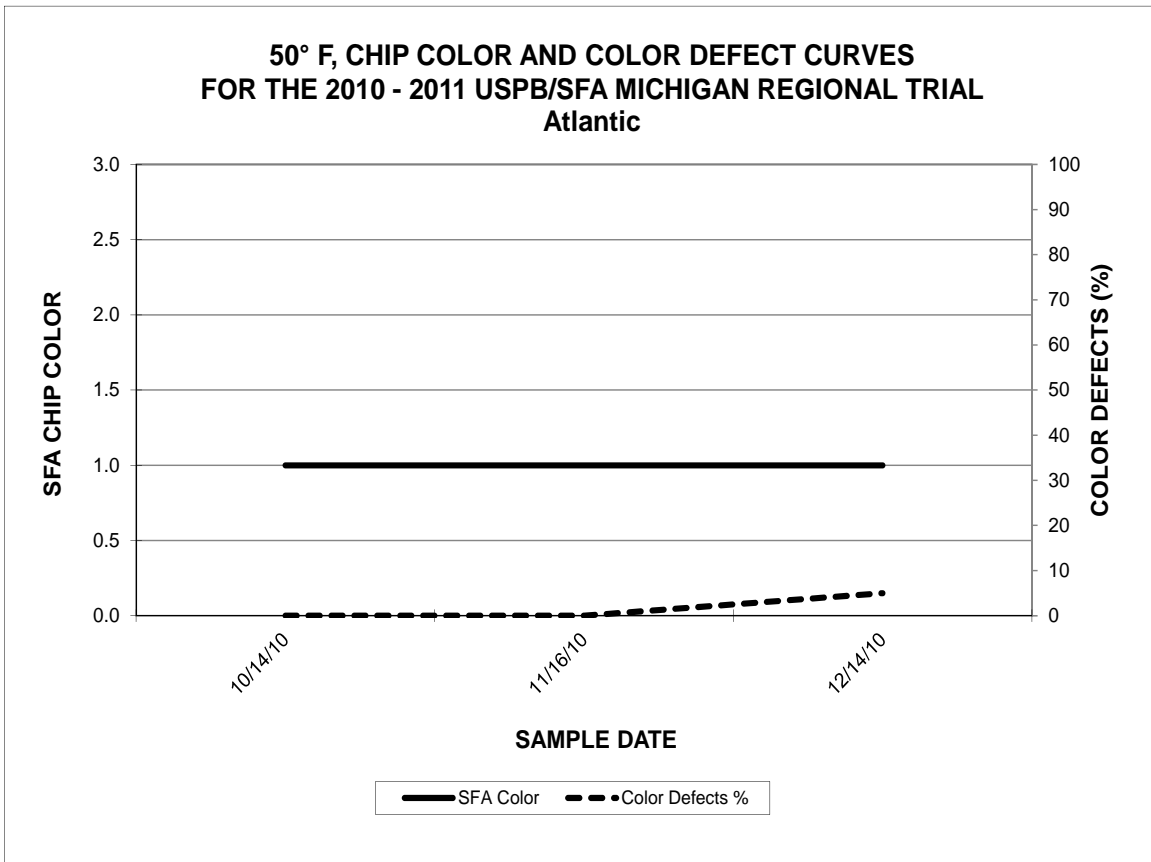


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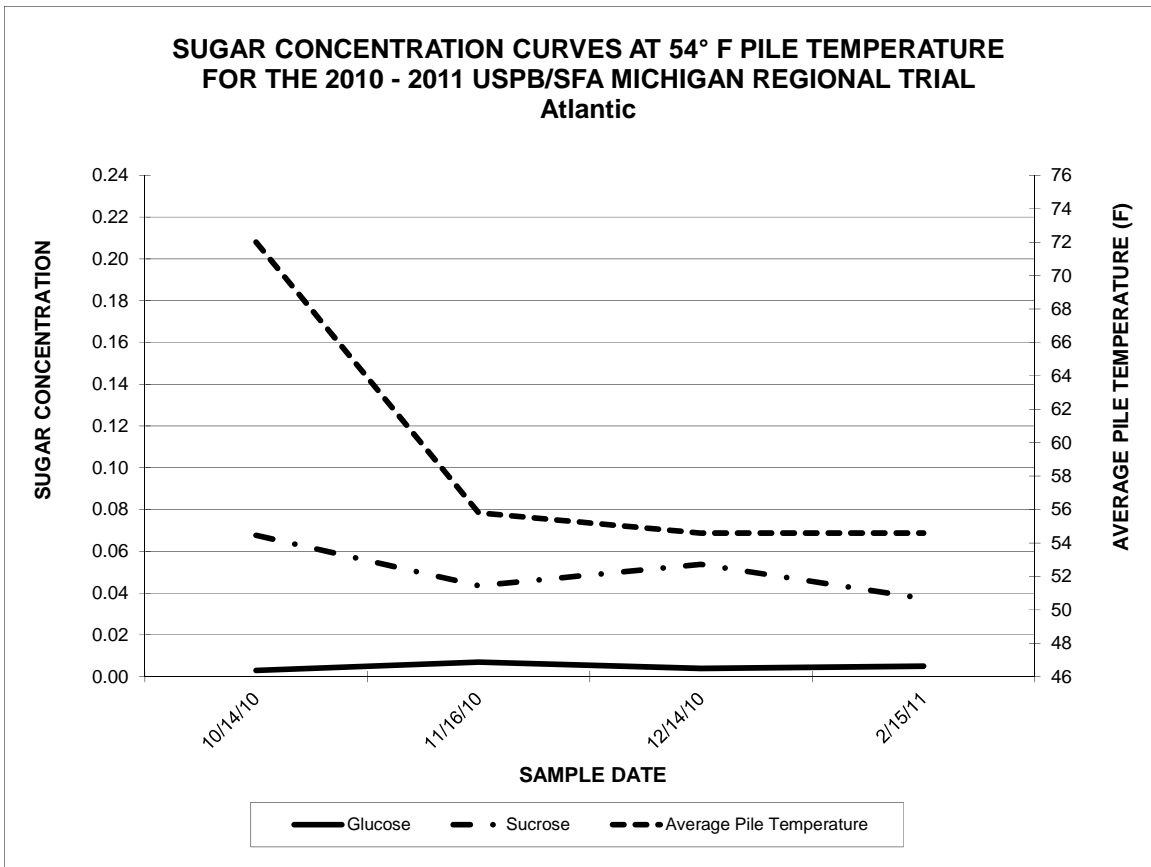


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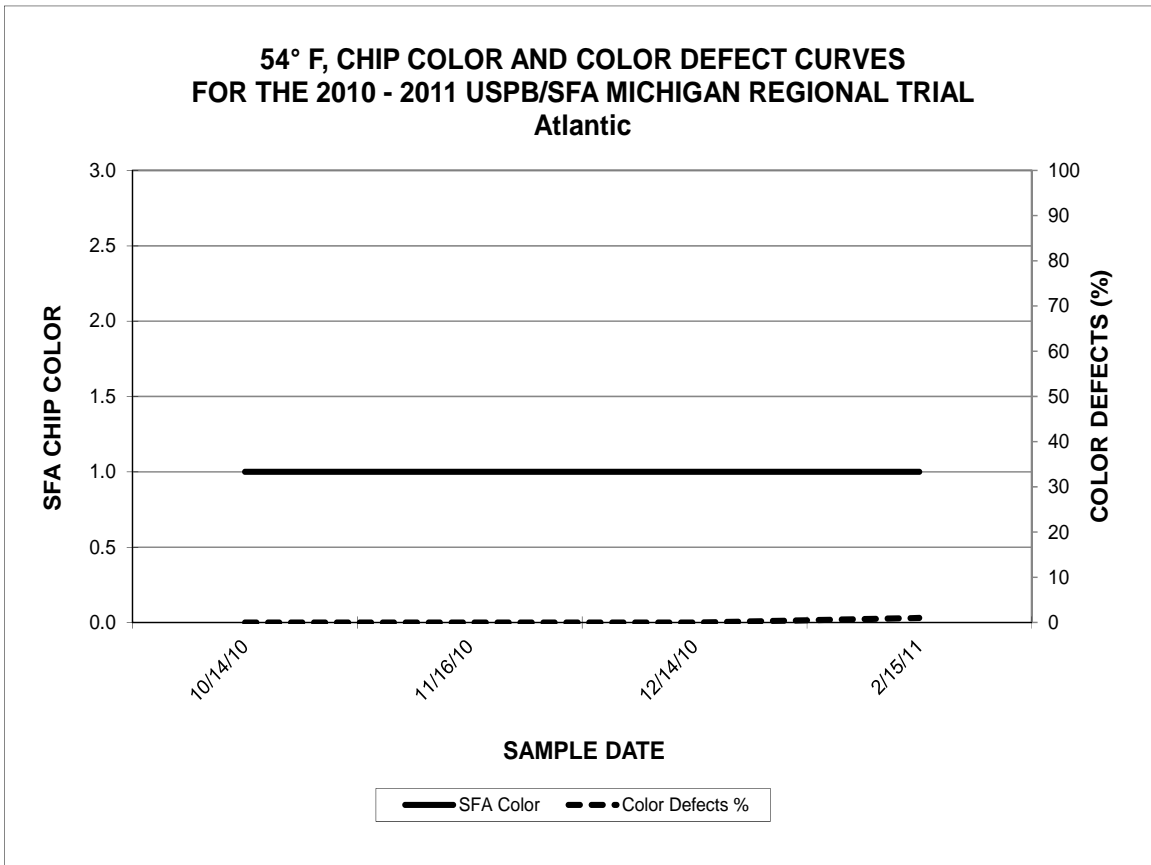


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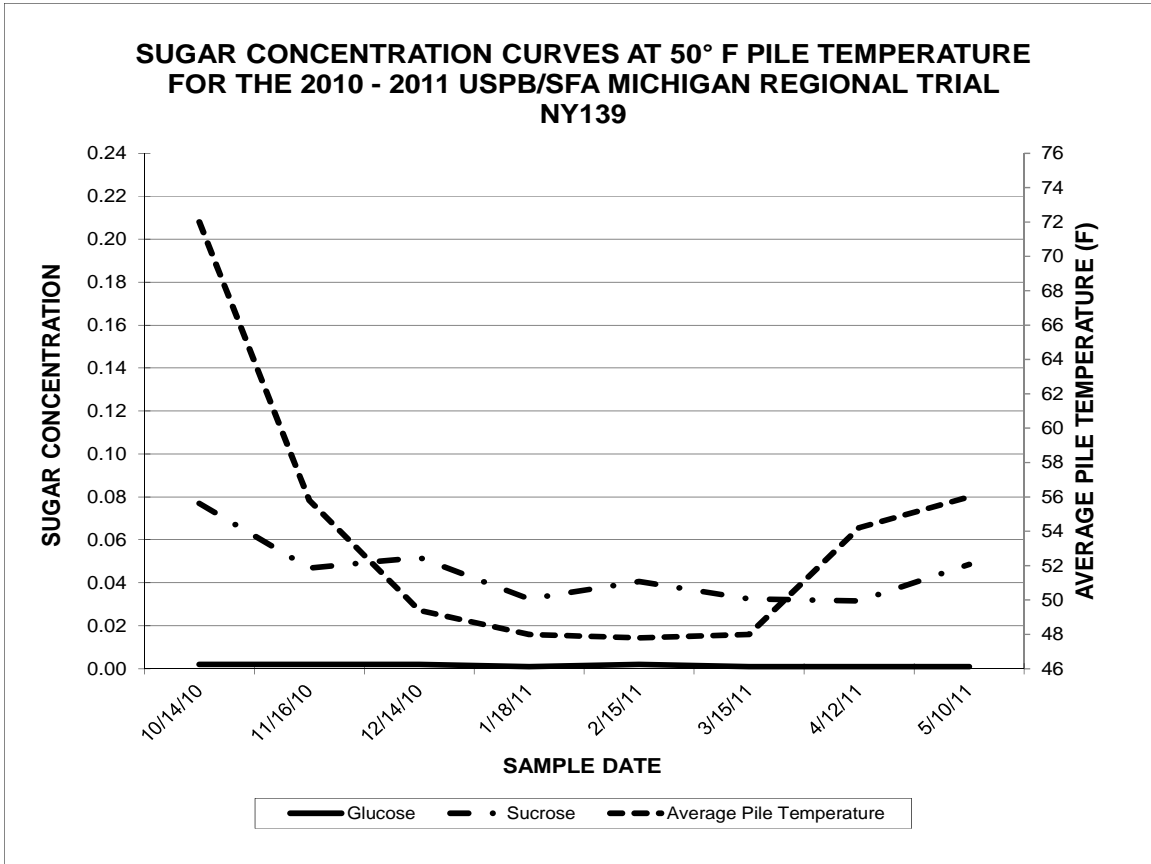


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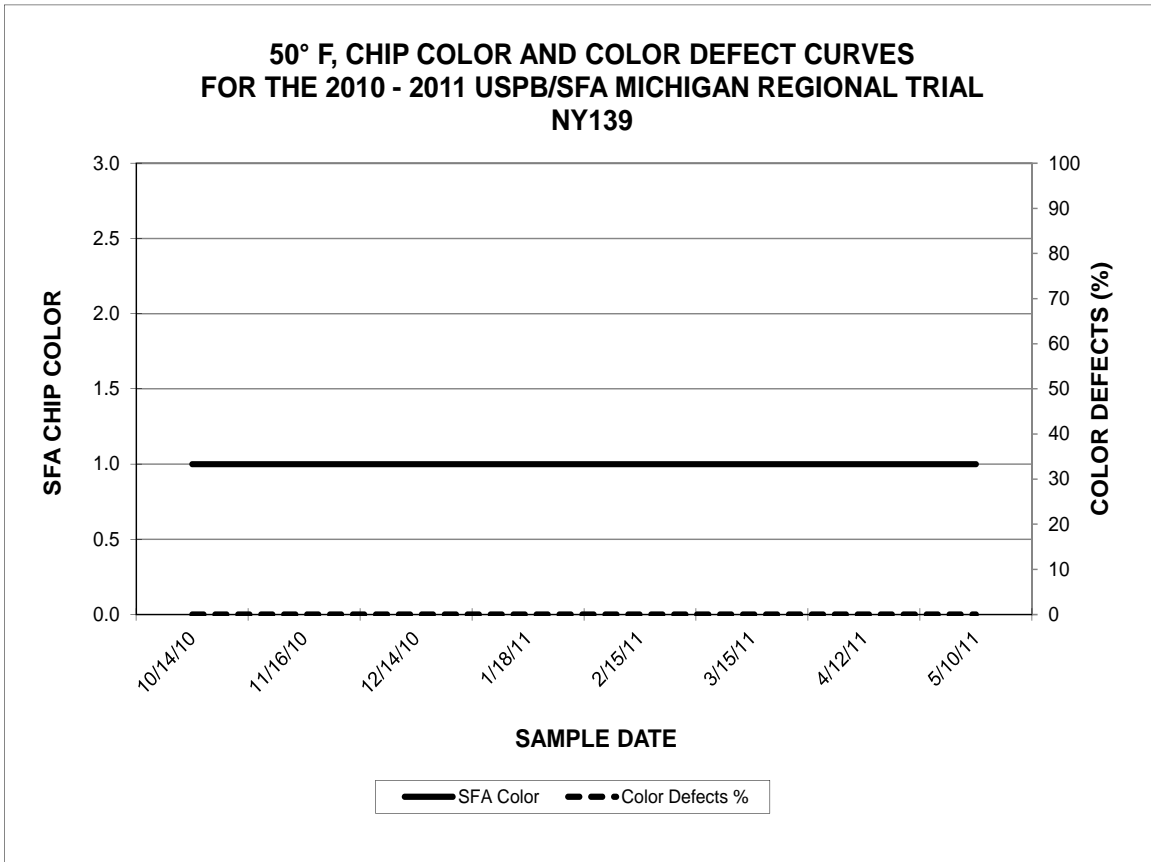


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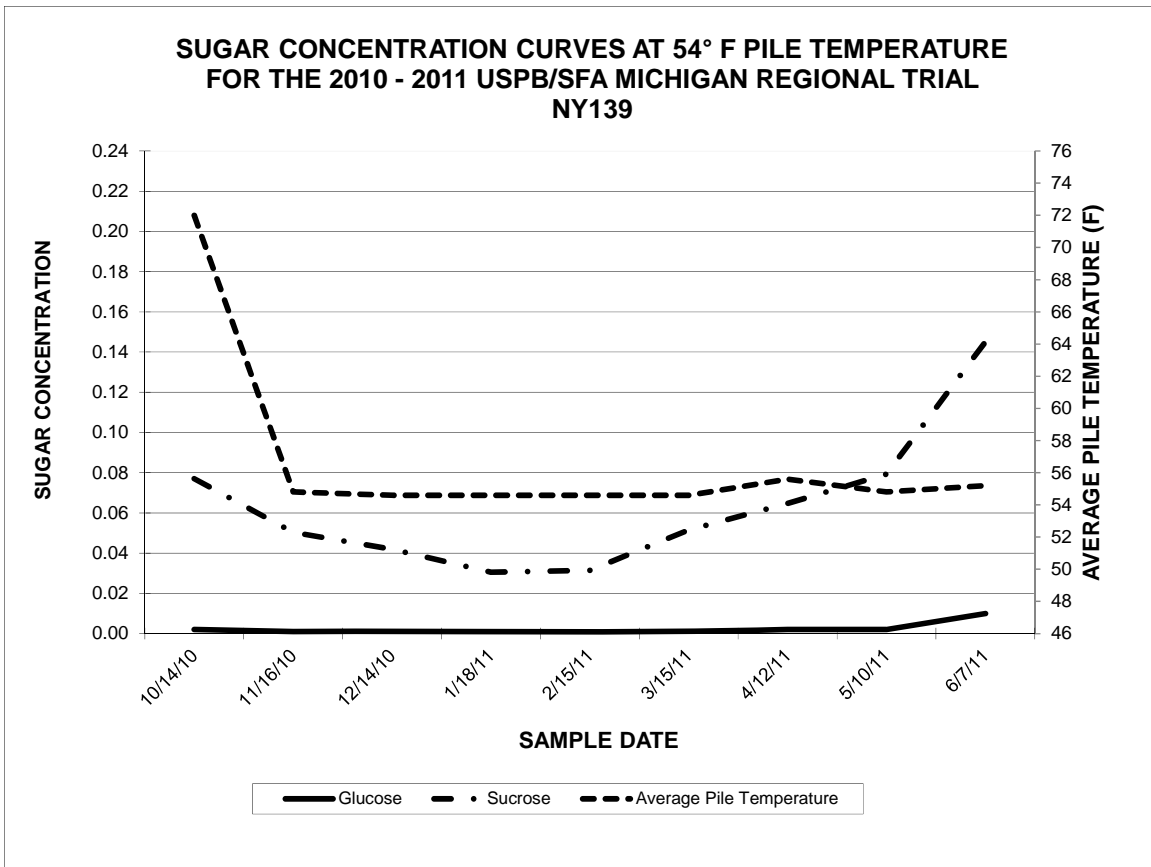


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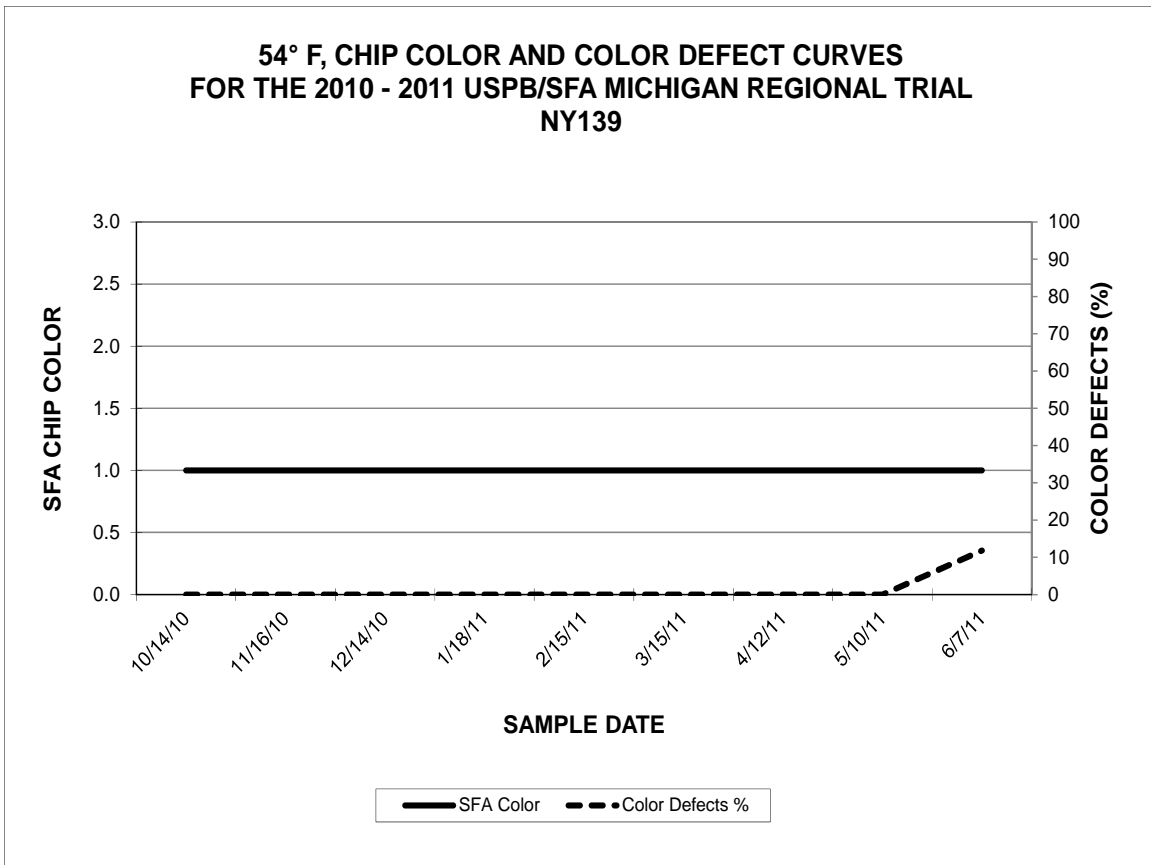


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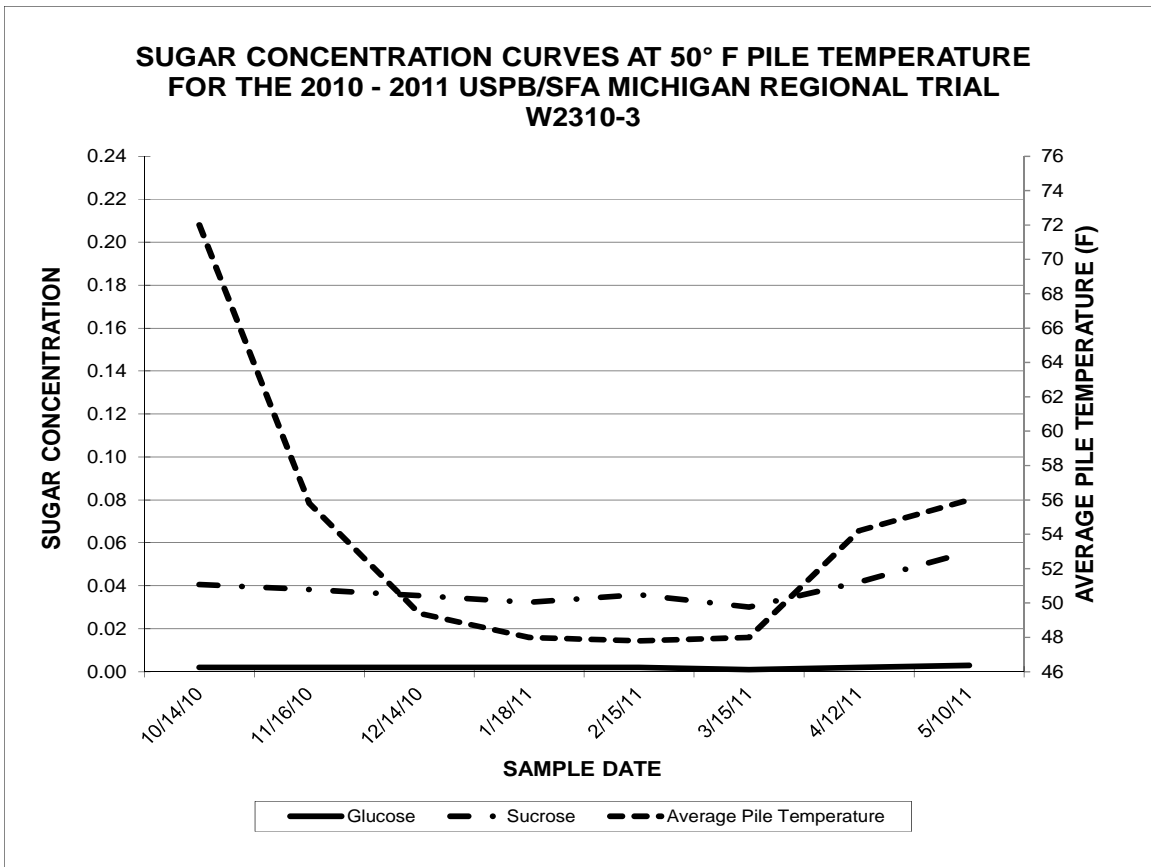


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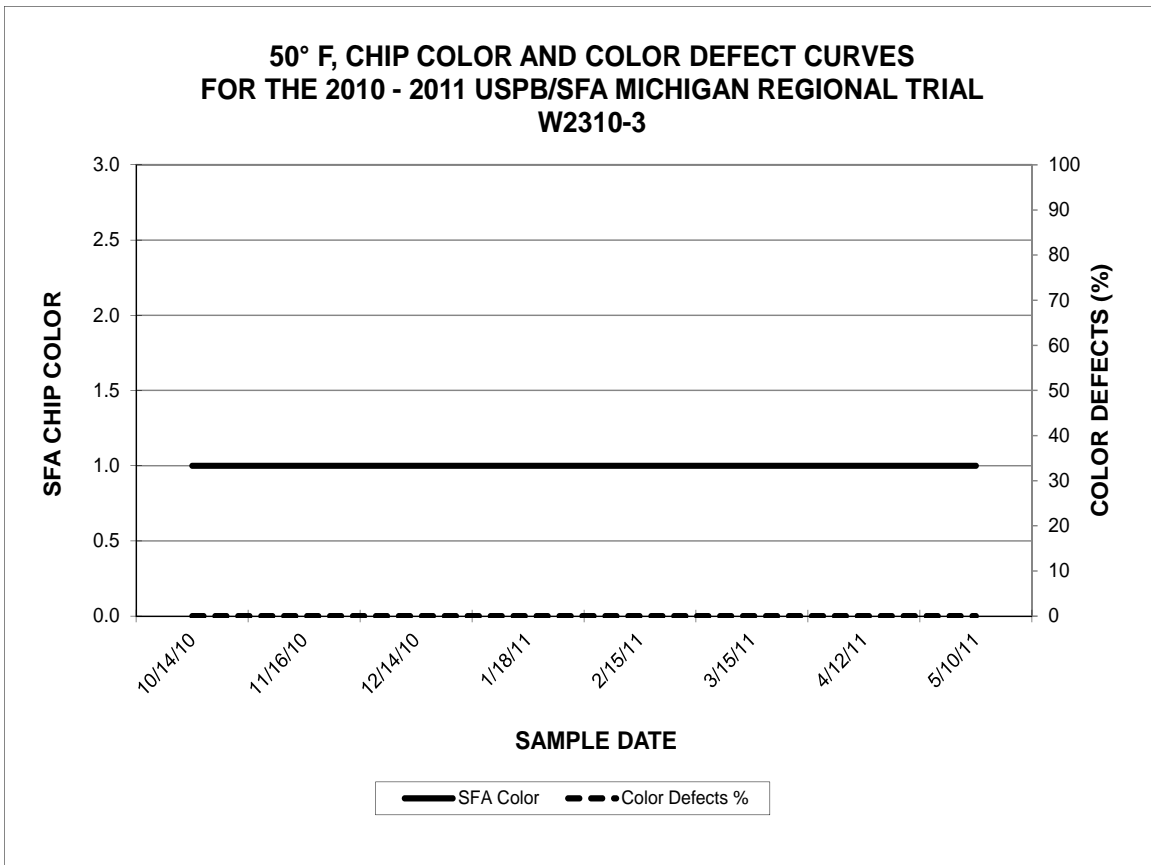


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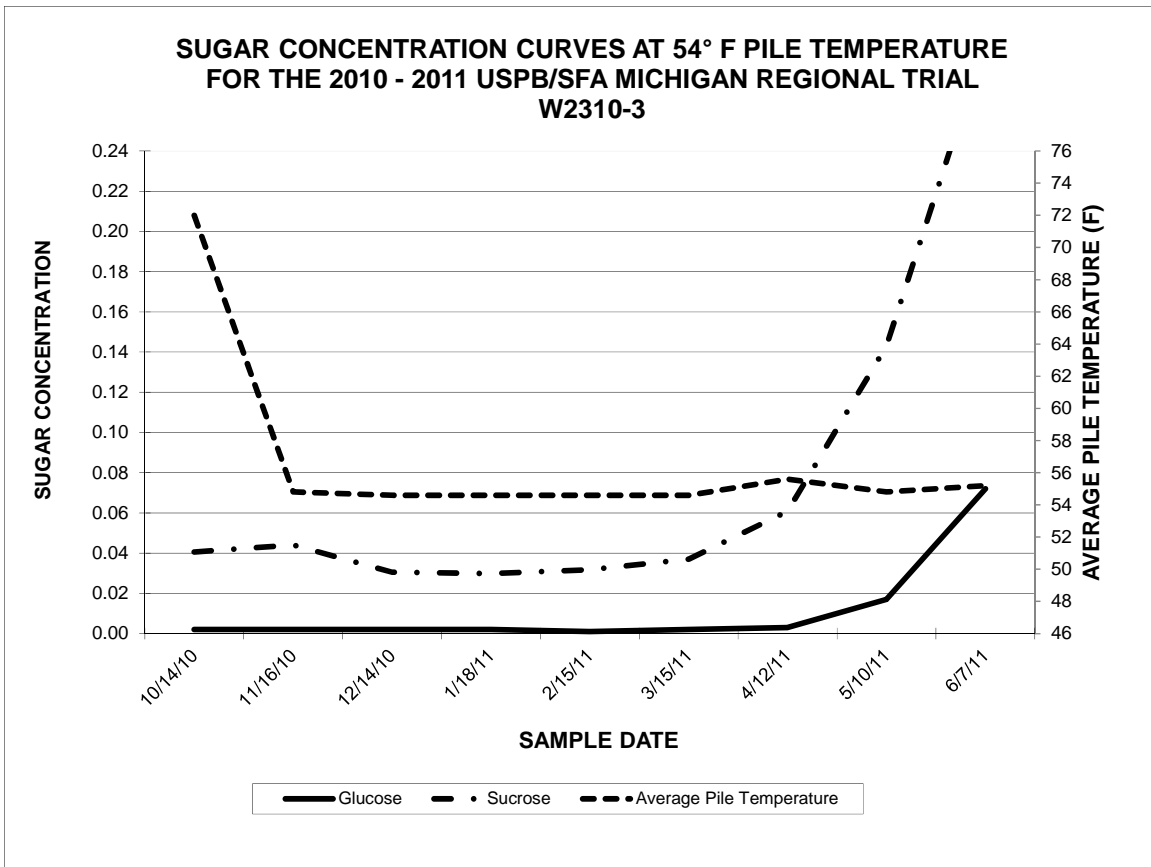


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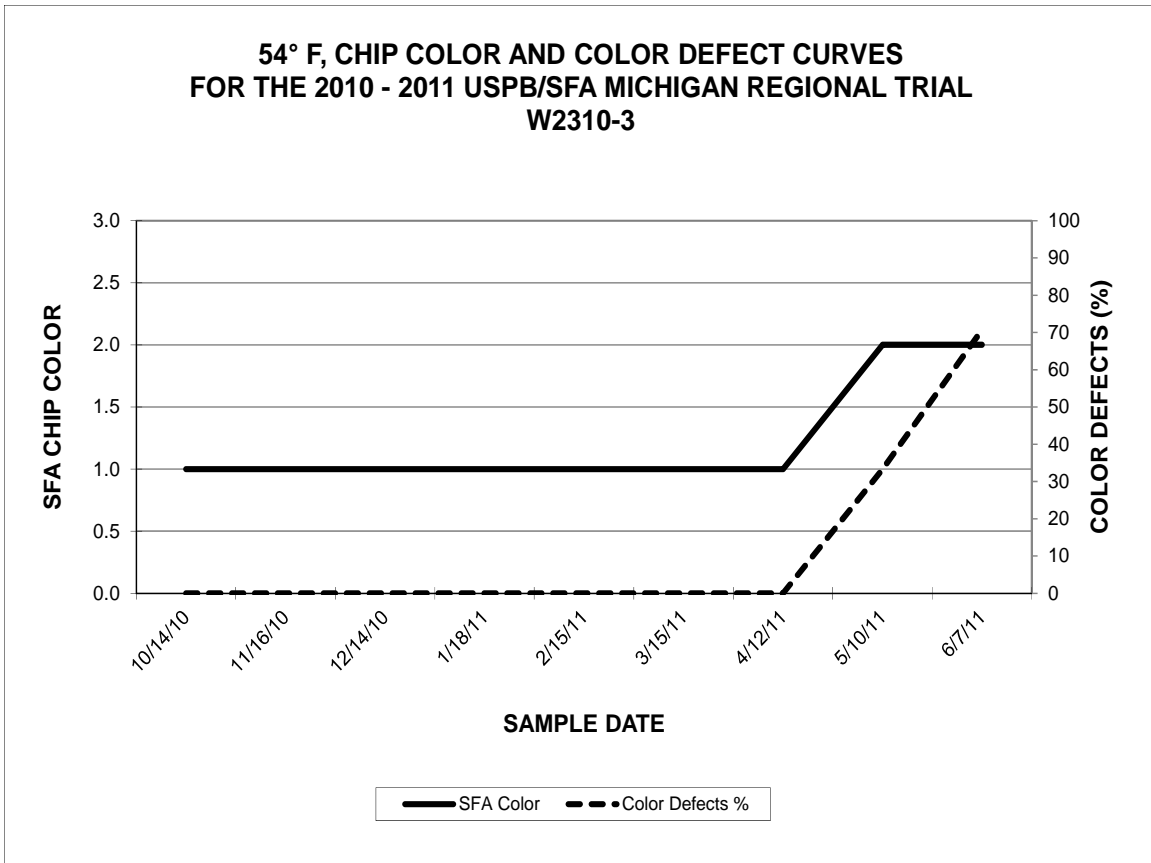


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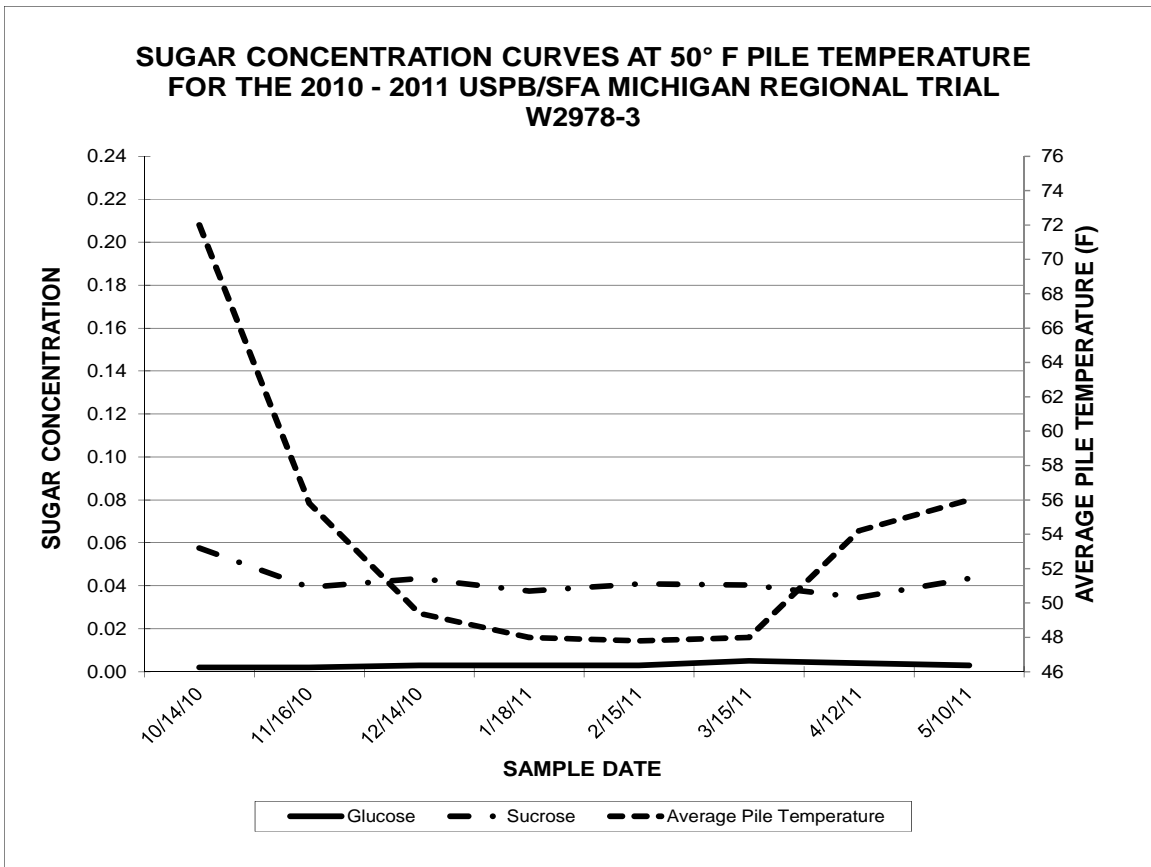


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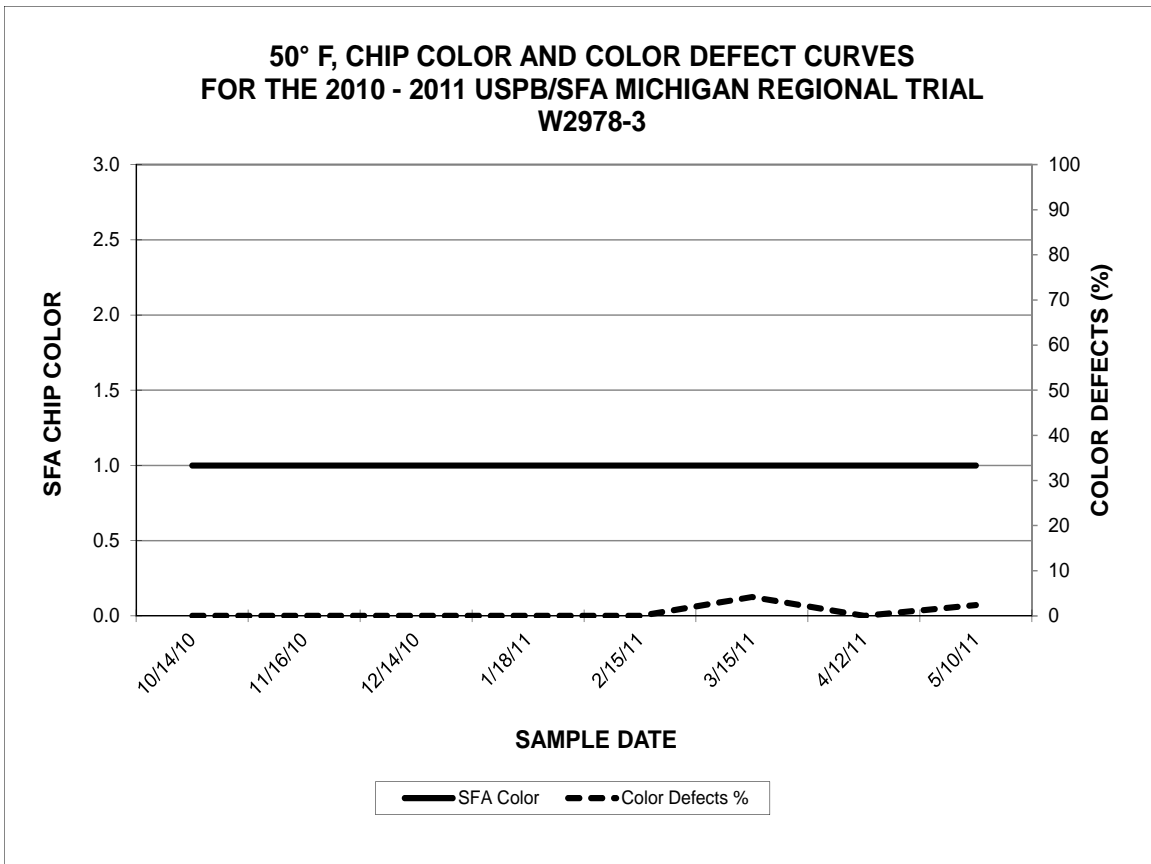


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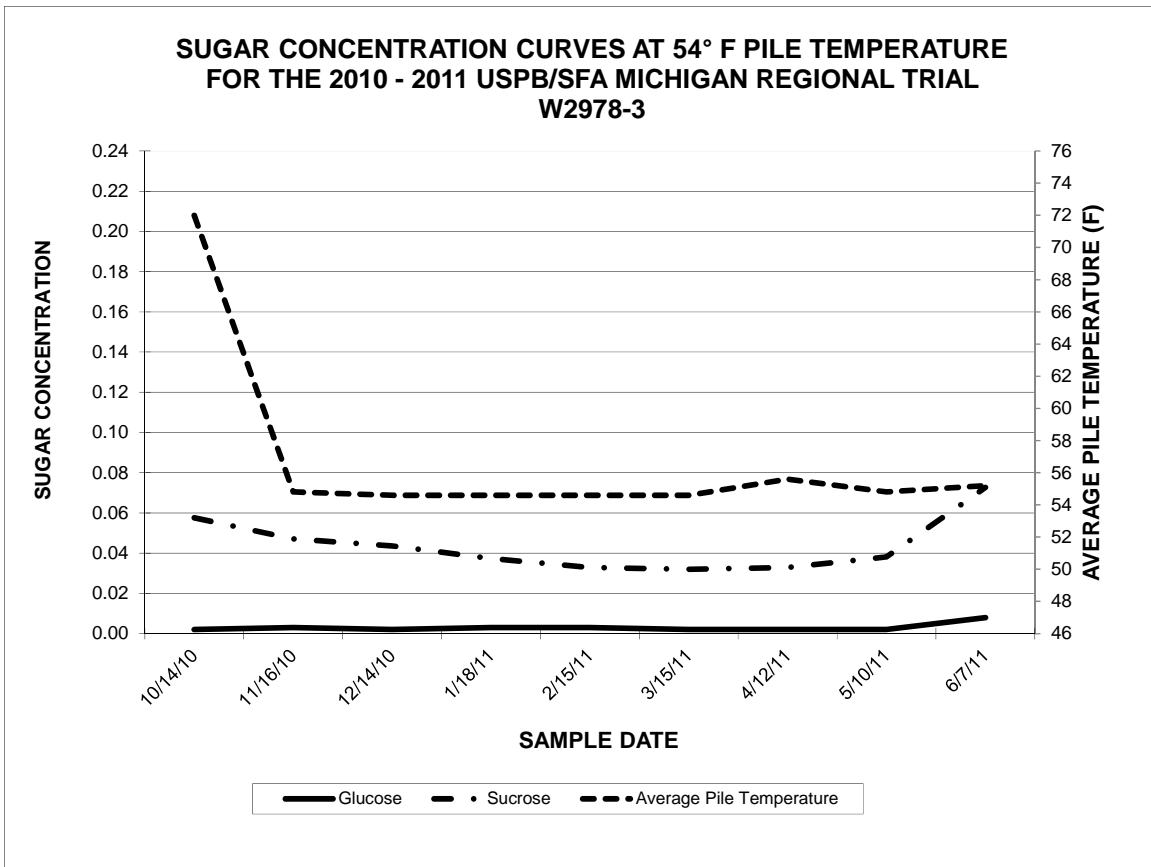


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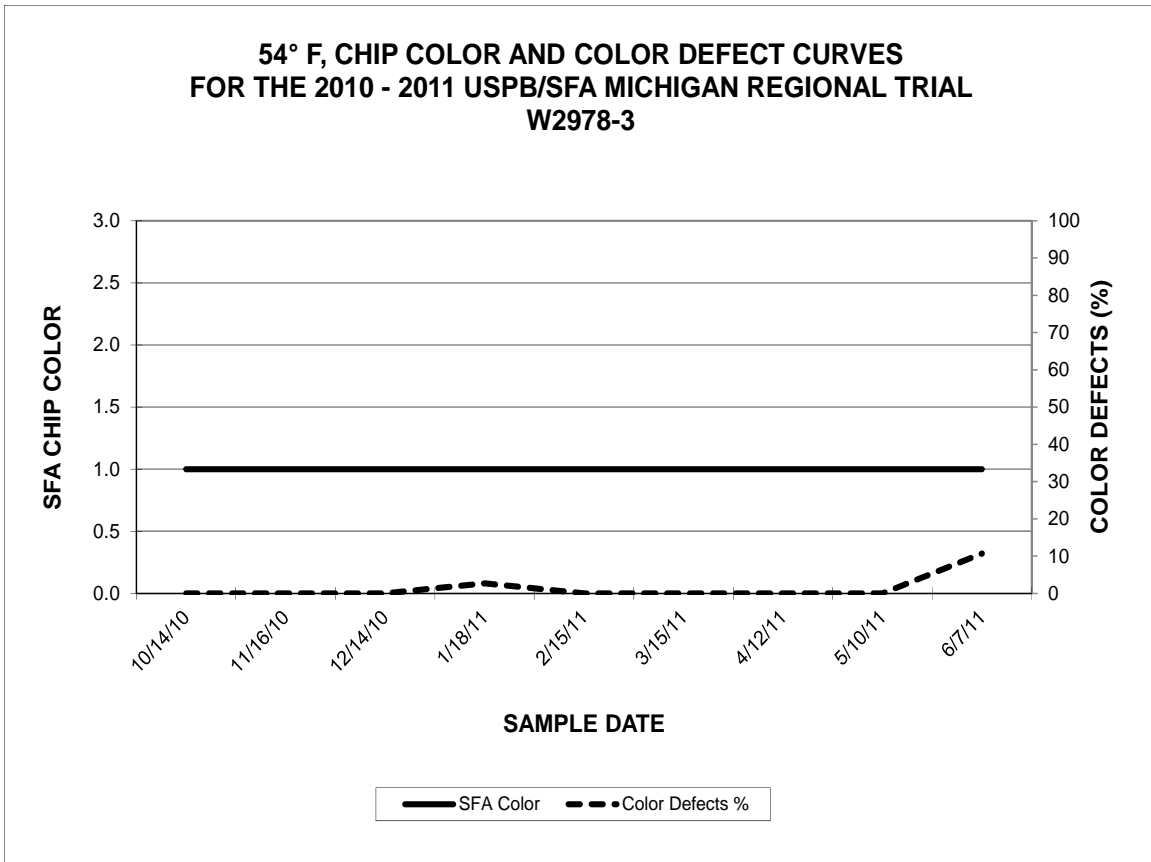


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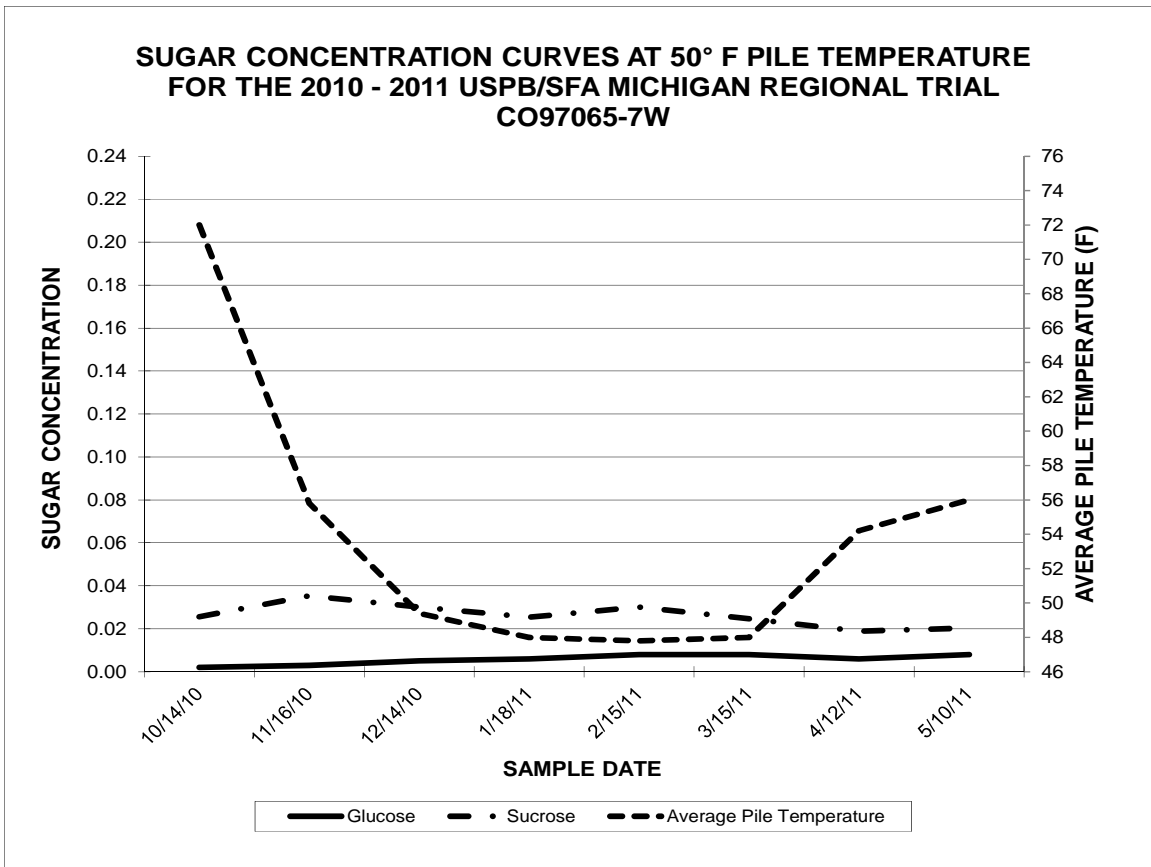


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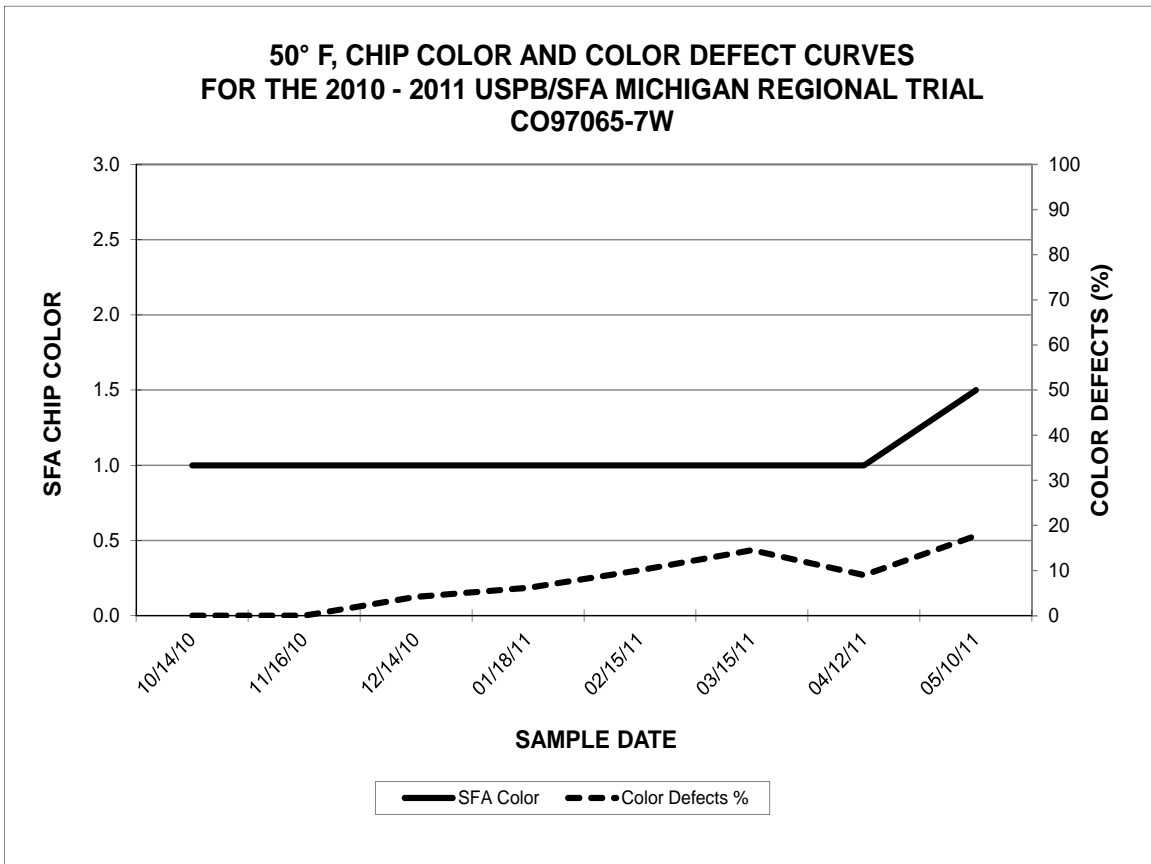


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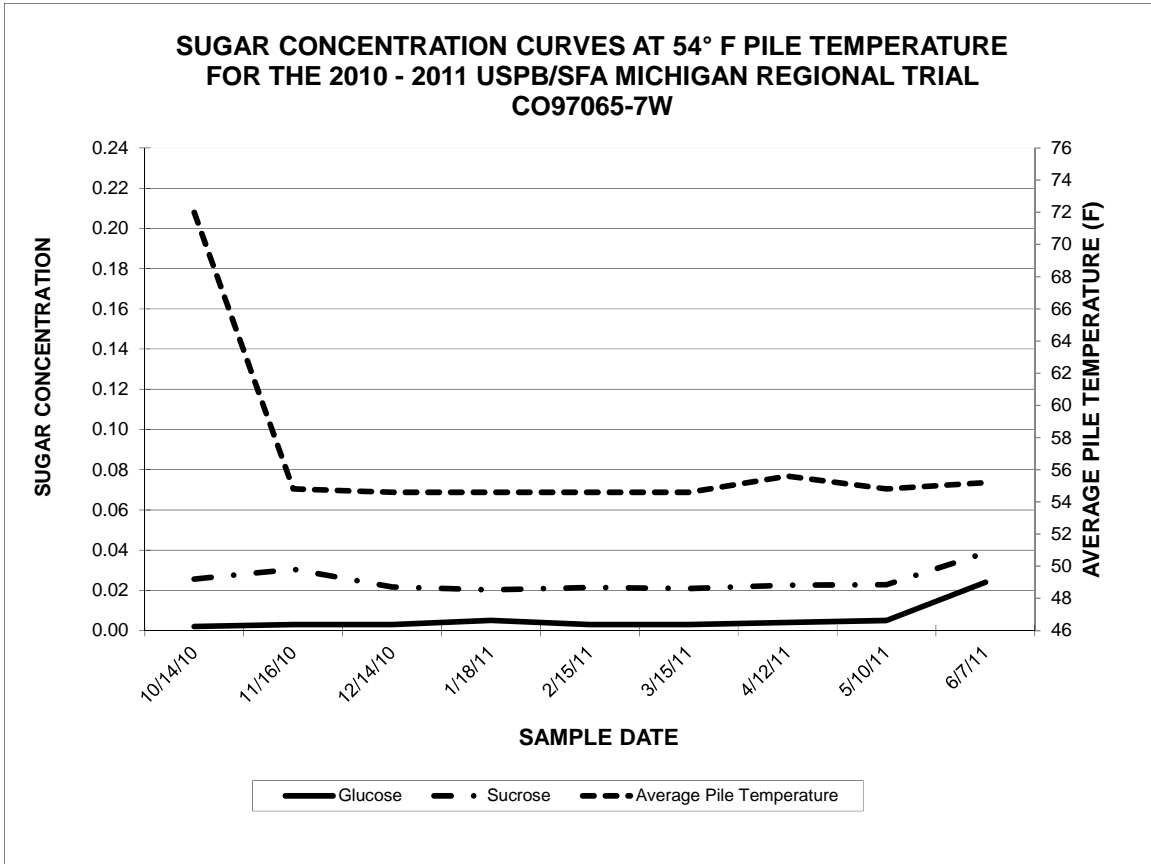


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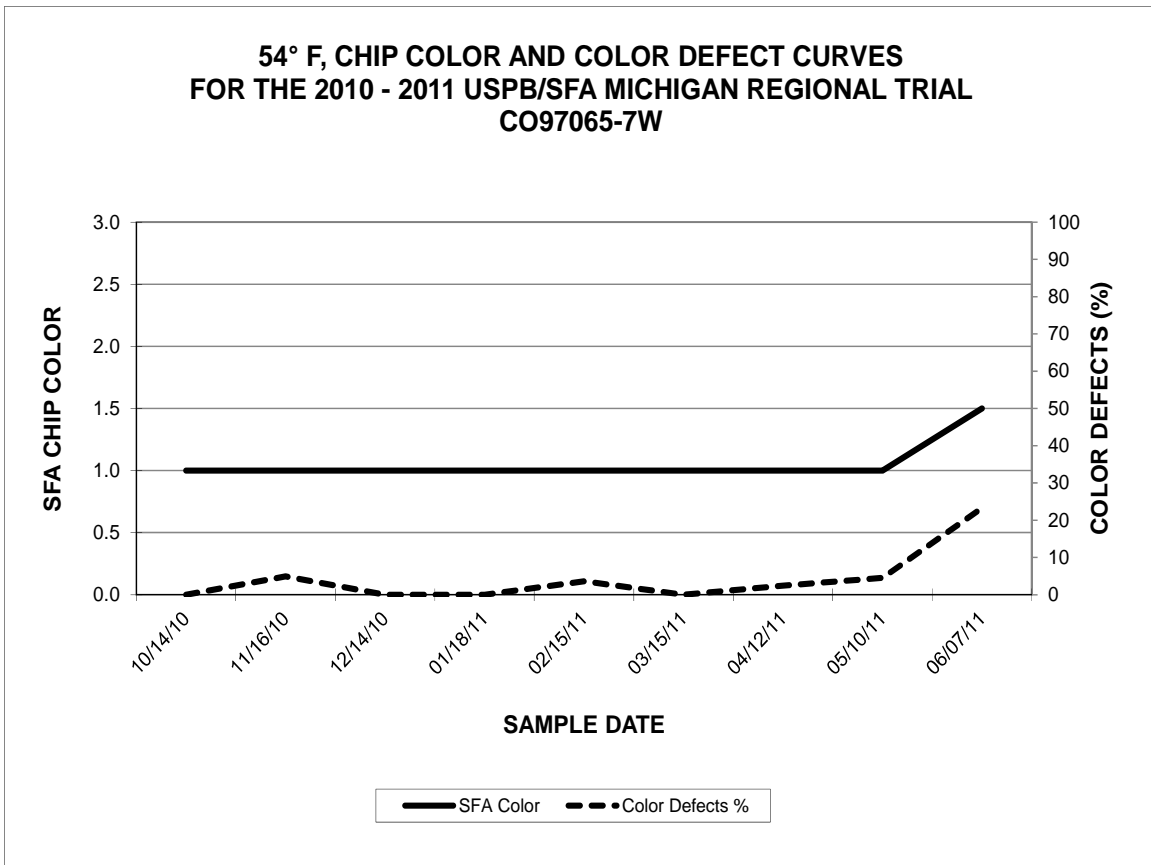


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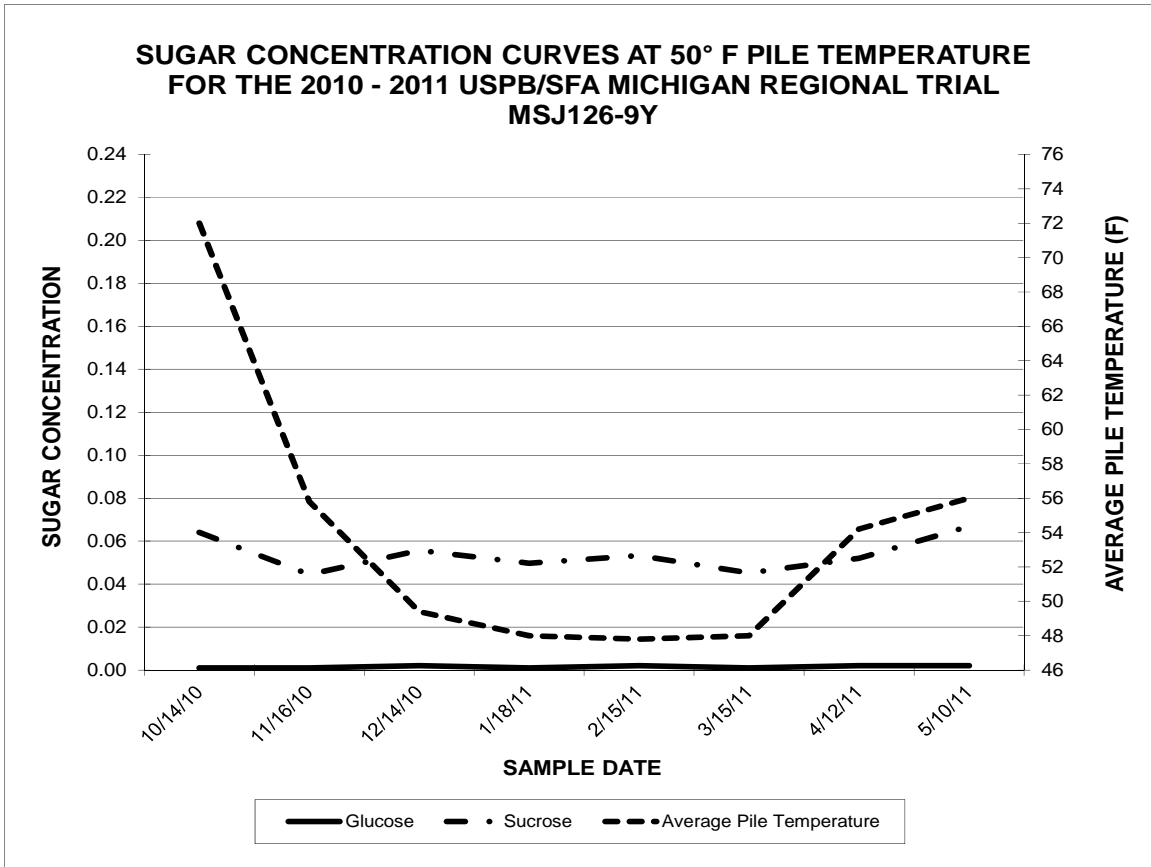


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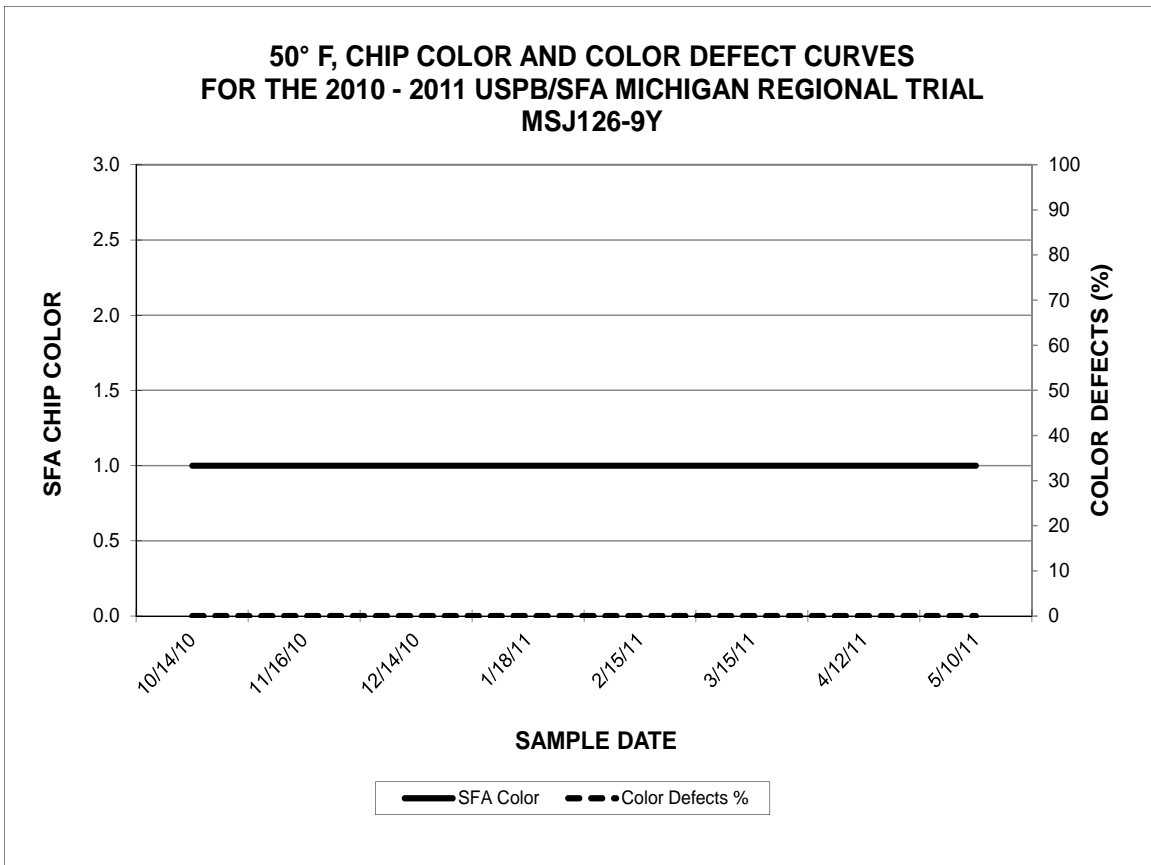


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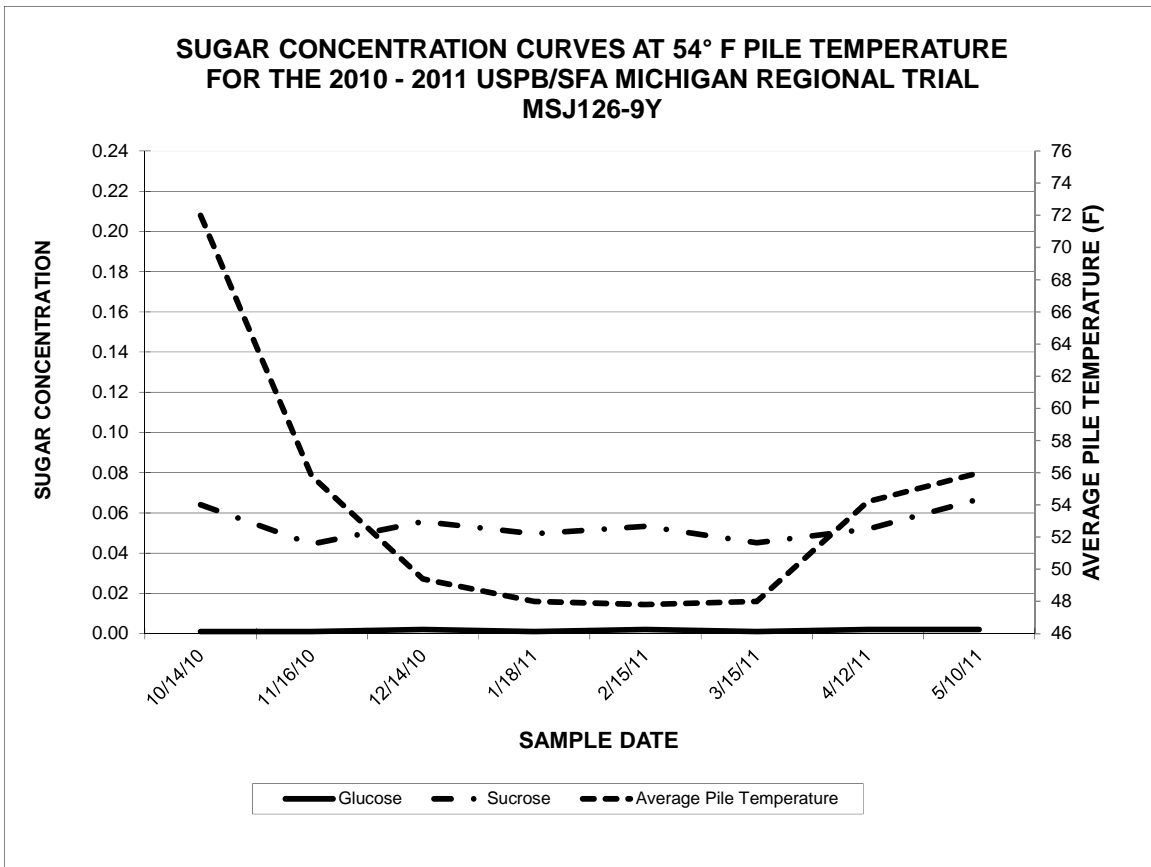


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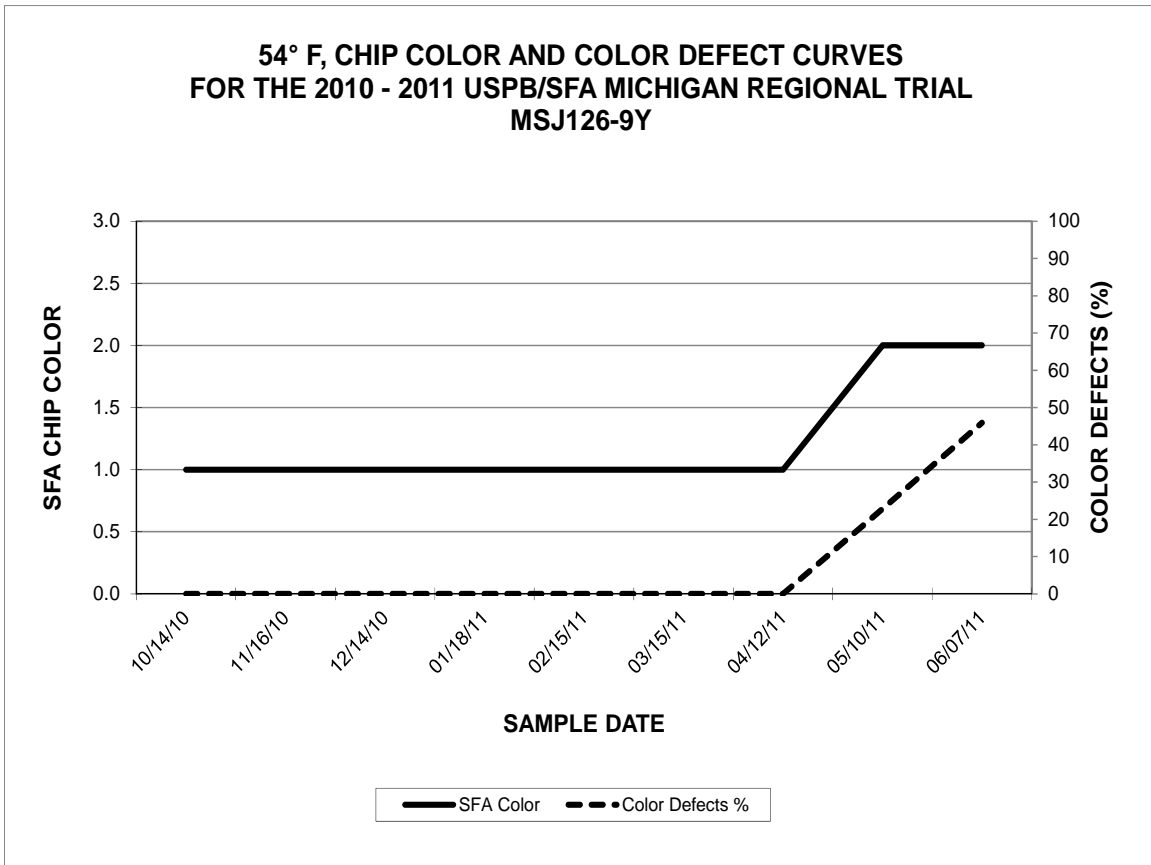


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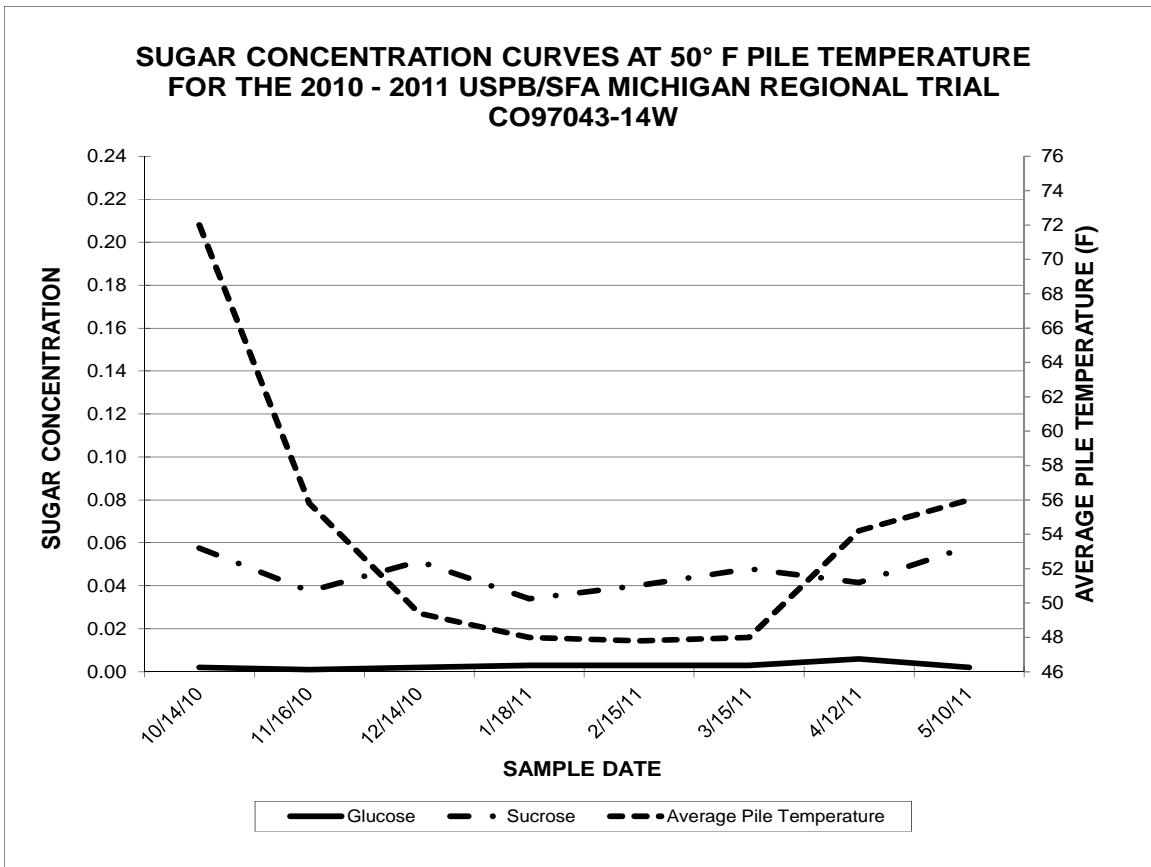


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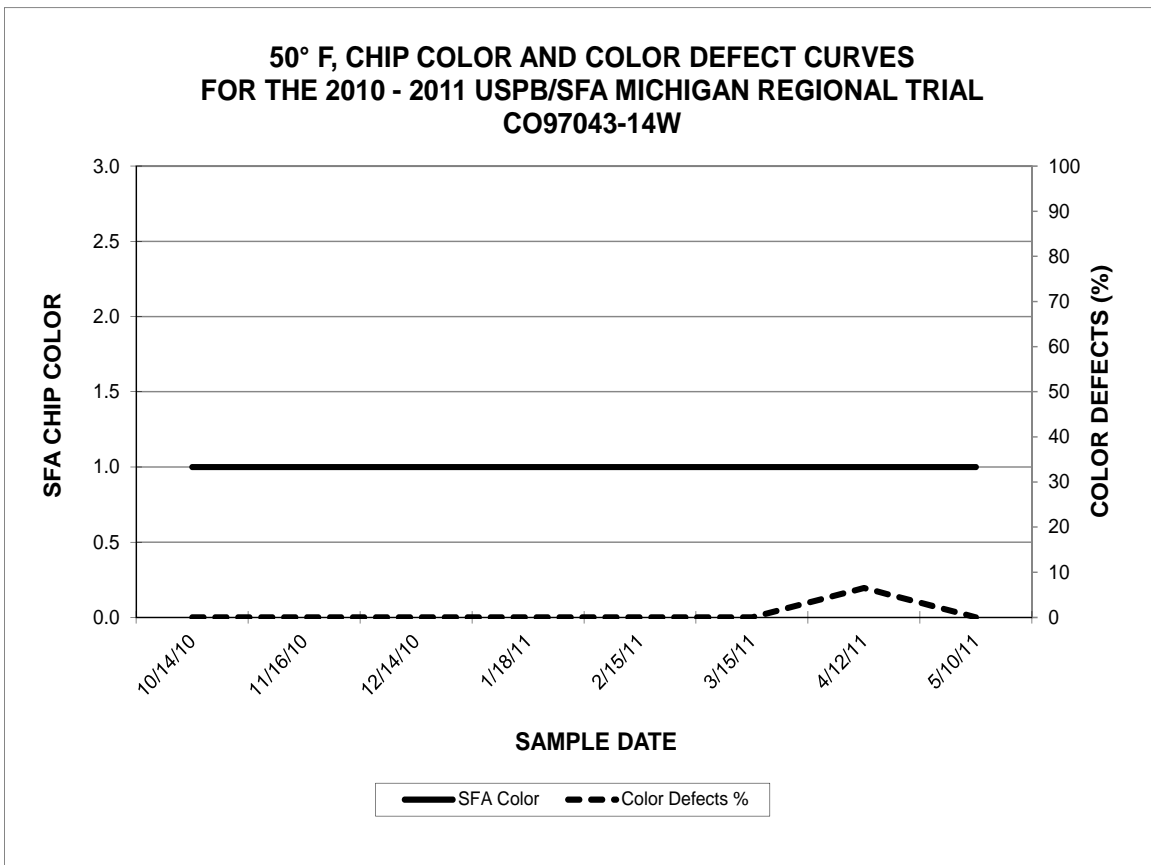


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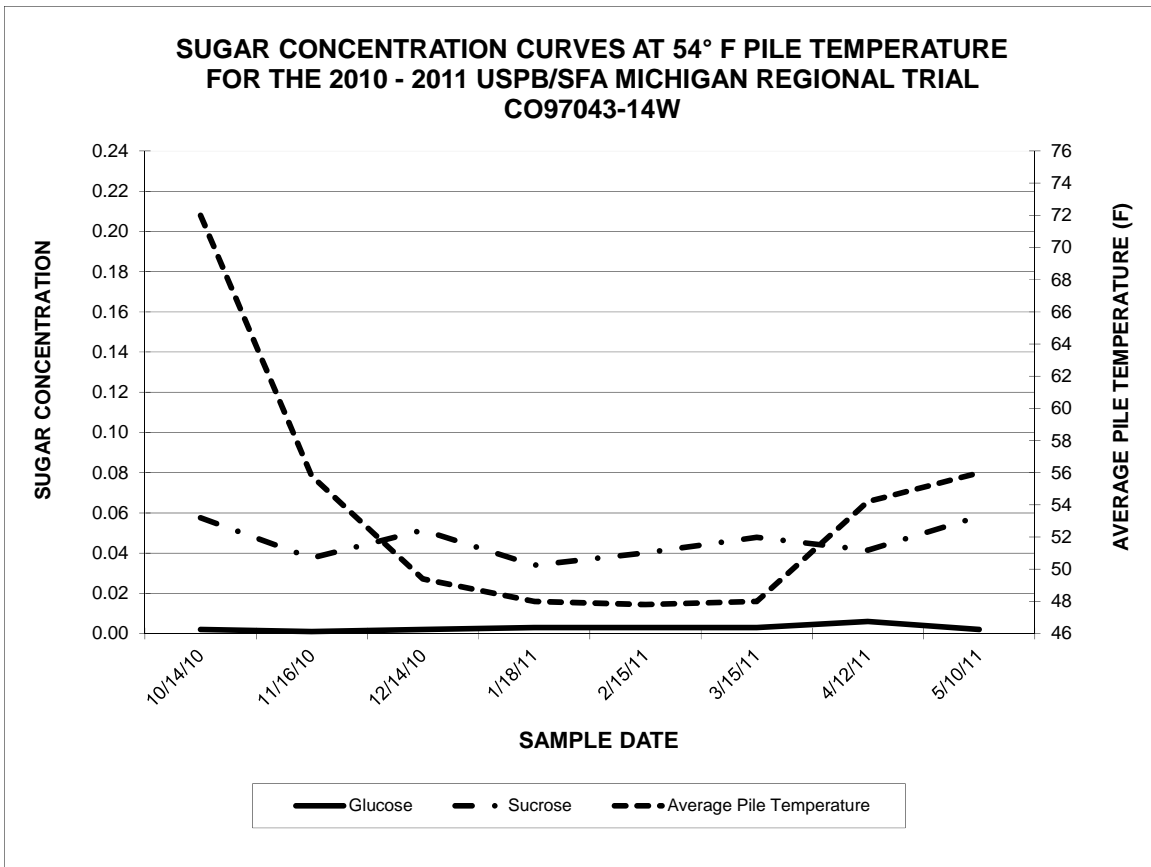


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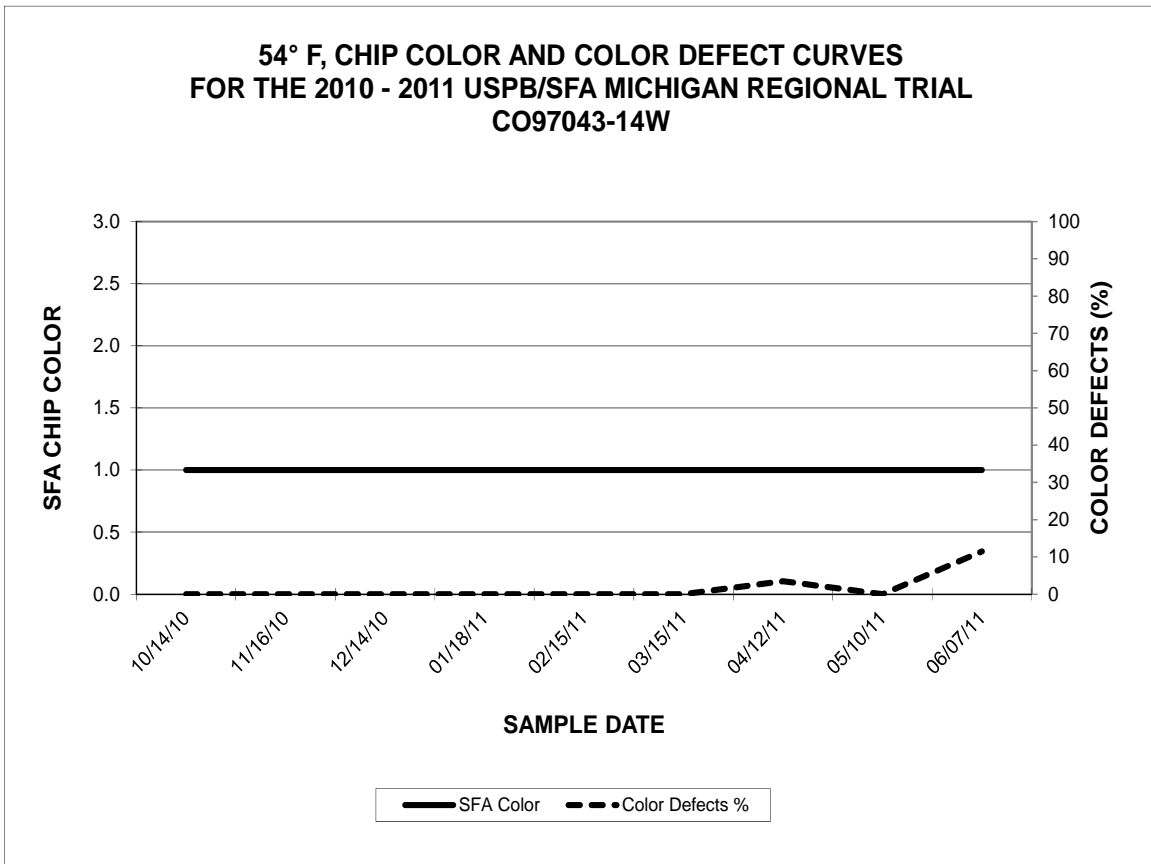


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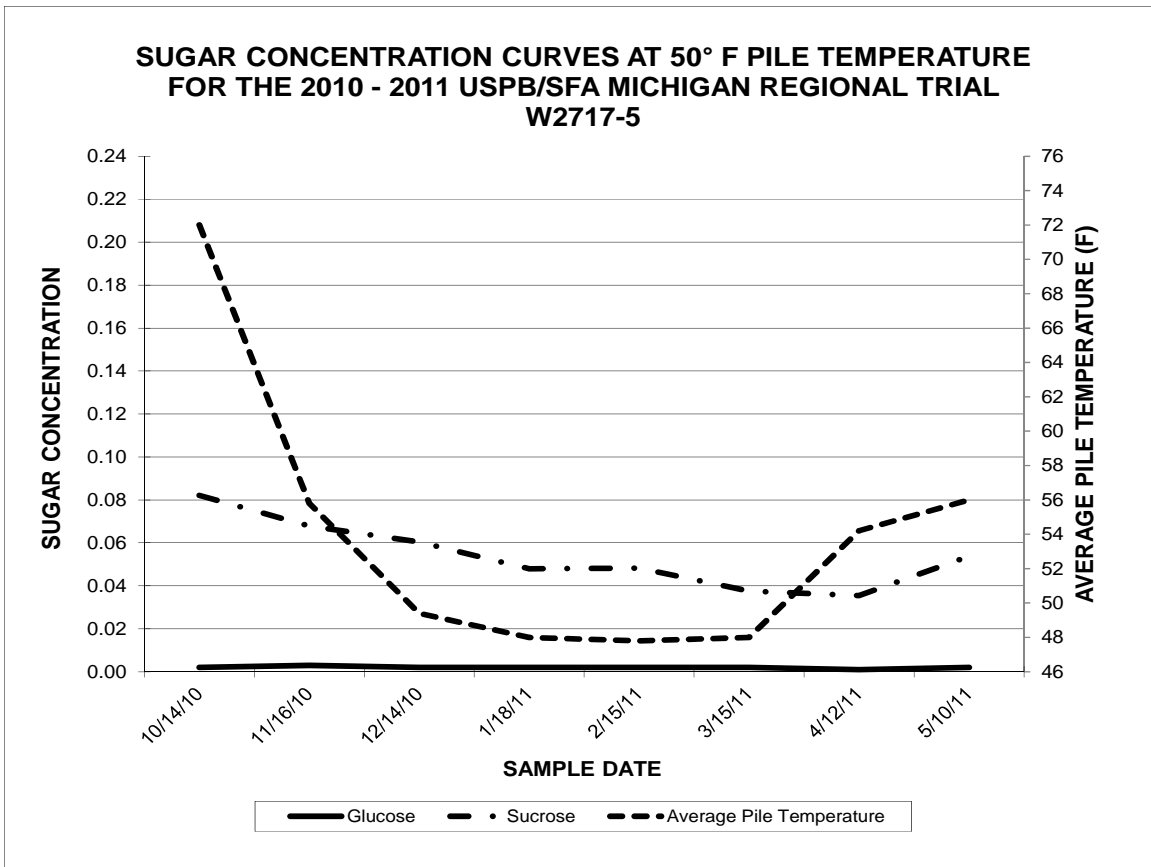


Figure 50.

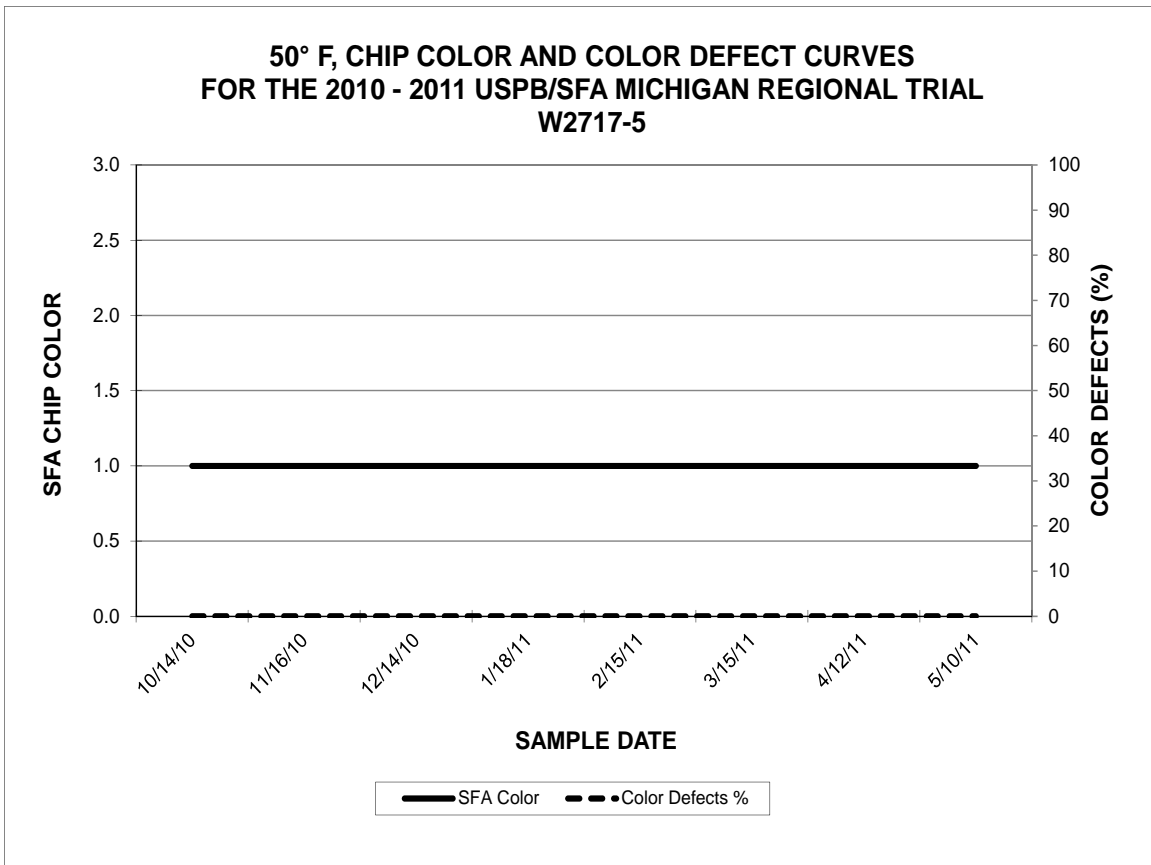


Figure 51.

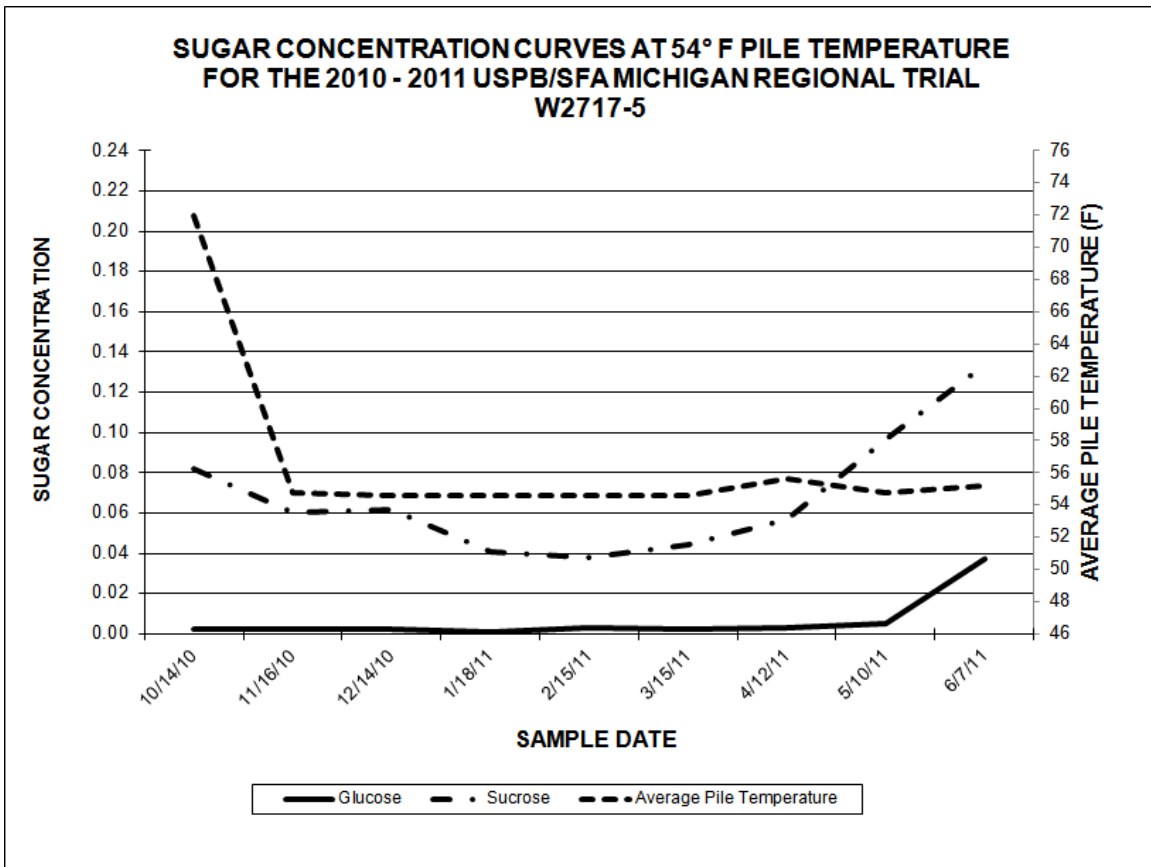


Figure 52.

