

OUT-OF-STORAGE CHIP QUALITY 2008-2009 MICHIGAN REGIONAL REPORT

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Procedure:

The 2008 USPB / SFA Chip Trial was harvested on October 1, 2008 at Sandyland Farms LLC, Howard City, MI. Several chip storage samples were collected from each variety at harvest. Two, 40 pound samples were collected from each entry and placed in the cooperating grower's commercial storage for evaluation in December 2008 and March of 2009 at Herr Foods, Nottingham PA. The 40 pound tuber samples placed in the grower's commercial storage were removed from storage in late December 2008 with a pile temperature of 54 °F and in March 2009 with a pile temperature of 48 °F. For sprout control, CIPC was applied in the storage in November 2008.

Eighteen, 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 nine samples were stored at approximately 54°F for monthly evaluation from October through June. The remaining nine, 30 tuber samples were stored at approximately 50°F and evaluated from October 2008 to January 2009. These samples from the MPIC storage were processed at Techmark, Inc. for a glucose value (a percent by fresh weight), a sucrose rating (a percent by fresh weight X10), an SFA color score and an undesirable chip color score. The undesirable chip color score is 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 17, 2008.

Six varieties were dropped from the storage evaluation process due to the fact that they did not appear to have long term storage potential in Michigan. They are Atlantic, Beacon Chipper, Kalkaska and CO96141-4W. The specific gravity of NY138 was very low and further evaluation was not prudent. Also, the internal chip quality of W2324-1 was so poor that further investment in evaluation was not advantageous.

Results:

Tables 1 and 2 summarize the chip quality of the 40 pound samples after being processed at Herr Foods, Inc. on December 29th, 2008 and March 24th, 2009. The varieties are listed in yield order, high to low, top to bottom, based on the 2008 field trial data. As seen in Table 1, Beacon Chipper exhibited the least amount of tuber defects. MSJ147-1 and W2717-5 had the highest specific gravity of any lines in the group.

From Table 2, W2717-5 continued to show a low percentage of chip defects and had the highest specific gravity (along with MSJ174-1) but lower yield potential need to be factored into further consideration of these varieties.

Tables 3-38 summarize the 30 tuber chip quality samples collected at harvest from each entry and stored at the MPIC Demonstration Storage in the fall of 2008 at two temperatures. Two graphs are provided for each line at each temperature for a total of four graphs per line. During the 2008-2009 storage season, the 50 °F samples were not evaluated beyond January 13th, 2009 due to the lack of variability in the storage bin temperatures where the two sets of samples were being stored. Both sets of samples were in bulk bins that were held at 54 °F, thus only one set of samples were evaluated for the remainder of the storage season. 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 chip quality of the 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 varieties are again reviewed in yield order, high to low, top to bottom.

Snowden: Snowden stored acceptably until mid February 2009 at 54 °F (Table 3). From Table 4, the chip quality in this variety was best from early January 2009 until mid March 2009. Snowden had an average chip quality performance at Herr Foods on both processing dates (Tables 1-2).

NY139: Table 8 shows acceptable chip quality for this variety until early May 2009. Table 7 shows a steady increase in sucrose from mid January through the end of the storage season. Glucose levels moved steadily upward in early March. Even with these sugar moves in early 2009, chip quality remained acceptable until early May. Herr Foods data in Tables 1-2 show this variety to have an average performance on both processing dates.

W2310-1: This Wisconsin variety had average to above average chip quality as shown in Tables 1-2. The March processing date shows this variety to have a very nice chip color (Table 2). W2310-1 stored well until late March when the sucrose levels rose quickly followed by the glucose levels in mid April (Table 11). Chip quality was acceptable until early to mid April (Table 12).

AF2291-10: AF2291-10 had above average chip quality performance at Herr Foods on both processing dates (Tables 1-2). Table 15 showed some variable sucrose levels early in the season. This elevated sucrose level appeared to have little effect on chip quality as shown in Table 16.

CO97043-14W: This variety exhibited above average chip quality at Herr Foods (Tables 1-2). The recorded AGTRON scores, for this variety, on both dates were the highest in the trial. There was some variability in sucrose and glucose levels through most of the storage season (Table 19). The chip quality remained acceptable until early May with no apparent impact from the variable glucose levels (Table 20).

ND7519-1: ND7519-1 appeared to have very good early season chip quality. This was confirmed by Herr Foods (Table 1) and the MPIC storage data (Tables 23-24). In January, the sucrose level rose quickly followed by the glucose level in mid February (Table 23). In mid February, the chip quality of this line declined quickly. Tuber rot was reported in this line during the March evaluation at Herr Foods. The warm storage temperature and the tuber rot may have played a major role in this variety not performing well late in the storage season.

W2717-5: W2717-5 had an average to above average chip quality at Herr Foods (Tables 1-2). The specific gravity was good and chip defects were below average on both dates. The sucrose level shown in Table 27 declined steadily October through mid February. The sugar stability and dormancy of this variety appear to be good when exposed to warm storage temperatures. Upon dormancy break in mid April, the chip quality declined quickly with rapid increases in sucrose and glucose levels (Table 28).

MSJ147-1: MSJ147-1 was an average performer at Herrs on both processing dates (Tables 1-2). The specific gravity was good with a below average size profile. A larger percentage of the tuber size profile of MSJ147-1 was below 2.5 inches. Some sucrose variability was evident October through February in Table 31, while glucose remained flat. Sucrose and glucose levels rose quickly in February and March resulting in poor chip quality in early April (Table 32).

CO95051-7W: This variety had average to above average chip quality at Herr Foods (Tables 1-2). Its yield was the lowest in the 2008 trial. The tuber size profile was smaller than average with most tubers being under 3 inches. In general, the variety had a low percentage of chip defects at Herrs. Sucrose levels were stable until mid February with a steady increase in concentration through the remainder of the season (Table 35). Glucose levels followed sucrose a month later, but overall, chip quality remained good into June (Table 36).

Table 1. 2008-2009 Out-of-Storage Chip Quality, December 29, 2008, Sandyland Farms, LLC ¹.

Entry	Agron Color	SFA ² Color	Specific Gravity	Percent Chip Defects ³			Comments
				Internal	External	Total	
Snowden	60.2	3.5	1.079	8.0	18.6	26.6	Internals: Scab showing on chips. Externals: Pitted scab. Oversize to 4".
NY139	60.1	2.5	1.077	6.9	7.6	14.5	Internals: A few light shading & internal necrosis. Externals: Some external bruise, no scab. Nice size.
W2310-3	56.4	3.0	1.079	6.9	1.7	8.6	Internals: A few light vascular & shading. Externals: 1 or 2 bruise, otherwise nice. No scab. Good size; some large to 4"
AF2291-10	60.9	2.5	1.071	12.6	3.3	15.9	Internals: A few light internal chip color. Externals: Some mechanical injury. Oversize to 4".
CO97043-14W	62.7	2.5	1.069	6.4	2.5	8.9	Internals: Defects on a few chips, otherwise nice color. Externals: Nice, 1 or 2 mechanical injury. Oversize to 4 1/4".
ND7519-1	56.0	2.0	1.080	1.4	7.9	9.3	Internals: Just a few stem color in chips. Nice externals. Good size profile to 3 1/2".
W2717-5	58.1	3.0	1.085	17.8	4.0	21.8	Internals: A few stem-end & light shading. Externals: Some green & mechanical injury with dry rot. Nice size to 3 1/4".
MSJ147-1	54.4	3.5	1.085	4.9	8.9	13.8	Internals: Fusarium shown in chips. Externals: Some fusarium in bruise, green. Some under 2".
CO95051-7W	58.9	2.5	1.074	5.5	2.8	8.3	Internals: A few stem-end & vascular ring. Externals: A few bruise & stem-end rot. Small grade, some under 2".

¹ Samples removed from 54 °F storage and processed by Herr Foods Inc., Nottingham, PA on December 29, 2008.
Chip defects are included in Agron 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. 2008-2009 Out-of-Storage Chip Quality, March 24, 2009, Sandyland Farms, LLC ¹.

Entry	Agron Color	SFA ² Color	Specific Gravity	Percent Chip Defects ³			Comments
				Internal	External	Total	
Snowden	58.7	4.0	1.074	19.9	11.0	30.9	Internals: Shading in chips. Externals: Nice grade, low internals. Good size.
NY139	56.8	4.0	1.076	21.5	13.4	34.9	Internals: Shading & external defects show in chips. Externals: A few scab, fusarium, Large size some 4 1/2".
W2310-3	59.4	2.0	1.077	15.2	6.5	21.7	Internals: Nice chip color. A few with light shading and some stem-end vascular browning (light). Externals: A few scab with fusarium.
AF2291-10	59.7	3.0	1.074	4.8	9.3	14.1	Internals: Nice chip color. Externals: A few scab, bruise. Nice grade overall.
CO97043-14W	61.0	3.0	1.065	7.7	4.7	12.4	Internals: Very light shading. Not bad. Nice externals. Size good to 3 1/2".
ND7519-1	48.7	5.0	1.071	65.8	3.0	68.8	Internals: Poor chip color. Externals: A few bruise, tuber rot bad. Size to 3 3/4".
W2717-5	57.9	3.0	1.084	5.5	5.2	10.7	Internals: Not bad chip color. Externals: Some scab and bruise. Nice size to 3 1/2".
MSJ147-1	54.3	3.0	1.084	5.6	9.5	15.1	Internals: A few shaded chips from dry rot. Externals: Fusarium on some tubers. Small 1 1/2" 3". Too many 2".
CO95051-7W	56.2	3.0	1.068	8.3	5.2	13.5	Internals: Slight vascular, nice chip color overall. Externals: A few scab & bruise. Not too bad external. Small, 2 - 3". Low gravity.

¹ Samples removed from 54 °F storage and processed by Herr Foods Inc., Nottingham, PA on March 24, 2009.
Chip defects are included in Agron 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 3.

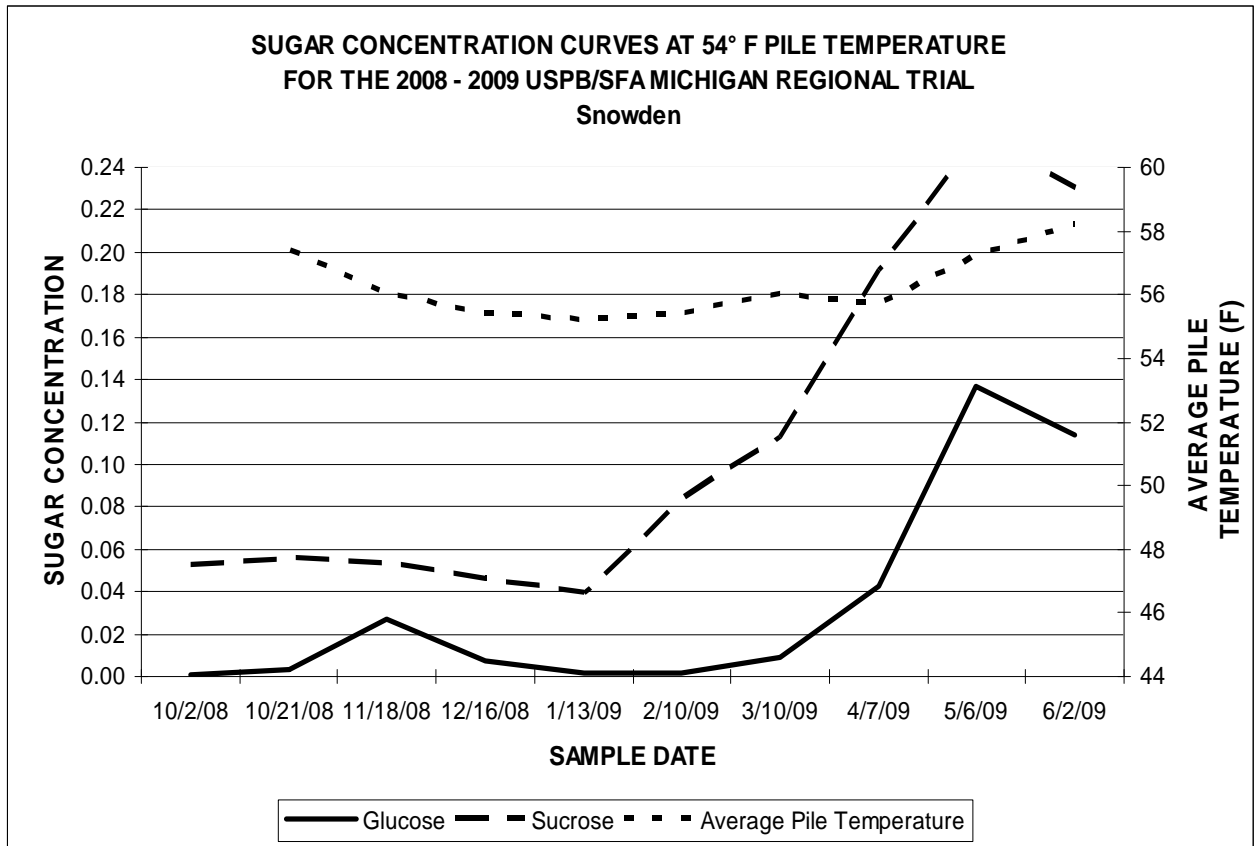


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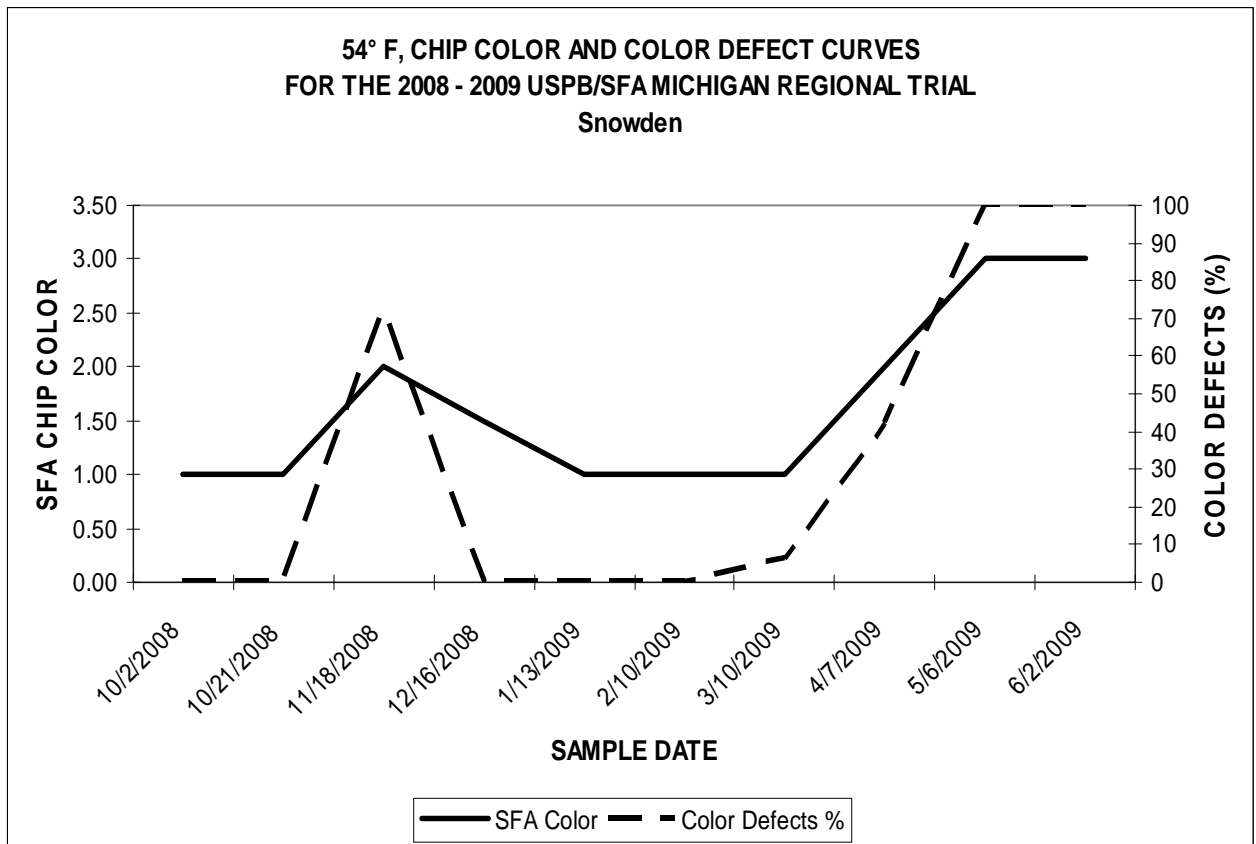


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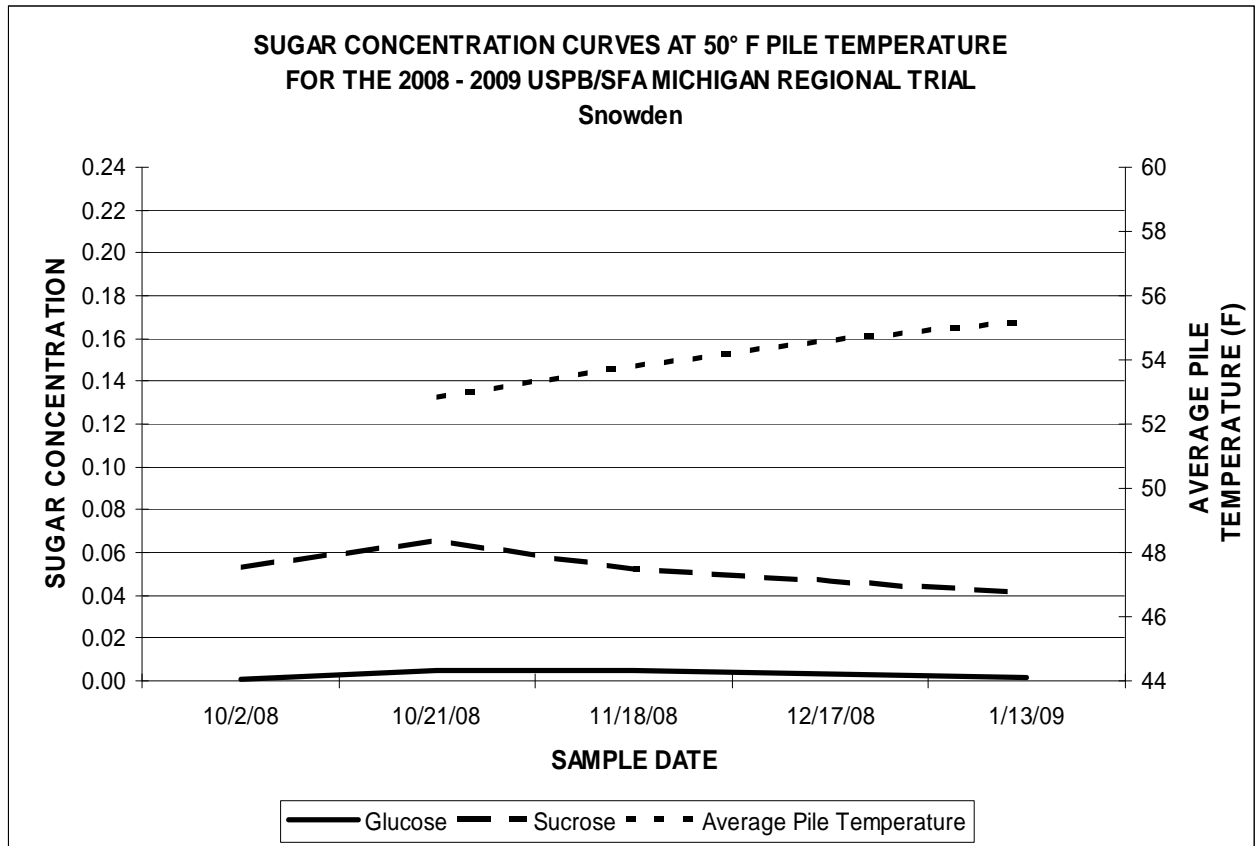


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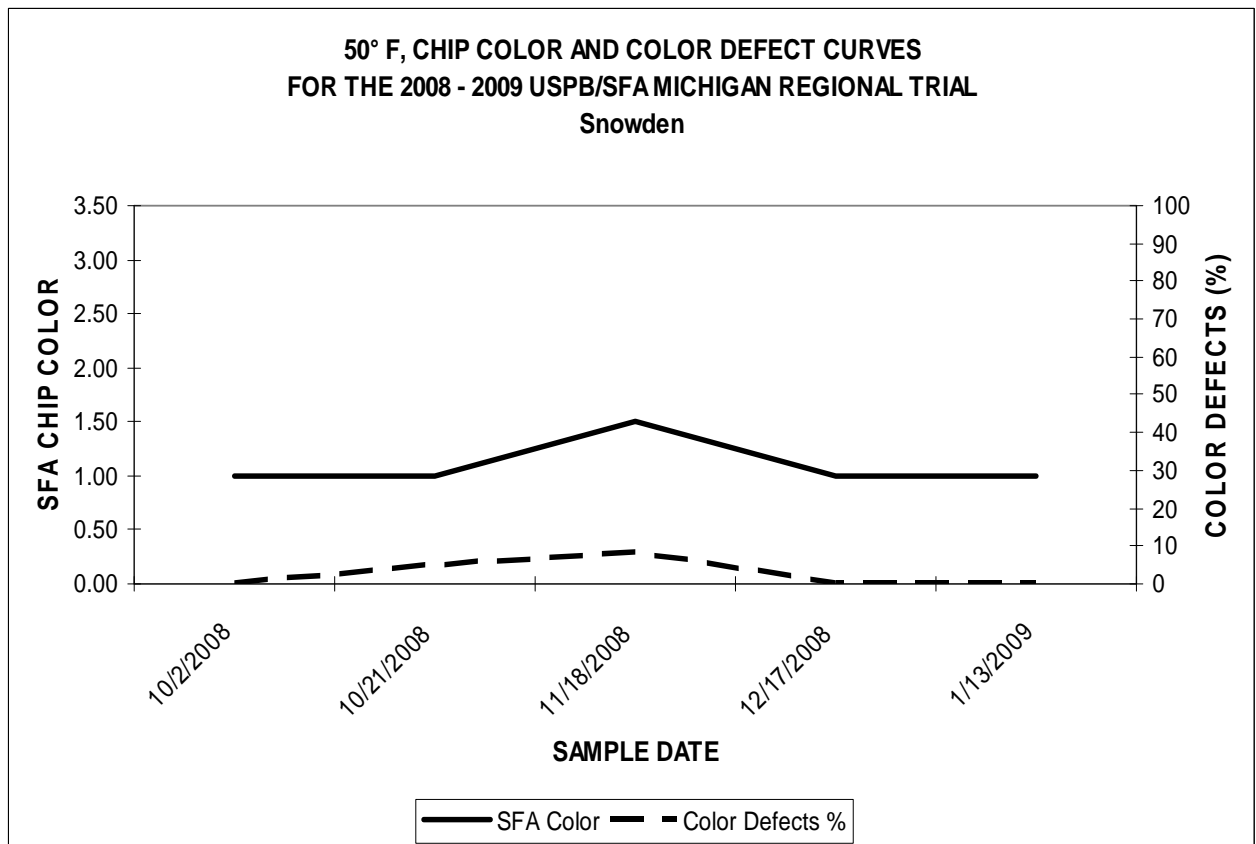


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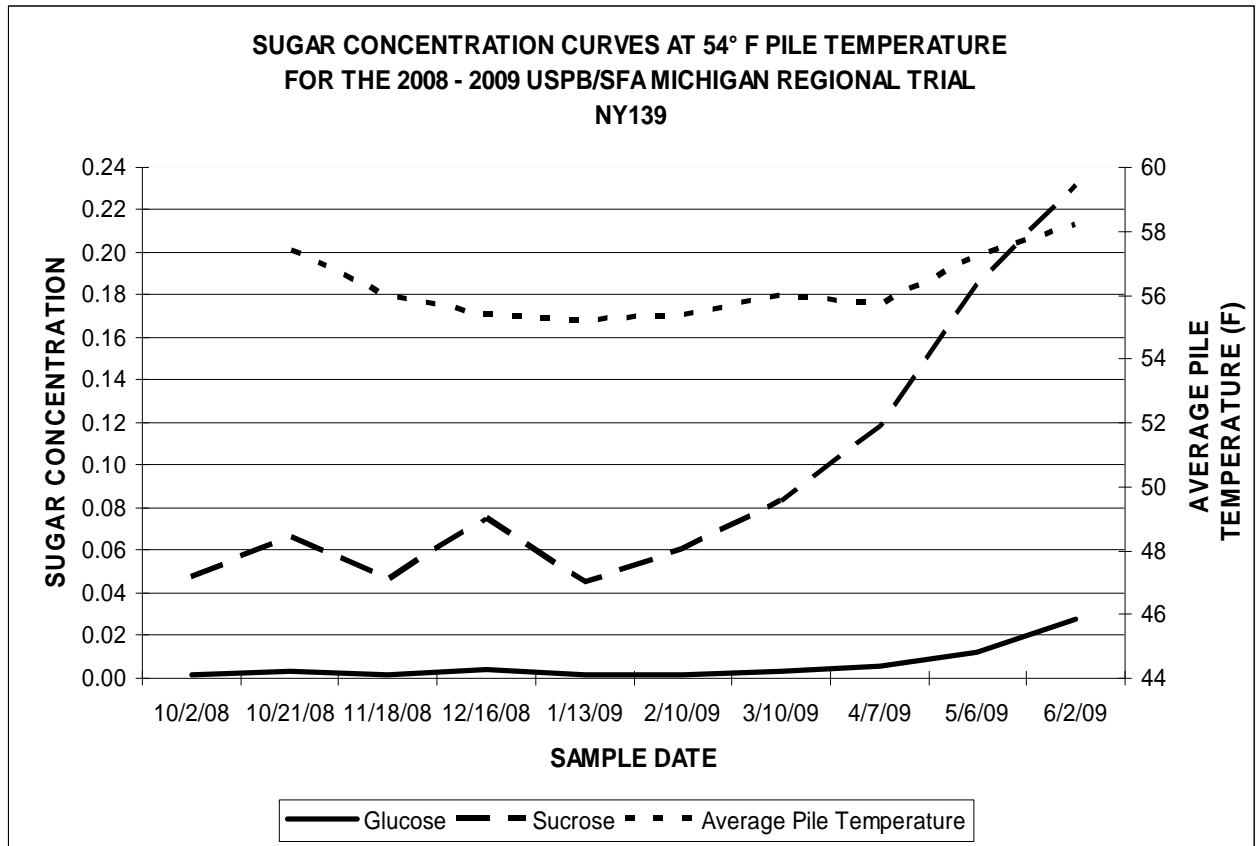


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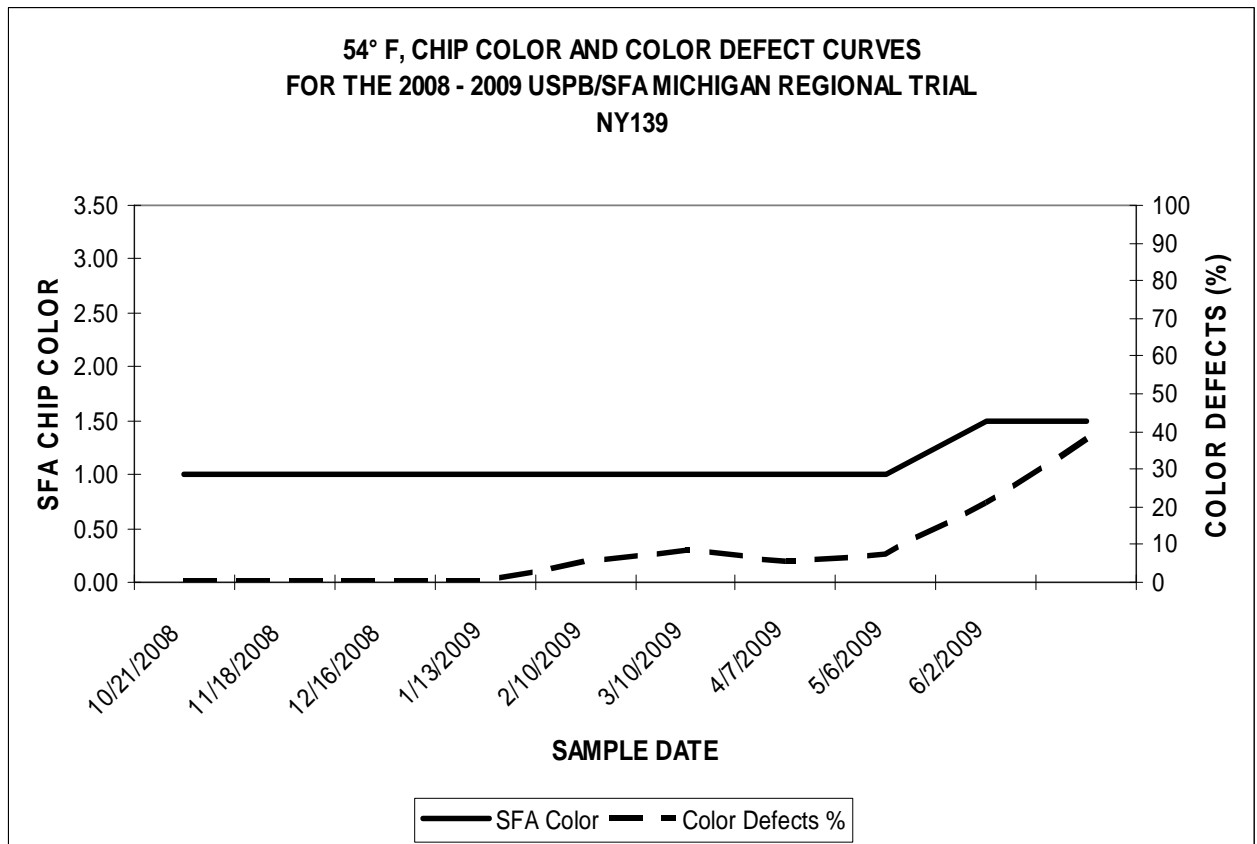


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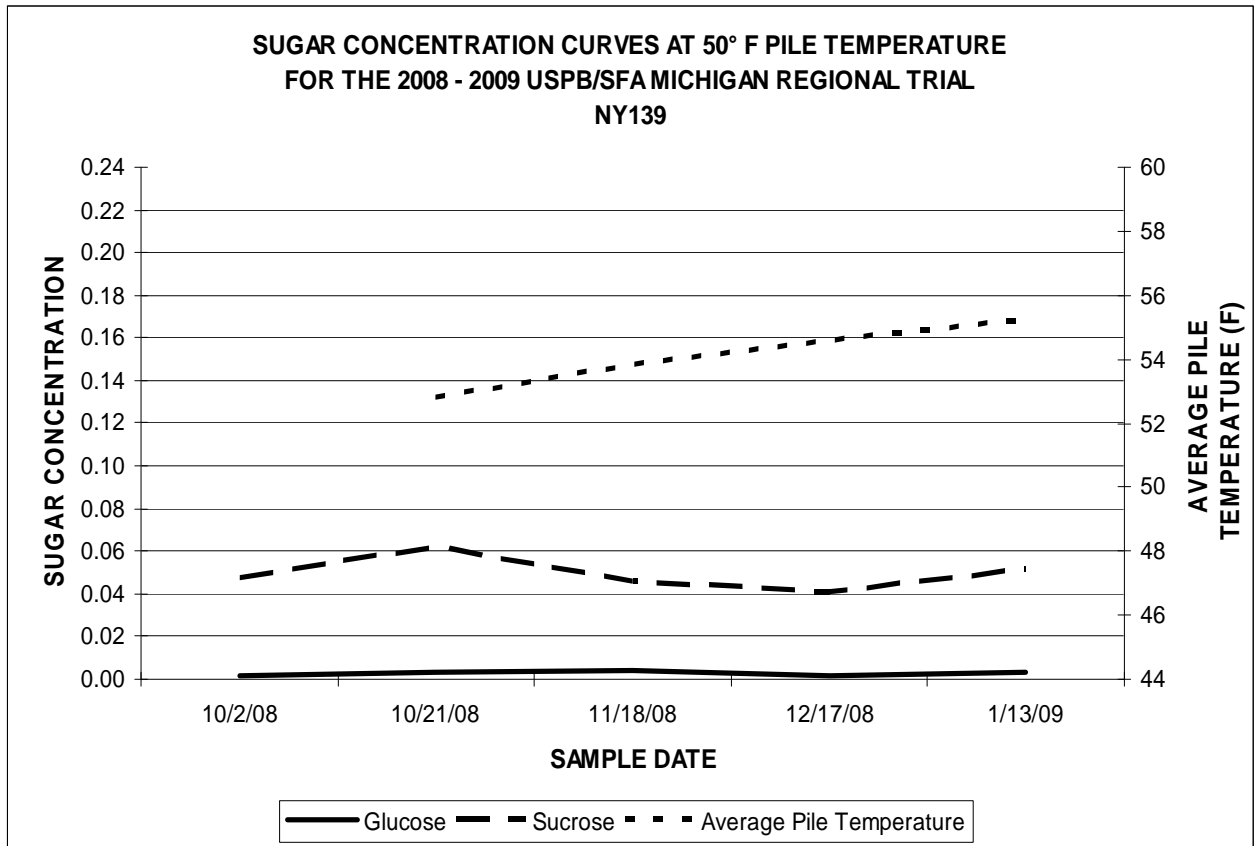


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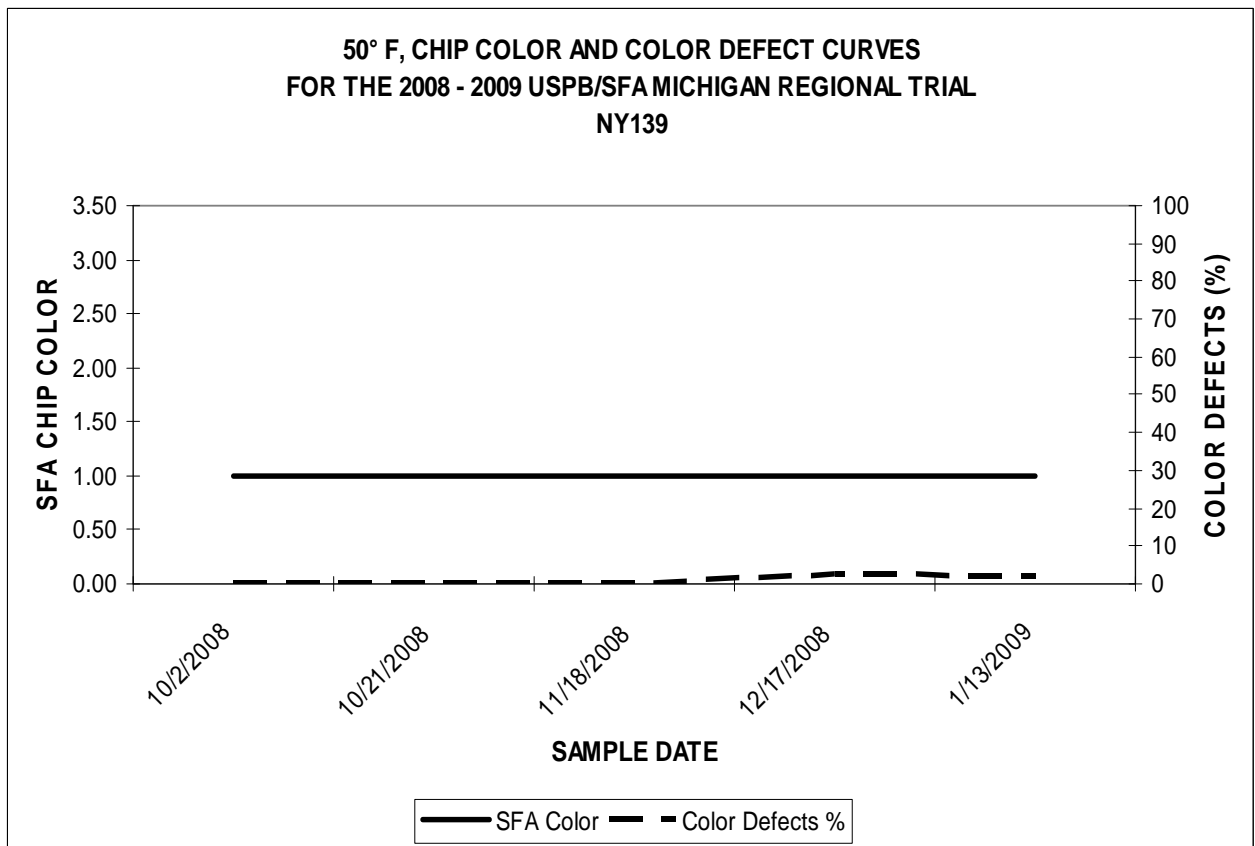


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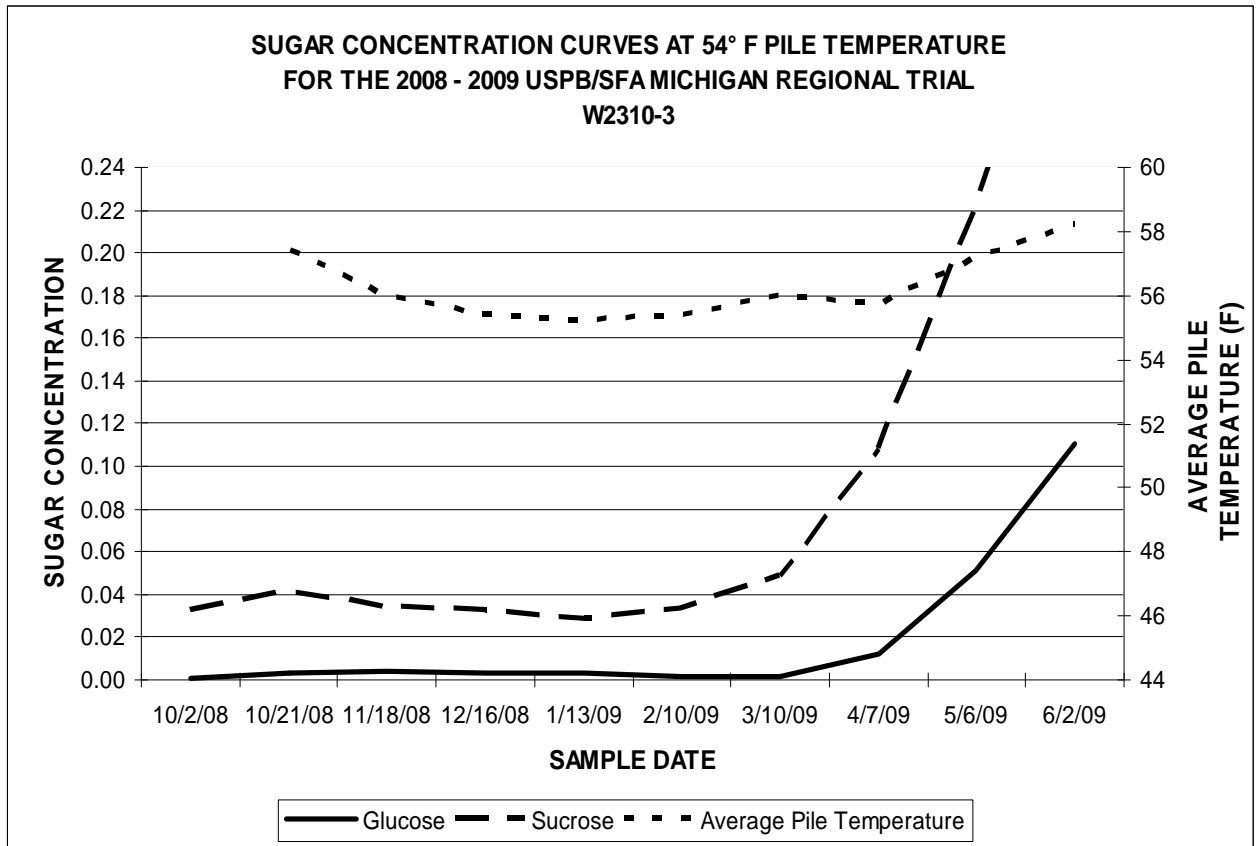


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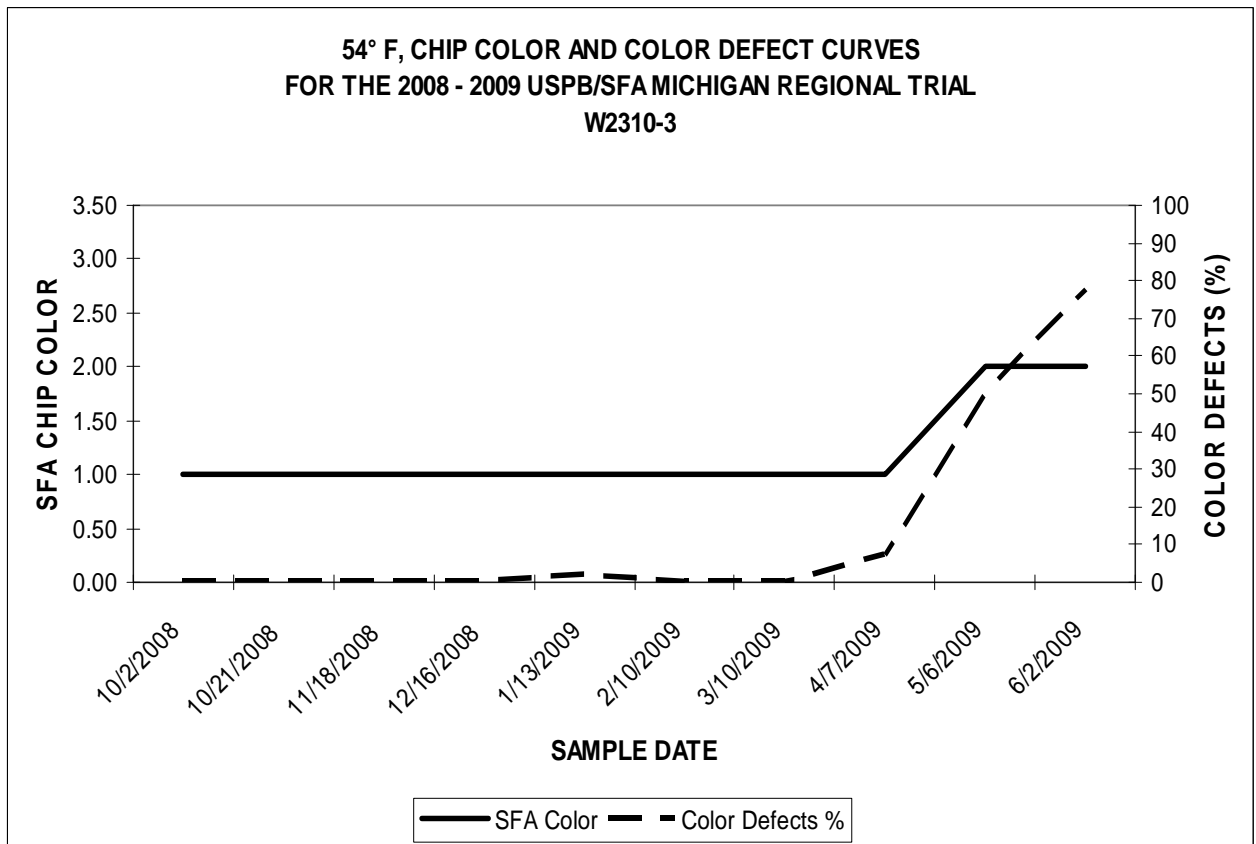


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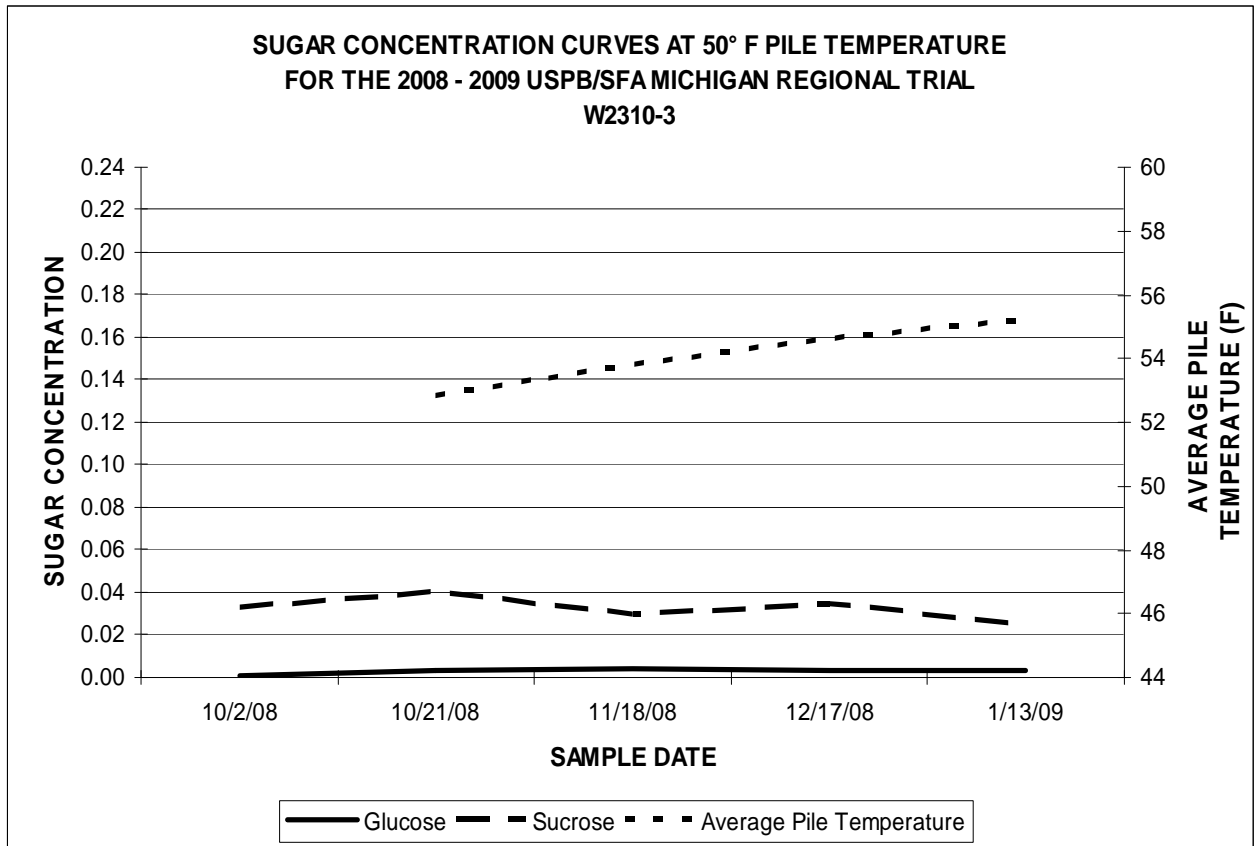


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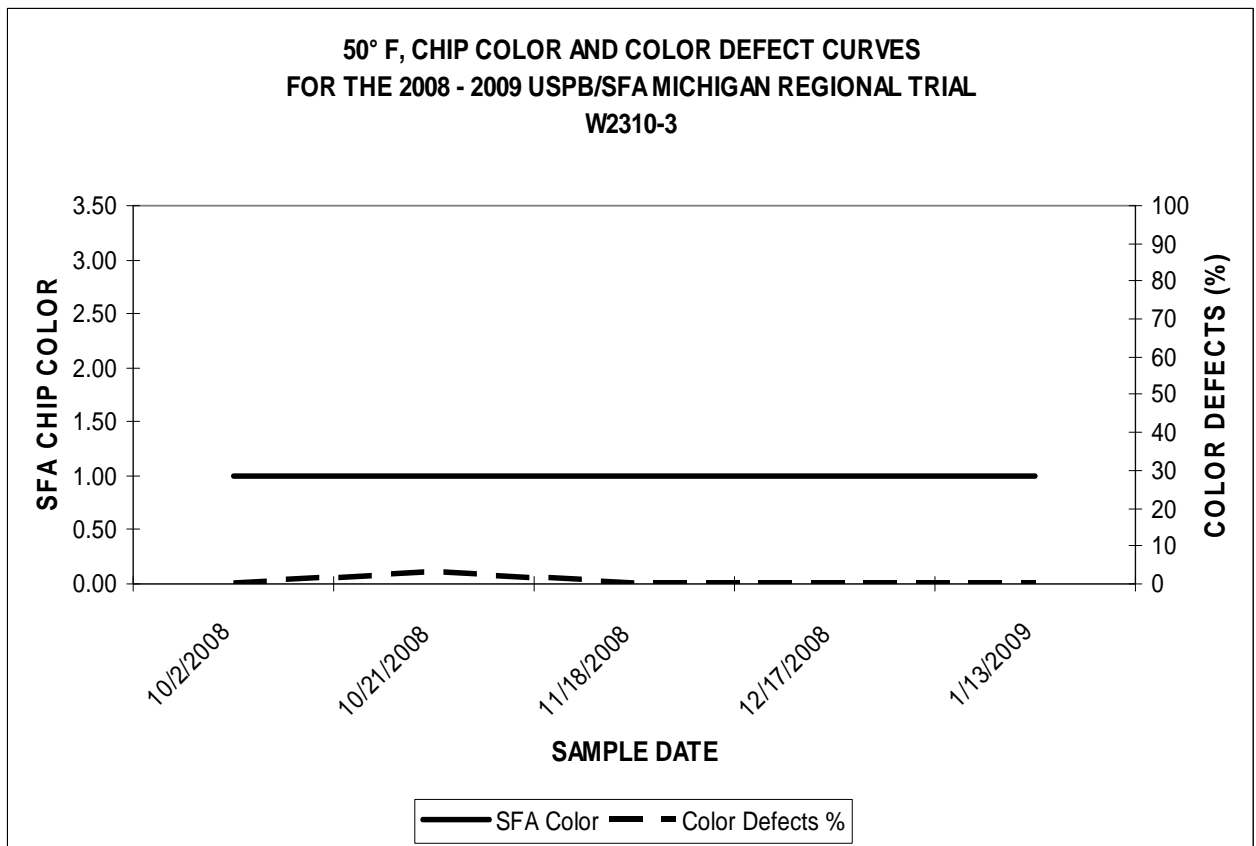


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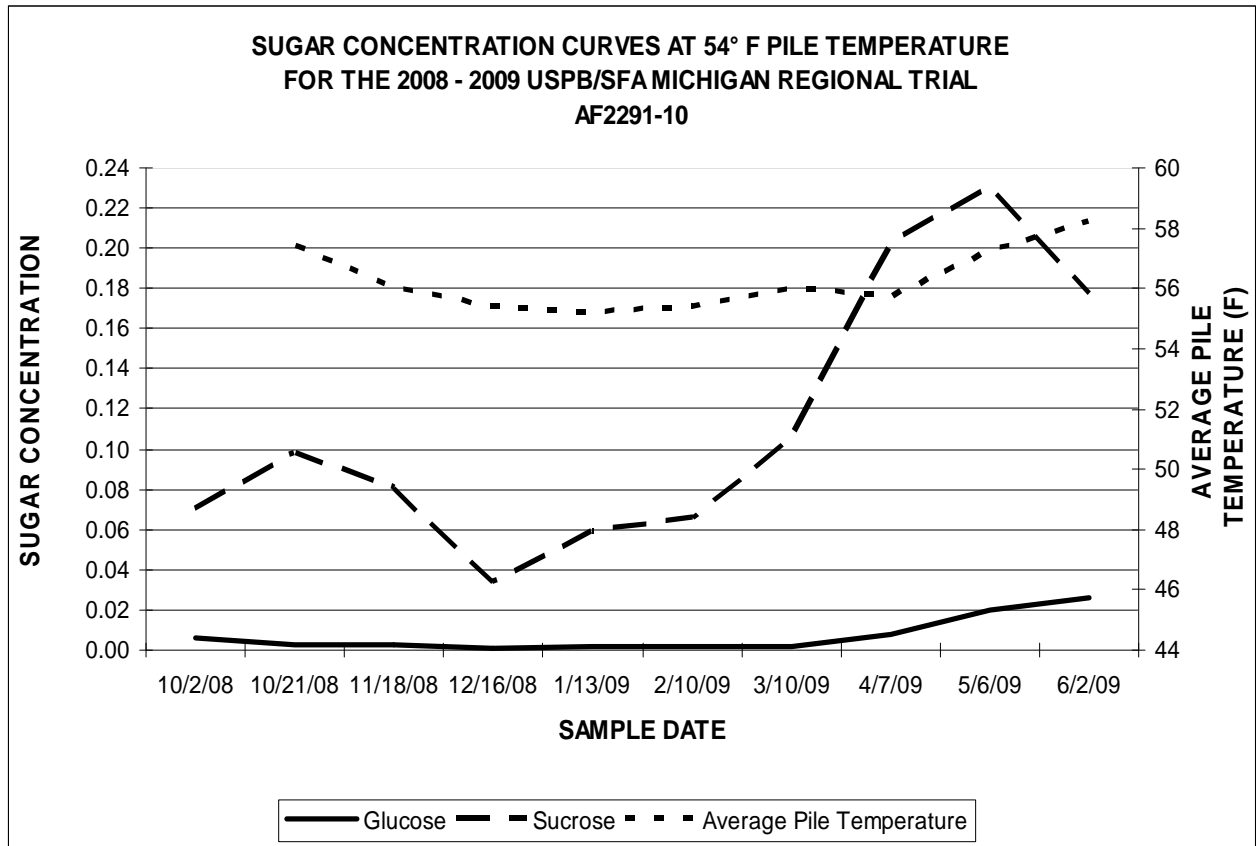


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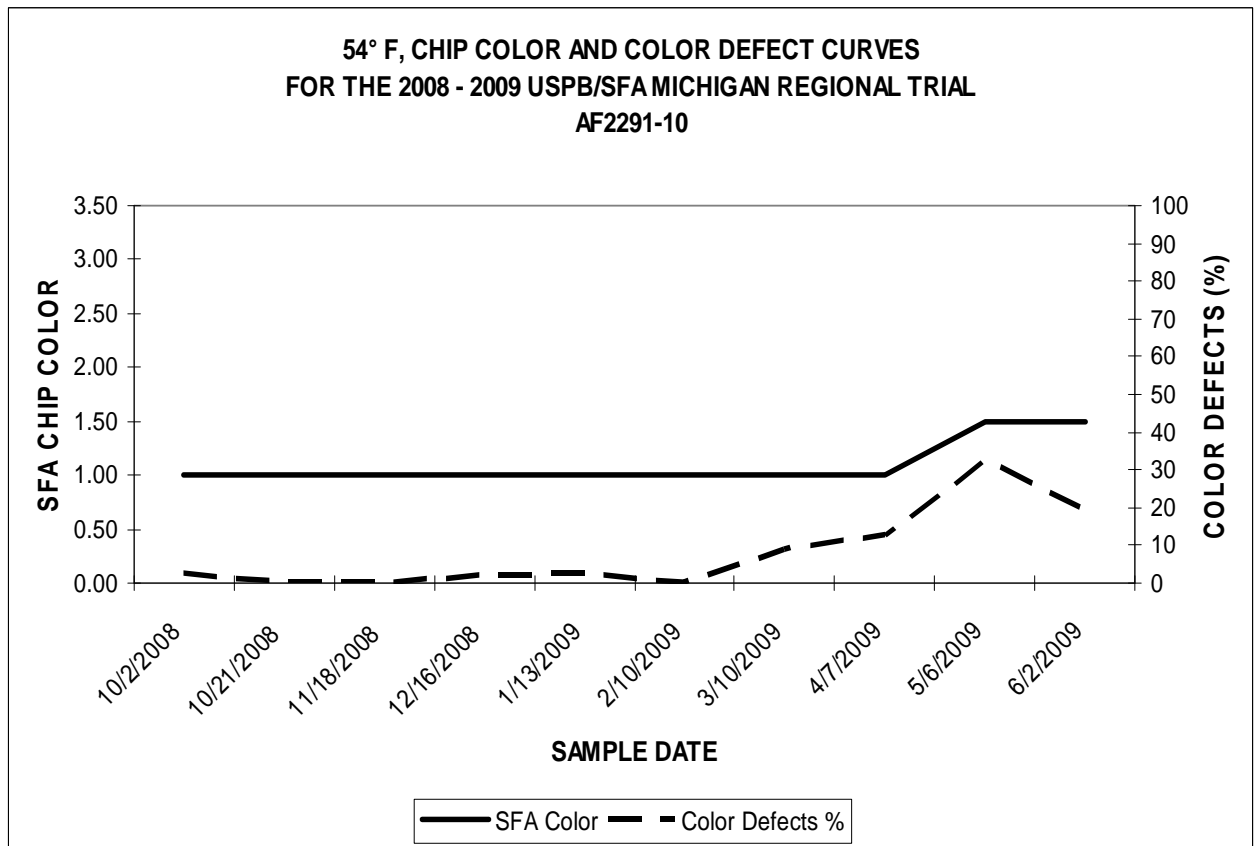


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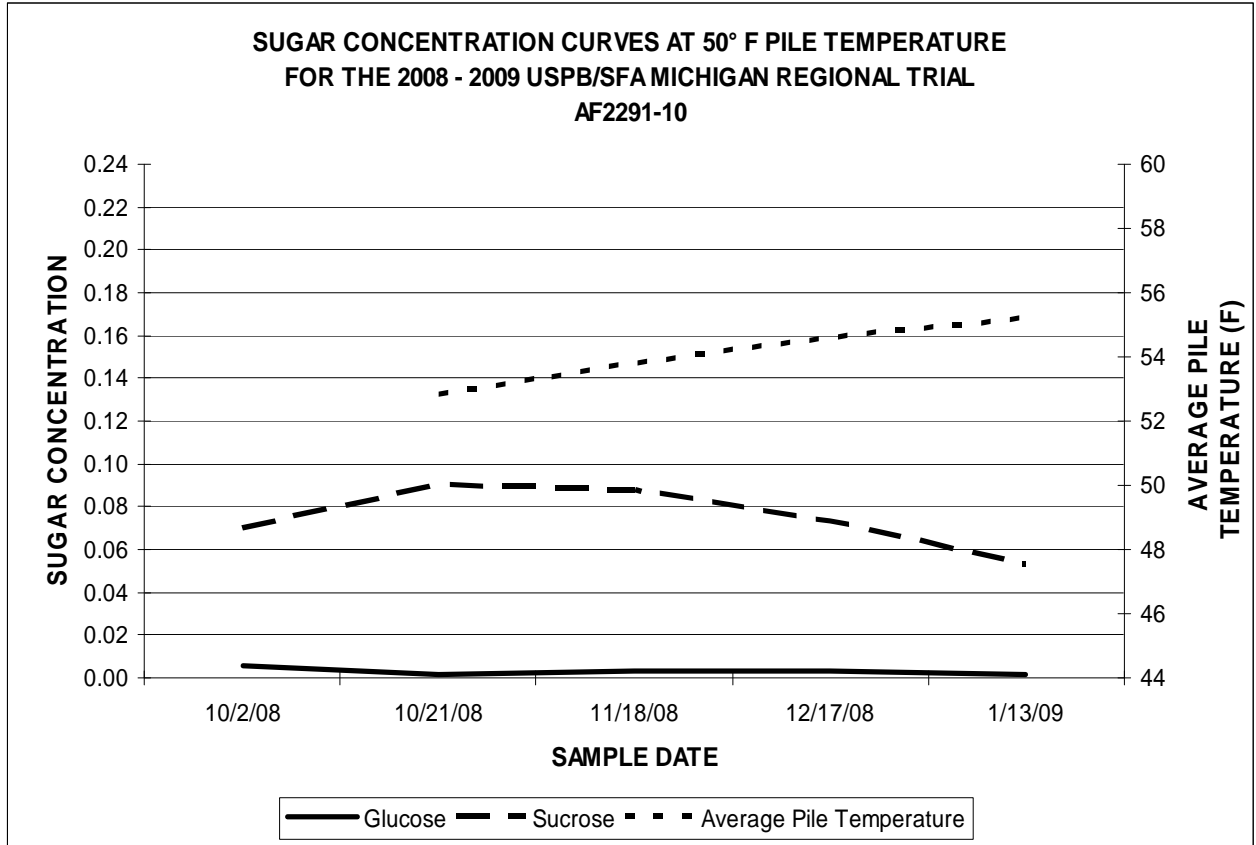


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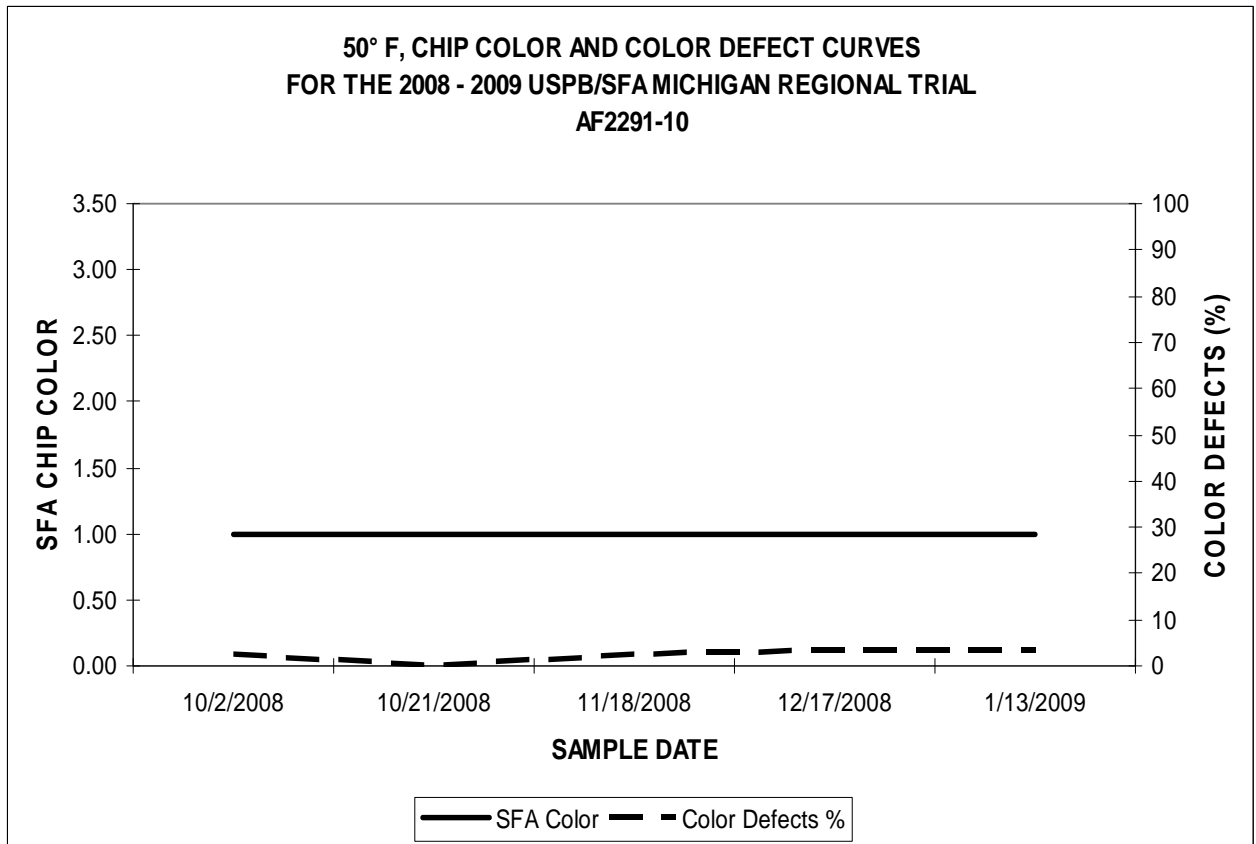


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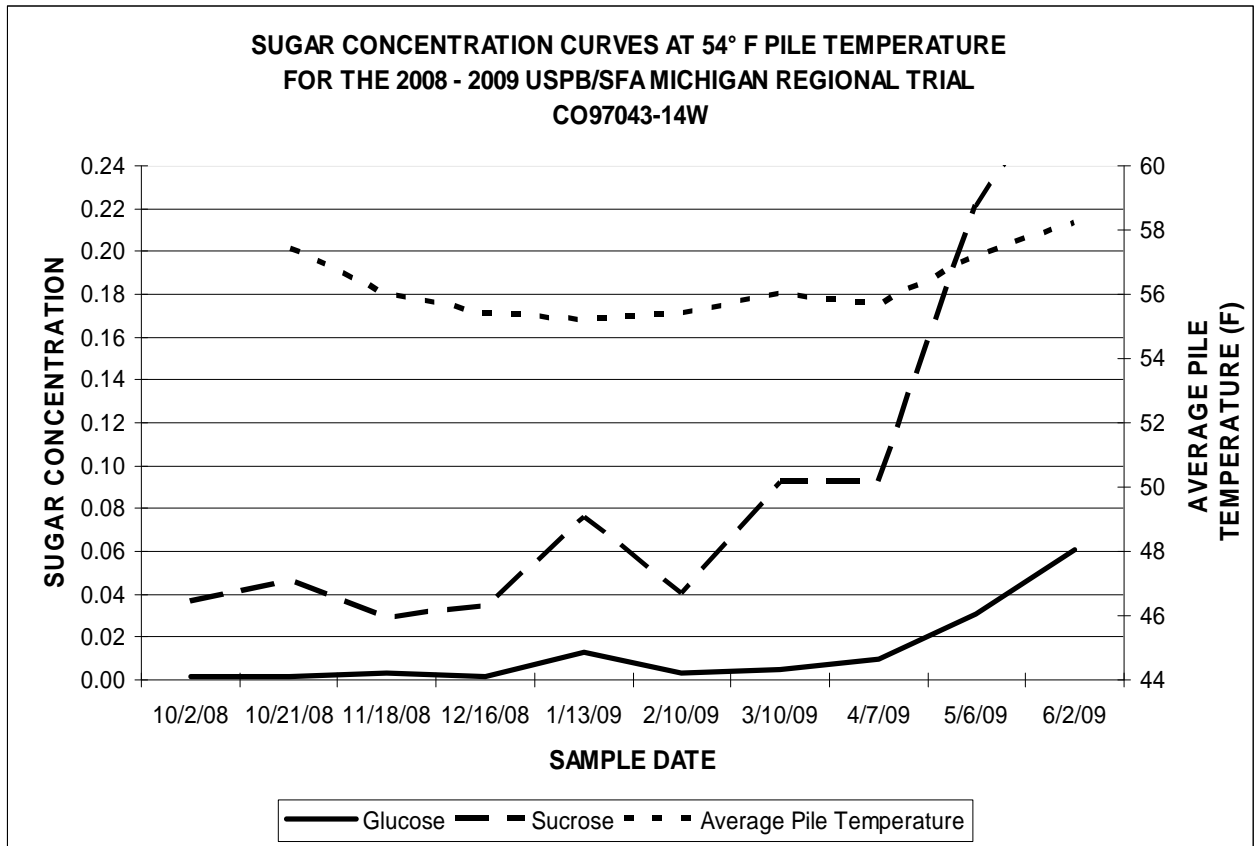


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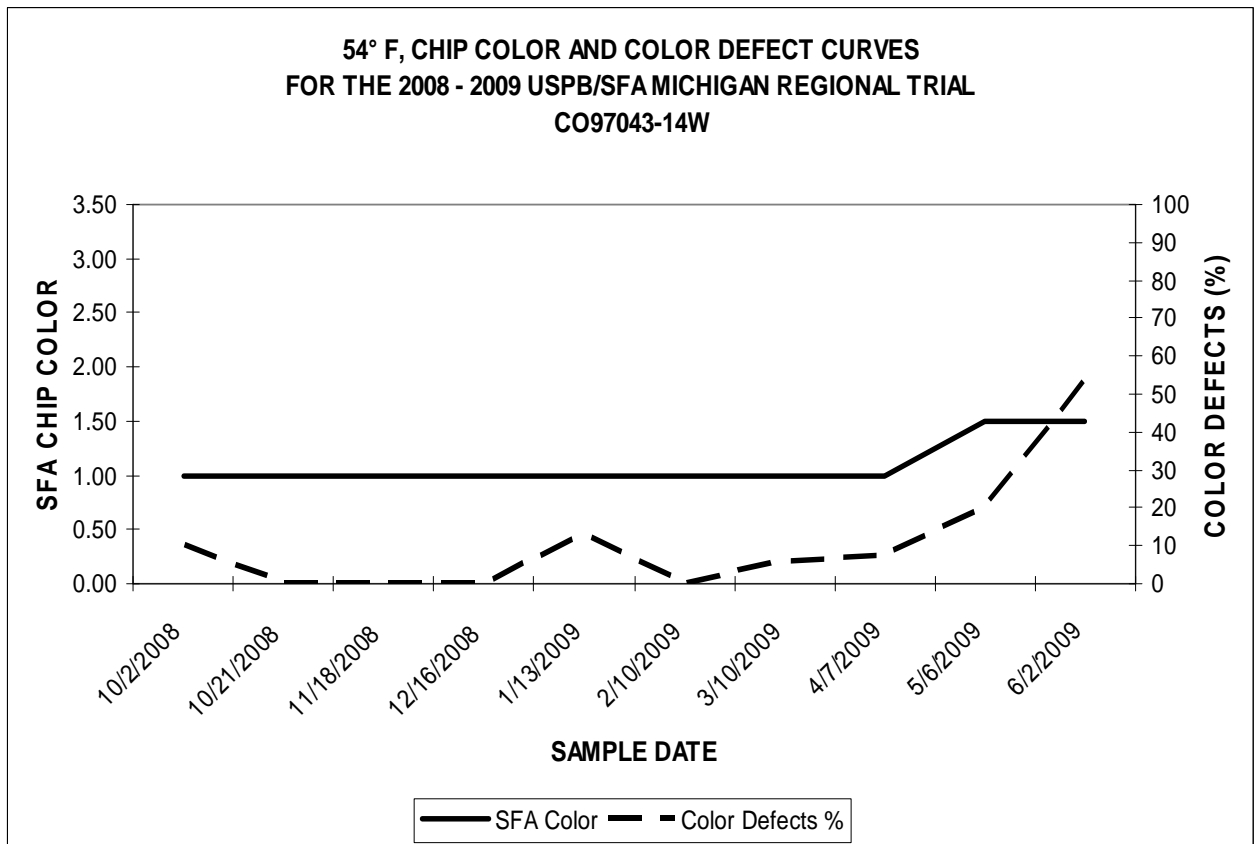


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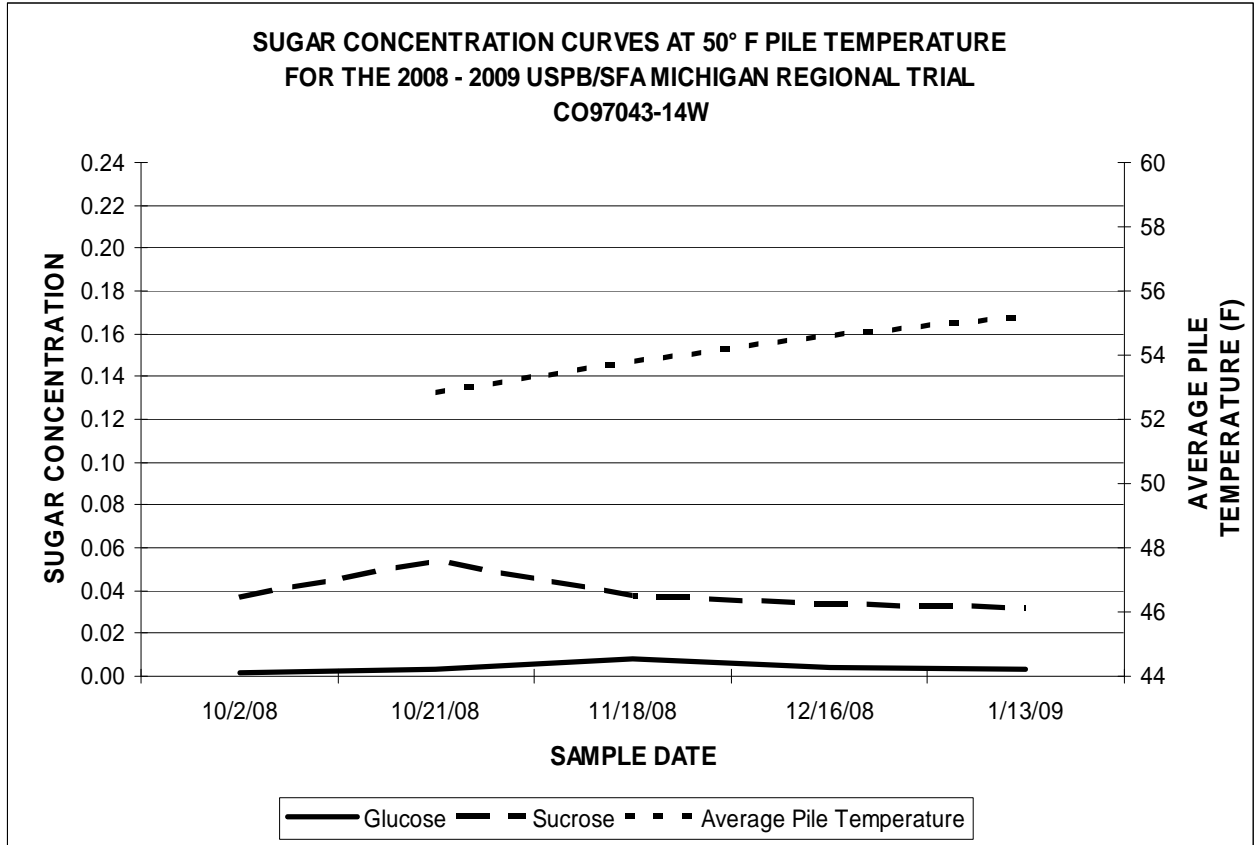


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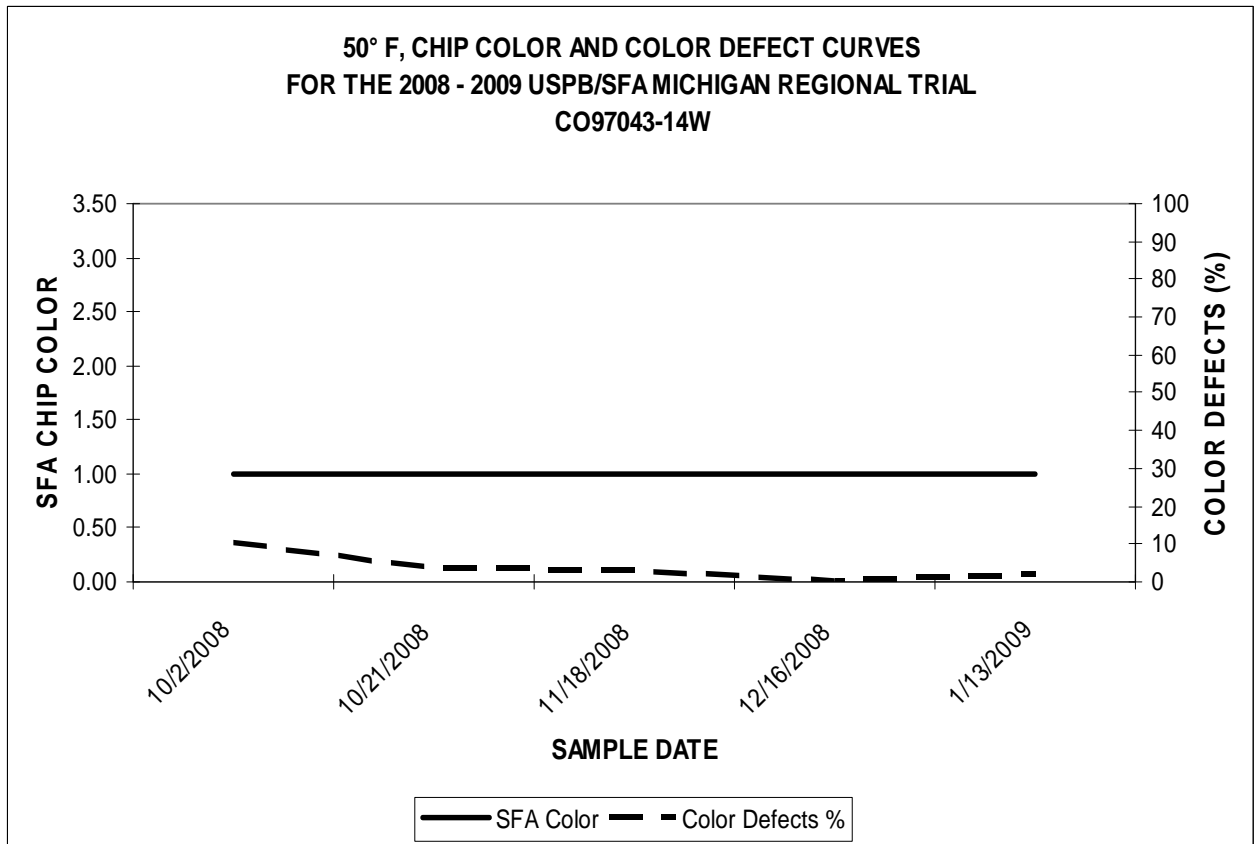


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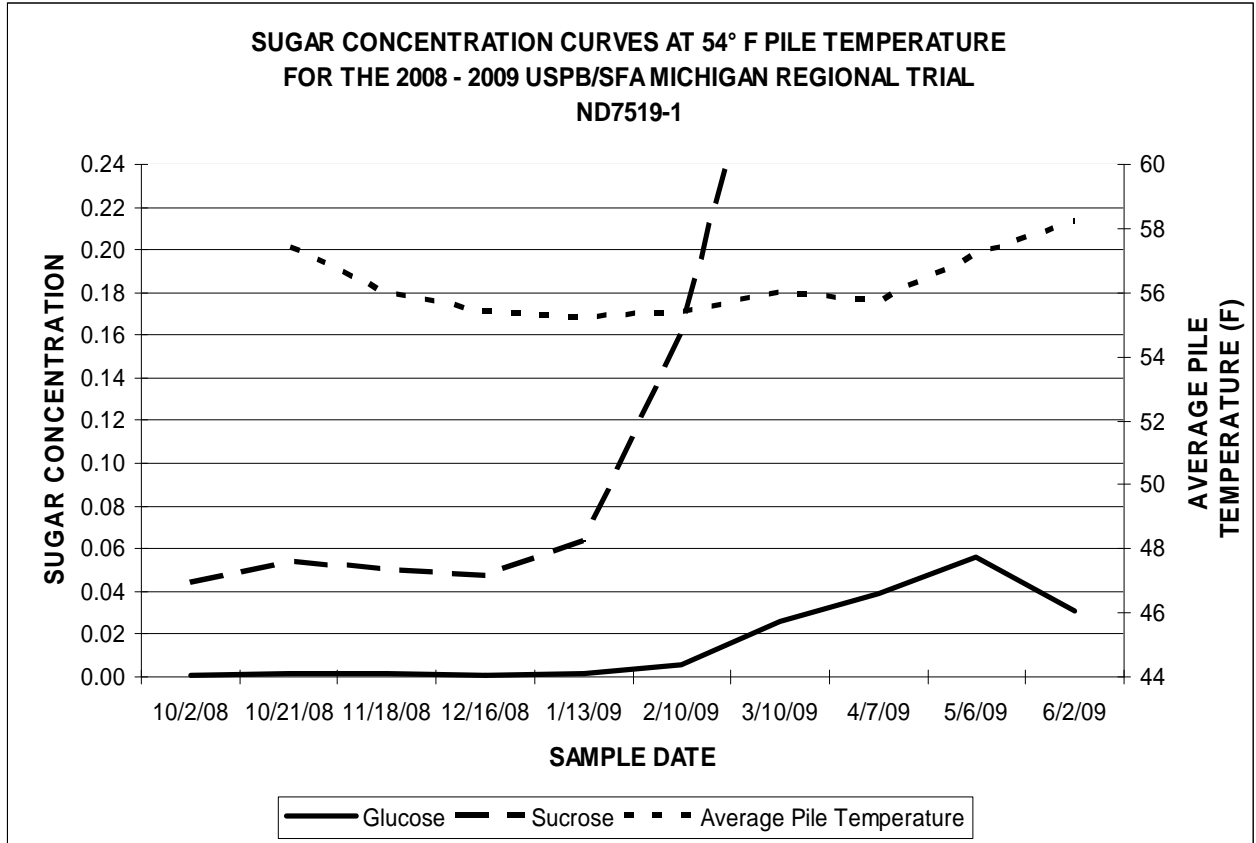


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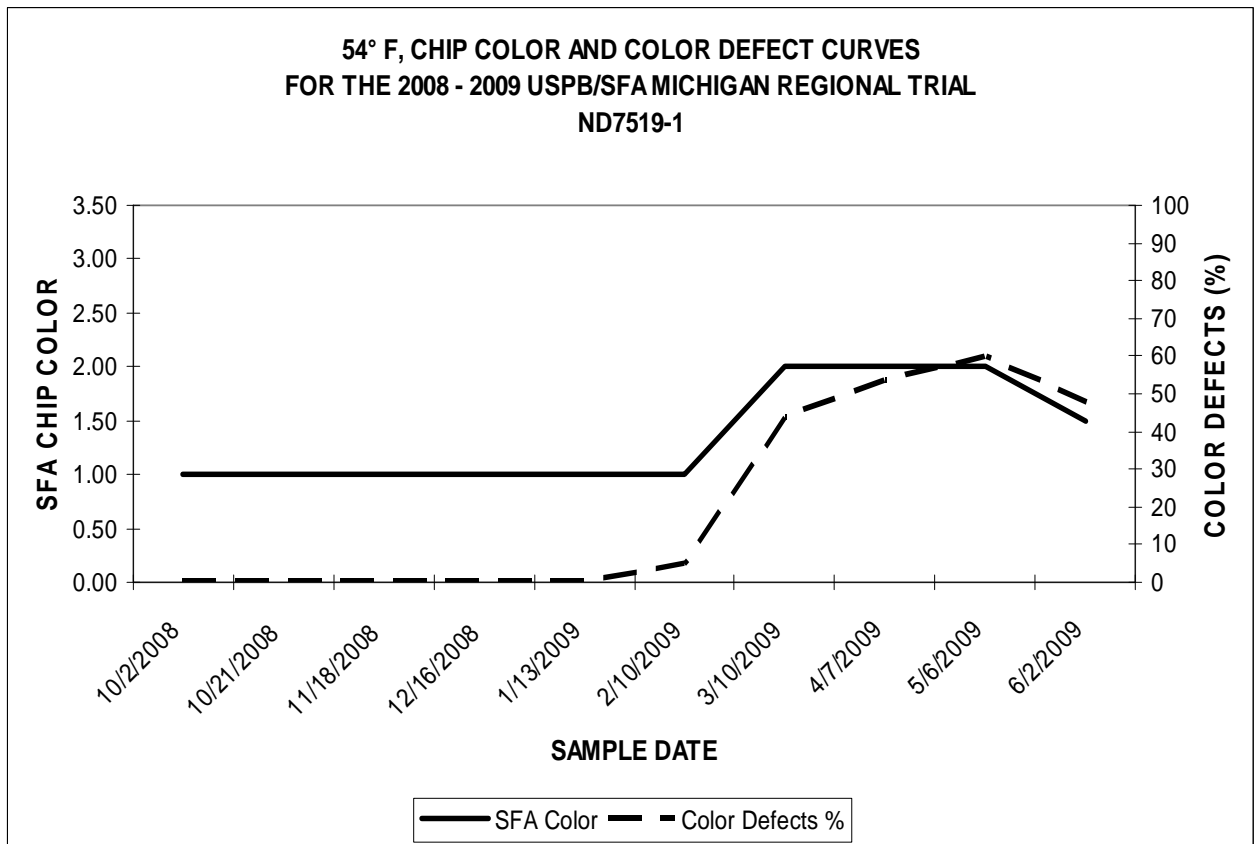


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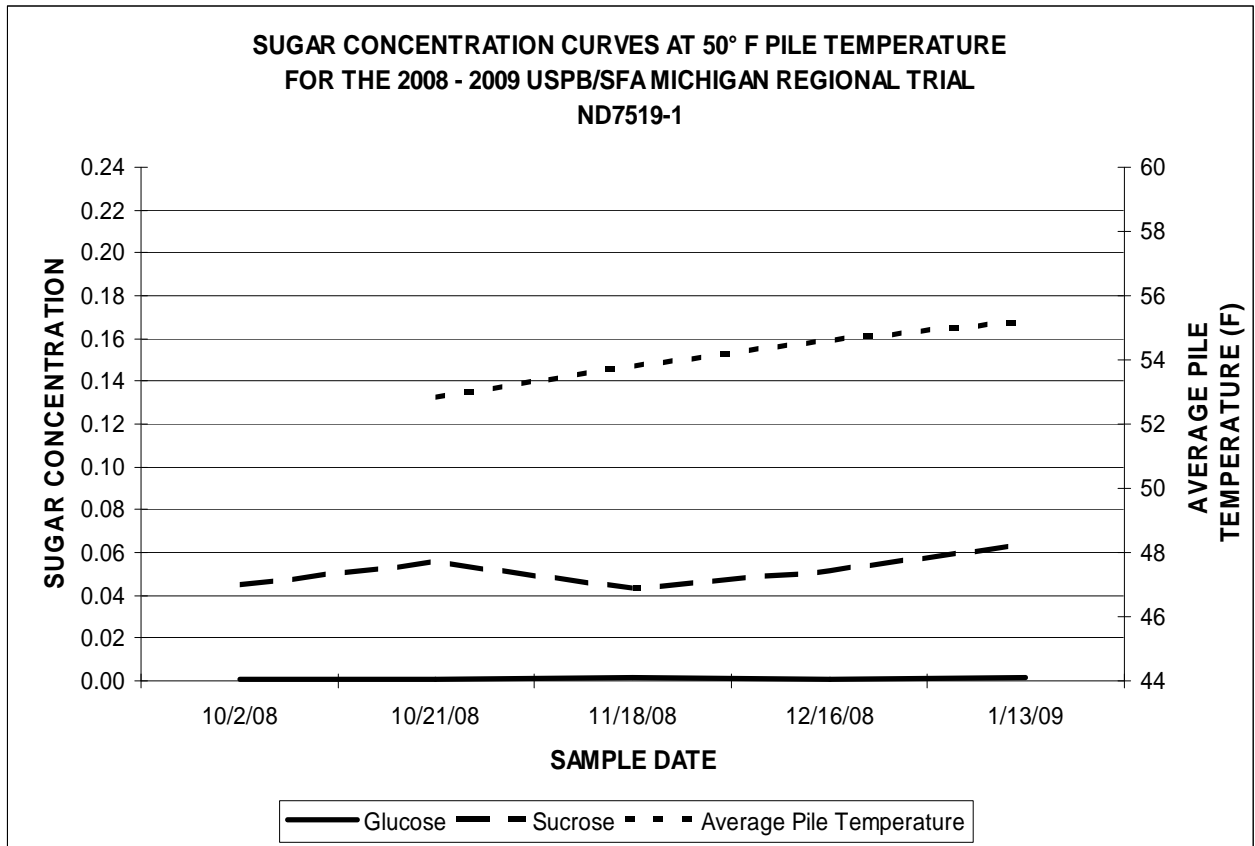


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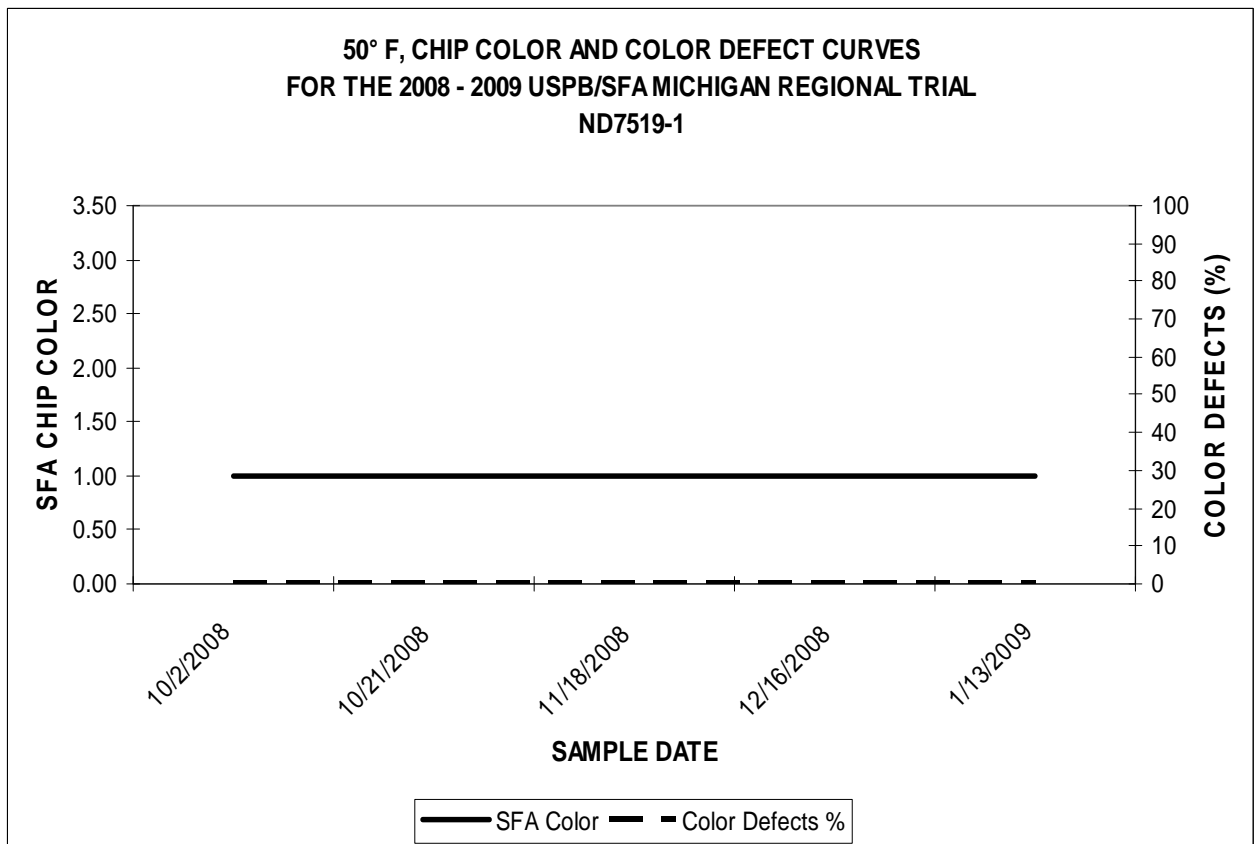


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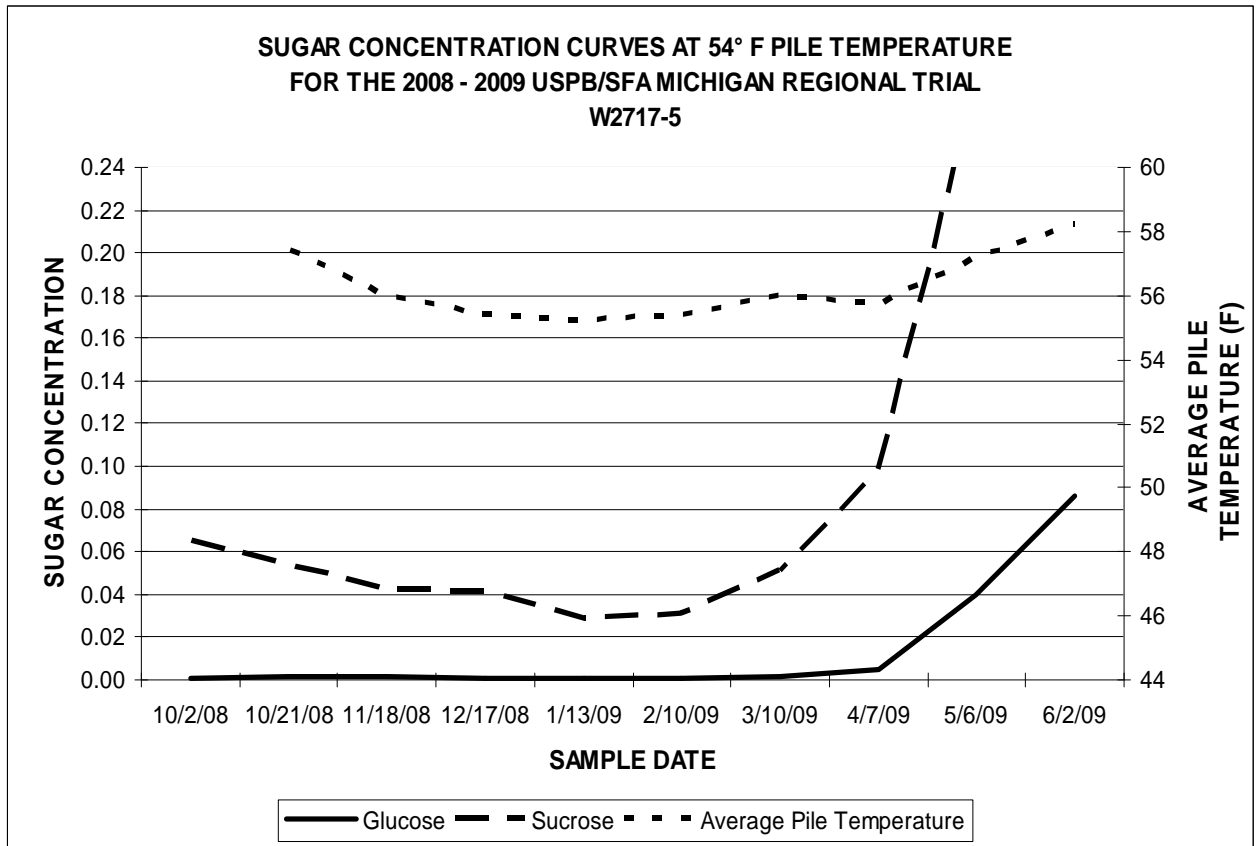


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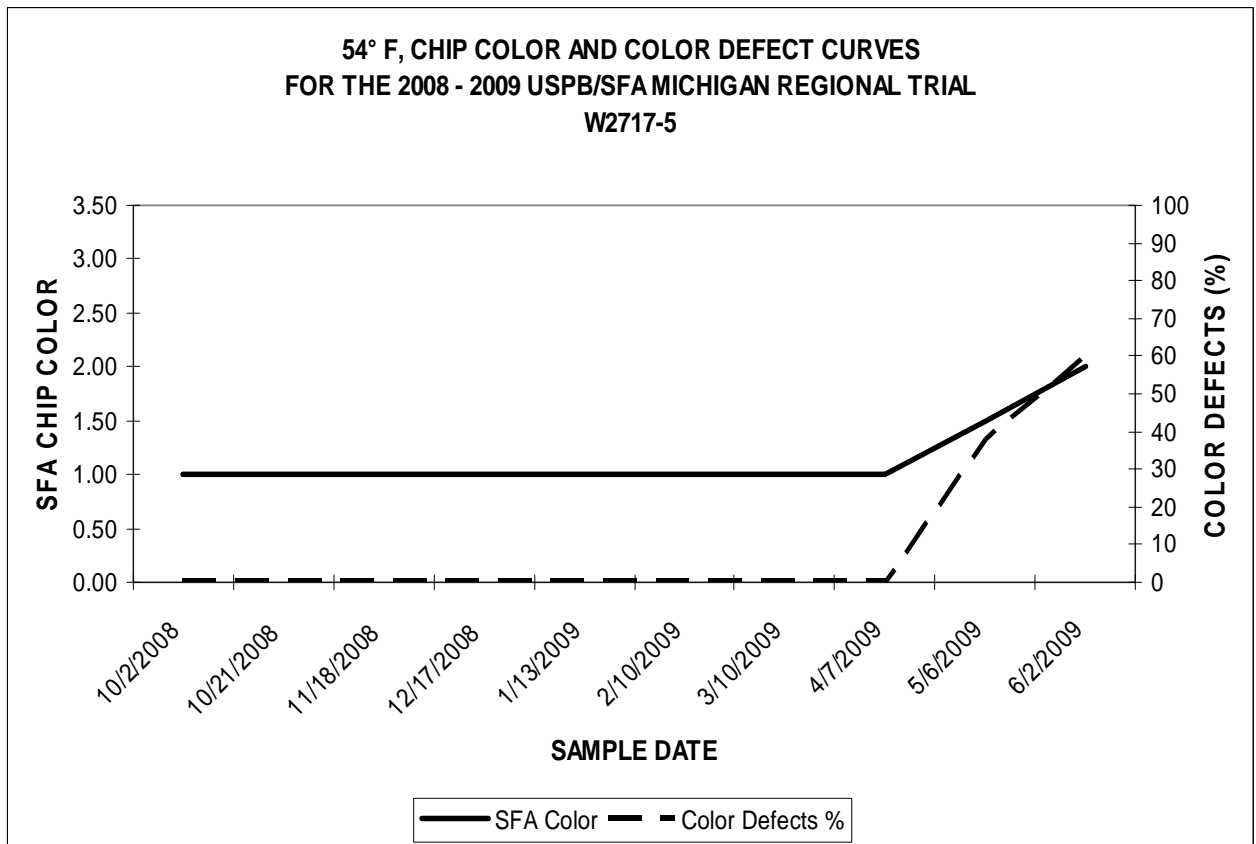


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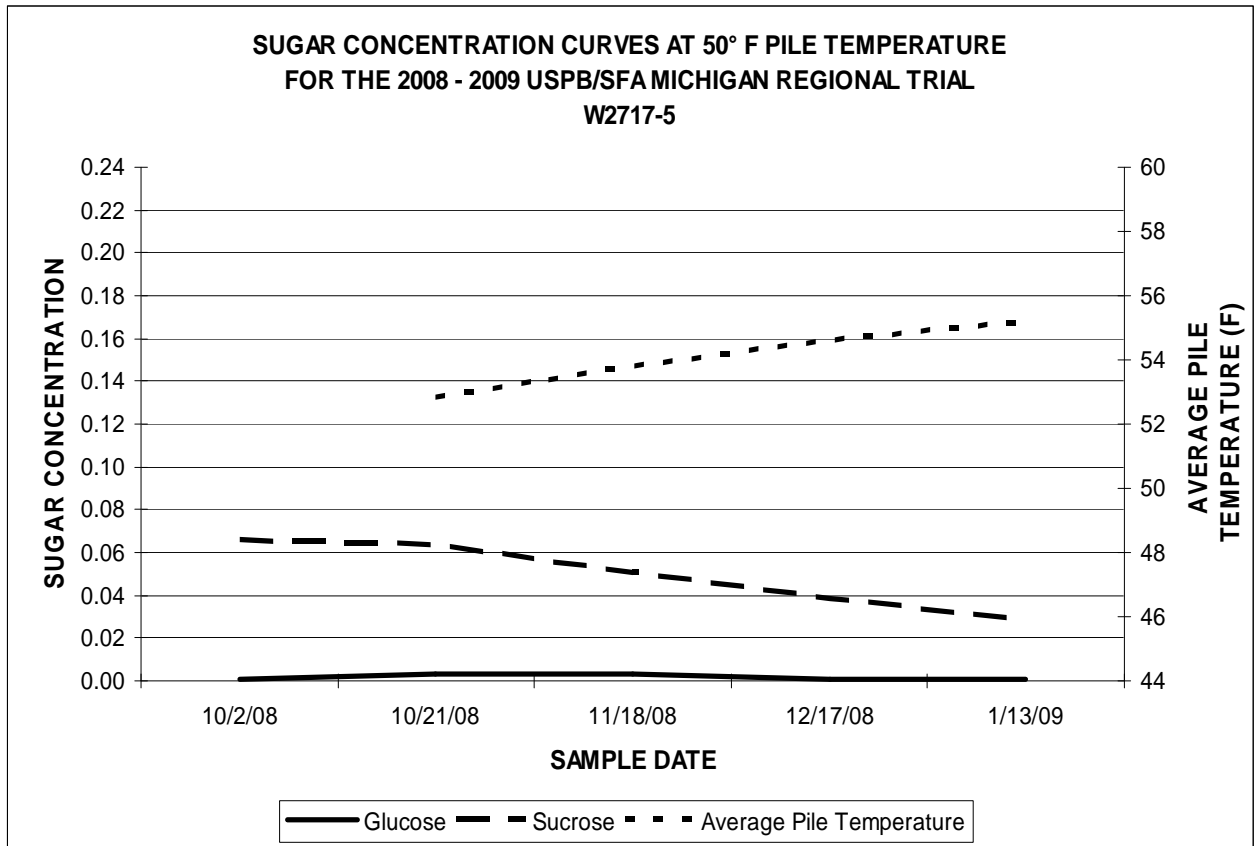


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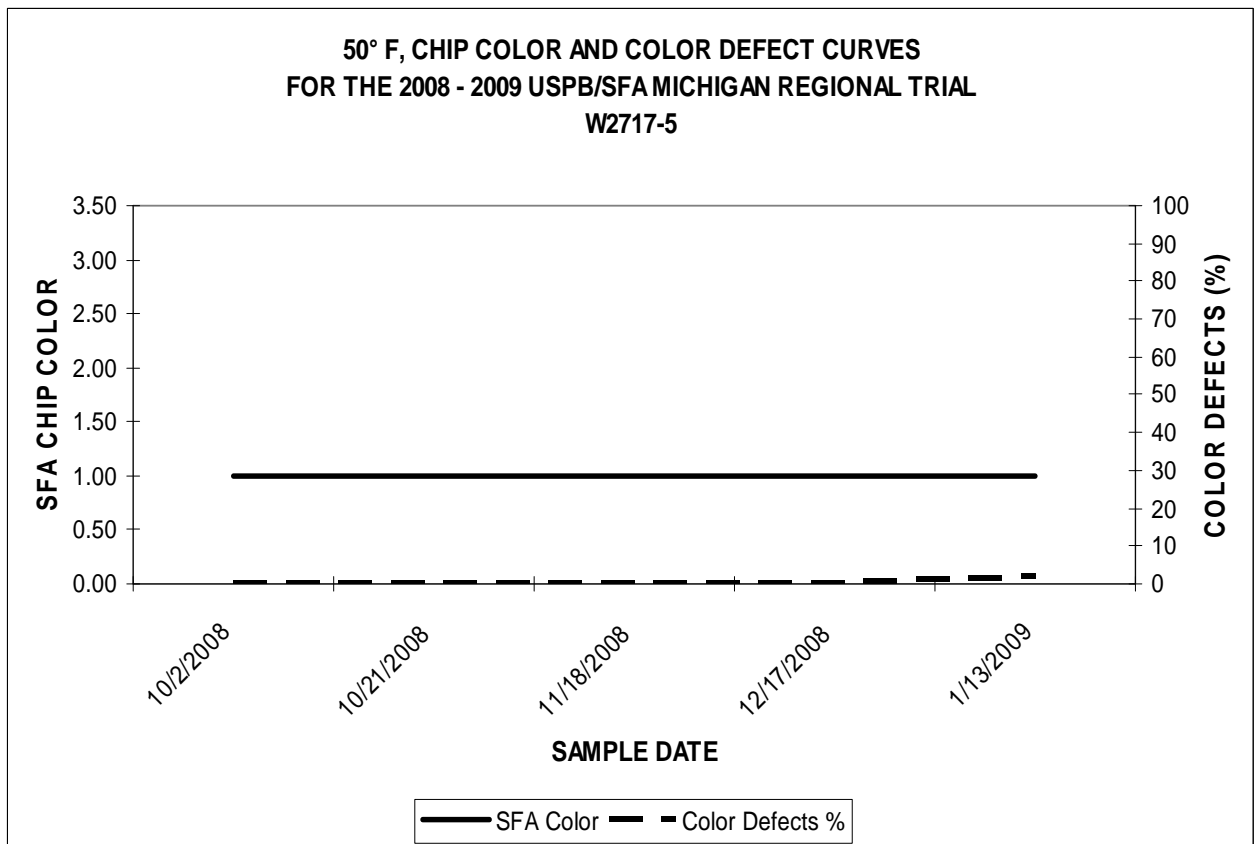


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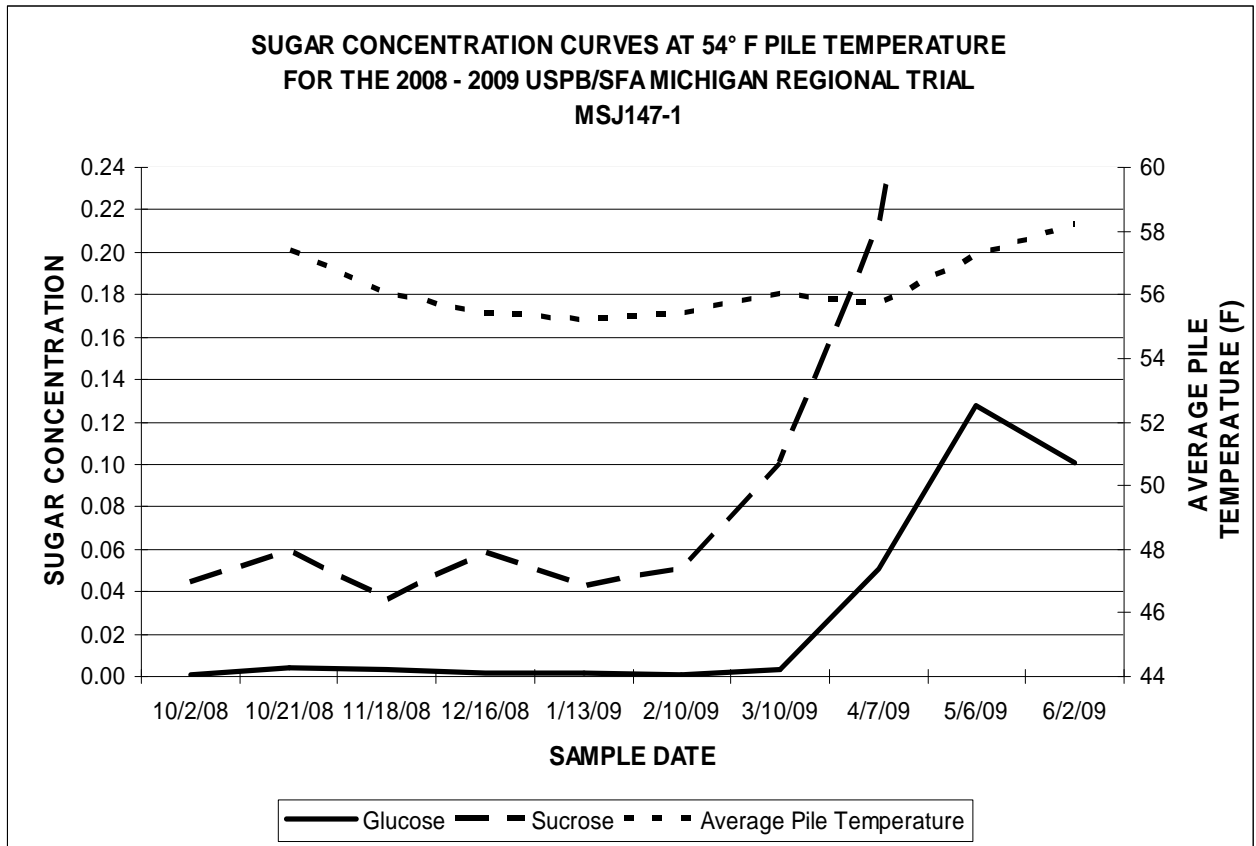


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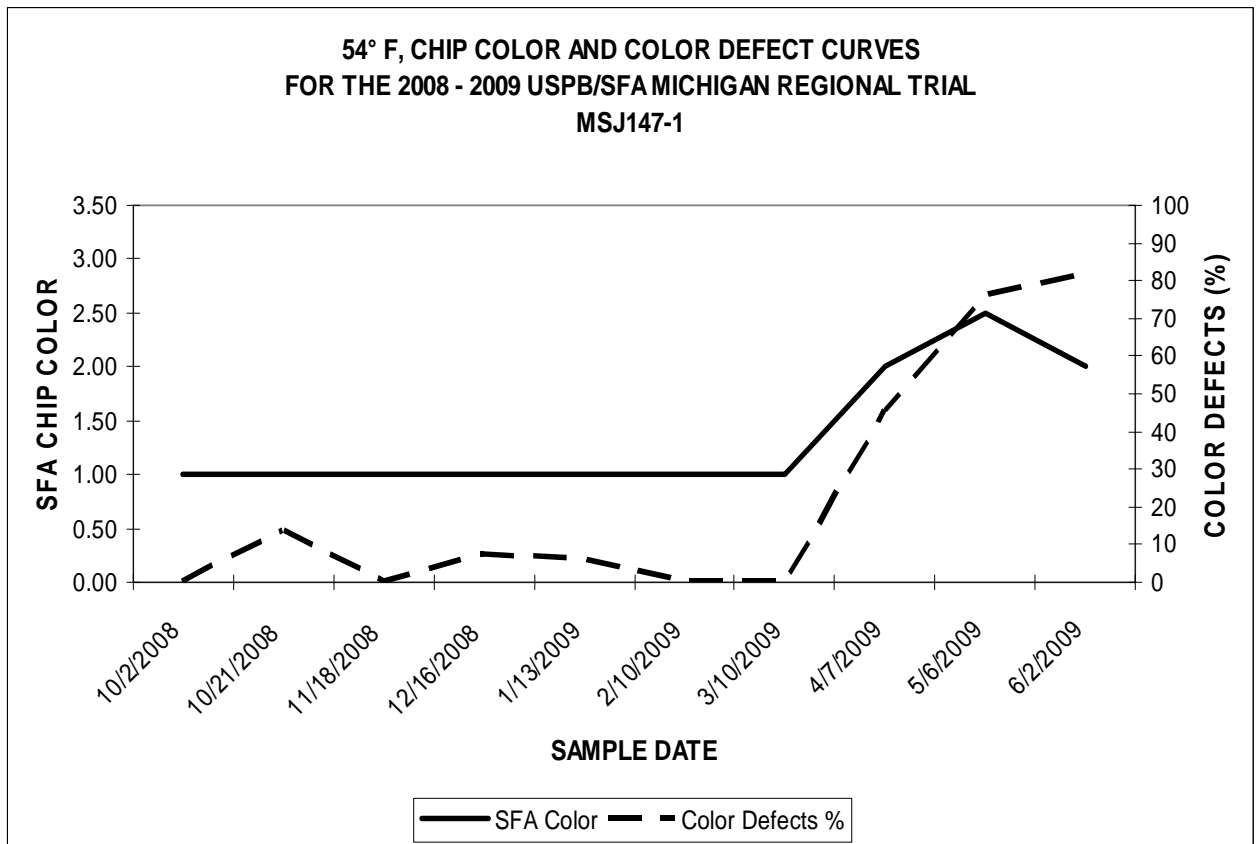


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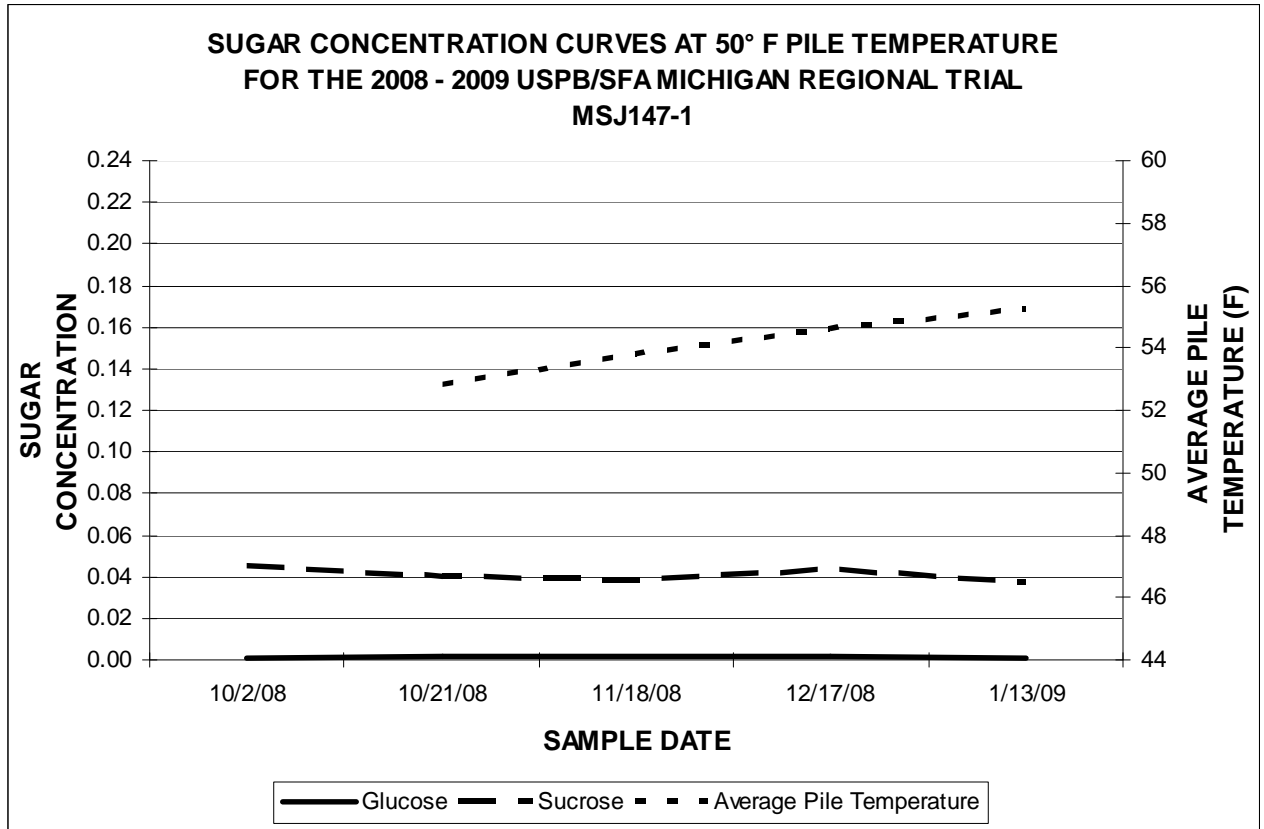


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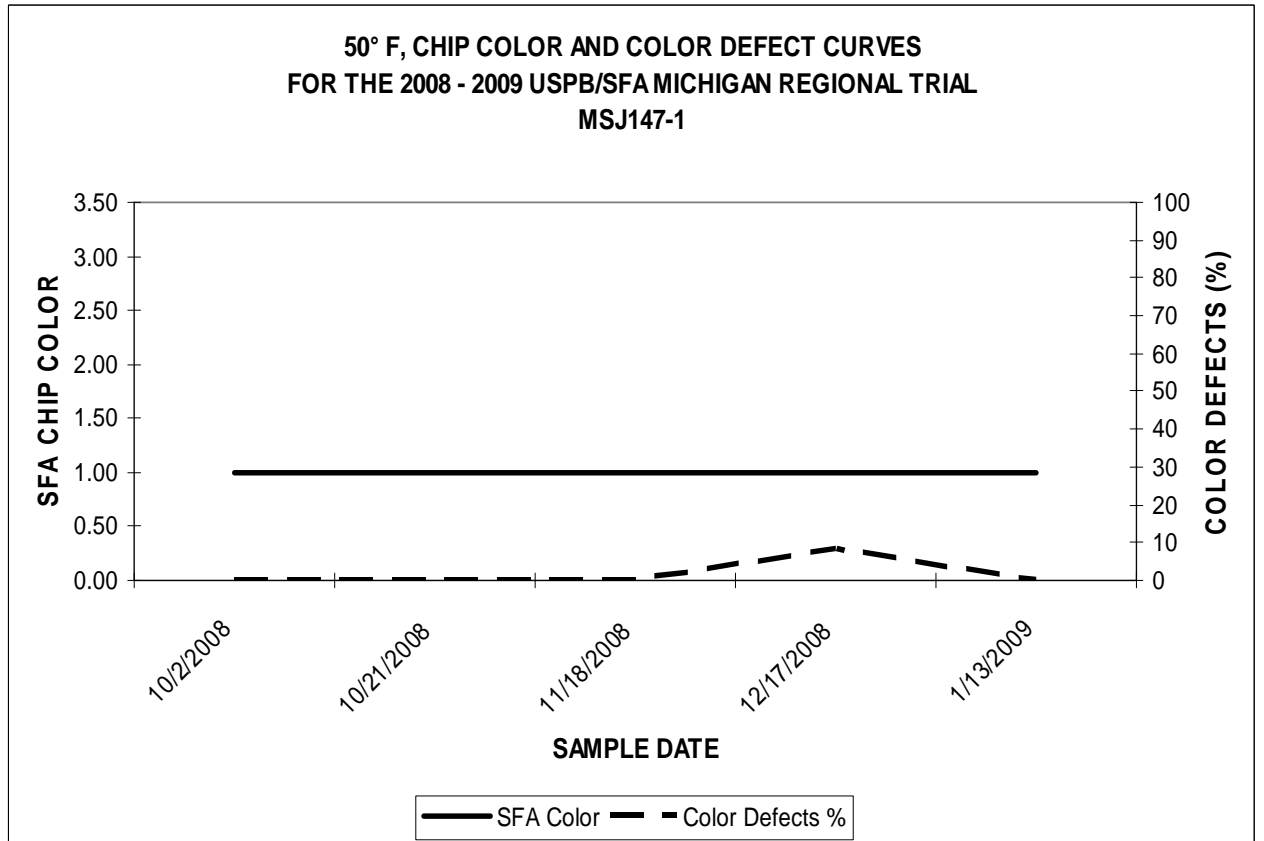


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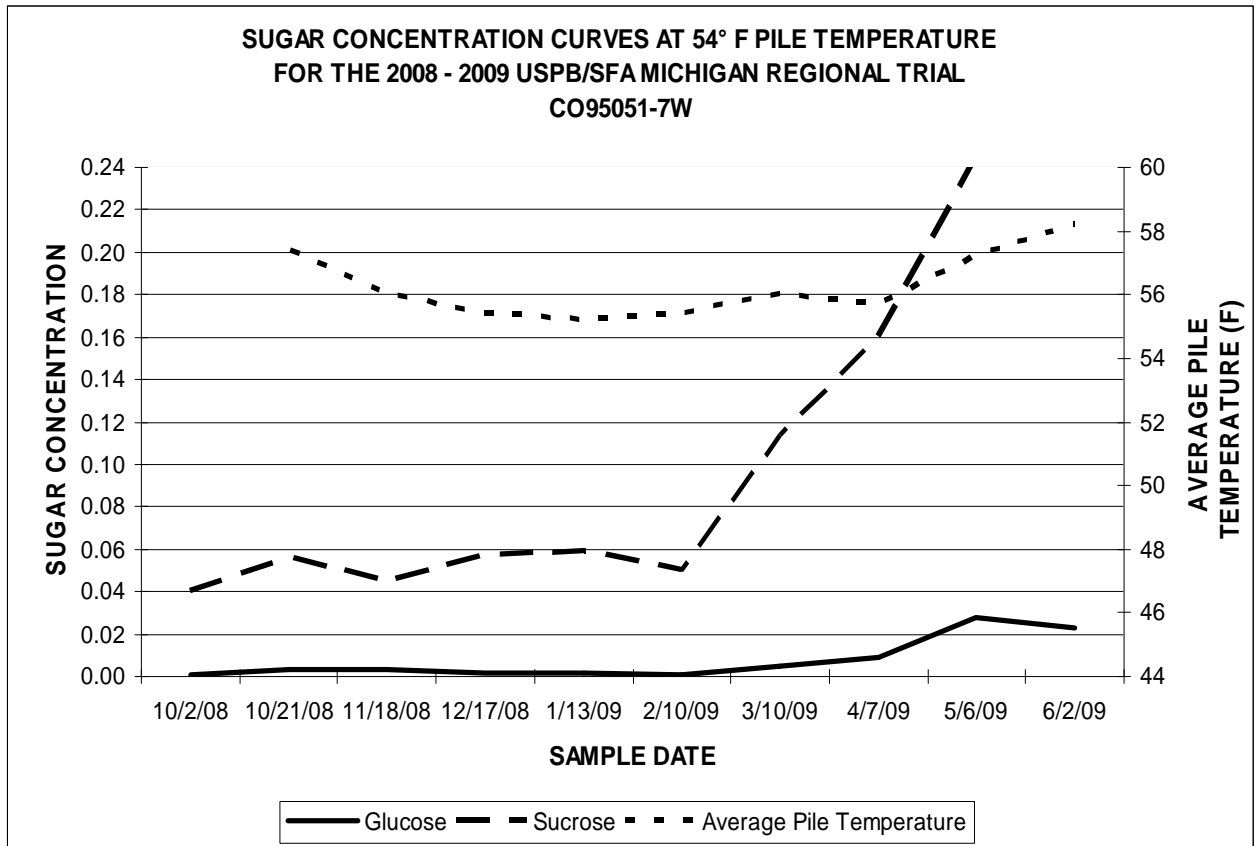


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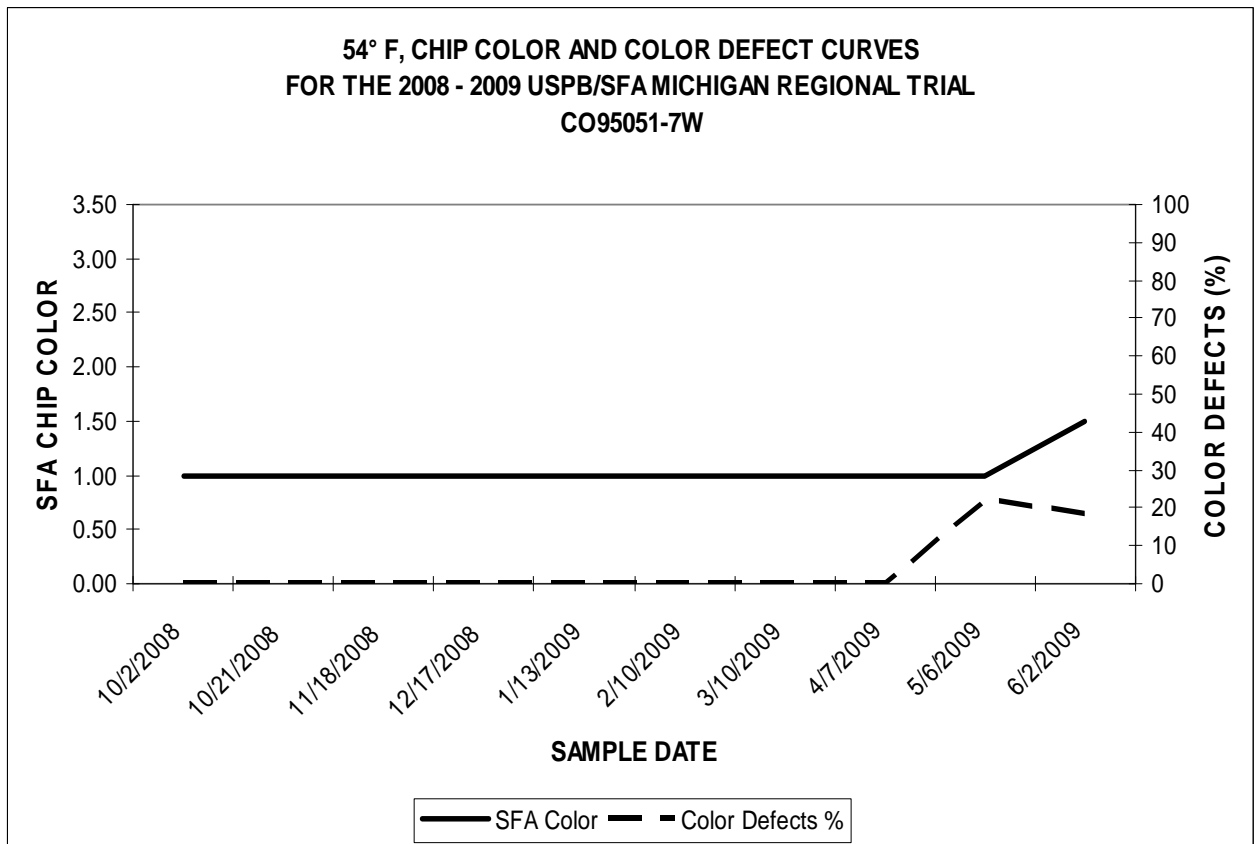


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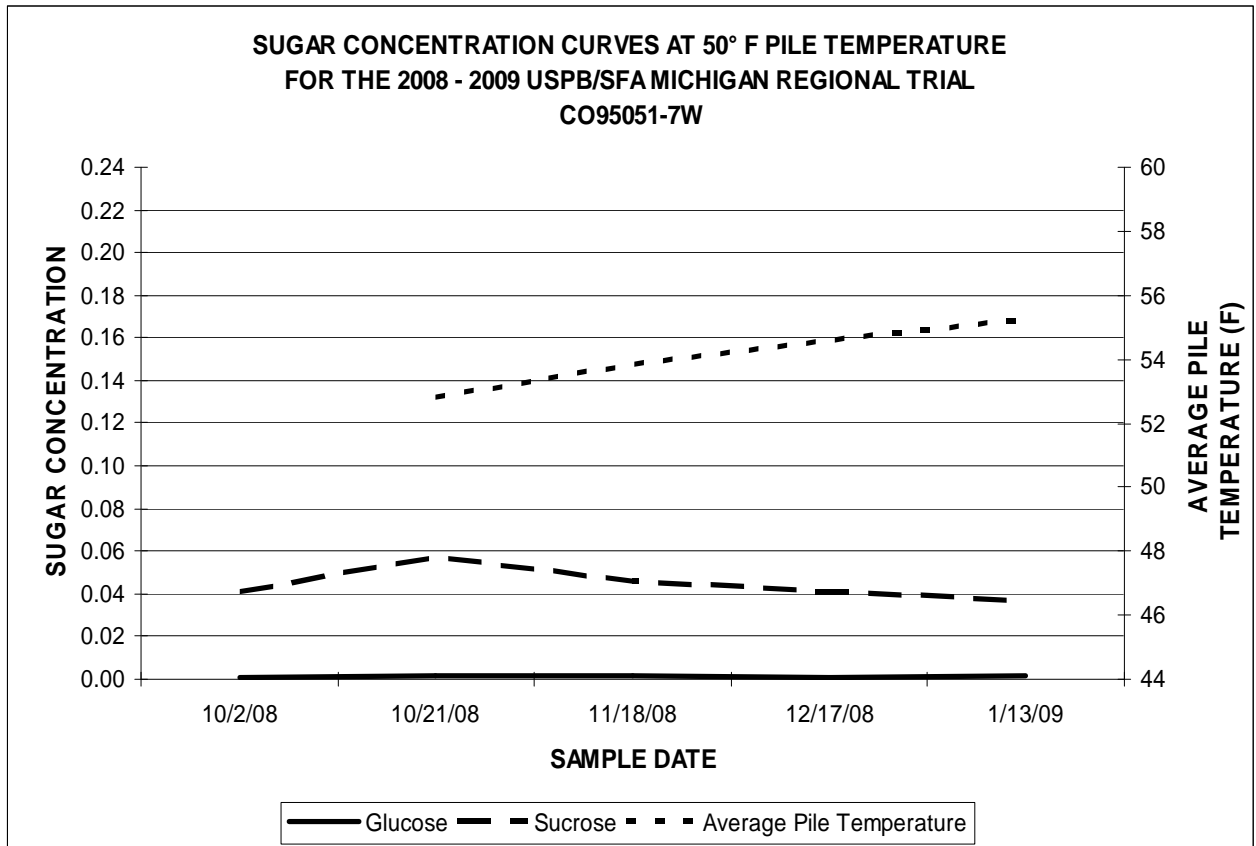


Table 38.

