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2007 USPFB/SFA Chip Variety Trials

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

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2007 USPB/SFA Potato Chip Trial Results

**Dr. Donald Halseth - Coordinator
Cornell University, Ithaca, NY**

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 nine trial locations in 2007 were Florida, Idaho, Maine, Michigan, North Carolina, Pennsylvania, the Red River Valley, Texas and Wisconsin.

This report is divided into two sections. The first section presents the variety performance data for the 2007 growing and harvest season at each of nine trial locations. The second section consists of the chipping data obtained from storage samples collected during the harvest of the 2006 trials in five states which were held in storage into 2007 for out-of-storage information. This section also includes extensive data from large chipping studies conducted by Duane Preston, UMN/NDSU, at four storage temperatures on 10 chipping lines from the 2006 RRV trial and at two storage temperatures on the seven chipping lines from the 2007 RRV trial. Chuck Kostichka, University of Wisconsin, also conducted similar long-term storage chipping trials at three temperatures on both the 2006 and 2007 Wisconsin trial material. The USPB-SFA Potato Technology Committee has thoroughly discussed the need and value of storage data and this report represents the fourth annual report to include this data.

Table 1. TRENDS IN THE SEED ACREAGE OF CURRENT CHIPPING VARIETIES

Variety	Year Released	2001	2002	2003	2004	2005	2006	2007
1. Atlantic	1976	5,075	4,645	4,351	3,635	2,592	2,693	2806
2. Snowden	1990	2,485	2,758	2,597	1,627	1,664	1,847	1794
3. Dakota Pearl	1999	88	248	1,749	1,868	1,348	1,388	1194
4. Reba	1992	755	908	981	898	808	764	828
5. Pike	1995	1,455	1,304	1,291	883	878	730	669
6. Andover	1995	419	418	392	393	399	382	364
7. NorValley	1996	2,244	1,946	1,344	475	455	453	361
8. Chipeta	1993	742	401	550	356	260	390	348
9. Ivory Crisp	2001	92	208	214	187	207	272	326
10. Marcy	2003	n/a	n/a	94	187	262	320	319
11. Megachip	2008	n/a	n/a	n/a	19	50	134	279
12. Monona	1964	307	509	495	586	333	518	243
13. Dakota Diamond	2005	n/a	n/a	n/a	0.5	5.9	31	232
14. Dakota Crisp	2005	n/a	n/a	n/a	89	102	161	218
15. Harley Blackwell	2003	n/a	n/a	n/a	71	160	174	105

Variety	Year Released	2001	2002	2003	2004	2005	2006	2007
16. Beacon Chipper	2005	n/a	n/a	n/a	n/a	n/a	10	25
17. White Pearl		n/a	n/a	n/a	18.2	10.5	27	25
18. Norchip	1968	206	116	73	52	50	33	11
19. MSJ147-1		n/a	n/a	n/a	n/a	n/a	n/a	4.2
20. CO96141-4W		n/a	n/a	n/a	n/a	n/a	n/a	1.2
21. CO95051-7W		n/a	n/a	n/a	n/a	n/a	n/a	0.7

Acres data obtained from the PAA seed certification section.

PROCEDURE

Trial entries are selected from candidates suggested by University and USDA potato breeders who have been cooperative in this project. The seven advanced breeding lines and newly released varieties evaluated in 2007 were Beacon Chipper, CO95051-7W, CO96141-4W, MSJ147-1, MSJ316-A, W2133-1 and W2324-1 (see Table 2 for descriptions), which were compared with the chip industry standards Atlantic and Snowden. Trial coordinators established trials in nine 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, and specific gravity were evaluated at harvest. 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 7-41 show the yield, percent size distribution, and specific gravity data obtained at each of the nine regional locations. Table 3 (pages 42-44) summarizes the overall average yield, percent size distribution and specific gravity for each of seven clones grown in the nine regional trial sites in 2007. Two breeding lines, MSJ316-A and W2133-1, have completed three years of trials from 2005 through 2007. Their three year summary data are presented in Table 4 (page 45) and Table 5 (page 46), respectively. These data provide the three-year average for each regional location and reflect the variable performance among nine locations.

MSJ316-A was developed by Michigan State University. In 25 trial sites during 2005-07 (see Table 4), this clone averaged a marketable yield of 302 cwt/acre (102% of Atlantic) and a total yield of 365 cwt/acre (106% of Atlantic). It had an average specific gravity of 1.080, which was .007 units below Atlantic and .002 units below Snowden. MSJ316-A averaged an Agtron chip color value of 64.7 (out of the field), 2 units above Atlantic but 0.5 units below Snowden. It had marketable yield higher than Atlantic for all three years of trials in Florida, Idaho, and Pennsylvania. Its highest marketable yield was 520 cwt/acre in the 2006 Wisconsin trial. Specific gravity was above 1.080 in 12 of the 25 trials. MSJ316-A had the best chip color from the 2006 RRV storage trial held at 42F with no reconditioning.

W2133-1 was developed by the University of Wisconsin. In 25 trial sites during 2005-07 (see Table 5), this clone averaged a marketable yield of 287 cwt/acre (97% of Atlantic) and a total yield of 349 cwt/acre (102% of Atlantic). It had an average specific gravity of 1.082, which was .005 units below Atlantic and equal to Snowden. W2133-1 averaged an Agtron chip color value of 63.3 (out of the field), 0.6 units above Atlantic but 1.9 units below Snowden. It had marketable yield higher than Atlantic in 9 of the 25 trials. Its highest marketable yield was 488 cwt/acre in the 2006 Idaho trial. Specific gravity was above 1.080 in 13 of the 25 trials. W2133-1 grown in the Michigan trial in 2006, stored at 48F and chipped on 3/29/07, had the best overall appearance rating by Herr Foods when evaluated by a six person panel.

Table 2. Characteristics of the 2007 USPB - SFA Chip Trials Entries

Advanced Seedlings	Characteristics	Seed Provided By
Beacon Chipper <i>Year 2</i>	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. Better scab tolerance than Atlantic. 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 <i>Year 2</i>	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 <i>Year 1</i>	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

<p>MSJ147-1</p> <p><i>Year 2</i></p>	<p>A selection from a cross between NorValley and S440. Mid-season maturity, uniform blocky tuber shape, sizes early, and high specific gravity. Lowest yielder in 8 of the 2007 trials. 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.</p>	<p>Dr. Dave Douches Michigan State Univ. East Lansing, MI</p>
<p>MSJ316-A</p> <p><i>Year 3</i></p>	<p>A selection from a cross between Pike and B0718-3 in 1997. Late maturity, moderate specific gravity, a round tuber shape and high yield potential. Scab tolerance and good uniform tuber type. Had very high No.1 yield in Idaho and Wisconsin in 2006 and 2007. Highest specific gravity in the RRV. Best chip color from 6 months storage at 42F in RRV in 2006, but poor color from 4 months at 45F in RRV in 2007.</p>	<p>Dr. Dave Douches Michigan State Univ. East Lansing, MI</p>
<p>W2133-1</p> <p><i>Year 3</i></p>	<p>A selection from a cross between Snowden and RHL167. Late maturity, relatively good specific gravity (averaged .005 units below Atlantic), round tuber shape and moderate yield (97% of Atlantic) in three years of trials. Chipped well from field in North Carolina but not in Florida in 2007. Chipped better than Snowden from 4 months storage at 45F in the 2007 RRV trial.</p>	<p>Dr. Jiwan Palta, Felix Navarro and Bryan Bowen University of Wisconsin Rhineland, WI</p>
<p>W2324-1</p> <p><i>Year 2</i></p>	<p>A selection from a cross between Snowden and RHL166. Late maturity, round uniform tubers, relatively high specific gravity (.002 units below Atlantic), and very high yield potential (127% of Atlantic marketable yield) in the 2007 trials. It was the highest yielder in 6 of the 9 trials. 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.</p>	<p>Dr. Jiwan Palta, Felix Navarro and Bryan Bowen University of Wisconsin Rhineland, WI</p>

Florida Regional Trial

Local Coordinators:	Cooperating Grower:	Cooperating Chip Processor:
Dr. Chad Hutchinson University of Florida/IFAS Horticultural Sciences Dept. Hastings, FL 32145-0728	University of Florida/IFAS, Florida Partnership for Water, Agricultural and Community Sustainability at Hastings	Wise Foods Inc. Berwick, PA
Mr. Doug Gergela University of Florida/IFAS Horticultural Sciences Dept. PO Box 728 Hastings, FL 32145-0728		

Trial Data:

Planting Site:	University of Florida/IFAS, Florida Partnership for Water, Agricultural and Community Sustainability at Hastings Research and Demonstration Farm
Planting Date:	January 31, 2007
Harvest Date:	May 22, 2007 (111 days)
Growing Conditions:	Overall, weather conditions were unseasonably dry during the 2007 potato season. February and March saw mostly normal rainfall but most of the precipitation fell over a total of 4 days. However, January, April and May were noticeably drier than normal in Northeast Florida. Only three mornings had temperature readings at or below freezing. Seepage irrigation ran almost constantly from about mid-late February until 2 weeks prior to harvest. 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:100-43-86/A; sidedress: 2 applications of 65-0-56/A (lb N-P-K/A)
Pest Control:	Pic-Clor 60 6 gpa, pre-plant Temik 15G, 20 lb/A, at planting Sencor DF, 16 oz/A and Dual Magnum, 16 fl oz/A at hilling Fungicides and Insecticides as needed. IPM program used.
Chip Ratings:	Potato sub-samples were shipped to Wise Foods Inc. directly from the field and chipped. Chips were prepared and rated following the procedures outlined in the Snack Food Association Chipping Potato Handbook (1995). Chip scores are presented in Table 3.

Table 1. Florida Trial 2007: Production statistics for USPB-SFA clones.

Clone	Tuber Yield			% Culls	Size Class Distribution ^{3,4} (%)					Size Class Range ⁴ (%)		Specific Gravity
	No.1 ¹ cwt/A	Total cwt/A	% No.1 ²		1	2	3	4	5	2 to 4	3 to 4	
Atlantic	298	337	93	5	7	52	36	4	0	93	41	1.086
Snowden	337	364	94	1	6	75	18	0	0	94	18	1.078
Beacon Chipper	254	286	91	2	8	56	34	1	0	91	35	1.081
CO95051-7W	298	365	83	2	15	71	12	0	0	83	12	1.070
CO96141-4W	312	379	83	1	16	80	2	0	0	83	2	1.080
MSJ147-1	185	272	68	1	29	61	6	1	0	68	7	1.083
MSJ316-A	301	364	84	2	14	69	15	0	0	84	15	1.071
W2133-1	327	360	91	0	8	59	27	6	0	91	32	1.078
W2324-1	365	388	96	2	3	46	42	8	0	96	50	1.082
Average	298	346										1.079

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 2007: External and internal defects for USPB-SFA clones.

Clone	% External Tuber Defects ¹					% Internal Tuber Defects ²			
	Growth Cracks	Mis- Shapen	Sun- burned	Rotten & misc.	Total Culls	HH	BR	CRS	IHN
Atlantic	0	3	2	0	5	3	0	0	6
Snowden	0	0	1	0	1	0	0	0	9
Beacon Chipper	0	1	0	1	2	0	0	0	3
CO95051-7W	0	1	1	0	2	0	0	0	0
CO96141-4W	0	0	0	0	1	0	0	0	0
MSJ147-1	0	0	0	0	1	0	0	0	0
MSJ316-A	0	0	1	0	2	0	0	0	0
W2133-1	0	0	0	0	0	0	0	0	0
W2324-1	0	0	1	1	2	0	0	0	0

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.

Table 3. Florida Trial 2007: Plant growth and tuber characteristics for USPB-SFA clones.

Clone	Plant Growth Characteristics ¹				Tuber Characteristics ²						Chip Rating ³
	Percent Stand	Early Vigor	Vine Type	Vine Maturity	IFC	SC	ST	TS	ED	APP	
Atlantic	68	6.3	9-6	4	2.5	6.0	5.0	3.0	6.0	6.0	2.0
Snowden	89	6.5	9-6	3.0	2.0	6.0	5.0	2.5	5.5	6.0	3.0
Beacon Chipper	55	5.5	8	4.5	1.5	6.0	5.0	3.0	6.0	6.0	2.0
CO95051- 7W	72	6.0	9-6	3.3	2.0	7.0	5.5	3.8	6.0	5.5	4.0
CO96141- 4W	78	5.5	9-6	3.5	2.0	7.0	5.5	3.8	6.5	6.0	4.0
MSJ147-1	61	4.0	8	4.5	1.5	6.5	5.5	3.5	6.5	6.0	2.0
MSJ316-A	79	5.0	9-6	3.0	2.5	7.0	6.0	4.0	7.0	6.5	3.5
W2133-1	71	6.0	9-6	4.8	1.5	6.0	5.5	2.5	6.5	6.0	5.0
W2324-1	93	7.0	9-6	3.5	1.5	6.0	5.5	3.0	5.5	5.5	4.0

¹Plant 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.

²Tuber 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.

³Chip Rating: Chips were prepared and rated following the procedures outlined in the Snack Food Association Chipping Potato Handbook (1995). A sub-sample of potatoes from the Chipping Trial was shipped to Wise Foods, chipped and rated on a 1-5 scale: 1 = outstanding, no blemishes and color variations; 2 = very good, minimal blemishes and color variations; 3 = good, acceptable blemishes and color variations; 4 = marginal acceptance, high levels of blemishes and color variations; 5 = not acceptable, high blemish and color variations.

Idaho Regional Trial

Local Coordinator:

Jeff Stark
Peggy Bain
Melvin Chappell

**University of Idaho
Aberdeen R&E Center
Aberdeen, Idaho**

Trial Data

PLANTED 1-May-07

VINE KILLED 4-Sep-07
(Reglone @ 2 pts/A)

HARVESTED 25-Sep-07

PLOT LENGTH	20'	HARVEST LENGTH	20'
HILL SPACING	10"	ROW SPACING	36"
HILLS PER PLOT	24	ROWS/ PLOT	1
REPS	4		

METHOD OF HARVEST Grimme Machine **IRRIGATION**
20" sprinkler applied

FERTILIZER
85 N - 105 P - 50 K - 10 lb zinc- pre-plant (17 April, 2007)
150 units injected through water

INSECTICIDES APPLIED/HILLING
Admire Pro (8 oz/A) - Shanked May 16

FUNGICIDES APPLIED
Quadris Opti 1.6 pints/acre & Dithane F-45 1.5 gts/Acre July 3 & Aug 10

HERBICIDES APPLIED
Sencor (0.3 lb/A), Matrix (0.5 oz/A), Eptam 4.5 pint/A
Spray Coupe- May 22

ENVIRONMENTAL FACTORS
Hot temperatures starting earlier than typical growing seasons

Table 1. Idaho Trial 2007, Yield, Size Distribution, Specific Gravity.

Clone	Yield (cwt/A)		Percent Size Distribution				% Unusable	Specific Gravity
	US No1	Total	<1 7/8"	1 7/8"-2.5"	2.5-4"	>4"		
MSJ147-1	232	403	33	28	29	1	9	1.099
CO96141-4W	354	436	15	28	49	4	4	1.084
CO95051-7W	387	460	14	32	52	0	2	1.101
BEACON CHIPPER	393	459	12	21	55	9	3	1.089
SNOWDEN	394	506	20	36	39	3	2	1.089
W2133-1	425	559	22	28	45	3	2	1.091
ATLANTIC	428	527	15	27	48	6	4	1.095
MSJ316-A	466	570	16	36	42	4	2	1.090
W2324-1	570	667	11	24	53	9	3	1.092
Mean	405	510	18	28	46	5	3	1.092
LSD (.05)	84	78						0.004
LSD (.01)	113	105						0.006

Table 2. Idaho Trial 2007, Vine and tuber characteristics.

Clone	Vine Size ¹	Vine Maturity ²	Stems/Plant	Fresh Merit Score ³	Tuber Color ⁴	Tuber Shape ⁵
MSJ147-1	1.8	2.5	2.8	1.5	1.3	2.8
CO96141-4W	1.0	2.0	2.6	3.3	1.0	2.3
CO95051-7W	2.3	3.3	2.6	3.3	1.8	1.5
BEACON CHIPPER	1.3	2.0	2.6	3.3	2.5	1.3
SNOWDEN	2.0	2.8	2.8	2.8	3.0	1.0
W2133-1	2.5	2.8	2.7	2.5	3.0	1.0
ATLANTIC	1.0	2.0	2.5	2.8	3.0	1.5
MSJ316-A	3.0	3.8	2.4	2.8	2.0	2.0
W2324-1	2.0	2.5	3.2	1.5	2.8	1.5
Mean	1.9	2.6	2.7	2.6	2.3	1.7
¹ (1-5) 5=Large						
² (1-5) 5=Late						
³ (1-5) 5=Best Preference Score						
⁴ (1-5) 1=White						
⁵ (1-5) 1=Round						

Table 3. Idaho Trial 2007, External and Internal Defects.

Clone	External defects ⁴				Internal Defects ⁶			
	Growth			Blackspot ⁵	%	%	%	%
	Scab	Cracks	Knobs		HH	BC	IBS	VD
MSJ147-1	4.3	4.3	4.5	2.8	13	0	0	0
CO96141-4W	3.8	5.0	5.0	2.2	0	0	0	0
CO95051-7W	4.5	5.0	5.0	2.3	0	0	0	0
BEACON CHIPPER	3.5	5.0	5.0	3.7	3	0	0	0
SNOWDEN	3.8	5.0	5.0	3.3	0	0	0	0
W2133-1	3.8	4.8	5.0	2.6	3	0	0	0
ATLANTIC	2.8	4.8	4.8	1.9	28	0	0	5
MSJ316-A	3.3	5.0	5.0	1.7	0	0	0	0
W2324-1	2.8	5.0	5.0	2.6	3	0	0	0
Mean	3.6	4.9	4.9	2.6	5.6	0.0	0.0	0.6

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 2007, After Harvest Quality Report.

Clone	Appearance comments	Chip defects	Chip 50 ⁸	Percent
			color ⁷	Sugar Ends
MSJ147-1	non uniform shape	mottled, dark vascular	1.1	8
CO96141-4W	smooth texture, flat	mottled, dark vascular	1.6	5
CO95051-7W	small tubers	sugar ends	1.5	25
BEACON CHIPPER	non uniform shape, stolons attached	mottled	1.2	8
SNOWDEN	deep bud ends	sugar ends	1.7	17
W2133-1	small, flat	few defects	1.6	0
ATLANTIC	scaley, scab	hollow heart	1.6	0
MSJ316-A	non uniform shape	few defects	1.9	0
W2324-1	deep bud ends, scab	green	1.3	0
Mean			1.5	7.0

⁷ SFA Color (1-5) 1=lightest
⁸ Samples stored at temperatures for approximately 1 month.

Maine Regional Trial

Cooperators:

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2007 Variety entries:

1. Atlantic (field std.)	Giberson Farms, Ft. Fairfield, ME
2. Snowden (storage Std.)	Giberson Farms, Ft. Fairfield, ME
3. MSJ316-A	Dr. Dave Douches, Michigan State, E. Lansing, MI
4. MSJ147-1	Dr. Dave Douches, Michigan State, E. Lansing, MI
5. Beacon Chipper	Dr. Dave Douches, Michigan State, E. Lansing, MI
6. CO96141-4W	Dr. David Holm, San Luis Valley Res. Center, Center, CO
7. CO95051-7W	Dr. David Holm, San Luis Valley Res. Center, Center, CO
8. W2324-1*	Dr. Jiwan Palta/Bryan Bowen Ag. Res. Station, Rhineland, WI
9. W2133-1	Dr. Jiwan Palta/Brian Bowen, Ag. Res. Station, Rhineland, WI

*= New entry, 2007

Trial Data:

Previous Crop:	Barley
Trial Location	Dorman Home Farm, Exeter, Maine
Soil:	Bangor silty loam series
Fertilization:	200-160-240
Planting Date:	May 18
Planter and Spacing:	Harriston pick type @ 9 inch spacing
Plot Size:	1 – 36" Row by 275 ft.
Tillage & Pest Management:	Traditional commercial chip production
Date Vine Kill:	September 7, 2007
Date Harvested:	September 22, 2007
Date Field Processed:	October 2, 2007 Frito-Lay Plant, Killingly, CT

PROCEDURE

Seed sample shipments were received by the Crane Brothers Farm in Exeter, Maine and held in seed storage until all samples had arrived and conditioned for cutting. Seed lots were hand cut and transported to Dorman Farms for planting. The seed lots were planted with a six-row Harriston pick-type planter on the Home Farm. The trial site received adequate rainfall during June and July but became droughty by mid-August and September impacting yields on several varieties. The trial site received standard cultural treatments and pest management applications throughout the growing season. No significant weed pests were noted during the growing season however a heavy infestation of late season emerging Colorado Potato Beetles defoliated portions of the row of several varieties and impacted total yield. A crop vigor and maturity rating was made on July 24, 2007 and the score ratings are presented in Table 1. No Late Blight was found in the plot area during the growing season and only an occasional foliage lesion of Early Blight was found on lower leaflets prior to vine kill. The USPB-SFA trial was harvested on September 22, 2007.

Yield samples were transferred to Bio-Ag Research grading shed for sizing and quality evaluation. Fifty pound chip fry samples were shipped from Grass Farms, in Robinson to the Frito-Lay plant in Dayville, CT on September 29, 2007 and commercially processed on October 2, 2007. Yield and Chip fry performance results are presented in Table 2.

Twenty-five pound tuber samples were placed in storage in jute bags at Dorman Farms for late storage season chip fry evaluation 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 stored at Crane Brothers Farm in Exeter, Maine for delivery to the Frito Lay Plant at Dayville, CT for field processing. Potato yield, size distribution and chip fry results are presented in Table 2.

RESULTS

Atlantic, Snowden, MSJ316-A and MSJ147-1 received heavy defoliation from Colorado Potato Beetle feeding defoliation on portions of the row that impacted total and marketable yield results. The insect feeding pressure also impacted crop vigor rating made prior to vine desiccation. All cultivars in the 2007 trial appeared to be medium late to late maturity.

Table 1. Crop Disease Rating, Visual Vigor Appraisal and Maturity of USPB/SFA Potato Chip Cultivars Grown in Central Maine – 2007.

Cultivar	Colorado Beetle Defoliation Index¹	Plant Vigor²	Varietal Maturity Rating³
Atlantic	3	6	Medium Late
Snowden	3	7	Late
MSJ316-A	6	6	Medium Late
MSJ147-1	6	8	Medium Late
Beacon Chipper	7	8	Late
CO96141-4W	5	6	Medium Late
CO95051-7W	5	7	Medium Late
W2324-1	8	10	Medium Late
W2133-1	8	8	Medium Late

1,2,3 = See Appendix attached

The 2007 USPB/SFA yield and chip performance results are presented in Table 2. Total and marketable yields were somewhat less than anticipated for all cultivars due to the invasion by Late Blight and the earlier vine desiccation treatment. Cullage losses from total and marketable yield were due primarily to Late Blight Tuber Rot, Common scab, deep pitted Common Scab and sunburn. Late Blight tuber rot and deep pitted scab significantly reduced the yield potential of W2324-1, NY132, and W2133-1. Significant air-cracking was observed on Beacon Chipper. Specific gravity and solids level of all cultivars was lower than past seasons but Chip Color Agron scores were acceptable for all cultivars.

The cooperation of John Dorman at Double D. Farms in Exeter, Maine, and Dennis Derey, Operations Manager at the Frito-Lay plant in Dayville, CT is sincerely appreciated. Dorman Farms have been the host of the Maine SFA trial for 21 consecutive years as has the participation of Dennis Derey at the Frito-Lay plant at Dayville, CT.

Table 2. Total and Marketable Yield, Size Distribution and Quality of USPB/SFA Potato Chip Cultivars Grown in Central Maine, - 2007.

Cultivar	Yield: (CWT. / Ac.)		Percent US No. 1	Percent(%) Size Distribution			Frito-Lay Data: Dayville, CT				"A" Value	
	Marketable Yield	Total Yield		Culls ¹	Small 0 – 2"	Medium 2 – 3.5"	Large Over 3.5"	Specific Gravity ²	Total Solids	Agtron Color		Total Defects
W2324-1	315	354	89.0	0	4.3	88.9	7.8	1.078	19.2	70.09	0 nice	-0.94
CO96141-4W	273	280	97.7	0	2.5	97.5	0	1.065	16.3	71.51	10.5 stem end	-0.97
Beacon Chipper	220	279	78.9	3.2	0.7	78.9	17.2	1.068	17.0	68.71	25.5 stem end	-1.57
CO95051-7W	214.5	224.5	95.5	0	4.5	95.5	0	1.074	18.3	69.71	10.5 externals	1.07
W2133-1	188	221	85.1	0	14.9	85.1	0	1.066	16.7	69.71	34.0 externals	1.09
Snowden	173.5	188.5	92	0	8.0	92.0	0	1.072	17.8	70.90	13.0 stem end	-0.68
MSJ316-A	165	212.5	77.6	0	10.1	77.6	12.3	1.065	15.6	68.76	11.2 externals	1.01
Atlantic	147	157	93.5	0.3	3.8	93.6	2.3	1.083	20.3	69.09	0 nice	-1.07
MSJ147-1	107	134.5	79.6	0	19.7	80.3	0	1.073	18.2	68.91	6.4 externals	-0.98

¹= Culls mostly sunburn ²= Measured by SFA potato hydrometer

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Machiasport, ME 04655

Michigan Regional Trial

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Cooperating Grower: Processor:

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Sandyland Farms LLC
Howard City, MI

Cooperating Chip

Herr Foods, Inc.
Nottingham, PA

Trial Data:

Planting Date:	May 14, 2007
Vine Kill Date:	September 5, 2007
Harvest Date:	October 4, 2007 (143 DAP)
Row & Plant Spacing:	34" x 11.5"; irrigated
Plots:	Single rows for each entry approximately 300' long
DD, Base 40	3161

Trial Procedure:

Seed was mechanically cut on April 23, 2007 and delivered to the grower's storage the following day. No seed treatments were applied at the time of seed cutting. A91814-5 was dropped from the trial this season due to reported high levels of virus infection.

Pre-harvest sugar profiles were taken for each variety approximately three weeks (August 9th) and one week (August 21st) prior to vine kill. The protocol is to obtain a minimum of 40 tubers from each variety, taking all the tubers from each hill even if that requires 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) were established.

At harvest, three plot areas of 23 feet were harvested from each entry and were used to determine yields, 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 2007 and the other in the spring of 2008. Twenty-five tuber samples were also collected at harvest and stored at the Michigan Potato Industry Commission's Cargill Demonstration Storage Facility at approximately 48°F and 55°F 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 14th. Atlantic and W2324-1 appeared to be the most vigorous vine types. 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 2007 growing season were dryer and warmer than average. July was the wettest month, receiving 2.4” of rainfall. Total rainfall from May 14th through October 4th, was 7.9”. There was one day in June, four in July, one in August and one in September where daytime temperatures exceeded 90°F. The most daytime heat stress occurred during the last days of July and the first few days of August. Nighttime temperatures during the period May through October were higher for a longer period of time than during the same period in 2006. The average specific gravity in Michigan was below average as a result of the nighttime heat stress.

Results:

Table 1 summarizes the yield, size distribution, and specific gravity data at harvest. Beacon Chipper and W2324-1 appear to be very strong yielding varieties. CO96141-4W falls far below acceptable levels for specific gravity. W2133-1 is an average yielding line with excellent chip quality and a good specific gravity. CO95051-7W and MSJ147-1, although both lines appear to yield below average, have excellent long term storage qualities.

Table 1. Yield ,Size Distribution*, Specific Gravity								
Entry	Yield (cwt/A)		Percent Size Distribution				Specific Gravity	
	US#1	TOTAL	US#1	Small	Mid-Size	Large		Culls
Beacon Chipper	585	600	97	2	79	18	1	1.077
W2324-1	564	598	95	3	82	13	2	1.081
Snowden	487	501	97	3	81	16	0	1.078
Atlantic	404	434	93	4	79	14	3	1.079
W2133-1	378	403	94	5	84	10	1	1.083
CO96141-4W	366	385	95	5	92	3	0	1.067
MSJ316-A	351	384	92	7	89	3	1	1.076
CO95051-7W	238	279	85	15	85	0	0	1.074
MSJ147-1	184	259	71	29	71	0	0	1.085
MEAN	395	427	91					1.078

*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 acceptable with hollow heart being prevalent in Atlantic. Beacon Chipper exhibited four hollow heart in thirty oversize tubers, similar to Snowden. Overall vascular discoloration was observed in almost every line.

Entry	Internal Defects ¹				Total Cut
	HH	VD	IBS	BC	
Beacon Chipper	4	3	0	0	30
W2324-1	2	2	0	0	30
Snowden	5	5	0	1	30
Atlantic	14	3	1	0	30
W2133-1	1	2	0	0	30
CO96141-4W	0	4	0	0	30
MSJ316-A	0	2	0	1	30
CO95051-7W	0	1	0	0	30
MSJ147-1	0	0	0	0	30

¹Internal 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 4th and processed at Herr Foods Inc. on October 8th, 4 days after harvest. Chip colors were generally acceptable, with Beacon Chipper having the highest Agtron score of 68.0. The varieties listed in ranked order based on observations from Herr Foods Inc. are as follows: MSJ147-1, CO96141-4W, CO95051-7W, MSJ316-A, W2133-1, W2324-1, Beacon Chipper, Snowden and Atlantic.

Entry	Agtron Color	SFA ² Color	Specific Gravity	Percent Chip Defects ³		
				Internal	External	Total
Beacon Chipper	68.0	1	1.075	4.2	10.0	14.2
W2324-1	62.9	2	1.078	1.5	13.9	15.4
Snowden	61.8	2	1.073	1.1	15.2	16.3
Atlantic	63.9	2	1.073	21.7	12.8	34.5
W2133-1	61.4	2	1.078	2.2	6.4	8.6
CO96141-4W	61.4	2	1.062	1.6	7.9	9.5
MSJ316-A	64.0	2	1.072	4.9	3.1	8.0
CO95051-7W	64.0	2	1.074	1.2	8.2	10.0
MSJ147-1	59.7	2	1.080	2.0	3.8	5.8

¹ Samples collected at harvest October 4th and processed by Herr Foods Inc., Nottingham, PA on October 8, 2007 (4 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 50°F, 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 black spot bruise. Among the “Simulated Bruise” samples, the best entries were Atlantic, CO96141-4W, MSJ147-1 and MSJ316-A. Beacon Chipper showed the lowest percent bruise free.

Entry	A. Check Samples ¹						B. Simulated Bruise Samples ²											
	# of Bruises Per Tuber					Total Tubers	Percent Bruise Free	Average Bruises Per Tuber	# of Bruises Per Tuber					Total Tubers	Percent Bruise Free	Average Bruises Per Tuber		
	0	1	2	3	4				5	0	1	2	3				4	5
Beacon Chipper	18	7					25	76	0.3	4	10	6	4	1		25	16	1.5
W2324-1	23	2					25	92	0.1	15	5	5				25	60	0.6
Snowden	25						25	100	0.0	12	8	4	1			25	48	0.8
Atlantic	22	0	2	1			25	88	0.3	17	6	2				25	68	0.4
W2133-1	19	2	2	2			25	76	0.5	10	11	4				25	40	0.8
CO96141-4W	23	1	1				25	92	0.1	19	4	1	1			25	76	0.4
MSJ316-A	25						25	100	0.0	18	5	2				25	72	0.4
CO95051-7W	25						25	100	0.0	13	9	2	1			25	52	0.6
MSJ147-1	23	2					25	92	0.1	18	5	2				25	72	0.4

¹Tuber samples collected at harvest and held at room temperature for later abrasive peeling and scoring.
²Tuber samples collected at harvest, held at 50°F 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 & 6 summarize the results of the pre-harvest panel data. MSJ147-1 appeared to be very immature on August 9th with a 1.067 specific gravity which increased to 1.080 on August 21st. CO96141-4W was one of the earliest maturing varieties second to Atlantic. Atlantic appeared to be mature on August 21st. Beacon Chipper had the largest average tuber weight of 6.37 oz. on August 21st.

Entry	Specific Glucose ¹		Sucrose ² Rating	Canopy		Number of		Average ⁵ Tuber Weight
	Gravity	%		Rating ³	Uniform. ⁴	Hills	Stems	
Beacon Chipper	1.070	0.004	1.006	95	100	4	16	4.68
W2324-1	1.068	0.003	0.568	95	100	2	10	2.27
Snowden	1.068	0.003	0.613	95	100	5	16	2.67
Atlantic	1.074	0.002	0.673	85	100	3	14	4.02
W2133-1	1.075	0.001	0.497	80	90	4	14	3.51
CO96141-4W	1.069	0.001	0.243	75	90	4	15	3.48
MSJ316-A	1.063	0.014	1.860	100	100	6	14	2.74
CO95051-7W	1.072	0.001	0.514	80	90	5	19	2.92
MSJ147-1	1.067	0.004	0.776	95	100	4	13	1.87

¹Percent Glucose is the percent of glucose by weight in a given amount of fresh tuber tissue.
²Sucrose Rating is the percent of sucrose by weight in a given amount of fresh tuber tissue X10.
³The Canopy Rating is a percent rating of green foliage (0 is all brown dead foliage, 100 is green vigorous foliage).
⁴The Canopy Uniformity is a percentage of how uniform the foliage health is at the date of observation.
⁵The Average Tuber Weight is the total tuber weight collected divided by the number of tubers reported in ounces.

Table 6. Pre-Harvest Panel, 8/21/07

Entry	Specific Glucose ¹		Sucrose ² Rating	Canopy		Number of		Average ⁵ Tuber Weight
	Gravity	%		Rating ³	Uniform. ⁴	Hills	Stems	
Beacon Chipper	1.077	0.002	0.546	95	90	4	12	6.37
W2324-1	1.078	0.003	0.462	90	85	3	16	4.13
Snowden	1.079	0.001	0.368	95	90	4	16	5.95
Atlantic	1.071	0.002	0.497	85	90	4	16	5.23
W2133-1	1.079	0.001	0.439	75	85	5	20	4.32
CO96141-4W	1.069	0.001	0.252	70	85	4	16	4.43
MSJ316-A	1.069	0.006	0.976	90	90	6	13	4.77
CO95051-7W	1.077	0.001	0.409	95	90	4	15	3.15
MSJ147-1	1.080	0.002	0.396	95	90	3	14	2.01

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

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

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

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

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

Variety Comments:

Beacon Chipper: The US#1 yield for this variety was 585 cwt/A. This was 180 cwt above the average and 21 cwt higher than the next closest variety. The specific gravity was just below average for this trial at 1.077. Beacon Chipper recorded the highest amount of oversize tubers at 18% of the total yield with four hollow heart noted in 30 tubers cut. Chip quality was average overall, placing this variety 7th in this trial. Susceptibility to black spot was higher than desired at 1.5 bruises per tuber.

W2324-1: On June 14th this variety was expressing a vine vigor that was above average when compared to others in the trial. The US#1 yield was excellent with an acceptable specific gravity of 1.081 at harvest. Raw internal quality was acceptable in the tubers. Out of the field chip processing results from Herr Foods ranked this variety 6th in the Michigan trial. A minimal amount of black spot bruise was recorded in the bruise test. The only concern noted is the common scab susceptibility of this variety.

Snowden: The US#1 yield was above average at 487 cwt/A. This variety recorded the second highest percent of “oversize” potatoes at 16% with an average specific gravity at 1.078. Chip quality was the second poorest recorded with a high level of total chip defects at 16.3%. Black spot bruise susceptibility was average.

Atlantic: This variety had an average yield and specific gravity of 1.079 for this trial. The size profile was well distributed. Chip quality was worst among the varieties tested at Herr’s. The black spot bruise susceptibility was low at 0.4 bruises per tuber.

W2133-1: This variety produced an average yield of good size potatoes. A good specific gravity was recorded at 1.083. Few internal defects were noted at harvest. W2133-1 was average in the overall chip score at Herr Foods on October 8, 2007. A slight amount of black spot bruise was recorded for this variety this year.

CO96141-4W: The US#1 yield for this variety was 29 cwt/A below the trial average with an unacceptable specific gravity of 1.067. Internal tuber quality was good with only a slight amount of vascular discoloration. Some pitted scab was noted at harvest. This variety was noted as second highest in chip quality at Herr Foods. Black spot bruise numbers were low.

MSJ316-A: This variety had a below average yield at 351 cwt/A and an average specific gravity of 1.076. MSJ316-A had good raw internal quality and above average chip quality when processed at Herr Foods out of the field. The percent of bruise free potatoes for this variety was among the top four of the varieties tested.

CO95051-7W: This variety recorded the second lowest yield in this year's trial. The specific gravity was marginal at 1.074. Raw internal quality was good. The chips recorded the third highest overall score in the trial for the second year. Black spot bruise susceptibility was noted as only a trace at 0.4 bruises per tuber.

MSJ147-1: US#1 yield was the lowest in the trial this year at 184 cwt/A. This variety recorded the highest percent of "small" potatoes at 29% with an acceptable specific gravity at 1.085. Chip quality was noted as the best overall, receiving the highest ranking in the Herr Foods scores. Black spot bruise susceptibility was slight. This variety appears to have excellent long term storage quality.

North Carolina Regional Trial

Local Coordinators:

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Cooperating Grower:

Chris Hopkins
Black Gold Farms
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Columbia, NC 27925

Cooperating Chip Processor:

Utz Quality Foods
Hanover, PA

Trial Data:

Planting Site:	Black Gold Farms, Gum Neck, Tyrrell County, NC
Planting Date:	March 13, 2007
Harvest Date:	June 26, 2007 (105 days)
Growing Conditions:	Planting was on time, and very dry. Temperatures and rainfall were favorable for growth and tuber development throughout the season. Rainfall was sparse throughout the growing season and a hard frost on April 9 th damaged tops burning some plots to the ground. Overall, insect pressure was low to manageable. Some minor Colorado Potato Beetle damage occurred but CPB pressure was kept in check throughout the season.
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:	152.2 lbs N, 177.3 lbs P, 101.2 lbs K, 1 qt/A lb Zn 14.98 gal/A N (side dress), 1 pt/A Zn (with Fungicide)
Weed Control:	Diametric 1.28lbs/A
Insect Control:	Actara 1.5 oz/A
Disease Control:	Quadris 6.2oz/A Dithane 2.0 lbs/A

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					Culls	1 ⁷ / ₈ to 4"	2 ¹ / ₂ to 4"	Specific Gravity ²	Chip Color ³	
			1	2	3	4	5					24 to 48 hrs	5 to 7 days
Atlantic	339	314	4	39	50	3	0	4	92	53	1.081	1	2
Beacon Chipper	333	307	4	35	51	6	0	4	92	57	1.080	2	2
CO95051-7W	293	263	8	52	37	1	0	2	90	38	1.074	2	2
CO96141-4W	344	309	8	47	40	3	0	3	90	43	1.069	1	2
MSJ147-1	234	177	22	63	14	0	0	2	77	14	1.081	2	1
MSJ316-A	291	250	11	60	26	0	0	3	86	26	1.075	2	3
Snowden	342	309	8	61	29	0	0	1	90	29	1.082	1	2
W2133-1	328	279	13	56	28	1	0	2	85	29	1.077	2	2
W2324-1	383	335	10	51	35	2	0	3	87	37	1.080	3	3
Grand Mean	321	282											
CV(%)	13.7	15.6											
LSD(K=100)	65.0	63.0											

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 96 hrs 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.

Clone	Plant Data ¹				Tuber Data ²								% Internal Defects ³						
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR
Atlantic	6	9	8	5	7	5	6	6	2	5	7	8	7	4	8.6	6	2	22	2
Beacon Chipper	8	9	8	7	9	6	7	6	2	7	7	8	7	0	9	0	0	4	2
CO95051-7W	6	9	8	7	8	7	4	7	2	7	5	8	7	8	8.0	2	0	2	0
CO96141-4W	6	9	8	4	8	8	4	7	4	8	6	8	5	0	9	0	0	2	0
MSJ147-1	6	7	8	5	9	7	7	7	2	7	3	6	5	0	9	0	0	2	0
MSJ316-A	9	8	8	8	9	7	4	5	5	7	5	6	6	0	9	0	0	0	2
Snowden	9	9	8	7	6	5	6	7	2	4	6	9	5	0	9	0	0	2	0
W2133-1	9	8	8	6	6	6	5	6	2	6	7	8	4	0	9	0	0	8	0
W2324-1	8	7	8	6	6	7	6	5	2	6	7	6	3	0	9	2	0	0	2

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. North Carolina. UTZ Quality Foods Chip Data.

Clone	% Defects		%Total Defects	Specific Gravity	Defect Descriptions ¹		Chip Color ²		
	Internal	External			Internal	External	Hunter Lab	Agtron	Visual
Atlantic	0	0	0	1.096	.	.	64.6	69.8	1
Beacon Chipper	1	0	1	1.084	ID(light)	.	63.7	68.5	1*
CO95051-7W	1	0	1	1.081	ID(dark)	.	61.7	62.9	1
C096141-4W	0	0	0	1.077	.	.	63.5	67.6	1
MSJ147-1	1	0	1	1.086	ID(light)	.	62.1	64.1	1
MSJ316-A	55	0	55	1.080	SEB,ID(dark)	.	59.7	58.3	3
Snowden	0	0	0	1.091	.	.	62.5	64.7	1
W2133-1	5	0	5	1.088	ID,BC	.	60.9	60.6	2
W2324-1	30	0	30	1.087	VB,BC	.	61.2	61.0	2

¹ Defect Descriptions:

ED = External Discoloration; ID = Internal Discoloration; RR = Ring Rot; SB = Stem End Browning; VB = Vascular Browning.

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

North Carolina Clone Summaries

Beacon Chipper: This was a mid to late maturing clone with 100% stands and fair vigor. Shapes were mostly round, size was medium to large and overall appearance was good. Marketable yields were 101% of Atlantic, gravity was 1.080, and chip color was excellent in both the 24 to 48 hour and 5 to 7 day chipping. No significant internal defects were observed, external defects included sunscald, soft rot, and skin blemishes due to Rhizoctonia.

CO95051-7W: This clone was mid to late maturing and had 96% stands and vigor was good. Shapes were mostly round, size was medium, and overall appearance was good. Marketable yields were 87% of Atlantic, gravity was 1.074, and chip color was excellent in both the 24 to 48 hour and the 5 to 7 day chip tests. External defects included sunscald, misshapes, and skin blemishes due to Rhizoctonia.

CO96141-4W: Maturity for this clone was slightly earlier than mid season with 100% stands, and vigor was better than fair. Shapes were mostly oblong, size was slightly larger than medium, and overall appearance was fair. Marketable yields were 103% of Atlantic, gravity was 1.069, and chip color was exceptional in the 24 to 48 hour test and excellent in the 5 to 7 day chip test. External defects included sunscald, enlarged lenticels, misshapes, and growth cracks.

MSJ147-1: Maturity for this clone was mid season, stands were 99%, and vigor was better than fair. Shapes were mostly round, size was small to medium, and overall appearance was fair. Marketable yields were 60% of Atlantic, gravity was 1.081, 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, and sunscald.

MSJ316-A: Stands were 99% for this mid to late maturing clone, and vigor was fair. Tuber shapes were oblong, size was medium, and overall appearance was better than fair. Marketable yield was 84% of Atlantic, gravity was 1.075 and chip color was excellent in the 24 to 48 hr test and good in the 5 to 7 day chip test. External defects included growth cracks, sunscald, common scab, misshapes, and skin blemishes due to Rhizoctonia.

W2133-1: Stands were 98% for this slightly later than mid-maturing clone with better than fair vigor. Shapes tended to be mostly round, size was medium-large, and overall appearance was less than fair. Marketable yield was 94% of Atlantic, gravity was 1.077, and chip color was excellent in the chipping tests. No significant internal defects were recorded. External defects included sunscald, misshapes, and tight stolon attachment.

W2324-1: This clone had stands of 99%, and was slightly later than mid-maturing with good vigor. Shapes were mostly round, size was medium to large and overall appearance was poor. Marketable yield was 111% Atlantic, gravity was 1.080, and chip scores were good for both tests. External defects included sunscald, common scab, and tight stolon attachment.

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: 10-May-03 Soil Temperature: 60°F
Vine Kill Date: 25-Aug-03
Harvest Date: 12-Sep-03 (125 days) Soil Temperature: 60°F

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

Growing Season Weather: The growing season was warm and sunny with about 14.25 in of rain from May 1 through September 13, 2007. The plot was not irrigated.

	*Avg. High °F	*Avg. Low °F	*Rain (inches)	
May	74	50	1.00	*Temperatures as reported at Altoona, PA by Pennsylvania State Climatologist
June	78	58	1.40	
July	79	58	4.90	*Rainfall as reported at Patton, PA by James Hite
August	81	62	6.95	
September	75	53	Trace	
Total Rainfall (May thru September 13)			14.25	

Previous crop: Wheat

Soil Type: shaley loam

Fertilizer: 13-13-13 1,250 pounds

Irrigation: Rainfall 14.25 inches

Herbicides: Before planting: Round-up (0.67 quart), Request (water cond. 1 qt./100 gal) 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 2007 USPB-SFA Chip Trial varieties at Chest Springs, PA.

Entry	Yield (cwt/A)		Percent Size Distribution					Characteristics			
	No. 1	Total	No. 1	Small	Mid-Size	Large	Culls	Agtron Score*	Specific Gravity*	% Hollow Heart	Major External Defects
MSJ 316-A	295	336	88	5	88	0	6	49	1.072	0	SC SB MS
Snowden	283	326	87	8	87	1	4	44	1.077	0	MS SB
Beacon Chipper	277	309	90	4	90	1	4	49	1.072	0	SC SB
W2324-1	258	326	79	4	79	2	15	39	1.082	0	SC SB MS
W2133-1	253	299	85	10	85	1	5	42	1.075	0	SB FR SC
CO96141-4W	237	258	92	5	92	1	2	45	1.068	0	SB FR MS SC
Atlantic	178	242	74	4	74	17	6	42	1.083	10	MS SB FR SC
CO95051-7W	165	189	87	9	87	0	4	41	1.068	0	MS SB GC FR
MSJ147-1	142	219	65	32	65	0	3	46	1.078	0	SC SB
mean	225	272	82	9	82	2	6		1.075		
lsd (0.05)	48	46									
CV%	14	11									

Defects:

SB = sunburn

RD = rodent damage

GC = growth cracks

SS = silver scurf

MS = mis-shapen

DD = digger damage

FR = Fusarium Rot

SC = Scab

Red River Valley Regional Trial

Local Trial Coordinator: Duane Preston, UMN/NDSU

Plot Location: North Dakota - Cavalier County - Section 32-159-54

Grower/Farm: Oberg Farms, Hoople, North Dakota

Crop Land History: 2003 Wheat
 2004 Potatoes
 2005 Wheat
 2006 Navy Beans
 2007 Potatoes

Planted: May 16 Row Width: 38 inches
Vine Kill: Aug 31 and Sept 9, Diquat 1 pt/acre with 100 gal water
Harvest: Sept 17

Fertilizer: 100-80-60-3 zinc broadcast May 14

Chemicals: Ultra Florish - 1 application - 11.2 oz.
 Quadris - 1 application - 5.6 oz.
 Alias - 1 application - 10 oz.
 Echo ZN - 5 applications - 1.5 pt
 Supertin - 2 applications - 2 oz.
 Baythroid - 2 applications - 1 oz.

Irrigation: None -- dryland grown

Weather Data:

Month	Rainfall (inches)		Monthly Temp. **
	2007	Average	
May	6.31	2.19	67 F
June	5.44	3.17	76 F
July	6.51	3.31	83 F
August	0.56	2.63	76 F
September	0.70	1.78	70 F
total	19.52	13.08	

** monthly average temperature

Chipping: Barrel O' Fun, Perham, Minnesota
USDA Potato Processing Lab, East Grand Forks, Minnesota

OBERG FARMS - RED RIVER VALLEY - HOOPLE, NORTH DAKOTA

Table 1. RRV USPB-SFA Trial - 2007 - yield, size distribution, hollow heart, specific gravity and out-of-field chip scores.											
Clone	Yield (cwt/acre)		Percent of Size Distribution					Hollow Heart **	Specific Gravity	Chip Color	Agtron
	US #1	Total	US #1	< 2 in	2-3 1/2 in	>3 1/2 in	Culls				
ATLANTIC	280	319	87.8	4.1	88.8	6.1	1.0	50	1.104	2	61
SNOWDEN	270	298	90.5	4.6	91.5	3.0	1.0	20	1.097	2	64
BEACON CHIPPER	204	248	82.2	2.7	83.7	12.0	1.5	13	1.092	1	68
CO95051-7W	162	189	85.5	8.7	88.0	0.8	2.5	0	1.107	1	69
CO96141-4W	221	245	90.0	3.0	91.7	3.5	1.7	7	1.096	1	67
MSJ147-1	163	210	77.4	18.4	79.5	0.0	2.1	0	1.102	1	69
MSJ316-A	189	223	84.8	10.1	86.8	1.2	2.0	13	1.097	2	61
W2133-1	225	281	80.1	15.9	81.3	1.6	1.2	5	1.101	1	67
W2324-1	302	334	90.5	4.2	92.7	1.0	2.2	20	1.099	2	58
mean	224	261	85.4	8.0	87.1	3.2	1.7	14	1.099	1	65

** Note: Hollow Heart readings from 5 jumbo (oversize) tubers cut per replication.

Planted: May 16

Vine-Killed: Aug 31 and Sept 9

Harvested: Sept 16

Chipped: Sept 17

Red River Valley Regional Trial

Table 2. RRV out of field specific gravity, chip color and sugar levels.					
CULTIVAR	SP.GR	CC	AGTRON	SUCROSE MG/GM	GLUCOSE MG/GM
Atlantic	1.1042	2	61	2.1863	0.1595
Beacon Chipper	1.0921	1	68	1.4804	0.0706
CO 95051-7W	1.1065	1	69	1.5858	0.0303
CO 96141-4W	1.0956	1	67	1.0244	0.0303
MSJ 147-1	1.1019	1	69	0.8754	0.0096
MSJ 316-A	1.0969	2	61	3.4421	0.137
Snowden	1.0973	2	64	1.5171	0.1682
W 2133-1	1.1007	1	67	1.7233	0.0999
W 2324-1	1.0987	2	58	1.1284	0.0995

Harvest Date: September 16, 2007

Sample Date: September 17, 2007

Texas Regional Trial

Location: Black Gold Farms, Pearsall, TX - 2007

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

Trial Outline:

Varieties included in statistical analysis:	12
Planting Date:	1/19/07
Planting Method	Hand planted using spacing tapes
Harvest Dates:	Early 05/04/07 105 DAP Late 05/18/07 119 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:	9 inches
Hills/ Row:	20

<u>Variety or clone</u>	<u>Seed Source</u>
1) Atlantic	Black Gold Farms
2) Snowden	Black Gold Farms
3) Beacon Chipper	Michigan State
4) CO95051-7W	Colorado State
5) CO96141-4W	Colorado State
6) MSJ147-1	Michigan State
7) MSJ316-A	Michigan State
8) W2133-1	University of Wisconsin
9) W2324-1	University of Wisconsin

Agronomic notes:

- High level of psyllid yellows present in the trial. (See Trial Notes for variety specific notes.)
- Psyllid pressure was constant starting when plants were about 12" tall through the remainder of the growing season.
- Above average rainfall during the growing season.
- Overall vine growth and vigor was poor for all varieties during the entire growing season.
- Complete row closure was never met during the growing season for any of the varieties planted.
- The plots were affected by frost twice during the growing season.
- Yields overall were below the area average.
- Solids at the late harvest dropped quite considerably from the early harvest. This was true for all varieties.
- Very little ZC was observed in the fry samples for all varieties at both harvests.

Texas Regional Trial

Black Gold Farms, Pearsall, TX - 2007

Harvest: Early

Planting Date: 1/19

Harvest Date: 5/4

DAP: 105

Variety	Vine Vigor	% Ground Cover	1 - 2"		> 4"		Marketable Yield			Total Yield Cwt/ac	Quality Assurance						
			tubers/ plant	Cwt/ac	tubers/ plant	Cwt/ac	2 - 4"				Specific Gravity	Cook Sample Defects					
							tubers/ plant	Cwt/ac	percent			CLR	% UC	% GRN	% ID	% ED	% Total
Atlantic	2.9	48.8	3.2	68.4	0.0	0.0	3.3	171.7	71.5	240	1.093	70	0.0	0.0	5.6	0.0	5.57
Snowden	2.3	33.8	6.0	109.4	0.0	0.0	2.6	105.3	49.1	215	1.096	70	1.9	0.0	0.0	0.0	1.88
Beacon Chipper	2.1	33.8	3.5	70.9	0.0	0.0	2.2	117.4	62.3	188	1.079	69	0.0	0.0	0.0	6.8	6.79
CO95051-7W	2.0	33.8	4.4	83.0	0.0	0.0	2.8	117.1	58.5	200	1.086	72	0.0	0.0	0.0	0.0	0
CO96141-4W	2.3	31.3	5.8	123.5	0.0	0.0	1.8	83.3	40.3	207	1.080	67	0.0	0.0	0.0	0.0	0
MSJ147-1	2.0	30.0	5.8	110.1	0.0	0.0	0.3	12.1	9.9	122	1.089	70	0.0	0.0	0.0	0.0	0
MSJ316-A	3.1	62.5	4.1	84.0	0.0	0.0	1.9	86.6	50.8	171	1.074	69	3.6	0.0	0.0	8.4	11.9
W2133-1	2.3	45.0	5.4	104.1	0.0	0.0	2.3	96.1	48.0	200	1.086	69	2.1	0.0	0.0	0.0	2.11
W2324-1	2.5	45.0	4.5	95.4	0.0	0.0	2.9	143.8	60.1	239	1.091	68	1.9	0.0	0.0	9.9	11.8
LSD (.10)	0.39	9.11	1.50	30.18	0.00	0.00	0.46	25.03			0.245						
Standard Deviation	0.23	5.37	0.88	17.79	0.00	0.00	0.27	14.75			0.144						
Coefficient of Variance	9.23	12.77	20.92	20.92	-	-	11.86	13.20			13.268						
Observed F Value	12.61	11.03	3.97	3.31	-	-	20.53	21.95			9.042						
Significance of F	*	*	*	*	-	-	*	*			*						

ns = Not Significant

* = Significant @ 90% Confidence

Note: Total Yield includes all size categories but does not include defects.

Texas Regional Trial

Black Gold Farms, Pearsall, TX - 2007

Harvest: Late

Planting Date: 1/19

Harvest Date: 5/18

DAP: 119

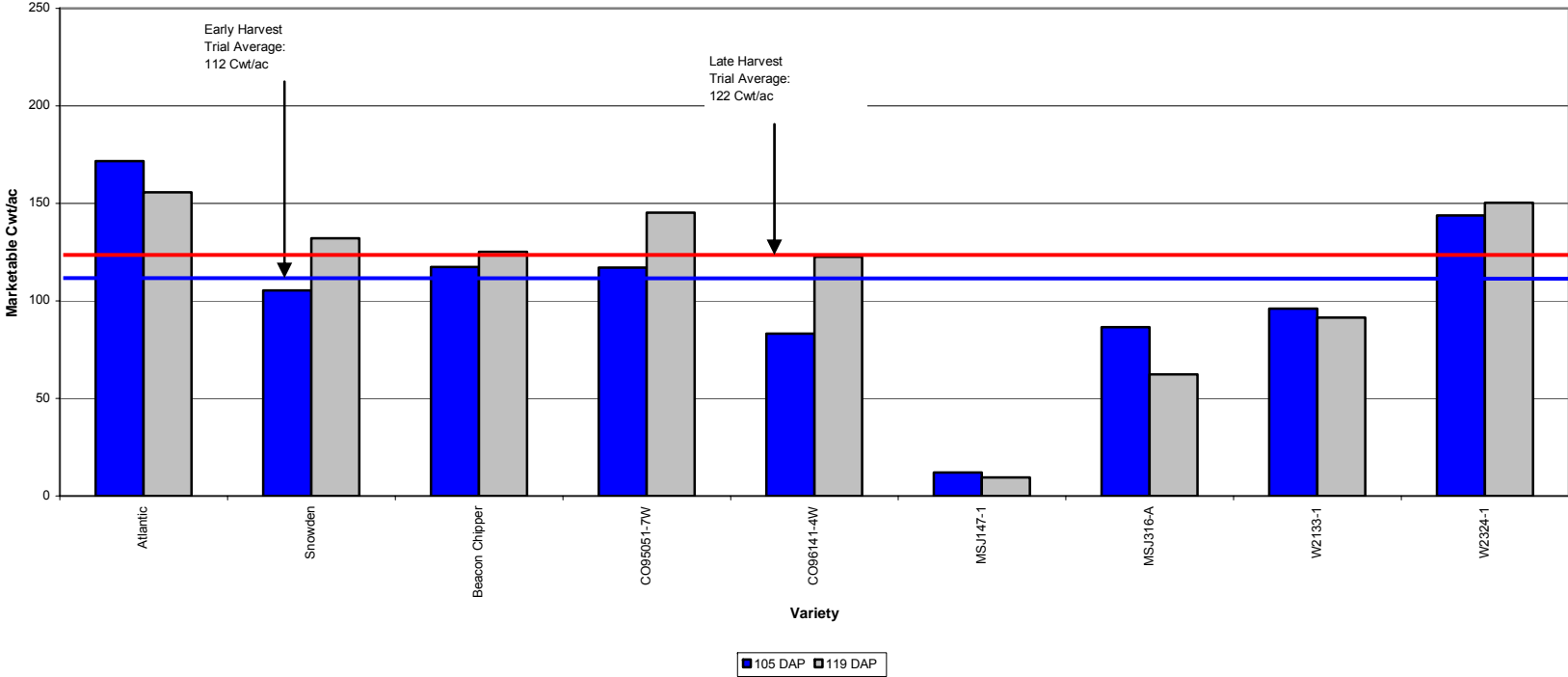
Variety	Vine Vigor	% Ground Cover	1 - 2"		> 4"		Marketable Yield			Total Yield Cwt/ac	Quality Assurance						
			tubers/ plant	Cwt/ac	tubers/ plant	Cwt/ac	2 - 4"				Specific Gravity	Cook Sample Defects					
							tubers/ plant	Cwt/ac	percent			CLR	% UC	% GRN	% ID	% ED	% Total
Atlantic	0.0	0.0	3.5	74.0	0.0	0.0	3.2	155.7	67.8	230	1.078	70	22.3	0.0	1.7	9.5	33.5
Snowden	0.0	0.0	4.2	88.0	0.0	0.0	2.7	132.1	60.0	220	1.067	70	12.0	0.0	2.5	0.0	14.5
Beacon Chipper	0.0	0.0	3.2	66.3	0.0	0.0	2.3	125.2	65.4	191	1.064	66	11.2	0.6	20.8	4.5	37.1
CO95051-7W	0.0	0.0	4.1	88.8	0.0	0.0	3.0	145.3	62.1	234	1.066	68	1.6	0.0	5.3	2.2	9.06
CO96141-4W	0.0	0.0	4.4	101.3	0.0	0.0	2.5	122.7	54.8	224	1.062	70	1.7	0.0	4.9	4.9	11.5
MSJ147-1	0.0	0.0	5.6	116.9	0.0	0.0	0.3	9.5	7.5	126	1.069	70	0.0	0.0	7.2	4.3	11.5
MSJ316-A	0.0	0.0	5.2	115.7	0.0	0.0	1.5	62.3	35.0	178	1.064	68	12.0	0.0	23.1	4.6	39.7
W2133-1	0.0	0.0	5.0	104.1	0.0	0.0	2.2	91.5	46.8	196	1.071	67	11.0	0.0	0.0	8.2	19.2
W2324-1	0.0	0.0	4.9	102.4	0.0	0.0	3.0	150.4	59.5	253	1.083	68	8.3	0.0	7.3	4.5	20.2
LSD (.10)	0.00	0.00	1.41	31.50	0.00	0.00	0.83	50.40			0.240						
Standard Deviation	0.00	0.00	0.83	18.56	0.00	0.00	0.49	29.70			0.141						
Coefficient of Variance	-	-	20.03	20.93	-	-	19.81	24.32			13.210						
Observed F Value	-	-	2.87	2.63	-	-	7.56	6.22			9.117						
Significance of F	-	-	*	*	-	-	*	*			*						

ns = Not Significant

* = Significant @ 90% Confidence

Note: Total Yield includes all size categories but does not include defects.

**USPB-SFA Chip Trial
Marketable Cwt/ac
Pearsall, TX 2007**



Harvest Field Notes - Texas Regional Trial Pearsall, TX

Atlantic	Tubers: Early Harvest:	Round to blocky in shape; Bright white flesh; Third highest tuber Specific Gravity; Fry defects due to vascular ring discoloration; Second highest yield behind Dakota Diamond; No oversize tubers (>4"); Average 6.5 tubers/plant (1-4"); 2% Hollow Heart;
	Late Harvest:	Round to blocky in shape; Bright white flesh; Second highest tuber Specific Gravity; Third highest yield; No oversize tubers (>4"); High fry defect levels mostly due to tuber soft rot with low levels of heat necrosis; Tuber soft rot due to <i>E. carotovora</i> and <i>P. erythroseptica</i> ; Average 6.7 tubers/plant (1-4"); Two tubers found with very light surface scab Marketable yield dropped 15.9 Cwt/A from the early to the late harvest due to tuber soft rot; 5.7% Hollow Heart;
	Vine: Early Harvest:	Medium vine; Green to light green in color; 48% Ground Cover; Moderate psyllid yellows symptoms in the above ground foliage;
	Late Harvest:	Vines were completely dead at the time of harvest.
Snowden	Tubers: Early Harvest:	Round to blocky in shape and slightly flat; Bright white flesh; Highest tuber Specific Gravity; Low total fry defects @ 1.88% total defects; Fry defects due to tuber soft rot; Below average marketable yield; Average 8.6 total tubers per plant (2.6 tubers/plant => 2"); No visual scab reported; 2.8% Hollow Heart;
	Late Harvest:	Round to blocky in shape and slightly flat; Bright white flesh; Below average Specific Gravity; Total fry defects @ 14.5% total defects; Fry defects due to tuber soft rot and vascular ring discoloration; Below average marketable yield; Average 8.6 total tubers per plant (2.6 tubers/plant => 2"); No visual scab reported;
	Vine: Early Harvest:	Short thin vine; Moderate level of psyllid yellows symptoms in all four plots; Lower 2/3 of the petioles have shed from the vines; Plant color is light green; Vines are quite short for snowden;
	Late Harvest:	Vines were completely dead at the time of harvest.
Beacon Chipper	Tubers: Early Harvest:	Blocky in shape; Slight taper towards the bud end of the tuber; Bright white flesh; 5.7 tubers/plant (2.2 tubers/plant => 2"); 6.79% total tuber fry defects; Tuber defects due to vascular ring discoloration; Specific gravity well below average; Surface to light pitted scab on 3.6% of the tubers;
	Late Harvest:	Round to blocky in shape; Bright white flesh; 5.5 tubers/plant (2.3 tubers/plant => 2"); 37.1% total tuber fry defects due mostly to vascular ring discoloration with low levels of tuber soft rot; Second lowest tuber specific gravity; Moderate level of tuber soft rot; 7.9% of the tubers had either surface or light pitted scab;
	Vine: Early Harvest:	Very short vine; Vine are light green to yellow; Severe psyllid yellows symptoms; Poor ground cover;
	Late Harvest:	Vines were completely dead at the time of harvest.

Harvest Field Notes - Texas Regional Trial Pearsall, TX

CO95051-7W Tubers: Early Harvest: Mostly blocky in shape; White flesh; 7.2 total tubers/plant (2.8 tubers/plant => 2.0"); No fry defects reported; Average specific gravity, less Atlantic, FL1867 and Snowden; Bright white chips;

Late Harvest: Mostly blocky in shape; White flesh; 7.1 total tubers/plant (3.0 tubers/plant => 2.0"); Below average tuber specific gravity; High % of tuber soft rot; 9.06% total tuber fry defects; Defects due to vascular ring discoloration;

Vine: Early Harvest: Very sort and thin vine; Vine color was light green to yellow; Moderate level Black Leg in 2 of the 4 plots; Moderate level of psyllid yellows symptoms in all four plots;

Late Harvest: Vines were completely dead at the time of harvest.

CO96141-4W Tubers: Early Harvest: Blocky to oblong in shape; A few pear shaped tubers; White flesh; 7.6 tubers/plant (1.8 tubers/plant =>2"); No tuber fry defects reported; Tuber defects due to vascular ring discoloration; Below average tuber specific gravity; Very light surface scab on a few tubers; Lots of undersize tubers; Below average marketable yield;

Late Harvest: Blocky to oblong in shape; A few pear shaped tubers; White flesh; 6.9 tubers/plant (2.5 tubers/plant =>2"); 11.5% total tuber fry defects; Tuber defects due to vascular ring discoloration; One tuber with possible ZC symptoms; Lowest tuber specific gravity of all varieties at the late harvest; Very light surface scab on a few tubers;

Vine: Early Harvest: Very short and thin vine with very poor ground cover; Vines exposed to the sunlight have turned purple in color; Light green to yellow vine color; Moderate level of psyllid yellows symptoms;

Late Harvest: Vines were completely dead at the time of harvest.

MSJ147-1 Tubers: Early Harvest: Mostly blocky in shape; Tubers are flat; A few tubers with moderate surface scab; Bright white flesh; Very thin brown slightly netted skin; Lowest marketable yield at 12.1 Cwt/A; Lots of undersize tubers (110 Cwt/A); Tubers are very uniform in size; No fry defects reported;

Late Harvest: Tubers are very flat; 7.3% of the tubers with moderate surface and or pitted scab; Moderate wet breakdown (6.7% on the raw grade); Lots of undersize tubers; Lowest yielding variety; Low tuber specific gravity; 11.5% total tuber fry defects; Fry defects due to stem end and vascular ring discoloration;

Vine: Early Harvest: Very short and thin vine; Very high incidence of Psyllid Yellows in all four replications; Vines will be completely dead in 3 - 5 days; Very poor ground cover

Late Harvest: Vines were completely dead at the time of harvest.

Harvest Field Notes - Texas Regional Trial Pearsall, TX

MSJ316-A	Tubers: Early Harvest: Round to block in shape; Fourth lowest yielding variety; 3.4% of the tubers had moderate levels of surface scab; Lowest average tuber specific gravity of all varieties tested; Very thin skin; Bright white flesh; Tubers are slightly flattened; Fourth lowest yielding variety; 11.9% total fry defects; Fry defects due to vascular ring discoloration;
	Late Harvest: Second lowest yielding variety; White flesh; 4.3% of the tubers had moderate levels of surface and pitted scab; Tubers are slightly flattened; Fourth lowest tuber specific gravity; 39.7% total fry defects; Fry defects mostly due to what appears to be Net Necrosis due to Potato Leafroll virus;
Vine:	Early Harvest: Short thin vine; Lots of small leaves throughout the canopy; % Ground Cover was rated as being the second highest at the early harvest; Approximately 10 - 14 days of vine growth left; Very high incidence of Psyllid Yellows;
	Late Harvest: Vines were completely dead at the time of harvest.

W2133-1	Tubers: Early Harvest: Below average yield; White flesh; Tubers can be very flat; Mostly round in shape; Below average tuber specific gravity; Very low total fry defects (2.1%) Very high number of undersize tubers; Tubers are fairly uniform in size;
	Late Harvest: Fourth lowest yielding variety; Slightly above average tuber specific gravity but less than Atlantic and Snowden; 19.2% total fry defects; Fry defects mostly due to tuber soft rot; 5.4 % tuber soft rot on the raw grade; 8.1% of the tubers had moderate levels of surface scab;
Vine:	Early Harvest: Very short and thin vine; Poor ground cover; High level of Psyllid Yellows; 3 - 5 days of vine growth remaining;
	Late Harvest: Vines were completely dead at the time of harvest.

W2324-1	Tubers: Early Harvest: Above average marketable yield but lower than Atlantic by 28 Cwt/A; Tuber specific gravity similar to Atlantic; Tubers are round to blocky; 2.6% of the tubers with moderate pitted scab with up to four lesions per tuber; Up to 10 - 15% of the tuber surface affected by scab on those tubers infected; High total tuber count; Lots of undersize tubers;
	Late Harvest: Marketable yield only increased by 8 Cwt/A from the early to the late harvest; Yield very similar to Atlantic; Highest tuber specific gravity at the late harvest; 20.2% total fry defects; Fry defects mainly due to tuber soft rot and vascular ring discoloration; 12.0% of the tubers with moderate levels pitted scab; Variety seems to be susceptible to tuber scab;
Vine:	Early Harvest: Very short vine; Lots of small leaves throughout the canopy; Moderate levels of Psyllid Yellows; Poor ground cover; 3 - 5 days of vine grow remaining
	Late Harvest: Vines were completely dead at the time of harvest.

Wisconsin Regional Trial

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Trial Site

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

Commercial Chip Processing Cooperator

Frito-Lay, Inc.

Technical Support

Jeff Breuer, Hancock Agricultural Research Station
Jolyn Rasmussen, Hancock Agricultural Research Station
Nancy Gilberts-Keegan, Hancock Agricultural Research Station
Janice Dukelow, Hancock Agricultural Research Station
Florence Johnson, 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, 2007 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 17, 2007 with special attention paid to cutting uniform-sized, blocky seed pieces ranging from 2 to 2½ oz in weight. Cut seed was placed in mesh plastic bags in well-ventilated plastic crates and held at 55°F for two days to promote drying and suberization prior to planting. Planting took place on April 19, 2007 using a custom-built Gallenberg 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 in the rows. 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 27, 2007 (130 days after planting) and harvested into plastic crates using a custom-built Gallenberg plot harvester on September 13, 2007.

Yield Data and Tuber Quality

Tubers were washed, graded and sized using a custom-built Gallenberg/Exeter grader and 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, specific gravity and internal defects were scored. Specific gravity was measured using a Weltech PW-2050 Dry Matter Assessment System (weight in air/weight in water method). Sixteen specific gravity measurements were taken for each variety. Average specific gravity data is presented in Table 3. Internal defects were assessed using a 30-tuber sample selected randomly to include all crates of each variety. Tubers were cut in half lengthwise using a custom-built potato splitter. One half was discarded and the other half evaluated for internal defects. Internal defects are listed in Table 4. External tuber defects and general tuber observations noted during grading are listed in Table 5.

Table 1. Total yield, U. S. No. 1 yield, <1 7/8" and culls, 2007.

Variety	Total Yield	U. S. No. 1 Yield (cwt)		<1 7/8 in.	Culls
	(cwt)	(cwt)	(%)	(%)	(%)
Atlantic	488	459	94	3	3
Beacon Chipper	474	454	96	2	2
CO95051-7W	391	351	90	9	2
CO96141-4W	432	401	93	6	1
MSJ147-1	339	289	85	14	1
MSJ316-A	504	474	94	4	2
Snowden	487	456	93	4	2
W2133-1	406	369	91	8	1
W2324-1	569	530	93	2	5

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

Table 2. U. S. No. 1 size distribution, 2007.

Variety	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
Atlantic	26	29	36	9	0	0
Beacon Chipper	20	29	40	11	0	0
CO95051-7W	63	31	6	0	0	0
CO96141-4W	36	38	24	2	0	0
MSJ147-1	62	27	10	0	0	0
MSJ316-A	28	35	31	6	0	0
Snowden	27	34	31	8	0	0
W2133-1	43	32	23	2	0	0
W2324-1	21	36	38	5	1	0

Table 3. Specific gravity, 2007.

Variety	Specific Gravity ¹
Atlantic	1.0871
Beacon Chipper	1.0686
CO95051-7W	1.0820
CO96141-4W	1.0723
MSJ147-1	1.0824
MSJ316-A	1.0832
Snowden	1.0773
W2133-1	1.0745
W2324-1	1.0819

Table 4. Internal defects, 2007.

Variety	Internal Defects (%)				
	BC	HH	IBS	VD	SED
Atlantic	10.0	0.0	0.0	0.0	0.0
Beacon Chipper	3.3	3.3	0.0	0.0	0.0
CO95051-7W	3.3	0.0	0.0	0.0	0.0
CO96141-4W	0.0	0.0	0.0	0.0	0.0
MSJ147-1	0.0	0.0	0.0	0.0	0.0
MSJ316-A	0.0	0.0	36.7	0.0	0.0
Snowden	3.3	0.0	0.0	0.0	0.0
W2133-1	0.0	0.0	0.0	0.0	0.0
W2324-1	0.0	0.0	0.0	0.0	0.0

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

Table 5. External tuber defects and general tuber observations, 2007.

Variety	External Defects and General Observations
Atlantic	Uniform type; slightly rough
Beacon Chipper	Stolons attached ++; slightly rough
CO95051-7W	Stolons attached +; small size profile
CO96141-4W	Smooth, bright white skin; uniform type; few culls
MSJ147-1	Stolons attached +; slightly rough tubers
MSJ316-A	Stolons attached +++
Snowden	Moderately rough
W2133-1	Slightly rough; few culls
W2324-1	Pitted scab +; stolons ++; moderately rough

Table 3. Overall average, percent size distribution and culls, specific gravity and out of field chip color for seven lines and two standards grown in FL, ID, ME, MI, NC, PA, RRV, TX and WI in 2007.

State	Clone or Variety	Yield (cwt/acre)		Percent Grade and Size Distribution					Specific Gravity	Field Chip Color	
		No.1	Total	No.1	Small	Mid-Size	Large	Culls		Agtron	SFA
FL	ATLANTIC	298	337	93	7	88	4	5	1.086		2.0
ID	ATLANTIC	428	527	81	15	75	6	4	1.095		1.6
ME	ATLANTIC	147	157	94	4	94	2	0	1.083		
MI	ATLANTIC	404	434	93	4	79	14	3	1.079	63.9	2.0
NC	ATLANTIC	314	339	93	4	89	3	4	1.081		1.0
PA	ATLANTIC	178	242	74	5	74	17	6	1.083	42.0	
RRV	ATLANTIC	280	319	88	4	89	6	1	1.104	61.0	2.0
TX	ATLANTIC	164	235	70	31	70	0	na	1.085	70.0	
WI	ATLANTIC	459	488	94	3	94	0	3	1.087		
average		297	342	87	9	83	6	3	1.087	59.2	1.7
FL	BEACON CHIPPER	254	286	91	8	90	1	2	1.081		2.0
ID	BEACON CHIPPER	393	459	86	12	76	9	3	1.089		1.2
ME	BEACON CHIPPER	220	279	79	1	79	17	3	1.068		
MI	BEACON CHIPPER	585	600	97	2	79	18	1	1.077	68.0	1.0
NC	BEACON CHIPPER	307	333	92	4	86	6	4	1.080		2.0
PA	BEACON CHIPPER	277	309	90	4	90	1	4	1.072	49.0	
RRV	BEACON CHIPPER	204	248	82	3	84	12	2	1.092	68.0	1.0
TX	BEACON CHIPPER	121	190	64	37	64	0	na	1.071	68.0	
WI	BEACON CHIPPER	454	474	96	2	96	0	2	1.069		
average		313	353	86	8	83	7	3	1.078	63.3	1.4
FL	CO95051-7W	298	365	83	15	83	0	2	1.070		4.0
ID	CO95051-7W	387	460	84	14	84	0	2	1.101		1.5
ME	CO95051-7W	215	225	96	5	96	0	0	1.074		
MI	CO95051-7W	238	279	85	15	85	0	0	1.074	64.0	2.0
NC	CO95051-7W	263	293	90	8	89	1	2	1.074		2.0
PA	CO95051-7W	165	189	87	9	87	0	4	1.068	41.0	
RRV	CO95051-7W	162	189	86	9	88	1	3	1.107	69.0	1.0
TX	CO95051-7W	131	217	61	40	61	0	na	1.076	70.0	
WI	CO95051-7W	351	391	90	9	90	0	2	1.082		
average		246	290	85	14	85	0	2	1.081	61.0	2.1

Table 3. Continued: Overall average, percent size distribution and culls, specific gravity and out of field chip color for seven lines and two standards grown in FL, ID, ME, MI, NC, PA, RRV, TX and WI in 2007.

State	Clone or Variety	Yield (cwt/acre)		Percent Grade and Size Distribution					Specific Gravity	Field Chip Color	
		No.1	Total	No.1	Small	Mid-Size	Large	Culls		Agtron	SFA
FL	CO96141-4W	312	379	83	16	82	0	1	1.080		4.0
ID	CO96141-4W	354	436	81	15	77	4	4	1.084		1.6
ME	CO96141-4W	273	280	98	3	98	0	0	1.065		
MI	CO96141-4W	366	385	95	5	92	3	0	1.067	61.4	2.0
NC	CO96141-4W	309	344	90	8	87	3	3	1.069		1.0
PA	CO96141-4W	237	258	92	5	92	1	2	1.068	45.0	
RRV	CO96141-4W	221	245	90	3	92	4	2	1.096	67.0	1.0
TX	CO96141-4W	103	216	48	53	48	0	na	1.071	69.0	
WI	CO96141-4W	401	432	93	6	93	0	1	1.072		
average		286	331	86	13	84	2	2	1.075	60.6	1.9
FL	MSJ147-1	185	272	68	29	67	1	1	1.083		2.0
ID	MSJ147-1	232	403	58	33	57	1	9	1.099		1.1
ME	MSJ147-1	107	135	80	20	80	0	0	1.073		
MI	MSJ147-1	184	259	71	29	71	0	0	1.085	59.7	2.0
NC	MSJ147-1	177	234	76	22	77	0	2	1.081		2.0
PA	MSJ147-1	142	219	65	32	65	0	3	1.078	46.0	
RRV	MSJ147-1	163	210	77	18	80	0	2	1.102	69.0	1.0
TX	MSJ147-1	11	124	9	91	9	0	na	1.079	70.0	
WI	MSJ147-1	286	339	84	14	84	0	1	1.082		
average		165	244	65	32	66	0	2	1.085	61.2	1.6
FL	MSJ316-A	301	364	84	14	84	0	2	1.071		3.5
ID	MSJ316-A	466	570	82	16	78	4	2	1.090		1.9
ME	MSJ316-A	165	213	78	10	78	12	0	1.065		
MI	MSJ316-A	351	384	92	7	89	3	1	1.076	64.0	2.0
NC	MSJ316-A	250	291	86	11	86	0	3	1.075		2.0
PA	MSJ316-A	295	336	88	5	88	0	6	1.072	49.0	
RRV	MSJ316-A	189	223	85	10	87	1	2	1.097	61.0	2.0
TX	MSJ316-A	75	175	43	57	43	0	na	1.069	69.0	
WI	MSJ316-A	474	504	94	4	94	0	2	1.083		
average		285	340	81	15	81	2	2	1.078	60.8	2.3

Table 3. Continued: Overall average, percent size distribution and culls, specific gravity and out of field chip color for seven lines and two standards grown in FL, ID, ME, MI, NC, PA, RRV, TX and WI in 2007.

State	Clone or Variety	Yield (cwt/acre)		Percent Grade and Size Distribution					Specific Gravity	Field Chip Color	
		No.1	Total	No.1	Small	Mid-Size	Large	Culls		Agtron	SFA
FL	SNOWDEN	337	364	94	6	93	0	1	1.078		3.0
ID	SNOWDEN	394	506	78	20	75	3	2	1.089		1.7
ME	SNOWDEN	174	189	92	8	92	0	0	1.072		
MI	SNOWDEN	487	501	97	3	81	16	0	1.078	61.8	2.0
NC	SNOWDEN	309	342	90	8	90	0	1	1.082		1.0
PA	SNOWDEN	283	326	87	8	87	1	4	1.077	44.0	
RRV	SNOWDEN	270	298	91	5	92	3	1	1.097	64.0	2.0
TX	SNOWDEN	119	218	55	46	55	0	na	1.082	70.0	
WI	SNOWDEN	456	487	94	4	94	0	2	1.077		
average		314	359	86	12	84	3	1	1.081	60.0	1.9
FL	W2133-1	327	360	91	8	86	6	0	1.078		5.0
ID	W2133-1	425	559	76	22	73	3	2	1.091		1.6
ME	W2133-1	188	221	85	15	85	0	0	1.066		
MI	W2133-1	378	403	94	5	84	10	1	1.083	61.4	2.0
NC	W2133-1	279	328	85	13	84	1	2	1.077		2.0
PA	W2133-1	253	299	85	10	85	1	5	1.075	42.0	
RRV	W2133-1	225	281	80	16	81	2	1	1.101	67.0	1.0
TX	W2133-1	94	198	48	53	48	0	na	1.078	68.0	
WI	W2133-1	369	406	91	8	91	0	1	1.075		
average		282	339	82	17	80	3	2	1.080	59.6	2.3
FL	W2324-1	365	388	96	3	88	8	2	1.082		4.0
ID	W2324-1	570	667	85	11	77	9	3	1.092		1.3
ME	W2324-1	315	354	89	4	89	8	0	1.078		
MI	W2324-1	564	598	95	3	82	13	2	1.081	62.9	2.0
NC	W2324-1	335	383	87	10	86	2	3	1.080		3.0
PA	W2324-1	258	326	79	4	79	2	15	1.082	39.0	
RRV	W2324-1	302	334	91	4	93	1	2	1.099	58.0	2.0
TX	W2324-1	147	246	60	40	60	0	na	1.087	68.0	
WI	W2324-1	530	569	93	2	93	1	5	1.082		
average		376	429	86	9	83	5	4	1.085	57.0	2.5

Table 4. Three year averages over nine regional USPB-SFA trial sites for MSJ316-A from 2005 to 2007.

State	Year	Yield (cwt/acre)		Percent Grade and Size Distribution					Specific Gravity	Field Chip Color	
		No.1	Total	No.1	Small	Med.	Large	Culls		Agtron	SFA
FL	2007	301	364	84	14	84	0	2	1.071		3.5
FL	2006	381	454	87	11	87	0	4	1.075	64.8	
FL	2005	334	429	78	19	79	1	3	1.086		
	average	339	416	83	15	83	0	3	1.077	64.8	3.5
ID	2007	466	570	82	16	78	4	2	1.090		1.9
ID	2006	450	546	82	15	79	4	2	1.089		3.5
ID	2005	349	470	74	25	73	1	1	1.097		1.2
	average	422	529	79	19	77	3	2	1.092		2.2
ME	2007	165	213	78	10	78	12	0	1.065		
ME	2006	184	220	84	7	71	12	9	1.071	71.7	
ME	2005	268	285	94	5	93	1	1	1.065	68.3	
	average	206	239	85	8	81	9	3	1.067	70.0	
MI	2007	351	384	92	7	89	3	1	1.076	64.0	2.0
MI	2006	411	437	94	5	82	12	1	1.083	58.8	2.0
MI	2005	380	420	91	7	82	9	2	1.079	59.5	3.0
	average	381	414	92	6	84	8	1	1.079	60.8	2.3
NC	2007	250	291	86	11	86	0	3	1.075		2.0
NC	2006	339	410	83	12	82	0	5	1.076	64.1	2.0
NC	2005	293	416	70	18	70	0	12	1.067		3.0
	average	294	372	80	14	79	0	7	1.073	64.1	2.3
PA	2007	295	336	88	5	88	0	6	1.072	49.0	
PA	2006	223	281	79	8	79	7	6	1.084		1.0
PA	2005	224	274	82	7	82	4	7	1.095	63.0	
	average	247	297	83	7	83	4	6	1.084	56.0	1.0
RRV	2007	189	223	85	10	87	1	2	1.097	61.0	2.0
RRV	2006	204	240	85	6	85	4	5	1.081	62.0	
RRV	2005	242	302	80	18	80	1	1	1.104	70.0	
	average	212	255	83	11	84	2	3	1.094	64.3	2.0
TX *	2007	75	175	43	57	43	0	na	1.069	69.0	
TX *	2006	187	271	69	31	69	0	na	1.072	72.0	
	average	131	223	56	44	56	0		1.071	70.5	
WI *	2007	474	504	94	4	94	0	2	1.083		
WI *	2006	520	598	87	4	87	7	3	1.085	70.2	
	average	497	551	91	4	91	4	3	1.084	70.2	
	overall average	302	365	82	14	80	3	3	1.080	64.7	2.2

Size categories: Small under 1 7/8 inch dia; Med. = 1 7/8 to 3 1/2 inch dia; Large over 3 1/2 inch dia.

* Texas and Wisconsin joined the USPB-SFA Regional Chip Trials in 2006.

Table 5. Three year averages over nine regional USPB-SFA trial sites for W2133-1 from 2005 to 2007.

State	Year	Yield (cwt/acre)		Percent Grade and Size Distribution					Specific Gravity	Field Chip Color	
		No.1	Total	No.1	Small	Med.	Large	Culls		Agtron	SFA
FL	2007	327	360	91	8	86	6	0	1.078		5.0
FL	2006	358	413	90	9	89	1	4	1.082	63.2	
FL	2005	255	298	86	12	86	1	2	1.081		
	average	313	357	89	10	87	3	2	1.080	63.2	5.0
ID	2007	425	559	76	22	73	3	2	1.091		1.6
ID	2006	488	595	82	13	70	12	5	1.095		3.0
ID	2005	339	486	70	29	66	3	1	1.090		1.2
	average	417	547	76	21	70	6	3	1.092		1.9
ME	2007	188	221	85	15	85	0	0	1.066		
ME	2006	138	202	68	5	68	0	27	1.081	69.4	
ME	2005	230	251	92	8	88	4	1	1.066	71.1	
	average	185	225	82	9	80	1	9	1.071	70.3	
MI	2007	378	403	94	5	84	10	1	1.083	61.4	2.0
MI	2006	401	442	91	8	88	3	1	1.084	57.2	1.0
MI	2005	304	336	91	8	83	8	1	1.084	59.1	2.0
	average	361	394	92	7	85	7	1	1.084	59.2	1.7
NC	2007	279	328	85	13	84	1	2	1.077		2.0
NC	2006	340	419	81	13	80	0	5	1.072	64.0	2.0
NC	2005	320	408	78	14	77	1	7	1.077		2.0
	average	313	385	81	13	80	1	5	1.075	64.0	2.0
PA	2007	253	299	85	10	85	1	5	1.075	42.0	
PA	2006	183	255	72	15	72	0	13	1.089		1.0
PA	2005	160	226	71	9	71	2	19	1.077	63.0	
	average	199	260	76	11	76	1	12	1.080	52.5	1.0
RRV	2007	225	281	80	16	81	2	1	1.101	67.0	1.0
RRV	2006	197	227	87	7	88	2	3	1.087	60.0	
RRV	2005	279	328	85	7	85	4	4	1.103	64.0	
	average	234	279	84	10	85	3	3	1.097	63.7	1.0
TX *	2007	94	198	48	53	48	0	na	1.078	68.0	
TX *	2006	198	267	74	26	74	0	na	1.077	72.0	
	average	146	233	61	40	61	0		1.077	70.0	
WI *	2007	369	406	91	8	91	0	1	1.075		
WI *	2006	450	529	85	3	85	8	4	1.075	65.5	
	average	410	468	88	6	88	4	3	1.075	65.5	
	overall average	287	349	81	14	79	3	5	1.082	63.3	

Size categories: Small under 1 7/8 inch dia; Med. = 1 7/8 to 3 1/2 inch dia; Large over 3 1/2 inch dia.

* Texas and Wisconsin joined the USPB-SFA Regional Chip Trials in 2006.

OUT-of-STORAGE CHIPPING EVALUATIONS

DATA FROM 2006 AND 2007 TRIALS

Idaho
Michigan
Pennsylvania
Red River Valley
Wisconsin



Table 1. 2006 USBP-SFA Chip Trial Grown at Aberdeen, Idaho.

CLONE	Out of Storage Quality Report				
	6 week cool down 6 weeks storage		3 week recondition	Percent Sugar Ends	Processing Defects
	Chip 40	Chip 50	Chip 40		
W2324-1	3.0	1.4	1.4	0	nice
MSJ461-1	4.4	1.3	2.7	13	dark color
W2133-1	3.0	1.0	1.1	0	nice
A91814-5	2.8	1.5	1.2	4	bruised
MSJ316-A	3.5	1.4	2.0	8	
Atlantic	3.6	1.7	2.7	4	hollow heart
Snowden	3.5	1.1	1.3	17	sugar ends
Beacon Chipper	2.8	1.0	1.6	4	hollow heart
CO95051-7W	3.0	1.1	1.4	0	
NY132	2.7	1.2	1.4	4	nice
MSJ147-1	2.0	1.1	1.1	0	hollow heart
AF2211-9	3.8	1.8	2.5	8	

Samples harvested September 25 and gradually cooled to 50°.
 Samples stored at 40 and 50° for 6 weeks.
 Samples reconditioned at 60° for 3 weeks.

OUT-OF-STORAGE CHIP QUALITY 2006-2007 MICHIGAN REGIONAL REPORT

Chris Long, Michigan State University

Procedure:

The 2006 USPB / SFA Chip Trial was harvested on September 28, 2006 at Sandyland Farms, LLC Howard City, MI. Several chip storage samples were collected for each variety at harvest. Two 40 pound samples were collected from each entry and placed in the cooperating grower's commercial storage for later evaluation in December 2006 and March 2007. Four, 25 tuber samples were also collected from each entry at harvest and stored in cold storage at the Michigan Potato Industry Commission's (MPIC) Cargill Potato Demonstration Storage Facility. Two samples were stored at approximately 55°F for a January and April 2007 evaluation. The remaining two, 25 tuber samples were stored at approximately 48°F to be evaluated in January and April 2007.

Results:

The first set of the 40 pound tuber samples placed in the grower's commercial storage was removed in December 2006 (Table 1). The second set of 40 pound tuber samples was evaluated in late March 2007 (Table 2). Table 3 summarizes the chip quality of the four, 25 tuber samples stored at the Cargill Potato Demonstration Storage Facility. In all tables, the varieties are listed in yield order from top to bottom, highest to lowest. CIPC was applied to all of the storage potato samples in November 2006.

As seen in Table 1, Herr Foods rated MSJ147-1 as having the best all around chip quality from these early storage samples. SFA chip color for MSJ147-1 was excellent and total defects were low. Specific gravity for MSJ147-1 was low at 1.074.

From Table 2, W2133-1 had the best overall appearance at Herr Foods when evaluated by a six person panel. MSJ147-1 had the best SFA color score in this table at 2.0

Table 3 summarizes the chip quality of the 25 tuber samples collected at harvest from each entry and stored at the MPIC demonstration storage in the fall of 2006. The samples were stored at approximately 48°F and 55°F and were chipped on January 15th and April 20th, 2007.

Table 1. 2006-2007 Out of Storage Chip Quality 12/13/06, Sandyland Farms, LLC ¹.

Entry	Agtron Color	SFA ² Color	Specific Gravity	Percent Chip Defects ³			Comments
				Internal	External	Total	
W2324-1	56.7	3.0	1.077	9	13	22	Shading in chips, light pitted scab, surface defects, nice uniform grade.
MSJ461-1	54.3	3.5	1.075	27	1	28	Lots of shading, poor color, nice externals, good uniform grade, nice average size.
A91814-5	53.6	4.0	1.081	24	7	31	Vascular, shading - poor, a few green, some pitted scab, range from 1 1/4"- 4 1/2", not uniform.
MSJ316-A	53.2	4.0	1.074	59	2	61	Dark blotches, heavy shading, nice external appearance, large grade, some tubers 3 1/2" this is acceptable but not ideal.
W2133-1	58	2.0	1.075	4	6	10	Some light shading, very few defects, nice size (2 1/2" - 3 1/2")
Beacon Chipper	62	1.5	1.076	10	4	14	Nice chip color!, very few light stem-end vascular, a few hollow heart, nice externals, large grade, some oversize (3 3/4")
AF2211-9	56	3.0	1.076	10	4	14	Light shading throughout, a few light pitted scab, decent grade, a little small.
NY132	56.2	3.0	1.081	36	3	39	Uneven shading in chips, nice externals, large, some oversize.
Atlantic	52.0	4.5	1.082	42	8	50	Very dark chip sample, shading in 95 %, some hollow heart, light pitted scab, oversized (some 4"), internal defects mostly-shading
Snowden	56.5	3.0	1.074	12	11	23	Shading in 50 % of sample, 1 or 2 pitted scab otherwise nice external, good uniform size.
MSJ147-1	62.9	1.0	1.075	4	2	6	Excellent chip color, very nice externals, good size and grade.
CO95051-7W	56.7	2.5	1.076	11	6	17	Light shading chip sample, very few external defects, good size uniform grade (2-3")

¹ Samples removed from 54 °F storage and processed by Herr Foods Inc., Nottingham, PA on December 13, 2006.

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. 2006-2007 Out of Storage Chip Quality, 3/29/07, Sandyland Farms, LLC¹

Entry	Agrtron Color	SFA ² Color	Specific Gravity	Percent Chip Defects ³			Comments
				Internal	External	Total	
W2324-1	50.8	3.5	1.080	47	12	59	Very poor chip color, light scab, nice size.
MSJ461-1	50	5.0	1.072	57	1	58	Very poor chip color, very nice external appearance, small grade.
A91814-5	55.1	5.0	1.082	41	14	55	Poor chip color, (internal defects-shading), moderate pitted scab, good size.
MSJ316-A	58.8	5.0	1.077	19	1	20	Some blotches on vascular ring area, light shading in chips, nice externals, good size.
W2133-1	56.7	3.0	1.074	7	15	22	A few chips with light bruise & shading, otherwise nice chip color, very nice external appearance, very nice size profile.
Beacon Chipper	53.6	2.5	1.075	23	11	34	Poor chip color, very nice external appearance, large grade
AF2211-9	46.5	4.0	1.077	71	15	86	Blotches on vascular ring, very poor chip color, some fusarium, light scab, nice size.
NY132	57.9	4.0	1.087	16	3	19	Chip sample marginal, a few bruises, nice externals, very nice size
Atlantic	47.9	5.0	1.078	64	11	75	Poor chip color, nice externals, good size.
Snowden	47.6	3.5	1.077	57	11	68	Poor chip color, light scab, nice size
MSJ147-1	54.4	2.0	1.079	25	10	35	A few hollow heart, poor chip color, most internal defects from shading, most external defects are minor, size good, some small
CO95051-7W	49.9	3.5	1.072	31	10	40	Brown centers, poor chip color, good externals, good size.

¹ Samples removed from 48 °F storage and processed by Herr Foods Inc., Nottingham, PA on March 29, 2007.

Chip defects are included in Agrtron 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. 2006-2007 Out of Storage Chip Quality Samples, Cargill Storage¹

ENTRY	55.6°F January 15, 2007					54.6°F January 16, 2007					48°F April 20, 2007					53.8°F April 20, 2007 ⁴				
	SFA ² COLOR		CHIP Defects ³			SFA ² COLOR		CHIP Defects ³			SFA ² COLOR		CHIP Defects ³			SFA ² COLOR		CHIP Defects ³		
	HH	BC	IBS	VD	SED	HH	BC	IBS	VD	SED	HH	BC	IBS	VD	SED	HH	BC	IBS	VD	SED
W2324-1	1.0	4%		8%		1.0	4%	8%	32%	8%	2.0			4%	8%	2.0			12%	24%
MSJ461-1	1.0			30%	30%	1.0				24%	1.0			4%	16%	1.0			8%	8%
A91814-5	1.0	12%		8%	16%	1.0			4%	16%	1.0				32%	1.0			8%	40%
MSJ316-A	1.0			4%		1.0				8%	1.0			4%		1.0			20%	
W2133-1	1.0					1.0			4%		1.0			8%	16%	1.0			12%	8%
Beacon Chipper	1.0		4%	12%	24%	1.0					2.0	4%		16%	32%	3.0	4%		4%	8%
AF2211-9	1.0	12%			8%	1.0	4%		4%	8%	2.0			8%		2.0		8%		16%
NY132	1.0	4%			8%	1.0				24%	1.0	4%			8%	1.0			4%	
Atlantic	1.0			24%	56%	1.0			4%	32%	2.0				32%	1.0			4%	16%
Snowden	1.0			12%	16%	1.0	4%		32%	16%	3.0			8%	12%	8%	2.0		12%	8%
MSJ147-1	1.0			4%	8%	1.0			8%	8%	1.0	4%		4%		1.0			8%	24%
CO95051-7W	1.0			4%		1.0		4%	4%		1.0			8%		1.0			20%	16%

¹ Samples Stored at the Michigan Potato Industry Commission's Cargill Potato Demonstration Storage

² SFA 1-5 Color Score; 1 = lightest, 5 = darkest

³ HH = hollow heart, BC = brown center, IBS = internal brown spot, VD = vascular discoloration; SED = stem end discoloration in finished chips.

⁴ These tubers were held at 48°F until February 26, 2007 at which time they were placed in 53.8°F until removal on April 19, and processed on April 20, 2007.

Pennsylvania Regional Trial

Table 1. 2006 USPB-SFA varieties storage and chipping information.														
			Average sprout length in inches. ²											
			15-Jan-03			15-Feb-03			15-Mar-03			15-Apr-03		
Entry	Agtron Color Score ¹	Specific Gravity ¹	41°F	45°F	notes	41°F	45°F	notes	41°F	45°F	notes	41°F	45°F	notes
A91814-5	63	1.085	0.0	0.0		0.0	0.7		0.5	1.3		1.3	2.8	
MSJ147-1	54	1.086	0.2	0.2		0.3	1.2		0.5	1.2		0.7	2.5	
MSJ461	54	1.080	0.0	0.0		0.3	0.3		0.2	0.8		0.8	2.3	
CO95051-7W	57	1.083	0.0	0.0		0.2	1.0		0.7	3.0		1.7	4.7	
MSJ316-A	56	1.082	0.0	0.0		0.2	0.7		0.0	1.7		0.7	2.5	
W2324-1	61	1.095	0.5	0.8		0.5	2.3		1.0	4.2		1.8	5.8	
AF2211-9	54	1.080	0.0	0.0		0.0	0.7		0.3	1.5		0.7	2.8	
Beacon Chipper	61	1.074	0.0	0.3		0.2	1.8		0.2	2.8		1.0	7.0	
NY 132	63	1.084	0.0	0.8		0.0	0.7	45°b	0.0	4.2	45°b	0.7	2.8	45°b
W2133-1	54	1.087	0.0	0.3		0.0	0.8		0.5	2.3		0.8	2.7	
Snowden	62	1.086	0.0	0.5		0.5	1.5		0.5	3.0		1.5	3.8	45°c
Atlantic	55	1.090	0.2	0.3		0.7	1.3		0.8	1.8		2.0	3.8	45°b

a = samples less than 0.5" were reported as 0.5"

b = minor tuber shrinkage

c = major tuber shrinkage

1 Out-of-storage samples held at 52F in grower storage and processed by Snyder of Berlin 13-Apr-07 without reconditioning.

2 Sprout length data processed by Penn State University, Dept of Horticulture, University Park, PA

Red River Valley Regional Trial

6 MONTHS STORAGE DATA ON 2006 CROP

Chip and Sugar data collected on 4/2/2007 (RC on 4/16/2007)

VARIETY or CLONE	48F			
	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC	1	65	1.353	0.167
SNOWDEN	1	69	1.801	0.184
A 91814-5	1	72	0.899	0.045
AF 2211-9	2	63	1.847	0.254
BEACON CHIPPER	1	72	1.159	0.045
CO 95051-7W	1	66	1.526	0.016
MSJ 147-1	1	68	1.471	0.043
MSJ 316-A	1	69	0.765	0.005
MSJ 461-1	1	72	1.282	0.054
NY 132	1	71	0.656	0.026
W 2133-1	1	71	0.442	0.021
W 2324-1	1	68	0.263	0.002

45F			
CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
2	62	1.920	0.921
2	64	1.389	0.189
2	63	0.916	0.142
3	50	1.467	0.962
1	65	1.645	0.237
2	64	1.156	0.030
2	62	2.145	0.106
1	69	1.083	0.063
1	68	1.613	0.094
1	69	1.028	0.045
1	66	0.579	0.175
2	61	0.705	0.410

VARIETY or CLONE	42F			
	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC	3	48	5.605	0.967
SNOWDEN	2	56	2.512	0.813
A 91814-5	2	60	0.959	0.196
AF 2211-9	4	40	2.173	2.402
BEACON CHIPPER	3	54	4.657	0.787
CO 95051-7W	1	66	1.755	0.061
MSJ 147-1	2	63	2.576	0.159
MSJ 316-A	1	68	1.494	0.123
MSJ 461-1	3	52	2.397	0.235
NY 132	2	61	2.278	0.376
W 2133-1	2	57	0.704	0.517
W 2324-1	2	56	0.756	0.937

42RC			
CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
3	54	1.668	0.622
2	61	1.852	0.132
1	68	0.789	0.061
3	51	4.276	0.930
2	62	2.026	0.051
2	62	1.282	0.025
2	63	1.682	0.087
2	64	0.820	0.012
2	61	1.313	0.135
1	66	1.471	0.180
2	61	0.499	0.039
2	58	0.558	0.377

VARIETY or CLONE	38F			
	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC	4	36	13.159	3.213
SNOWDEN	4	42	5.033	2.778
A 91814-5	4	44	5.092	2.310
AF 2211-9	5	28	16.775	6.687
BEACON CHIPPER	3	47	13.035	1.372
CO 95051-7W	3	53	11.944	0.604
MSJ 147-1	4	44	6.921	1.164
MSJ 316-A	4	40	12.719	1.244
MSJ 461-1	4	41	10.129	1.838
NY 132	3	53	12.581	1.879
W 2133-1	5	33	2.677	2.448
W 2324-1	5	31	3.328	4.560

38RC			
CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
4	42	7.416	1.852
3	53	2.626	0.493
3	48	1.777	0.126
4	40	9.845	3.250
2	56	9.616	0.360
2	60	2.108	0.173
2	56	3.488	0.450
2	62	3.584	0.155
2	62	4.373	0.275
1	66	5.193	0.191
2	56	0.829	0.146
3	52	1.293	0.821

Note: This is the fourth chipping and sugar measurement data set from 6 months storage on 4/2/2007.

This trial was grown in Hoople, ND in 2006 in cooperation with Oberg Farms and Duane Preston.

Data on chip color and sugar levels from out of the field, 2 months storage (11/29/2006), and 4 months storage (2/2/2007) are presented on page 56 of the 2006 USPB/SFA Chip Variety Trials annual report.

RC = Reconditioning of 42F and 38F samples was done for two weeks at 55F.

Red River Valley Regional Trial
4 MONTHS STORAGE DATA ON 2007 CROP

VARIETY CLONE		TEMP	DATE	INTERNALS	SPECIFIC GRAVITY	CC	AGT	SUCROSE (mg/g)	GLUCOSE (mg/g)
ATLANTIC	PREHARVEST		8/21/07	2 HH	1.102	1	68	3.6346	0.0394
	PREHARVEST		8/28/07	1 HH	1.104	1	70	2.0671	0.0083
	PREHARVEST		9/4/07		1.110	2	64	0.5963	0.0050
	0 TIME		9/17/07	1 HH	1.104	2	61	2.1863	0.1595
	OCTOBER	50F	10/29/07	3HH	1.089	3	46	1.5767	1.0138
		45F	10/29/07	1HH	1.105	4	43	2.5942	1.4483
	NOVEMBER	50F	11/26/07	2HH	1.095	2	59	1.3947	0.7549
		45F	11/26/07	4HH	1.091	3	49	2.8096	1.2274
	DECEMBER	50F	12/26/07		1.088	2	59	1.1124	0.8782
		45F	12/26/07	2HH	1.080	2	58	2.6858	1.9983
	JANUARY	50F	1/29/08	1 HH	1.089	2	60	1.3113	0.3442
		45F	1/29/08		1.088	2	57	1.4300	0.7957

BEACON CHIPPER	PREHARVEST		8/21/07		1.084	1	72	2.5667	0.0481
	PREHARVEST		8/28/07		1.092	1	72	1.5354	0.0138
	PREHARVEST		9/4/07		1.095	1	69	1.0001	0.0193
	0 TIME		9/17/07		1.092	1	68	1.4804	0.0706
	OCTOBER	50F	10/29/07		1.088	2	55	2.0258	0.6655
		45F	10/29/07		1.093	2	55	2.2046	0.7370
	NOVEMBER	50F	11/26/07		1.089	2	63	1.2183	0.4973
		45F	11/26/07	2HH1BC	1.086	2	59	2.7546	0.7278
	DECEMBER	50F	12/26/07		1.087	2	64	0.5518	0.1613
		45F	12/26/07		1.090	2	57	2.7317	0.8291
	JANUARY	50F	1/29/08		1.085	1	67	0.4299	0.0633
		45F	1/29/08		1.086	2	56	1.9296	0.5990

CO95051-7W	PREHARVEST		8/21/07		1.092	1	69	0.8232	0.0110
	PREHARVEST		8/28/07		1.098	1	73	0.9497	0.0041
	PREHARVEST		9/4/07		1.097	1	69	0.4533	0.0069
	0 TIME		9/17/07		1.107	1	69	1.5858	0.0303
	OCTOBER	50F	10/29/07	1BC	1.110	2	56	1.7233	0.2920
		45F	10/29/07	1VD	1.105	3	53	2.0854	0.3016
	NOVEMBER	50F	11/26/07		1.101	1	67	1.1500	0.0399
		45F	11/26/07		1.085	2	59	2.8371	0.3277
	DECEMBER	50F	12/26/07		1.107	1	69	1.3099	0.0490
		45F	12/26/07		1.095	1	67	1.3924	0.1769
	JANUARY	50F	1/29/08		1.089	1	65	0.7833	0.0252
		45F	1/29/08		1.095	1	65	1.5079	0.1357

CO96141-4W	PREHARVEST		8/21/07		1.081	1	72	0.7636	0.0138
	PREHARVEST		8/28/07		1.090	1	71	0.6637	0.0028
	PREHARVEST		9/4/07		1.097	1	68	0.3887	0.0073
	0 TIME		9/17/07		1.096	1	67	1.0244	0.0303
	OCTOBER	50F	10/29/07		1.084	2	60	1.0546	0.2778
		45F	10/29/07		1.095	2	58	1.8425	0.4405
	NOVEMBER	50F	11/26/07		1.086	1	68	0.7874	0.2058
		45F	11/26/07		1.088	2	58	1.8792	0.4070
	DECEMBER	50F	12/26/07		1.088	1	69	0.5321	0.2085
		45F	12/26/07		1.085	2	58	1.6683	0.7842
	JANUARY	50F	1/29/08		1.084	1	67	0.5450	0.0660
		45F	1/29/08		1.085	2	56	2.6996	0.6495

MSJ147-1	PREHARVEST		8/21/07		1.091	1	72	0.6123	0.0142
	PREHARVEST		8/28/07		1.092	1	72	0.8126	0.0032
	PREHARVEST		9/4/07		1.107	1	69	0.4735	0.0156
	0 TIME		9/17/07		1.102	1	69	0.8754	0.0096
	OCTOBER	50F	10/29/07	2HH	1.091	1	66	1.4713	0.0536
		45F	10/29/07		1.102	2	64	2.0763	0.0784
	NOVEMBER	50F	11/26/07		1.099	1	68	0.7682	0.0124
		45F	11/26/07		1.095	1	69	1.6225	0.0752
	DECEMBER	50F	12/26/07	1HH	1.092	1	70	1.0473	0.0472
		45F	12/26/07		1.090	1	73	1.3759	0.0578
JANUARY	50F	1/29/08		1.086	1	68	0.6550	0.0289	
	45F	1/29/08		1.096	1	66	0.9740	0.0307	

MSJ316- A	PREHARVEST		8/21/07		1.083	1	69	1.7463	0.0147
	PREHARVEST		8/28/07		1.089	1	69	1.1119	0.0078
	PREHARVEST		9/4/07		1.093	1	66	0.6082	0.0147
	0 TIME		9/17/07		1.097	2	61	3.4421	0.1370
	OCTOBER	50F	10/29/07		1.089	3	46	2.3375	0.9671
		45F	10/29/07		1.095	3	48	3.4054	0.8012
	NOVEMBER	50F	11/26/07		1.097	2	56	1.2398	0.4134
		45F	11/26/07		1.091	4	43	2.1221	0.7159
	DECEMBER	50F	12/26/07		1.086	2	59	0.6518	0.1325
		45F	12/26/07		1.091	3	54	2.4979	1.3933
JANUARY	50F	1/29/08		1.082	1	65	0.4524	0.1169	
	45F	1/29/08		1.082	3	51	1.3700	0.8800	

SNOWDEN	PREHARVEST		8/21/07		1.086	1	69	1.6317	0.0197
	PREHARVEST		8/28/07		1.090	1	71	0.8883	0.0078
	PREHARVEST		9/4/07	1 HH	1.100	1	70	0.7714	0.0078
	0 TIME		9/17/07		1.097	2	64	1.5171	0.1682
	OCTOBER	50F	10/29/07	1HH	1.094	3	52	1.5308	0.2053
		45F	10/29/07		1.097	2	55	1.8288	0.6903
	NOVEMBER	50F	11/26/07	1HH	1.096	1	67	1.2714	0.1966
		45F	11/26/07		1.090	2	58	1.2247	0.2548
	DECEMBER	50F	12/26/07	2HH	1.087	1	70	0.5867	0.0170
		45F	12/26/07		1.097	1	66	1.1330	0.3254
JANUARY	50F	1/29/08	1 HH	1.086	1	67	0.5587	0.0183	
	45F	1/29/08		1.091	1	63	1.2696	0.3561	

W 2133-1	PREHARVEST		8/21/07		1.086	1	66	4.6063	0.0669
	PREHARVEST		8/28/07		1.094	1	70	1.7463	0.0064
	PREHARVEST		9/4/07	2 HH	1.094	1	67	0.8850	0.0083
	0 TIME		9/17/07		1.101	1	67	1.7233	0.0999
	OCTOBER	50F	10/29/07		1.088	3	51	1.3979	0.6848
		45F	10/29/07		1.092	3	52	1.8838	0.8786
	NOVEMBER	50F	11/26/07		1.092	2	60	1.0537	0.2507
		45F	11/26/07		1.096	3	50	1.3814	0.7893
	DECEMBER	50F	12/26/07	1BC	1.089	2	64	0.5683	0.0981
		45F	12/26/07		1.089	2	61	1.0024	0.7535
JANUARY	50F	1/29/08		1.082	1	67	0.4295	0.0197	
	45F	1/29/08		1.082	1	65	0.8003	0.3085	

W 2324-1	PREHARVEST		8/21/07		1.084	2	64	3.6804	0.0724
	PREHARVEST		8/28/07		1.089	1	66	1.8333	0.0587
	PREHARVEST		9/4/07		1.104	1	67	0.4285	0.0220
	0 TIME		9/17/07		1.099	2	58	1.1284	0.0995
	OCTOBER	50F	10/29/07		1.087	2	57	1.0262	0.2324
		45F	10/29/07		1.097	2	55	1.5721	0.6320
	NOVEMBER	50F	11/26/07		1.099	2	61	0.9153	0.1632
		45F	11/26/07		1.093	2	55	1.0010	0.3676
	DECEMBER	50F	12/26/07		1.082	1	69	0.4033	0.0454
		45F	12/26/07		1.088	2	62	0.6545	0.4721
JANUARY	50F	1/29/08		1.088	1	68	0.5147	0.2255	
	45F	1/29/08		1.086	2	58	0.6371	0.3323	

**OUT-OF-STORAGE CHIP QUALITY
2006-2007 WISCONSIN REGIONAL REPORT**

Processing Studies

Samples for processing were drawn from plots following grading. Enough 2-13 oz tubers to fill nine 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 with supplemental humidity for four weeks to promote wound healing. Following wound healing, three crates of each variety were moved to long-term storage. Long-term storage lockers were set at 55°F initially and lowered 0.1°F per 12 hrs until final set points of 42°F, 45°F, and 48°F were reached. The first processing was done on October 11, 2007. Ten tubers were selected randomly from each variety held at each storage temperature for processing into chips. Samples were processed directly from storage with no warming period. 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 and then drained on paper towels. The slices were placed in a specially designed wire basket to hold them flat while frying. The slices were fried in refined soybean oil at 365°F for two minutes and 30 seconds. Slices were drained in the frying basket for a short period of time and then placed on paper towels for further draining. Chips from each storage temperature were scored visually within one hour after frying. Processed chip samples were evaluated visually and scored on a scale of 1-10 according to the Potato Chip International Institute (PCII) color chart. Scores presented in Table 6 are an average of the 10 chips in each sample. Table 7 presents long-term storage processing data from the 2006 trial that was not available when the 2006 final report was published. A score of 1 represents the lightest color and 10 the darkest color. Scores of 4 or less are considered acceptable color. Samples consisting of 12 medium-sized tubers of each variety stored at 48°F were collected for commercial processing by Frito-Lay, Inc on February 13, 2008. Results of the Frito-Lay evaluation are presented in Tables 8 and 9.

Table 6. Processing scores by date and storage temperature, 2007-08 storage season.

Variety	10/11/07	1/15/08		
	55°F	42°F	45°F	48°F
Atlantic	3.0	7.0	7.7	6.3
Beacon Chipper	4.0	4.9	6.4	4.0
CO95051-7W	3.8	3.5	4.7	3.6
CO96141-4W	3.2	5.9	8.1	5.9
MSJ147-1	2.7	2.8	5.6	3.2
MSJ316-A	4.7	7.8	8.4	6.1
Snowden	3.7	2.8	4.5	2.9
W2133-1	3.0	3.5	5.2	2.9
W2324-1	5.0	4.2	6.0	3.8
Scores of 4 or less are considered acceptable color.				

Table 7. Processing scores by date and storage temperature, 2006-07 storage season.

Variety	1/23/07			3/27/07			5/31/07		
	42°F	45°F	48°F	42°F	45°F	48°F	42°F	45°F	48°F
Atlantic	8.7	7.1	6.4	9.0	7.4	6.3	8.6	7.9	6.6
Beacon Chipper	5.0	4.6	4.1	8.8	6.6	3.6	7.7	4.7	3.3
CO95051-7W	7.0	4.0	3.1	7.7	3.5	3.0	6.5	3.1	4.5
MSJ147-1	7.2	4.5	2.6	7.2	4.7	2.8	7.1	6.4	4.3
MSJ316-A	8.2	5.9	6.2	9.1	6.1	5.1	7.6	6.9	3.7
Snowden	7.1	5.5	4.4	7.5	4.4	3.0	6.4	7.3	7.7
W2133-1	8.5	6.6	4.4	7.9	4.4	2.0	4.4	3.6	2.9
W2324-1	7.4	3.6	2.8	8.8	4.7	4.4	7.5	5.2	5.0

Scores of 4 or less are considered acceptable color.

Table 8. Processing scores for samples evaluated by Frito-Lay, Inc., 2007.

Variety	Sucrose	Glucose	Hunter Values			Specific Gravity
			L-value	A-value	B-value	
Atlantic	0.729	0.4111	59.48	7.57	25.35	1.0862
Beacon Chipper	0.624	0.2613	65.69	2.39	24.62	1.0742
CO95051-7W	0.650	0.0502	68.13	0.70	24.12	1.0850
CO96141-4W	1.541	0.4551	63.51	4.88	24.71	1.0693
MSJ147-1	0.573	0.0765	67.10	-0.45	22.64	1.0824
MSJ316-A	0.836	0.4386	65.88	2.33	24.58	1.0756
Snowden	0.452	0.0267	67.71	0.08	23.67	1.0836
W2133-1	0.404	0.0532	66.02	1.01	24.58	1.0728
W2324-1	0.407	0.1458	65.32	1.37	23.33	1.0826

Table 9. Defect scores for samples evaluated by Frito-Lay, Inc., 2007.

Variety	Internal	External	Undesirable	Greening	Total
	Discolor. (%)	Discolor. (%)	Color (%)	(%)	Defects (%)
Atlantic	26	43	31	0	100
Beacon Chipper	33	8	5	0	46
CO95051-7W	0	17	9	0	26
CO96141-4W	34	0	40	0	74
MSJ147-1	25	6	0	0	31
MSJ316-A	61	12	0	0	73
Snowden	12	8	0	0	20
W2133-1	0	11	0	9	20
W2324-1	22	9	0	0	31

Table 6. USPB-SFA Chip Trial Entry Summary: 1985 - 2007

Atlantic, 1985-2007 and Snowden, 1988-2007 as Standards

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