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2008 USPB/SFA Chip Variety Trials

Sponsored by
The United States Potato Board
&
The Snack Food Association

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2008 USPB/SFA Potato Chip Trial Results

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INTRODUCTION

The search for new and improved potato varieties is an ongoing and challenging task. During 2002 the United States Potato Board joined with the Snack Food Association in sponsorship of these chip variety trials, which were initiated by the SFA in 1985. The ten trial locations in 2008 were California, Florida, Idaho, Maine, Michigan, Missouri, North Carolina, Pennsylvania, the Red River Valley, and Wisconsin.

This report is divided into two sections. The first section presents the variety performance data for the 2008 growing and harvest season at each of ten state trial locations. The second section consists of the chipping data obtained from storage samples collected during the harvest of the 2007 trials in five states which were held in storage into 2008 for out-of-storage information. This section includes extensive chipping and sugar data from large long-term cold storage temperature research conducted by Chris Long of Michigan Sate University, Duane Preston and Nick David, UMN/NDSU, and Chuck Kostichka, University of Wisconsin. The USPB-SFA Potato Technology Committee has thoroughly discussed the need and value of storage data and this report represents the fifth annual report to include this data.

Table 1. TRENDS IN THE SEED ACREAGE OF CURRENT CHIPPING VARIETIES (Plus Breeding Lines in USPB/SFA Chip Trials)

Variety	Year Released	2003	2004	2005	2006	2007	2008
1. Atlantic	1976	4351	3635	2592	2693	2806	2604
2. Snowden	1990	2597	1627	1664	1847	1794	1477
3. Dakota Pearl	1999	1749	1868	1348	1388	1194	992
4. Reba	1992	981	898	808	764	828	853
5. Pike	1995	1291	883	878	730	669	613
6. Megachip	2008	n/a	19	50	134	279	361
7. Ivory Crisp	2001	214	187	207	272	326	331
8. Chipeta	1993	550	356	260	390	348	323
9. Dakota Crisp	2005	n/a	89	102	161	218	316
10. Marcy	2003	94	187	262	320	319	314
11. Andover	1995	392	393	399	382	364	282
12. Monona	1964	495	586	333	518	243	256
13. NorValley	1996	1344	475	455	453	361	255
14. Norchip	1968	73	52	50	33	11	102
15. Harley Blackwell	2003	n/a	71	160	174	105	87
16. Dakota Diamond	2005	n/a	0.5	5.9	31	232	84

Variety	Year Released	2003	2004	2005	2006	2007	2008
17. Monticello		8.8	12	20	43	59	78
18. Beacon Chipper	2005	n/a	n/a	n/a	10	25	62
19. Kalkaska	2008	n/a	n/a	n/a	1.1	10.5	21
20. White Pearl		n/a	18	10.5	27	25	19
21. CO96141-4W		n/a	n/a	n/a	n/a	1.2	6.4
22. NY138		n/a	n/a	n/a	n/a	n/a	4.0
23. CO95051-7W		n/a	n/a	n/a	n/a	0.7	2.3
24. MSJ147-1		n/a	n/a	n/a	n/a	4.2	1.9
25. W2133-1		n/a	n/a	n/a	n/a	n/a	1.3
26. CO97065-7W		n/a	n/a	n/a	n/a	1.0	0.5
27. NY139		n/a	n/a	n/a	n/a	n/a	0.5
28. CO97043-14W		n/a	n/a	n/a	n/a	n/a	0.2

Acreage data obtained from the PAA seed certification section.

PROCEDURE

Trial entries are selected for three years of USPB-SFA sponsored chip trials from candidates suggested by University and USDA potato breeders who have been strong collaborators in this project. The fourteen advanced breeding lines and newly released varieties evaluated in 2008 were AF2291-10, Beacon Chipper, CO95051-7W, CO96141-4W, CO97043-14W, CO97065-7W, MSJ036-A (recently named Kalkaska), MSJ147-1, ND7519-1, NY138, NY139, W2310-3, W2324-1, and W2717-5 (see Table 2 for descriptions), which were compared with the chip industry standards Atlantic and Snowden. Trial coordinators established trials in ten states with grower or research farm plots where entries were grown using standard cultural practices. Observation on emergence, growth characteristics and maturity are made during the growing season. Yield, tuber size distribution, external and internal defects, specific gravity and other plant and tuber characteristics were evaluated. Storage samples were held in grower storages and university facilities and chip processors participated in chipping evaluations from various temperature and storage durations.

OVERVIEW

It is important to look at the performance of the individual entries at each location because of the variations in soil types, weather, growing conditions and crop management. State reports in pages x-xx show the yield, percent size distribution, and specific gravity data obtained at each of the ten regional locations. Table 3 (pages xx-xx) summarizes the overall average yield, percent size distribution and specific gravity for each of fourteen clones grown in the ten regional trial sites in 2008. The variety Beacon Chipper and three breeding lines, CO95051-7W, MSJ147-1, and W2324-1, have completed three years of trials from 2006 through 2008 and will be replaced with new entries in 2009. Their three year summary data are presented in Tables 4, 5, 6 and 7 (pages w,x,y, and z respectively). These data tables provide both annual and three-year averages for each regional location and reflect the stable or variable performance of these four entries over eleven locations (TX dropped out after 2007, and CA and MO were added in 2008).

BEACON CHIPPER – has been evaluated buy Michigan State University. In 28 trial sites during 2006-08 (see Table 4), this clone averages a marketable yield of 297 cwt/acre (96% of Atlantic's marketable yield) and a total yield of 339 cwt/acre (95% of Atlantic). Beacon Chipper had its highest marketable yield of 585 cwt/acre in the Michigan trial in 2007. It had an average specific gravity of 1.080, which is .008 units below Atlantic. Specific gravity was above 1.080 in 11 of 28 trials. Beacon Chipper averaged an Agtron chip color value of 65.7 (out of the field), 2.8 units above Atlantic. It chips well from 48F and has reconditioned from 6 months storage at 42F in ND trials.

CO95051-7W – was developed by Colorado State University. In 28 trial sites during 2006-08 (see Table 5), this clone averages a marketable yield of 224 cwt/acre (73% of Atlantic's marketable yield) and a total yield of 278 cwt/acre (78% of Atlantic). CO95051-7W had its highest marketable yield of 388 cwt/acre in the Wisconsin trial in 2006. This clone had the lowest average marketable yield over 9 trials in 2006. It had an average specific gravity of 1.082, which is .006 units below Atlantic. Specific gravity was above 1.080 in 12 of 28 trials. CO95051-7W averaged an Agtron chip color value of 64.5 (out of the field), 1.6 units above Atlantic. It had the best chip color from 6 months storage at 42F in ND trials in 2006.

MSJ147-1 – was developed by Michigan State University. In 28 trial sites during 2006-08 (see Table 6), this clone averages a marketable yield of 190 cwt/acre (62% of Atlantic's marketable yield) and a total yield of 269 cwt/acre (76% of Atlantic). MSJ147-1 had its highest marketable yield of 382 cwt/acre in the Wisconsin trial in 2006, but had the lowest average marketable yield over 9 trials in 2007 and 10 trials in 2008. It had an average specific gravity of 1.085, which is .003 units below Atlantic. Specific gravity was above 1.080 in 19 of 28 trials. MSJ147-1 averaged an Agtron chip color value of 63.4 (out of the field), 2.8 units above Atlantic. Best chipper in Wisconsin trials from 45F storage and one of best from 42F in ND trials in 2006.

W2324-1 – was developed by the University of Wisconsin. In 28 trial sites during 2006-08 (see Table 7), this clone averages a marketable yield of 357 cwt/acre (116% of Atlantic's marketable yield) and a total yield of 421 cwt/acre (118% of Atlantic). W2324-1 had its highest marketable yield of 601 cwt/acre in the Idaho trial in 2006. This clone had the highest average marketable yield in all three seasons of testing. It had an average specific gravity of 1.085, which is .003 units below Atlantic. Specific gravity was above 1.080 in 20 of 28 trials. W2342-1 averaged an Agtron chip color value of 63.4 (out of the field), 0.5 units above Atlantic and produces good chip color from 45F storage.

Table 2. Characteristics of the 2008 USPB - SFA Chip Trials Entries

Advanced Seedlings	Characteristics	Seed Provided By
AF2291-10 *Year 1*	Parentage: SA8211-6 x EB8109-1. Mid-season maturity, round tubers, some misshapen tubers, with medium yield potential. Moderate to good resistance to internal heat necrosis, early blight and common scab. High specific gravity, chips from field and warm storage (50F), not a cold storage chipper.	Dr. Greg Porter University of Maine Orono, ME

Beacon Chipper *Year 3*	Unknown parentage. A mid-season maturity, round tubers with modest specific gravity, but high yield potential. Best yields in 2007 were in Idaho, North Carolina and Wisconsin. Verticillium and scab susceptible. While not a long-term cold storage chipper, it had the best chip color at 6 months at 48F in the 2006 RRV trial and chipped better than Atlantic at four months from 50F in the 2007 RRV trial.	Dr. Dave Douches Michigan State Univ. East Lansing, MI
CO95051-7W *Year 3*	A selection from a cross between AC88456-6W and BC0894-2W. Mid-season maturity, round tuber shape with a high percent of No. 1 grade, good specific gravity (.006 units below Atlantic) and medium yield potential. Low external and internal defects, short dormancy. In the 2006 RRV trial it had the best chip color at 6 months at 38F, and responded well to reconditioning. Chip color was good from 45F at 3 and 4 months storage of the 2007 RRV trial.	Dr. David Holm Colorado State Univ. Center, CO
CO96141-4W *Year 2*	A selection made in 1996 from a cross between BC0894-2W and AC87340-2W. Mid-season maturity, blocky tuber shape, lower specific gravity (.012 points below Atlantic) and moderately high yield potential (96% of Atlantic). Good tuber size, resistant to hollow heart and Blackspot Bruise. In the 2007 RRV trial it chipped well from the field and from 4 months storage at 50F.	Dr. David Holm Colorado State Univ. Center, CO
CO97043-14W *Year 1*	Parentage: AC91817-5W x AC87340-2W. Mid-season maturity, round tubers, low levels of external and internal defects, with relatively good yield (86% of Atlantics marketable yield) and moderate specific gravity (averaged 1.080) in 2008 trials. Medium-long tuber dormancy, blackspot resistant, and few defects. Good out of field chip color and some potential to recondition out of 40F.	Dr. David Holm Colorado State Univ. Center, CO
CO97065-7W *Year 1*	Parentage: AC92513-3 x Chipeta. Early to mid-season maturity, round tubers, low levels of external and internal defects. Averaged 264 cwt/acre marketable yield (74% of Atlantic) and had a specific gravity of 1.085 (.005 units below Atlantic) in ten trials in 2008. Long tuber dormancy, blackspot resistant, and some potential to recondition out of 40F.	Dr. David Holm Colorado State Univ. Center, CO

MSJ036-A Kalkaska *Year 1*	Parentage: B1254-1 x S440. Breeding line MSJ036-A has been named Kalkaska. Late maturity, excellent round tuber shape, good scab resistance, moderate specific gravity (averaged 1.084), but relatively good yield potential (averaged 317 cwt/a marketable yield). Need to watch sugar levels at early harvest.	Dr. Dave Douches Michigan State Univ. East Lansing, MI
MSJ147-1 *Year 3*	A selection from a cross between NorValley and S440. Mid-season maturity, uniform blocky tuber shape, sizes early, and high specific gravity. Lowest average marketable yield over 9 trials in 2007 and 10 trials in 2008. A long-term storage chipper, which chips from 45F storage. It had the best chip color in Florida, Michigan, Idaho, RRV and Wisconsin trials in 2006 and/or 2007.	Dr. Dave Douches Michigan State Univ. East Lansing, MI
ND7519-1 *Year 1*	Mid-season maturity, good specific gravity (similar to Atlantic), moderate yield potential, and prone to hollow heart and brown center. In the first year of USPB-SFA chip trials it averaged 288 cwt/acre marketable yield (81% of Atlantic) and a specific gravity of 1.089 (.001 below Atlantic).	Dr. Susie Thompson ND StateUniv. Fargo, ND
NY138 *Year 1*	Parentage: Marcy x NY115. Late maturity, round tubers, few external defects, less blackspot than Snowden, moderate scab resistance, resistant to race Ro1 of golden nematode, long tuber dormancy. Medium yield potential, lower specific gravity range, but chips from 44F.	Dr. Walter De Jong Cornell University Ithaca, NY
NY139 *Year 1*	Parentage: NY120 x NY115. Medium-late maturity, round tubers, few external defects, some internal necrosis, good resistance to common scab, resistant to race Ro1 of golden nematode, medium tuber dormancy. Medium yield potential, good specific gravity, can chip from 44F storage.	Dr. Walter De Jong Cornell University Ithaca, NY
W2310-3 *Year 1*	Parentage: Pike x S440. Late maturity, round tubers of medium size, , medium yield potential, medium to high specific gravity. Good internal quality, low sugars, medium term storability, good chipping ability. Moderate scab susceptibility.	Dr. Jiwan Palta, Felix Navarro and Bryan Bowen University of Wisconsin Rhinelander, WI

W2324-1 *Year 3*	A selection from a cross between Snowden and RHL166. Late maturity, round uniform tubers, and relatively high specific gravity. In three years of trials it had an average specific gravity of 1.085, which is .003 units below Atlantic. Specific gravity was above 1.080 in 20 of 28 trials. This clone had the highest average marketable yield in all three seasons of USPB-SFA testing. Strong vigor and large vine type. Some hollow heart in large tubers and moderate scab susceptibility. Chip color variable, ranging from poor to excellent, depending upon the trial site.	Dr. Jiwan Palta, Felix Navarro and Bryan Bowen University of Wisconsin Rhinelander, WI
W2717-5 *Year 1*	Parentage: S440 x ND3828-15. Late maturity, round tubers of medium size, medium yield potential, medium to high specific gravity. Good internal quality, low sugars, medium term storability, good chipping ability. Moderate scab susceptibility.	Dr. Jiwan Palta, Felix Navarro and Bryan Bowen University of Wisconsin Rhinelander, WI

California Regional Trial

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2008 Variety Entries:

1. AF2291-10
2. MJS036-A
3. MJS147-1
4. Beacon Chipper
5. NY138
6. NY139
7. W2324-1
8. W2310-3
9. W2717-5
10. ND7519-1
11. CO95051-7W
12. CO96141-4W
13. CO97065-7W
14. CO97043-14W

Trial Information:

Previous Crop: Potatoes have been grown in this field for at least the past 5 years.
Trial Location: Johnston Farms, Edison, CA.
Soil Type: Cajon Sand
Fertilizer: 300 – 100 – 100
Planting Date: 2/15/08
Vine Kill Date: 5/31/08 (mowed)
Harvest Date: 6/9/08
Plant Spacing: Hand Planted at 9 inch spacing
Plot Size: 20 ft row x 32 inch bed width, 4 replications
Irrigation: Solid set sprinkler, 40ft x 30 ft
Pest Management: Standard grower's practice

Procedure

Approximately 20 pound seed potato samples of the Snack Food Association chip trial were received by FedEx during the months of January and February from the chip trial breeders. The seed was held in a warehouse until seed was cut by hand. Twenty seven seed pieces were placed into a small paper bag and held until planted on 2/15/08. The Snack Food Association trial was hosted by Johnston Farms of Edison CA on one of their field sites.

Plots were marked off every 23 feet and the beds were opened up in the middle with a 2 row potato planter. The 27 seed pieces were dropped by hand into the opened beds with a 3 foot buffer between each plot. Once planted, the seed was cover with soil and the beds were reformed with a cultivator. The experimental design was a randomized complete block design.

The field trial received all standard growing practices for fertilization and pest management. There was no significant insect or disease pressure at the field site but it did receive regular preventive fungicide treatments. Weeds were controlled with early season cultivation and use of Eptam herbicide.

The tops were beaten off on 5/31/08 and the plots were harvested on 6/9/08. A single row digger lifted the tubers and dropped them on the ground. The tubers were then picked up by a hand crew and placed into burlap sacks and transported to a nearby shop for grading. The tubers were graded the following day and a 12-15 lb sub-sample taken from each plot. From the sub-samples taken an 8 lb sample from each variety was taken to White Wolf Potato packing shed and specific gravity tests were performed. All data was analyzed using MSTAT-C.

Results

All of the varieties grew well in Kern County with no growth or vigor problems. Disease or insects were not an issue so no observations or comments can be provided on those issues. Some varieties did do better than others however. NY139 and CO96141-4W were the top performers in yield but the vigor was slightly lower for CO96141-4W. Beacon Chipper and NY138 also did very well with excellent yield and vigor. MJS147-1 and W2717-5 were the weakest performers but had good vigor. MJS147-1 had a high percentage of its tubers in the smallest category.

Table 1. California Trial 2008, Total and Marketable Yield, Culls, Specific Gravity and Solids, and Vigor.

	Yield (cwt/acre)		Precent Size Distribution							
ENTRY	US#1	TOTAL	US#1	0-2"	2-3.5"	OVER 3.5"	CULLS	SP GR	% SOLIDS	VIGOR
AF2291-10	254	304	84	15	64	20	2	1.092	23.4	3.25
MJS036-A	208	313	66	32	59	7	2	1.085	21.8	3.00
MSJ147-1	99	245	40	58	36	5	1	1.092	23.4	3.25
BEACON CHIPPER	352	396	89	8	43	46	3	1.081	21.0	3.25
NY138	358	395	91	8	37	54	2	1.082	21.2	4.00
NY139	409	446	92	7	52	39	1	1.089	22.7	3.25
W2324-1	287	393	73	18	49	24	9	1.084	21.6	3.00
W2310-3	281	319	88	10	61	27	2	1.092	23.4	3.00
W2717-5	143	248	58	40	47	10	2	1.09	22.9	3.00
ND7519-1	255	379	67	30	59	9	3	1.083	21.4	3.00
CO95051-7W	251	298	85	15	62	23	1	1.078	20.3	3.00
CO96141-4W	353	411	86	13	60	26	1	1.072	19.0	2.75
CO97065-7W	253	325	78	21	61	17	2	1.086	22.0	3.00
C097043-14W	286	339	84	15	59	25	1	1.083	21.4	3.00

Florida Regional Trial

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Trial Data:

Planting Site:	University of Florida/IFAS, Florida Partnership for Water, Agricultural and Community Sustainability at Hastings Research and Demonstration Farm
Planting Date:	February 4, 2008
Harvest Date:	May 15, 2008 (101 days)
Growing Conditions:	This growing season was a bit drier than normal, especially in January and May, although we did have one leaching rainfall of 3.17" on 7 March, 2008. Temperature patterns were average, and only two mornings had temperature readings at or below freezing. Overall, yields and quality were average.
Experimental Design:	Each variety/clone was planted in a single 250 ft row as directed by the SFA protocol. Four 20 ft sections of each row were harvested and graded. This was not a randomized and replicated experiment. Only means were calculated.
Row Spacing:	Machine planted. Approx. 8 inches in-row, 40 inches between-rows.
Fertilizer:	Preplant: 714 lb/A of 14-6-12 (100 lbs N/A, 43 lbs P/A, 86 lbs K/A) Sidedress (3/4/08): 714 lb/A of 14-0-12 (100 lbs N/A, 86 lbs K/A) Sidedress after rain (3/11/08): 214 lb/A of 14-0-12 (30 lbs N/A, 26 lbs K/A)
Pest Control:	C60 (4 gal/A 1,3-dichloropropene, 60 lbs/A Chloropicrin), pre-plant. Maxim MZ fungicide for potato seed pieces, pre-plant. Aldicarb (Temik, 20 lb/A), at planting. Sencor DF (1 lb/A) and Dual Magnum (1 pt/A), at hilling. Fungicides and Insecticides as needed. IPM program used.
Chip Ratings:	Chips were prepared and rated following the procedures outlined in the Snack Food Association Chipping Potato Handbook (1995). Chip scores are presented in Table 2.

Table 1. Florida Trial 2008: Production statistics for SFA clones.

Clone	Tuber Yield				Size Class Distribution[3, 4] (%)					Size Class Range[4] (%)		
	No.1[1] cwt/A	Total cwt/A	% No.1[2]	% Culls	1	2	3	4	5	2 to 4	3 to 4	Specific Gravity
Atlantic	285	343	83	3	12	72	12	2	0	86	14	1.088
Beacon Chipper	218	290	75	2	20	73	3	0	0	76	3	1.089
Snowden	333	402	83	3	14	78	7	0	0	85	7	1.086
AF2291-10	219	273	80	4	15	66	16	2	0	84	18	1.091
CO95051-7W	171	298	57	2	38	58	1	0	0	59	1	1.084
CO96141-4W	294	358	82	1	15	79	4	1	0	84	5	1.075
CO97065-7W	242	314	77	1	18	75	2	0	0	77	2	1.088
CO97043-14W	243	307	79	4	15	75	7	1	0	83	8	1.084
MSJ036-A	302	361	84	2	14	74	10	1	0	85	11	1.087
MSJ147-1	108	256	42	1	52	43	0	0	0	43	0	1.091
ND7519-1	242	330	74	1	22	68	5	1	0	74	6	1.090
NY138	244	300	81	2	15	65	15	2	0	82	17	1.080
NY139	214	259	82	4	11	73	11	3	1	87	14	1.083
W2310-3	199	268	74	3	21	74	1	0.3	0	75	1.3	1.091
W2324-1	275	314	88	3	8	67	17	6	0	90	23	1.089
W2717-5	244	312	78	5	16	77	5	0.5	0	83	5.5	1.101
Average	240	312										1.087

[1]**No.1 Yield**: marketable yield, size classes 2 to 4

[2]**Percent No**. **1**: calculated based on weight using the formula, No. 1 Wt / Total Yield Wt

[3]**Size Class Distribution**: calculated based on weight using the formula, Class Wt / (Total Yield Wt – Cull Wt).

[4]**Size Classes**: 1 = 1.5 to 1 7/8", 2 = 1 7/8 to 2.5", 3 = 2.5 to 3.25", 4 = 3.25 to 4", 5 = > 4"; Class size C (<1.5") was recorded and is included in Total Yield but is not shown as a separate size category.

Table 2. Florida Trial 2008: Plant growth and tuber characteristics for SFA clones.

	Plant Growth Characteristics[1]				Tuber Characteristics[2]						
Clone	Percent Stand	Early Vigor	Vine Type	Vine Maturity	IFC	SC	ST	TS	ED	APP	Chip Rating[3]
Atlantic	71	6.3	9-6	7.0	2.0	6.5	5.5	2.5	7.5	6.0	3.9
Beacon Chipper	71	7.0	6-9	7.1	1.0	6.5	5.5	2.5	7.0	5.5	2.9
Snowden	71	7.3	9-6	8.1	1.0	6.0	5.5	2.0	6.0	6.5	3.4
AF2291-10	57	5.0	9-6	7.8	2.0	6.5	6.0	2.5	6.0	5.0	3.6
CO95051-7W	71	5.5	6-9	6.5	2.0	8.0	6.0	2.5	7.5	5.5	4.0
CO96141-4W	74	7.0	6-9	6.6	1.0	7.0	6.5	2.5	8.0	5.0	3.8
CO97065-7W	65	7.0	9-6	6.8	2.0	7.5	5.5	1.5	7.5	6.5	3.5
CO97043-14W	76	6.3	5-8	6.0	2.0	7.0	6.0	2.0	7.5	6.5	3.7
MSJ036-A	58	5.8	9-6	7.1	1.0	6.5	6.0	2.0	7.5	5.5	4.3
MSJ147-1	74	5.0	5-8	7.5	1.0	7.0	6.0	2.5	7.5	5.5	2.6
ND7519-1	58	6.8	6-9	7.0	1.0	6.5	6.0	2.5	7.5	5.5	2.8
NY138	60	6.0	6-9	7.6	3.0	6.5	6.0	2.5	7.0	5.5	3.6
NY139	57	6.3	6-9	7.6	2.0	6.5	6.0	2.5	7.0	5.5	4.8
W2310-3	71	7.0	5-8	7.5	2.0	5.5	5.5	2.5	7.5	5.0	3.5
W2324-1	67	6.3	6-9	7.3	2.0	6.5	5.5	2.5	7.5	6.0	3.4
W2717-5	68	6.3	9-6	7.9	2.0	6.5	5.5	2.5	8.0	5.0	4.8

[1]**Plant Growth Characteristics.**

Percent Stand: based on machine planted 8 inch in-row spacing, 20 ft plot.

Early Vigor: 1 = no emergence, 2 = leaves in rosette, 3 = plants < 2 in., 4 = plants 2 to 4 in., 5 = plants 4 to 6 in., 6 = plants 6 to 8 in., 7 = plants 8 to 10 in., 8 = plants 10 to 12 in., 9 = plants > 12 inches.

Vine Type: 1 = decumbent - poor canopy, 2 = decumbent - fair canopy, 3 = decumbent - good canopy, 4 = spreading - poor canopy, 5 = spreading - fair canopy, 6 = spreading - good canopy, 7 = upright - poor canopy, 8 = upright - fair canopy, 9 = upright - good canopy.

Vine Maturity: 1 = completely dead, 3 = yellow and dying, 5 = moderately senesced, 7 = starting to senesce, 9 = green and vigorous.

[2]**Tuber Characteristics.**

Internal Flesh Color (IFC): 1 = white, 2 = cream, 3 = light yellow, 4 = medium yellow, 5 = dark yellow, 6 = pink, 7 = red, 8 =blue, 9 = purple.

Skin Color (SC): 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan, 7 = buff, 8 = white, 9 = cream.

Skin Texture (ST): 1 = partially russet, 2 = heavy russet, 3 = moderate russet, 4 = light russet, 5 = netted, 6 = slightly netted, 7 = moderately smooth, 8 = smooth, 9 = very smooth.

Eye Depth (ED): 1 = very deep, 3 = deep, 5 = intermediate,7 = shallow, 9 = very shallow

Overall Appearance (APP): 1 = very poor, 3 = poor, 5 = fair, 7 = good, 9 = excellent.

[3]**Chip Rating:** Chips were prepared and rated following the procedures outlined in the Snack Food Association Chipping Potato Handbook (1995). They were rated on a 1-9 scale: 1 = outstanding, no blemishes and color variations; 3 = very good, minimal blemishes and color variations; 5 = good, acceptable blemishes and color variations; 7 = marginal acceptance, high levels of blemishes and color variations; 9 = not acceptable, high blemish and color variations.

Table 3.Florida Trial 2008: External and internal defects for SFA clones.

	% External Tuber Defects[1]					% Internal Tuber Defects[2]			
Clone	Growth Cracks	Mis-shapen	Sun-burned	Rotten & misc.	Total Culls	HH	BR	CRS	IHN
Atlantic	0	1	2	0	3	0	0	0	13
Beacon Chipper	0	1	1	0	2	0	0	0	1
Snowden	0	1	2	0	3	0	0	0	3
AF2291-10	0	3	1	0	4	0	0	0	13
CO95051-7W	0	0	0	1	2	0	0	0	11
CO96141-4W	0	0	1	0	1	0	0	0	0
CO97065-7W	0	0	0	0	1	0	0	0	1
CO97043-14W	0	1	1	2	4	0	0	0	0
MSJ036-A	0	0	1	0	2	0	0	0	1
MSJ147-1	0	0	0	1	1	0	0	0	1
ND7519-1	0	0	1	0	1	0	0	0	1
NY138	0	0	1	0	2	1	0	0	1
NY139	0	2	2	1	4	0	0	0	1
W2310-3	0	2	0	0	3	0	0	0	4
W2324-1	0	1	0	2	3	0	0	0	4
W2717-5	0	3	1	2	5	1	0	0	8

[1]**External Tuber Defects**: Total Culls is sum of growth cracks, misshapen, sunburned and rotten/miscellaneous.

[2]**Percent Internal Tuber Defects**: percent of tubers showing defects; HH = hollow heart, BR = brown rot, CRS = corky ringspot, IHN = internal heat necrosis.

Idaho Regional Trial

Local Coordinator:
Jeff Stark
Peggy Bain
Melvin Chappell

University of Idaho
Aberdeen R&E Center
Aberdeen, Idaho

Trial Data

PLANTED	2-May-08
VINE KILLED	3-Sep-08
	(Reglone @ 2 pts/A)
HARVESTED	24-Sep-08

PLOT LENGTH	18'	**HARVEST LENGTH**	18'
HILL SPACING	10"	**ROW SPACING**	36"
HILLS PER PLOT	20	**ROWS/ PLOT**	1
REPS	4		

METHOD OF HARVEST Grimme Machine

IRRIGATION
Sprinkler
22 " applied

FERTILIZER
105 N - 100 P - 80 K - 10 lb zinc– pre-plant
120 units injected through water

INSECTICIDES APPLIED/HILLING
Admire Pro (8 oz/A) - Shanked May 27

FUNGICIDES APPLIED
Dithane F-45 1.5 gts/Acre July 17
Equus 8 pints/A July 28

HERBICIDES APPLIED
Sencor (0.4 lb/A), Matrix (1.5 oz/A), Eptam (6 pint/A)
Spray Coupe- May 30

ENVIRONMENTAL FACTORS
Early spring cool weather factors, resulted in week delay of normal crop crop development.

Table 1. IDAHO TRIAL 2008, Yield, Size Distribution, Specific Gravity

Clone	Yield (cwt/A)		Percent Size Distribution				%	Specific
	US No1	Total	<1 7/8 "	1 7/8-2.5"	2.5-4"	>4"	Unusable	Gravity
ATLANTIC	489	559	4	14	48	26	9	1.096
W2324-1	482	565	6	15	50	20	9	1.095
W2310-3	477	540	6	48	35	6	5	1.096
CO97043-14W	432	492	10	18	52	17	2	1.086
MSJ036-A	413	495	14	33	47	4	3	1.096
NY138	410	470	10	17	63	7	3	1.085
NY139	393	462	12	38	46	2	3	1.095
CO96141-4W	379	439	11	26	50	10	3	1.086
BEACON CHIPPER	373	399	4	17	53	24	2	1.086
CO95051-7W	357	412	12	27	58	2	1	1.100
SNOWDEN	333	449	25	43	28	4	1	1.092
ND7519-1	315	414	19	33	40	3	5	1.095
AF2291-10	305	400	4	9	35	33	19	1.095
MSJ147-1	285	376	23	36	37	3	2	1.104
CO97065-7W	278	358	21	43	34	1	1	1.086
W2717-5	242	331	22	29	34	10	5	1.091
Mean	**373**	**448**	**13**	**28**	**44**	**11**	**5**	**1.093**
LSD (.05)	153	146						0.005
LSD (.01)	204	195						0.006

Table 2. IDAHO TRIAL 2008, Vine and tuber characteristics.

Clone	Vine Size [1]	Vine Maturity[2]	Stems/ Plant	Fresh Merit Score [3]	Avg. Tuber Size (oz.)	Tuber Shape[4]
ATLANTIC	2.0	2.5	2.3	2.8	8.4	2.5
W2324-1	2.5	3.0	2.4	2.3	7.8	2.5
W2310-3	1.0	2.0	3.0	2.3	9.8	2.8
CO97043-14W	1.5	2.0	2.8	2.8	6.8	2.0
MSJ036-A	2.0	2.5	2.3	4.3	5.6	1.5
NY138	2.0	2.0	1.7	3.0	6.5	2.0
NY139	2.0	2.5	2.9	3.0	5.7	2.0
CO96141-4W	1.0	1.5	2.7	3.5	6.3	2.5
BEACON CHIPPER	1.5	3.0	2.5	3.0	8.1	2.0
CO95051-7W	2.5	3.5	2.3	4.3	5.8	1.8
SNOWDEN	2.0	1.0	3.0	2.8	4.7	1.0
ND7519-1	2.0	1.5	3.3	3.0	5.3	1.5
AF2291-10	2.5	3.0	2.2	1.3	9.6	2.8
MSJ147-1	2.0	2.5	2.9	3.0	4.8	2.0
CO97065-7W	1.0	1.0	2.8	2.5	4.9	1.3
W2717-5	2.0	1.0	2.7	2.5	5.0	1.5
Mean	**1.8**	**2.2**	**2.6**	**2.9**	**6.6**	**2.0**

[1] (1-5) 5=Large
[2] (1-5) 5=Late
[3] (1-5) 5=Best Preference Score
[4] (1-5) 1=Round

Table 3. IDAHO TRIAL 2008, External and Internal Defects.

	External defects[4]				Internal Defects[6]			
		Growth			%	%	%	%
Clone	Scab	Cracks	Knobs	Blackspot [5]	HH	BC	IBS	VD
ATLANTIC	2.8	5.0	5.0	3.0	63	0	0	0
W2324-1	3.3	5.0	4.8	3.9	43	0	0	0
W2310-3	3.0	4.3	4.8	4.3	8	0	0	0
CO97043-14W	1.8	4.5	5.0	3.2	0	0	0	0
MSJ036-A	4.5	4.5	5.0	3.2	20	5	0	0
NY138	3.3	5.0	5.0	2.3	0	0	0	0
NY139	3.5	5.0	5.0	3.6	3	0	0	0
CO96141-4W	3.8	5.0	5.0	2.5	0	0	0	0
BEACON CHIPPER	2.3	5.0	5.0	4.3	0	0	3	0
CO95051-7W	4.8	5.0	5.0	2.6	0	0	0	0
SNOWDEN	3.0	5.0	5.0	3.8	0	0	0	0
ND7519-1	3.5	4.8	5.0	3.0	5	0	30	0
AF2291-10	3.5	4.8	4.8	4.7	3	0	0	0
MSJ147-1	4.8	5.0	5.0	3.0	28	0	0	0
CO97065-7W	2.0	5.0	5.0	3.7	3	0	0	0
W2717-5	3.0	4.3	5.0	2.3	5	0	0	0
Mean	**3.3**	**4.8**	**5.0**	**3.3**	**11.3**	**0.3**	**2.1**	**0.0**

[4] (1-5) 5=None

[5] (1-5) 5=severe. Tubers peeled in abrasive peeler.

[6] Percent of defects on 10 large tubers

HH=hollow heart, BC=brown center, IBS=internal brown spot, VD=vascular discoloration

Table 4. IDAHO TRIAL 2008, Harvest Quality Report and Field Diseases

Clone	Appearance comments	Chip color	Early Blight[7]	Verticillium Wilt[7]
ATLANTIC	green, scaley buff,scab	Not Available	2.0	3.0
W2324-1	dimpled, rot, shattered		3.0	2.5
W2310-3	non-uniform		2.0	1.5
CO97043-14W	ad stolons, scab, flat, deep ends		2.5	2.0
MSJ036-A	nice, ad stolons		3.0	2.0
NY138	lt yellow, scab, slty flat		2.5	1.5
NY139	adhering stolons		3.0	2.0
CO96141-4W	deep ends		2.5	2.0
BEACON CHIPPER	flat, deep ends, ad stolons		2.5	2.5
CO95051-7W	nice		2.5	3.0
SNOWDEN	scaley, deep ends		2.0	1.0
ND7519-1	small		2.5	1.5
AF2291-10	rot, green, non-uniform		2.0	3.0
MSJ147-1	elongated		2.5	2.5
CO97065-7W	small, good shape		1.5	1.0
W2717-5	GC, shattered		2.0	1.0
Mean			**2.4**	**2.0**

[7] (1-5) 5=severe.

Maine Regional Trial

Cooperators

Local Coordinator	Cooperating Grower	Cooperating Processor	SFA Coordinator
Ed Plissey, Research Dir.	Dale Turner	Dennis Deary	Dr. Don Halseth
Bio-Ag Research	Turner Farms	Frito-Lay Inc.	Cornell University
601 Yoho Head Road	30 Tabor Road	1886 Upper Maple Street	15D Plant Science Bldg.
Machiasport, ME 04655	Washburn, ME 04786	Daville, CT 06241	Ithaca, NY 14853
207-255-6166	207-455-4901	860-779-0200 ext. 2304	607-255-5460
Bioag97@aol.com		Deary.Dennis@Fritolay.com	deh3@cornell.edu

Variety Entries

1. Atlantic (field std.)	Giberson Farms, Fort Fairfield, ME
2. Snowden (storage std.)	Giberson Farms, Fort Fairfield, ME
3. AF2291-10	Dr. Greg Porter, University of Maine
4. MSJ147-1	Dr. Dave Douches, Michigan State, E. Lansing, MI
5. MSJ036-A	Dr. Dave Douches, Michigan State, E. Lansing, MI
6. Beacon Chipper	Dr. Dave Douches, Michigan State, E. Lansing, MI
7. NY 138	Dr. Walter DeJong, Cornell University, Ithaca, NY
8. NY 139	Dr. Walter DeJong, Cornell University, Ithaca, NY
9. ND7519-1	Dr. Susie Thompson, NDSU, Fargo, ND
10. W2324-1	Dr. Jiwan Palta, University of Wisconsin, Rhinelander, WI
11. W2310-3	Dr. Jiwan Palta, University of Wisconsin, Rhinelander, WI
12. CO97043-14W	Dr. David Holm, San Louis Valley Research Center, CO
13. CO95051-7W	Dr. David Holm, San Louis Valley Research Center, CO
14. CO96141-4W	Dr. David Holm, San Louis Valley Research Center, CO
15. CO97065-7W	Dr. David Holm, San Louis Valley Research Center, CO

Trial Data

Trial Location	Tabor Road, Washburn, ME
Soil Type	Caribou Loam
Soil Test	MH to H, P, K
Previous Crop	Barley
Planting Date	May 14, 2008
Fertilization	175 – 180 – 140
Plots	1-36” Row by 250’
Planter and Spacing	9.0”
Tillage and Pest Management	Conventional Maine Cultural Practices
Date Vine Kill	August 28, 2008
Date Harvest	September 13, 2008
Processing Date	September 17-18, 2008

Procedure

Seed sample shipments from regional breeding programs were received by Crane Brothers Farm in Exeter, Maine and held in seed storage until all samples had arrived. Seed lots were conditioned for cutting at Bio-Ag Research, hand cut and treated with a mancozeb base seed treatment fungicide. Seed lots were transported to Turner Farms in Washburn, Maine. The seed logs were planted on May 14, 2008 in 250 foot row length plots using a four-row Lockwood pick-type planter.

The trial site received standard cultural treatments and pest management applications throughout the growing season. No weed pressure and minimal insect pressure from Colorado Potato Beetle occurred during the growing season. Late Blight was reported occurring in the growing area but no evidence of the disease was

found in the trial area. Vines were treated with Regione Herbicide for vine desiccation on August 28, 2008. A field rating for stand and crop vigor was made on July 7, and a follow-up rating of crop vigor and maturity was made on July 25, 2008. The results of stand, vigor and maturity assessment are presented in Table 1. The trial area was harvested on September 13, 2008 and replicated yield samples were transferred to Bio-Ag Research grading laboratory for sizing and grade evaluation. A fifty-pound sample of each variety was delivered to Grass Brothers Farm in Blaine, Maine, and was transferred to the Frito-Lay potato chip plant in Dayville, Connecticut on September 15, 2008. Yield, size distribution and chip processing results are presented in Table 2. A thirty-pound sample of each variety was placed in jute bags and stored at random in a bin at the Turner Farms for chip fry evaluation following late-season storage.

Results

Most cultivars in the 2008 Maine Regional Trial exhibited excellent vigor as the season progressed. MSJ147-1 produced a poor stand that resulted in the lowest yield in the trial. Examination of seed pieces at harvest indicated many seed pieces had adequate eye distribution but germination resulted in aerial tubers at the seed piece and no emerging shoots. Silver scurf damage to the eye area of the seed pieces may have contributed to the nonemergence. AF2291-10 and MSJ147-1 appeared slow to develop strong vine growth early but appeared to recover well by late July. All other cultivars emerged with vigorous vine development and were showing minimal senescence at the time of vine desiccation.

Table 1. Stand, Visual Vigor Appraisal and Maturity of USPB/SFA Potato Chip Cultivars Grown in Northern Maine – 2008.

	July 7, 2008		July 25, 2008	
Cultivar	Vigor	Percent (%) Stand	Vigor	Varietal Maturity Rating
Atlantic	9.0	95	9	Medium Late
Snowden	9.8	96	10	Medium Late
AF2291-10	6.0	94	9	Medium Early
MSJ147-1	5.5	70	8	Medium Early
MSJ036-A	10	96	10	Late
Beacon Chipper	9.8	96	10	Late
NY138	9.8	94	10	Late
NY139	9.0	94	9	Medium Late
ND7519-1	10	96	10	Medium
W2324-1	10	96	10	Medium Late
W2310-3	10	95	10	Medium Late
CO97043-14W	9.0	92	9	Medium
CO95051-7W	9.0	90	9	Medium
CO96141-4W	9.0	94	9	Medium Late
CO97065-7W	10	90	10	Medium Late

1,2,3 = See Appendix attached

All cultivars except MSJ147-1 produced acceptable total yield and high percentages of US No. 1 size distribution. A high incidence of Common Scab impacted the marketable yield of CO97065-7A and to a lesser extent the marketable yield of ND7519-1. A small percentage of sunburn was produced by all cultivars and was generally thought to be caused primarily by heavy rainfall just prior to row closure but following final hilling.

Beacon Chipper, CO97043-14W and AF2291-10 produced high percentages of over 3.5 inch diameter tubers indicating a narrower hill spacing may be useful in Northern Maine for these cultivars to limit and achieve a more desirable size distribution for potato chip manufacture.

All cultivars were processed into potato chips at the Frito-Lay plant in Dayville, CT within five days of harvest. Acceptable Agtron color measurements were found for all cultivars following commercial chip frying. Specific gravity and total solids were quite uniform for all cultivars, however the scores were somewhat lower than those found in earlier years when the trial was grown in the central Maine area. The Atlantic and Snowden standard varieties produced slightly higher solids as well as the cultivars AF2291-10 and ND7519-1.

MSJ036-A produced a high percentage of both external and internal discoloration upon chip frying resulting in the lowest Agtron chip color. Most other cultivar process defects were of an external nature and were associated with tuber greening.

The cooperation of Dale and Ward Turner of Turner Farms in Washburn, Maine and Dennis Deary at the Frito-Lay Plant in Dayville, CT is sincerely appreciated. The support of Gerald Miller at Aroostook Produce Distributors is also appreciated for arranging prompt delivery of the harvest samples to the chip plant for process evaluation. Appreciation is also extended to Todd Winslow at Maine Potato Growers Cooperative in Presque Isle, Maine for arranging harvest equipment and labor for the harvest and grading operations.

I am pleased to present this twenty-third and final annual report as local Maine Coordinator for the NPPB/SFA trial. I have enjoyed working with Dr. Richard Chase of Michigan State University and Dr. Don Halseth at Cornell University as the USPB-SFA Chip Trial Program Coordinators as well as the staff at the Potato Board and Snack Food Association who have been involved with this most effective national trial.

APPENDIX 1.
RATING CODE FOR PLANT VIGOR FOR THE 2008 USPB/SFA CHIP TRIAL

Rating Code	Plant Vigor
1	Very Poor
2	Poor
3	+
4	----
5	Fair
6	+
7	----
8	++
9	Good
10	Excellent

Table 2. Total and Marketable Yield, Size Distribution and Quality of USPB/SFA Potato Chip Cultivars Grown in Northern Maine - 2008

	Yield: CWT./Ac.			Percent (%) Size Distribution						Frito Lay Plant Data: Dayville, CT Plant						
Cultivar	Marketable Yield	Total Yield	Percent U.S. No. 1	Culls	Cull Type	Small 0 - 2"	Medium 2 - 3.5"	Large <3.5"	Specific Gravity	Total Solids	Agtron Color	Chip Plant Defects Int.	Ext.	Total	Type	"A" Value
W2324-1	436.3	462.5	94.3	3.3	Sb, Cs	3.5	90.3	2.7	1.080	19.6	69.8	0	3.8	3.8	Green	0.52
Beacon Chipper	402.0	423.5	94.9	1.2	Sb	7.4	70.6	20.8	1.073	17.9	70.3	0	0.5	0.5		-0.43
Snowden	390.0	405.5	93.7	1.1	Sb	9.9	89.0	0.0	1.085	20.6	70.8	2.1	3.1	5.2	Green	-0.56
NY138	387.5	416.3	93.1	3.8	Sb, Cs	4.8	87.2	4.2	1.073	18.1	70.4	0	3.8	3.8	Green	-0.83
MSJ036-A	381.5	412.0	92.6	0.4	Sb	11.3	86.3	2.0	1.075	18.4	68.7	11.0	7.8	18.8	Dk Color	0.93
Atlantic	361.0	388.5	92.9	2.5	Sb	9.7	81.2	6.6	1.080	19.4	69.1	2.0	3.0	5.0	Green	-0.35
ND7519-1	326.3	383.8	85.0	8.5	Sb, Cs	12.8	78.7	0.0	1.083	20.2	70.8	0	0	0		-1.13
CO96141-4	320.0	350.0	91.4	3.2	Sb	7.9	84.2	4.7	1.076	18.7	71.1	0	0	0		-1.35
CO97043-14W	313.8	341.3	92.0	5.0	Cs, Sb	5.8	75.8	13.4	0.072	17.8	69.4	0	3.1	3.1	Dk Edge	0.83
AF2291-10	302.5	310.5	97.4	0.3	Sb	4.6	86.1	9.0	1.085	20.6	70.7	2.1	4.1	6.2	Green	-0.56
CO95051-7W	282.5	306.3	92.2	2.5	Sb	10.6	86.9	0.0	1.079	19.4	68.9	0	2.6	2.6	Green	-0.61
CO97065-7W	278.8	348.8	80.0	16.5	Cs	7.9	75.6	0.0	1.077	18.9	69.1	0	1.1	1.1	Dk Edge	-0.21
W2310-3	272.5	286.3	95.2	0.9	Sb	7.8	91.3	0.0	1.075	18.7	71.1	0	0	0		0.48
NY139	258.8	278.3	96.4	1.8	Sb	6.0	90.2	1.8	1.076	18.7	71.1	0	0	0		-1.35
MSJ147-1	174.0	197.5	88.1	0.5	Sb	20.0	79.5	0.0	1.078	19.1	69.3	0	4.3	4.3	Dk Color	-0.08

1=Specific gravity measured by SFA hydrometer

Cull Potato Code: Sb = sunburn, Cs = common scab

Michigan Regional Trial

Local Coordinators:	**Cooperating Grower:**	**Cooperating Chip Processor:**
Chris Long Dave Douches Michigan State University East Lansing, MI	Tim & Todd Young Sandyland Farms LLC Howard City, MI	Herr Foods, Inc. Nottingham, PA

Trial Data:

Planting Date:	May 6, 2008
Vine Kill Date:	August 20, 2008
Harvest Date:	October 1, 2008 (148 DAP)
Row & Plant Spacing:	34″ x 11″; irrigated
Plots:	Single rows for each entry approximately 300′ long
GDD, Base 40	2605

Trial Procedure:

Seed was mechanically cut on April 30, 2008 and delivered to the grower's storage the following day. No seed treatments were applied at the time of seed cutting.

One pre-harvest sugar profile was taken for each variety just prior to vine kill on August 20th. The pre-harvest sugar profile protocol was as follows: obtained a minimum of 40 tubers from each variety, taking all the tubers from each hill even if that required collecting more than 40 tubers. A canopy rating was taken for each variety as a percent rating of green foliage and canopy uniformity was noted as a percentage of how uniform the foliage health appeared. The number of hills required to obtain 40 tubers was recorded, along with the total number of stems harvested. From the tubers harvested, specific gravity, a glucose value (a percent by fresh weight), a sucrose rating (a percent by fresh weight X10) and an average tuber weight (in ounces) was established.

At harvest, three plot areas of 23 feet were harvested from each entry and were used to determine yield, size distribution, specific gravity and internal defects. Two - 40 lb. storage samples were collected from each entry and were placed in the grower's commercial storage for evaluation. One set of samples will be evaluated in the winter of 2008 and the other in the spring of 2009. Twenty-five tuber samples were also collected at harvest and stored at the Michigan Potato Industry Commission's Cargill Demonstration Storage Facility at approximately 48ºF and 55ºF for a monthly sugar profile evaluation at Techmark Inc. The storage sugar profiles began the day of harvest. Two out of the field chip samples were taken for each variety at harvest. One was sent to Herr Foods, Inc. for processing and the additional sample was processed at Michigan State University.

A plant growth and vigor observation was made on June 25th. The CO95051-7W and MSJ147-1 appeared to have the slowest rate of vine growth on this date.

Growing Season Weather:

Weather conditions during the 2008 growing season were cooler than average. Growing degree days base 40 recorded for this time period was slightly below the 10 year average of 2783. Total rainfall from May 6th through August 20th, was approximately 9". The daytime temperatures during this growing period never exceeded 90ºF. Nighttime temperatures during the period May through August were also below the 10 year average recording only 13 nights with temperatures over 70 degrees F. The average specific gravity in Michigan was above average as a result of the reduced heat stress. The lack of heat units reduced overall yield and productivity of the potato crop.

Results:

Table 1 summarizes the yield, size distribution, and specific gravity data at harvest. W2324-1 and NY139 appeared to be very strong yielding varieties followed closely by NY138 and Kalkaska. CO96141-4W fell far below acceptable levels for specific gravity. NY138 and CO97043-14W recorded marginal specific gravity numbers. Beacon Chipper had one very poor replication and thus fell in the overall yield standing. Although CO95051-7W and MSJ147-1 appeared to yield below average, they both have excellent long term storage qualities. There were only 106 days from planting to vine kill. This had a major effect on full season varieties like CO95051-7W in that it reduced their yield potential.

Table 1. Yield ,Size Distribution*, Specific Gravity

	Yield (cwt/A)		Percent Size Distribution					
Entry	US#1	TOTAL	US#1	Small	Mid-Size	Large	Culls	Specific Gravity
Snowden	**569**	**598**	**95**	**4**	**85**	**10**	**1**	**1.081**
W2324-1	555	604	92	5	77	14	3	1.078
NY139	521	542	96	3	88	8	1	1.082
NY138	504	525	96	4	79	17	1	1.066
Kalkaska	465	512	91	9	90	1	0	1.078
Atlantic	**414**	**443**	**93**	**5**	**80**	**13**	**1**	**1.077**
CO96141-4W	410	449	91	5	86	5	4	1.061
W2310-3	401	432	93	6	91	2	2	1.080
AF2291-10	394	414	95	3	79	17	2	1.078
CO97043-14W	379	402	94	6	86	8	0	1.068
CO97065-7W	363	408	89	10	89	0	1	1.079
ND7519-1	350	381	92	7	90	2	1	1.079
Beacon Chipper	320	333	96	4	79	17	0	1.072
W2717-5	318	354	90	9	88	2	2	1.085
MSJ147-1	254	336	76	24	76	0	1	1.089
CO95051-7W	177	210	84	16	83	1	0	1.072
MEAN	400	434	91	7	84	7	1	1.077

*small <1 7/8"; mid-size 1 7/8"-3 1/4"; large >3 1/4"

Table 2 summarizes the at-harvest tuber quality. Internal quality across the trial was generally acceptable. Hollow heart was prevalent in W2324-1 and to a lesser degree in Atlantic, AF2291-10 and W2717-5. Beacon Chipper exhibited two hollow heart in thirty oversize tubers, similar to Snowden. CO95051-7W exhibited slight aerial black leg symptoms throughout the plot.

Table 2. At-Harvest Tuber Quality. Sandyland Farms, Howard City, Michigan.

	Internal Defects[1]				
Entry	**HH**	**VD**	**IBS**	**BC**	**Total Cut**
Snowden	**1**	**1**	**0**	**0**	**30**
W2324-1	9	0	0	0	30
NY139	0	0	0	0	30
NY138	1	0	0	0	30
Kalkaska	0	2	0	4	30
Atlantic	**4**	**0**	**0**	**0**	**30**
CO96141-4W	0	1	0	1	30
W2310-3	0	0	0	0	30
AF2291-10	4	0	0	0	30
CO97043-14W	0	2	0	0	30
CO97065-7W	0	1	0	1	30
ND7519-1	0	2	1	0	30
Beacon Chipper	2	0	0	1	30
W2717-5	4	2	0	0	30
MSJ147-1	0	0	0	0	30
CO95051-7W	0	1	0	0	30

[1]Internal Defects. HH = hollow heart, VD = vascular discoloration, IBS = internal brown spot, BC = brown center.

Table 3 shows the post-harvest chip quality based on samples collected at harvest on October 1st and processed at Herr Foods, Inc. on October 6th. Chip colors were generally acceptable, with NY 138 having the highest Agtron score of 69.0. The varieties listed in ranked order based on observations from Herr Foods, Inc. are as follows: NY138, ND7519-1, W2717-5, CO97043-14W, W2310-1, MSJ147-1, AF2291-10, CO96141-4W, Snowden, NY139, Beacon Chipper, CO95051-7W, Atlantic, CO97065-7W, W2324-1 and Kalkaska.

Table 3. 2008 Post-Harvest Chip Quality[1].

Entry	Agtron Color	SFA[2] Color	Specific Gravity	Percent Chip Defects[3]		
				Internal	External	Total
Snowden	**61.3**	**2**	**1.071**	**15.8**	**10.0**	**25.8**
W2324-1	60.7	3	1.075	16.7	6.6	23.3
NY139	62.2	3	1.073	29.4	2.3	31.7
NY138	69.0	1	1.069	6.5	1.4	7.9
Kalkaska	60.5	4	1.075	46.4	1.5	47.9
Atlantic	**64.9**	**3**	**1.074**	**30.4**	**4.2**	**34.6**
CO96141-4W	66.7	2	1.055	18.1	4.9	23.0
W2310-3	62.7	2	1.078	10.7	1.8	12.5
AF2291-10	64.4	1	1.075	17.6	10.4	28.0
CO97043-14W	65.2	2	1.068	4.4	9.0	13.4
CO97065-7W	64.4	3	1.081	16.2	4.7	20.9
ND7519-1	64.0	1	1.073	2.9	1.5	4.4
Beacon Chipper	64.7	3	1.076	13.5	11.3	24.8
W2717-5	63.1	2	1.084	10.5	6.5	17.0
MSJ147-1	62.4	2	1.084	9.0	1.5	10.5
CO95051-7W	63.4	3	1.073	15.9	4.0	19.9

[1] Samples collected at harvest October 1st and processed by Herr Foods, Inc., Nottingham, PA on October 6, 2008 (5 days).

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 4 summarizes the results of the samples collected for black spot bruise. Two-25 tuber samples were collected at harvest. One sample served as a check and the second sample was stored for at least 12 hours at 50ºF, then placed in a 6 sided plywood drum and rotated 10 times to produce a simulated bruise. Two to three weeks later, all samples were abrasively peeled and scored for the presence of black spot bruise. Among the "Simulated Bruise" samples, the best entries were NY138, CO96141-4W and CO95051-7W. NY139 and Snowden showed the lowest percent bruise free.

Table 4. Black Spot Bruise Test

	A. Check Samples[1]									B. Simulated Bruise Samples[2]								
	# of Bruises Per Tuber						Total	Percent Bruise	Average Bruises Per	# of Bruises Per Tuber						Total	Percent Bruise	Average Bruises Per
Entry	0	1	2	3	4	5	Tubers	Free	Tuber	0	1	2	3	4	5	Tubers	Free	Tuber
Snowden	**13**	**7**	**4**	**1**			**25**	**52**	**0.7**	**4**	**6**	**4**	**7**	**1**	**3**	**25**	**16**	**2.2**
W2324-1	12	4	6	3			25	48	1.0	7	3	6	4	4	1	25	28	1.9
NY139	12	9	2	2			25	48	0.8	3	3	4	7	3	5	25	12	2.8
NY138	24	1					25	96	0.0	24	1					25	96	0.0
Kalkaska	15	6	4				25	60	0.6	9	8	4	2	1	1	25	36	1.2
Atlantic	**12**	**9**	**4**				**25**	**48**	**0.7**	**13**	**7**	**4**	**0**	**0**	**1**	**25**	**52**	**0.8**
CO96141-4W	25						25	100	0.0	20	4	1				25	80	0.2
W2310-3	16	5	3	1			25	64	0.6	8	7	2	3	4	1	25	32	1.6
AF2291-10	21	3	1				25	84	0.2	13	7	1	3	1		25	52	0.9
CO97043-14W	21	3	1				25	84	0.2	17	5	3				25	68	0.4
CO97065-7W	19	3	2	1			25	76	0.4	14	2	3	4	1	1	25	56	1.2
ND7519-1	23	2					25	92	0.1	13	10	2				25	52	0.6
Beacon Chipper	16	4	3	1	1		25	64	0.7	8	4	4	6	2	1	25	32	1.7
W2717-5	19	4	1	1			25	76	0.4	12	7	2	4			25	48	0.9
MSJ147-1	17	4	3	1			25	68	0.5	9	6	7	1	2		25	36	1.2
CO95051-7W	22	2	1				25	88	0.2	21	3	1				25	84	0.2

[1]Tuber samples collected at harvest and held at room temperature for later abrasive peeling and scoring.

[2]Tuber samples collected at harvest, held at 50ºF for at least 12 hours, then placed in a 6 sided plywood drum and rotated 10 times to produce simulated bruising. They were then held at room temperature for later abrasive peeling and scoring.

Table 5 summarizes the results of the pre-harvest panel data. Kalkaska appeared to be very immature on August 20th with a 1.067 specific gravity and a sucrose rating of 1.103. CO96141-4W and CO97043-14W appeared to be the earliest maturing varieties. W2324-1, NY139, ND7519-1 and MSJ147-1, based on canopy rating, appeared to be very late maturing lines. NY138 had the largest average tuber weight of 12.04 oz.

Table 5. Pre-Harvest Panels, 08/20/08

Entry	Specific Gravity	Glucose[1] %	Sucrose[2] Rating	Canopy Rating[3]	Canopy Uniform.[4]	Number of Hills	Number of Stems	Average[5] Tuber Weight
Snowden	**1.081**	**0.002**	**0.398**	**70**	**90**	**4**	**11**	**12.04**
W2324-1	1.070	0.007	0.475	100	100	3	12	8.00
NY139	1.082	0.002	0.462	90	100	5	14	10.71
NY138	1.070	0.002	0.409	70	90	4	7	13.34
Kalkaska	1.067	0.003	1.103	75	100	3	9	5.64
Atlantic	**1.077**	**0.001**	**0.424**	**80**	**100**	**3**	**12**	**9.73**
CO96141-4W	1.061	0.000	0.198	30	90	4	12	9.22
W2310-3	1.071	0.005	0.241	80	100	4	20	6.43
AF2291-10	1.068	0.012	0.716	90	100	4	15	7.62
CO97043-14W	1.068	0.001	0.219	50	90	4	12	9.77
CO97065-7W	1.069	0.005	0.385	70	80	4	16	7.33
ND7519-1	1.080	0.001	0.673	90	100	4	17	8.12
Beacon Chipper	Not available							
W2717-5	1.082	0.006	0.968	75	100	3	16	7.84
MSJ147-1	1.069	0.002	0.421	90	100	5	16	5.18
CO95051-7W	1.072	0.001	0.344	30	95	5	16	3.89

[1]Percent Glucose is the percent of glucose by weight in a given amount of fresh tuber tissue.

[2]Sucrose Rating is the percent of sucrose by weight in a given amount of fresh tuber tissue X10.

[3] The Canopy Rating is a percent rating of green foliage (0 is all brown, dead foliage, 100 is green, vigorus foliage).

[4] The Canopy Uniformity is a percentage of how uniform the foliage health is at the date of observation.

[5] The Average Tuber Weight is the total tuber weight collected, divided by the number of tubers reported in ounces.

Variety Comments:

Snowden: This was the top yielding variety in the 2008 variety trial with a 569 cwt./A US#1 yield and an above average specific gravity. This variety was average in overall chip performance at Herr Foods at the out-of-the-field fry test. Snowden was the second most susceptible line to black spot bruise in the trial.

W2324-1: This variety was the second highest yielding line at 555 cwt./A. It had 14 percent oversize tubers and recorded nine out of thirty tubers with hollow heart. W2324-1 exhibited the most hollow heart of any line in the trial. This line ranked second from the bottom in out-of-the-field chip performance at Herr Foods. Some moderate black spot bruise susceptibility was noted. The August 20th pre-harvest panel data revealed that this variety was immature at the time of vine kill and was still bulking when it was killed. Based on the pre-harvest data, W2324-1 is a full season variety.

NY139: NY139 had a nice yield of US#1 tubers and good size distribution with an above average specific gravity for the trial. The internal defects were excellent, but the at-harvest chip fry ranked this variety 10th out of the 16 varieties for overall appearance. This variety had the greatest black spot bruise susceptibility in the 2008 trial.

NY138: This variety recorded a nice overall yield with large tuber size, but displayed a 1.066 specific gravity, which is far out of the tolerable range. Internal defects were good with the best out-of-the-field chip quality at Herr Foods with a 69 Agtron score recorded. Also, this variety was the least susceptible to black spot bruise in the trial.

Kalkaska: Kalkaska was well above average in yield at 465 cwt./A US#1. The specific gravity for this variety was slightly above the trial average. This variety exhibited slight brown centers in 4 out of thirty cut tubers. This variety ranked last at Herr's out-of-the-field chip evaluation. Kalkaska was moderately susceptible to black spot bruise and ranked about average.

Atlantic: Atlantic was slightly above average in yield with the specific gravity at the trial average of 1.077. This variety had a slight incidence of hollow heart with 4 out of thirty hollow noted. Atlantic was number 13 at Herr's October chip quality evaluation. Atlantic had slight black spot bruise susceptibility.

CO96141-4W: This variety had a 410 cwt./A US#1 yield with the lowest recorded specific gravity in the trial at 1.061. Internal defects were good ranking 8th at Herr's for chip quality. The variety does not appear to be black spot bruise susceptible, but with this low of SG this is not uncommon. The specific gravity of this line is out of tolerance for chip processing. This variety appeared to be very mature in the August 20th pre-harvest panel indicating that this variety is an early maturing line.

W2310-1: This variety yielded at the trial average of 400 cwt./A US#1. W2310-1 had an above average specific gravity at 1.080. The internal tuber quality was excellent. This variety ranked 5th in the Herr Foods chip evaluation and exhibited moderate black spot susceptibility in the bruise evaluation. This variety appears to be a full season type.

AF2291-10: This variety was slightly below average in tuber yield with an average specific gravity. The variety had 4 severe hollow heart in thirty cut tubers. This line ranked 7th at Herr's. AF2291-1 appeared to be tolerant to black spot bruise. This variety may have still been bulking when vine killed in late August which could have reduced yield, specific gravity and impacted chip quality.

CO97043-14W: The US#1 yield for this line was 379 cwt./A with below average specific gravity. Internal defects were low and the out-of-the-field chip quality was above average ranking 4th at Herr's. The variety appeared to be tolerant of black spot bruise. This variety was mature at the time of vine kill and appears to have a mid season maturity.

CO97065-7W: This variety had a 363 cwt./A US#1 yield with an above average specific gravity. Internal defects were low, but ranking at Herr's was poor coming in at number 14. Black spot bruise susceptibility was moderate for this line. The vine maturity appears to be mid to late season.

ND7519-1: The yield on ND7519-1 was below average at 350 cwt./A US#1. The specific gravity was excellent at 1.085. Internal defects were low and the ranking at Herr's was excellent, ranking second of 16 varieties in out-of-the-field chip performance. This variety could possibly be late maturing.

Beacon Chipper: The low yield recorded for this line in 2008 is not typical for this variety in our area and is most likely a result of a poor replication. The variety exhibited two hollow in thirty and ranked 11th in the out-of-the-field chip evaluation.

W2717-5: W2717-5 yielded 318 cwt./A US#1 with a specific gravity of 1.085. The variety had four hollow and two vascular discoloration in thirty cut tubers. Herr's ranked this variety 3rd in the overall chip quality evaluation. The line appears to be tolerant of black spot bruise and was nearly mature at time of vine kill.

MSJ147-1: This variety recorded the second lowest yield in this year's trial which was similar to 2007 data where it ranked last in yield. This variety recorded the highest percent of "small" potatoes at 24% with the highest specific gravity in the trial at 1.089. Internal tuber quality was excellent while receiving 6th place at Herr's in the chip quality ranking. This variety appears to be late maturing and may not have been mature when vine killed in late August. MSJ147-1 appears to have excellent long term storage quality, storing well into late May in 2007 from larger scale commercial trials.

CO95051-7W: US#1 yield was the lowest in the trial this year at 177 cwt./A. The specific gravity was marginal at 1.072. Raw internal quality was good. This line ranked 12th at Herr Foods for chip quality. Tuber immaturity could again be the result of poor yield and chip performance. This variety was stored until June 9th in 2007 from a commercial trial and chip processed very well at this time at a regional chip plant. Black spot bruise susceptibility was noted as only a trace at 0.2 bruises per tuber.

Missouri Regional Trial

Location: Arbyrd, MO 2008 - Black Gold Farms

Objective: Evaluate all current and near-future cultivars for maturity, yield, and quality.

Trial Outline:

Varieties included in statistical analysis:	17	
Planting Date:	3/25/2008	
Planting Method	Hand planted using spacing tapes	
Harvest Dates:	07/10/08	107 DAP
Statistical Design:	Randomized Complete Block	
Replications:	4	
Rows/Rep:	4	
Length of Plot:	15	feet
Row Spacing:	34	inches
Scale:	1/ 1025	of an Acre/Row
Seed Piece Size:	2.5	oz
Seed Spacing:	10	inches
Hills/ Row:	20	

	Variety	Seed Source
1)	Atlantic	Black Gold Farms
2)	Snowden	Black Gold Farms
3)	AF2291-10	University of Maine
4)	B. Chipper	Michigan State University
5)	CO95051-7W	Colorado State University
6)	CO96141-4W	Colorado State University
7)	CO97043-14W	Colorado State University
8)	CO97065-7W	Colorado State University
9)	MSJ036-A	Michigan State University
10)	MSJ147-1	Michigan State University
11)	ND7519-1	North Dakota State University
12)	NY138	Cornell University
13)	NY139	Cornell University
14)	W2310-3	University of Wisconsin
15)	W2324-1	University of Wisconsin
16)	W2717-5	University of Wisconsin

Harvest Notes:
- Several plots were lost due to excessive rainfall during the month of March

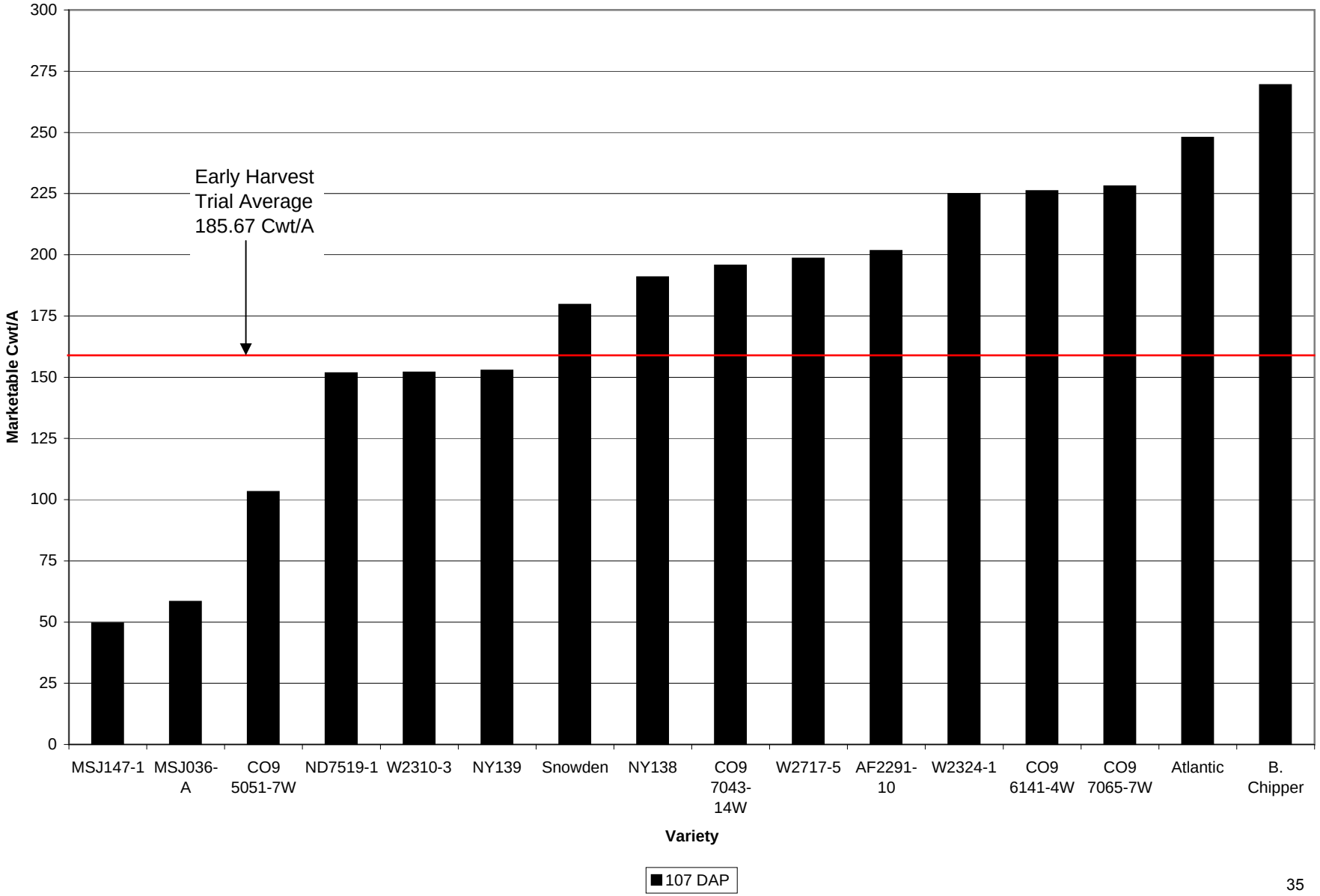
Missouri Regional Trial

Arbyrd, MO 2008 - Black Gold Farms

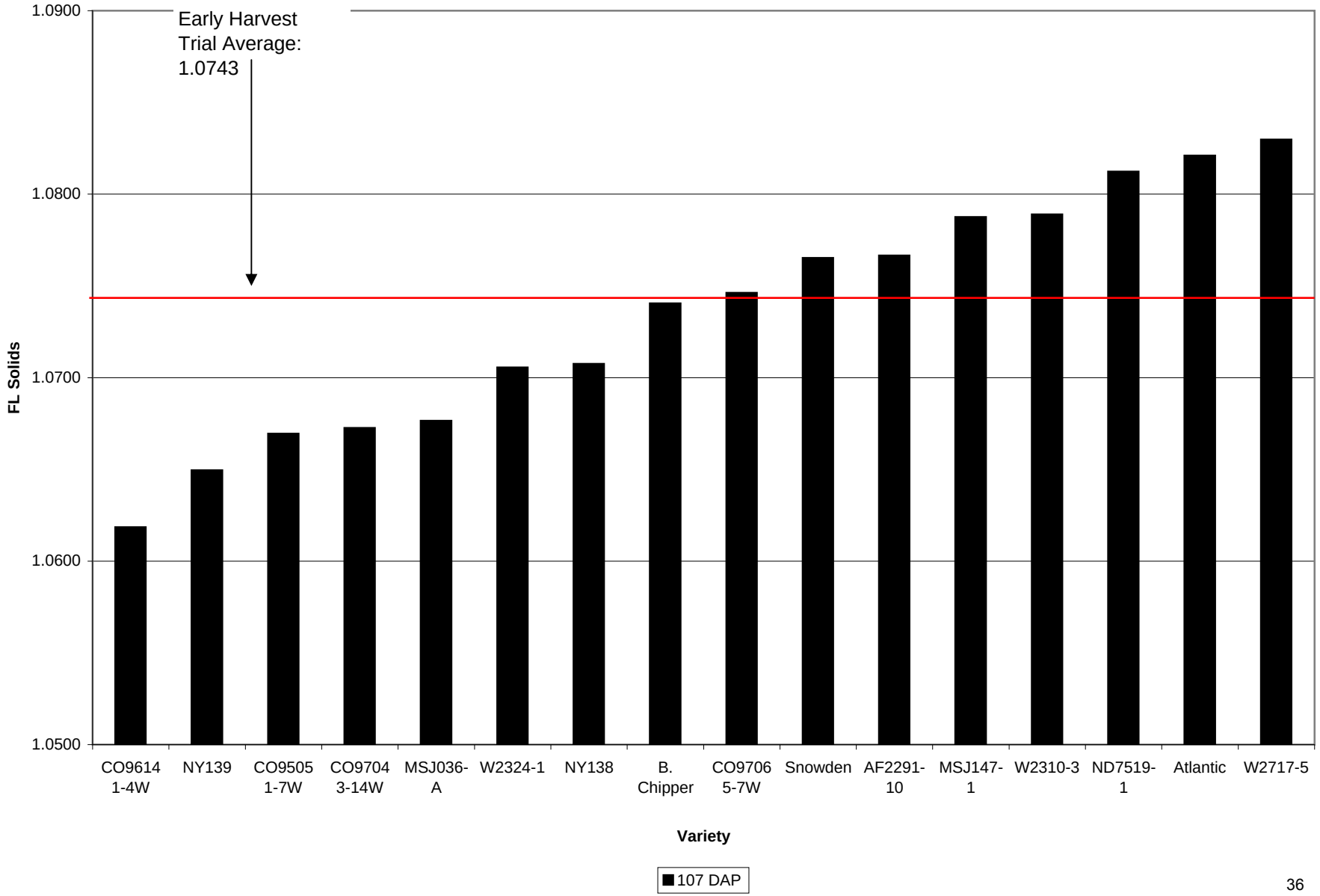
Planting Date: 3/25/08 Harvest Date: 7/10/2008 DAP: 107

Variety	Vine Vigor	% Ground Cover	1" - 2"			> 4"			Marketable Yield 2" - 4"			Total Yield	Quality Assurance						
			tubers/ plant	% of total	Cwt/ac	tubers/ plant	% of total	Cwt/ac	tubers/ plant	% of total	Cwt/ac		Specific Gravity	Cook Sample Defects					
														CLR	% UC	% GRN	% ID	% ED	% Total
Atlantic	2.1	26.3	3.0	20	60.6	0.0	0.0	0.0	5.4	80.3	248	**308**	1.082	67	10.2	0.0	3.3	0.0	**13.5**
Snowden	2.3	30.0	3.5	28	69.4	0.0	0.0	0.0	4.1	72.1	180	**249**	1.077	68	1.3	0.0	0.0	0.0	**1.3**
AF2291-10	2.0	18.8	3.8	28	79.5	0.0	0.0	0.0	4.8	71.7	202	**281**	1.077	69	0.0	0.0	0.0	3.5	**3.5**
B. Chipper	2.0	21.3	1.7	11	34.9	0.0	0.0	0.0	4.7	88.5	269	**304**	1.074	70	3.4	0.0	0.0	0.0	**3.4**
CO95051-7W	1.3	15.0	5.6	54	121.4	0.0	0.0	0.0	2.6	45.9	103	**225**	1.067	67	0.0	0.0	1.0	0.0	**1.0**
CO96141-4W	1.5	16.3	4.2	28	88.7	0.0	0.0	0.0	5.0	71.8	226	**315**	1.062	67	6.9	0.0	0.0	5.2	**12.1**
CO97043-14W	1.9	18.8	3.2	25	65.1	0.0	0.0	0.0	4.3	75.0	196	**261**	1.067	69	0.0	0.0	0.0	0.0	**0.0**
CO97065-7W	1.6	21.3	2.5	18	51.7	0.0	0.0	0.0	5.1	81.5	228	**280**	1.075	67	2.1	0.0	0.0	0.0	**2.1**
MSJ036-A	2.4	25.0	3.2	53	65.6	0.0	0.0	0.0	1.4	47.0	58	**124**	1.068	63	12.5	0.0	1.8	4.1	**18.4**
MSJ147-1	1.8	20.0	6.8	74	139.7	0.0	0.0	0.0	1.4	26.1	49	**189**	1.079	67	0.0	0.0	0.0	2.5	**2.5**
ND7519-1	1.0	0.0	6.7	48	141.7	0.0	0.0	0.0	3.7	51.7	152	**293**	1.081	71	0.0	0.0	1.4	0.0	**1.4**
NY138	1.5	18.8	2.1	19	45.3	0.0	0.0	0.0	3.9	80.8	191	**236**	1.071	64	0.0	0.0	0.0	2.0	**2.0**
NY139	1.6	18.8	3.0	30	64.0	0.0	0.0	0.0	3.3	70.5	153	**217**	1.065	69	1.0	0.0	0.0	0.0	**1.0**
W2310-3	2.6	32.5	3.7	34	79.6	0.0	0.0	0.0	3.8	65.6	152	**231**	1.079	70	0.0	2.4	0.0	0.0	**2.4**
W2324-1	2.6	31.3	4.4	28	86.7	0.0	0.0	0.0	4.9	72.2	225	**312**	1.071	69	0.0	0.0	1.6	0.0	**1.6**
W2717-5	2.8	33.8	3.6	27	74.6	0.0	0.0	0.0	4.2	72.7	198	**273**	1.083	69	0.0	0.0	0.0	0.0	**0.0**
LSD (.10)	0.27	4.99	0.93		19.69	0.00		0.00	1.06		53.19		0.002						
Standard Deviation	0.16	2.96	0.55		11.69	0.00		0.00	0.63		31.59		0.001						
Coefficient of Variance	8.09	13.20	14.82		15.30	-		-	15.67		17.01		0.138						
Observed F Value	20.89	16.72	14.46		15.24	-		-	7.77		10.21		46.564						

USPB/SFA Chip Trial
Marketable Cwt/A (Sorted)
Arbyrd, MO 2008



USPB/SFA Chip Trial
Specific Gravity (Sorted)
Arbyrd, MO 2008



North Carolina Regional Trial

Local Coordinators:	Cooperating Grower:	Cooperating Chip Processor:
Dr. Craig Yencho North Carolina State University 214A Kilgore Hall Raleigh NC, 27695 Mr. Mark Clough North Carolina State University 207 Research Station Rd. Plymouth NC 27962	Chris Hopkins Black Gold Farms 2815 N Gum Neck Road Columbia, NC 27925	Utz Quality Foods Hanover, PA

Trial Data:

Planting Site:	Black Gold Farms, Gum Neck, Tyrrell County, NC
Planting Date:	March 4, 2008
Harvest Date:	June 19, 2008 (107 days)
Growing Conditions:	Planting was on time, but dry. Temperatures and rainfall were favorable for plant growth until late May. Late May to mid-June was very dry and warm.
Soil Type:	Weeksville black silt loam
Experimental Design:	Randomized complete block design with 5 replications.
Row Spacing:	28 hills, 9 inches apart, 34” row width.
Fertilizer:	151 lbs N, 121 lbs P, 76 lbs K (preplant) 21 lbs N, 57 lbs P, 5lbs S, 0.5 lbs Zn (at planting) 48 lbs N (side dress), 1 pt/A 10% Zn (2 times in season)
Weed Control:	Sencor DF 1.0 lbs/A
Insect Control:	Actara 1.5 oz/A
Disease Control:	Quadris 6.2oz/A Manzate Pro-stick 1.0 lb/A Manzate Pro-stick 2.0 lbs/A (2 times)

Table 1.North Carolina. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Size Distribution by Class[1] 1	2	3	4	5	Culls	$1^{7}/_{8}$ to 4"	$2^{1}/_{2}$ to 4"	Specific Gravity[2]	Chip Color[3] 24 to 48 hrs	5 to 7 days
AF2291-10	284	256	8	46	43	1	0	2	90	44	1.095	2	2
Atlantic	375	324	10	38	47	2	0	4	86	49	1.097	1	1
Beacon Chipper	320	263	11	53	29	0	0	7	82	29	1.093	2	1
CO95051-7W	288	232	16	61	19	1	0	4	80	20	1.082	1	1
CO96141-4W	364	315	11	55	31	0	0	3	87	32	1.080	2	2
CO97043-14W	347	284	16	57	24	0	0	2	82	25	1.085	2	2
CO97065-7W	304	265	10	55	32	0	0	2	87	32	1.096	2	2
MSJ036-A	355	306	12	65	21	0	0	2	86	21	1.086	2	2
MSJ147-1	205	83	60	40	0	0	0	0	40	0	1.098	2	1
ND7519-1	337	276	17	62	19	0	0	1	82	19	1.103	1	1
NY138	284	261	8	23	68	1	0	1	92	69	1.082	3	1
NY139	308	278	7	42	48	0	0	2	90	48	1.090	2	1
Snowden	315	261	17	64	19	0	0	0	83	19	1.094	2	1
W2310-3	293	256	11	47	40	0	0	1	87	40	1.094	2	2
W2324-1	376	333	10	45	43	1	0	1	89	44	1.090	2	1
W2717-5	264	229	9	51	36	0	0	4	87	36	1.095	1	2
Grand Mean	314	264											
CV(%)	6.9	8.5											
LSD(K=100)	25.2	25.5											

[1] **Size Classes:**
1's < 1 7/8"; 2's 1 7/8 to 2 1/2"; 3's 2 1/2 to 3 1/4"; 4's 3 1/4 to 4"; 5's ≥ 4"; Culls = all defective potatoes.

[2] **Specific Gravity**
Determined by weight in air/water method.

[3] **Chip Color**
Ratings conducted by the NCSU Potato Breeding Program at the TRS/VGJREC within 48 hrs and again in 5 to 7 days after harvest: 1 = no defects, exceptionally bright; 2 = excellent, bright; 3 = good, light or golden; 4 = dark defects, marginal; 5 = not acceptable.

Table 2. North Carolina. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes.

	Plant Data[1]				Tuber Data[2]									% Internal Defects[3]					
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR
AF2291-10	9	8	8	8	7	7	7	6	4	7	7	8	6	0	9	8	0	0	0
Atlantic	6	7	8	5	7	6	7	6	2	5	7	7	6	8	8.4	12	0	36	0
Beacon Chipper	6	7	8	6	9	7	7	7	3	5	6	9	4	0	9	0	0	0	0
CO95051-7W	6	8	8	7	9	8	7	7	2	7	6	6	6	6	8.4	0	0	0	0
CO96141-4W	6	8	8	7	9	8	5	7	5	7	7	8	6	2	8.4	8	0	0	0
CO97043-14W	6	8	8	6	9	9	7	7	2	8	5	8	7	0	9	2	0	6	8
CO97065-7W	6	7	8	5	6	7	7	7	1	8	6	8	7	0	9	0	0	2	6
MSJ036-A	6	8	8	7	6	6	7	6	2	5	6	8	6	0	9	0	0	8	0
MSJ147-1	6	7	8	8	9	7	6	7	2	7	2	9	5	0	9	0	0	0	0
ND7519-1	9	8	8	5	6	7	5	7	3	7	6	8	5	48	8.0	0	0	32	2
NY138	9	9	8	6	7	7	7	7	3	7	7	8	8	2	8.8	0	0	0	8
NY139	6	8	8	6	6	7	6	7	4	7	7	8	7	0	9	0	0	0	2
Snowden	9	8	7	7	6	6	7	7	2	5	5	8	5	0	9	0	0	0	4
W2310-3	6	7	8	5	6	6	4	7	5	6	7	8	5	0	9	0	0	0	0
W2324-1	5	7	8	4	6	7	7	7	3	5	6	8	4	2	8.8	2	0	0	2
W2717-5	6	7	8	6	9	8	6	7	3	7	5	8	5	0	9	2	0	6	0

[1] **Plant Data:**

Vine Type: 1 = decumbent –poor canopy, 2 = decumbent – fair canopy, 3 = decumbent – good canopy, 4 = spreading – poor canopy, 5 = spreading – fair canopy, 6 = spreading - good canopy, 7 = upright – poor canopy, 8 = upright – fair canopy, 9 = upright good canopy.
Vine Disease: 1 = very severe, 5 = moderate, 9 = none.
Vine Pollution: 1 = very severe, 5 = moderate, 9 = none.
Vine Maturity: 1= very early, 5 = mid-season, 9 = very late.

[2] **Tuber Data:**

Skin Color: 1 = purple, 2 = red, 3 = pink, 4 = dark brown, 5 = brown, 6 = tan to light brown, 7 = buff, 8 = white, 9 = cream.
Skin Texture: 1= partial russet, 2 = heavy russet, 3 = moderate russet, 4 = light russet, 5 = netted, 6 = slight net, 7 = moderately smooth, 8 = smooth, 9 = very smooth.
Cross Section: 1 = very flat, 3 = flat, 5 = intermediate to oval, 7 = mostly round, 9 = very round.
Skin Set: 1 = very poor, 5 = fair, 9 = excellent.
Shape: 1 = very round, 2 = mostly round, 3 = round to oblong, 4 = mostly oblong, 5 = oblong, 6 = oblong to long, 7 = mostly long, 8 = long, 9 = cylindrical.
Eye Depth: 1= very deep, 5 = medium, 9 = very shallow.
Size: 1 = small, 5 = medium, 9 = large.
Tuber Disease: 1 = very severe, 5 = moderate, 9 = none.
Overall Appearance: 1 = very poor, 5 = fair, 9 = excellent.

[3] **Internal Defects:**

Percentage determined from 10 randomly selected potatoes /rep (40 total) in size classes 3 and 4. HN=heat necrosis; HNR=average heat necrosis rating (Rating Scale: 1= very severe to 9 = absent); HH=hollow heart; VR=vascular ring discoloration; BC=brown center; SR=soft rot

Table 3. UTZ Quality Foods Chip Data – North Carolina Regional Trial.

	% Defects		%Total	Specific	Defect Descriptions[1]		Chip Color[2]		
Clone	Internal	External	Defects	Gravity	Internal	External	Hunter Lab	Agtron	Visual
AF2291-10	4%	1%	5%	1.100	VR	WW	63.17	66.0	1
Atlantic	16%	24%	40%	1.098	ID	WW	62.9	65.3	2
Beacon Chipper	0%	5%	5%	1.109	.	ED	64.6	70.4	1
CO95051-7W	1%	0%	1%	1.083	ID	.	63.5	67.7	1
CO96141-4W	5%	1%	6%	1.090	VR,SB	WW	64.3	70.1	1
CO97043-14W	4%	0%	4%	1.093	ID	.	64.6	70.4	1
CO97065-7W	0%	1%	1%	1.103	.	WW	65.5	71.2	1
MSJ036-A	39%	0%	39%	1.091	ID,VR	.	64.4	70.4	2
MSJ147-1	0%	6%	6%	1.098	.	WW	61.1	60.9	2
ND7519-1	1%	0%	1%	1.110	ID	.	63.8	68.9	1
NY138	2%	4%	6%	1.078	ID,HH	WW	64.4	70.2	1
NY139	2%	4%	6%	1.104	SB	WW	64.60	70.5	1
Snowden	5%	0%	5%	1.102	.	.	62.5	64.5	1
W2310-3	0%	2%	2%	1.112	ID,VR	WW	63	65.3	1
W2324-1	15%	7%	22%	1.100	ID,SB	BR	62.5	64.5	1
W2717-5	4%	0%	4%	1.100	.	.	64.6	70.8	1

[1] **Defect Descriptions:**

BR = Bruising; ED = External Discoloration; HH = Hollow Heart; ID = Internal Discoloration; SB = Stem End Browning; VR = Vascular Ring Discoloration; WW = Wire Worm.

[2] **Chip Color:**

Hunter Lab Scores

Taken with defective chips included in sample

Visual Scores

Ratings conducted by the UTZ Quality Foods Inc. in Hanover PA with in 24 hrs of harvest. Visual Rating Score: 1 = no defects, exceptionally bright; 2 = excellent, bright; 3 = good, light or golden; 4 = dark defects, marginal; 5 = not acceptable. *= brightest chip in visual observation

Clone Summaries

AF2291-10: Maturity for this clone was late with 95% stands and fair vigor. Shapes were mostly oblong, size was medium to large and overall appearance was better than fair. Marketable yields were 79% of Atlantic, gravity was 1.095 and chip color was excellent in both the 24 to 48 hour and 5 to 7 day chip tests. No significant internal defects were recorded. External defects included misshapes, growth cracks, sunscald and skin blemishes due to Rhizoctonia.

Beacon Chipper: This was a slightly later than mid-maturing clone with 100% stands and good vigor. Shapes were round to oblong, size was medium to large and overall appearance was better than fair. Marketable yields were 82% of Atlantic, gravity was 1.093, and chip color was excellent in the 24 to 48 hour and exceptional 5 to 7 day chipping. No significant internal defects were observed, external defects included growth cracks, and misshapes.

CO95051-7W: This clone was late maturing and had 97% stands and vigor was less than fair. Shapes were mostly round, size was a step better than medium, and overall appearance was better than fair. Marketable yields were 82% of Atlantic, gravity was 1.082, and chip color was exceptional in both the 24 to 48 hour and the 5 to 7 day chip tests. External defects included sunscald, star cracking, and high levels of skin blemishes due to Rhizoctonia.

CO96141-4W: Maturity for this clone was late season with 99% stands, and vigor was better than fair. Shapes were oblong, size was medium, and overall appearance was better than fair. Marketable yields were 98% of Atlantic, gravity was 1.085, and chip color was excellent in the 24 to 48 hour test and excellent in the 5 to 7 day chip test. External defects included sunscald, and misshapes.

CO97043-14W: Maturity for this clone was slightly late than mid-season with 99% stands, and good vigor. Shapes were mostly round, size was medium and overall appearance was good. Marketable yields were 88% of Atlantic, gravity was 1.085 and chip scores were excellent for both the 24 to 48 hour and 5 to 7 day chip tests. External defects included sunscald and black scurf.

CO97065-7W: This clone was mid-maturing and had 99% stands with good vigor. Shapes were very round, size was slightly better than medium, and overall appearance was good. Marketable yields were 82% of Atlantic, gravity was 1.096 and chip scores were excellent for both the 24 to 48 hour and 5 to 7 day chip tests. External defects were sunscald and skin blemishes due to Rhizoctonia.

MSJ036-A: This was a late maturing clone with 93% stands and fair vigor. Shapes were mostly round, size was slightly larger than medium, and overall appearance was better than fair. Marketable yields were 95% of Atlantic, gravity was 1.086 and chip scores were excellent for both the 24 to 48 hour and 5 to 7 day chip tests. External defects were sunscald, misshapes, and skin blemishes due to Rhizoctonia.

MSJ147-1: Maturity for this clone was late, stands were 100%, and vigor was better than fair. Shapes were mostly round, size was small, and overall appearance was fair. Marketable yields were 26% of Atlantic, gravity was 1.098, and chip color was excellent in the 24 to 48 hours test and exceptional in the 5 to 7 day chip test. External defects included common scab.

ND7519-1: This clone was mid-maturing, stands were 97% and had better than fair vigor. Marketable yields were 86% of Atlantic, gravity was 1.103, and chip scores were exceptional for both the 24 to 48 hour and 5 to 7 day chip tests. Internal defects of tubers sampled included 48% internal heat necrosis with a severity rating of 8.0 and 32% brown center. External defects included sunscald.

NY138: This slightly later than mid-maturing clone had 96% stands and fair vigor. Shapes were round to oblong, size was medium-large, and overall appearance was better than good. Marketable yields were 82% of Atlantic, gravity was 1,082, the chip score for the 24 to 48 hour test was good and the score for the 5 to 7 day test was exceptional. External defects included soft rot, misshapes, and sunscald.

NY139: Maturity for this clone was slightly later than mid-season, stands were 95% and vigor was fair. Shapes were mostly oblong, size was medium to large, and overall appearance was good. Marketable yields were 87% of Atlantic, gravity was 1.090, the chip score for the 24 to 48 hour test was excellent and the score for the 5 to 7 day test was exceptional. External defects included sunscald, misshapes, soft rot, and skin blemishes due to Rhizoctonia.

W2310-3: This clone was mid-maturing with 96% stands and better than fair vigor. Shapes were oblong, size was medium to large and overall appearance was fair. Marketable yields were 79% of Atlantic, gravity was 1.094, and chip scores were excellent in both the 24 to 48 hour and 5 to 7 day chip tests. External defects included sunscald, common scab, and misshapes.

W2324-1: This clone had stands of 99%, and was mid to early maturing with good vigor. Shapes were round to oblong, size was slightly larger than medium and overall appearance was less than fair. Marketable yield was 104% Atlantic, gravity was 1.090, and chip scores were excellent in the 24 to 48 hour and exceptional in the 5 to 7 day tests. External defects included sunscald, soft rot, common scab, and misshapes.

W2717-5: This clone was slightly later than mid-season with 99% stands and fair vigor. Shapes were round to oblong, medium sized, and fair for overall appearance. Marketable yields were 71% of Atlantic, gravity was 1.095, and chip scores were exceptional in the 24 to 48 hour and excellent in the 5 to 7 day tests. External defects included growth cracks, misshapes, sunscald, soft rot, and skin blemishes due to Rhizoctonia.

Pennsylvania Regional Trial

Local Coordinator:
Dr. Bill Lamont
Penn State Univ.
Department of Horticulture
University Park, PA 16802

Cooperative Grower:
James Hite
Patton, PA 16668

Cooperating Chip Processor:
Snyder of Berlin
John Blough
Berlin, PA 15530

Trial Data:

Planting Date: 07-May-08 Soil Temperature: 60ºF
Vine Kill Date: 7-Sep-08
Harvest Date: 22-Sep-08 138 days Soil Temperature: 60ºF

Row and plant spacing: 34 inches between rows; 10.5 inches between plants;
Plot length 25 feet, 4 replications

Growing Season Werather: The growing season was warm and dry with about 14.25 inches of rain from May 1 through September 22, 2008. The plot was not irrigated.

	*Avg. High ºF	*Avg. Low ºF	*Rain (inches)
May	66	45	1.00
June	79	60	1.40
July	81	62	4.90
August	78	57	6.95
September	71	54	Trace
Total Rainfall (May thru September 22)			14.25

*Temperatures as reported at at Altona, PA by Pennsylvania State Climatologist

*Rainfall as reported at Patton, PA by James Hite

Trial Procedure:

Previous crop: Wheat Soil Type: shaley loam

Fertilizer: 13-13-13 1,250 pounds

Irrigation: Rainfall 14.25 inches

Herbicides: Pre planting: Round-up (0.67 quart), Request (water conditioning 1 qt/100 ga)
Sencor (2/3 pound) / Medal (1 pint) - 2 sprays

Insecticides: Baythroid (2 ounces) / Thionex (1.3 quarts) -2 sprays
Spintor (4 ounces) - 2 sprays

Fungicides: Manzate® (5 sprays, total of 7 pounds Manzate® over growing season)

Vine Kill: Reglone (1 pint) / Induce (1 pint)

Pennsylvania Regional Trial

Table 1. Yield, Size Distribution, and Characteristics of 2008 Snack Food varieties at Chest Springs, PA.

	Yield (cwt/A)		Percent Size Distribution					Characteristics				
Entry	No. 1	Total	No. 1	Small	Mid-Size	Large	Culls	Agtron Score[a]	Specific Gravity[a]	% Hollow Heart	Major External Defects	Maturity Rating[b] 1 = Dead 5 = Green
W2324-1	305.5	346.7	88	9	88	0	3	47	1.099	0	SB MS RH GC	3
Snowden	290.9	362.1	80	16	80	1	3	50	1.099	0	SB RH FR ST	**5**
Atlantic	286.7	335.9	85	6	85	3	7	44	1.096	20	SB RH GC ST	4
CO97043-14W	270.9	323.6	84	7	84	4	5	50	1.089	0	SB GC FR	3
NY139	256.7	301.7	85	8	85	2	5	42	1.094	0	SB RH	3
Beacon Chipper	237.0	312.1	76	4	76	17	4	47	1.091	0	SB MS RH	3
MSJ036-A	228.2	266.3	86	12	86	0	2	47	1.093	0	SB RH	3
AF2291-10	203.6	262.4	78	5	78	11	6	51	1.094	15	SB RH MS	4
NY138	199.6	228.8	87	9	87	0	3	56	1.093	0	SB ST RH	3
ND 7519-1	198.6	248.6	80	17	80	0	3	44	1.095	0	SB RH SG	2
W2310-3	188.2	217.8	86	11	86	0	2	46	1.099	0	SB MS RH	2
CO95051-7W	168.2	192.4	87	7	87	2	4	43	1.090	0	SB RH PC	5
MSJ147-1	149.3	210.9	71	28	71	0	1	48	1.092	0	SB RH	5
CO96141-4W	147.4	183.2	80	9	80	2	9	53	1.089	0	SB RH MS	2
CO97065-7W	107.4	143.9	75	8	75	2	15	49	1.092	0	SB GC ST	1
W 2717-5	106.2	152	70	5	70	7	18	45	1.099	20	SB MS PC RH	3
Mean	209	256						48	1.094			
lsd 0.05	73	63						[a] Samples processed 23-Sep-08 by Snyder of Berlin				[b] Rating Date 22-Aug-08
CV%	20	21										

Defects:

SB = sunburn PC = Pressure Crack GC = growth cracks SG = Secondary Growth

MS = mis-shapen ST = Stone Damage FR = Fusarium Rot RH = Rhizoctonia

Red River Valley Regional Trial

Nick David, Extension Potato Agronomist
Department of Plant Sciences, North Dakota State University
Phone: (701) 231-8732

Technical Support

Mr. Duane Preston – Extension Potato Agronomist, University of Minnesota
Mr. Marty Glynn – USDA Potato Research Facility, East Grand Forks, MN
Mr. Dennis Olson – USDA Potato Research Facility, East Grand Forks, MN
Mrs. Becky Sayre – USDA Potato Research Facility, East Grand Forks, MN
Mr. Todd Schutz – USDA Potato Research Facility, East Grand Forks, MN

Site Location

Oberg Farms, Hoople, ND

Site History

2006 – Wheat, 2007 – Wheat, 2008 – Potatoes

Procedures

Seed handling

Seed was stored at 50°F until it was hand cut into 2.0 – 2.5 oz pieces on May 12, 2009. Following cutting, seed was immediately treated with Maxim 4FS and then suberized at 55°F and 95% RH until planting.

Planting and Harvest Operations

Potato seed pieces were planted with an in-row spacing of 9 inches and a between-row spacing of 36" on May 22 using a two-row assist feed Harriston potato planter. Varieties were arranged in a randomized complete block design and replicated four times. A Dark Red Norland seed piece was planted at the beginning and end of each plot as a guard plant to minimize border effects. On September 22, a 1-row Grimme harvester was used to harvest the trial area. Yield and grade was determined immediately following harvest and subsamples for the long-term storage trial were placed in 45 and 50°F storage facilities.

Red River Valley Regional Trial

Yield and size distribution of entries in the 2008 USPB/SFA Chip Trial
Hoople, ND

	Yield (cwt/acre)						
Variety/Clone	**< 1 7/8"**	**1 7/8 – 2 1/4"**	**2 1/4 – 4"**	**> 4"**	**Total**	**Percent Atlantic**	**Percent Snowden**
W2324-1	20 def	80 cdefg	273 bcd	0 b	373 bc	105	121
MSJ036-A	45 ab	143 a	185 de	0 b	372 bc	105	121
Atlantic	16 def	65 defgh	276 bcd	0 b	355 bcd	100	116
CO97043-14W	24 def	103 abcde	189 de	0 b	315 bcde	89	103
Snowden	17 def	86 bcdef	204 cde	0 b	307 bcde	86	100
NY138	16 def	87 bcdef	198 de	0 b	301 bcde	85	98
W2310-3	27 cd	99 abcdef	173 ef	0 b	299 bcde	84	97
W2717-5	27 cd	94 bcdef	170 ef	0 b	290 bcde	82	94
CO96141-4W	26 de	112 abcd	147 ef	0 b	285 bcde	80	93
NY139	24 def	86 bcdef	168 ef	0 b	277 bcde	78	90
ND7519-1	17 def	103 abcde	157 ef	0 b	276 bcde	78	90
CO97065-7W	28 bcd	102 abcdef	145 ef	0 b	275 bcde	77	90
Beacon Chipper	15 def	53 fgh	196 de	0 b	263 cde	74	86
AF2291-10	18 def	72 defgh	170 ef	0 b	260 cde	73	85
MSJ147-1	60 a	108 abcde	76 f	0 b	243 de	68	79
CO95051-7W	30 bcd	91 bcdef	78 f	0 b	198 e	56	64
	$p \leq 0.0001$	$p \leq 0.0001$	$p \leq 0.0001$	$p \leq 0.002$	$p \leq 0.0001$		

[1]Values followed by a different letter within a column are significantly different according to Duncan's multiple comparison.

Wisconsin Regional Trial

Charles J. Kostichka, Superintendent, Hancock Agricultural Research Station
Phone: 715-249-5961; E-mail: cjkostic@wisc.edu
College of Agricultural and Life Sciences, University of Wisconsin-Madison

Trial Site

Hancock Agricultural Research Station, N3909 CTH V, Hancock, WI 54943

Commercial Chip Processing Cooperator

Frito-Lay, Inc.

Technical Support

Mary LeMere, Hancock Agricultural Research Station
Jolyn Rasmussen, Hancock Agricultural Research Station
Janice Dukelow, Hancock Agricultural Research Station
Margie Kostichka, Hancock Agricultural Research Station

Trial Procedure

Seed was received from trial cooperators during the first two weeks of April, 2008 and held in a locker in the Wisconsin Potato and Vegetable Storage Research Facility at 38°F until cutting. Seed was moved to 55°F to warm two days prior to cutting. Cutting was done by hand on April 18, 2008 with special attention paid to cutting uniform-sized, blocky seed pieces ranging from 2 to 2½ oz in weight. Cut seed was placed in well-ventilated plastic crates and held at 55°F for three days to promote drying and suberization prior to planting. Planting took place on April 21, 2008 using an Iron Age assist-feed planter. Varieties were planted in single-row plots 200 ft. in length. Rows were spaced 36 in. apart. Seed pieces were placed 12 in. apart within each row. Plots were maintained according to standard production practices recommended by the University of Wisconsin (detailed accounting of fertilizer, pesticide and irrigation rates and dates is available from author). Plots were vine-killed on August 29, 2008 (130 days after planting) and harvested into plastic crates using a custom-built Gallenberg plot harvester on September 22, 2008.

Yield Data and Tuber Quality

Tubers were graded and sized using a custom-built Gallenberg grader and Exeter optical sizer. Total yield, U. S. No. 1 yield, undersize and culls are presented in Table 1. U. S. No. 1 size distribution data is presented in Table 2. Following grading eight specific gravity measurements were taken for each variety using a Weltech PW-2050 Dry Matter Assessment System (weight in air/weight in water method). Averaged specific gravity data is presented in Table 3.

Table 1. Total yield, U. S. No. 1 yield, <1 7/8" and culls, 2008.

Variety	Total Yield	U. S. No. 1		<1 7/8 in.	Culls
	(cwt)	(cwt)	(%)	(%)	(%)
AF2291-10	411	390	95	1	4
ATLANTIC	508	486	96	3	1
BEACON CHIPPER	496	461	93	3	4
CO95051-7W	320	287	90	7	3
CO96141-4W	470	437	93	4	3
CO97043-14W	408	379	93	3	4
CO97065-7W	403	374	93	2	5
MSJ036-A	520	481	93	4	4
MSJ147-1	406	354	87	9	3
ND7519-1	541	504	93	5	2
NY138	372	354	95	3	2
NY139	416	395	95	3	3
SNOWDEN	526	498	95	2	3
W2310-3	350	328	94	4	2
W2324-1	618	577	93	2	4
W2717-5	389	352	90	4	5

Culls = tubers not meeting U. S. No. 1 standards due to external defects.

Table 2. U. S No. 1 size distribution, 2008.

	U. S. No. 1 Size Distribution (% of U. S. No. 1 Yield)					
	2-4 oz.	4-6 oz.	6-10 oz.	10-13 oz.	13-16 oz.	>16 oz.
AF2291-10	19	22	35	13	8	3
ATLANTIC	20	24	37	11	6	2
BEACON CHIPPER	26	26	37	8	2	0
CO95051-7W	64	24	11	1	0	0
CO96141-4W	33	25	34	6	2	1
CO97043-14W	29	31	34	4	3	0
CO97065-7W	34	35	31	1	0	0
MSJ036-A	43	31	25	1	0	0
MSJ147-1	69	20	10	1	0	0
ND7519-1	53	31	16	1	0	0
NY138	40	20	32	6	0	1
NY139	25	23	40	9	4	1
SNOWDEN	30	28	36	5	1	0
W2310-3	41	28	29	2	0	0
W2324-1	35	27	31	5	2	1
W2717-5	38	31	27	3	1	0

Table 3. **Specific gravity, 2008**

Variety	Specific Gravity
AF2291-10	1.082
ATLANTIC	1.086
BEACON CHIPPER	1.072
CO95051-7W	1.079
CO96141-4W	1.069
CO97043-14W	1.074
CO97065-7W	1.077
MSJ036-A	1.081
MSJ147-1	1.091
ND7519-1	1.086
NY138	1.073
NY139	1.082
SNOWDEN	1.080
W2310-3	1.084
W2324-1	1.083
W2717-5	1.087

Table 4. **Internal defects, 2008.**

Variety	Internal Defects (%)				
	BC	HH	IBS	VD	SED
AF2291-10	0	0	0	0	0
CO96141-4W	0	0	0	3	0
W2310-3	0	0	3	0	0
SNOWDEN	0	0	0	7	0
CO97043-14W	10	0	0	0	0
NY139	3	0	0	3	0
MSJ147-1	0	3	0	0	0
BEACON CHIPPER	0	0	0	0	0
CO95051-7W	3	0	0	0	0
W2324-1	3	0	0	3	0
W2717-5	0	0	3	0	0
ND7519-1	13	3	10	0	0
MSJ036-A	0	0	0	0	0
ATLANTIC	3	0	0	0	0
NY138	0	0	0	0	0
CO97065-7W	7	0	0	0	0

Internal defects: BC = brown center; HH = hollow heart;
IBS = internal brown spot; VD = vascualr discoloration;
SED = stem end discoloration

Table 3. Overall average yield, percent size distribution and culls, specific gravity and out of field chip color for fourteen lines and two standards grown in CA, FL, ID, ME, MI, MO, NC, PA, RRV and WI in 2008.

	Clone or	Yield (cwt/acre)			Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Variety	No. 1	Total		No. 1	Small	Mid-Size	Large	Culls	Gravity	Agtron	SFA
CA	AF2291-10	254	304		84	15	64	20	2	1.092		
FL	AF2291-10	219	273		80	15	82	2	4	1.091		3.60
ID	AF2291-10	305	400		76	4	44	33	19	1.095		
ME	AF2291-10	303	311		97	5	86	9	0.3	1.085	70.7	
MI	AF2291-10	394	414		95	3	79	17	2	1.078	64.4	1.00
MO	AF2291-10	202	281		72	28	72	0		1.077	69.0	
NC	AF2291-10	256	284		90	8	89	1	2	1.095	66.0	2.00
PA	AF2291-10	204	262		78	5	78	11	6	1.094	51.0	
RRV	AF2291-10	242	260		93	7	93	0	0	1.098	50.0	3.00
WI	AF2291-10	347	411		84	1	84	10	4	1.082		
	average	**273**	**320**		**85**	**9**	**77**	**10**	**4**	**1.089**	**61.9**	**2.4**
CA	ATLANTIC											
FL	ATLANTIC	285	343		83	12	84	2	3	1.088		3.9
ID	ATLANTIC	489	559		87	4	62	26	9	1.096		
ME	ATLANTIC	361	389		93	10	81	7	3	1.080	69.1	
MI	ATLANTIC	414	443		93	5	80	13	1	1.077	64.9	3.0
MO	ATLANTIC	248	308		80	20	80	0		1.082	67.0	
NC	ATLANTIC	324	375		86	10	85	2	4	1.097	65.3	1.0
PA	ATLANTIC	287	336		85	6	85	3	7	1.096	44.0	
RRV	ATLANTIC	339	355		96	5	96	0	0	1.104	42.0	4.0
WI	ATLANTIC	447	508		88	3	88	8	1	1.086		
	average	**355**	**402**		**88**	**8**	**82**	**7**	**4**	**1.090**	**58.7**	**3.0**

Table 3. Continued: Overall average yield, percent size distribution and culls, specific gravity and out of field chip color for fourteen lines and two standards grown in CA, FL, ID, ME, MI, MO, NC, PA, RRV and WI in 2008.

	Clone or	Yield (cwt/acre)			Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Variety	No. 1	Total		No. 1	Small	Mid-Size	Large	Culls	Gravity	Agtron	SFA
CA	BEACON CHIPPER	352	396		89	8	43	46	3	1.081		
FL	BEACON CHIPPER	218	290		75	20	76	0	2	1.089		2.9
ID	BEACON CHIPPER	373	399		93	4	70	24	2	1.086		
ME	BEACON CHIPPER	402	424		95	7	71	21	1	1.073	70.3	
MI	BEACON CHIPPER	320	333		96	4	79	17	0	1.072	64.7	3.0
MO	BEACON CHIPPER	269	304		89	11	89	0		1.074	70.0	
NC	BEACON CHIPPER	263	320		82	11	82	0	7	1.093	70.4	2.0
PA	BEACON CHIPPER	237	312		76	4	76	17	4	1.091	47.0	
RRV	BEACON CHIPPER	248	263		94	6	95	0	0	1.091	61.0	2.0
WI	BEACON CHIPPER	447	496		90	3	90	2	4	1.072		
	average	**313**	**354**		**88**	**8**	**77**	**13**	**3**	**1.082**	**63.9**	**2.5**
CA	CO95051-7W	251	298		85	15	62	23	1	1.078		
FL	CO95051-7W	171	298		57	38	59	0	2	1.084		4.0
ID	CO95051-7W	357	412		87	12	85	2	1	1.100		
ME	CO95051-7W	283	306		92	11	87	0	3	1.079	68.9	
MI	CO95051-7W	177	210		84	16	83	1	0	1.072	63.4	3.0
MO	CO95051-7W	103	225		46	54	46	0		1.067	67.0	
NC	CO95051-7W	232	288		81	16	80	1	4	1.082	67.7	1.0
PA	CO95051-7W	168	192		87	7	87	2	4	1.090	43.0	
RRV	CO95051-7W	168	198		85	15	85	0	0	1.097	55.0	2.0
WI	CO95051-7W	287	320		90	7	90	0	3	1.079		
	average	**220**	**275**		**79**	**19**	**76**	**3**	**2**	**1.083**	**60.8**	**2.5**

Table 3. Continued: Overall average yield, percent size distribution and culls, specific gravity and out of field chip color for fourteen lines and two standards grown in CA, FL, ID, ME, MI, MO, NC, PA, RRV and WI in 2008.

	Clone or	Yield (cwt/acre)			Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Variety	No. 1	Total		No. 1	Small	Mid-Size	Large	Culls	Gravity	Agtron	SFA
CA	CO96141-4W	353	411		86	13	60	26	1	1.072		
FL	CO96141-4W	294	358		82	15	83	1	1	1.075		3.8
ID	CO96141-4W	379	439		86	11	76	10	3	1.086		
ME	CO96141-4W	320	350		91	8	84	5	3	1.076	71.1	
MI	CO96141-4W	410	449		91	5	86	5	4	1.061	66.7	2.0
MO	CO96141-4W	226	315		72	28	72	0		1.062	67.0	
NC	CO96141-4W	315	364		87	11	86	0	3	1.08	70.1	2.0
PA	CO96141-4W	147	183		80	9	80	2	9	1.089	53.0	
RRV	CO96141-4W	259	285		91	9	91	0	0	1.094	64.0	2.0
WI	CO96141-4W	428	470		91	4	91	3	3	1.069		
	average	**313**	**362**		**86**	**11**	**81**	**5**	**3**	**1.076**	**65.3**	**2.5**
CA	CO97043-14W	286	339		84	15	59	25	1	1.083		
FL	CO97043-14W	243	307		79	15	82	1	4	1.084		3.7
ID	CO97043-14W	432	492		88	10	70	17	2	1.086		
ME	CO97043-14W	314	341		92	6	76	13	5	1.072	69.4	
MI	CO97043-14W	379	402		94	6	86	8	0	1.068	65.2	2.0
MO	CO97043-14W	196	261		75	25	75	0		1.067	69.0	
NC	CO97043-14W	284	347		82	16	81	0	2	1.085	70.4	2.0
PA	CO97043-14W	271	324		84	7	84	4	5	1.089	50.0	
RRV	CO97043-14W	291	315		92	8	93	0	0	1.093	68.0	1.0
WI	CO97043-14W	371	408		91	3	91	3	4	1.074		
	average	**307**	**354**		**86**	**11**	**80**	**7**	**3**	**1.080**	**65.3**	**2.2**

Table 3. Continued: Overall average yield, percent size distribution and culls, specific gravity and out of field chip color for fourteen lines and two standards grown in CA, FL, ID, ME, MI, MO, NC, PA, RRV and WI in 2008.

	Clone or	Yield (cwt/acre)			Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Variety	No. 1	Total		No. 1	Small	Mid-Size	Large	Culls	Gravity	Agtron	SFA
CA	CO97065-7W	253	325		78	21	61	17	2	1.086		
FL	CO97065-7W	242	314		77	18	77	0	1	1.088		3.5
ID	CO97065-7W	278	358		78	21	77	1	1	1.086		
ME	CO97065-7W	279	349		80	8	76	0	17	1.077	69.1	
MI	CO97065-7W	363	408		89	10	89	0	1	1.079	64.4	3.0
MO	CO97065-7W	228	280		82	18	82	0		1.075	67.0	
NC	CO97065-7W	265	304		87	10	87	0	2	1.096	71.2	2.0
PA	CO97065-7W	107	144		75	8	75	2	15	1.092	49.0	
RRV	CO97065-7W	247	275		90	10	90	0	0	1.096	64.0	2.0
WI	CO97065-7W	378	403		94	2	94	0	5	1.077		
	average	**264**	**316**		**83**	**13**	**81**	**2**	**5**	**1.085**	**64.1**	**2.6**
CA	MSJ036-A	208	313		66	32	59	7	2	1.085		
FL	MSJ036-A	302	361		84	14	84	1	2	1.087		4.3
ID	MSJ036-A	413	495		83	14	80	4	3	1.096		
ME	MSJ036-A	381	412		93	11	86	2	0.4	1.075	68.7	
MI	MSJ036-A	465	512		91	9	90	1	0	1.078	60.5	4.0
MO	MSJ036-A	58	124		47	53	47	0		1.068	63.0	
NC	MSJ036-A	306	355		86	12	86	0	2	1.086	70.4	2.0
PA	MSJ036-A	228	266		86	12	86	0	2	1.093	47.0	
RRV	MSJ036-A	327	372		88	12	88	0	0	1.093	51.0	3.0
WI	MSJ036-A	481	520		93	4	93	0	4	1.081		
	average	**317**	**373**		**82**	**17**	**80**	**2**	**2**	**1.084**	**60.1**	**3.3**

Table 3. Continued: Overall average yield, percent size distribution and culls, specific gravity and out of field chip color for fourteen lines and two standards grown in CA, FL, ID, ME, MI, MO, NC, PA, RRV and WI in 2008.

	Clone or	Yield (cwt/acre)			Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Variety	No. 1	Total		No. 1	Small	Mid-Size	Large	Culls	Gravity	Agtron	SFA
CA	MSJ147-1	99	245		40	58	36	5	1	1.092		
FL	MSJ147-1	108	256		42	52	43	0	1	1.091		2.6
ID	MSJ147-1	285	376		76	23	73	3	2	1.104		
ME	MSJ147-1	174	198		88	20	80	0	0.5	1.078	69.3	
MI	MSJ147-1	254	336		76	24	76	0	1	1.089	62.4	2.0
MO	MSJ147-1	50	189		26	74	26	0		1.079	67.0	
NC	MSJ147-1	83	205		40	60	40	0	0	1.098	60.9	2.0
PA	MSJ147-1	149	211		71	28	71	0	1	1.092	48.0	
RRV	MSJ147-1	183	243		75	25	76	0	0	1.095	67.0	1.0
WI	MSJ147-1	354	406		87	9	87	0	3	1.091		
	average	**174**	**267**		**62**	**37**	**61**	**1**	**1**	**1.091**	**62.4**	**1.9**
CA	ND7519-1	255	379		67	30	59	9	3	1.083		
FL	ND7519-1	242	330		74	22	73	1	1	1.090		2.8
ID	ND7519-1	315	414		76	19	73	3	5	1.095		
ME	ND7519-1	326	384		85	13	79	0	9	1.083	70.8	
MI	ND7519-1	350	381		92	7	90	2	1	1.079	64.0	1.0
MO	ND7519-1	152	293		52	48	52	0		1.081	71.0	
NC	ND7519-1	276	337		82	17	81	0	1	1.103	68.9	1.0
PA	ND7519-1	199	249		80	17	80	0	3	1.095	44.0	
RRV	ND7519-1	259	276		94	6	94	0	0	1.099	65.0	1.0
WI	ND7519-1	509	541		94	5	94	0	2	1.086		
	average	**288**	**358**		**80**	**18**	**78**	**2**	**3**	**1.089**	**64.0**	**1.5**

Table 3. Continued: Overall average yield, percent size distribution and culls, specific gravity and out of field chip color for fourteen lines and two standards grown in CA, FL, ID, ME, MI, MO, NC, PA, RRV and WI in 2008.

	Clone or	Yield (cwt/acre)		Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Variety	No. 1	Total	No. 1	Small	Mid-Size	Large	Culls	Gravity	Agtron	SFA
CA	NY138	358	395	91	8	37	54	2	1.082		
FL	NY138	244	300	81	15	80	2	2	1.080		3.6
ID	NY138	410	470	87	10	80	7	3	1.085		
ME	NY138	388	416	93	5	87	4	4	1.073	70.4	
MI	NY138	504	525	96	4	79	17	1	1.066	69.0	1.0
MO	NY138	191	236	81	19	81	0		1.071	64.0	
NC	NY138	261	284	92	8	91	1	1	1.082	70.2	3.0
PA	NY138	200	229	87	9	87	0	3	1.093	56.0	
RRV	NY138	285	301	95	5	95	0	0	1.086	62.0	2.0
WI	NY138	347	372	93	3	93	1	2	1.073		
	average	**319**	**353**	**90**	**9**	**81**	**9**	**2**	**1.079**	**65.3**	**2.4**
CA	NY139	409	446	92	7	52	39	1	1.089		
FL	NY139	214	259	82	11	84	4	4	1.083		4.8
ID	NY139	393	462	85	12	84	2	3	1.095		
ME	NY139	259	278	96	6	90	2	2	1.076	71.1	
MI	NY139	521	542	96	3	88	8	1	1.082	62.2	3.0
MO	NY139	153	217	71	30	71	0		1.065	69.0	
NC	NY139	278	308	90	7	90	0	2	1.09	70.5	2.0
PA	NY139	257	302	85	8	85	2	5	1.094	42.0	
RRV	NY139	253	277	91	9	92	0	0	1.094	62.0	2.0
WI	NY139	383	416	92	3	92	5	3	1.082		
	average	**312**	**351**	**88**	**10**	**83**	**6**	**2**	**1.085**	**62.8**	**3.0**

Table 3. Continued: Overall average yield, percent size distribution and culls, specific gravity and out of field chip color for fourteen lines and two standards grown in CA, FL, ID, ME, MI, MO, NC, PA, RRV and WI in 2008.

	Clone or	Yield (cwt/acre)			Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Variety	No. 1	Total		No. 1	Small	Mid-Size	Large	Culls	Gravity	Agtron	SFA
CA	SNOWDEN											
FL	SNOWDEN	333	402		83	14	85	0	3	1.086		3.4
ID	SNOWDEN	333	449		74	25	71	4	1	1.092		
ME	SNOWDEN	390	406		94	10	89	0	1	1.085	70.8	
MI	SNOWDEN	569	598		95	4	85	10	1	1.081	61.3	2.0
MO	SNOWDEN	180	249		72	28	72	0		1.077	68.0	
NC	SNOWDEN	261	315		83	17	83	0	0	1.094	64.5	2.0
PA	SNOWDEN	291	362		80	16	80	1	3	1.099	50.0	
RRV	SNOWDEN	290	307		95	6	94	0	0	1.094	48.0	2.0
WI	SNOWDEN	493	526		94	2	94	1	3	1.080		
	average	**349**	**402**		**86**	**14**	**84**	**2**	**2**	**1.088**	**60.4**	**2.4**
CA	W2310-3	281	319		88	10	61	27	2	1.092		
FL	W2310-3	199	268		74	21	75	0	3	1.091		3.5
ID	W2310-3	477	540		88	6	83	6	5	1.096		
ME	W2310-3	273	286		95	8	91	0	1	1.075	71.1	
MI	W2310-3	401	432		93	6	91	2	2	1.080	62.7	2.0
MO	W2310-3	152	231		66	34	66	0		1.079	70.0	
NC	W2310-3	256	293		87	11	87	0	1	1.094	65.3	2.0
PA	W2310-3	188	218		86	11	86	0	2	1.099	46.0	
RRV	W2310-3	272	299		91	9	91	0	0	1.094	65.0	1.0
WI	W2310-3	328	350		94	4	94	0	2	1.084		
	average	**283**	**324**		**86**	**12**	**83**	**4**	**2**	**1.088**	**63.4**	**2.1**

Table 3. Continued: Overall average yield, percent size distribution and culls, specific gravity and out of field chip color for fourteen lines and two standards grown in CA, FL, ID, ME, MI, MO, NC, PA, RRV and WI in 2008.

	Clone or	Yield (cwt/acre)			Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Variety	No. 1	Total		No. 1	Small	Mid-Size	Large	Culls	Gravity	Agtron	SFA
CA	W2324-1	287	393		73	18	49	24	9	1.084		
FL	W2324-1	275	314		88	8	84	6	3	1.089		3.4
ID	W2324-1	482	565		85	6	65	20	9	1.095		
ME	W2324-1	436	463		94	4	90	3	3	1.080	69.8	
MI	W2324-1	555	604		92	5	77	14	3	1.078	60.7	3.0
MO	W2324-1	225	312		72	28	72	0		1.071	69.0	
NC	W2324-1	333	376		89	10	88	1	1	1.09	64.5	2.0
PA	W2324-1	306	347		88	9	88	0	3	1.099	47.0	
RRV	W2324-1	353	373		95	5	95	0	0	1.096	53.0	3.0
WI	W2324-1	565	618		91	2	91	3	4	1.083		
	average	**382**	**437**		**87**	**10**	**80**	**7**	**4**	**1.087**	**60.7**	**2.9**
CA	W2717-5	143	248		58	40	47	10	2	1.090		
FL	W2717-5	244	312		78	16	82	1	5	1.101		4.8
ID	W2717-5	242	331		73	22	63	10	5	1.091		
ME	W2717-5											
MI	W2717-5	318	354		90	9	88	2	2	1.085	63.1	2.0
MO	W2717-5	198	273		73	27	73	0		1.083	69.0	
NC	W2717-5	229	264		87	9	87	0	4	1.095	70.8	1.0
PA	W2717-5	106	152		70	5	70	7	18	1.099	45.0	
RRV	W2717-5	263	290		91	9	91	0	0	1.107	62.0	2.0
WI	W2717-5	348	389		90	4	90	1	5	1.087		
	average	**232**	**290**		**79**	**16**	**77**	**3**	**5**	**1.093**	**62.0**	**2.5**

Table 4. Three year averages over eleven regional UPS-SFA trial sites for Beacon Chipper from 2006 to 2008.

		Yield (cwt/acre)		Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Year	No. 1	Total	No. 1	Small	Med.	Large	Culls	Gravity	Agtron	SFA
CA	2008	352	396	89	8	43	46	3	1.081		
FL	2006	310	366	75	20	76	0	2	1.089		2.9
FL	2007	254	286	93	4	70	24	2	1.086		
FL	2008	218	290	95	7	71	21	1	1.073	70.3	
average		**261**	**314**	**88**	**10**	**72**	**15**	**2**	**1.083**	**70.3**	**2.9**
ID	2006	376	413	96	4	79	17	0	1.072	64.7	3.0
ID	2007	393	459	89	11	89	0		1.074	70.0	
ID	2008	373	399	82	11	82	0	7	1.093	70.4	2.0
average		**381**	**424**	**89**	**9**	**83**	**6**	**4**	**1.080**	**68.4**	**2.5**
ME	2006	308	352	76	4	76	17	4	1.091	47.0	
ME	2007	220	279	94	6	95	0	0	1.091	61.0	2.0
ME	2008	402	424	90	3	90	2	4	1.072		
average		**310**	**352**	**87**	**4**	**87**	**6**	**3**	**1.085**	**54.0**	**2.0**
MI	2006	378	391	91	8	90	1	2	1.081		2.0
MI	2007	585	600	79	0.7	79	17	3	1.068		
MI	2008	320	333	90	4	90	1	4	1.072	49.0	
average		**428**	**441**	**87**	**4**	**86**	**6**	**3**	**1.074**	**49.0**	**2.0**
MO	2008	269	304	97	2	79	18	1	1.077	68.0	1.0
NC	2006	378	443	82	2.7	84	12	2	1.092	68.0	1.0
NC	2007	307	333	86	12	76	9	3	1.089		1.2
NC	2008	263	320	92	4	86	6	4	1.080		2.0
average		**316**	**365**	**87**	**6**	**82**	**9**	**3**	**1.087**	**68.0**	**1.4**
PA	2006	262	309	62	38	62	0	na	1.079	69.0	
PA	2007	277	309	65	35	65	0	na	1.064	66.0	
PA	2008	237	312	64	37	64	0	na	1.071	68.0	
average		**259**	**310**	**64**	**37**	**64**	**0**		**1.071**	**67.7**	
RRV	2006	225	242	96	2	96	0	2	1.069		
RRV	2007	204	248	91	8	91	0	7	1.088	67.0	
RRV	2008	248	263	88	4	72	16	9	1.073	68.2	
average		**226**	**251**	**92**	**5**	**86**	**5**	**6**	**1.077**	**67.6**	
TX	2006	232	265	93	2.7	84	12	2	1.080	62.0	
TX	2007	121	190	88	13	88	0	na	1.076	72.0	
average		**177**	**228**	**90**	**8**	**86**	**6**	**2**	**1.078**	**67.0**	
WI	2006	385	433	88	12	88	0	na	1.083	72.0	
WI	2007	454	474	88	12	88	0	na	1.080	72.0	
WI	2008	447	496	89	1	89	7	3	1.075	72.5	
average		**429**	**468**	**88**	**8**	**88**	**2**	**3**	**1.079**	**72.2**	
overall avg.		**297**	**339**	**86**	**9**	**80**	**9**	**3**	**1.080**	**65.7**	**1.9**

Table 5. Three year averages over eleven regional UPS-SFA trial sites for CO95051-7W from 2006 to 2008.

		Yield (cwt/acre)		Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Year	No. 1	Total	No. 1	Small	Med.	Large	Culls	Gravity	Agtron	SFA
CA	2008	251	298	85	15	62	23	1	1.078		
FL	2006	286	345	57	38	59	0	2	1.084		4.0
FL	2007	298	365	87	12	85	2	1	1.100		
FL	2008	171	298	92	11	87	0	3	1.079	68.9	
average		**252**	**336**	**79**	**20**	**77**	**1**	**2**	**1.088**	**68.9**	**4.0**
ID	2006	352	420	84	16	83	1	0	1.072	63.4	3.0
ID	2007	387	460	46	54	46	0		1.067	67.0	
ID	2008	357	412	81	16	80	1	4	1.082	67.7	1.0
average		**365**	**431**	**70**	**29**	**70**	**1**	**2**	**1.074**	**66.0**	**2.0**
ME	2006	150	201	87	7	87	2	4	1.090	43.0	
ME	2007	215	225	85	15	85	0	0	1.097	55.0	2.0
ME	2008	283	306	90	7	90	0	3	1.079		
average		**216**	**244**	**87**	**10**	**87**	**1**	**2**	**1.089**	**49.0**	**2.0**
MI	2006	292	322	83	15	83	0	2	1.070		4.0
MI	2007	238	279	96	5	96	0	0	1.074		
MI	2008	177	210	87	9	87	0	4	1.068	41.0	
average		**236**	**270**	**89**	**10**	**89**	**0**	**2**	**1.071**	**41.0**	**4.0**
MO	2008	103	225	85	15	85	0	0	1.074	64.0	2.0
NC	2006	269	324	86	9	88	1	3	1.107	69.0	1.0
NC	2007	263	293	84	14	84	0	2	1.101		1.5
NC	2008	232	288	90	8	89	1	2	1.074		2.0
average		**255**	**302**	**87**	**10**	**87**	**1**	**2**	**1.094**	**69.0**	**1.5**
PA	2006	115	155	59	42	59	0	na	1.086	72.0	
PA	2007	165	189	62	38	62	0	na	1.066	68.0	
PA	2008	168	192	61	40	61	0	na	1.076	70.0	
average		**149**	**179**	**61**	**40**	**61**	**0**		**1.076**	**70.0**	
RRV	2006	162	176	90	9	90	0	2	1.082		
RRV	2007	162	189	87	13	87	0	4	1.082	67.6	
RRV	2008	168	198	83	12	82	0	6	1.077	66.5	
average		**164**	**188**	**87**	**11**	**86**	**0**	**4**	**1.080**	**67.1**	
TX	2006	159	241	92	4	91	3	2	1.088	62.0	
TX	2007	131	217	66	34	66	0	na	1.075	72.0	
average		**145**	**229**	**79**	**19**	**79**	**2**	**2**	**1.082**	**67.0**	
WI	2006	388	426	66	34	66	0	na	1.078	72.0	
WI	2007	351	391	66	34	66	0	na	1.077	72.0	
WI	2008	287	320	91	4	91	1	4	1.082	66.2	
average		**342**	**379**	**74**	**24**	**74**	**0**	**4**	**1.079**	**70.1**	
overall avg.		**224**	**278**	**80**	**18**	**79**	**1**	**3**	**1.087**	**64.5**	**2.0**

Table 6. Three year averages over eleven regional UPS-SFA trial sites for MSJ147-1 from 2006 to 2008.

		Yield (cwt/acre)		Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Year	No. 1	Total	No. 1	Small	Med.	Large	Culls	Gravity	Agtron	SFA
CA	2008	99	245	40	58	36	5	1	1.092		
FL	2006	317	356	42	52	43	0	1	1.091		2.6
FL	2007	185	272	76	23	73	3	2	1.104		
FL	2008	108	256	88	20	80	0	1	1.078	69.3	
average		**203**	**295**	**69**	**32**	**65**	**1**	**1**	**1.091**	**69.3**	**2.6**
ID	2006	306	418	76	24	76	0	1	1.089	62.4	2.0
ID	2007	232	403	26	74	26	0		1.079	67.0	
ID	2008	285	376	40	60	40	0	0	1.098	60.9	2.0
average		**274**	**399**	**47**	**53**	**47**	**0**	**1**	**1.089**	**63.4**	**2.0**
ME	2006	172	207	71	28	71	0	1	1.092	48.0	
ME	2007	107	134.5	75	25	76	0	0	1.095	67.0	1.0
ME	2008	174	198	87	9	87	0	3	1.091		
average		**151**	**180**	**78**	**21**	**78**	**0**	**1**	**1.093**	**57.5**	**1.0**
MI	2006	311	379	68	29	67	1	1	1.083		2.0
MI	2007	184	259	80	20	80	0	0	1.073		
MI	2008	254	336	65	32	65	0	3	1.078	46.0	
average		**250**	**325**	**71**	**27**	**71**	**0**	**1**	**1.078**	**46.0**	**2.0**
MO	2008	50	189	71	29	71	0	0	1.085	59.7	2.0
NC	2006	322	381	77	18	80	0	2	1.102	69.0	1.0
NC	2007	177	234	58	33	57	1	9	1.099		1.1
NC	2008	83	205	76	22	77	0	2	1.081		2.0
average		**194**	**273**	**70**	**24**	**71**	**0**	**4**	**1.094**	**69.0**	**1.4**
PA	2006	233	302	10	90	10	0	na	1.089	70.0	
PA	2007	142	219	8	92	8	0	na	1.069	70.0	
PA	2008	149	211	9	91	9	0	na	1.079	70.0	
average		**175**	**244**	**9**	**91**	**9**	**0**		**1.079**	**70.0**	
RRV	2006	172	206	84	14	84	0	1	1.082		
RRV	2007	163	210	90	9	90	0	1	1.090	70.0	
RRV	2008	183	243	83	15	82	2	1	1.071	69.7	
average		**173**	**220**	**86**	**13**	**85**	**1**	**1**	**1.081**	**69.9**	
TX	2006	207	267	84	9	80	7	4	1.082	70.0	
TX	2007	11	124	79	21	79	0	na	1.082	72.0	
average		**109**	**196**	**81**	**15**	**80**	**3**	**4**	**1.082**	**71.0**	
WI	2006	382	449	77	23	77	0	na	1.078	72.0	
WI	2007	286	339	78	22	78	0	na	1.080	72.0	
WI	2008	354	406	85	7	85	1	6	1.083	69.8	
average		**341**	**398**	**80**	**17**	**80**	**0**	**6**	**1.080**	**71.3**	
overall avg.		**190**	**269**	**66**	**32**	**66**	**1**	**2**	**1.085**	**65.7**	**1.6**

Table 7. Three year averages over eleven regional UPS-SFA trial sites for W2324-1 from 2006 to 2008.

		Yield (cwt/acre)		Percent Grade and Size Distribution					Specific	Field Chip Color	
State	Year	No. 1	Total	No. 1	Small	Med.	Large	Culls	Gravity	Agtron	SFA
CA	2008	287	393	73	18	49	24	9	1.084		
FL	2006	359	413	88	8	84	6	3	1.089		3.4
FL	2007	365	388	85	6	65	20	9	1.095		
FL	2008	275	314	94	4	90	3	3	1.080	69.8	
average		**333**	**372**	**89**	**6**	**80**	**10**	**5**	**1.088**	**69.8**	**3.4**
ID	2006	601	670	92	5	77	14	3	1.078	60.7	3.0
ID	2007	570	667	72	28	72	0		1.071	69.0	
ID	2008	482	565	89	10	88	1	1	1.090	64.5	2.0
average		**551**	**634**	**84**	**14**	**79**	**5**	**2**	**1.080**	**64.7**	**2.5**
ME	2006	178	310	88	9	88	0	3	1.099	47.0	
ME	2007	315	354	95	5	95	0	0	1.096	53.0	3.0
ME	2008	436	463	91	2	91	3	4	1.083		
average		**310**	**376**	**91**	**5**	**91**	**1**	**2**	**1.093**	**50.0**	**3.0**
MI	2006	488	515	96	3	88	8	2	1.082		4.0
MI	2007	564	598	89	4	89	8	0	1.078		
MI	2008	555	604	79	4	79	2	15	1.082	39.0	
average		**536**	**572**	**88**	**4**	**85**	**6**	**6**	**1.081**	**39.0**	**4.0**
MO	2008	225	312	95	3	82	13	2	1.081	62.9	2.0
NC	2006	461	521	91	4	93	1	2	1.099	58.0	2.0
NC	2007	335	383	85	11	77	9	3	1.092		1.3
NC	2008	333	376	87	10	86	2	3	1.080		3.0
average		**376**	**427**	**88**	**8**	**85**	**4**	**3**	**1.090**	**58.0**	**2.1**
PA	2006	351	408	60	40	60	0	na	1.091	68.0	
PA	2007	258	326	60	40	60	0	na	1.083	68.0	
PA	2008	306	347	60	40	60	0	na	1.087	68.0	
average		**305**	**360**	**60**	**40**	**60**	**0**		**1.087**	**68.0**	
RRV	2006	296	328	93	2	93	1	5	1.082		
RRV	2007	302	334	94	6	87	7	5	1.081	64.1	
RRV	2008	353	373	57	2	48	10	41	1.072	69.8	
average		**317**	**345**	**81**	**3**	**76**	**6**	**17**	**1.078**	**67.0**	
TX	2006	257	305	90	4	89	4	3	1.086	62.0	
TX	2007	147	246	88	12	88	0	na	1.078	72.0	
average		**202**	**276**	**89**	**8**	**88**	**2**	**3**	**1.082**	**67.0**	
WI	2006	433	656	81	19	81	0	na	1.083	72.0	
WI	2007	530	569	84	16	84	0	na	1.081	72.0	
WI	2008	565	618	66	2	66	2	29	1.082	69.2	
average		**509**	**614**	**77**	**12**	**77**	**1**	**29**	**1.082**	**71.1**	
overall avg.		**357**	**421**	**84**	**11**	**80**	**5**	**6**	**1.085**	**63.4**	**2.4**

OUT-OF-STORAGE CHIPPING EVALUATIONS

DATA FROM 2007 AND 2008 TRIALS

Idaho
Maine
Michigan
Pennsylvania
Red River Valley
Wisconsin

Table 1. 2007 USPB-SFA Chip Trial Grown at Aberdeen, Idaho.

	Out of Storage Quality Report				
	6 week cool down 6 weeks storage		3 week recondition		
CLONE	Chip 40	Chip 50	Chip 40	Percent Sugar Ends	Processing Defects
MSJ147-1	2.9	1.1	1.4	3	hollow heart
CO96141-4W	4.1	1.3	2.9	30	mottling, bruise
CO95051-7W	3.3	1.1	1.9	15	
BEACON CHIPPER	3.3	1.0	2.5	18	
SNOWDEN	4.4	1.5	2.0	48	
W2133-1	4.2	1.4	1.7	3	
ATLANTIC	3.7	1.8	2.8	50	
MSJ316-A	3.6	1.4	1.9	5	
W2324-1	3.9	1.5	3.0	30	dark vascular

Samples harvested September 25 and gradually cooled to 50^{o}.
Samples stored at 40 and 50^{o} for 6 weeks.
Samples reconditioned at 60^{o} for 3 weeks.

Maine Regional Trial

OUT OF **52F STORAGE** CHIP FRY DATA - 2007 CROP

Variety	Condition	SFA Fry Color[1]	USDA Color[2]	Defects (%) Internal & External
Atlantic	Firm	2+	3	I = 4 BS E = 1
Snowden	Firm	1-	2	I = 2 VR E = 0
AF2291-10	Firm	2+	2	I = 4 VR, PAD E = 0 Blister Chips
MSJ316-A	Firm	1-	3	I = 2 VR E = 0
MSJ147-1	Fairly Firm PB	2-	5	I = 4 BS E = 2 DPS Blistering
Beacon Chipper	Firm	2+	3	I = 6 VR, BS E = 2 Fusarium
CO96141-4W	Firm	1-	2	I = 0 Slight Blistering E = 0 Bright, Exc. Fresh potential
CO95051-7W	Fairly Firm PB	2+	4	I = 1 VR Blistering E = 2 SS
W2324-1	Fairly Firm PB	3	5	I = 8 VR, PAD Blistering E = 2 DPS
W2133-1	Firm Heavy SS	2-	5	I = 6 VR, PAD E = 4 SS

[1] = SFA rating scale from Wilbur Gould Text

[2] = ARS Handbook # 267, pp 58

Date Stored: Sept. 28, 2007
Date Removed: April 28, 2008
Date Processed: May 6, 2008
Processed at: Bio-Ag Research Laboratory

Defect Key

BS = Black Spot
VR = Vascular Ring
DPS = Deep pitted scab
PB = Pressure bruise
FUS = Fusarium dry rot
PAD = Pith area darkening
SS = Silver Scurf

OUT OF STORAGE CHIP FRY TEST RESULTS
2008 USPB-SFA CHIP VARIETY TRIAL
MAINE

Overview: Potato varieties were harvested and stored at the Dale Turner Farm in Washburn, Maine on September 13, 2008. The Samples were placed in Jute bags and co-mingled into a bin of Russet Burbank variety potatoes being held for French fry manufacture. Samples were held in storage at 48 to 50 degree F. and 90 percent RH until February when the bin was emptied for French fry processing. Samples were transferred to 55 degree storage at Aroostook Research Farm in Presque Isle and held until April 12, 2009. Samples were transferred to Bio-Ag Research Laboratory and were fried on April 22, 2009 following two weeks conditioning at room temperature.

Tuber samples were washed, sliced and fried in 100 percent corn oil for 3 minutes at 375 degrees F. Chip slices were evaluated for color using the SFA Chip Fry Chart and the USDA color chart as published in the USDA Agricultural Handbook, "Commercial Potato Production".

RESULTS: 2008 SFA/NPPB OUT-OF-STORAGE CHIP VARIETY TRIAL FRY TEST

VARIETY	SFA Chip Fry Chart	U.S.D.A. 1-10 Fry Chart	Chip Defects External	Chip Defects Internal
1. Atlantic	2	4	0	3 dp
2. Snowden	2+	3	1	3 vr
3. AF 22?	1	6	1	10 dao
4. MSJ 147-1	2+	4	2 bs	1
5. MSJ 036-A	1	7	1	15 dao
6. Beacon Chip	1	6	1	8 vr
7. NY 138	3	2	0	3 vr
8. NY 139	3++	2	0	0
9. ND 7519-1	3	2	0	0
10. W2324-1	2	5	2	8 dao
11. W2310-3	3++	1	1	0
12. CO97043-14	3	2	0	0
13. CO95051-7W	3	2	0	0
14. Sample lost 1n storage				
15. CO97065-7W	1	6	2 bs	8 dao

Defect Code: dao = dark all over
vr = Vascular Ring
dp = Dark Pith
bs = Black spot

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OUT-OF-STORAGE CHIP QUALITY
2007-2008 MICHIGAN REGIONAL REPORT

Chris Long, Michigan State University

Procedure:

The 2007 USPB / SFA Chip Trial was harvested on October 4, 2007 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 January and March of 2008 at Herr Foods, Nottingham PA. The 40 pound tuber samples placed in the grower's commercial storage were removed from storage in late January 2008 with a pile temperature of 54 ºF and in March 2008 with a pile temperature of 48 ºF. For sprout control, CIPC was applied in the storage in November 2007.

Eighteen, 30 tuber samples were also collected from each trial entry at harvest and stored in two cold storages at the Michigan Potato Industry Commission's (MPIC), Cargill Potato Demonstration Storage Facility. One set of nine samples were stored at approximately 54ºF for monthly evaluation, October through June. The remaining nine, 30 tuber samples were stored at approximately 48ºF to be evaluated during this same time period. 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 late October 2007.

Results:

Tables 1 and 2 summarize the chip quality of the 40 pound samples after being processed at Herr Foods, Inc. on January 30th and March 26th, 2008. The varieties are listed in yield order high to low, top to bottom based on the 2007 field trial data. As seen in Table 1, Herr Foods rated Beacon Chipper as having the best all around chip quality from these storage samples on this date. MSJ147-1 exhibited the least amount of tuber defects and the highest specific gravity of any line in the group.

From Table 2, W2133-1 appears to have the best overall chip quality appearance and highest specific gravity at this point in storage. Some concerns have been raised that this variety masks PVY expression. MSJ147-1 and CO95051-7W both appeared to have excellent Agtron numbers, as well as, low internal defect scores. Yield and overall agronomic productivity of these lines needs to be weighed with the benefit of the late season chip quality exhibited here.

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 2007 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 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.

Beacon Chipper: Table 3 indicates that Beacon Chipper at 54 ºF lost its dormancy quickly and consequently its chip quality declined after three months in storage. Sucrose rose quickly at the end of January, followed by an increase in glucose in mid-February. This rise in sugar levels was observed in the decline in chip quality (Table 4). This line appeared to store longer at 48 ºF with no negative impact to sugar concentration as a result of being cooled (Table 5). The storage life of this potato was more than doubled by storing the variety at 48 ºF. The chip quality of Beacon Chipper, when stored at 48 ºF, appeared to be good into early May (Table 6).

W2324-1: This line selection, when stored at 54 ºF, appeared to be stable until mid-February at which time the variety began to lose dormancy (Table 7). In early March, chip quality began to change as sugar related defects increased to almost 10 percent (Table 8). The colder storage temperature (48 ºF) did delay the rise in sucrose, but it was apparent that some physiological changes were beginning to occur in late March that brought about a rise in glucose (Table 9). This rise in glucose did not drastically impact the SFA color score, but can be seen in the increase in sugar related defects (Table 10).

Snowden: Snowden had a predictable response, as it stored to late February when held at 54 ºF (Tables 11-12). When subjected to it's standard storage protocol of being stored at 48 ºF, this variety was able to be stored acceptably into mid-April (Tables 13-14).

Atlantic: The objective of this sugar profiling study was to look for long term storage performance in new varieties. Atlantic, not being a storage potato, was only sampled for a few months to save money on sampling costs.

W2133-1: This line, when stored at 54 ºF, maintained relativly low sucrose and glucose values until early May at which point the SFA and sugar related defect levels rose to unacceptable levels (Tables 19-20). When W2133-1 was stored at 48 ºF the sugar quality and subsequent chip quality remained excellent into early June (Tables 21-22). This data is consistent with that from Herr Foods in Table 2 which ranked W2133-1 the best overall for chip quality in March of 2008.

CO96141-4W: Table 23 shows CO96141-4W increasing sucrose levels steadily from mid February to late May. Sugar levels began to negatively impact chip quality in early June (Table 24). The 48 ºF storage temperature kept the sucrose levels lower throughout the storage season resulting in a slight improvement in chip quality (Tables 25-26). Overall, this variety stored quite well based on this set of sugar data.

MSJ316-A: This line did not handle the warmer storage temperature of 54 ºF well. The sucrose level rose quickly after the first of February, resulting in a high level of sugar related defects accumulating in the finished chips, beginning in early March and lasting for the remainder of the storage season (Tables 27-28). The cooler storage temperature helped slow the physiological aging of the potatoes and stabilized glucose accumulation (Table 29). Table 30 shows that the variety maintained a good SFA color overall through the storage season, but there appeared to be some variability in the sugar related defects of MSJ316-A.

CO95051-7W: This variety, at both 54 ºF and 48 ºF, steadily increased sucrose levels from early March to early June with little or no impact on increasing glucose levels (Tables 31 and 33). Tables 32 and 34 show little, if any, sugar related chip defects for this variety throughout the storage season. This variety was not a top agronomic performer based on large scale commercial trials, but has excellent chip quality late out of cold storage.

MSJ147-1: This variety performed very well in storage at both 54 ºF and 48 ºF into June. At 54 ºF the sucrose levels rose steadily from March through June, but had little impact on glucose concentration (Table 35). Table 36 depicts the excellent chip quality that was evident from this line. The cooler storage, once again, reduced the aging process while having no negative impact on glucose levels (Table 37). MSJ147-1 exhibited a little higher level of sugar related defects being noted in the finished chips (Table 38). Overall, this variety had very nice chip quality late out of storage.

Table 1. 2007-2008 Out-of-Storage Chip Quality, 1/30/08, Sandyland Farms, LLC [1].

Entry	Agtron Color	SFA[2] Color	Specific Gravity	Percent Chip Defects[3] Internal	External	Total	Comments
Beacon Chipper	65	1.0	1.078	1.5	9.7	11.2	nice chip color, a few shaded, externals good overall, a few pitted and surface scab, nice grade, some oversize
W2324-1	61.3	2.0	1.079	5.6	14.4	20.0	light shading, light pitted scab, nice size
Snowden	**61.8**	**1.0**	**1.078**	**0.8**	**17.5**	**18.3**	**nice chip color, pitted scab, a few stem end browning, nice size**
Atlantic	**60.5**	**2.5**	**1.078**	**23.1**	**12.5**	**35.6**	**hollow heart, poor chip color, pitted scab, oversize**
W2133-1	64.4	1.0	1.080	4.3	9.0	13.3	nice chip color, pitted scab, light bruise, good size
CO96141-4W	64.3	1.5	1.069	5.1	2.0	7.1	nice chip color, a few stem end and vascular browning, light pitted scab, low gravity, oversize
MSJ316-A	65.7	1.0	1.073	5.5	2.3	7.8	nice chip color, a few surface scab, a few oversize, low gravity
CO95051-7W	60.6	1.5	1.080	1.5	4.8	6.3	a few shaded chips, nice externals, small grade
MSJ147-1	59.4	1.0	1.083	0.5	3.5	4.0	nice chip color, nice externals, too small

[1] Samples removed from 54 ºF storage and processed by Herr Foods Inc., Nottingham, PA on January 30, 2008.
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. 2007-2008 Out-of-Storage Chip Quality, 3/26/08, Sandyland Farms, LLC[1]

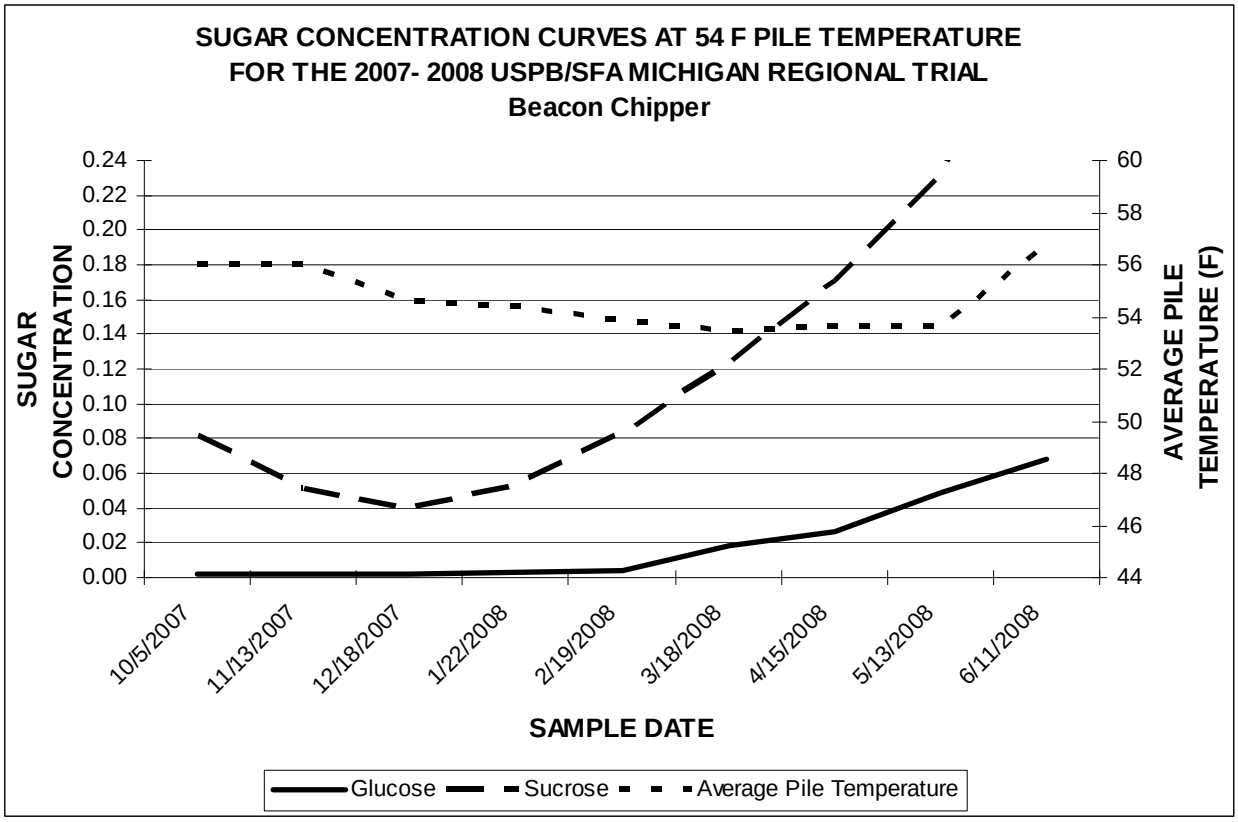
Entry	Agtron Color	SFA[2] Color	Specific Gravity	Percent Chip Defects[3] Internal	External	Total	Comments
Beacon Chipper	55.5	4.0	1.081	62.2	0.0	62.2	poor chip color, large grade 4"+, very nice externals
W2324-1	55.8	3.0	1.090	25.9	11.6	37.5	poor chip color, light surface/pitted scab, nice grade
Snowden	**61.5**	**1.5**	**1.078**	**20.5**	**10.6**	**31.1**	**a few hollow heart, good chip color, light scab, 2 green, large grade, some 4"**
Atlantic	**56.9**	**3.5**	**1.089**	**31.1**	**14.5**	**45.6**	**poor chip color, surface & pitted scab, large grade to 4"**
W2133-1	60.4	1.0	1.091	3.6	10.3	13.9	nice chip color, a few light scab, nice grade
CO96141-4W	58	2.5	1.078	15.7	8.4	24.1	shading in some chips, light scab, 4 green, large grade 4"
MSJ316-A	59.5	1.0	1.085	7.8	6.0	13.8	nice chip color, a few hollow heart, nice externals, nice grade
CO95051-7W	60.5	1.0	1.086	2.2	6.3	8.5	nice chip color, light surface scab, small grade
MSJ147-1	60.7	1.0	1.089	2.9	3.0	5.9	nice chip color, nice externals, too many 2" and under

[1] Samples removed from 48 ºF storage and processed by Herr Foods Inc., Nottingham, PA on March 26, 2008.
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 3.



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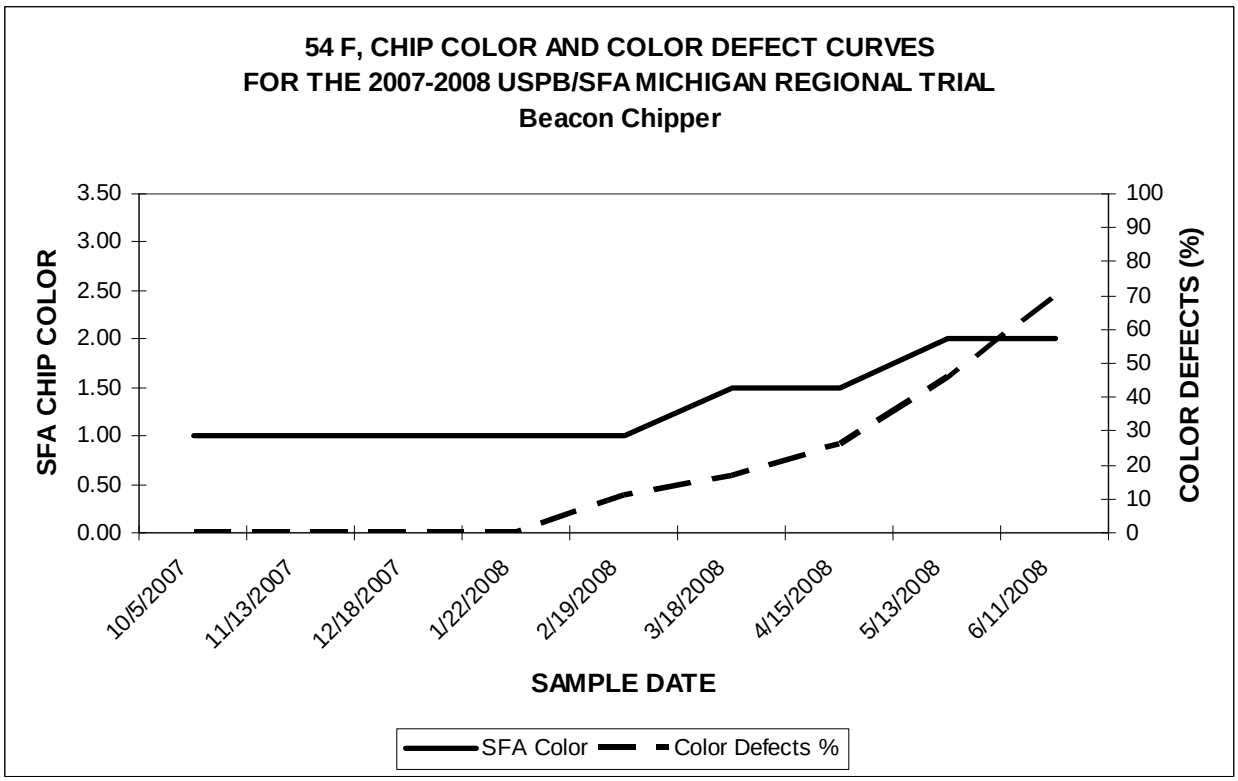

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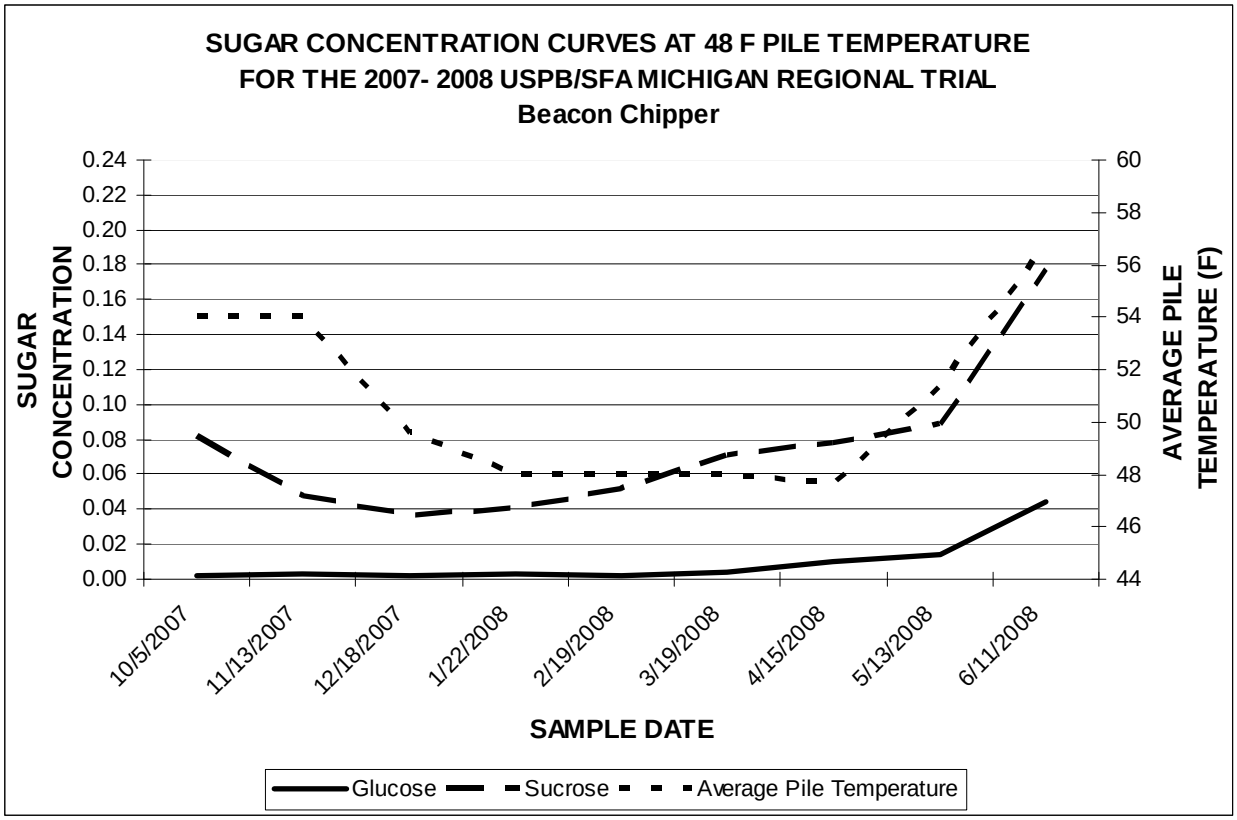

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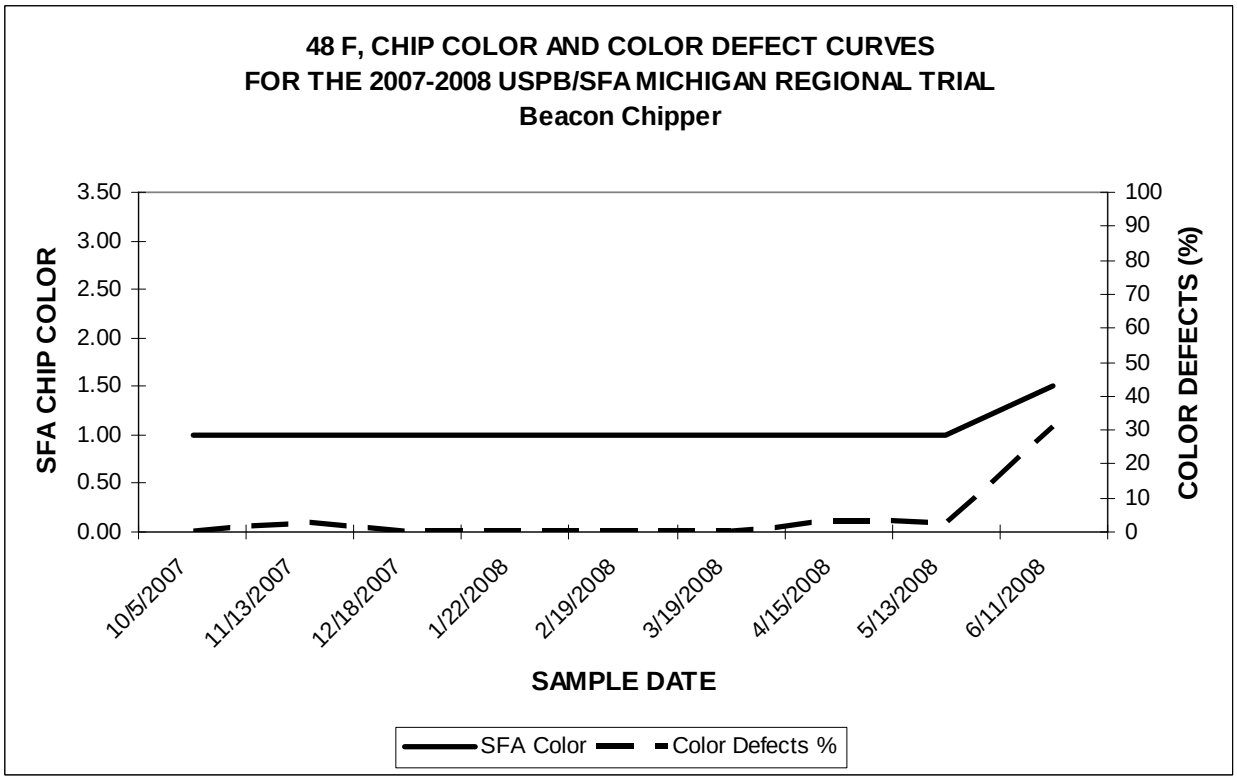

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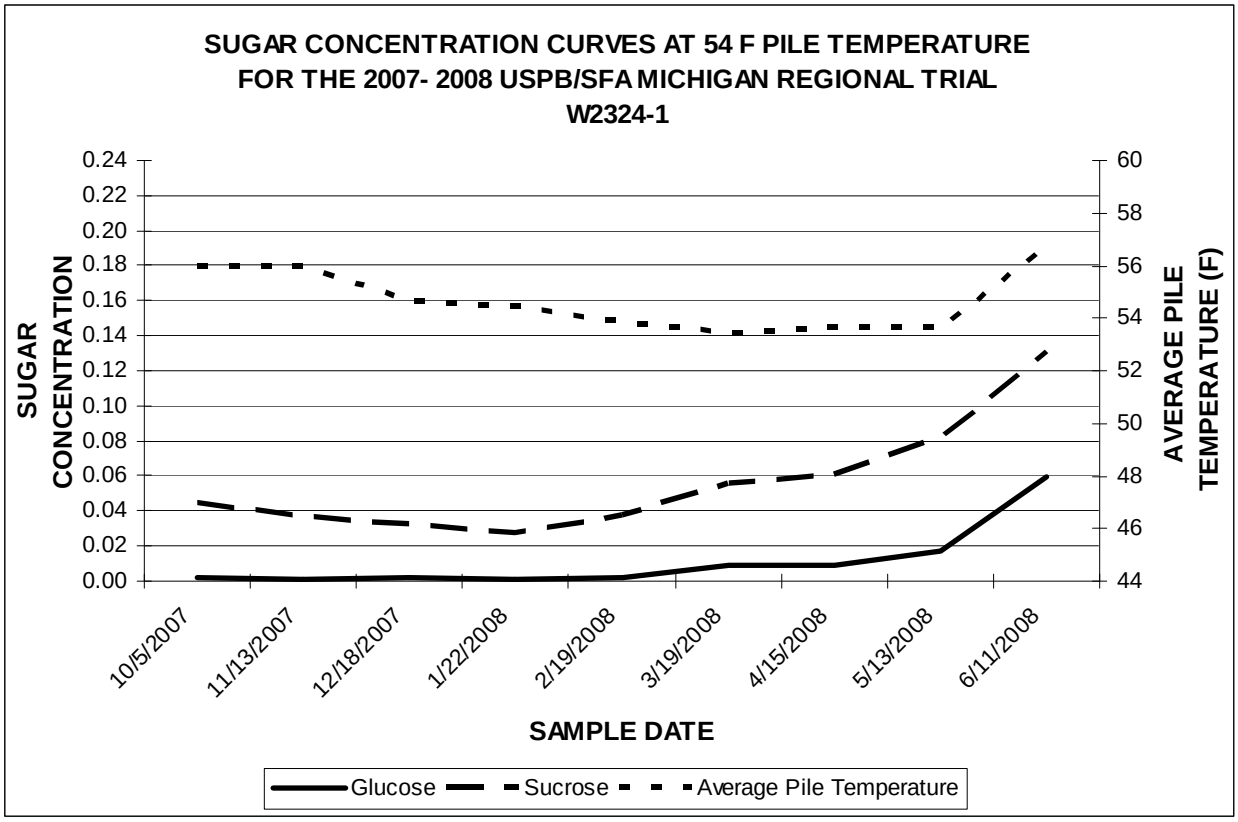

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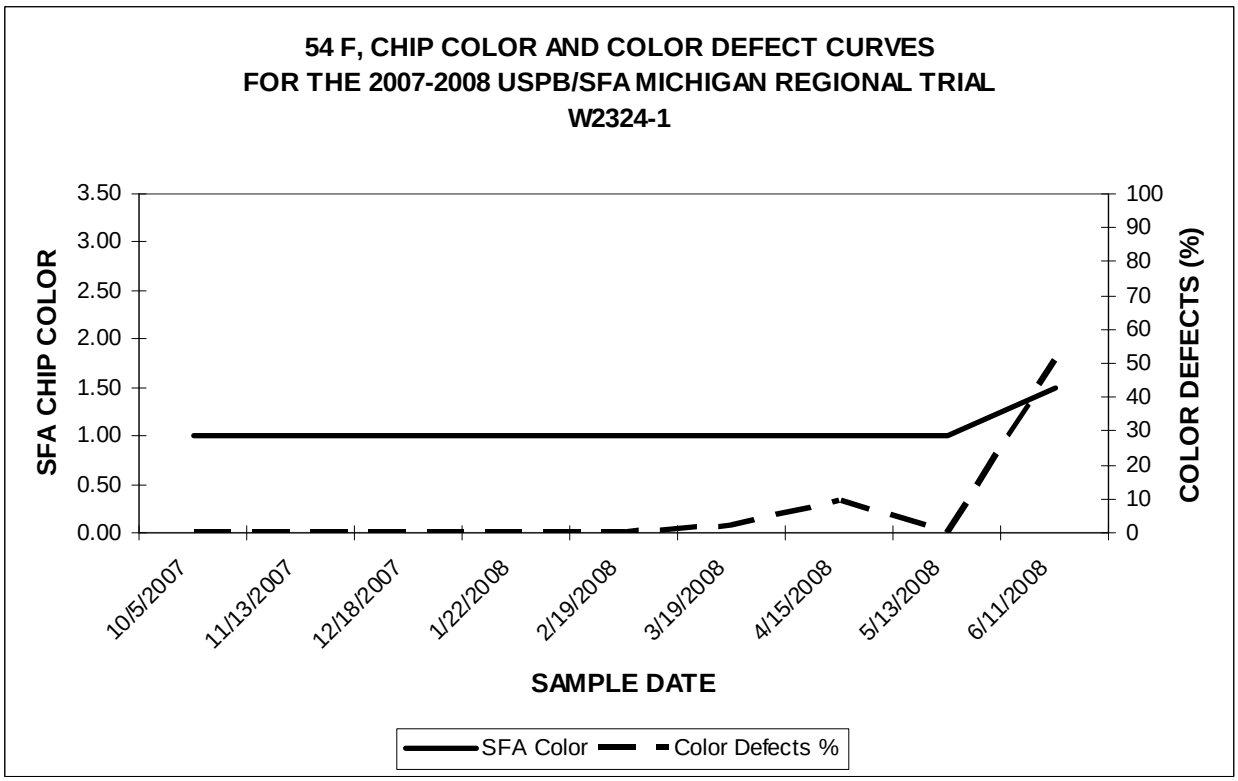

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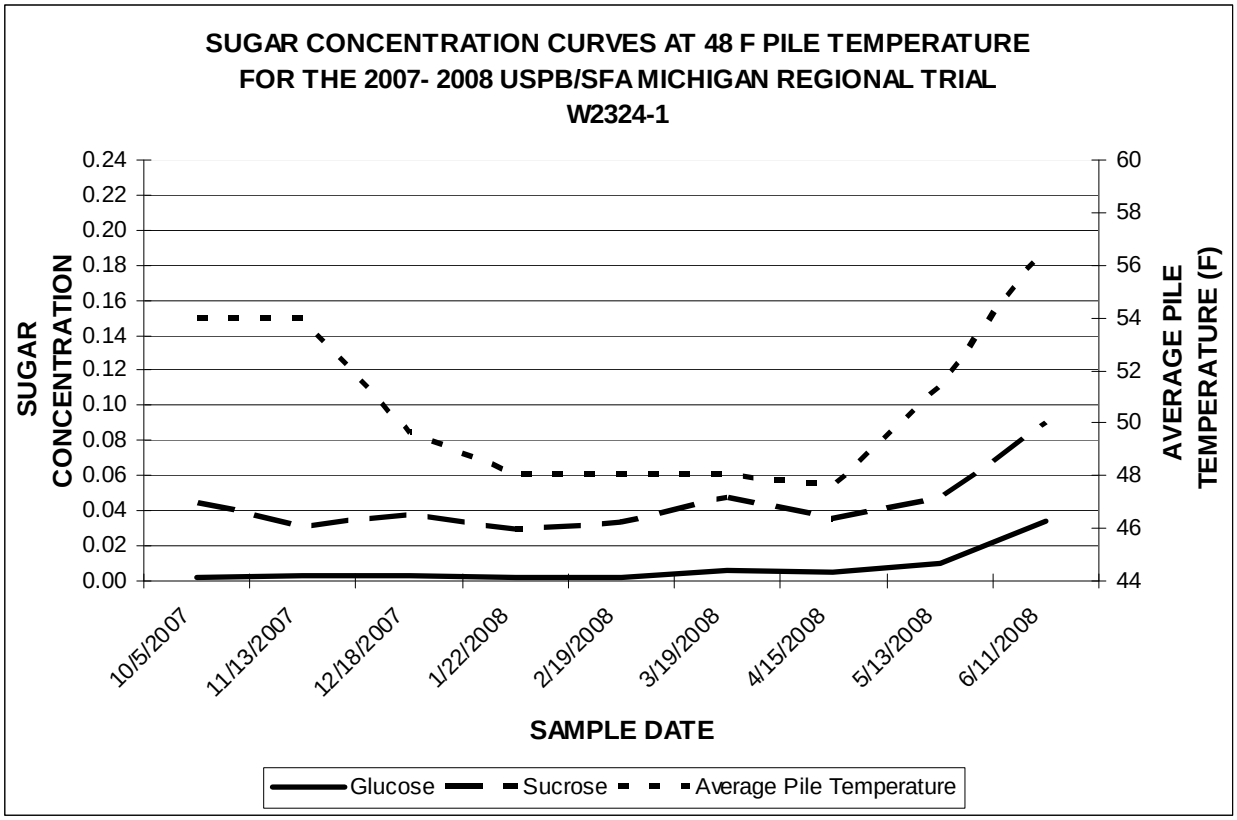

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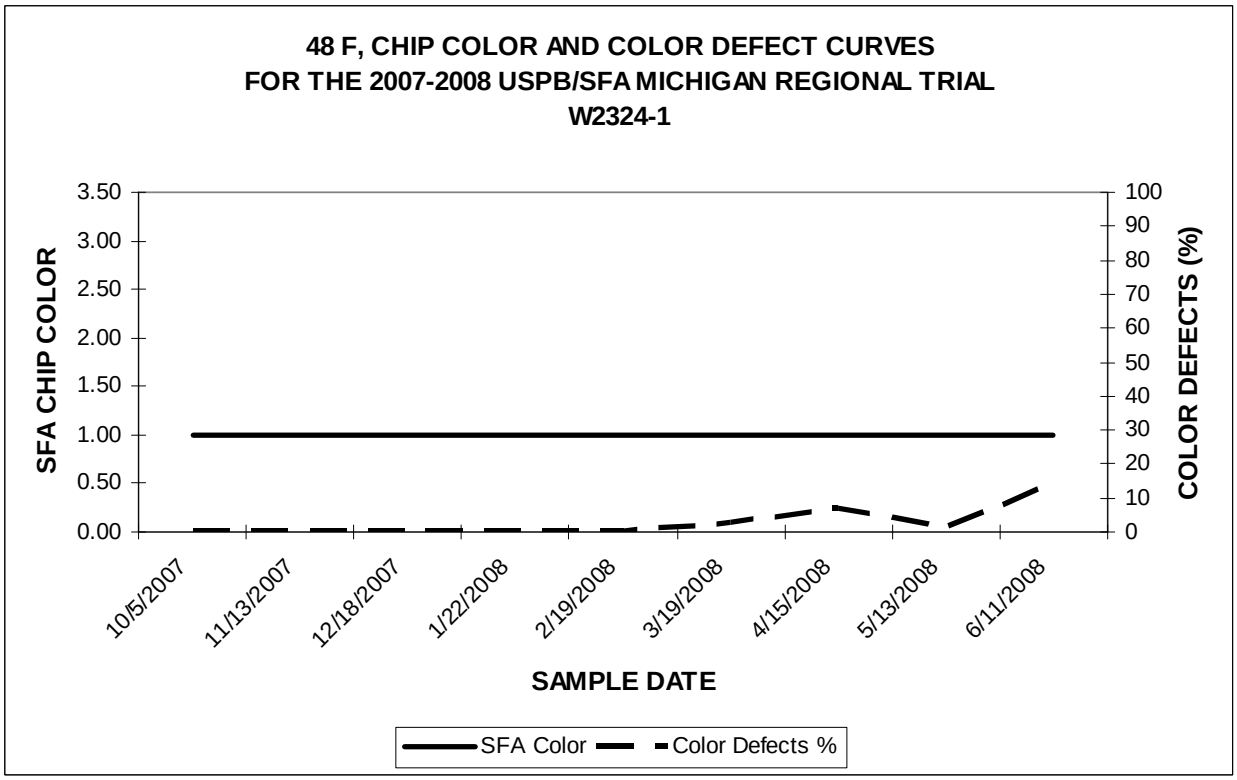

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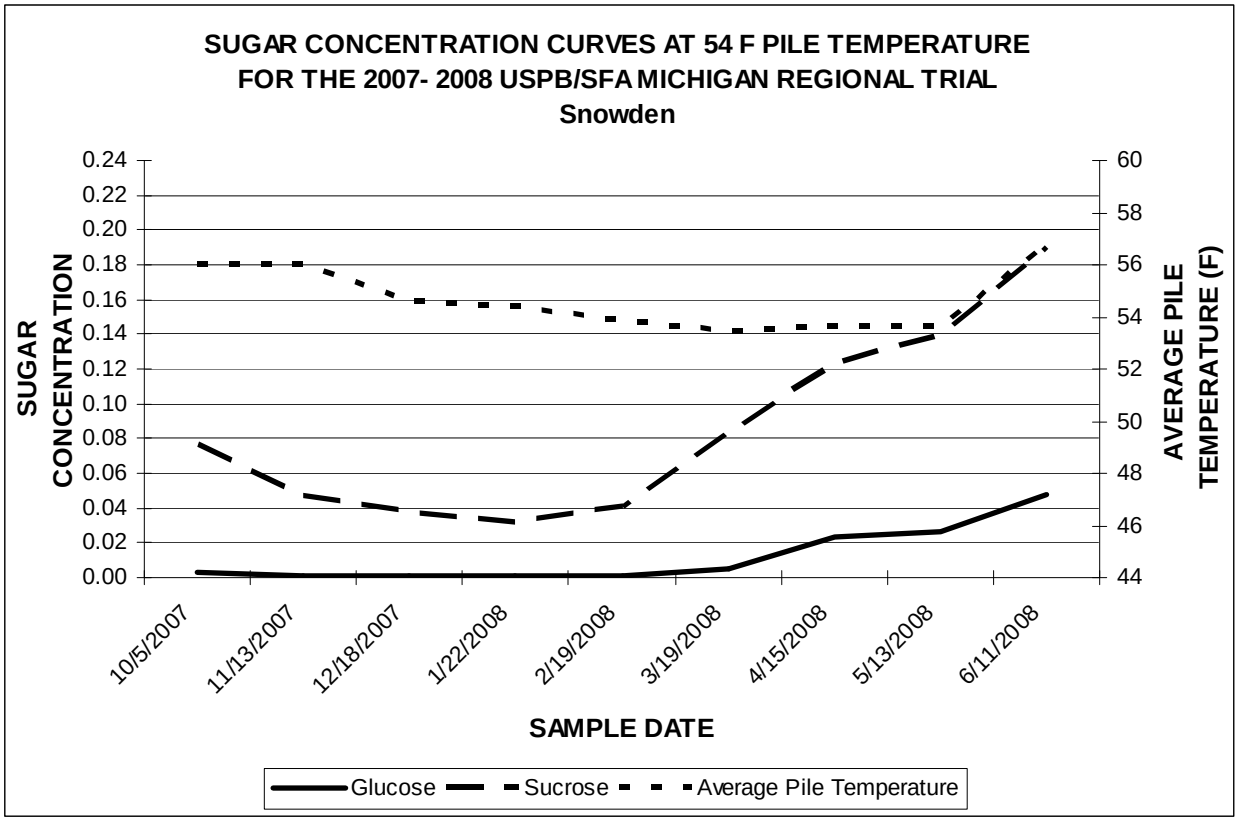

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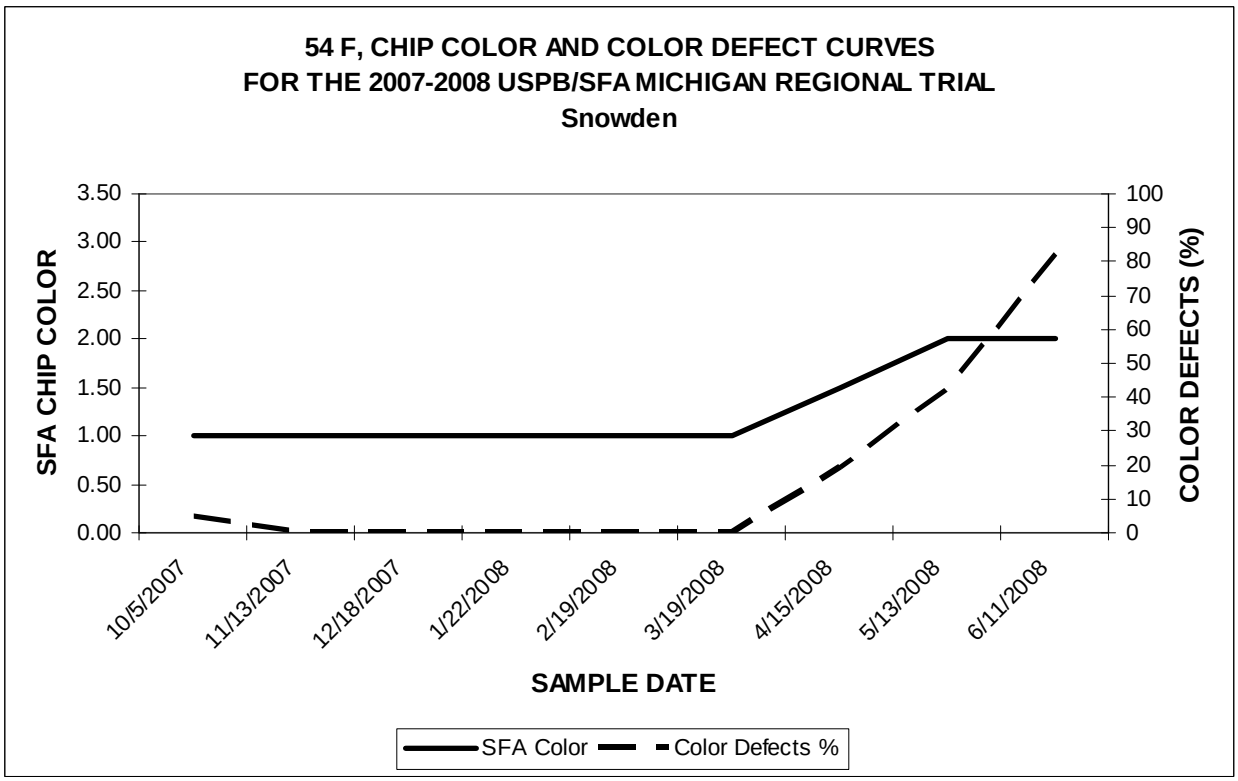

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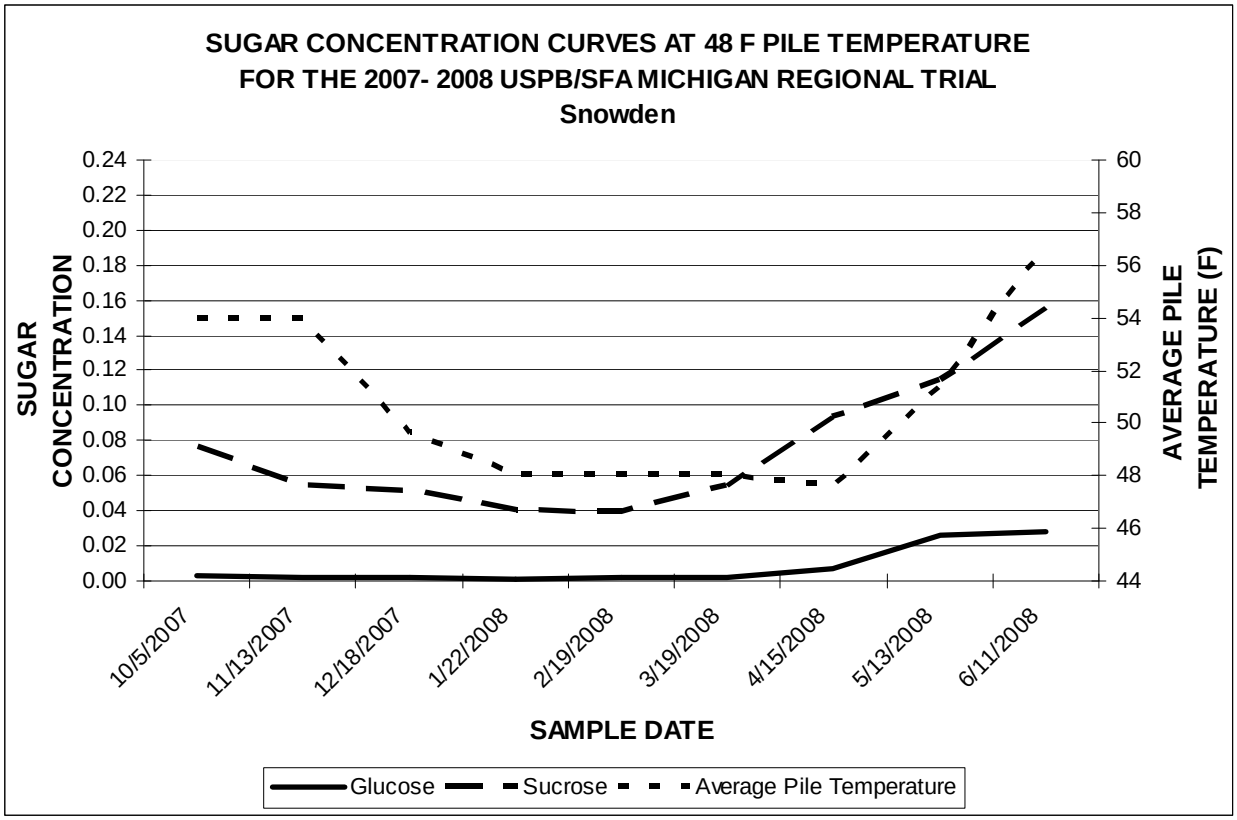

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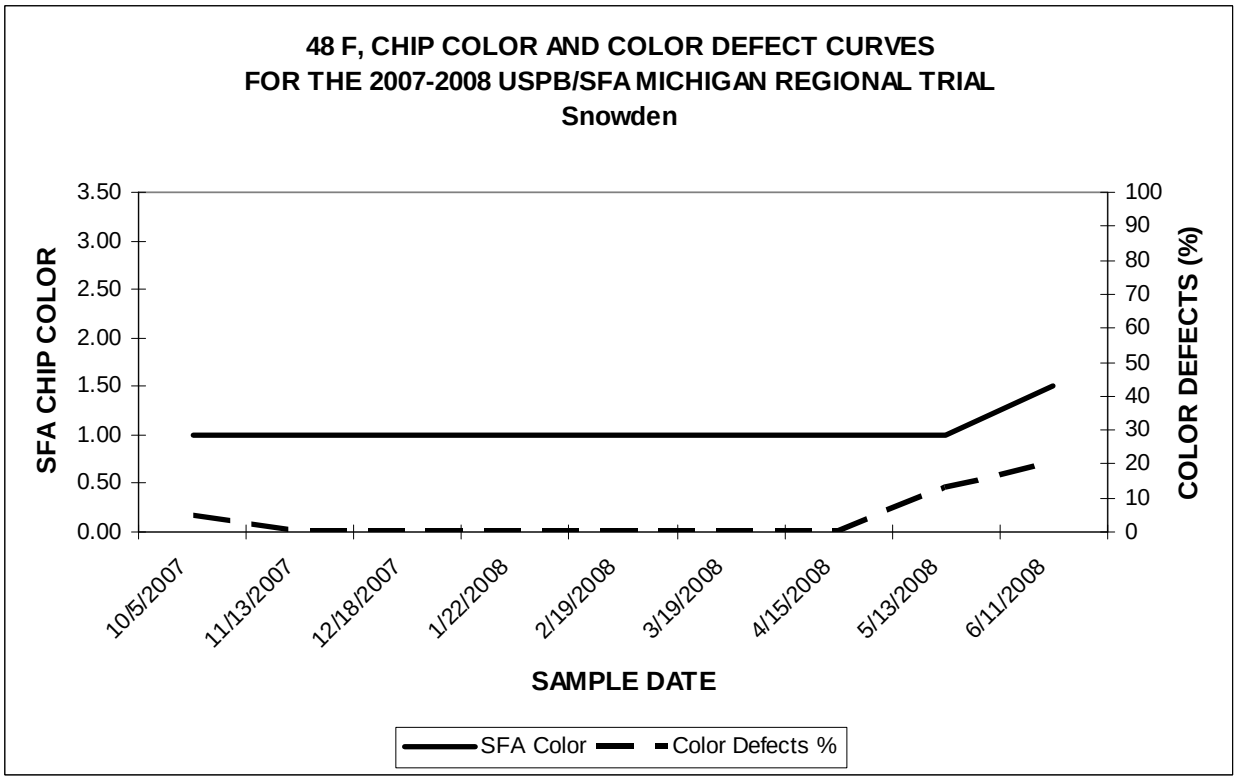

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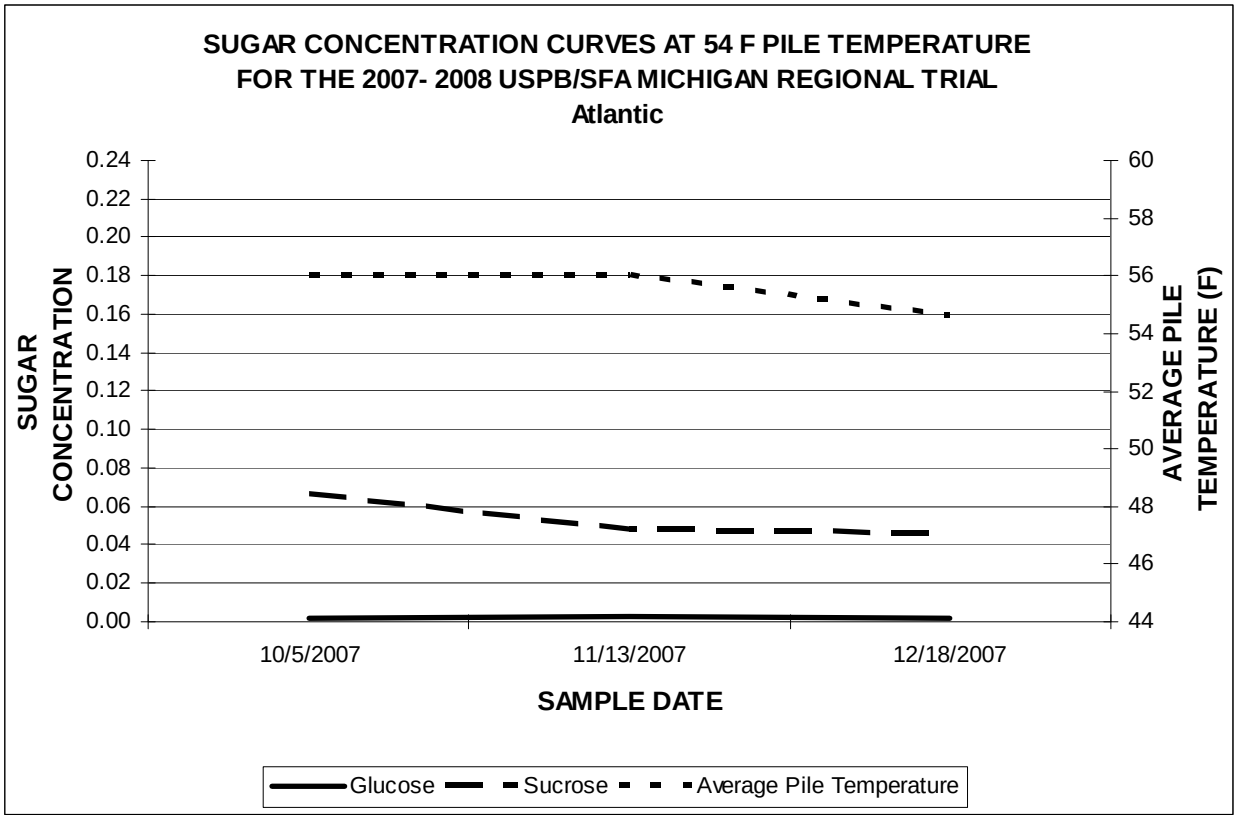

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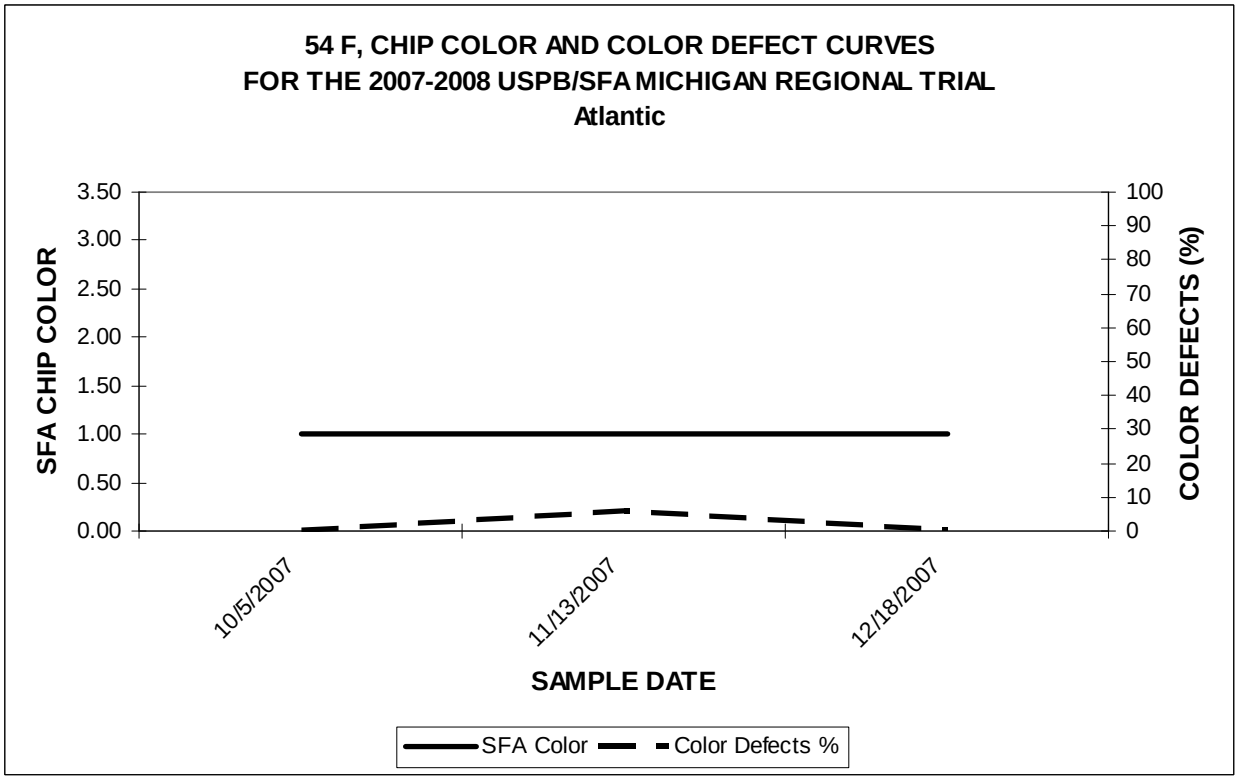

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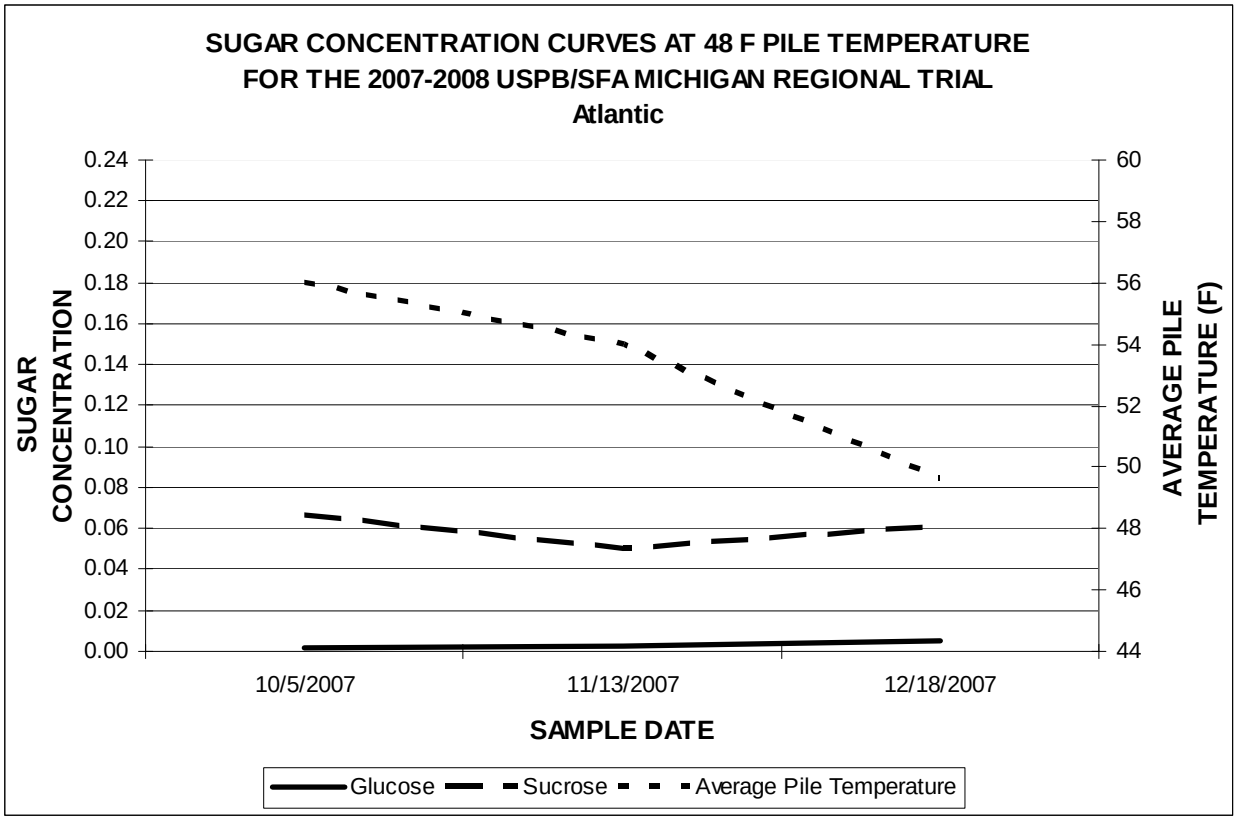

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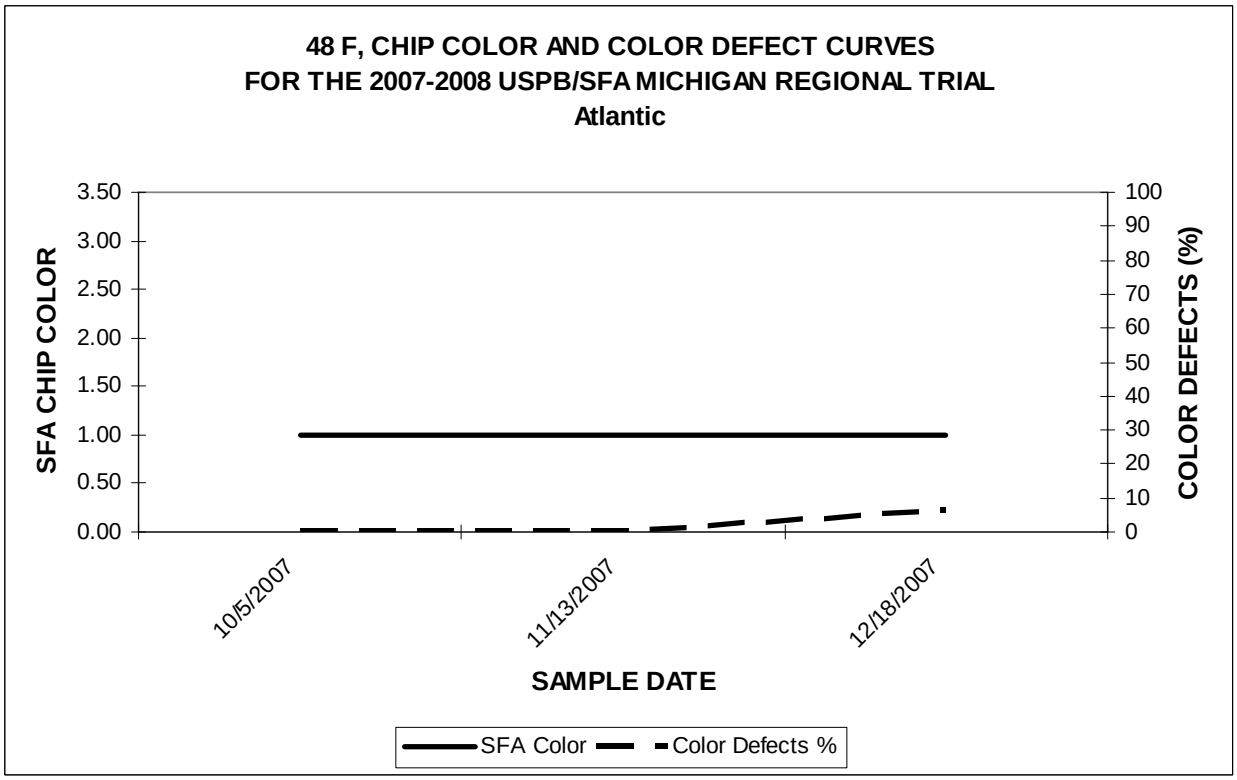

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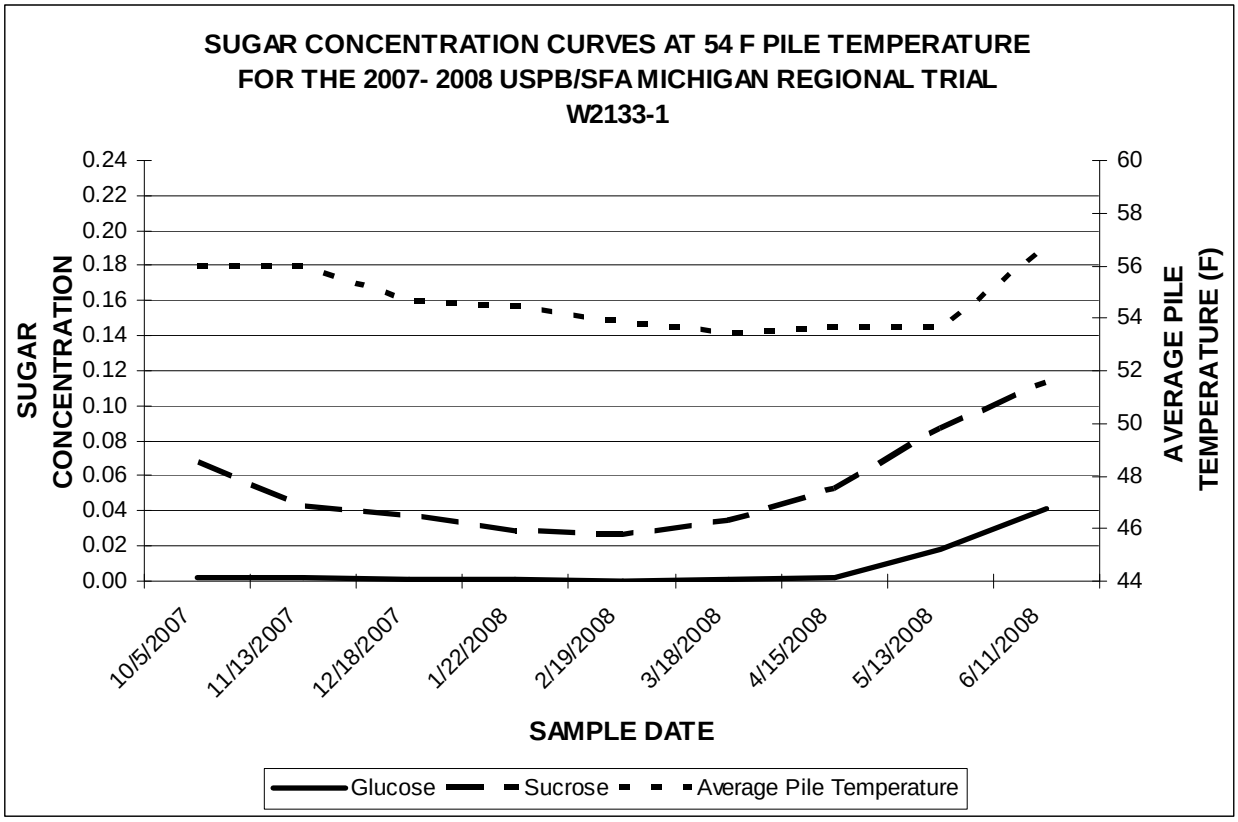

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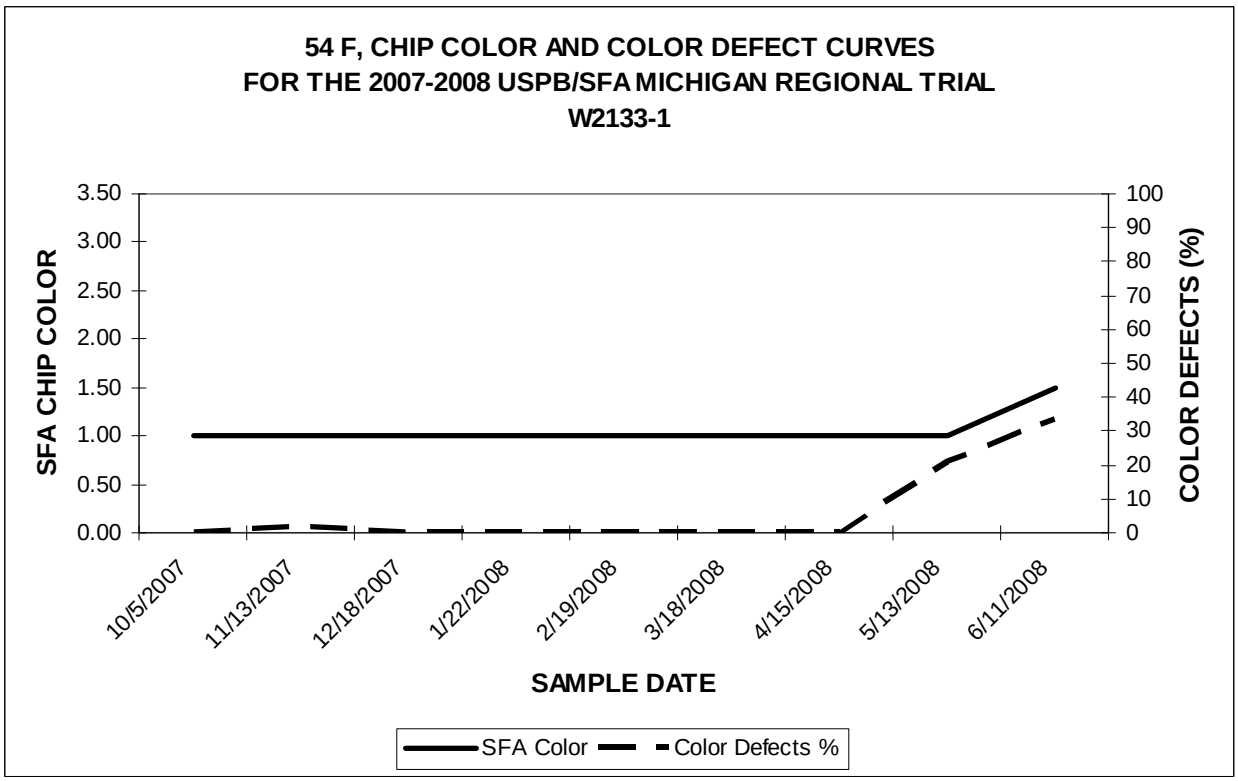

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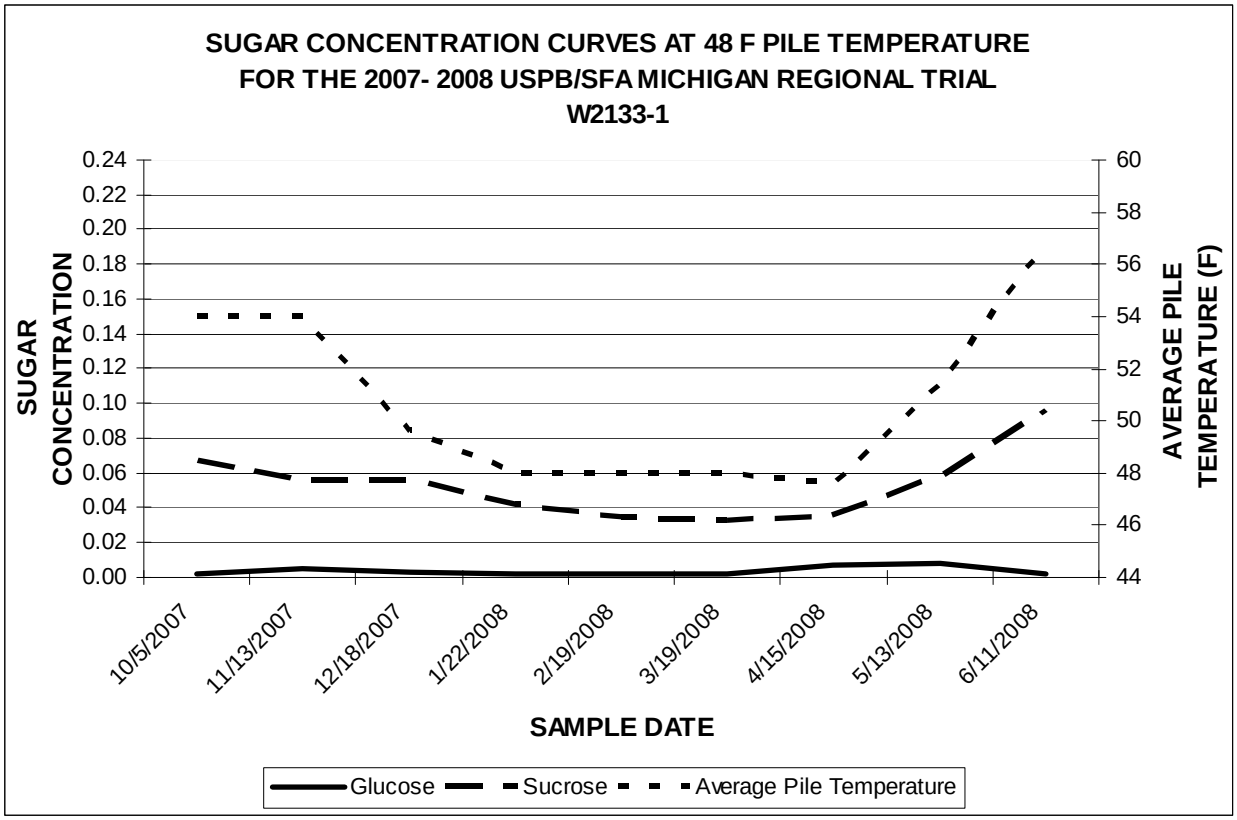

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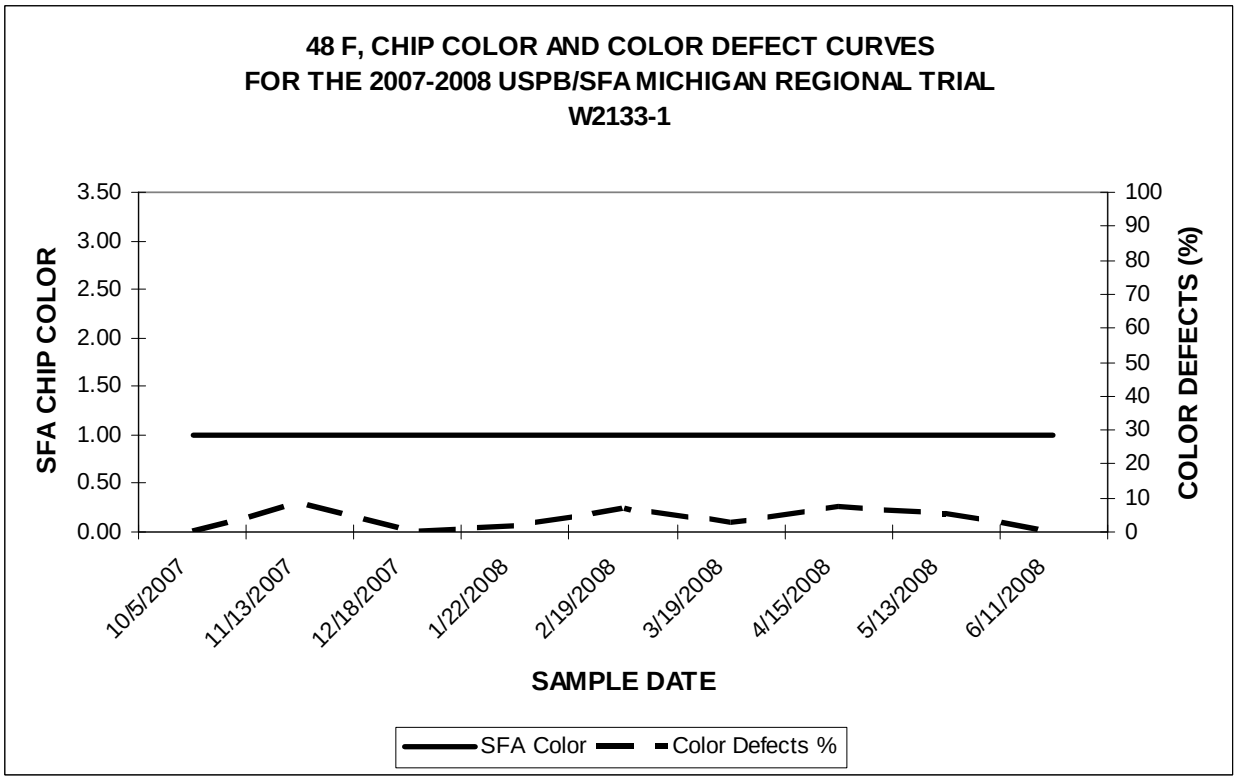

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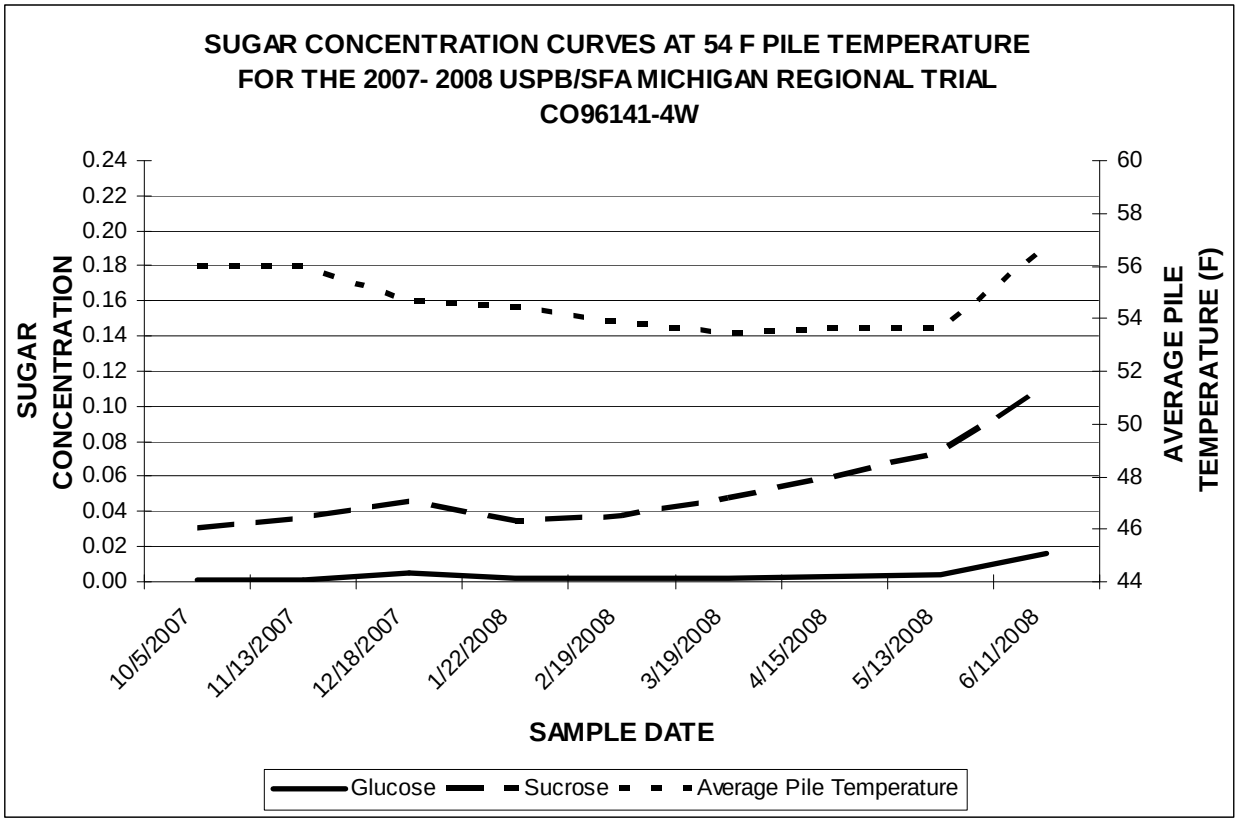

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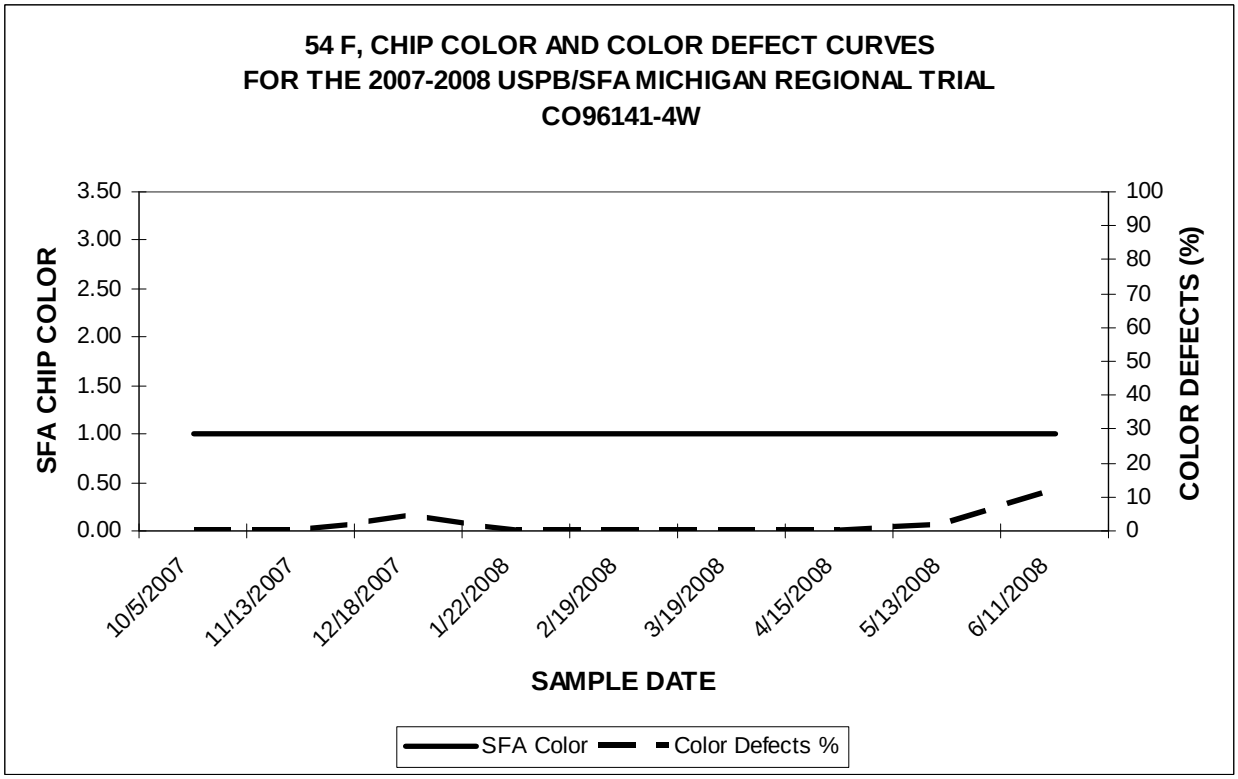

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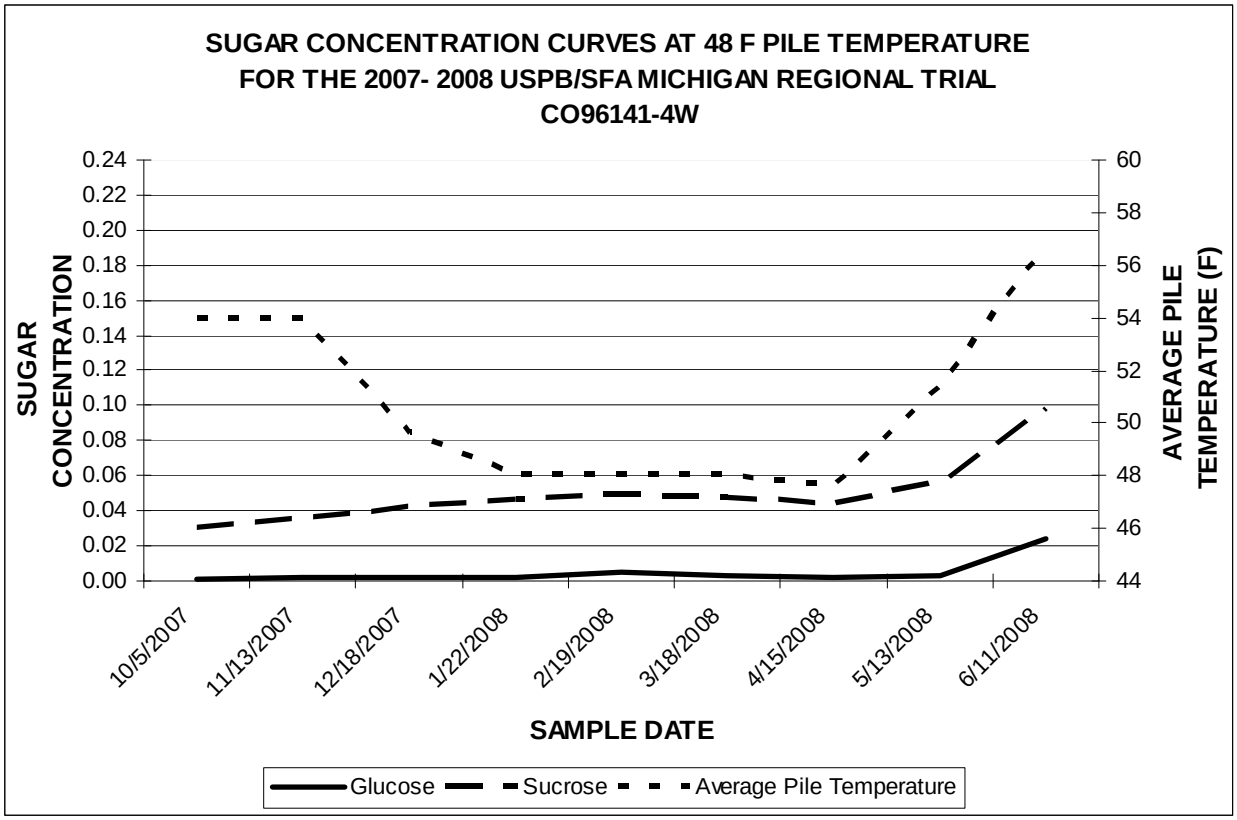

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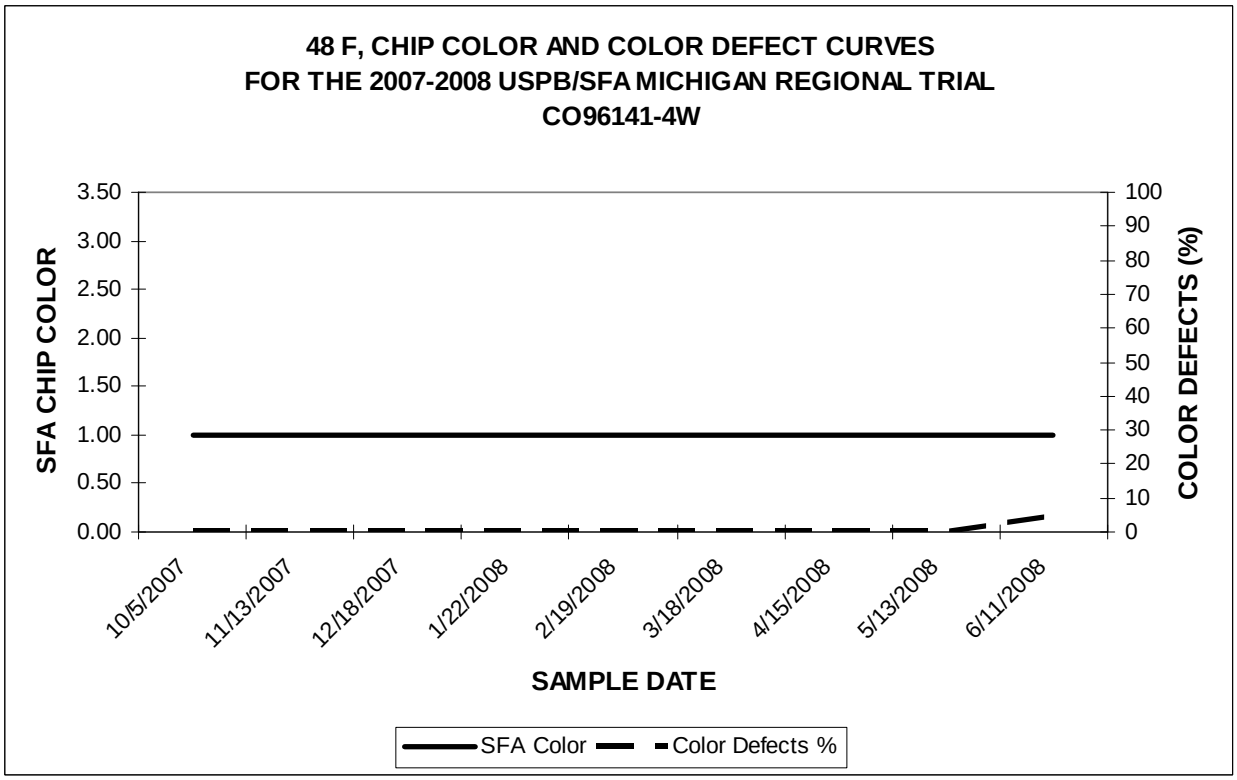

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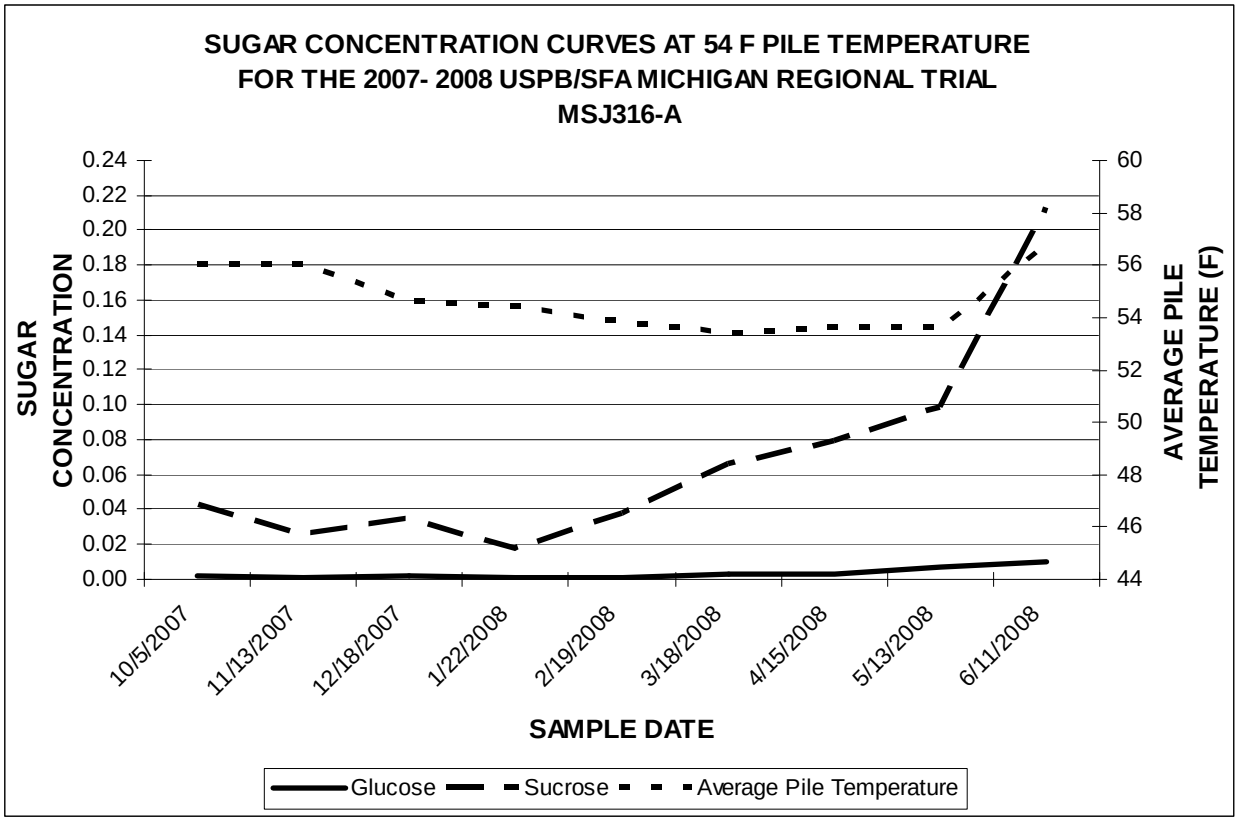

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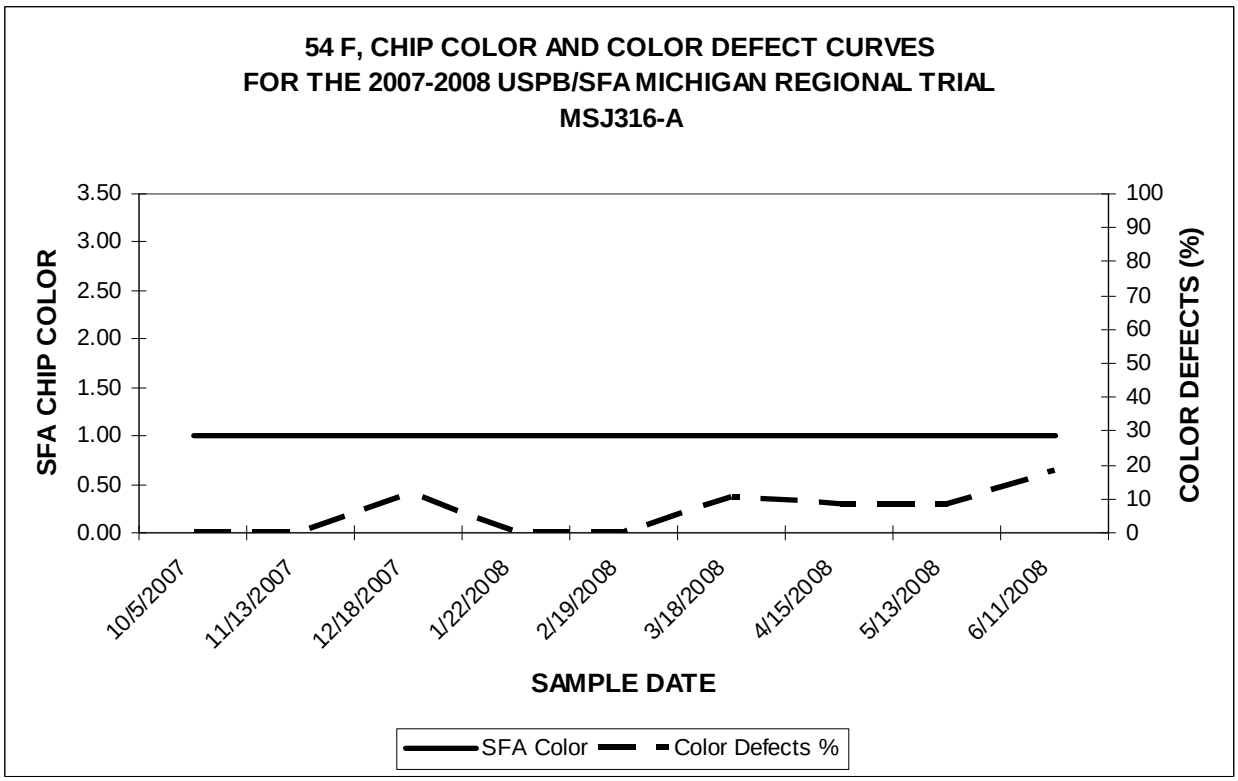

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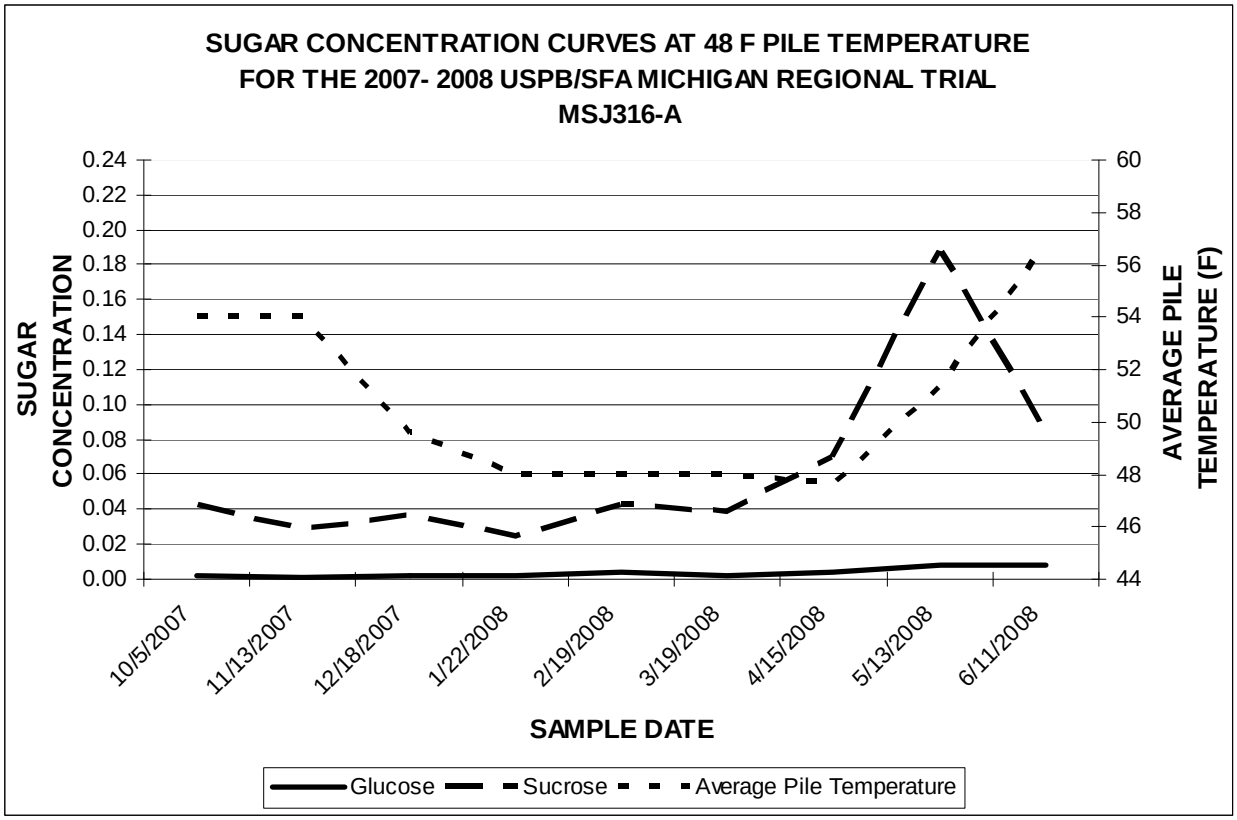

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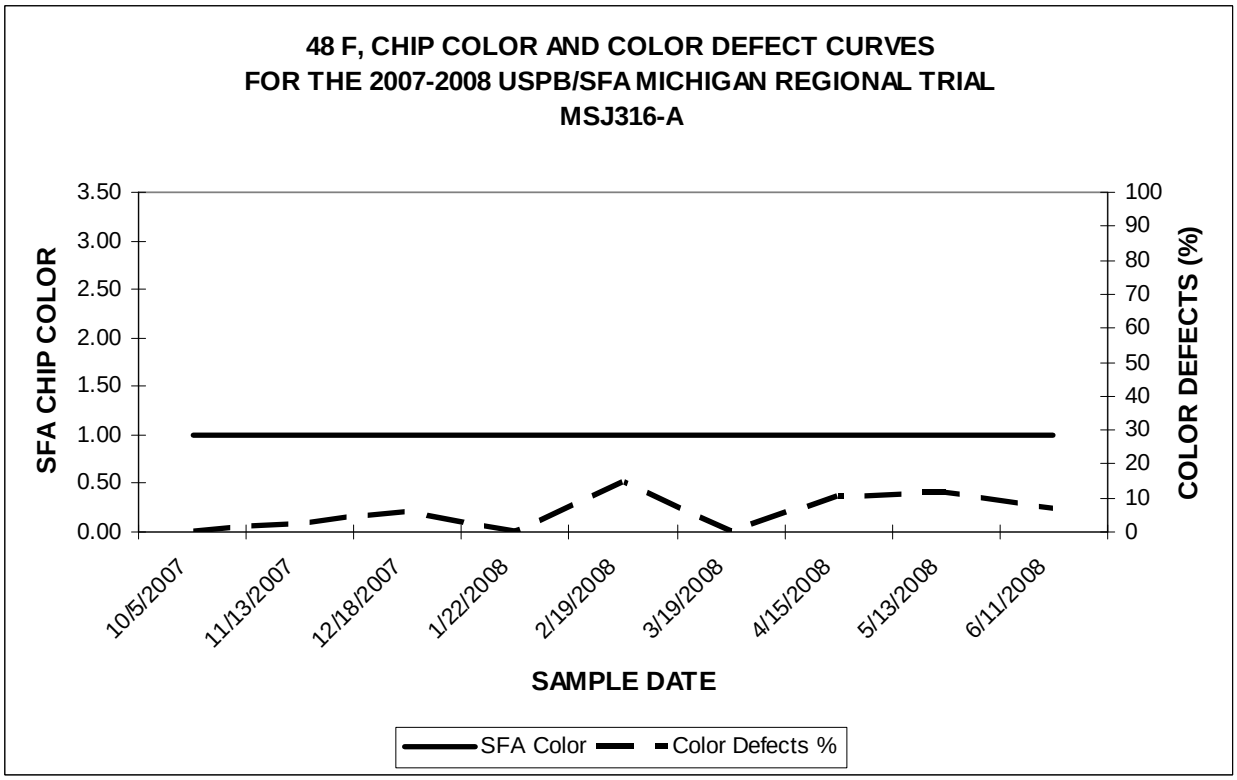

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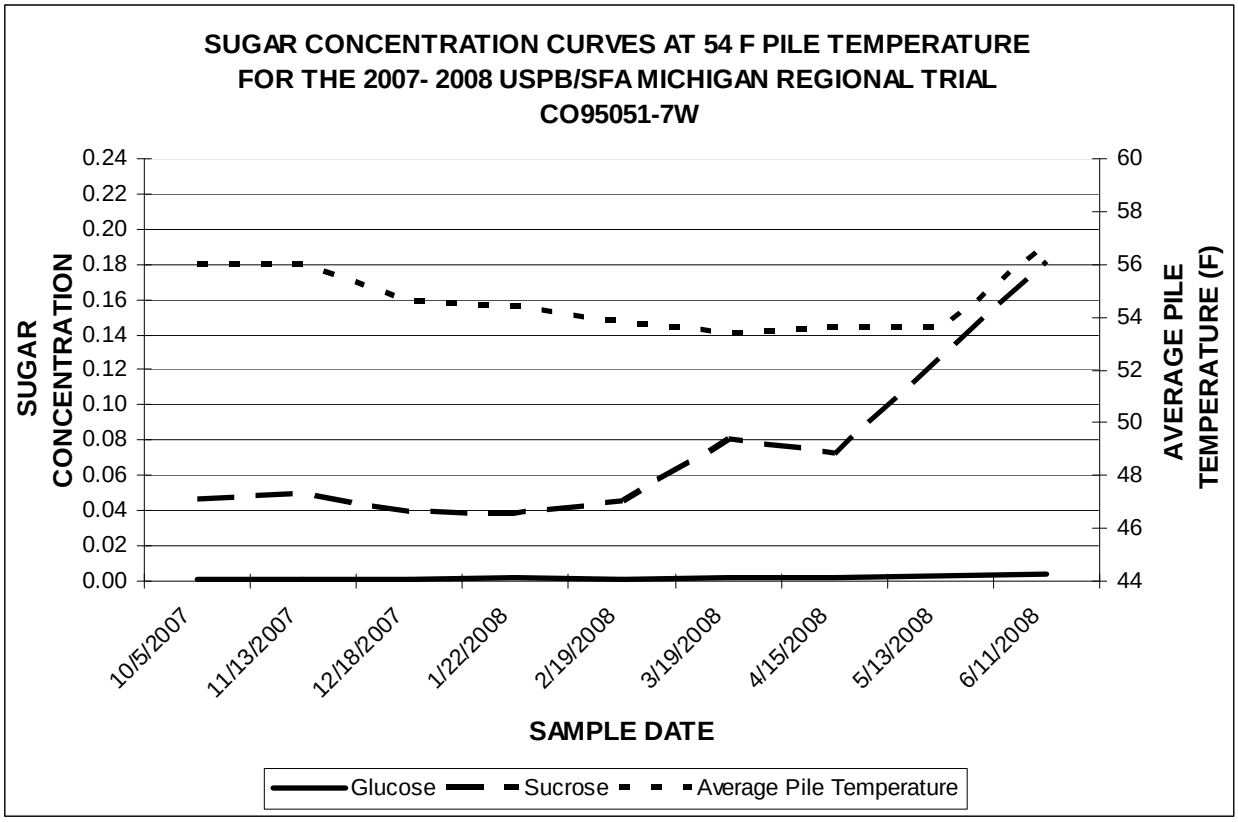

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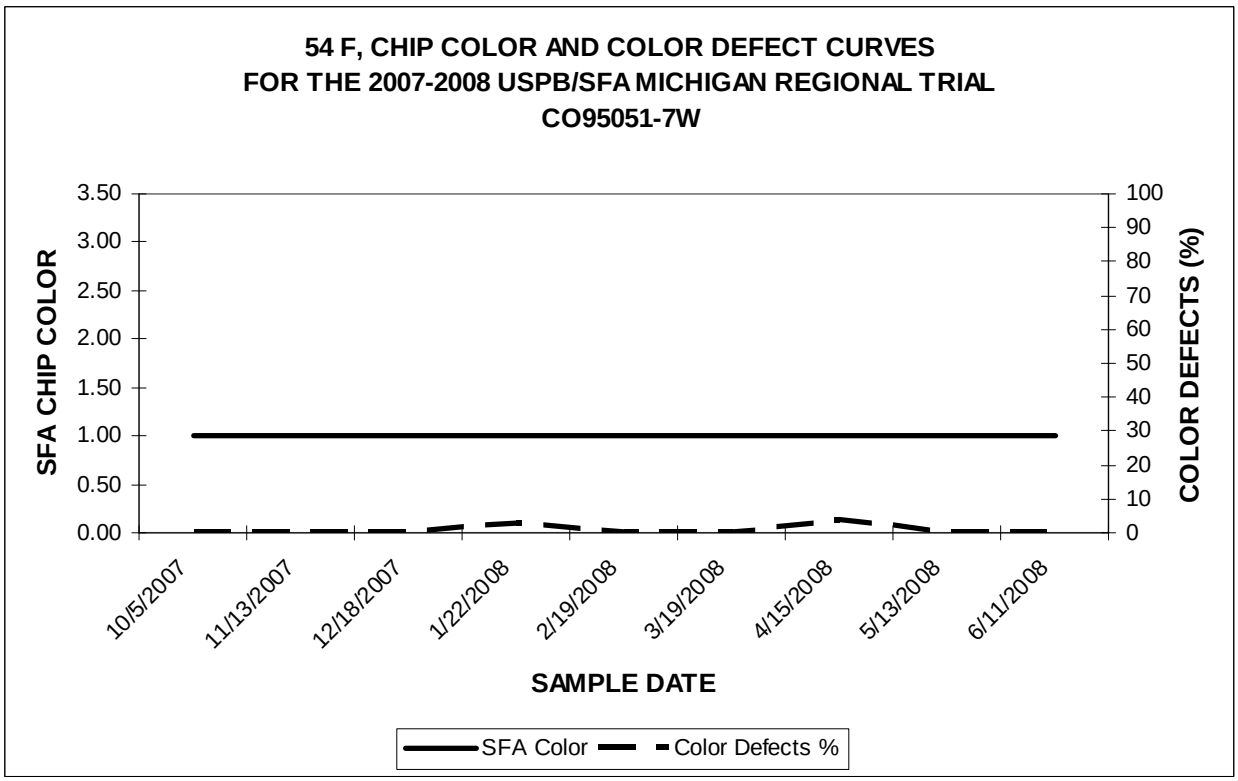

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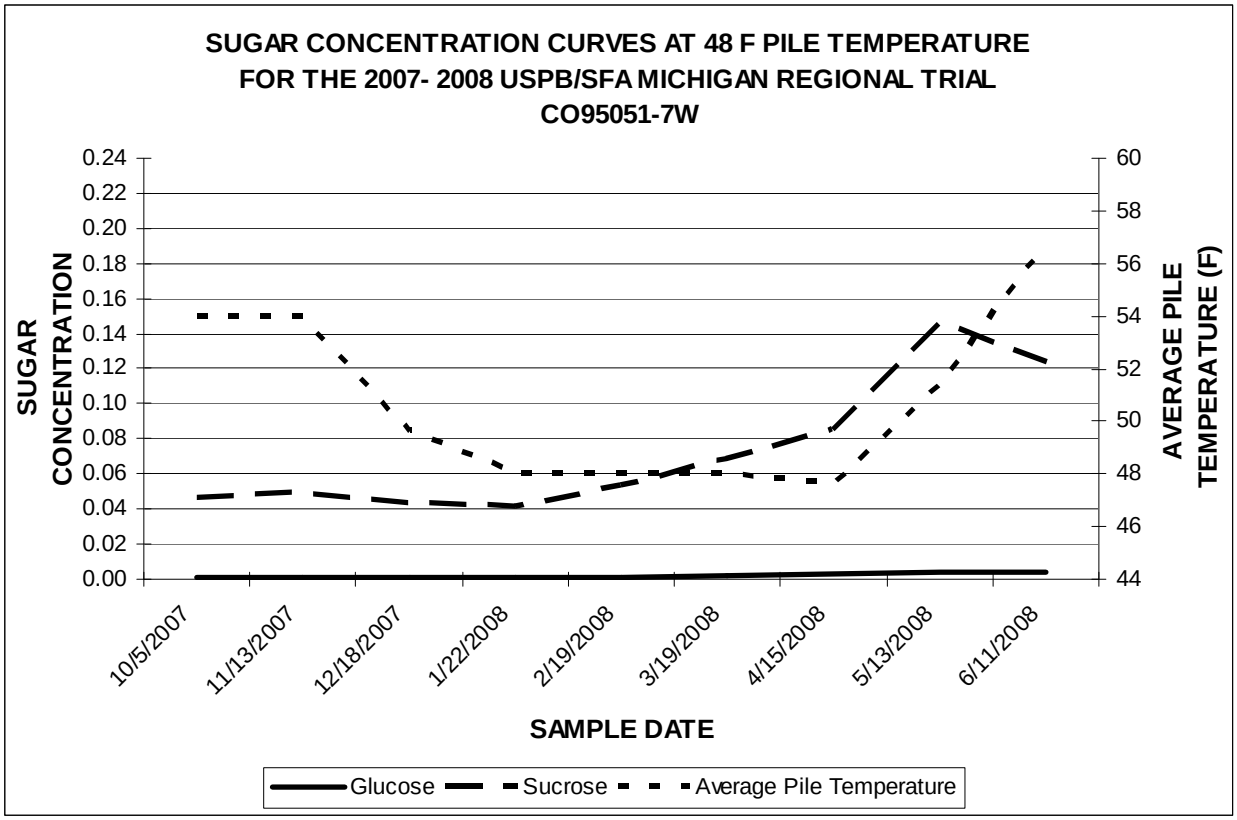

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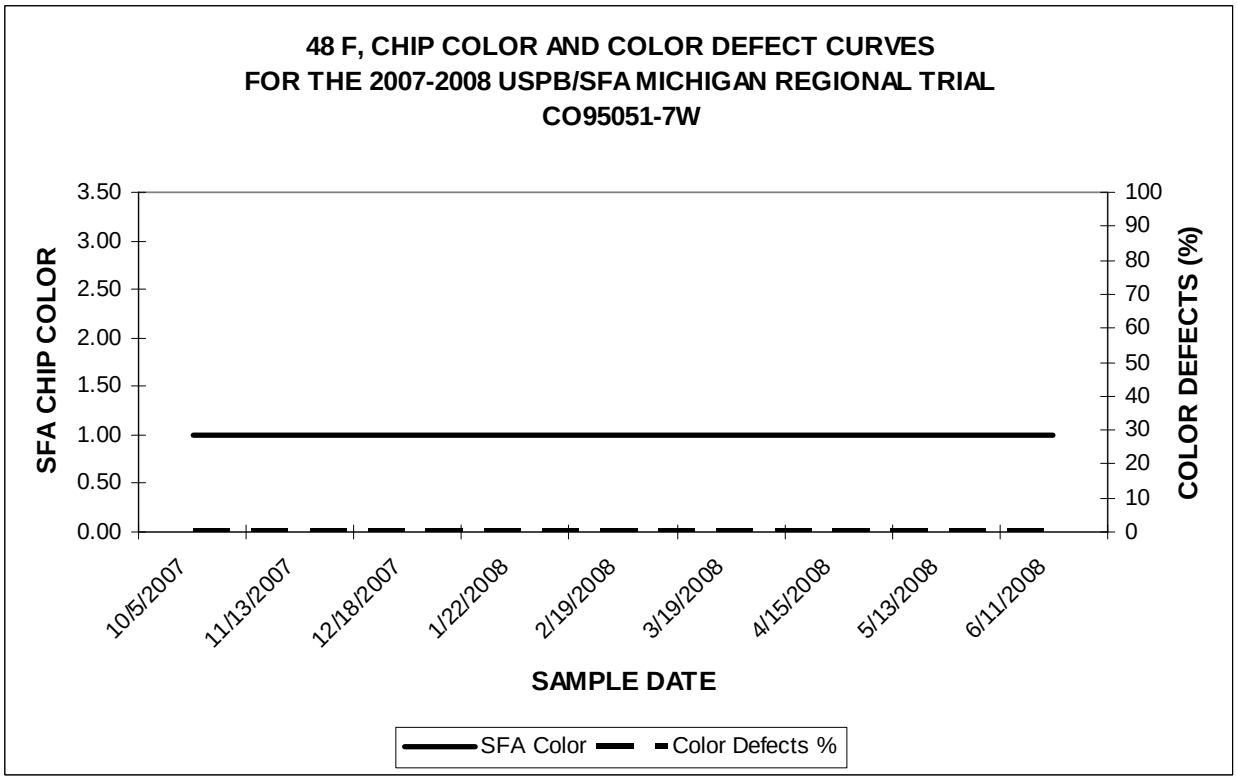

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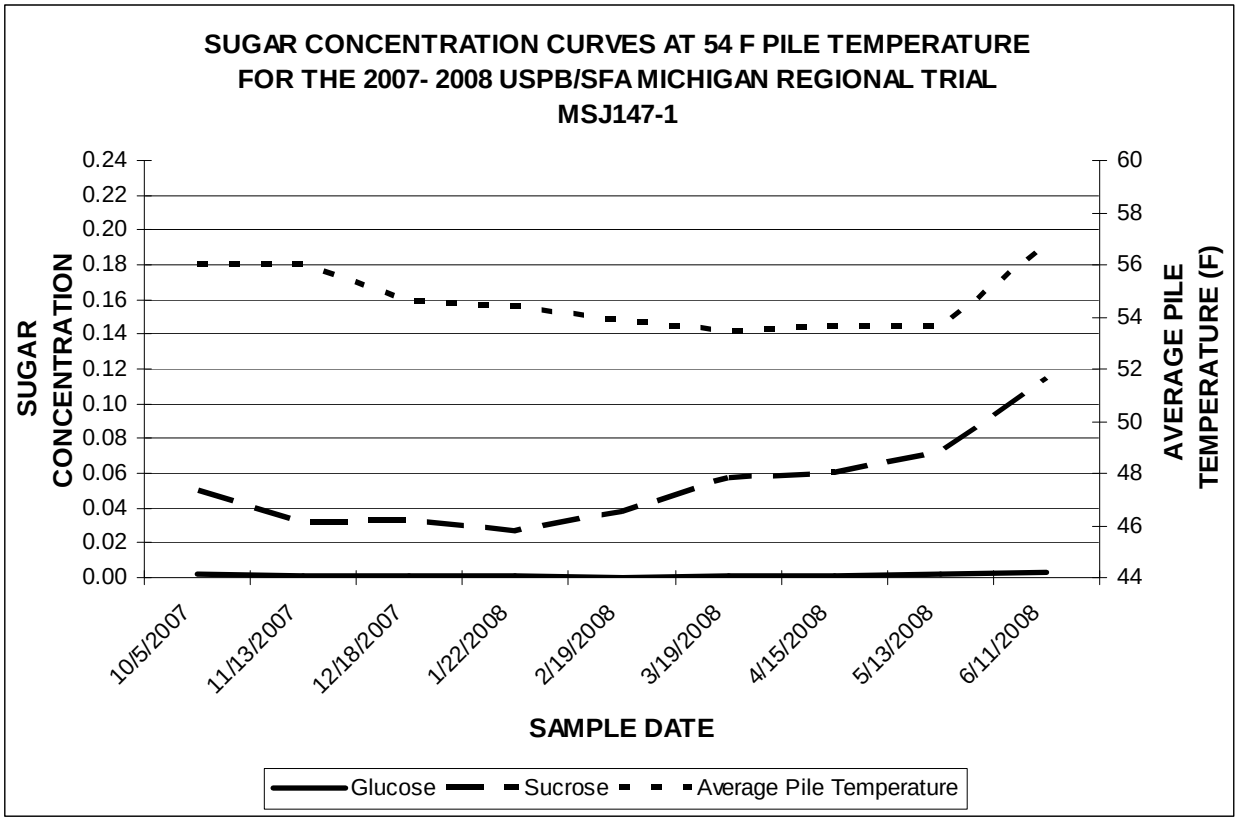

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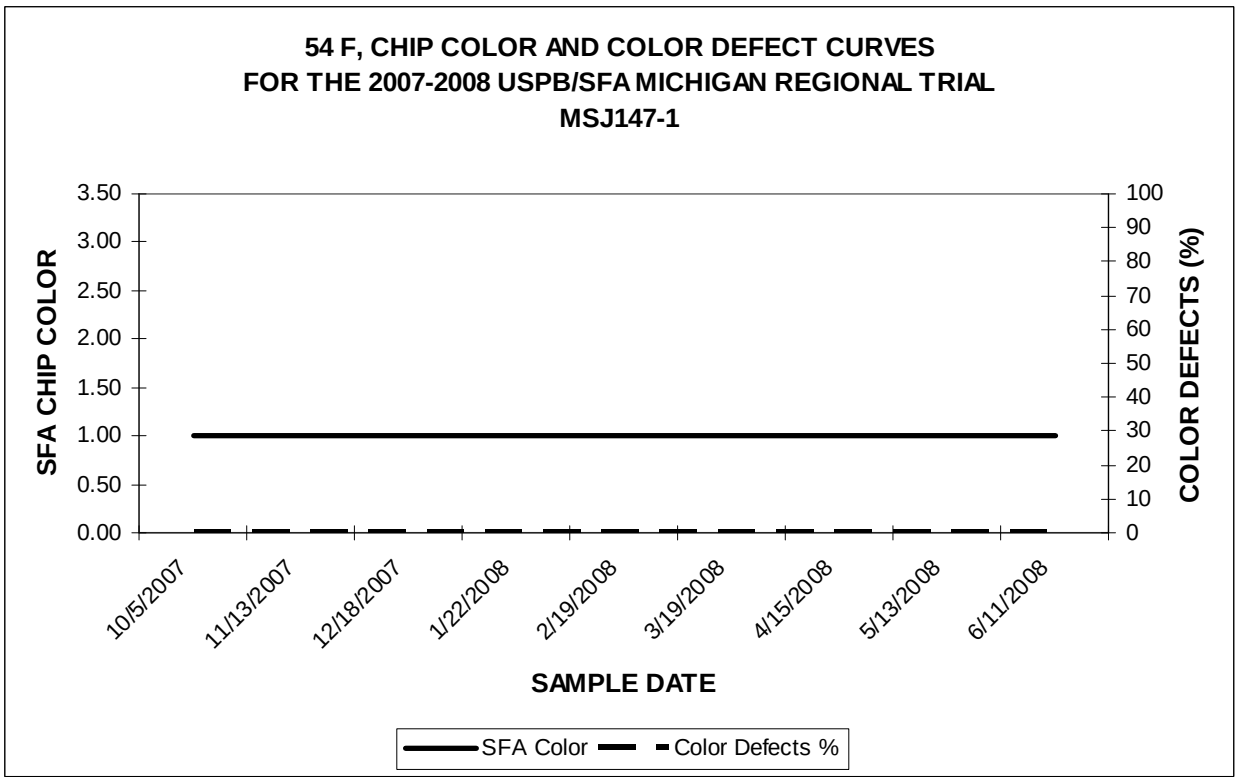

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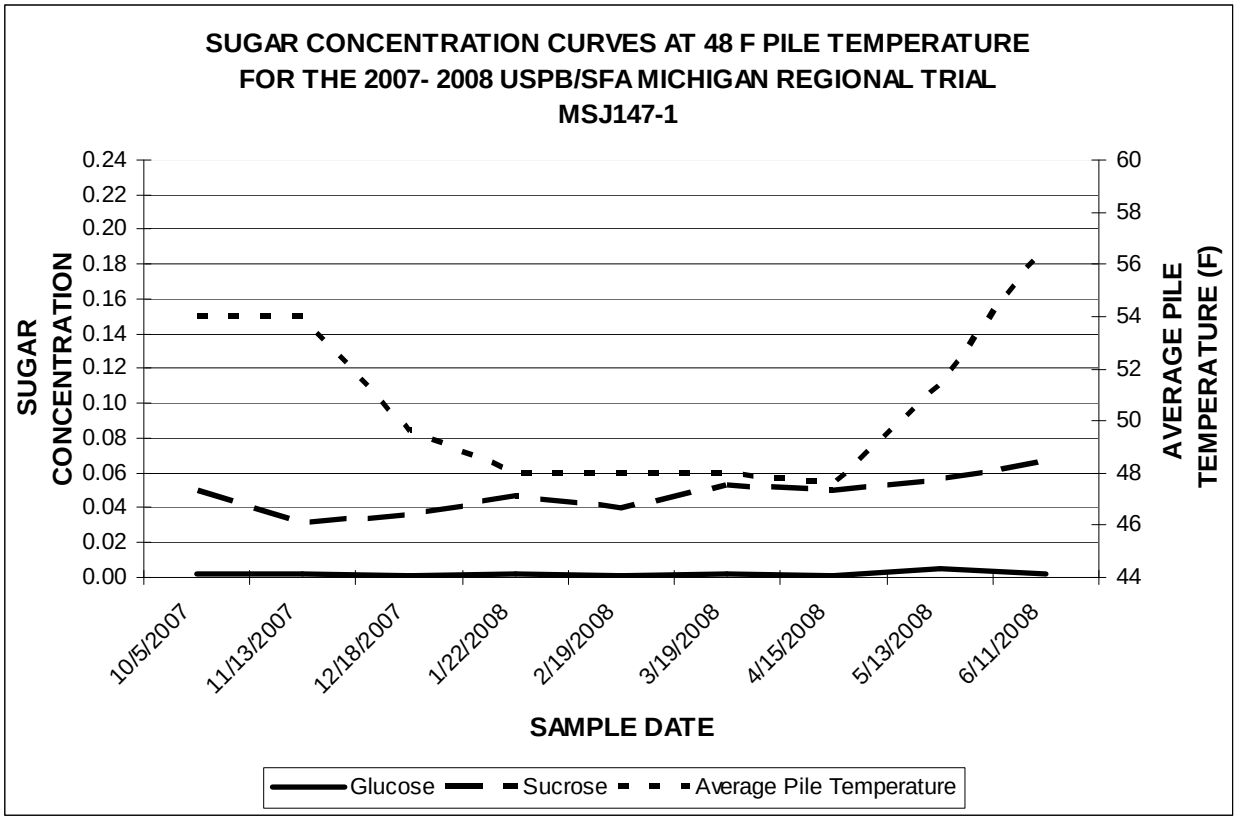

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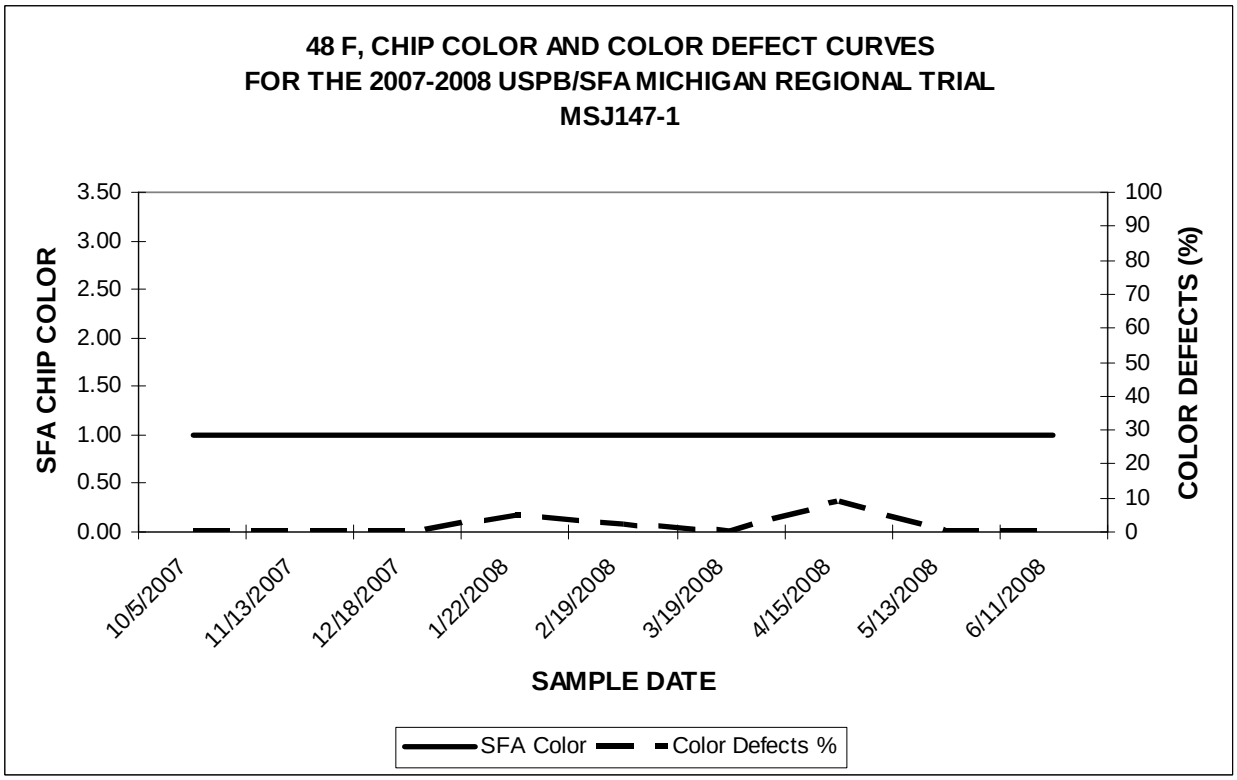

Pennsylvania Regional Trial

Table 1. 2007 Snack Food Trial varieties storage information.

Entry	Average sprout length in inches							Chip Data	
	15-Jan-08			21-Feb-08		15-Mar-08		2/1/2008 *	
	45°F	55ºF *	notes	45°F	notes	45°F	notes	Agtron	S G
CO95051-7W	1.0	8.3		1.4	b	4.2		41	1.085
CO96141-4W	1.5	6.7		2.2		10.7	cd	48	1.080
Atlantic	**1.0**	**11.3**	**bc**	**1.8**		**3.3**	**cd**	**42**	**1.077**
W2133-1	0.8	6.0		0.9	d	2.8	b	44	1.079
Snowden	**0.8**	**11.5**	**bc**	**2.6**	**d**	**3.8**	**b**	**45**	**1.082**
Beacon Chipper	2.3	11.0	bc	3.5	b	5.7		47	1.080
W2324-1	3.3	27.3	bc	5.8	b	8.0	bd	40	1.088
MSJ147-1	0.5	6.8		0.8		1.7	bd	46	1.085
MSJ 316-A	0.0	4.2		1.3	d	1.6	cd	49	1.073

Notes:

55ºF storage terminated due to excessive sprout length after January 15, 2008.

* Agtron rating and Specific Gravity provided by Snyder of Berlin.

a = samples less than 0.5" were reported as 0.5"
b = minor tuber shrinkage
c = major tuber shrinkage
d = air roots

Red River Valley Regional Trial

Chipping 2007 trial from pre-harvest, harvest and 45F & 50F Storage

	PREHARVEST 8/21/2007						PREHARVEST 8/28/2007					
VARIETY	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC	2 HH	1.1016	1	68	3.6346	0.0394	1 HH	1.1040	1	70	2.0671	0.0083
BEACON CHIPPER		1.0836	1	72	2.5667	0.0481		1.0923	1	72	1.5354	0.0138
CO 95051-7W		1.0918	1	69	0.8232	0.0110		1.0979	1	73	0.9497	0.0041
CO 96141-4W		1.0813	1	72	0.7636	0.0138		1.0903	1	71	0.6637	0.0028
MSJ 147-1		1.0913	1	72	0.6123	0.0142		1.0922	1	72	0.8126	0.0032
MSJ 316- A		1.0825	1	69	1.7463	0.0147		1.0886	1	69	1.1119	0.0078
SNOWDEN		1.0862	1	69	1.6317	0.0197		1.0901	1	71	0.8883	0.0078
W 2133-1		1.0863	1	66	4.6063	0.0669		1.0935	1	70	1.7463	0.0064
W 2324-1		1.0841	2	64	3.6804	0.0724		1.0890	1	66	1.8333	0.0587

	PREHARVEST 9/4/2007						HARVEST 9/17/2007					
VARIETY	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC		1.1095	2	64	0.5963	0.0050	1 HH	1.1042	2	61	2.1863	0.1595
BEACON CHIPPER		1.0945	1	69	1.0001	0.0193		1.0921	1	68	1.4804	0.0706
CO 95051-7W		1.0971	1	69	0.4533	0.0069		1.1065	1	69	1.5858	0.0303
CO 96141-4W		1.0968	1	68	0.3887	0.0073		1.0956	1	67	1.0244	0.0303
MSJ 147-1		1.1069	1	69	0.4735	0.0156		1.1019	1	69	0.8754	0.0096
MSJ 316- A		1.0933	1	66	0.6082	0.0147		1.0969	2	61	3.4421	0.1370
SNOWDEN	1 HH	1.1000	1	70	0.7714	0.0078		1.0973	2	64	1.5171	0.1682
W 2133-1	2 HH	1.0943	1	67	0.8850	0.0083		1.1007	1	67	1.7233	0.0999
W 2324-1		1.1036	1	67	0.4285	0.0220		1.0987	2	58	1.1284	0.0995

Red River Valley Regional Trial

Chipping 2007 trial from pre-harvest, harvest and 45F & 50F Storage

	ONE MONTH STORAGE - 10/29/07											
	50F STORAGE						45F STORAGE					
VARIETY	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC	3 HH	1.0894	3	46	1.5767	1.0138	1 HH	1.1046	4	43	2.5942	1.4483
BEACON CHIPPER		1.0882	2	55	2.0258	.6655		1.0930	2	55	2.2046	0.7370
CO 95051-7W	1BC	1.1098	2	56	1.7233	.2920	1VD	1.1049	3	53	2.0854	0.3016
CO 96141-4W		1.0839	2	60	1.0546	.2778		1.0953	2	58	1.8425	0.4405
MSJ 147-1		1.0909	1	66	1.4713	.0536	2HH	1.1022	2	64	2.0763	0.0784
MSJ 316- A		1.0893	3	46	2.3375	.9671		1.0954	3	48	3.4054	0.8012
SNOWDEN	1 HH	1.0935	3	52	1.5308	.2053		1.0969	2	55	1.8288	0.6903
W 2133-1		1.0882	3	51	1.3979	.6848		1.0919	3	52	1.8838	0.8786
W 2324-1		1.0868	2	57	1.0262	.2324		1.0970	2	55	1.5721	0.6320

	TWO MONTH STORAGE - 11/26/07											
	50F STORAGE						45F STORAGE					
VARIETY	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC	2HH	1.0948	2	59	1.3947	0.7549	4HH	1.0909	3	49	2.8096	1.2274
BEACON CHIPPER		1.0885	2	63	1.2183	0.4973	2HH 1BC	1.0856	2	59	2.7546	0.7278
CO 95051-7W		1.1009	1	67	1.1500	0.0399		1.0851	2	59	2.8371	0.3277
CO 96141-4W		1.0857	1	68	0.7874	0.2058		1.0883	2	58	1.8792	0.4070
MSJ 147-1		1.0992	1	68	0.7682	0.0124		1.0949	1	69	1.6225	0.0752
MSJ 316- A		1.0969	2	56	1.2398	0.4134		1.0913	4	43	2.1221	0.7159
SNOWDEN	1HH	1.0957	1	67	1.2714	0.1966		1.0901	2	58	1.2247	0.2548
W 2133-1		1.0924	2	60	1.0537	0.2507		1.0956	3	50	1.3814	0.7893
W 2324-1		1.0993	2	61	0.9153	0.1632		1.0930	2	55	1.0010	0.3676

Red River Valley Regional Trial

Chipping 2007 trial from pre-harvest, harvest and 45F & 50F Storage

	THREE MONTH STORAGE - 12/26/07											
	50F STORAGE						45F STORAGE					
VARIETY	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC		1.0884	2	59	1.1124	0.8782	2HH	1.0800	2	58	2.6858	1.9983
BEACON CHIPPER		1.0874	2	64	0.5518	0.1613		1.0897	2	57	2.7317	0.8291
CO 95051-7W		1.1072	1	69	1.3099	0.0490		1.0950	1	67	1.3924	0.1769
CO 96141-4W		1.0875	1	69	0.5321	0.2085		1.0847	2	58	1.6683	0.7842
MSJ 147-1	1HH	1.0918	1	70	1.0473	0.0472		1.0899	1	73	1.3759	0.0578
MSJ 316- A		1.0863	2	59	0.6518	0.1325		1.0911	3	54	2.4979	1.3933
SNOWDEN	2HH	1.0873	1	70	0.5867	0.0170		1.0967	1	66	1.1330	0.3254
W 2133-1		1.0886	2	64	0.5683	0.0981	1BC	1.0888	2	61	1.0024	0.7535
W 2324-1		1.0822	1	69	0.4033	0.0454		1.0875	2	62	0.6545	0.4721

	FOUR MONTH STORAGE - 1/29/08											
	50F STORAGE						45F STORAGE					
VARIETY	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC	1 HH	1.0885	2	60	1.3113	0.3442		1.0877	2	57	1.4300	0.7957
BEACON CHIPPER		1.0851	1	67	0.4299	0.0633		1.0858	2	56	1.9296	0.5990
CO 95051-7W		1.0892	1	65	0.7833	0.0252		1.0948	1	65	1.5079	0.1357
CO 96141-4W		1.0843	1	67	0.5450	0.0660		1.0851	2	56	2.6996	0.6495
MSJ 147-1		1.0864	1	68	0.6550	0.0289		1.0960	1	66	0.9740	0.0307
MSJ 316- A		1.0816	1	65	0.4524	0.1169		1.0816	3	51	1.3700	0.8800
SNOWDEN	1 HH	1.0863	1	67	0.5587	0.0183		1.0913	1	53	1.2696	0.3561
W 2133-1		1.0821	1	67	0.4295	0.0197		1.0821	1	65	0.8003	0.3085
W 2324-1		1.0875	1	68	0.5147	0.2255		1.0855	2	58	0.6371	0.3323

Red River Valley Regional Trial

Chipping 2007 trial from pre-harvest, harvest and 45F & 50F Storage

	FIVE MONTH STORAGE - 2/21/08											
	50F STORAGE						45F STORAGE					
VARIETY	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC		1.0816	1	65	0.9891	0.0871	2HH	1.0917	2	56	1.7554	0.6430
BEACON CHIPPER		1.0890	1	67	0.6843	0.0385		1.0911	2	59	1.5446	0.3227
CO 95051-7W		1.0892	2	64	1.0652	0.0124		1.0983	1	66	1.8333	0.0628
CO 96141-4W		1.0827	1	68	0.6788	0.0600		1.0912	2	60	2.1863	0.5161
MSJ 147-1		1.0983	1	68	0.7865	0.0220		1.0982	1	65	1.0890	0.0468
MSJ 316- A		1.0909	1	65	0.5688	0.0541		1.0892	2	57	2.0579	0.9029
SNOWDEN		1.0929	1	69	0.6573	0.0142		1.0992	1	67	1.6638	0.3988
W 2133-1	1HH	1.0914	1	68	0.4281	0.0165		1.0862	1	65	1.1110	0.1352
W 2324-1		1.0874	1	68	0.4767	0.0403		1.0810	2	59	0.8287	0.1265

	SIX MONTH STORAGE - 3/27/08											
	50F STORAGE						45F STORAGE					
VARIETY	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC		1.1017	2	59	0.9002	0.0248	1HH	1.0848	4	40	1.9388	0.5509
BEACON CHIPPER	1HH	1.0886	2	64	0.2800	0.0156		1.0838	2	53	1.2535	0.3048
CO 95051-7W		1.0973	2	60	0.9492	0.0083		1.1050	2	57	1.3979	0.0591
CO 96141-4W		1.0913	2	63	0.3978	0.0399		1.0887	3	49	1.1981	0.5376
MSJ 147-1		1.0985	2	56	0.9066	0.0151		1.0985	2	50	1.2678	0.0234
MSJ 316- A		1.0973	2	57	0.7466	0.0330	1HH	1.0929	3	50	0.9831	0.7544
SNOWDEN		1.1016	2	62	0.3900	0.0133		1.0954	2	62	0.9176	0.1027
W 2133-1		1.0832	2	57	0.1985	0.0289		1.0918	2	55	0.8337	0.0339
W 2324-1		1.0913	2	59	0.3112	0.0413	1HH	1.0859	3	52	0.4551	0.1247

Red River Valley Regional Trial

Chipping 2007 trial from pre-harvest, harvest and 45F & 50F Storage

	SEVEN MONTH STORAGE - 4/28/08											
	50F STORAGE						45F STORAGE					
VARIETY	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC		1.1103	2	61	1.0739	0.0697	1HH	1.0836	3	45	2.6354	0.6334
BEACON CHIPPER		1.0887	2	60	0.6078	0.0225		1.0881	5	33	1.5171	0.9928
CO 95051-7W		1.1017	2	60	0.9391	0.0069		1.1069	4	43	1.8013	0.3800
CO 96141-4W		1.0903	2	60	0.4235	0.0165		1.1022	4	35	1.8425	0.9721
MSJ 147-1		1.1000	2	60	0.6655	0.0041		1.0971	3	48	1.9250	0.4391
MSJ 316- A		1.0925	2	63	0.6692	0.0170		1.0887	3	53	1.3837	0.8644
SNOWDEN		1.0933	2	57	0.8470	0.1499		1.0935	4	44	1.0913	0.3172
W 2133-1	1HH	1.0824	2	58	0.3300	0.0518		1.0972	3	47	0.4790	0.1824
W 2324-1		1.0954	2	59	0.3130	0.0078		1.0981	3	45	0.4771	0.4730

	EIGHT MONTH STORAGE - 6/3/08											
	50F STORAGE						45F STORAGE					
VARIETY	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC		1.0973	2	55	1.3173	0.0710		1.1010			3.0388	1.4529
BEACON CHIPPER		1.0833	2	63	0.9556	0.0431		1.0921	3	47	6.2563	0.8663
CO 95051-7W		1.1035	2	57	3.1808	0.0211		1.1067			3.7492	0.0802
CO 96141-4W		1.0950	2	62	1.5721	0.4336		1.0832	3	45	1.6729	0.6779
MSJ 147-1		1.0930	2	59	2.1221	0.1503		1.1022	2	59	1.5171	0.0261
MSJ 316- A		1.0904	2	58	1.0005	0.0417		1.0852	3	45	1.1183	0.2828
SNOWDEN		1.0845	2	55	1.9158	0.7732	1HH	1.0922			1.9904	0.3912
W 2133-1		1.0830	2	58	0.6256	0.0069		1.0878	2	55	0.6843	0.0160
W 2324-1		1.0859	2	55	0.5578	0.0756		1.0963			0.7104	0.4826

Red River Valley Regional Trial

Pre-Harvest and Harvest Chip Information
2008 Red River Valley Regional Chip Trial
Hoople, North Dakota

	Pre-Harvest Sample[1]					Harvest Sample[2]				
Variety/Clone	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**
AF2291-10	1.0802	1	67	1.2073	0.0096	1.0977	3	50	2.6996	2.0579
ATLANTIC	1.1052	2	57	0.8663	0.0092	1.1043	4	42	1.1477	1.9342
BEACON CHIPPER	1.0878	1	69	1.271	0.0138	1.0911	2	61	0.9588	0.3470
CO95051-7W	1.0894	2	63	1.9708	0.055	1.0969	2	55	1.0794	0.2970
CO96141-4W	1.0809	1	74	0.7521	0.0096	1.0943	2	64	1.9388	0.3708
CO97043-14W	1.0838	1	66	0.7086	0.0078	1.0930	1	68	1.3933	0.3538
CO97065-7W	1.0857	1	65	0.3914	0.006	1.0959	2	64	1.4896	0.2512
MSJ036-A	1.0941	2	60	1.4942	0.0078	1.0933	3	51	1.3507	1.1729
MSJ147-1	1.0835	2	62	0.7595	0.0119	1.0946	1	67	1.7600	0.1994
ND7519-1	1.0946	1	69	0.9863	0.0078	1.0992	1	65	1.2820	0.1962
NY138	1.0852	1	70	0.6013	0.0064	1.0856	2	62	1.2045	0.4359
NY139	1.0841	1	68	0.9341	0.0087	1.0938	2	62	1.4071	0.2521
SNOWDEN	1.0911	1	65	0.9396	0.016	1.0943	2	48	1.8104	0.9107
W2310-3	1.1005	1	65	0.402	0.0128	1.0942	1	65	0.9932	0.1311
W2324-1	1.0985	1	65	1.3562	0.0339	1.0957	3	53	1.0991	1.3979
W2717-5	1.1005	2	56	0.8484	0.0087	1.1070	2	62	1.4942	0.0788

[1]September 9, 2008. [2]September 26, 2008. [3]S.P. = Specific Gravity. [4]Chip Color {1(light) – 5 (dark)}.
[5]Agtron Reading (The higher the number the lighter the chip). [6]mg/g of Sucrose. [7]mg/g of Glucose.

Red River Valley Regional Trial

October 2008 (1 month) Storage Chip Information
2008 Red River Valley Regional Chip Trial
Hoople, North Dakota

	50°F					45°F				
Variety/Clone	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**
AF2291-10	1.0954	3	53	1.8563	0.5711	1.0971	3	47	3.5108	0.8562
ATLANTIC	1.0995	3	45	1.1426	2.1954	1.1027	3	45	2.0121	1.9983
BEACON CHIPPER	1.0897	2	64	1.0216	0.2599	1.0925	2	55	2.4933	0.5784
CO95051-7W	1.1012	2	61	0.9391	0.2910	1.0952	2	52	2.1679	0.8704
CO96141-4W	1.0929	2	64	1.3296	0.1334	1.0861	2	58	2.1129	0.4725
CO97043-14W	1.0892	1	67	0.8557	0.0523	1.0900	1	65	2.5529	0.3383
CO97065-7W	1.0949	1	66	2.3421	0.2759	1.0968	2	57	5.1700	0.2764
MSJ036-A	1.0919	3	53	1.0436	0.8291	1.0879	3	45	1.5629	1.2095
MSJ147-1	1.0942	2	62	1.3173	0.1123	1.0930	2	58	2.1450	0.2558
ND7519-1	1.1024	1	66	1.2898	0.1678	1.1030	2	61	1.7738	0.1416
NY138	1.0866	2	63	1.1949	0.2718	1.0885	2	57	2.4658	0.3314
NY139	1.098	2	64	1.5354	0.1948	1.0952	3	52	2.3971	0.6018
SNOWDEN	1.0959	2	55	1.1220	0.4208	1.0952	3	48	1.9342	1.7463
W2310-3	1.1026	1	67	0.6247	0.0765	1.1020	2	58	1.0670	0.3841
W2324-1	1.1002	2	57	0.9144	0.8887	1.0987	4	43	1.5400	1.2824
W2717-5	1.1015	2	62	1.2338	0.0422	1.1054	2	64	1.7004	0.0633

[1]September 9, 2008. [2]September 26, 2008. [3]S.P. = Specific Gravity. [4]Chip Color {1(light) – 5 (dark)}.
[5]Agtron Reading (The higher the number the lighter the chip). [6]mg/g of Sucrose. [7]mg/g of Glucose.

Red River Valley Regional Trial

November 2008 (2 month) Storage Chip Information
2008 Red River Valley Regional Chip Trial
Hoople, North Dakota

	50°F					45°F				
Variety/Clone	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**
AF2291-10	1.0981	3	50	1.7004	0.6577	1.0951	4	44	3.6025	0.6765
ATLANTIC	1.0994	3	46	0.9510	1.0569	1.0980	4	41	2.0167	1.3415
BEACON CHIPPER	1.0909	2	61	0.8328	0.2250	1.0922	3	53	1.9938	0.4111
CO95051-7W	1.1053	2	63	1.0005	0.1742	1.1010	2	55	2.8692	0.6903
CO96141-4W	1.0955	2	63	1.2100	0.4203	1.1041	3	54	2.9563	0.5248
CO97043-14W	1.0983	1	67	1.0216	0.0582	1.0924	3	52	5.4863	0.4171
CO97065-7W	1.0918	2	59	1.7600	0.1930	1.0946	4	43	8.4838	1.8792
MSJ036-A	1.0982	2	56	0.8800	0.6041	1.0921	3	48	1.4483	1.1293
MSJ147-1	1.0974	2	64	0.8754	0.0591	1.0972	2	60	1.8929	0.3548
ND7519-1	1.0966	1	67	0.7283	0.0307	1.1030	2	60	1.5308	0.2548
NY138	1.0880	2	63	1.1889	0.2402	1.0898	3	49	5.2433	0.9226
NY139	1.1020	2	63	1.4483	0.2333	1.0974	3	46	2.5804	0.7219
SNOWDEN	1.0995	2	61	0.8241	0.3236	1.0963	4	41	1.9113	1.6546
W2310-3	1.1037	2	59	0.5954	0.1572	1.1055	2	63	1.1798	0.0770
W2324-1	1.1033	3	54	0.9199	0.7214	1.1053	4	40	1.4208	1.4025
W2717-5	1.1087	1	67	1.5354	0.0312	1.1034	2	61	3.5246	0.2177

[1]September 9, 2008. [2]September 26, 2008. [3]S.P. = Specific Gravity. [4]Chip Color {1(light) – 5 (dark)}.
[5]Agtron Reading (The higher the number the lighter the chip). [6]mg/g of Sucrose. [7]mg/g of Glucose.

Red River Valley Regional Trial

December 2008 (3 month) Storage Chip Information
2008 Red River Valley Regional Chip Trial
Hoople, North Dakota

	50°F					45°F				
Variety/Clone	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**
AF2291-10	1.0992	3	54	1.6500	0.6838	1.1030	3	46	3.3229	1.0578
ATLANTIC	1.0923	3	52	1.0711	1.0739	1.1023	3	47	1.8150	1.9067
BEACON CHIPPER	1.0920	1	64	0.8768	0.1160	1.0921	3	50	1.6821	0.5660
CO95051-7W	1.1073	1	66	1.0115	0.1994	1.0930	2	62	1.7554	0.2470
CO96141-4W	1.0997	1	65	0.7480	0.1132	1.0991	2	60	1.7829	0.4556
CO97043-14W	1.0923	1	70	0.7182	0.0289	1.0956	2	60	3.6438	0.3777
CO97065-7W	1.0923	1	65	0.6527	0.1600	1.0868	2	53	3.6529	0.6939
MSJ036-A	1.0936	2	58	0.8846	0.4400	1.0939	3	51	1.6546	1.1046
MSJ147-1	1.1074	1	66	0.9996	0.1105	1.0990	1	66	1.1944	0.0999
ND7519-1	1.1047	1	70	0.7141	0.0234	1.1030	1	67	1.2513	0.1723
NY138	1.0925	1	68	0.8901	0.1270	1.0857	2	57	1.7463	0.4432
NY139	1.1031	1	66	1.0464	0.0958	1.1053	2	62	2.0396	0.3795
SNOWDEN	1.1011	2	63	0.8140	0.1540	1.0993	3	47	1.8517	1.4804
W2310-3	1.0872	1	71	0.4803	0.0101	1.1032	1	66	0.8635	0.0518
W2324-1	1.1032	2	59	1.4163	0.5280	1.1071	4	44	0.8750	1.0789
W2717-5	1.1087	1	67	0.9323	0.0197	1.1076	1	64	2.0992	0.0921

[1]September 9, 2008. [2]September 26, 2008. [3]S.P. = Specific Gravity. [4]Chip Color {1(light) – 5 (dark)}.
[5]Agtron Reading (The higher the number the lighter the chip). [6]mg/g of Sucrose. [7]mg/g of Glucose.

Red River Valley Regional Trial

January 2009 (4 month) Storage Chip Information
2008 Red River Valley Regional Chip Trial
Hoople, North Dakota

	50°F					45°F				
Variety/Clone	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**
AF2291-10	1.0780	2	55	1.6225	0.3905	1.0952	3	47	2.6492	1.2971
ATLANTIC	1.0852	3	52	0.9093	0.8580	1.0911	3	46	1.7233	1.4529
BEACON CHIPPER	1.0997	2	60	0.8461	0.2191	1.0883	2	55	1.4300	0.7100
CO95051-7W	1.0855	1	67	0.9153	0.0289	1.1045	2	62	1.1248	0.1150
CO96141-4W	1.1000	2	63	0.9139	0.2388	1.1006	2	56	2.7042	1.0198
CO97043-14W	1.0982	1	68	0.7783	0.0935	1.0943	3	53	2.3650	0.5321
CO97065-7W	1.0977	1	66	0.6591	0.1201	1.1017	3	50	1.7371	0.4693
MSJ036-A	1.0947	2	60	0.9863	0.6142	1.0911	3	49	1.5538	1.4483
MSJ147-1	1.1000	1	66	1.1449	0.0394	1.0961	2	63	1.5767	0.2897
ND7519-1	1.1071	1	66	0.8374	0.0202	1.1055	2	63	0.8525	0.0536
NY138	1.0923	2	64	0.9213	0.0958	1.0899	2	57	1.0372	0.3153
NY139	1.0984	1	66	0.9281	0.0284	1.0980	2	58	1.3521	0.4203
SNOWDEN	1.0976	2	61	0.7398	0.1155	1.0964	3	50	1.0326	0.6738
W2310-3	1.0996	2	64	0.5651	0.0885	1.1033	2	59	1.1032	0.1719
W2324-1	1.1004	2	59	1.0138	0.2860	1.0886	2	46	1.1055	1.8150
W2717-5	1.1043	1	65	1.0111	0.0312	1.1097	2	61	2.3788	0.0999

[1]September 9, 2008. [2]September 26, 2008. [3]S.P. = Specific Gravity. [4]Chip Color {1(light) – 5 (dark)}.
[5]Agtron Reading (The higher the number the lighter the chip). [6]mg/g of Sucrose. [7]mg/g of Glucose.

Red River Valley Regional Trial

February 2009 (5 month) Storage Chip Information
2008 Red River Valley Regional Chip Trial
Hoople, North Dakota

	50°F					45°F				
Variety/Clone	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**	**S.G.[3]**	**C.C.[4]**	**AGT[5]**	**Suc[6]**	**Gluc[7]**
AF2291-10	1.1017	2	58	1.3026	0.2810	1.0942	3	47	1.8975	0.8910
ATLANTIC	1.1023	2	53	1.0487	0.8534	1.0878	3	48	1.5583	0.9602
BEACON CHIPPER	1.0939	2	62	0.7118	0.0234	1.0872	2	55	1.2526	0.4130
CO95051-7W	1.1039	2	62	0.8828	0.0362	1.1010	2	58	0.9327	0.1004
CO96141-4W	1.0923	2	62	1.0569	0.1801	1.0938	3	54	2.5438	0.7517
CO97043-14W	1.0981	2	64	0.9002	0.0335	1.0980	2	55	1.5492	0.6637
CO97065-7W	1.0622	2	62	0.5725	0.0692	1.0905	2	55	0.9776	0.6834
MSJ036-A	1.0947	3	54	0.9455	0.5143	1.0948	3	49	1.1990	0.7013
MSJ147-1	1.1058	2	63	1.1752	0.0303	1.0956	2	61	0.7650	0.1838
ND7519-1	1.0994	2	63	0.8672	0.0179	1.1083	2	62	1.0125	0.1022
NY138	1.0894	2	62	0.7769	0.0371	1.0837	2	58	0.9520	0.2993
NY139	1.0974	2	60	0.9428	0.0138	1.0925	2	62	1.2623	0.0564
SNOWDEN	1.0996	2	59	0.7544	0.0490	1.0927	3	54	0.9895	0.4895
W2310-3	1.0974	2	63	0.6389	0.0655	1.0825	2	56	0.9730	0.1975
W2324-1	1.1062	2	56	0.8333	0.2402	1.1010	3	50	0.6316	1.2513
W2717-5	1.0995	2	59	1.1128	0.0289	1.1029	2	61	1.0720	0.0545

[1]September 9, 2008. [2]September 26, 2008. [3]S.P. = Specific Gravity. [4]Chip Color {1(light) – 5 (dark)}.
[5]Agtron Reading (The higher the number the lighter the chip). [6]mg/g of Sucrose. [7]mg/g of Glucose.

OUT-OF-STORAGE CHIP QUALITY

2007-2008 WISCONSIN REGIONAL TRIAL

Processing scores by date and storage temperature, 2007-2008 storage season.

Variety	10/11/07	1/15/08			3/25/08			6/10/08		
	55°F	42°F	45°F	48°F	42°F	45°F	48°F	42°F	45°F	48°F
Atlantic	3.0	7.0	7.7	6.3	8.0	6.1	4.4	8.9	7.1	6.4
Beacon Chipper	4.0	4.9	6.4	4.0	6.6	6.3	4.1	7.8	6.3	5.8
CO95051-7W	3.8	3.5	4.7	3.6	4.7	5.0	2.3	7.6	6.9	5.5
CO96141-4W	3.2	5.9	8.1	5.9	7.7	8.1	5.2	7.2	6.8	5.5
MSJ147-1	2.7	2.8	5.6	3.2	2.1	2.0	2.7	4.1	5.7	6.2
MSJ316-A	4.7	7.8	8.4	6.1	7.1	4.4	4.2	6.3	4.8	2.5
Snowden	3.7	2.8	4.5	2.9	5.0	3.1	3.3	7.8	7.2	7.8
W2133-1	3.0	3.5	5.2	2.9	4.6	3.6	2.1	1.8	1.9	4.5
W2324-1	5.0	4.2	6.0	3.8	6.3	4.0	3.5	6.0	5.0	7.3

Scores of 4 or less are considered acceptable color.

Wisconsin Regional Trial Processing Studies – 2008-09

Samples for processing were drawn from plots following grading. Enough 2-13 oz tubers to fill eight plastic crates (35 lbs capacity) were saved for each variety. Samples were moved to the Wisconsin Potato and Vegetable Storage Research Facility and stored at 55°F and 95% relative humidity for four weeks to promote wound healing. Following wound healing each variety was divided into three samples and moved to three lockers for long-term storage. Lockers were set at 55°F initially. Ramping of temperatures down to final set points of 42°F, 45°F, and 48°F was initiated at the rate of 0.1°F per eight hrs. Final set points will be reached in late-November to early-December. An early processing was done on November 4, 2008 when storage temperatures were at 52°F. Ten tubers were selected randomly from each variety and processed into chips. Samples were processed following a one-day warming period at room temperature. Tubers were cut in half lengthwise (along stem end to bud end axis) using a custom-built potato splitter. One-half of the tuber was discarded. Two slices were taken from the remaining half of each tuber using a custom-built slicer. Slices were cut approximately one millimeter thick. The first slice from each tuber half was discarded and the second was used for the processing evaluation. Each slice was rinsed briefly in cold water to remove free starch granules. Excess water was absorbed from the chips using a terry cloth bath towel. The slices were placed in a specially designed wire basket designed to orient them vertically and keep them separated while frying. The slices were fried in cottonseed oil at 365°F for two minutes and 10 seconds. Slices were drained in the frying basket for a short period of time and then placed on paper towels for further draining. Chips were scored visually within one hour after frying. Processed chip samples were evaluated visually and scored on a scale of 1-10 using a color chart devised by potato breeders at the Rhinelander Agricultural Research Station, Rhinelander, WI that parallels the Potato Chip International Institute (PCII) color chart. Scores presented in Table 4 are averages of the 10 chips in each sample. A score of 1 represents the lightest color and 10 the darkest color. Scores of 4 or less are considered acceptable color.

Table 5. **Processing scores by date and storage temperature, 2008**

Variety	11/04/2008	1/15/2009		
	52°F	42°F	45°F	48°F
AF2291-10	3.2	7.2	6.9	6.6
CO96141-4W	3.3	6.8	6.4	5.3
W2310-3	2.5	4.1	3.1	2.9
SNOWDEN	3.7	5.4	4.8	3.2
CO97043-14W	2.7	7.0	5.3	5.0
NY139	2.8	6.0	5.0	3.1
MSJ147-1	2.6	3.4	2.9	3.1
BEACON CHIPPER	3.8	7.3	4.9	4.6
CO95051-7W	2.5	3.8	4.3	3.2
W2324-1	3.1	6.0	5.9	4.5
W2717-5	2.0	3.3	2.9	2.3
ND7519-1	2.3	4.1	3.5	2.6
MSJ036-A	2.7	6.1	5.6	4.4
ATLANTIC	3.9	7.5	5.9	5.5
NY138	2.4	5.0	2.9	2.9
CO97065-7W	3.3	7.3	7.0	6.2

Table 6. **Processing scores for samples evaluated by Frito-Lay, Inc., 2008**

Variety	Sucrose (mg/g fresh wt.)	Glucose (mg/g fresh wt.)	Hunter Score (L-value)
AF2291-10	1.636	0.583	60
CO96141-4W	0.740	0.414	60
W2310-3	0.572	0.066	67
SNOWDEN	0.549	0.161	66
CO97043-14W	1.118	0.439	60
NY139	1.213	0.117	64
MSJ147-1	0.864	0.059	64
BEACON CHIPPER	1.026	0.487	60
CO95051-7W	0.887	0.168	63
W2324-1	0.399	0.223	63
W2717-5	0.637	0.045	67
ND7519-1	0.510	0.016	68
MSJ036-A	0.705	0.412	60
ATLANTIC	1.136	0.692	60
NY138	0.737	0.023	67
CO97065-7W	1.548	1.180	60

Table 7. **Defect scores for samples evaluated by Frito-Lay, Inc., 2008**

Variety	Internal Defects (%)	External Defects (%)	Total Defects (%)
AF2291-10	0	77	77
CO96141-4W	12	28	40
W2310-3	0	26	26
SNOWDEN	0	25	25
CO97043-14W	38	5	43
NY139	0	23	23
MSJ147-1	0	75	75
BEACON CHIPPER	0	46	46
CO95051-7W	0	53	53
W2324-1	6	26	32
W2717-5	0	22	22
ND7519-1	0	10	10
MSJ036-A	0	22	22
ATLANTIC	0	75	75
NY138	0	9	9
CO97065-7W	6	34	40

Table 8. USPB-SFA Chip Trial Entry Summary: 1985 - 2008

Atlantic, 1985-2008 and Snowden, 1988-2008 as Standards

WNC672-2, 1985-1987
WNC521-12, 1985-1986
W879, 1985-1986
W833, 1985
TXA17-1, 1985-1986
A70369-2, 1985-1986
ND860-2, 1985-1986
G670-11, 1985
BR7093-24 (Gemchip), 1986-1988
W848 (Niska), 1986-1987
NY71 (Kanona), 1986-1988
NY81 (Steuben), 1986-1988
NY72 (Allegany), 1987-1989
AF236-1 (Somerset), 1987-1989
MS700-70, 1987-1989
AC80545-1 (Chipeta), 1987-1989
LA01-38 (LaBelle), 1988-1990
MS716-15, 1988-1990
MS700-83 (Spartan Pearl), 1988-1990
W855 (Snowden), 1988-1990
Saginaw Gold, 1988-1990
AF875-16 (Mainechip), 1989-1991
D195-24, 1989
ND2008-2, 1990
Coastal Chip, 1990
CS7232-4, 1990-1992
Andover, 1991-1993
Pike, 1991-1993
NY87 (Reba), 1991
W887, 1991-1993
W870, 1991-1993
A80559-2, 1991-1993
NDA2031-2, 1992-1994
Suncrisp, 1992-1994
B0178-34, 1992-1994
NDO1496-1 (Ivory Crisp), 1993-1995
NY95, 1993
AF875-15, 1994-1996
ND2417-6 (NorValley), 1994-1996
ND2471-8, 1994-1996
NY102 (Monticello), 1994-1995
NY103 (Eva), 1995-1997
BCO894-2, 1995-1997
ATX85404-8, 1996-1998
AF1433-4, 1996-1998
ND2676-10 (Dakota Pearl), 1997-1999
B0564-8 (Harley Blackwell), 1997-1999
B0564-9, 1997-1999
NY115, 1997-1999
W1313, 1999
NY112 (Marcy), 1998-2000
AF1668-60, 1998-2000
MSNT-1, 1998-2000
MSA091-1 (Liberator), 1999-2001
B0766-3, 2000-2002
AF1775-2, 2000-2002
W1431, 2000-2002
NY120, 2000-2002
AF1424-7, 2001-2003
MSG227-2, 2001-2003
W1355-1 (White Pearl), 2001-2003
NDTX4930-5W, 2001-2003
ND2470-27 (Dakota Crisp), 1999, 2003-2004
A91790-13, 2002-2004
MSF099-3, 2002-2004
B1240-1, 2004
W1773-7, 2004
ND5822C-7 (Dakota Diamond), 2003-2005
W1201(Megachip), 2003-2005
AF2211-9, 2004-2006
MSJ461-1, 2004-2006
NY132, 2004-2006
MSJ316-A, 2005-2007
W2133-1, 2005-2007
BEACON CHIPPER, 2006-2008
CO95051-7W, 2006-2008
MSJ147-1, 2006-2008
W2324-1, 2006-2008