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# 2010 USPB/SFA Chip Variety Trials

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

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## **TABLE OF CONTENTS**

Introduc	ction, Procedure and Overview	Page 3
Table 1.	Seed Acreage of Current Chipping Varieties	4
Table 2.	Characteristics of the 2008 USPB-SFA Chip Trial Entries	5
Regional	l Trial Reports:	
-	California	8
	Florida	10
	Idaho	14
	Maine	17
	Michigan	26
	Missouri	36
	North Carolina	39
	Pennsylvania	<b>48</b>
	Red River Valley	50
	Wisconsin	52
Table 3.	Summary of performance of fourteen lines in 2010 trials	55
Table 4.	Three-year averages for AF2291-10 (2008-2010)	60
Table 5.	Three-year averages for CO97043-14W (2008-2010)	61
Table 6.	Three-year averages for CO97065-7W (2008-2010)	62
Table 7.	Three-year averages for NY138 (2008-2010)	63
Table 8.	Three-year averages for NY139 (2008-2010)	64
Table 9.	Three-year averages for W2717-5 (2008-2010)	65
Table 10	. Three-year averages for standard Alantic (2008-2010)	66
Table 11	. Three-year averages for standard Snowden (2008-2010)	67
Table 12	. USPB-SFA Chip trial entry summary (1985-2010)	68

## **2010 USPB/SFA Potato Chip Trial Results**

#### Dr. Donald Halseth – Chip Trial 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 national potato chip variety trials, which were initiated by the SFA in 1985. The ten trial locations in 2010 were California, Florida, Idaho, Maine, Michigan, Missouri, North Carolina, Pennsylvania, the Red River Valley, and Wisconsin.

In the past USPB-SFA annual reports provided field yield data for the most recent season along with chipping data from the previous year's trials. In an effort to get the yield data out earlier, and to consolidate all the chipping data for a storage season into one report once all the storage trials were concluded, there will now be two annual reports. This report represents all the field yield trial data and performance notes for the ten USPB-SFA Chip Trials grown in 2010. A second report on storage temperature and duration, sugar levels and chip quality for the 2010-2011 storage experiments will follow once those studies have been completed.

#### PROCEDURE

Trial entries are selected for three years of USPB-SFA sponsored chip trials by University and USDA potato breeders and USPB-SFA Chip Committee members who have been strong collaborators in this project. The fourteen advanced breeding lines and newly released varieties evaluated in 2010 were AF2291-10, CO97043-14W, CO97065-7W, MSJ126-9Y, MSL292-A, MSQ086-3, ND7519-1, NY138, NY139, W2310-3, W2324-1, W2717-5, W2978-3, and W5015-12, which were compared with the chip industry standards Atlantic and Snowden. Trial coordinators established trials in ten states with grower or research farm plots where entries were grown using standard cultural practices. Note that while eleven entries were tested in all ten states, ND7519-1 was only trialed in ND while MSQ086-3 and W2324-1 (this line in a 5<sup>th</sup> year of trials) were only trialed in CA, FL, MO and NC. Observation on emergence, growth characteristics and maturity are made during the growing season. Yield, tuber size distribution, external and internal defects, specific gravity and other plant and tuber characteristics were evaluated at harvest. Storage samples were held in grower and university storages 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 8-55 show the yield, percent size distribution, and specific gravity data obtained at each of the ten regional locations. Table 3 (pages 56-60) summarizes the overall average yield, percent size distribution and specific gravity for each of the fourteen clones grown in one to ten regional trial sites in 2010. Six entries (AF2291-10, CO97043-14W, CO97065-7W, NY138, NY139, and W2717-5) completed three years of trials from 2008 through 2010 and will be replaced with new entries in 2011. A three year summary of performance data for these six lines is presented in Table 4 though Table 9 (with comparison data for Atlantic and Snowden provided in Tables 10 and 11, respectively), including both annual and three-year averages over all states.

Variety	Year	2004	2005	2006	2007	2008	2009	2010
	Released							
1 Atlantic	1976	3635	2592	2693	2806	2604	2824	2811
2 Snowdon	1000	1627	1664	1847	1704	1477	1640	1735
2. Showuch 3. Dakota Poarl	1990	1868	13/18	1388	1/94	002	1344	1755
1 Dakota i Carr	1002	808	808	764	878	853	750	705
4. Reba 5. Pike	1992	898	808 878	730	669	613	647	793 793
6. Ivory Crisp	2001	187	207	272	326	331	555	444
7. Dakota Crisp	2005	89	102	161	218	316	376	392
8. Chipeta	1993	356	260	390	348	323	371	364
9. Megachip	2008	19	50	134	279	361	385	349
10. Andover	1995	393	399	382	364	282	300	333
11. Marcy	2003	187	262	320	319	314	339	283
12. Monona	1964	586	333	518	243	256	277	153
13. Beacon Chipper	2005	na	na	10	25	62	76	128
14. Norchip	1968	52	502	33	11	102	77	118
15. Harley Blackwell	2003	71	160	174	105	87	70	115
16. NorValley	1996	475	455	453	361	255	164	99
17. Monticello	2004	12	20	43	59	78	72	78
18. NY138	2011	na	na	na	na	4.0	23	43
19. NY139	2011	na	na	na	na	0.5	5.5	39
20. CO95051-7W		na	na	na	0.7	2.3	13	32
21. W2133-1		na	na	na	na	1.3	5.2	23
22. Dakota Diamond	2005	0.5	5.9	31	232	84	31	18
23. W2324-1		na	na	na	na	na	0.1	15
24. MSJ126-9Y		na	na	na	na	2.0	5.0	5.2
25. MSJ147-1		na	na	na	4.2	1.9	8.1	0.8
26. AF2291-10		na	na	na	na	na	na	0.7
27. CO96141-4W		na	na	na	1.2	6.4	10	0.2

## TABLE 1. TRENDS IN THE SEED ACREAGE OF CURRENT CHIPPING VARIETIES (Plus Breeding Lines Tested in the USPB-SFA Chip Trials)

Seed acreage obtained from the PAA seed certification section.

Table	Table 2. Characteristics of the 2010 USPB - SFA Chip Trials Entries							
Advanced								
Seedlings	Characteristics	Seed Provided By						
U	Parentage: SA8211-6 x EB8109-1. Mid-season	<b>,</b>						
AF2291-10	maturity, round tubers, some misshapen tubers,	Dr. Greg Porter						
	with medium yield potential. Moderate to good	University of Maine						
	resistance to internal heat necrosis, early blight	Orono, ME						
	and common scab. High specific gravity, chips							
	from field and warm storage (50F), not a cold							
	storage chipper. Averaged 91% of Atlantic's							
	marketable yield, had the same specific gravity							
Year 3	as Atlantic, and good out-of-field chip scores in							
-	three years of trials.							
	Parentage: AC91817-5W x AC87340-2W. Mid-							
CO97043-14W	season maturity, round tubers, low levels of	Dr. David Holm						
	external and internal defects. Medium-long tuber	Colorado State Univ.						
	dormancy, blackspot resistant, and few defects.	Center, CO						
	Good out of field chip color and some potential							
	Atlantia's marketable yield, was eight specific							
	arouity units (0.008) lower then Atlantic and had							
Vear 3	the best out-of-field chip scores in three years of							
1eur 5	trials							
	Parentage: AC92513-3 x Chipeta Early to mid-							
CO97065-7W	season maturity, round tubers, low levels of	Dr. David Holm						
	external and internal defects. Long tuber	Colorado State Univ.						
	dormancy, blackspot resistant, and some	Center, CO						
	potential to recondition out of 40F. Averaged							
	86% of Atlantic's marketable yield, was 5							
	specific gravity units (0.005) lower than Atlantic							
Year 3	and had good out-of-field chip scores in three							
	years of trials.							
	Parentage: Penta OP. Mid-season maturity, scab							
MSJ126-9Y	resistance, low internal defects, low sugars and	Dr. Dave Douches						
	long-term storage potential. Intermediate	Michigan State Univ.						
	specific gravity, small vine size and yellow flesh.	East Lansing, MI						
	Averaged /4% of Atlantic's marketable yield,							
Vogr 2	Atlantia and had good out of field abin geores in							
Tear 2	Attained and had good out-of-field chip scores in							
	Parentage: Snowden x MSH098-2 Mid_season							
MSL292-A	maturity uniform tuber size high yield notential	Dr. Dave Douches						
	relatively high specific gravity, low sugars, low	Michigan State Univ						
	internal defects and long-term storage potential.	East Lansing, MI						

	No scab resistance Averaged 103% of	
	Atlantic's marketable yield was three specific	
Vear 1	gravity units (0.003) lower than Atlantic and had	
1001 1	good out of field chip scores	
	Berentage: Onway & Misseukaa Early meturity	
MS0006 2	ratellage. Onway x Missaukee. Early maturity,	Dr. Dava Davahas
M3Q000-3	quality and late blight registering. I ower specific	DI. Dave Douclies
	quality and no soch resistance. Lower specific	Fast Longing MI
	gravity and no scale resistance. Best for southern	East Lansing, MI
	MO and NC) in 2010 it averaged 01% of	
	Atlantia's marketable yield, was four specific	
Vern 1	arouity units (0.004) lower then Atlantic and had	
Ieur I	gravity units (0.004) lower than Atlantic, and had	
	Mid season metunity, good specific anovity	
ND7510 1	(similar to Atlantia) moderate viold notantial	Dr. Susia Thomason
ND/519-1	(similar to Atlantic), moderate yield potential,	ND State University
	In 14 trials from 2008 to 2010 it averaged 88% of	ND State Oniversity
Vear 3	Atlantic's marketable yield was two specific	Faigo, ND
(only ND)	gravity units (0.002) lower than Atlantic and had	
(Only IVD)	very good out-of-field chip scores	
	Parentage: Marcy v NV115 Late maturity	
NV138	round tubers few external defects less blacksnot	Dr. Walter De Jong
11130	than Snowden, moderate scab resistance	Cornell University
	resistant to race Rol of golden nematode long	Ithaca NY
	tuber dormancy Medium yield potential lower	Infaca, IVI
	specific gravity range but chips from 44F	
	Averaged 99% of Atlantic's marketable yield	
	was eleven specific gravity units (0.011) lower	
Year 3	than Atlantic and had the best out-of-field chin	
I cur 5	scores in three years of trials	
	Parentage: NY120 x NY115 Medium-late	
NY139	maturity, round tubers, few external defects.	Dr. Walter De Jong
	some internal necrosis, good resistance to	Cornell University
	common scab, resistant to race Ro1 of golden	Ithaca, NY
	nematode, medium tuber dormancy. Medium	<b>,</b> ,
	vield potential, good specific gravity, can chip	
	from 44F storage. Averaged 96% of Atlantic's	
	marketable yield, was three specific gravity units	
Year 3	(0.003) lower than Atlantic, and had good out-of-	
	field chip scores in three years of trials.	
	Parentage: Pike x S440. Late maturity, high	
W2310-3	specific gravity, good chipping ability, probable	Dr. Jiwan Palta and
	medium term storage, good internal quality and	Dr. Felix Navarro
	low sugars. Medium size tubers with moderate	University of
Year 2 (2008 &	scab susceptibility. Averaged 82% of Atlantic's	Wisconsin
2010)	marketable yield, was equal to Atlantic's specific	Rhinelander, WI
,	gravity, and had good out-of-field chip scores.	,

	A selection from a cross between Snowden and	
W2324-1	RHL166. Late maturity, round uniform tubers,	Dr. Jiwan Palta and
	and relatively high specific gravity. Strong vigor	Dr. Felix Navarro
	and large vine type. Some hollow heart in large	University of
	tubers and moderate scab susceptibility. Chip	Wisconsin
	color variable, ranging from poor to excellent,	Rhinelander, WI
	depending upon the trial site. This clone had the	,
	highest average marketable vield in all three	
	seasons (2006-2008) of USPB-SFA testing in all	
	states. In 2009 and 2010 it was trialed in 4	
	southern locations only (CA. FL. MO and NC).	
	Over 5 seasons (36 total trial sites) it has	
Year 5	averaged 104% of Atlantic's marketable vield.	
(only CA. FL.	was two specific gravity units (0.002) below	
MO and NC)	Atlantic, and had on average good out-of-field	
	chip scores.	
	Parentage: S440 x ND3828-15. Late maturity,	
W2717-5	round tubers of medium size, medium yield	Dr. Jiwan Palta and
	potential, medium to high specific gravity. Good	Dr. Felix Navarro
	internal quality, low sugars, medium term	University of
	storability, good chipping ability. Moderate scab	Wisconsin
	susceptibility. Averaged 78% of Atlantic's	Rhinelander, WI
	marketable yield, was two specific gravity units	
Year 3	(0.002) above Atlantic, and had good out-of-field	
	chip scores in three years of trials.	
	Parentage: Monticello (NY102) x Dakota Pearl	
W2978-3	(ND2676-10. Relative early maturity, high tuber	Dr. Jiwan Palta and
	set, attractive white skin, moderate scab	Dr. Felix Navarro
	tolerance, dual purpose (chip/fresh), with good	University of
	long term storage chipping from 48F. Medium	Wisconsin
	specific gravity and medium yield potential.	Rhinelander, WI
	Averaged 83% of Atlantic's marketable yield,	
	was ten specific gravity units (0.010) lower than	
Year 1	Atlantic, and had good out-of-field chip scores in	
	2010 trials.	
	Parentage: Brodick x White Pearl	
W5015-12	Mid-season maturity, relatively high specific	Dr. Jiwan Palta and
	gravity, late blight resistance, strong vigor and	Dr. Felix Navarro
	large vine type. Medium-high yield potential,	University of
	chips from field or long term 48F storage, but	Wisconsin
	with flat tuber shape not suitable for tablestock.	Rhinelander, WI
	Averaged 96% of Atlantic's marketable yield,	
	was one specific gravity unit $(0.001)$ lower than	
Year 1	Atlantic, and had good out-of-field chip scores in	
	2010 trials.	

## **California Regional Trial**

#### Trial Coordinator: Brian Kirschenmann

Kirschenmann Farms, Inc. 10508 S. Edison Rd. Bakersfield, CA 93307

- Planting site: Lamont, CA
- Planting Date: Feb 18, 2010
- Harvest Date: June 11, 2010 no vine kill
- **Plot Information:** plant three row plots, harvest center bed

planted 20 hills at 6.5 inch spacing on 32 inch bed

- Soil Type: Sandy Loam Crop Rotation: Sudan grass-2009
- **Fertilizer:** 300 120 150
- Irrigation: every 4 days Rainfall: very wet 8 inches
- Growing conditions: a wet year, lower than normal yield,

no pest or disease pressure

**Comments**: no tubers over 4 inches in diameter,

only culls were seed pieces

## **CALIFORNIA USPB-SFA CHIP TRIAL - 2010**

	Total	Mkt.	Percer	nt Size Distributio	on for Yield	Percent S	ize Distribution for	Tuber Count	Tuber A	verages	Specific
Entry:	Yield	Yield	< 1 7/8"	1 7/8 to 2 1/2"	2 1/2 to 4"	< 1 7/8"	1 7/8 to 2 1/2"	2 1/2 to 4"	Wt. (oz)	#/hill	Gravity
ATLANTIC	409	392	4.0	na	na	na	na	na	5.4	4.0	1.080
AF2291-10	443	433	2.4	25.7	71.9	8.9	38.5	52.5	5.1	4.6	1.102
CO97043-14W	563	466	17.3	34.3	48.4	15.7	48.3	36.1	4.6	6.5	1.088
CO97065-7W	480	449	6.3	42.6	51.1	19.6	46.4	34.1	4.2	6.1	1.101
MSJ126-9Y	325	297	8.6	50.2	41.2	21.5	54.1	24.3	3.7	4.7	1.098
MSL292-A	333	306	7.9	45.5	46.6	21.3	50.5	28.2	3.7	4.7	1.097
MSQ086-3	477	429	10.1	45.9	44.0	27.0	48.7	24.2	3.5	7.2	1.094
NY138	416	396	4.8	35.7	59.5	15.7	44.2	40.0	4.9	4.5	1.098
NY139	456	431	5.4	39.6	55.0	15.9	46.6	37.5	4.2	5.7	1.105
W2310-3	400	383	4.1	23.6	72.3	16.6	33.8	49.6	4.8	4.4	1.106
W2324-1	475	455	4.3	39.6	56.1	14.4	49.1	36.5	4.5	5.6	1.102
W2717-5	406	374	7.8	50.2	42.0	20.5	53.9	25.6	3.7	5.8	1.108
W2978-3	416	389	6.4	39.2	54.4	19.0	47.9	33.1	4.1	5.4	1.096
W5015-12	458	369	19.4	62.2	18.3	37.0	54.3	8.7	2.5	9.9	1.104
SNOWDEN	479	432	9.9	57.0	33.1	22.5	59.3	18.2	3.4	7.5	1.100

## FLORIDA REGIONAL TRIAL

Local Coordinator:	Cooperating Grower: Cooperating Chip Proce					
Mr. Doug Gergela Research Coordinator University of Florida/IFAS Hastings Demonstration Unit	University of Florida/IFAS Hastings Demonstration Unit, Hastings, FL	Wise Snacks Inc. Berwick, Pa				
Hastings, FL 32145-0728		Utz Quality Foods Inc. Hanover, PA				
Trial Data:						
Planting Site:	University of Florida/IFAS, Hastings Demonstr Hastings, FL	ration Unit Research Farm,				
Planting Date:	February 1, 2010					
Harvest Date:	May 25, 2010 (113 days)					
Growing Conditions:	Overall, weather conditions in the region for the 2010 growing season were rated as poor to fair. January, February, and March were colder and wetter than normal. The average temperatures in January were about five degrees colder than normal for both the daily highs and low readings. February was about six degrees colder for the daily high temperature, with about normal low readings. March was also colder than normal, with average daily highs about seven degrees below normal and low readings about four degrees below normal. April was very dry. May and June were also drier than previous years, which allowed for harvest in the growing area to occur without any major interruptions. The colder than normal temperatures dramatically slowed down plant growth in the earliest plantings in the growing area. The plants were not able to make up the lost growing time, and thus total and marketable yields were lower overall than what would be expected in more "normal" years. Then the weather turned hotter than normal. April, May and June saw average daily high temperature readings about two to three degrees hotter than normal. These hotter than normal conditions rapidly increased soil temperatures and quickly hastened tuber breakdown and rot in the field, which in turn also peratively affected total and marketable yields					
Experimental Design:	Each variety/clone was planted in a single 250 ft row as directed by the protocol. Four 20 ft sections of each row were harvested and graded. 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:	pre-plant: 50-100-150/A; side-dress: 2 applica	tions of 75-0-64/A (lb N-P-K/A)				
Pest Control:	Pic-Clor 60 11 G/A, pre-plant Temik 15G, 20 lb/A, at planting Boundary 1.5 pt/A at hilling for weed control Fungicides and Insecticides as needed. IPM program used.					
Chip Ratings:	Chips were prepared and rated following the procedures outlined in the Snack Food Association Chipping Potato Handbook (1995). Chips were fried by both Wise Snacks and Utz Quality Food, however, due to space limitations, only scores rated by Wise are presented in this report. Chip scores are presented in Table 2.					

ction sta	atistics	for USPE	8-SFA clo	nes.									
Tuber Yield			Tuber Yield				Size Class Distribution <sup>3, 4</sup> (%)				Size Rang		
No.1 <sup>1</sup>	Total	%	%								Specific		
cwt/A	cwt/A	No.1 <sup>2</sup>	Culls	1	2	3	4	5	2 to 4	3 to 4	Gravity		
283	393	74	3	22	63	7	4	0	74	11	1.065		
296	406	75	3	20	60	10	4	0	75	15	1.072		
389	482	82	2	16	78	4	1	0	82	5	1.073		
224	360	65	5	31	64	1	0	0	65	1	1.070		
204	307	73	8	23	60	10	3	0	73	13	1.065		
163	292	57	3	34	53	3	1	0	57	4	1.066		
208	288	75	5	24	70	5	0	0	75	5	1.068		
321	411	81	3	17	69	10	1	0	81	12	1.071		
217	390	57	3	31	21	6	0	1	57	6	1.067		
263	383	71	3	25	63	7	1	0	71	8	1.060		
175	408	57	25	36	51	5	1	0	57	6	1.064		
167	271	63	2	34	60	2	0	0	63	2	1.075		
348	415	87	4	12	64	17	6	0	87	22	1.071		
269	367	77	5	19	69	7	2	0	77	9	1.074		
178	350	57	6	34	21	2	0	0	57	3	1.062		
255	389	69	6	26	62	6	2	0	69	8	1.066		
247	369										1.068		
	tion sta No.1 <sup>1</sup> cwt/A 283 296 389 224 204 163 208 321 217 263 175 167 348 269 178 255 247	Tuber Yie           No.1 <sup>1</sup> Total           cwt/A         cwt/A           283         393           296         406           389         482           224         360           204         307           163         292           208         288           321         411           217         390           263         383           175         408           167         271           348         415           269         367           178         350           255         389           247         369	Tuber Yield           No.1 <sup>1</sup> Total         %           cwt/A         cwt/A         No.1 <sup>2</sup> 283         393         74           296         406         75           389         482         82           224         360         65           204         307         73           163         292         57           208         288         75           321         411         81           217         390         57           263         383         71           175         408         57           167         271         63           348         415         87           269         367         77           178         350         57           255         389         69           247         369         54	tion statistics for USPB-SFA clop           Tuber Yield         %           No.1 <sup>1</sup> Total         %         %           cwt/A         cwt/A         No.1 <sup>2</sup> Culls           283         393         74         3           296         406         75         3           389         482         82         2           224         360         65         5           204         307         73         8           163         292         57         3           208         288         75         5           321         411         81         3           217         390         57         3           263         383         71         3           175         408         57         25           167         271         63         2           348         415         87         4           269         367         77         5           178         350         57         6           255         389         69         6           247         369         4	ction statistics for USPB-SFA clones.Tuber YieldSizeNo.11Total% $cwt/A$ $cwt/A$ No.12Culls283393743222964067532038948282216224360655312043077382316329257334208288755243214118131721739057331263383713251754085725361672716323434841587412269367775191783505763425538969626247369	tion statistics for USPB-SFA clones.Tuber YieldSize ClassNo.11Total%%cwt/Acwt/ANo.12Culls1228339374322632964067532060389482822167822436065531642043077382360163292573345320828875524703214118131769217390573312126338371325631754085725365116727163234603484158741264269367775196917835057634212553896962662247369	ction statistics for USPB-SFA clones.Tuber YieldSize Class DistribNo.11Total%% $cwt/A$ $cwt/A$ No.12Culls1232833937432263729640675320601038948282216784224360655316412043077382360101632925733453320828875524705321411813176910217390573312162633837132563717540857253651516727163234602348415874126417269367775196971783505763421225538969626626247369	ction statistics for USPB-SFA clones.Size Class Distribution <sup>3.</sup> No.11Total% $cwt/A$ cwt/ANo.12Culls123428339374322637429640675320601043894828221678412243606553164102043077382360103163292573345331208288755247050321411813176910121739057331216026338371325637117540857253651511672716323460203484158741264176269367775196972178350576342120255389696266262247369575365152	ction statistics for USPB-SFA clones.Tuber YieldSize Class Distribution <sup>3, 4</sup> (%)No.11Total%%cwt/Acwt/ANo.12Culls1234528339374322637402964067532060104038948282216784102043077382360103016329257334533102082887552470500321411813176910102173905733121601263383713256371017540857253651510167271632346020034841587412641760269367775196972017835057634212002553896962662620247369	ction statistics for USPB-SFA clones.Tuber YieldSize Class Distribution <sup>3, 4</sup> (%)Size RangeNo.11Total%%123452 to 428339374322637407429640675320601040753894828221678410822243606553164100652043077382360103073163292573345331057321411813176910108121739057331216015716727163234602063348415874126417687269367775196972077178350576342120057255389696266262069247369434343434343437	trion statistics for USPB-SFA clones.Size Class Distribution <sup>3, 4</sup> (%)Size Class Range <sup>4</sup> (%)No.11Total%%Size ClassSize Class Range <sup>4</sup> (%)2833937432263740741129640675320601040751538948282216784108252243606553164100651204307738236010307313163292573345331057420828875524705007553214118131769101081122173905733121601576263383713256371071817540857253651510632269367775196972063226936777519697206982147369696266262<		

<sup>1</sup>No.1 Yield: marketable yield, size classes 2 to 4

<sup>2</sup>Percent No. 1: calculated based on weight using the formula, No. 1 Wt / Total Yield Wt

<sup>3</sup>Size Class Distribution: calculated based on weight using the formula, Class Wt / (Total Yield Wt – Cull Wt). <sup>4</sup>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. Plant gro	owth and t	uber ch	aracteri	stics for US	PB-SFA c	lones.					
	Plant	Growth	Characte	eristics <sup>1</sup>			Tuber	Characte	eristics <sup>2</sup>		
	Percent	Early	Vine	Vine							Chip
Clone	Stand	Vigor	Туре	Maturity	IFC	SC	ST	TS	ED	APP	Rating <sup>3</sup>
Atlantic	94	3.8	9	4.0	2	6	5	4	5	6	2
Harley Blackwell	94	3.5	8	4.0	1	7	5	3	6	7	3.5
Snowden	103	3.8	9-6	5.0	2	6	5	3	3	6	4
AF2291-10	93	3.0	9	5.0	1	6	5	3	5	6	3.5
CO97065-7W	78	4.0	8	3.0	1	7	6	3	6	5	1
CO97043-14W	95	3.5	9	4.0	2	7	6	3	6	5	1
MSJ126-9Y	77	3.0	8	4.0	3.5	6	5	3	6	6	5
MSL292-A	86	3.0	9	3.0	1	6	5	4	6	6	2
MSQ086-3	88	3.5	8-5	5.0	1	6	6	4	6	5	2
NY138	92	3.0	8	3.0	1	6	6	4	7	5	1.5
NY139	84	4.5	9-6	5.0	1	5	5	3	6	5	5
W2310-3	93	3.8	9	5.0	1	5	5	4	7	5	2
W2324-1	93	3.5	9-6	6.0	1	5	5	4	6	5	3
W2717-5	93	3.0	8-5	5.0	1	6	6	4	6	5	2
W2978-3	80	3.8	8-5	3.0	1	5	5	4	6	6	3.5
W5015-12	78	3.0	9	7.0	2	5	5	4	7	6	2.5

#### <sup>1</sup>Plant Growth Characteristics.

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

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

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

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

#### <sup>2</sup>Tuber Characteristics.

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

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

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

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

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

<sup>3</sup>**Chip 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 Snacks Inc., 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.

Table 3. External and internal defects for USPB-SFA clones.										
		% Exter	nal Tuber		%	Internal T	uber Defec	ts <sup>2</sup>		
	Growth	Mis-	Sun-	Rotten	Total					
Clone	Cracks	shapen	Burned	& misc.	Culls		HH	BR	CRS	IHN
Atlantic	0	1	1	0	3		16	0	0	21
Harley Blackwell	0	1	1	1	3		0	0	0	0
Snowden	0	0	2	0	2		3	0	0	4
AF2291-10	0	1	0	3	5		11	0	0	3
CO97065-7W	0	0	3	4	8		5	0	0	0
CO97043-14W	0	0	1	2	3		4	0	0	3
MSJ126-9Y	0	0	0	4	5		0	0	0	1
MSL292-A	1	0	2	0	3		0	0	0	1
MSQ086-3	0	1	2	0	3		0	0	0	3
NY138	0	1	1	1	3		5	0	0	0
NY139	1	1	1	23	25		5	0	0	0
W2310-3	0	1	0	1	2		0	0	0	0
W2324-1	0	2	0	1	4		3	0	0	0
W2717-5	1	2	2	1	5		1	0	0	1
W2978-3	1	1	2	2	6		1	0	0	0
W5015-12	0	0	2	3	6		1	0	0	3

<sup>1</sup>External Tuber Defects: Total Culls is sum of growth cracks, misshapen, sunburned and rotten/miscellaneous.

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

## **Idaho Regional Trial**

Local	Coordinator:	
	Jeff Stark	

Peggy Bain Melvin Chappell University of Idaho Aberdeen R&E Center Aberdeen, Idaho

	<u>Trial</u>	<u>Data</u>
PLAN	ΓED	

3-May-10

VINE KILLED	1-Sep-10
	(Reglone @ 2 pts/A)
HARVESTED	27-Sep-10

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

METHOD OF HARVEST Gri	mme Machine	RRIGATION
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#### FERTILIZER

115 N - 115 P - 0 K - 60S - 5 lb zinc- pre-plant 120 units injected through water

#### INSECTICIDES APPLIED/HILLING

Admire Pro (8 oz/A) - Shanked May 26

#### **FUNGICIDES APPLIED**

Echo @1.5pt/Acre 7-8, 7-20, 8-5

#### HERBICIDES APPLIED

Sencor - 0.45 lb, Matrix - 1.5 oz., Eptam - 6.5 pints/acre Spray Coupe- June 1

	Yield (d	cwt/A)	Perce	ent Size	Distribu	ition	%	Specific
Clone	US No1	Total	<1 7/8 "	1 <sup>7/8</sup> -2.5"	2.5-4"	>4"	Unusable	Gravity
ATLANTIC	453	519	10	21	57	12	3	1.094
NY138	401	444	9	16	61	14	1	1.087
CO97043-14W	388	436	10	16	61	13	1	1.086
NY139	341	435	19	33	43	5	3	1.093
CO97065-7W	330	384	14	29	55	2	0	1.093
SNOWDEN	326	436	25	32	38	5	0	1.094
AF2291-10	322	377	8	19	56	17	7	1.095
MSL292-A	296	380	20	27	49	4	2	1.089
W2717-5	290	352	14	24	51	11	3	1.089
W2978-3	280	387	25	29	44	2	3	1.082
MSJ126-9Y	276	328	15	28	54	3	1	1.089
W2310-3	266	327	15	24	51	10	3	1.093
W5015-12	241	365	33	35	30	2	1	1.093
Mean	324	398	17	26	50	8	2	1.091
LSD (.05)	57	50						0.006
LSD (.01)	76	68						0.008

Table 2. IDAHO TRI/	AL 2010, V	/ine and tuber	characteristics			
Clone	Vine Size <sup>1</sup>	Vine Maturity <sup>2</sup>	Tubers/ Plant	Fresh Merit Score <sup>3</sup>	Avg. Tuber Size (oz.)	Tuber Shape⁴
ATLANTIC	2.0	2.0	8.3	2.8	6.5	1.3
NY138	1.5	2.3	6.4	4.0	6.9	1.8
CO97043-14W	1.0	1.8	6.6	2.8	6.6	1.3
NY139	1.8	2.5	8.8	3.7	5.1	1.8
CO97065-7W	1.3	2.0	7.1	3.3	5.4	1.0
SNOWDEN	2.0	2.5	9.1	2.0	4.8	1.0
AF2291-10	1.5	2.3	5.5	2.0	7.2	2.8
MSL292-A	1.5	1.8	7.5	2.8	5.2	1.8
W2717-5	1.8	1.8	6.3	3.0	5.7	2.8
W2978-3	1.0	1.3	8.3	2.8	4.7	2.3
MSJ126-9Y	1.0	1.8	6.2	2.5	5.4	1.5
W2310-3	1.0	1.3	5.8	2.0	5.8	2.5
W5015-12	2.3	2.8	9.9	1.0	3.7	1.0
<b>Mean</b> <sup>1</sup> (1-5) 5=Large	1.5	2.0	7.4	2.7	5.6	1.8
<sup>2</sup> (1-5) 5=Late <sup>3</sup> (1-5) 5=Best Prefere <sup>4</sup> (1-5) 1=Round	ence Score	÷				

			4				c	
	Exte	rnal defec	ts⁴			Internal De	efects°	
		Growth		Eye	%	%	%	%
Clone	Scab	Cracks	Knobs	Depth <sup>5</sup>	HH	BC	IBS	VD
ATLANTIC	3.5	5.0	4.5	3.3	35	0	0	0
NY138	4.5	5.0	5.0	3.8	8	0	0	0
CO97043-14W	2.8	5.0	5.0	3.3	0	0	0	0
NY139	3.8	5.0	5.0	3.5	0	0	0	0
CO97065-7W	3.0	5.0	5.0	3.0	0	0	0	0
SNOWDEN	3.8	5.0	5.0	1.8	0	0	0	0
AF2291-10	4.5	5.0	4.0	4.0	0	0	0	0
MSL292-A	4.0	5.0	5.0	2.8	0	0	0	0
W2717-5	3.0	4.3	4.8	4.3	13	0	0	0
W2978-3	4.3	4.8	4.0	4.5	0	8	0	0
MSJ126-9Y	4.8	5.0	5.0	3.3	0	0	0	0
W2310-3	3.3	4.8	4.8	4.0	5	0	0	0
W5015-12	4.3	5.0	5.0	4.0	0	0	0	0
Mean	3.8	4.9	4.8	3.5	4.7	0.6	0.0	0.0
<sup>4</sup> (1-5) 5=None								

<sup>6</sup> Percent of defects on 10 large tubers HH=hollow heart, BC=brown center, IBS=internal brown spot, VD=vascular discoloration

Clone	Appearance comments	Chip color	Early Blight'	Verticillium Wilt'
ATLANTIC	big, buff, shattered	not available	1.8	1.5
NY138	nice, oval, shallow ends		2.3	2.0
CO97043-14W	adhereing stolons, flat, deepends		2.0	1.5
NY139	adhereing stolons flat		2.3	1.8
CO97065-7W	round, buff, adhering stolons, scab,		1.3	1.0
SNOWDEN	small, deep ends		2.3	1.8
AF2291-10	non-uniform, rhizoc, rot		2.0	1.5
MSL292-A	scaley, flat, deep ends		1.0	1.0
W2717-5	bad skin PVY?, shattered		1.3	1.0
W2978-3	flat, small, some points		1.3	1.0
MSJ126-9Y	deep ends, shattered		2.0	1.0
W2310-3	misshaped, flat, shattered		1.5	1.0
W5015-12	small, looks like pebbles, rot		2.5	1.5
Mean			1.8	1.4

#### **Maine Regional Trial**

#### **\*\*YIELD, GRADE, AND OUT-OF-FIELD QUALITY REPORT\*\***

#### US POTATO BOARD/SNACK FOOD ASSOCIATION POTATO CHIP VARIETY TRIAL, MAINE 2010

#### **Cooperators:**

Local Coordinator: Greg Porter 5722 Deering Hall, Room 114 University of Maine Orono, ME 04469-5722 (207) 581-2943 porter@maine.edu <u>Cooperating Grower(s):</u> Aroostook Research Farm University of Maine 59 Houlton Road Presque Isle, ME 04769

Aroostook Produce Distributors Gerry Miller Houlton, ME 04730

SFA Coodinator:

Donald E. Halseth

Cornell University

Ithaca, NY 14853

deh3@cornell.edu

(607)255-5460

150 Plant Science Building

<u>Cooperating Processor:</u> Frito-Lay, Inc Dennis Deary, Process Mgr. 1886 Upper Maple Street Dayville, CT 06241 (860)779-0200x2304 Deary.Dennis@Fritolay.com

#### Variety Entries:

Atlantic (Field Std.) Snowden (Storage Std.) AF2291-10 ME, University of Maine, Greg Porter CO, San Luis Valley Res. Ctr., David Holm CO97065-7W CO97043-14W CO, San Luis Valley Res. Ctr., David Holm MI, Michigan State Univ., David Douches MSJ126-9Y MSL292-A MI, Michigan State Univ., David Douches NY138 NY, Cornell University, Walter DeJong NY, Cornell University, Walter DeJong NY139 W2310-3 WI, University of Wisconsin, Jiwan Palta W2717-5 WI, University of Wisconsin, Jiwan Palta WI, University of Wisconsin, Jiwan Palta W2978-3 WI, University of Wisconsin, Jiwan Palta W5015-12

#### **Trial Information:**

Location:	Aroostook Research Farm, Presque Isle, ME
Soil Type:	Caribou loam

#### **Trial Information (continued):**

Soil Test:	рН 5.5	Avail P (MH), K (VH), Ca (ML), Mg (MH)
	3.8% soil o	rganic matter
Previous Crop:	oats (2009)	, potatoes (2008)
Planting Date:	May 13, 20	010
Plot size/design:	36" row spa	acing, plots 2 rows x 30'
	Randomize	ed (RCBD), four replicates per variety
Fertilization:	140-140-14	10 at planting
	Foliar boro	n applied June 24
In-row Spacing:	10" except	Snowden (14"), AF2291-10 (8"), NY138 (8")
Crop Management:	Typical of	commercial production in the area
Sprout Inhibitor:	none applie	ed
Vinekill Date:	August 31,	2010 (110 DAP)
Harvest Date:	September	20, 2010
Processing Date:	September	24, 2010

#### **Procedures:**

Seed potatoes were received from the cooperating programs listed above and held under controlled storage conditions at Aroostook Research Farm, Presque Isle, ME. The seed potatoes were warmed and hand-cut about two weeks prior to planting. They were suberized in controlled storage and hand-planted without a commercial seed treatment.

The trial was managed using practices typical of the production area. Weeds were controlled with a standard herbicide program followed by normal cultivation and hilling. Insect pests were controlled with an in-furrow insecticide. Subsequent foliar insecticides were applied based on insect pressure determined by regular scouting for pests. Foliar diseases were controlled using a conventional spray program based on the University of Maine's IPM program. Late blight was not observed in this trial during 2010. Vine desiccation was accomplished using a standard chemical desiccant. Natural rainfall was abundant through early August, but became somewhat limiting during mid to late August (Table 1). No supplemental irrigation was applied. The plots were harvested with a hand crew following lifting with a one-row, research-scale potato digger. All tubers were weighed and a 50-lb sample was graded for external defects and sized using a spool-type sizer. Ten tubers per size class were examined for hollow heart. Specific gravity was determined on a 5-kg sample using the weight-in-air/weight-in-water method. A 50-lb sample was collected at harvest and shipped to Frito-Lay's Davville plant for evaluation of chip quality. Additional tuber samples were placed in controlled storage for evaluation of chip color during the storage season.

#### **Results:**

There was ample rainfall through early August though moisture became somewhat limiting during mid to late August (Table 1). Early crop growth was good and most of the clones were still growing quite vigorously at vinekill (Table 2). No late blight was observed in the plots during 2010. Slight early dying was noted in three of the clones, while two other clones had slight to moderate early dying (Table 2). NY138, NY139, CO97065-7W, and CO97043-14W had the highest US#1 yields in the experiment (Table 3). W2310-3 and W2717-5 were relatively low yielding. W2717-5, NY139, W2310-3, and AF2291-10 had particularly high specific gravity. Tuber size profiles were acceptable for all clones; however, W5015-12, W2310-3, NY139, and MSL292-A had smaller tuber size profiles than would be ideal.

NY138 and MSJ126-9Y had low external tuber defects incidence (Table 4). Atlantic, W5015-12, W2717-5, and AF2291-10 had greater than 10% external tuber defects. Off-shaped tubers were the most prevalent external defect, especially in AF2291-10 and Atlantic; however, growth cracks (W2717-5, AF2291-10), sunburn (CO97065-7W, NY139, Atlantic, W5015-12, MSL292-A, and W2717-5) and scab (W2978-3, W2310-3) were prevalent in several clones. Greater than five percent hollow heart was observed in Atlantic, Snowden, CO97065-7W, W2978-3, W5015-12, AF2291-10, and W2717-5. No hollow heart was observed in NY138, NY139, CO97043-14W, MSJ126-9Y, and W2310-3 (Table 4).

Tuber characteristics are summarized in Table 5. NY138, NY139, CO97065-7W, and W2978-3 had the best external tuber appearance. CO97043-14W, Atlantic, MSJ126-9Y, MSL292-A, and Snowden has indented stem ends and/or deep apical eyes which would make peeling difficult. Tubers of W5015-12, W2310-3, and MSL292-A were judged to have an undesirably flat cross section.

Chip color evaluations were conducted at the Frito-Lay plant in Dayville, CT (Table 6). W5015-12 had undesirable color and a relatively high incidence of chip defects otherwise the chip samples were good (AF2291-10) to very good (all others). Only NY138, CO97043-14W, W2978-3, and W5015-12 and NY138 had total solids values below 18% and all of these clones were very close to 18%.

Susceptibility to skinning and bruising was evaluated by tumbling tuber samples in a drum. MSJ126-9Y was especially resistant to skinning, while W2310-3 and W2717-5 were the most susceptible. NY138, NY139, MSJ126-9Y, and CO97043-14W were relatively resistant to bruise damage, while Atlantic, W2310-3, W2717-5, and W5015-12 were quite susceptible (Table 7). AF2291-10, Snowden, MSL292-A, CO97065-7W, and W2978-3 had intermediate susceptibility. Indented stem ends caused peeling problems in MSL292-A. W2310-3 and W2717-5 had moderate to severe enzymatic browning, while fusarium dry rot was observed as a problem in W5015-12.

Month	Week	(inches	s)		Total	Avera	<u>Average (°F)</u>		
	1	2	3	4	(inches)	High	Low		
May	0.58	0.45	0.62	0.92	2.57	68.5	44.5		
June	2.77	0.02	1.02	1.32	5.13	73.8	51.4		
July	0.09	1.74	0.64	0.50	2.97	81.3	59.6		
August	1.97	0.00	0.08	0.58	2.63	79.3	54.7		
September	1.76	1.06	0.25	1.98	5.05	68.5	50.4		
Grand total					18.35				

Table 1. Rainfall and temperature, 2010 Aroostook Research Farm, Presque Isle, ME

	%					
Variety/Clone	Plant	Vigor	Vigor	Vine		Foliar Disease
	Stand	Early	Late	Mat.	Foliage Color	Problems
NY138	96	G	VG	Late	Med. green	None
NY139	94	VG	VG	Med. late	Light green	None
CO97065-7W	99	VG	G	Medium	Med. green	S-M VW
CO97043-14W	99	VG	G	Med-early	Med. green	Sl. VW
Atlantic	97	VG	VG	Med. late	Med. green	None
MSJ126-9Y	97	F	G	Med. late	Dark green	Sl. VW
W2978-3	96	VG	G	Medium	Light green	S-M VW
W5015-12	93	VG	VG	Late	Med. Green	None
AF2291-10	98	G	VG	Late	Med. green	None
MSL292-A	98	VG	G	Medium	Med. Green	Sl. VW
Snowden	99	VG	VG	Med. late	Med. green	None
W2310-3	97	VG	VG	Med. late	Med. green	None
W2717-5	92	G	VG	Med. late	Med. green	None

Table 2. Plant characteristics, UPSB/SFA Chip Variety Trial, Maine, 2010.

Table 3. Yield, size distribution, and specific gravity, UPSB/SFA Chip Variety Trial, Maine, 2010.

	Yield	<u>d (cwt</u>	$(A)^1$	Si	ze D	istri	buti	<u>on (</u>	<u>% by we</u>	eight) <sup>2</sup>	Spec.
Variety/Clone	Tot.	US#1	%Std	1	2	3	4	5	1-7/8	2-1/2	Grav.
									to 4"	to 4"	
NY138	405	366	115	5	50	39	6	0	95	45	1.080
NY139	395	343	108	7	75	18	1	0	93	19	1.094
CO97065-7W	389	336	106	6	61	30	3	0	94	33	1.089
CO97043-14W	373	328	103	5	45	44	6	1	95	50	1.083
Atlantic	383	318	100	3	43	44	9	0	96	53	1.095
MSJ126-9Y	347	308	97	7	62	26	4	0	93	30	1.080
W2978-3	358	304	96	6	53	38	2	1	93	40	1.080
W5015-12	376	302	95	10	58	26	5	0	89	31	1.087
AF2291-10	369	297	93	3	41	44	13	0	97	57	1.093
MSL292-A	356	294	92	9	64	24	3	0	91	27	1.090
Snowden	340	287	90	5	60	26	8	1	94	34	1.097
W2310-3	339	283	89	9	67	23	1	0	91	23	1.094
W2717-5	314	260	82	6	58	35	1	0	94	36	1.096
Moon	265	210							04	27	1 080
	10.0	127							94 2.5	212	1.009
UV(70)	10.0	12.7							2.3	24.3 12	0.41
LSD(K-100)	68	12							4	12	0.006

<sup>1</sup>US#1 yield was calculated as yield from 1<sup>7</sup>/<sub>8</sub> to 4" diameter, minus tubers with external defects.

<sup>2</sup>Size Classes:  $1=1\frac{1}{2}$  to  $1\frac{7}{8}$ ";  $2=1\frac{7}{8}$  to  $2\frac{1}{2}$ ";  $3=2\frac{1}{2}$  to  $3\frac{1}{4}$ ";  $4=3\frac{1}{4}$  to 4"; 5= over 4"

, ,							Holl	ow Hea	art		
Variety/Clone	Exterr	nal Def	fects (%	by wei	ght)		by Size Class <sup>1</sup> (%)				
	Total	Sunb	Mshp	Grck	Scab	Rot	3	4	5		
NY138	5.3	3.3	0.2	1.7	0.0	0.1	0.0	0.0	n/a		
NY139	7.4	4.5	2.1	0.0	0.0	0.7	0.0	0.0	n/a		
CO97065-7W	8.8	4.9	2.0	1.6	0.0	0.3	0.0	12.5	n/a		
CO97043-14W	7.0	3.1	3.1	0.8	0.0	0.0	0.0	0.0	0.0		
Atlantic	14.0	4.4	7.5	1.6	0.0	0.5	5.0	16.7	0.0		
MSJ126-9Y	4.5	1.3	2.1	0.7	0.0	0.4	0.0	0.0	0.0		
W2978-3	9.3	2.8	3.0	0.9	2.4	0.1	0.0	0.0	100.0		
W5015-12	10.3	4.0	4.5	1.8	0.0	0.0	5.0	6.7	0.0		
AF2291-10	17.0	2.0	12.5	2.2	0.0	0.4	2.5	16.7	n/a		
MSL292-A	9.0	5.6	2.9	0.2	0.2	0.2	2.5	0.0	n/a		
Snowden	9.9	1.9	7.1	0.9	0.0	0.1	0.0	27.3	50.0		
W2310-3	8.4	2.1	4.7	0.1	1.5	0.0	0.0	0.0	n/a		
W2717-5	11.5	4.0	2.0	5.4	0.0	0.1	5.0	25.0	n/a		
Mean	9.4										
CV(%)	49.5										
LSD(k=100)	8.5										
$^{1}$ Sizo Classos: 1-11	( to 17/".	2-17/	to 21/"	$\cdot 2 - 21/$	$t_{0} 21/$	1-21/	to 1". 5	- over	1". n/a		

Table 4. External tuber defects and hollow heart incidence, UPSB/SFA Chip Variety Trial, Maine, 2010.

<sup>1</sup>Size Classes:  $1=1\frac{1}{2}$  to  $1\frac{7}{8}$ ";  $2=1\frac{7}{8}$  to  $2\frac{1}{2}$ ";  $3=2\frac{1}{2}$  to  $3\frac{1}{4}$ ";  $4=3\frac{1}{4}$  to 4"; 5= over 4"; n/a indicates that no tubers were examined for hollow heart in this size category.

Variety/Clone	Shape	Skin Tex- ture	Eye Depth	Gen. Appear.	Flesh Col.	Comments
NY138	O-R	M-S	M-S	F-G	OW	bright, russet scab
NY139	R-O	M-S	M-S	F-G	OW	bright
CO97065-7W	R	Sln.	M-S	F-G	OW	bright, nice shape
CO97043-14W	R	M-S	M-D	F-G	OW	bright, deep stem & apical
Atlantic	R-O	Net	M-D	F	OW	dull, deep stem & apical
MSJ126-9Y	R	Net	M-D	F	YF1	yellow, bright, deep stem & apical ends
W2978-3	R-O	S	M-S	G	OW	bright, russet scab
W5015-12	O-R	Net	M-S	F	OW	dull, flat, sticky stolons
AF2291-10	R-O	Sln.	M-S	F-G	Wh	some mshp, black scurf
MSL292-A	R	Net	M-D	F-P	OW	flat, deep stem & apical
Snowden	R	Net	M-D	F	OW	dull, deep stem & apical
W2310-3	R	Net	M-S	F-P	Wh	dull, flat, russet scab, black scurf
W2717-5	R-O	M-S	M-S	F	Wh	bright, russet scab, black scurf

Table 5. Tuber characteristics, UPSB/SFA Chip Variety Trial, Maine, 2010.

Shape: R=mostly round; R-O=round to oblong; O-R=oblong to round; O=oblong Skin Texture: S=smooth; M-S=moderately smooth; Sln.=slight net; Net=strongly netted Eye Depth: S=shallow; M-S=moderate to shallow; M-D=moderate to deep; D=deep Flesh Color: Wh=white; OW=off white; YF=yellow fleshed, higher numbers indicate brighter yellow.

	Frito-L	<u>ay Plant E</u>	Data, Dayvi	lle, CT	(Septer	<u>uber 24, 2010)</u>
Variety/Clone	Total	Color <sup>1</sup>	Defec	<u>ets (%)</u>		Comments
	Solids		Ext.	Int.	Tot.	
NY138	17.97	71.6	0.0	0.0	0.0	Very nice
NY139	20.22	70.8	0.0	0.0	0.0	Very nice
CO97065-7W	18.40	69.7	1.0	1.0	2.0	Very nice
CO97043-14W	17.90	71.2	1.0	0.0	1.0	Very nice
Atlantic	20.90	70.5	1.0	2.0	3.0	Very nice
MSJ126-9Y	18.30	69.2	1.0	1.0	2.0	Very nice
W2978-3	17.53	72.0	0.0	0.0	0.0	Very nice
W5015-12	17.89	61.3	10.8	4.6	15.4	Lots of color, 15.9%
						UDC, not good
AF2291-10	19.09	68.3	6.0	1.0	7.0	Nice, some stem end
						color
MSL292-A	20.70	72.1	0.0	0.0	0.0	Very nice
Snowden	21.10	70.3	2.0	1.0	3.0	Very nice, slight stem
						end color
W2310-3	20.98	71.8	0.0	0.0	0.0	Very nice
W2717-5	20.24	70.8	0.0	0.0	0.0	Very nice

Table 6. Chip quality one week after harvest, UPSB/SFA Chip Variety Trial, Maine, 2010.

<sup>1</sup>Higher L-values indicate lighter color. All except W5015-12 were good to very good at this sample date. All A-values were negative except for AF2291-10 (0.62) and W5015-12 (2.66).

Table 7. Bruise susceptibility scores, October 2010, UPSB/SFA Chip Variety Trial, Maine, 2010.

Variety/Clone	<u>Skinni</u>	Skinning & Bruise (tumble method) <sup>1</sup>						
-	Prior to	Peeling	Peeled T	ubers	Comments on			
	Index	% Skin	% Incid.	% Surf	peeled tubers			
		Cracks						
NY138	2.97	38	43.3	3.8				
NY139	3.97	4	71.3	5.7				
CO97065-7W	3.40	33	78.1	9.7				
CO97043-14W	3.17	7	74.6	5.7				
Atlantic	2.22	59	83.5	13.0				
MSJ126-9Y	1.09	83	67.9	5.0	yellow			
W2978-3	2.41	59	65.4	4.8	-			
W5015-12	3.02	45	90.0	13.2	some fusarium			
AF2291-10	2.73	25	76.3	7.0				
MSL292-A	4.08	10	57.6	8.4	deep stem end,			
					peeling problems			
Snowden	2.36	18	85.2	10.1				
W2310-3	4.69	5	77.7	11.6	severe enzymatic			
					browning			
W2717-5	4.55	51	86.4	11.5	severe enzymatic			
					browning			
Mean	3.13	33	73.6	8.4				
CV(%)	18.8	49.4	16.2	51.0				
LSD(k=100)	0.78	22	17.5	7.4				

<sup>1</sup>Sixty tubers were evaluated per variety/clone. Fifteen tubers per plot were tumbled on September 21 (1 day after harvest) in a paddled drum for 1 minute at 15 rpm. Index scores indicate combined severity of skinning plus fresh bruise (higher values indicate more severe bruising) rated on September 21. Percent incidence (% of tubers with visible bruise) and surface area values are combined scores for shatter and blackspot rated on peeled tubers (October 28, 2010)

#### Variety/Clone Summary 2010:

<u>NY138:</u> Late vine maturity, oblong to round, relatively large tubers with moderatelysmooth skin, moderately-shallow eyes, and off-white flesh. Good yields, low to moderate specific gravity, very good chip color, low external defects incidence (predominant defect type was sunburn), no hollow heart observed, low bruise susceptibility.

<u>NY139:</u> Medium-late vine maturity, round to oblong, relatively small tubers with moderately smooth skin, moderately-shallow eyes, and off-white flesh. Good yields, high specific gravity, very good chip color, relatively low external defects incidence (predominant defect type was sunburn), no hollow heart observed, low bruise susceptibility.

<u>CO97065-7W</u>: Medium vine maturity, mostly round tubers with slightly netted skin, moderately-shallow eyes, and off-white flesh. Good yields, high specific gravity, very good chip color, relatively low external defects incidence (predominant defect type was sunburn), moderate levels of hollow heart observed, intermediate bruise susceptibility.

<u>CO97043-14W:</u> Medium-early vine maturity, mostly round, compressed tubers with moderately smooth skin, moderately-deep eyes, deep apical and stem ends, and off-white flesh. Good yields, moderate specific gravity, very good chip color, relatively low external defects incidence (predominant defect types were sunburn and off shapes), no hollow heart observed, low bruise susceptibility.

<u>Atlantic:</u> Medium-late vine maturity, round to oblong tubers with netted skin, moderately-deep eyes, deep apical and stem ends, and off-white flesh. Good yields, high specific gravity, very good chip color, relatively high external defects incidence (predominant defect types were off shapes and sunburn), moderate hollow heart incidence, relatively high bruise susceptibility.

<u>MSJ126-9Y</u>: Medium-late vine maturity, mostly round tubers with netted skin, moderately-deep eyes, deep stem and apical ends, and pale yellow flesh. Moderate to high yield, relatively small tubers, moderate to low specific gravity, very good chip color, relatively low external defects incidence (predominant defect type was off shapes), no hollow heart observed, low bruise susceptibility.

<u>W2978-3:</u> Medium vine maturity, round to oblong tubers with smooth skin, moderatelyshallow eyes, and off-white flesh. Moderate to high yield, moderate to low specific gravity, very good chip color, intermediate external defects incidence (predominant defect types were was off shapes and sunburn), high hollow heart incidence in large tubers, intermediate bruise susceptibility.

<u>W5015-12</u>: Late vine maturity, oblong to round flattened tubers with netted skin, moderately-shallow eyes, and off-white flesh. Moderate to high yield, high specific gravity, relatively small tubers, poor chip color and undesirably high levels of chip defects, intermediate external defects incidence (predominant defect types were off

shapes and sunburn), hollow heart observed in medium to large tubers, relatively high bruise susceptibility, fusarium dry rot observed in bruise test samples.

<u>AF2291-10:</u> Late vine maturity, round to oblong tubers with slightly netted skin, moderately-shallow eyes, and white flesh. Moderate to high yield, high specific gravity, large tubers, good chip color with slight stem-end color, relatively high external defects incidence (predominant defect type was off shapes), moderate hollow heart incidence observed in large tubers, intermediate bruise susceptibility.

<u>MSL292-A:</u> Medium vine maturity, mostly round flattened tubers with netted skin, moderately-deep eyes, deep stem and apical ends, and off-white flesh. Moderate to high yield, high specific gravity, relatively small tubers, very good chip color, intermediate external defects incidence (predominant defect types were sunburn and off shapes), very low hollow heart incidence, intermediate bruise susceptibility.

<u>Snowden:</u> Medium-late vine maturity, mostly round tubers with netted skin, moderatelydeep eyes, deep stem and apical ends, and off-white flesh. Moderate yield, high specific gravity, very good chip color, intermediate external defects incidence (predominant defect type was off shapes), moderate to high hollow heart incidence in large tubers, intermediate bruise susceptibility.

<u>W2310-3</u>: Medium-late vine maturity, mostly round flattened tubers with netted skin, moderately-shallow eyes, and white flesh. Moderate yield, high specific gravity, relatively small tubers, very good chip color, intermediate external defects incidence (predominant defect types were off shapes and sunburn), no hollow heart observed, relatively high bruise susceptibility.

<u>W2717-5:</u> Medium-late vine maturity, round to oblong tubers with moderately-smooth skin, moderately-shallow eyes, and white flesh. Moderate to low yield, high specific gravity, very good chip color, relatively high external defects incidence (predominant defect types were sunburn and growth cracks), moderate hollow heart observed, relatively high bruise susceptibility.

## **Michigan Regional Location**

#### Local Coordinators:

#### **Cooperating Grower:**

Chris Long Dave Douches Michigan State University East Lansing, MI

Tim & Todd Young Sandyland Farms LLC Howard City, MI **Cooperating Chip Processor:** 

Herr Foods, Inc. Nottingham, PA

#### **Trial Information:**

Planting Date: Vine Kill Date: Harvest Date: Between Row & In Row Plant Spacing: Plots: GDD, Base 40

May 21, 2010 September 9, 2010 October 8, 2010 (140 Days)

34" x 10"; irrigated Single rows for each entry approximately 300' long 3327

#### **Trial Procedure:**

Seed was mechanically cut on May 14, 2010 and delivered to the grower's seed storage three days later. No seed treatments were applied at the time of seed cutting.

Two pre-harvest sugar profiles were taken for each variety three weeks and one week prior to vine kill on August 24<sup>th</sup> and September 7<sup>th</sup>, respectively. The pre-harvest sugar profile protocol was as follows: obtained a minimum of 40 tubers from each variety, take all the tubers from each hill, even if that required collecting more than 40 tubers. A canopy rating was taken for each variety as a percent rating of green foliage. Canopy uniformity was noted as a percentage of how uniform the foliage health appeared. The number of hills required to obtain 40 tubers was recorded, along with the total number of stems harvested. From the tubers harvested, specific gravity, a glucose value (a percent by fresh weight), a sucrose rating (a percent by fresh weight X10) and an average tuber weight (in ounces) was established.

At harvest, three plot areas of 23 feet were harvested from each entry and were used to determine yield, size distribution, specific gravity and internal defects. Two, 40 lb. storage samples were collected from each entry and were placed in the grower's commercial storage for evaluation. One set of samples will be evaluated in the winter of 2010 and the other in the spring of 2011. Eighteen, 40 tuber samples were also collected for each variety at harvest. All eighteen samples were stored at the Michigan Potato Industry Commission's Cargill Demonstration Storage Facility at approximately 48°F or 55°F for a monthly sugar profile evaluation at Techmark, Inc. Nine, 40 tuber samples were stored at each temperature and

evaluated October 2010 through June 2011. The storage sugar profiles began six days after 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 21<sup>st</sup>. MSJ126-9Y appeared to have the slowest rate of vine growth, whereas, NY139 and W2717-5 were the most vigorous at this date.

#### **Growing Season Weather:**

Weather conditions during the 2010 growing season were warmer than average. Growing degree days base 40 recorded for this time period was the highest in six years at 3327. Total rainfall from May 20<sup>th</sup> through September 8<sup>th</sup> was approximately 9.83". The daytime temperatures during this growing period did not exceeded 90°F. The nighttime temperatures during this period, May through September, were the highest in six years. The nights with temperatures over 70 °F during this growing period were twice the five year average. The average specific gravity in Michigan was below average as a result of the increased nighttime heat stress.

#### **Results:**

*Table 1* summarizes the yield, size distribution, and specific gravity data at harvest. AF2291-10 and W5015-12 topped the yield table in 2010 followed by a group of lines that yielded above average. These lines are: Snowden, MSL292-A, NY138, Atlantic, NY139 and W2310-3. AF2291-10 and MSL292-A had a large percentage of recorded oversize tubers. W2978-3, MSJ126-9Y and CO97043-14W had very low specific gravities.

Table 1. Yield ,Size D	istributio	n*, Specific	: Gravity					
	Yield (cwt/A) Percent Size Distribution							
								Specific
Entry	<u>US#1</u>	TOTAL	<u>US#1</u>	Small	Mid-Size	Large	Culls	Gravity
AF2291-10	506	565	90	4	74	16	6	1.081
W5015-12	498	565	89	11	78	11	0	1.080
Snowden	463	510	90	10	82	8	0	1.077
MSL292-A	457	490	93	7	79	14	0	1.071
NY138	444	471	94	6	82	12	0	1.071
Atlantic	443	472	94	6	82	12	0	1.082
NY139	428	469	91	8	80	11	1	1.076
W2310-3	418	479	87	6	78	9	7	1.082
W2978-3	392	434	91	9	82	9	0	1.064
CO97065-7W	344	377	91	8	81	10	1	1.070
MSJ126-9Y	285	336	84	16	81	3	0	1.065
CO97043-14W	265	305	87	13	80	7	0	1.065
W2717-5	258	300	86	13	84	2	1	1.080
MEAN	400	444	90	9	80	10	1.2	1.074

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

*Table 2* summarizes the at-harvest tuber quality. Internal quality across the trial was generally acceptable. Hollow heart was prevalent in Atlantic, CO97065-7W and to a lesser degree in W5015-12 and W2717-5. W5015-12 also recorded six internal brown spots in addition to the hollow heart.

Table 2. At-Harvest Tuber Quality	. Sandy	land Farms,	, Howard C	ity, Michig	gan.
_		Internal	Defects <sup>1</sup>		
Entry	нн	VD	IBS	BC	Total Cut
AF2291-10	2	5	0	0	30
W5015-12	3	5	6	0	30
Snowden	1	7	0	0	30
MSL292-A	0	5	0	0	30
NY138	1	5	0	0	30
Atlantic	8	3	2	0	30
NY139	0	2	0	0	30
W2310-3	0	3	0	1	30
W2978-3	0	2	0	0	30
CO97065-7W	9	1	0	1	30
MSJ126-9Y	0	3	0	0	30
CO97043-14W	0	7	0	0	30
W2717-5	3	7	0	0	30
<sup>1</sup> Internal Defects. HH = hollow heart, VD = $\sqrt{100}$	/ascular dis	coloration, IBS	S = internal bro	own spot, BC	C = brown center.

*Table 3* shows the post-harvest chip quality based on samples collected at harvest on October 8<sup>th</sup> and processed at Herr Foods, Inc. on October 11<sup>th</sup>. Chip colors were generally acceptable, with MSL292-A having the highest Agtron score of the trial at 67.3. The varieties listed in ranked order based on observations from Herr Foods, Inc. are as follows: CO97043-14W, W2310-3, NY138, W2717-5, W5015-12, MSL292-A, Snowden, W2978-3, MSJ126-9Y, Atlantic, CO97065-7W, AF2291-10 and NY139.

Table 3. 2010 Post-Harvest	Chip Quali	ty <sup>1</sup> .				
	Agtron	SFA <sup>2</sup>	Specific	Perce	nt Chip De	fects <sup>3</sup>
Entry	Color	Color	Gravity	Internal	External	Total
AF2291-10	62.4	3	1.075	56.1	4.0	60.1
W5015-12	62.0	3	1.077	18.4	13.9	32.3
Snowden	63.5	2	1.076	21.9	4.9	26.8
MSL292-A	67.3	2	1.071	9.1	6.7	15.8
NY138	65.4	3	1.070	37.0	3.4	40.4
Atlantic	62.9	4	1.080	47.9	5.4	53.3
NY139	62.0	2	1.076	26.6	11.4	38.0
W2310-3	64.5	3	1.082	31.4	5.2	36.6
W2978-3	64.2	2	1.064	21.5	30.6	52.1
CO97065-7W	61.0	3	1.066	18.2	10.8	29.0
MSJ126-9Y	65.7	2	1.066	24.8	6.6	31.4
CO97043-14W	63.5	3	1.065	20.9	10.5	31.4
W2717-5	60.3	3	1.078	22.4	7.7	30.1

<sup>1</sup> Samples collected at harvest October 8<sup>th</sup> and processed by Herr Foods, Inc., Nottingham, PA on October 11, 2010 (3 days).

Chip defects are included in Agtron and SFA samples.

<sup>2</sup>SFA Color: 1= lightest, 5 = darkest

<sup>3</sup>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 the presence of black spot bruise. Among the "Simulated Bruise" samples, the best entries were NY138, MSJ126-9Y and W2978-3. W5015-12, AF2291-10, Snowden, and Atlantic showed the lowest percent bruise free.

Table 4. Black Spot E	Bruise	e Te	st															
	A. Check Samples <sup>1</sup>						B. Simulated Bruise Samples <sup>2</sup>					oles <sup>2</sup>						
								Percent	Average								Percent	Average
	# of	Brui	ses	Ре	r Tu	ıber	Total	Bruise	Bruises Per	<u># of</u>	Brui	ses	Pe	r Tu	ber	Total	Bruise	<b>Bruises Per</b>
Entry	0	1	2	3	4	5	Tubers	Free	Tuber	0	1	2	3	4	5	Tubers	Free	Tuber
AF2291-10	10	13	2				25	40	0.7	2	10	5	5	2	1	25	8	1.9
W5015-12	11	5	5	3	1		25	44	1.1	1	4	5	6	3	6	25	4	3.0
Snowden	14	8	2	1			25	56	0.6	3	2	7	8	1	4	25	12	2.6
MSL292-A	12	6	3	2	2		25	48	1.0	10	9	3	1	1	1	25	40	1.1
NY138	23	1	1				25	92	0.1	17	6	1	1			25	68	0.4
Atlantic	2	12	4	5	1	1	25	8	1.8	3	7	7	2	3	3	25	12	2.2
NY139	14	9	1	1			25	56	0.6	9	10	5		1		25	36	1.0
W2310-3	8	10	5	2			25	32	1.0	4	9	4	3	2	3	25	16	2.0
W2978-3	22	3					25	88	0.1	12	8	3	2			25	48	0.8
CO97065-7W	13	9	3				25	52	0.6	5	5	11	4			25	20	1.6
MSJ126-9Y	20	5					25	80	0.2	15	9	1				25	60	0.4
CO97043-14W	14	10	1				25	56	0.5	10	9	4	2			25	40	0.9
W2717-5	15	10					25	60	0.4	10	5	5	3	2		25	40	1.3

<sup>1</sup>Tuber samples collected at harvest and held at room temperature for later abrasive peeling and scoring.

<sup>2</sup>Tuber 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. *Tables 5A and 5B* summarize the results of the pre-harvest panel data. All varieties appeared to have stable sugar levels prior to harvest. CO97065-7W and W2978-3 were the earliest maturing varieties based on the canopy rating. AF2291-10 had the largest average tuber weight at both panel dates.

Table 5A. Pre-Harves	t Panels, 8	/24/10						
								Average <sup>5</sup>
	Specific (	Glucose <sup>1</sup>	Sucrose <sup>2</sup>	Ca	nopy	Num	ber of	Tuber
Entry	Gravity	%	Rating	Rating <sup>3</sup>	Uniform. <sup>4</sup>	Hills	Stems	Weight
AF2291-10	1.072	0.013	0.568	90	90	5	9	6.84
W5015-12	1.073	0.002	0.385	80	90	5	17	4.00
Snowden	1.073	0.002	0.297	85	95	4	28	4.68
MSL292-A	1.069	0.002	0.363	75	95	4	10	4.80
NY138	1.065	0.002	0.228	75	95	4	7	5.89
Atlantic	1.072	0.002	0.280	90	95	4	11	5.65
NY139	1.074	0.002	0.363	85	90	4	13	5.73
W2310-3	1.079	0.005	0.419	80	90	5	17	5.02
W2978-3	1.063	0.002	0.469	20	90	3	7	5.48
CO97065-7W	1.070	0.002	0.226	10	80	5	18	4.36
MSJ126-9Y	1.066	0.002	0.720	60	90	7	13	4.24
CO97043-14W	1.062	0.001	0.280	85	90	5	12	3.64
W2717-5	1.083	0.002	0.636	70	90	5	12	4.71

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

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

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

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

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

Table 5B. Pre-Harves	Table 5B.    Pre-Harvest Panels, 9/7/10									
								Average <sup>5</sup>		
	Specific (	Glucose <sup>1</sup>	Sucrose <sup>2</sup>	Ca	nopy	Num	ber of	Tuber		
Entry	Gravity	%	Rating	Rating <sup>3</sup>	Uniform. <sup>4</sup>	Hills	Stems	Weight		
AF2291-10	1.079	0.003	0.503	45	90	5	9	6.51		
W5015-12	1.080	0.002	0.312	35	90	4	15	4.24		
Snowden	1.076	0.002	0.484	40	95	3	24	3.99		
MSL292-A	1.075	0.002	0.452	35	95	4	9	5.92		
NY138	1.071	0.002	0.299	35	95	4	7	5.07		
Atlantic	1.076	0.002	0.417	50	95	4	18	4.34		
NY139	1.076	0.002	0.428	40	95	5	15	4.74		
W2310-3	1.085	0.003	0.275	35	90	5	15	4.48		
W2978-3	1.064	0.003	0.434	15	85	4	12	5.23		
CO97065-7W	1.070	0.002	0.286	5	95	6	15	5.21		
MSJ126-9Y	1.064	0.002	0.705	20	90	4	10	3.37		
CO97043-14W	1.069	0.001	0.316	30	85	5	13	4.94		
W2717-5	1.065	0.003	0.796	30	90	5	19	3.92		

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

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

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

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

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

#### Variety Comments:

<u>AF2291-10:</u> This was the top yielding variety in the 2010 variety trial with a 506 cwt./A US#1 yield and an above average specific gravity at 1.081. The variety had the largest number of oversize tubers of any variety in the trial at 16 percent. Internal raw tuber defects were moderate. AF2291-10 performed at the bottom of the group at Herr Foods on October 11<sup>th</sup>, 2010 and recorded the highest amount of chip defects of any variety totaling 60.1 percent. AF2291-10 exhibited a very high level of black spot bruise susceptibility for the second year in a row with only 8 percent of the tubers being bruise free both in 2009 and 2010. It appears to be a full season variety.

<u>W5015-12</u>: This variety had the second highest yield in 2010 at 498 cwt./A US#1 yield with a specific gravity of 1.080. Internal tuber defects were moderate at harvest. W5015-12 ranked 5<sup>th</sup> at Herr's for chip quality out-of-the-field. The variety had the worst black spot bruise reaction of any of the varieties in the trial, receiving only a 4 percent bruise free rating in the simulated bruise testing. This variety appeared to be mature in the September 7<sup>th</sup> pre-harvest panel.

<u>Snowden:</u> Snowden was the third highest yielding variety in the 2010 variety trial with a 463 cwt./A US#1 yield and an above average specific gravity at 1.077. Internal raw tuber quality was good at harvest. This variety was average in chip performance at Herr Foods at the out-of-the-field fry test. Snowden was tied for third most susceptible line to black spot bruise in the trial.

<u>MSL292-A:</u> MSL292-A was above average in yield at 457 cwt./A US#1 with 14 percent oversize recorded. The specific gravity for this variety was slightly below the trial average at 1.071. This variety exhibited very low raw internal tuber effects. This variety ranked highest at Herr's out-of-the-field chip evaluation for AGTRON color at 67.3 and the lowest for total percent chip defects at 15.8. MSL292-A was moderately resistant to black spot bruise and ranked near the trial average. This variety appeared to be the most mature based on the pre-harvest panel data from September 7<sup>th</sup> where the sucrose rating was 0.452 and glucose level was 0.002.

<u>NY138</u>: NY138 yielded higher than the trial average at 444 cwt./A US#1. Specific gravity was just below average at 1.071. Tuber quality at harvest was good. Only a slight amount of internal defects were observed. Herr's ranked this variety 3 of 13 in chip performance out-of-the-field mostly due to a strong AGTRON number of 65.4. NY138 showed the lowest susceptibility to black spot bruising with 68 percent of the tubers being bruise free after simulated bruise testing.

<u>Atlantic:</u> This was an above average yielding variety with a 443 cwt./A US#1 yield and an above average specific gravity at 1.082. This variety had a good percentage of oversize tubers, but 27 percent of them were hollow. Chip quality at Herr Foods on October 11<sup>th</sup> ranked below average with 53.5 percent total chip defects recorded; this is the second worst in the trial. Atlantic showed black spot bruise susceptibility with only 12 percent of the tubers being bruise free. The vines appeared to hold-on this growing season for an extended period of time.

<u>NY139</u>: NY139 had a nice yield of US#1 tubers at 428 cwt./A and a tuber size distribution that consisted of 80 percent A-size and 11 percent oversize tubers. The specific gravity was above the trial average. The internal tuber defects were very low, but the at-harvest chip fry ranked this variety 13<sup>th</sup> out of the 13 varieties for overall appearance even though the AGTRON and chip defects were average. This variety was average for black spot bruise susceptibility in the 2010 trial.

<u>W2310-3:</u> The US#1 yield for W2310-3 was slightly above the trial average at 418 cwt./A. The specific gravity was good at 1.082. This was the highest recorded specific gravity in the trial for 2010. Seven percent of the total harvested tubers for this variety were culls which was the highest in the trial. Internal tuber defects were low and the ranking at Herr's was excellent, ranking second of 13 varieties in out-of-the-field chip performance. Black spot bruise tolerance was poor with only 16 percent of the tubers remaining bruise free.

<u>W2978-3:</u> The yield on W2978-3 was below average at 392 cwt./A US#1. The specific gravity was the lowest in the 2010 trial at 1.064. Internal defects were very low and the ranking at Herr's was below average, ranking eight of 16 varieties in out-of-the-field chip performance. Recorded total percent chip defects for W2978-3 was the third highest in the trial at 52.1 percent. Black spot bruise tolerance was very good but expected with such a low specific gravity. This variety showed signs of having an early maturity in 2010 based on the pre-harvest panel data collected.

<u>CO97065-7W:</u> This variety had a 344 cwt./A US#1 yield with a below average specific gravity of 1.070. Nine hollow heart were observed in thirty cut oversize tubers at harvest giving this variety the worst hollow heart susceptibility in the trial. Herr's ranked this variety 11<sup>th</sup> for overall chip quality. CO97065-7W recorded only 20 percent of the tubers with a bruise free rating. The vine maturity appeared to be the earliest in the trial.

<u>MSJ126-9Y</u>: This variety recorded the third lowest yield in this year's trial. MSJ126-9Y was tied for the second to lowest for specific gravity in the trial at 1.065. Internal tuber quality was generally good. The clone ranked 9<sup>th</sup> at Herr's in the chip quality. The bruise free rating was 60 percent which ranked MSJ126-9Y second in black spot bruise tolerance.

<u>CO97043-14W</u>: The US#1 yield for this line was 265 cwt./A with below average specific gravity. Internal defects were generally low with some vascular discoloration recorded. The variety appeared to be slightly susceptible to black spot bruise. This variety was mature at the time of vine kill.

<u>W2717-5</u>: W2717-5 yielded 258 cwt./A US#1 with a specific gravity of 1.080. This is the lowest recorded US#1 yield for the 2010 trial. The variety had three hollow heart and seven vascular discoloration in thirty cut tubers. Herr's ranked this variety 4<sup>th</sup> in the overall chip quality evaluation. The line appears to have an average tolerance to black spot bruise and was mature at the time of vine kill.

## **Missouri Regional Trial**

#### 2010 USPB-SFA Regional Variety Trial - Black Gold Farms Charleston, MO

#### **Cooperator: Black Gold Farms**

#### Local Coordinator: Don Crosier, Black Gold Farms Agronomist

Field Name: Blackgold

Soil Test:	<b>pH:</b> 6.7	<b>P:</b> 24 ppm	<b>K:</b> 118 ppm	<b>OM:</b> 0.80%
	<b>B:</b> 0.1 ppm	<b>Mg:</b> 78 ppm	Ca: 693 ppm	<b>CEC:</b> 4.5 meq

Planting Date: 3/19/2010

Harvest Date: 7/7/2010

Row Spacing: 34" between rows, 10" spacing between plants within the row

#### Plot Length: 25 feet, Four Replications

Tillage:	Date	Tool	Function	
	1/26/2010	Vertical Tillage	Pre-plant Tillage	
	2/19/2010	DMI Bedder	Pre-plant Hilling	
	4/9/2010	Dammer Diker	Final Hill, Herbicide	
Fertilizer Applied:	258N- 112P- 257K- 15	5Mg- 106S- 1B5Zn		
Herbicides Applied:	Prowl 3.3 EC, Medal(S	S-metolachlor), Matrix, Inte	nsity(clethodim); all applied at lab	el rates
Fungicides Applied:	Quadris, Ridomil Gold	/Bravo SC, Revus Top, Bra	wo Weather Stik, Curzate 60DF, M	Ianzate 75DF; all applied a
Insecticides Applied:	Advise 2FL(Imidaclop	rid); applied at label rate		
Nematicide:	Telone II, applied 2/19	/10; applied at label rate		
Weather	Planting	Cold and damp, < 40	F degree soil temps	
	Emergence	Dry and cool		
	<b>Tuber Initiation</b>	Warm and damp-good	l growing weather	
	Tuber Bulk	Warm and dry, late by	alking was very hot	
	Harvest	Hot and dry		
Irrigation:	Full season irrigation v	vhen needed		
Cultural Notes:	Cool, cloudy and wet t	he first half of the season		
	Very hot week around	June 15th. Soil temps at 1"	were ranging from 108 F to 110F c	legrees
	After the hot week, the	ere were 3 nights of 50 F ter	nps and that helped the crop rejuve	nate new growth

## **MISSOURI REGIONAL TRIAL**

## Charleston, Missouri - Black Gold Farms - 2010

Planting Date: 3/19/2010

Harvest Date: 7/9/2010 (112 DAP)

				Marketa	ble Yield		Total			
	Vine &	1" - 1	1 7/8"	1 7/8	" - 4"	> 4"	Yield	% of Sta	andard's	
Variety	Vigor	# of		# of				Marketa	ble Yield	Specific
	Rating	tubers	cwt/ac	tubers	cwt/ac	cwt/ac	cwt/ac	Atlantic	Snowden	Gravity
Atlantic	4	34.8	36	155.0	506	0	542	100	127	1.081
Snowden	4	27.5	26	141.3	398	0	424	79	100	1.074
AF2291-10	4	27.8	28	116.0	407	0	435	80	102	1.078
CO97043-14W	2	30.0	27	133.8	402	0	429	79	101	1.064
CO97065-7W	2	34.5	32	133.8	449	0	481	89	113	1.067
MSJ126-9Y	1	27.5	27	116.3	312	0	339	62	78	1.066
MSL292-A	3	26.3	24	130.5	448	0	472	89	112	1.074
MSQ086-3	5	51.0	52	161.0	448	0	500	89	112	1.063
NY138	4	32.3	33	123.3	458	0	490	90	115	1.059
NY139	3	34.8	37	134.8	400	0	437	79	100	1.076
W2310-3	4	31.3	36	111.5	358	0	394	71	90	1.074
W2324-1	5	33.0	32	124.0	427	0	460	85	107	1.074
W2717-5	3	27.3	29	94.0	314	0	343	62	79	1.075
W2978-3	1	55.8	55	131.3	400	0	455	79	100	1.064
W5015-12	5	32.0	33	135.8	403	0	436	80	101	1.076

Vine & Vigor Rating: 1 = 100 % dead vines

2 = 90% defoliated, 80-90% dead vines 3 = 75% defoliated, 25-50% dead vines 4 = 25% defoliated, 10% dead vines 5 = 0-10% defoliated, yellowing leaves common

6 = Green, no new growth, some lower leaves yellowing.

7 = Green, no flowering

8 = Green, vigorous, 0-10% flowering

Harvested Sample: 4 Replications of 25 feet

## **MISSOURI REGIONAL TRIAL**

## Charleston, Missouri - Black Gold Farms - 2010

### **QC Monitoring**

VARIETY		RAW GRADE										COOK SAMPLE				
	Solids a	lids and Specific Gravity External Defects						Internal Defects								
	F-L Solids	% of Standard Atlantic Solids	Specific Gravity	GRN	GC	WB	SC	HN	Other	НН	CLR	UC	GRN	ID	ED	TOTAL
Atlantic	16.9	100	1.081	0.0	0.0	0.0	0.0	3.0	3.0	0.0	72.0	2.0	0.0	2.5	2.0	6.5
Snowden	15.8	93	1.074	0.0	0.0	0.0	0.0	0.0	0.0	1.5	70.0	6.5	0.0	0.0	6.5	13.0
AF2291-10	16.4	97	1.078	0.0	0.0	0.0	0.0	0.0	0.0	4.0	70.0	1.5	0.0	8.0	1.0	10.5
CO97043-14W	1.7	10	1.064	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.0	3.5	0.0	11.5	6.0	21.0
CO97065-7W	14.5	86	1.067	0.5	0.0	0.0	0.0	0.0	0.0	0.0	70.0	2.0	0.0	0.0	9.0	11.0
MSJ126-9Y	14.3	85	1.066	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.0	5.0	0.0	1.0	4.0	10.0
MSL292-A	15.7	93	1.074	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.0	2.0	0.0	1.5	3.5	7.0
MSQ086-3	13.6	81	1.063	2.0	0.0	0.0	0.0	0.0	0.5	0.0	72.0	7.5	0.0	2.5	2.0	12.0
NY138	12.9	76	1.059	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.0	5.0	0.0	0.0	2.0	7.0
NY139	16.0	95	1.076	0.5	0.0	0.0	0.0	0.0	2.0	0.0	70.0	5.5	0.0	3.5	3.5	12.5
W2310-3	15.8	94	1.074	2.0	0.0	0.5	0.0	0.0	0.0	0.0	70.0	10.0	1.0	0.0	1.0	12.0
W2324-1	15.7	93	1.074	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.0	1.5	0.0	3.0	2.5	7.0
W2717-5	16.0	94	1.075	0.5	0.0	0.0	0.0	0.0	0.0	0.0	71.0	2.0	0.0	2.0	4.5	8.5
W2978-3	13.9	82	1.064	0.0	0.0	0.5	0.0	0.0	0.0	0.0	70.0	2.5	0.0	4.0	4.0	10.5
W5015-12	16.2	96	1.076	0.0	0.0	0.0	0.0	2.0	2.0	0.0	72.0	1.5	0.0	6.0	3.0	10.5

Key:

GC = Growth Crack GRN = Greening WB = Wet Breakdown SC = Pitted Scab HN = Heat Necrosis CLR = Color HH = Hollow Heart UC= Undesira

CLR = Color ID= Internal Defects UC= Undesirable Color ED = External Defects

## North Carolina Regional Trial

Local Coordinators:		<b>Cooperating Grower:</b>	<b>Cooperating Chip Processor:</b>
Dr. Craig Yencho North Carolina State Unive 214A Kilgore Hall Raleigh NC, 27695	ersity	Chris Hopkins Black Gold Farms 2815 N Gum Neck Road Columbia, NC 27925	Utz Quality Foods Hanover, PA
Mr. Mark Clough North Carolina State Unive 207 Research Station Rd. Plymouth NC 27962	ersity		
Trial Data:			
Planting Site:	Black Gold Farm	s, Gum Neck, Tyrrell County, NC	
Planting Date:	March 18, 2010		
Harvest Date:	June 28, 2010 (10	)2 days)	
Growing Conditions:	Planting was slig conditions persist Early May. By m 2010 was the ho normal for the 11/10).	ghtly delayed by wet weather but a ted through March tapering off in A hid-May the rainfall ended followed ttest spring/summer season on recon state (http://www.noaanews.noaa.)	still within the normal time frame. Wet april. Rainfall was adequate in April and by high temperatures. In-fact. May - July d in NC. Rainfall was also well below gov/stories2010/20100809_julytemps.html
Soil Type:	Cape Fear silt loa	m	
Experimental Design:	Randomized com	plete block design with 5 replications	
Row Spacing:	28 hills, spaced 9	inches apart, 34" row width.	
Fertilizer:	210 N, 143 P, 92	K	
Weed Control:	Metribuzin 1.25 l Volunteer 8 fl oz/	bs/A /A	
Insect Control:	Actara 3 oz/A		
Disease Control:	Manzate Pro-stick Curzate 60 DF 3.2 Revus Top 6.2 fl	x 7.0 lb/A 2 oz/A oz/A	

							- 1		.7.	. 1 .		Chip C	color <sup>3</sup>	
	Total Yield	Marketable Yield	9	6 Size	Distribu	<u>ition by</u>	/ Class'		1′/ <sub>8</sub>	2'/2	Specific	24 to	5 to	
Clone	cwt/A	cwt/A	1	2	3	4	5	Culls	to 4"	to 4"	Gravity	48 hrs	7 days	
	2.52	4.0.0	_	~ ~	40	-				-	1 0 6 0	-	-	
AF2291-10	260	192	/	23	48	3	0	19	/3	51	1.069	3	3	
Atlantic	340	299	10	47	41	1	0	2	88	41	1.072	2	2	
CO97043-14W	317	264	16	49	34	0	0	1	83	34	1.066	2	1	
CO97065-7W	313	260	16	50	33	0	0	1	83	33	1.065	3	2	
MSJ126-9Y	302	251	16	50	32	1	0	1	83	33	1.062	3	2	
MSL292-A	406	359	4	26	59	3	0	8	88	62	1.071	2	2	
MSQ086-3	393	251	26	51	13	0	0	10	64	13	1.059	3	3	
NY138	359	292	6	27	53	2	0	12	82	55	1.060	2	3	
NY139	361	318	10	57	31	0	0	2	88	31	1.067	2	3	
Snowden	393	333	15	59	25	1	0	1	84	26	1.071	2	2	
W2310-3	285	172	14	42	18	0	0	25	60	18	1.075	2	2	
W2324-1	420	347	10	38	43	1	0	8	82	44	1.070	1	3	
W2717-5	279	236	9	38	47	0	0	7	84	47	1.075	1	2	
W2978-3	329	260	18	57	22	0	0	3	79	22	1.066	2	3	
W5015-12	415	302	19	60	12	0	0	8	73	12	1.069	2	3	
Grand Mean	345	276												
CV(%)	13.7	16.6												
LSD(K=100)	64.7	62.8												
<sup>1</sup> Size Classes:														

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

1's < 17/8"; 2's 17/8 to 21/2"; 3's 21/2 to 31/4"; 4's 31/4 to 4"; 5's ≥ 4"; Culls = all defective potatoes.

<sup>2</sup> Specific Gravity

Determined by weight in air/water method.

<sup>3</sup> Chip Color

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

		Plant [	Data <sup>1</sup>					Tub	er Da	$ta^2$					% Inter	nal D	efect	s <sup>3</sup>		
Clone	TYPE	DIS	POL	_ MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	ΗH	VR	BC	SR	
452201 10	0	0	0	0	<i>c</i>	7	7	F	4	~	7	0	4	2	0.0	0	0	~	0	
AF2291-10	9	9	9	8	6	<u>′</u>	_	5	4	6	/	8	4	2	8.8	0	0	6	0	
Atlantic	6	9	8	5	5	5	7	1	2	7	6	9	7	48	6.9	0	0	2	0	
CO97043-14W	6	9	7	5	9	8	5	7	2	7	5	8	7	0	9.0	0	0	0	2	
CO97065-7W	6	9	8	5	6	6	5	7	2	7	6	7	6	0	9.0	0	0	0	0	
MSJ126-9Y	8	9	8	4	6	5	7	7	2	7	6	8	7	0	9.0	0	0	0	0	
MSL292-A	9	9	9	5	5	5	3	5	3	6	7	7	4	12	7.9	0	0	0	0	
MSQ086-3	9	9	9	7	9	7	7	7	2	8	4	5	4	26	7.0	0	0	0	0	
NY138	8	9	8	6	6	6	6	7	3	8	7	4	4	6	8.3	0	0	0	0	
NY139	7	9	8	5	6	5	5	6	4	8	6	7	6	0	9.0	0	0	0	0	
Snowden	9	9	8	7	5	5	7	6	2	6	5	8	7	12	8.3	0	0	6	0	
W2310-3	6	8	8	6	5	6	4	7	3	7	5	4	4	2	8.8	0	0	0	0	
W2324-1	8	9	8	8	6	6	7	7	3	7	5	5	5	32	7.4	0	0	0	0	
W2717-5	9	8	7	5	9	7	5	7	3	8	5	7	6	6	8.6	2	0	4	0	
W2978-3	6	8	8	4	6	7	7	7	3	8	6	8	8	0	9.0	0	0	0	0	
W5015-12	9	9	8	6	5	5	4	7	2	7	6	4	4	36	6.8	0	0	0	0	

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.

#### <sup>1</sup> 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.

#### <sup>2</sup> <u>Tuber Data:</u>

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.

#### <sup>3</sup> Internal Defects:

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

#### Table 3. UTZ Quality Foods Chip Data.

	% De	fects	%Total	Specific		Chi	p Color <sup>2</sup>		
Clone	Internal	External	Defects	Gravity	Defect Descriptions <sup>1</sup>	Hunter Lab	Agtron	Visual	
Atlantic	21	0	21	1.080	IHN	60.2	59.5	2	
Snowden	4	0	4	1.080	IBS	63.0	65.6	1	
AF2291-10	16	0	16	1.083	SB	61.7	62.9	2	
CO97043-14W	1	0	1	1.080	VB, ID	61.4	61.8	2	
C097065-7W	1	0	1	1.082	SB	60.8	60.4	2	
MSJ126-9Y	1	0	1	1.077	IHN	62.9	65.3	2	
MSL292-A	7	0	7	1.085	IHN	61.4	61.8	2	
MSQ086-3	18	4	22	1.078	ED, VB, ID, IHN	62.5	64.6	2	
NY138	1	0	1	1.080	SB	63.6	68.1	2	
NY139	1	0	1	1.086	VB, ID	62.1	64.1	2	
W2310-3	1	0	1	1.080	SB	64.0	69.7	1	
W2324-1	25	0	25	1.080	VB, SB, ID	60.7	60.2	2	
W2717-5	3	0	3	1.083	BC, ID	64.2	70.4	1	
W2978-3	1	0	1	1.077	ID	62.3	64.4	1	
W5015-12	3	0	3	1.081	VB	61.6	62.5	2	

#### <sup>1</sup> Defect Descriptions:

BR = Bruising; ED = External Discoloration; HH = Hollow Heart; ID = Internal Discoloration; IHN = Internal Heat Necrosis; SB = Stem End Browning; VB = Vascular Browning; WW = Wire Worm.

#### <sup>2</sup> Chip Color:

#### Hunter Lab Scores

Taken with defective chips included in sample

#### Visual Scores

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

#### **Clone Summaries**

AF2291-10: Maturity for this clone was late and stand counts averaged 88% and vigor was fair. Shapes were round to oblong, size was medium to large and overall appearance was less than fair. Marketable yields were 65% of Atlantic, gravity was 1.069 and chip color was good in the 24 to 48 hour and the 5 to 7 day chip tests. External defects included misshapes, growth cracks, common scab, secondary growth, heat sprouts and skin blemishes due to Rhizoctonia.

CO97043-14W: Maturity for this clone was mid-season with 95% stands and good plant vigor. Shapes were mostly round, size was medium and overall appearance was good. Marketable yields were 90% of Atlantic, gravity was 1.066 and chip scores were excellent for the 24 to 48 hour test and exceptional in the 5 to 7 day chip tests. External defects included sunscald, common scab, and soft rot.

CO97065-7W: This clone was mid-maturing and had 97% stands with good plant vigor. Shapes were mostly round, size was slightly larger than medium, and overall appearance was better than fair. Marketable yields were 88% of Atlantic, gravity was 1.065 and chip scores were good for the 24 to 48 hour and excellent for the 5 to 7 day chip tests. External defects were misshapes, common scab, sunscald and Fusarium dry rot.

MSJ126-9Y: Maturity for this clone was slightly earlier than mid-season, stands were 92% and plant vigor was better than fair. Shapes were mostly round, size was medium to medium-large and overall appearance was good. Marketable yields were 86% of Atlantic, gravity was 1.062, and chip test scores were good for the 24 to 48 hour and excellent for the 5 to 7 day tests. External defects included high numbers of sunscald and misshapes.

MSL292-A: This clone was mid-maturing and had 79% stands with better than fair vigor. Shapes were round to oblong, size was medium-large, and overall appearance was less than fair. Marketable yields were 122% of Atlantic, gravity was 1.071, and chip scores were excellent for both the 24 to 48 hour and 5 to 7 day tests. External defects included sunscald, common scab, misshapes, soft rot, and deep apical and stem ends.

MSQ086-3: This clone was mid to late maturing and had stands of 94% with good vigor. Shapes were mostly round, size was smaller than medium, and overall appearance was less than fair. Marketable yields were 84% of Atlantic, gravity was 1.059, and chip scores were good for both the 24 to 48 hour and 5 to 7 day chip tests. External defects included high amounts of common scab, sunscald, misshape, secondary growth and heat sprouts.

NY138: This slightly later than mid-maturing clone had poor stands of 89% with fair plant vigor. Shapes were round to oblong, size was medium-large, and overall appearance was less than fair. Marketable yields were 99% of Atlantic, gravity was 1.060, chip scores were excellent for the 24 to 48 hour and good for the 5 to 7 day chip tests. External defects included high amounts of skin blemishes due to Rhizoctonia and sunscald.

NY139: Maturity for this clone was mid-season, stands were 98% and vigor was good. Shapes were mostly oblong, size was slightly larger than medium, and overall appearance was better than fair. Marketable yields were 107% of Atlantic, gravity was 1.067, chip scores were excellent for the 24 to 48 hour and good for the 5 to 7 day test. External defects included skin blemishes due to Rhizoctonia, sunscald, misshapes, and growth cracks.

W2310-1: This clone was later than mid-maturing, and stands were 92% with better than fair vigor. Shapes were round to oblong, size was medium and overall appearance was less than fair. Marketable yields were 58% of Atlantic, gravity was 1.075, and chip scores were excellent for both the 24 to 48 hour and 5 to 7 day chip tests. External defects included high amounts of common scab, sunscald, and secondary growth.

W2324-1: This clone had stands of 100%, and was late maturing with better than good vigor. Shapes were round to oblong, size was medium and overall appearance was fair. Marketable yields were 116% Atlantic, gravity was 1.070, and chip scores were exceptional in the 24 to 48 hour and good in the 5 to 7 day test. External defects included common scab, misshapes, and sunscald.

W2717-5: This clone was mid-maturing with 68% stands and fair vigor. Shapes were round to oblong, medium size, and better than fair for overall appearance. Marketable yields were 80% of Atlantic, gravity was 1.075, and chip scores were exceptional in the 24 to 48 hour and excellent in the 5 to 7 day tests. External defects included common scab, growth cracks, and sunscald.

W2978-3: Maturity for this clone was earlier than mid-season, and had 98% stands with better than fair vigor. Shapes were round to oblong, size was medium to medium large, and overall appearance was better than good. Marketable yields were 88% of Atlantic, specific gravity was 1.066, and chip scores were excellent for the 24 to 48 hour and good for the 5 to 7 day tests. External defects included misshapes, sunscald, growth cracks, soft rot, and common scab.

W5015-12: Maturity for this clone was later than mid-season and stands were 92% with good vigor. Shapes were mostly round, size was larger than medium, and overall appearance was less than fair. Marketable yields were 102% of Atlantic, gravity was 1.069, and chip scores were excellent for the 24 to 48 hour and good for the 5 to 7 day tests. External defects included very high amounts of common scab, sunscald, misshapes, and skin blemishes due to Rhizoctonia.

NC 24 to 48 hr chip	NC 5 to 7 day chip
<b>AF2291-10</b> AF2291-10	<b>6</b>
Atlantic Atlantic	Atlantic North
C097043-14W CO97043-14	CO97043-14W
C097065-7W CO97065-7W	C097065-7W
MSJ126-9Y MSJ126-9Y	MSJ126-9Y
MSL292-A MSL292-A	MSL292-A Lur

NC 24 to 48 hr chip		NC 5 to 7 day chip
MSQ086-3	MSQ086-3	MSQ086-3
NY138	NY138	NY138
NY139	NY139	NY139
Snowden	Snowden	Snowden
W2310-3	W2310-1	W2310-3
W2324-1	W2324-1	W2324-1

NC 24 to 48 hr chip		NC 5 to 7 day chip
W2717-5	W2717-5	W2717-5
W2978-3	W2978-3	<b>W2978-3</b>
W5015-12	W5015-12	<b>W5015-12</b>

#### Pennsylvania Regional Trial

Local Coordinat	or:	Cooperative Grower:	Cooperating Chip Processor:
Dr. Bill Lamont		James Hite	Snyder of Berlin
Penn State Univ.		Patton, PA 16668	John Blough
Department of Ho	orticulture		Berlin, PA 15530
University Park, F	PA 16802	Report Preparation: B. Dye	and I. Huerta
Trial Data:			
Planting Date:	21-May-10	Soil Temp	perature: 70°F
Vine Kill Date:	15-Sep-10	(117 growing days)	

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

Soil Temperature: 73°F

Growing Season Weather: season was cool and moist with a warmer July. A total of 17.92 inches of rain fell from May 1 through September 30, 2010. The plot was not irrigated.

22-Sep-10

	*Avg. High ⁰F	*Avg. Low ⁰F	*Rain (inches)	Grow Deg Days
Мау	70	46	4.46	286
June	80	54	4.35	512
July	85	57	5.04	650
August	81	56	1.60	566
September	74	48	2.47	170
Total Rainfall (	May through Septer	nber)	17.92	2184

Total Rainfall (May through September)

\*Temperature, Rainfall, and Growing Degree Days as reported at Prince Gallitzin State Park, Patton, PA, by Weather Warehouse.

#### **Trial Procedure:**

Harvest Date:

Previous crop: W	'heat	Soil Type: shaley loam
Fertilizer:	13-13-13 1,300 p	pounds
Irrigation:	Rainfall 17.92 inc	hes
Herbicides:	Before planting: I Sencor (2/3 poun	Round-up (0.67 quart) d) / Medal (1 pint)
Insecticides:	Baythroid (2 ound Admire, Coragen	ces) / Thionex (1.3 quarts) (label rates)
Fungicides:	Manzate®, Curza	tte, Previcur (all at label rates)
Vine Kill:	Reglone (1 pint)	

#### Pennsylvania Regional Trial

	Yield	(cwt/A)	Pe	ercent S	Size Di	stributi	on		Cł	naracterist	ics
Entry	No. 1	Total	No. 1	Small	Mid- Size	Large	Culls	Agtron Scoreª	Specific Gravity <sup>a</sup>	% Internal Defects	Major External Defects
CO97065-7W	302	359	84	5	84	1	10	56	1.076	0.4	SB DD GC SG
MSL126-9Y	287	322	89	8	89	0	3	57	1.075	0.0	SB DD RD MS
NY139	273	338	81	6	81	1	13	58	1.084	0.0	SB DD
W2310-3	271	309	87	8	87	0	4	58	1.090	0.0	SB MS SG
NY138	268	334	80	3	80	2	14	57	1.086	0.5	SB DD GC
Snowden	265	319	83	11	83	1	4	60	1.085	0.0	SB MS DD
AF2291-10	259	326	80	7	80	7	6	56	1.088	0.5	SB DD MS SG
W2978-3	259	325	80	10	80	1	10	59	1.074	0.0	SB DD MS SG
W2717-5	241	346	69	8	69	0	22	60	1.088	0.4	SB DD
MSL292-A	240	343	70	4	70	9	17	60	1.084	2.2	SB DD GC MS
Atlantic	215	279	77	9	77	4	10	58	1.089	1.7	SB MS DD
CO97043-14W	210	277	76	9	76	5	11	64	1.085	1.7	SB MS DD
W5015-12	187	257	73	11	73	0	16	61	1.086	0.6	SB MS DD
Mean	252	318						59	1.084		
lsd 0.05	79.8	73.0						<sup>a</sup> Sample	s processe	ed 23-Sep	-10 by Snyder
CV%	17.3	19.9						of Berlin			
Defects:											
SB = Sunburn		PC = P	ressure	Crack		GC = (	Growth	Cracks		SG = Sec	ondary Growth
MS = Mis-shapen		ST = St	one Da	mage		FR = F	usariur	n Rot		RH = Rhiz	zoctonia
PS = Pitted Scab		VVVV = V	vvire wo	orm dam	nage						

 Table 1. Yield, Size Distribution, and Characteristics of 2010 USPB-SFA Chipping Lines at Chest Springs, PA.

Internal Defects include Hollow Heart and Internal Heat Necrosis; percentages calculated in Cwt/A

#### Table 1. Total, Usable, and Unusable Yield & Size Profile of 2010 Minnesota Irrigated Chip Trial > 4" Variety/ **Total Yield** US No. 1 US No. Rot Misshapen Green < 1 <sup>7</sup>/<sub>8</sub> - 2<sup>1</sup>/<sub>4</sub> - 3<sup>1</sup>/<sub>2</sub>" 3½ -4" Nitrogen Rate (cwt/a) (cwt/a) 1 (%) (%) (%) (%) (%) (%) (%) (%) (%) AF2291-10 608 597 98 0.0 1.2 0.5 16.0 78.8 0.3 0.0 0.1 180N 584 573 98 0.0 1.2 0.2 0.5 16.1 79.1 0.3 0.0 280N 631 621 98 0.0 1.1 0.0 0.5 16.0 78.6 0.4 0.0 Atlantic 684 667 98 0.2 1.7 0.2 0.3 9.0 76.4 1.2 0.2 180N 687 670 98 0.4 1.4 0.3 0.3 8.9 83.2 0.6 0.0 280N 681 664 98 0.0 2.0 0.1 0.3 9.2 69.6 1.9 0.4 CO97043-14W 656 0.2 82.8 668 98 0.3 0.5 0.8 13.3 0.2 0.0 630 180N 645 98 0.3 0.7 0.7 0.7 13.4 83.3 0.1 0.0 683 280N 691 99 0.0 0.0 0.4 0.8 13.2 82.3 0.3 0.0 CO97065-7W 85.7 533 520 98 0.1 0.2 1.3 0.9 11.6 0.0 0.0 180N 544 527 97 0.1 0.3 1.8 0.9 11.0 85.5 0.0 0.0 510 280N 519 98 0.0 0.0 0.7 0.9 12.4 86.0 0.0 0.0 ND7519-1 651 635 98 0.4 1.3 0.2 0.5 26.7 70.9 0.0 0.0 588 180N 608 97 0.7 1.6 0.4 0.5 31.5 65.3 0.0 0.0 280N 682 0.0 0.4 76.6 694 98 1.0 0.1 21.8 0.0 0.0 625 0.2 82.7 NY138 634 99 0.2 0.6 0.4 11.3 0.5 0.0 180N 595 586 98 0.5 0.0 0.6 0.5 12.0 84.6 0.2 0.0 280N 662 654 99 0.0 0.3 0.5 0.4 10.8 81.3 0.7 0.0 NY139 657 644 98 0.1 0.6 0.6 0.7 13.6 81.3 0.3 0.0 180N 597 582 97 0.2 0.6 0.9 0.8 14.1 80.8 0.3 0.0 706 0.0 280N 717 98 0.6 0.3 0.6 13.2 81.7 0.4 0.0 Snowden 664 651 98 0.4 0.5 0.7 0.3 8.6 83.1 0.7 0.0 180N 597 83.2 611 98 0.4 0.4 1.2 0.3 9.7 0.5 0.0 280N 716 706 99 0.4 0.5 0.2 0.4 7.4 83.1 0.8 0.0 76.9 W2310-3 528 519 98 0.0 0.5 0.6 0.7 21.4 0.0 0.0 180N 524 517 99 0.0 0.3 23.3 75.4 0.5 0.5 0.0 0.0 280N 532 521 98 0.0 0.6 0.7 0.9 19.5 78.4 0.0 0.0 0.2 W2717-5 531 521 98 0.4 0.6 0.8 20.5 74.7 0.3 0.0 180N 508 495 97 0.3 0.6 1.0 0.7 22.5 72.0 0.3 0.0 280N 554 547 0.0 0.1 0.2 0.9 18.5 77.4 0.3 0.0 99 W2978-3 537 528 98 0.1 0.5 0.3 0.7 24.8 72.5 0.1 0.0 180N 520 510 98 0.3 0.3 0.5 0.8 26.0 72.0 0.0 0.0 280N 554 547 99 0.0 0.7 0.1 0.5 23.5 73.0 0.2 0.0 W5015-12 693 677 98 0.2 0.5 0.5 1.1 32.2 64.5 0.1 0.0 180N 699 685 98 0.1 0.5 0.5 0.9 35.8 60.9 0.1 0.0 280N 687 669 97 0.4 0.5 0.4 1.4 28.6 68.1 0.1 0.0

#### **Red River Valley Regional Trial**

## **Red River Valley Regional Trial**

Table 2.	Specific	Gravity	Vas. Disc	coloration	Brown	Center	Hollow	Heart	Int. Bro	wn Spot
Variety/	1 3 - 21⁄4"	2¼ - 3½"	1 1⁄8 - 21⁄4"	2¼ - 3½"	1 3 - 21⁄4"	2¼ - 3½"	1 1⁄8 - 21⁄4"	3½"	1 3 - 21⁄4"	2¼ - 3½"
Nitrogen Rate	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
AF2291-10	1.082	1.086	2.5	2.5	0.0	1.3	0.0	1.3	0.0	0.0
180N	1.079	1.085	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0
280N	1.086	1.088	5.0	5.0	0.0	0.0	0.0	2.5	0.0	0.0
Atlantic	1.088	1.090	7.1	4.4	0.0	4.8	0.0	5.0	0.0	1.3
180N	1.086	1.088	10.0	0.0	0.0	0.0	0.0	5.0	0.0	2.5
280N	1.091	1.092	4.2	8.8	0.0	9.6	0.0	5.0	0.0	0.0
CO97043-14W	1.078	1.079	12.5	2.5	0.0	0.0	0.0	0.0	1.3	1.3
180N	1.073	1.077	15.0	2.5	0.0	0.0	0.0	0.0	2.5	2.5
280N	1.082	1.080	10.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0
CO97065-7W	1.074	1.081	18.6	1.4	0.0	5.7	0.0	0.0	0.0	0.0
180N	1.076	1.083	20.0	2.5	0.0	2.5	0.0	0.0	0.0	0.0
280N	1.071	1.079	16.7	0.0	0.0	10.0	0.0	0.0	0.0	0.0
ND7519-1	1.082	1.086	16.3	12.5	0.0	0.0	0.0	0.0	0.0	12.5
180N	1.081	1.086	22.5	22.5	0.0	0.0	0.0	0.0	0.0	10.0
280N	1.083	1.086	10.0	2.5	0.0	0.0	0.0	0.0	0.0	15.0
NY138	1.076	1.076	11.8	5.7	0.0	0.0	0.0	0.0	0.0	0.0
180N	1.077	1.074	13.3	3.3	0.0	0.0	0.0	0.0	0.0	0.0
280N	1.075	1.078	10.6	7.5	0.0	0.0	0.0	0.0	0.0	0.0
NY139	1.080	1.084	11.1	5.0	0.0	0.0	0.0	0.0	0.0	3.9
180N	1.079	1.081	17.3	5.0	0.0	0.0	0.0	0.0	0.0	2.8
280N	1.081	1.086	5.0	5.0	0.0	0.0	0.0	0.0	0.0	5.0
Snowden	1.079	1.086	10.0	3.8	0.0	2.5	1.3	1.3	1.3	0.0
180N	1.080	1.084	5.0	2.5	0.0	2.5	0.0	0.0	0.0	0.0
280N	1.079	1.089	15.0	5.0	0.0	2.5	2.5	2.5	2.5	0.0
W2310-3	1.078	1.083	8.8	12.5	0.0	0.0	0.0	1.3	0.0	1.3
180N	1.074	1.081	5.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0
280N	1.081	1.085	12.5	22.5	0.0	0.0	0.0	2.5	0.0	2.5
W2717-5	1.078	1.081	17.5	15.0	0.0	3.8	0.0	1.3	1.3	0.0
180N	1.078	1.084	15.0	7.5	0.0	2.5	0.0	2.5	2.5	0.0
280N	1.079	1.079	20.0	22.5	0.0	5.0	0.0	0.0	0.0	0.0
W2978-3	1.070	1.076	7.5	5.0	0.0	1.3	0.0	0.0	0.0	0.0
180N	1.070	1.076	10.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0
280N	1.070	1.076	5.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
W5015-12	1.084	1.086	3.8	1.3	0.0	0.0	0.0	1.3	1.3	1.3
180N	1.084	1.084	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
280N	1.083	1.088	7.5	2.5	0.0	0.0	0.0	2.5	2.5	2.5

## Wisconsin Regional Trial

Mary T. LeMere, Interim Superintendent, Hancock Agricultural Research Station Phone: 715-249-5961; E-mail: lemere@wisc.edu College of Agricultural and Life Sciences, University of Wisconsin-Madison

#### Trial Site

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

#### Technical Support

Amber Gotch, Hancock Agricultural Research Station Jolyn Rasmussen, Hancock Agricultural Research Station

#### **Trial Procedure**

Seed was received from trial cooperators during the first two weeks of April, 2010 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 19, 2010 with special attention paid to cutting uniform-sized, blocky seed pieces ranging from 2 to 2½ oz in weight. Cut seed was placed in well-ventilated plastic crates and held at 55°F for three days to promote drying and suberization prior to planting. Planting took place on April 26, 2010 using an Iron Age assist-feed planter. Varieties were placed 12 in. apart within each row. Plots were vine-killed on September 9, 2010 and using a custom-built Gallenberg plot harvester on September 20, 2010.

Plots were maintained according to standard production practices recommended by the University of Wisconsin. Unusually heavy rains and subsequent petiole nitrate monitoring led to additional fertilizer applications. Elevated disease pressure resulted in frequent fungicide applications. Irrigation schedules and application rates were based on in-hill soil moisture monitors and daily field observations.

Fertility: 0-0-60; 6-24-24; 0-0-0-17S-21Ca, 6-30-22-4S, 21-0-0-24S, 34-0-0, 32-0-0 UAN

Weed Control: Matrix, Clethodim 2E

Insect Control: Coragen

Disease Control: Champ Formula II, Bravo ZN, Headline, Endura, Equus 500 ZN, Manzate Pro-Stick, Tanos, Agri Tin 80WP, Metastar

Vine Kill: Diquat E, Reglone

Rainfall: 29.6 in

Irrigation: 15.5 in

Soil type: Plainfield loamy sand

#### Yield Data and Tuber Quality

Tubers were graded and sized using a custom-built Gallenberg grader and Exeter optical sizer. Specific gravity measurements were taken for each variety using a Weltech PW-2050 Dry Matter Assessment System (weight in air/weight in water method). Specific gravity, 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. Internal defects were evaluated as a percent of 50 individual tubers. Table 3 indicates percent incidence of brown center, hollow heart, internal brown spot, vascular discoloration, and stem end discoloration.

	Specific	Total Yield	U. S. N	No. 1	<1 7/8 in.	Culls
Variety	Gravity	(cwt)	(cwt)	(%)	(%)	(%)
AF2291-10	1.085	359	339	95	4	2
CO97043-14W	1.073	527	479	91	3	7
CO97065-7W	1.070	442	381	86	3	11
MSJ126-9Y	1.073	155	137	88	7	5
MSL292-A	1.075	696	632	91	5	4
NY138	1.071	435	408	94	2	4
NY139	1.084	533	496	93	3	4
W2310-3	1.087	500	455	91	6	3
W2717-5	1.080	382	330	86	4	9
W2978-3	1.071	312	276	89	4	8
W5015-12	1.083	605	539	89	5	6
Atlantic	1.087	425	395	93	2	5
Snowden	1.088	613	563	92	6	2

Table 1. Specific gravity, Total yield, U. S. No. 1 yield, <1 7/8" and culls, 2010.

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

Table 2. U. S	S No. 1	size distribution,	2010.
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		U. S. No. 1	Size Distrib	ution (% of U	. S. No. 1 Yiel	d)
	2-4 oz.	4-6 oz.	6-10 oz.	10-13 oz.	13-16 oz.	>16 oz.
AF2291-10	24	17	34	13	7	5
CO97043-14W	14	12	34	18	12	10
CO97065-7W	14	15	38	18	11	5
MSJ126-9Y	20	11	35	16	13	4
MSL292-A	22	22	37	12	5	2
NY138	19	16	34	18	8	5
NY139	20	14	31	16	10	10
W2310-3	25	21	39	11	2	1
W2717-5	26	19	36	12	6	1
W2978-3	26	19	31	16	5	3
W5015-12	34	24	31	6	3	1
Atlantic	14	13	33	19	12	9
Snowden	31	21	34	9	4	2

	Exte	ernal D	efects	(%)	-	Int	ernal E	Defects	(%)
Variety	GC	MS	SB	SC	-	BC	HH	IBS	VD
AF2291-10	0	0	0	0	-	0	0	0	14
CO97043-14W	0	0	0	0		0	0	0	0
CO97065-7W	0	0	0	0		0	0	2	0
MSJ126-9Y	0	0	0	2		0	0	0	6
MSL292-A	0	0	0	0		2	2	0	0
NY138	0	0	0	2		0	0	0	0
NY139	0	0	0	0		0	0	0	2
W2310-3	0	0	0	0		0	0	0	6
W2717-5	0	0	0	0		0	0	0	4
W2978-3	0	0	0	0		0	0	0	6
W5015-12	0	0	0	2		0	0	0	0
Atlantic	0	0	0	2		0	0	2	0
Snowden	0	0	0	0		0	4	0	20

Table 3. External and internal defects, 2010.

External defects: GC = growth cracks; MS = misshapen; SB = sunburned; SC = scab Internal defects: BC = brown center; HH = hollow heart; IBS = internal brown spot; VD = vascular discoloration

Table	3. Summary c	of yield,	size dist	ributic	on, cull	s, specif	ic grav	/ity, an	d out of	field ch	ip color	for	
fourte	en clones and	two sta	andards	grown	in CA,	FL, ID, N	ЛЕ, AI,	MO, N	IC, PA, R	<b>RV and</b>	I WI in 2	010.	
	CLONE or	No.1	TOTAL		PERCEN	T OF CATE	GORIES		SPECIFIC	AGTRO	N VALUE	SFA S	CORE
STATE	VARIETY	YIELD	YIELD	NO. 1	SMALL	<b>MID-SIZE</b>	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
CA	AF2291-10	433	443	98	2	98	0	0	1.102				
Ę	AF2291-10	224	360	65	31	65	0	5	1.070			3.5	
₽	AF2291-10	322	377	85	∞	75	17	7	1.095				
В	AF2291-10	297	369	80	ო	85	13	17	1.093		68.3		
Σ	AF2291-10	506	565	06	4	74	16	9	1.081	62.4		3.0	
MO	AF2291-10	407	435	94	7	93	0	0	1.078	70.0			
NC	AF2291-10	192	260	74	7	71	ო	19	1.069	62.9		3.0	3.0
PA	AF2291-10	259	326	80	7	80	7	9	1.088	56.0			
RRV	AF2291-10	597	608	<u> 8</u> 6	0.5	95	0.3	1.3	1.086				
M	AF2291-10	298	359	83	4	83	11	7	1.085				
	average:	354	410	85	7	82	7	9	1.085	62.8	68.3	3.2	3.0
CA	ATLANTIC	392	409	96	4	96	0	0	1.080				
Ę	ATLANTIC	283	393	74	22	20	4	ო	1.065			2.0	
٩	ATLANTIC	453	519	87	10	78	12	з	1.094				
ВΕ	ATLANTIC	318	383	83	3	87	6	14	1.095		70.5		
M	ATLANTIC	443	472	94	9	82	12	0	1.082	62.9		4.0	
MO	ATLANTIC	506	542	63	7	93	0	0	1.081	72.0			
NC	ATLANTIC	299	340	88	10	88	1	2	1.072	59.5		2.0	2.0
ΡA	ATLANTIC	215	279	17	6	77	4	10	1.089	58.0			
RRV	ATLANTIC	667	684	98	0.3	85	1.4	2.1	1.090				
M	ATLANTIC	312	425	73	2	73	20	5	1.087				
	average:	389	445	86	7	83	9	4	1.084	63.1	70.5	2.7	2.0
CA	CO97043-14W	466	563	83	17	83	0	0	1.088				
Ľ	CO97043-14W	163	292	57	34	56	-	e	1.066			1.0	
₽	CO97043-14W	388	436	89	10	77	13	-	1.086				
ЯЕ	CO97043-14W	328	373	88	5	89	7	7	1.083		71.2		
M	CO97043-14W	265	305	87	13	80	7	0	1.065	63.5		3.0	
MO	CO97043-14W	402	429	94	9	94	0	0	1.064	73.0			
NC	CO97043-14W	264	317	83	16	83	0	-	1.066	61.8		2.0	1.0
PA	CO97043-14W	210	277	76	6	76	5	11	1.085	64.0			
RRV	CO97043-14W	656	668	98	0.8	96	0.2	-	1.079				
M	CO97043-14W	374	527	71	З	71	20	7	1.073				
	average:	352	419	83	11	81	5	ო	1.076	65.6	71.2	2.0	1.0

Table	3. Summary c	of yield,	size dist	ributic	on, cull	s, specif	ic grav	/ity, an	d out of	field ch	ip color	for	
fourte	en clones and	two sta	indards (	grown	in CA,	FL, ID, N	ΛE, MI,	MO, N	C, PA, R	<b>RV and</b>	WI in 2	010.	
	CLONE or	No.1	TOTAL		PERCEN	T OF CATE	GORIES		SPECIFIC	AGTRON	I VALUE	SFA S	CORE
STATE	VARIETY	YIELD	YIELD	NO. 1	SMALL	<b>MID-SIZE</b>	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
CA	CO97065-7W	449	480	94	9	94	0	0	1.101				
Ę	CO97065-7W	204	307	73	23	70	n	∞	1.065			1.0	
₽	CO97065-7W	330	384	86	14	84	2	0	1.093				
ШЫ	CO97065-7W	336	389	86	9	91	ო	6	1.089		69.7		
Σ	CO97065-7W	344	377	91	∞	81	10	~	1.070	61.0		3.0	
MO	CO97065-7W	449	481	93	7	<u>9</u> 3	0	0	1.067	70.0			
NC	CO97065-7W	260	313	83	16	83	0	-	1.065	60.4		3.0	2.0
ΡA	CO97065-7W	302	359	84	5	84	-	10	1.076	56.0			
RRV	CO97065-7W	520	533	98	0.9	97	0	1.6	1.081				
M	CO97065-7W	324	442	73	3	73	14	11	1.070				
	average:	352	407	86	6	85	3	4	1.078	61.9	69.7	2.3	2.0
		1	L	2	¢	2	(	0					
CA	MSJ126-9Y	297	325	91	6	91	0	0	1.098				
Ŀ	MSJ126-9Y	208	288	75	24	75	0	5	1.068			5.0	
D	MSJ126-9Y	276	328	84	15	82	3	1	1.089				
ME	MSJ126-9Y	308	347	89	7	88	4	5	1.080		69.2		
Σ	MSJ126-9Y	285	336	84	16	81	ო	0	1.065	65.7		2.0	
MO	MSJ126-9Y	312	339	92	∞	92	0	0	1.066	73.0			
NC	MSJ126-9Y	251	302	83	16	82	-	~	1.062	65.3		3.0	2.0
ΡA	MSJ126-9Y	287	322	89	∞	89	0	с	1.075	57.0			
M	MSJ126-9Y	112	155	72	7	72	15	5	1.073				
	average:	260	305	84	12	84	e	7	1.075	65.3	69.2	3.3	2.0
CA	<b>MSL292-A</b>	306	333	92	8	92	0	0	1.097				
	<b>MSL292-A</b>	321	411	81	17	79	-	e	1.071			2.0	
ݠ	<b>MSL292-A</b>	296	380	78	20	76	4	7	1.089				
ВΕ	<b>MSL292-A</b>	294	356	83	6	88	с	6	1.090		72.1		
M	MSL292-A	457	490	93	7	79	14	0	1.071	67.3		2.0	
QM	<b>MSL292-A</b>	448	472	95	5	95	0	0	1.074	70.0			
NC	<b>MSL292-A</b>	359	406	88	4	85	с	8	1.071	61.8		2.0	2.0
PA	MSL292-A	240	343	70	4	70	6	17	1.084	60.0			
M	<b>MSL292-A</b>	588	696	84	5	84	9	4	1.075				
	average:	368	432	85	6	83	4	5	1.080	64.8	72.1	2.0	2.0

Table	3. Summary c	of yield,	size dist	ributic	on, cull	s, specif	ic grav	/ity, an	d out of	field ch	ip color	for	
fourte	en clones and	two sta	andards (	grown	in CA,	FL, ID, N	ИЕ, MI,	MO, N	IC, PA, R	<b>RV and</b>	WI in 2	010.	
	CLONE or	No.1	TOTAL		PERCEN	T OF CATE	GORIES		SPECIFIC	AGTRON	I VALUE	SFA S	CORE
STATE	VARIETY	YIELD	YIELD	NO. 1	SMALL	<b>MID-SIZE</b>	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
CA	MSQ086-3	429	477	06	10	06	0	0	1.094				
Ę	MSQ086-3	217	390	57	31	27	-	с	1.067			2.0	
MO	MSQ086-3	448	500	06	10	06	0	0	1.063	72.0			
NC	MSQ086-3	251	393	64	26	64	0	10	1.059	64.6		3.0	3.0
	average:	336	440	75	19	68	0	3	1.071	68.3		2.5	3.0
RRV	ND7519-1	635	651	98	0.5	98	0	1.9	1.086				
CA	NY138	396	416	95	5	95	0	0	1.098				
Ę	NY138	263	383	71	25	20	ſ	с	1.060			1.5	
٩	NY138	401	444	06	6	77	14	-	1.087				
ME	NY138	366	405	90	5	89	6	5	1.080		71.6		
M	NY138	444	471	94	9	82	12	0	1.071	65.4		3.0	
MO	NY138	458	490	93	7	93	0	0	1.059	71.0			
NC	NY138	292	359	81	9	80	2	12	1.060	68.1		2.0	3.0
PA	NY138	268	334	80	3	80	2	14	1.086	57.0			
RRV	NY138	625	634	66	0.4	94	0.5	-	1.076				
M	NY138	355	435	82	2	82	12	4	1.071				
	average:	387	437	88	7	84	5	4	1.075	65.4	71.6	2.2	3.0
e CA	NY139	431	456	95	5	95	0	0	1.105			1	
	NY139	175	408	57	36	56	-	25	1.064			5.0	
٩	NY139	341	435	78	19	76	5	ო	1.093				
Ш Ы	NY139	343	395	87	7	93	-	7	1.094		70.8		
Σ	NY139	428	469	91	∞	80	11	-	1.076	62.0		2.0	
QM	NY139	400	437	92	6	91	0	0	1.076	70.0			
NC	NY139	318	361	88	10	88	0	2	1.067	64.1		2.0	3.0
PA	NY139	273	338	81	9	81	-	13	1.084	58.0			
RRV	NY139	644	657	98	0.7	95	0.3	1.3	1.084				
M	NY139	402	533	75	с	75	19	4	1.084				
	average:	376	449	84	10	83	4	9	1.083	63.5	70.8	3.0	3.0

Table	3. Summary c	of yield,	size dist	tributic	on, cull	s, specif	ic grav	vity, an	id out of	field ch	ip color	for	
fourte	en clones and	two sta	andards	grown	in CA,	FL, ID, N	ΛE, MI,	MO, N	IC, PA, R	<b>RV and</b>	WI in 2	010.	
	CLONE or	No.1	TOTAL		PERCEN	T OF CATE	GORIES		SPECIFIC	AGTRO	N VALUE	SFA S	CORE
STATE	VARIETY	YIELD	YIELD	NO. 1	SMALL	<b>MID-SIZE</b>	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
CA	SNOWDEN	432	479	90	10	06	0	0	1.100				
님	SNOWDEN	389	482	82	16	82	-	2	1.073			4.0	
D	SNOWDEN	326	436	22	25	20	5	0	1.094				
В	SNOWDEN	287	340	84	5	86	6	10	1.097		70.3		
Z	SNOWDEN	463	510	06	10	82	8	0	1.077	63.5		2.0	
QM	SNOWDEN	398	424	94	9	94	0	0	1.074	70.0			
NC	SNOWDEN	333	393	85	15	84	~	-	1.071	65.6		2.0	2.0
ΡA	SNOWDEN	265	319	83	11	83	-	4	1.085	60.0			
RRV	SNOWDEN	651	664	98	0.3	92	0.7	1.6	1.086				
M	SNOWDEN	535	613	87	9	87	9	2	1.088				
	average:	408	466	87	10	85	e	7	1.085	64.8	70.3	2.7	2.0
		000	0.07	00	•	0	(	(					
CA	W2310-3	383	400	96	4	96	0	0	1.106				
Ŀ	W2310-3	167	271	63	34	62	0	2	1.075			2.0	
ݠ	W2310-3	266	327	81	15	75	10	ი	1.093				
ME	W2310-3	283	339	83	6	06	1	8	1.094		71.8		
IW	W2310-3	418	624	87	9	78	6	7	1.082	64.5		3.0	
QM	W2310-3	358	394	91	6	91	0	0	1.074	70.0			
NC	W2310-3	172	285	60	14	60	0	25	1.075	69.7		2.0	2.0
ΡA	W2310-3	271	608	87	8	87	0	4	1.090	58.0			
RRV	W2310-3	519	528	98	0.7	98	0	1.1	1.083				
MI	W2310-3	437	500	87	9	87	3	3	1.087				
	average:	327	383	83	11	82	7	5	1.086	65.6	71.8	2.3	2.0
CA	W2324-1	455	475	96	4	96	0	0	1.102				
님	W2324-1	348	415	87	12	81	9	4	1.071			3.0	
QM	W2324-1	427	460	93	7	93	0	0	1.074	70.0			
NC	W2324-1	347	420	83	10	81	-	8	1.070	60.2		1.0	3.0
	average:	394	443	06	∞	88	2	ო	1.079	65.1		2.0	3.0

Table	3. Summary c	of yield,	size dist	tributic	on, cull	s, specif	ic grav	rity, an	d out of	field ch	ip color	for	
fourte	en clones and	two st	andards	grown	in CA,	FL, ID, N	ЛЕ, AI,	MO, N	IC, PA, R	<b>RV and</b>	WI in 2	010.	
	CLONE or	No.1	TOTAL		PERCEN	T OF CATE(	GORIES		SPECIFIC	AGTRON	I VALUE	SFA S	CORE
STATE	VARIETY	YIELD	YIELD	NO. 1	SMALL	MID-SIZE	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
CA	W2717-5	374	406	92	8	92	0	0	1.108				
Ę	W2717-5	269	367	17	19	76	2	5	1.074			2.0	
٩	W2717-5	290	352	82	14	75	11	з	1.089				
В	W2717-5	260	314	83	9	63	-	12	1.096		70.8		
Σ	W2717-5	258	300	86	13	84	2	-	1.080	60.3		3.0	
MO	W2717-5	314	343	92	6	91	0	0	1.075	71.0			
NC	W2717-5	236	279	85	6	85	0	7	1.075	70.4		1.0	2.0
ΡA	W2717-5	241	346	69	∞	69	0	22	1.088	60.0			
RRV	W2717-5	521	531	98	0.8	95	0.3	1.2	1.081				
N	W2717-5	307	382	80	4	80	9	6	1.080				
	average:	307	362	84	6	84	7	9	1.085	65.4	70.8	2.0	2.0
CA	W2978-3	389	416	94	9	94	0	0	1.096				
F	W2978-3	178	350	57	34	23	0	6	1.062			3.5	
D	W2978-3	280	387	72	25	73	2	3	1.082				
ME	W2978-3	304	358	85	9	91	3	9	1.080		72.0		
M	W2978-3	392	434	91	6	82	6	0	1.064	64.2		2.0	
МО	W2978-3	400	455	88	12	88	0	0	1.064	70.0			
NC	W2978-3	260	329	62	18	79	0	3	1.066	64.4		2.0	3.0
PA	W2978-3	259	325	80	10	80	1	10	1.074	59.0			
RRV	W2978-3	528	537	98	0.7	97	0.1	0.9	1.076				
M	W2978-3	254	312	81	4	81	7	8	1.071				
	average:	324	390	83	12	79	2	4	1.074	64.4	72.0	2.5	3.0
CA	W5015-12	369	458	81	19	81	0	0	1.104				
Ę	W5015-12	255	389	69	26	68	2	9	1.066			2.5	
₽	W5015-12	241	365	66	33	65	2	-	1.093				
ME	W5015-12	302	376	80	10	84	5	10	1.087		61.3		
M	W5015-12	498	565	89	11	78	11	0	1.080	62.0		3.0	
MO	W5015-12	403	436	92	7	93	0	0	1.076	72.0			
NC	W5015-12	302	415	73	19	72	0	8	1.069	62.5		2.0	3.0
PA	W5015-12	187	257	73	11	73	0	16	1.086	61.0			
RRV	W5015-12	677	693	98	1.1	97	0.1	1.2	1.086				
M	W5015-12	512	605	85	9	85	4	9	1.083				
	average:	375	456	81	14	80	2	5	1.083	64.4	61.3	2.5	3.0

TABL	E 4 - A	F2291-10 CO	MPLETI	NG TH	IREE Y	EARS	OF US	SPB-SFA	CHIP	TRIAL	<mark>S - 20</mark> 08	-2010			
YEAR	STATE	CLONE or	No. 1 Y	IELD	TOTAL		PERCEN	IT OF CATE	GORIES		SPECIFIC	AGTRO	N VALUE	SFA S	CORES
		VARIETY	VIELD	% ATL.	YIELD	No.1	SMALL	<b>MID-SIZE</b>	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
2010	CA	AF2291-10	433	110	443	98	2	98	0	0	1.102				
2010	Ę	AF2291-10	224	62	360	65	31	65	0	5	1.070			3.5	
2010	D	AF2291-10	322	11	377	85	8	75	17	7	1.095				
2010	ME	AF2291-10	297	86	369	80	3	85	13	17	1.093		68.3		
2010	Σ	AF2291-10	506	114	565	90	4	74	16	9	1.081	62.4		3.0	
2010	QM	AF2291-10	407	80	435	94	7	93	0	0	1.078	70.0			
2010	NC	AF2291-10	192	64	260	74	7	71	с	19	1.069	62.9		3.0	3.0
2010	PA	AF2291-10	259	120	326	80	7	80	7	9	1.088	56.0			
2010	RRV	AF2291-10	597	06	608	86	0.5	95	0.3	1.3	1.086				
2010	M	AF2291-10	298	96	359	83	4	83	11	2	1.085				
2009	CA	AF2291-10	287	75	324	89	6	89	2	0.7	1.088				
2009	Ę	AF2291-10	205	91	262	78	10	85	9	14	1.073			3.0	
2009	₽	AF2291-10	283	98	327	87	6	69	17	5	1.093				
2009	ME	AF2291-10	314	116	365	86	5	91	4	9.8	1.092	70.0			
2009	Σ	AF2291-10	466	64	480	97	3	86	11	0	1.089	58.5		2.0	
2009	MO	AF2291-10	187	69	194	96	4	96	0	NA	1.087	64.0			
2009	NC	AF2291-10	266	72	300	89	9	88	1	9	1.080			3.0	2.0
2009	PA	AF2291-10	306	203	335	91	2	91	2	4	1.082	56.0			
2009	<b>RRV-I</b>	AF2291-10	337	91	351	96	4	88	6	NA	1.094	73.0			
2009	<b>RRV-D</b>	AF2291-10	192	112	211	91	6	78	14	AN	1.108				
2009	M	AF2291-10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2008	CA	AF2291-10	254	NA	304	84	15	64	20	7	1.092				
2008	님	AF2291-10	219	77	273	80	15	82	7	4	1.091			3.6	
2008	₽	AF2291-10	305	62	400	76	4	44	33	19	1.095				
2008	ШΣ	AF2291-10	303	84	311	97	5	86	6	0.3	1.085	70.7			
2008	Σ	AF2291-10	394	95	414	95	e	79	17	7	1.078	64.4		1.0	
2008	QM	AF2291-10	202	81	281	72	28	72	0	NA	1.077	69.0			
2008	S	AF2291-10	256	79	284	06	8	89	-	7	1.095	66.0		2.0	2.0
2008	PA	AF2291-10	204	71	262	78	5	78	1	9	1.094	51.0			
2008	RRV	AF2291-10	242	71	260	93	7	93	0	0	1.098	50.0		3.0	
2008	M	AF2291-10	347	78	411	84	٦	84	10	4	1.082				
	2010 ave	rage:	354	92	410	85	7	82	7	9	1.085	62.8	68.3	3.2	3.0
	2009 ave	rage:	284	101	315	90	6	86	7	6	1.089	64.3		2.7	2.0
	2008 ave	srage:	273	78	320	85	6	77	10	4	1.089	61.9		2.4	2.0
	three yes	ar average:	303	91	348	87	8	82	8	5	1.087	62.9	68.3	2.7	2.3

TABL	E 5 - C	097043-14W	COMPL	ETING	<b>THRE</b>	E YEA	<b>RS OI</b>	= USPB-	SFA CI	<b>HIP TR</b>	IALS - 2	008-20	10		
YEAR	STATE	CLONE or	No. 1 Y	IELD	TOTAL		PERCEN	<b>NT OF CATE</b>	GORIES		SPECIFIC	AGTRO	N VALUE	SFA S	CORES
		VARIETY	YIELD	% ATL.	YIELD	No.1	SMALL	MID-SIZE	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
2010	CA	CO97043-14W	466	119	563	83	17	83	0	0	1.088				
2010	Ę	CO97043-14W	163	58	292	57	34	56	-	з	1.066			٢	
2010	D	CO97043-14W	388	86	436	89	10	77	13	1	1.086				
2010	ME	CO97043-14W	328	103	373	88	5	89	7	7	1.083		71.2		
2010	Z	CO97043-14W	265	60	305	87	13	80	7	0	1.065	63.5		3	
2010	QM	CO97043-14W	402	79	429	94	9	94	0	0	1.064	73			
2010	S	CO97043-14W	264	88	317	83	16	83	0	-	1.066	61.8		2	-
2010	PA	CO97043-14W	210	98	277	76	6	76	5	11	1.085	64			
2010	RRV	CO97043-14W	656	98	668	86	0.8	96	0.2	-	1.079				
2010	M	CO97043-14W	374	120	527	71	n	71	20	7	1.073				
2009	CA	CO97043-14W	342	89	385	89	8	89	3	0.4	1.084				
2009	FL	CO97043-14W	301	133	346	87	8	80	11	4	1.066			1	
2009	₽	CO97043-14W	316	96	409	17	23	75	2	0	1.088				
2009	ME	CO97043-14W	236	87	295	80	5	06	5	16.2	1.081	70			
2009	Z	CO97043-14W	455	91	472	96	3	85	11	1	1.073	62.7		2	
2009	MO	CO97043-14W	201	74	239	84	16	84	0	NA	1.083	64			
2009	NC	CO97043-14W	330	89	373	88	6	88	0	2	1.071			1	2
2009	PA	CO97043-14W	144	95	169	85	ო	85	0	11	1.074	59			
2009	<b>RRV-I</b>	CO97043-14W	359	97	390	92	8	77	15	NA	1.084	73			
2009	<b>RRV-D</b>	CO97043-14W	189	110	222	85	15	76	10	NA	1.096				
2009	M	CO97043-14W	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2008	CA	CO97043-14W	286	NA	339	84	15	59	25	-	1.083				
2008	근	CO97043-14W	243	85	307	79	15	82	-	4	1.084			3.7	
2008	₽	CO97043-14W	432	88	492	88	10	70	17	2	1.086				
2008	ШΣ	CO97043-14W	314	87	341	92	9	76	13	5	1.072	69.4			
2008	E	CO97043-14W	379	92	402	94	9	86	œ	0	1.068	65.2		2	
2008	QM	CO97043-14W	196	79	261	75	25	75	0	NA	1.067	69			
2008	S	CO97043-14W	284	88	347	82	16	81	0	2	1.085	70.4		2	2
2008	ΡA	CO97043-14W	271	94	324	84	7	84	4	5	1.089	50			
2008	RRV	CO97043-14W	291	86	315	92	œ	93	0	0	1.093	68		-	
2008	M	CO97043-14W	371	83	408	91	3	91	3	4	1.074				
	2010 ave	rage:	352	91	419	83	11	81	5	3	1.076	65.6	71.2	2.0	1.0
	2009 ave	srage:	287	96	330	86	10	83	9	5	1.080	65.7		1.3	2.0
	2008 ave	erage:	307	87	354	86	11	80	7	3	1.080	65.3		2.2	2.0
	three yes	ar average:	315	92	367	85	11	81	9	3	1.079	65.5	71.2	1.9	1.7

TABL	E 6 - C	097065-7W C	COMPLE	ETING	THREE	YEAF	RS OF	<b>USPB-S</b>	FA CH	P TRI	ALS - 20	08-201	0		
YEAR	STATE	CLONE or	No. 1 Y	IELD	TOTAL		PERCEN	IT OF CATE	GORIES		SPECIFIC	AGTROI	N VALUE	S FA S	CORES
		VARIETY	YIELD	% ATL.	YIELD	No.1	SMALL	<b>MID-SIZE</b>	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
2010	CA	CO97065-7W	449	115	480	94	9	94	0	0	1.101				
2010	Ę	CO97065-7W	204	72	307	73	23	70	3	8	1.065			1	
2010	Q	CO97065-7W	330	73	384	86	14	84	2	0	1.093				
2010	ШΣ	CO97065-7W	336	106	389	86	9	91	ო	6	1.089		69.7		
2010	Σ	CO97065-7W	344	78	377	91	œ	81	10	-	1.070	61.0		3	
2010	Q	CO97065-7W	449	68	481	93	7	93	0	0	1.067	70			
2010	NC	CO97065-7W	260	87	313	83	16	83	0	-	1.065	60.4		3	2
2010	PA	CO97065-7W	302	140	359	84	5	84	-	10	1.076	56			
2010	RRV	CO97065-7W	520	78	533	86	0.9	97	0	1.6	1.081				
2010	Z	CO97065-7W	324	104	442	73	e	73	14	11	1.07				
2009	CA	CO97065-7W	303	79	380	80	12	80	8	0.4	1.087				
2009	Ę	CO97065-7W	288	127	325	89	7	91	-	5	1.075			-	
2009	₽	CO97065-7W	213	65	393	54	46	54	0	0	1.089				
2009	Ш	CO97065-7W	258	96	322	80	5	93	2	16.1	1.090	70			
2009	Σ	CO97065-7W	404	18	420	96	3	81	15	1	1.078	58.5		2	
2009	MO	CO97065-7W	136	50	147	93	7	93	0	NA	1.085	64			
2009	NC	CO97065-7W	323	87	363	89	7	88	1	4	1.072			1	1
2009	PA	CO97065-7W	200	132	218	92	e	92	0	5	1.086	57			
2009	<b>RRV-I</b>	CO97065-7W	368	66	396	93	7	88	5	NA	1.056	73			
2009	<b>RRV-D</b>	CO97065-7W	84	49	112	75	25	71	5	NA	1.113				
2009	M	CO97065-7W	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2008	СA	CO97065-7W	253	NA	325	78	21	61	17	2	1.086				
2008	ᡄ	CO97065-7W	242	85	314	1	18	77	0	-	1.088			3.5	
2008	₽	CO97065-7W	278	57	358	78	21	77	-	-	1.086				
2008	ВΕ	CO97065-7W	279	77	349	80	8	76	0	17	1.077	69.1			
2008	Ξ	CO97065-7W	363	88	408	89	10	89	0	-	1.079	64.4		3	
2008	MO	CO97065-7W	228	92	280	82	18	82	0	NA	1.075	67			
2008	NC	CO97065-7W	265	82	304	87	10	87	0	2	1.096	71.2		2	2
2008	PA	CO97065-7W	107	37	144	75	8	75	2	15	1.092	49			
2008	RRV	CO97065-7W	247	73	275	90	10	<b>0</b> 6	0	0	1.096	64		2	
2008	M	CO97065-7W	378	85	403	94	2	94	0	5	1.077				
	2010 ave	srage:	352	64	407	86	6	85	3	4	1.078	61.9	69.7	2.3	2.0
	2009 ave	srage:	258	28	308	84	12	83	4	5	1.083	64.5		1.3	1.0
	2008 ave	srage:	264	75	316	83	13	81	7	5	1.085	64.1		2.6	2.0
	three yea	ar average:	291	86	343	84	11	83	S	5	1.082	63.6	69.7	2.2	1.7

TABL	E 7 - N	<b>Y138 COMPL</b>	ETING	THREE	E YEAR	S OF I	<b>USPB-</b>	SFA CH	IP TRI/	7LS - 2	2008-201	0			
YEAR	STATE	CLONE or	No. 1 Y	'IELD	TOTAL		PERCEN	IT OF CATE	GORIES		SPECIFIC	AGTROI	<b>N VALUE</b>	S FA S	CORES
		VARIETY	YIELD	% ATL.	YIELD	No.1	SMALL	<b>MID-SIZE</b>	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
2010	CA	NY138	396	101	416	95	5	95	0	0	1.098				
2010	Ę	NY138	263	93	383	71	25	70	-	e	1.060			1.5	
2010	D	NY138	401	89	444	<b>0</b> 6	6	77	14	1	1.087				
2010	ME	NY138	366	115	405	60	5	89	9	5	1.080		71.6		
2010	M	NY138	444	100	471	94	9	82	12	0	1.071	65.4		с	
2010	MO	NY138	458	91	490	93	7	93	0	0	1.059	71			
2010	S	NY138	292	98	359	81	9	80	2	12	1.060	68.1		2	ო
2010	PA	NY138	268	125	334	80	ო	80	7	14	1.086	57			
2010	RRV	NY138	625	94	634	66	0.4	94	0.5	-	1.076				
2010	M	NY138	355	114	435	82	2	82	12	4	1.071				
2009	CA	NY138	354	92	426	83	9	83	11	0.5	1.078				
2009	FL	NY138	331	146	395	84	5	64	30	10	1.062			1	
2009	D	NY138	362	110	438	83	17	78	4	1	1.083				
2009	ME	NY138	214	79	297	72	4	87	9	25.2	1.083	70			
2009	M	NY138	444	68	458	97	3	78	19	0	1.073	63.1		ŀ	
2009	MO	NY138	226	84	252	90	10	<b>0</b> 6	0	NA	1.075	64			
2009	NC	NY138	314	84	349	06	4	81	6	9	1.065			2	2
2009	PA	NY138	250	166	357	70	3	70	7	21	1.074	58			
2009	<b>RRV-I</b>	NY138	386	104	420	92	9	74	18	NA	1.063	75			
2009	RRV-D	NY138	186	108	200	93	7	92	7	AN	1.096				
2009	M	NY138	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2008	CA	NY138	358	AN	395	91	8	37	54	2	1.082				
2008	Ę	NY138	244	86	300	81	15	80	2	2	1.080			3.6	
2008	٩	NY138	410	84	470	87	10	80	7	3	1.085				
2008	ME	NY138	388	107	416	93	5	87	4	4	1.073	70.4			
2008	MI	NY138	504	122	525	96	4	79	17	1	1.066	69.0		1	
2008	MO	NY138	191	77	236	81	19	81	0	NA	1.071	64			
2008	NC	NY138	261	81	284	92	8	91	1	1	1.082	70.2		3	1
2008	PA	NY138	200	70	229	87	6	87	0	S	1.093	56			
2008	RRV	NY138	285	84	301	95	5	95	0	0	1.086	62		2	
2008	M	NY138	347	78	372	93	3	93	1	2	1.073				
	2010 aver	age:	387	102	437	88	7	84	5	4	1.075	65.4	71.6	2.2	3.0
	2009 aver	age:	307	106	359	85	7	80	11	9	1.075	66.0		1.3	2.0
	2008 aver	age:	319	88	353	00	6	81	6	2	1.079	65.3		2.4	1.0
	three year	average:	337	66	383	88	7	82	8	5	1.076	65.5	71.6	2.0	2.0

TABL	E 8 - N	<b>Y139 COMPL</b>	ETING	THREE	E YEAR	S OF I	<b>USPB-</b>	SFA CH	IP TRI/	ALS - 2	2008-201	0			
YEAR	STATE	CLONE or	No. 1 Y	IELD	TOTAL		PERCEN	IT OF CATE	GORIES		SPECIFIC	AGTROI	N VALUE	S FA S	CORES
		VARIETY	YIELD	% ATL.	YIELD	No.1	SMALL	<b>MID-SIZE</b>	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
2010	CA	NY139	431	110	456	95	5	95	0	0	1.105				
2010	Ŀ	NY139	175	62	408	57	36	56	-	25	1.064			5	
2010	Q	NY139	341	75	435	78	19	76	5	3	1.093				
2010	ME	NY139	343	108	395	87	7	93	1	7	1.094		70.8		
2010	W	NY139	428	97	469	91	8	80	11	-	1.076	62.0		2	
2010	MO	NY139	400	79	437	92	6	91	0	0	1.076	70			
2010	S	NY139	318	106	361	88	10	88	0	2	1.067	64.1		2	ო
2010	PA	NY139	273	127	338	81	9	81	-	13	1.084	58			
2010	RRV	NY139	644	97	657	86	0.7	95	0.3	1.3	1.084				
2010	M	NY139	402	129	533	75	ო	75	19	4	1.084				
2009	CA	NY139	379	66	437	87	5	87	8	0.3	1.083				
2009	FL	NY139	246	109	314	78	7	82	10	15	1.065			1	
2009	₽	NY139	372	113	488	76	23	73	3	1	1.094				
2009	ME	NY139	251	93	318	79	7	<b>0</b> 6	3	14.6	1.090	70			
2009	MI	NY139	455	91	462	66	1	73	26	0	1.087	61.5		1	
2009	MO	NY139	204	76	212	96	4	96	0	NA	1.088	64			
2009	NC	NY139	354	95	404	88	7	87	0	6	1.071			2	2
2009	PA	NY139	296	196	346	86	2	86	6	6	1.075	60			
2009	<b>RRV-I</b>	NY139	299	81	340	88	12	85	4	NA	1.095	73			
2009	<b>RRV-D</b>	NY139	163	95	185	88	12	83	5	AN	1.106				
2009	M	NY139	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2008	CA	NY139	409	NA	446	92	7	52	39	1	1.089				
2008	닌	NY139	214	75	259	82	11	84	4	4	1.083			4.8	
2008	₽	NY139	393	80	462	85	12	84	2	S	1.095				
2008	ME	NY139	259	72	278	96	9	<b>0</b> 6	2	2	1.076	71.1			
2008	MI	NY139	521	126	542	96	3	88	8	1	1.082	62.2		3	
2008	MO	NY139	153	62	217	71	30	71	0	NA	1.065	69			
2008	NC	NY139	278	86	308	90	7	<b>0</b> 6	0	2	1.09	70.5		2	1
2008	PA	NY139	257	90	302	85	œ	85	2	5	1.094	42			
2008	RRV	NY139	253	75	277	91	6	92	0	0	1.094	62		2	
2008	M	NY139	383	86	416	92	3	92	5	3	1.082				
	2010 avei	rage:	376	66	449	84	10	83	4	6	1.083	63.5	70.8	3.0	3.0
	2009 avei	rage:	302	105	351	87	8	84	7	6	1.085	65.7		1.3	2.0
	2008 aver	rage:	312	83	351	88	10	83	9	2	1.085	62.8		3.0	1.0
	three year	r average:	330	96	383	86	6	83	9	5	1.084	64.0	70.8	2.5	2.0

TABL	E 9 - V	12717-5 COM	PLETIN	G THR	ΕΕ ΥΕ/	ARS O	F USP	B-SFA C	HIP TF	RIALS	- 2008-2	010			
YEAR	STATE	CLONE or	No. 1 Y	'IELD	TOTAL		PERCEN	IT OF CATE	GORIES		SPECIFIC	AGTROI	N VALUE	SFA S	CORES
		VARIETY	YIELD	% ATL.	YIELD	No.1	SMALL	<b>MID-SIZE</b>	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
2010	CA	W2717-5	374	95	406	92	8	92	0	0	1.108				
2010	Ę	W2717-5	269	<u> 56</u>	367	<i>11</i>	19	76	2	5	1.074			2	
2010	Q	W2717-5	290	64	352	82	14	75	11	3	1.089				
2010	ME	W2717-5	260	82	314	83	9	93	1	12	1.096		70.8		
2010	M	W2717-5	258	58	300	86	13	84	2	-	1.080	60.3		3	
2010	Q	W2717-5	314	62	343	92	6	91	0	0	1.075	71			
2010	S	W2717-5	236	79	279	85	6	85	0	7	1.075	70.4		-	2
2010	PA	W2717-5	241	112	346	69	œ	69	0	22	1.088	60			
2010	RRV	W2717-5	521	78	531	86	0.8	95	0.3	1.2	1.081				
2010	N	W2717-5	307	98	382	80	4	80	9	6	1.080				
2009	CA	W2717-5	264	69	321	82	12	82	3	1.7	1.087				
2009	FL	W2717-5	154	68	235	66	18	80	1	19	1.071			1	
2009	Q	W2717-5	275	84	388	71	27	65	9	2	1.094				
2009	ME	W2717-5	227	84	348	65	5	92	3	31.5	1.097	70			
2009	M	W2717-5	361	72	395	91	4	82	6	5	1.085	60.6		3	
2009	MO	W2717-5	168	62	187	90	10	<b>0</b> 6	0	NA	1.088	64			
2009	NC	W2717-5	192	52	226	85	8	85	1	7	1.080			2	1
2009	PA	W2717-5	214	142	285	75	5	75	1	18	1.087	58			
2009	<b>RRV-I</b>	W2717-5	333	<b>0</b> 6	354	94	9	89	4	NA	1.096	73			
2009	<b>RRV-D</b>	W2717-5	127	74	155	82	18	76	4	NA	1.114				
2009	M	W2717-5	312	97	363	86	2	83	3	12	1.089				
2008	CA	W2717-5	143	NA	248	58	40	47	10	2	1.090				
2008	Ľ	W2717-5	244	86	312	78	16	82	-	5	1.101			4.8	
2008	₽	W2717-5	242	49	331	73	22	63	10	5	1.091				
2008	Ш	W2717-5	NA	NA	NA	NA	NA	AN	NA	NA	NA	NA	NA	NA	NA
2008	W	W2717-5	318	77	354	<b>0</b> 0	6	88	2	2	1.085	63.1		2	
2008	QM	W2717-5	198	80	273	73	27	73	0	NA	1.083	69			
2008	S	W2717-5	229	71	264	87	6	87	0	4	1.095	70.8		-	2
2008	PA	W2717-5	106	37	152	70	5	70	7	18	1.099	45			
2008	RRV	W2717-5	263	78	290	91	6	91	0	0	1.107	62		2	
2008	N	W2717-5	348	78	389	90	4	90	1	5	1.087				
	2010 ave	rage:	307	82	362	84	6	84	2	9	1.08	65.4	70.8	2.0	2.0
	2009 ave	rage:	239	81	296	81	10	82	3	12	1.09	65.1		2.0	1.0
	2008 ave	irage:	232	69	290	79	16	77	3	5	1.09	62.0		2.5	2.0
	three yea	ir average:	260	78	316	81	12	81	3	8	1.089	64.1	70.8	2.2	1.7

TABL	E 10	<b>ATLANTIC IN</b>	THREE	YEAR	S OF U	S-BPB-S	SFA CI	HIP TRI⊿	<b>LS - 2</b>	008-20	10				
YEAR	STATE	CLONE or	No. 1 Y	IELD	TOTAL		PERCEN	IT OF CATE	GORIES		SPECIFIC	AGTROI	N VALUE	S FA S	CORES
		VARIETY	YIELD	% ATL.	YIELD	No.1	SMALL	<b>MID-SIZE</b>	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
2010	CA	ATLANTIC	392	100	409	96	4	96	0	0	1.080				
2010	Ę	ATLANTIC	283	100	393	74	22	70	4	ო	1.065			2	
2010	D	ATLANTIC	453	100	519	87	10	78	12	3	1.094				
2010	ME	ATLANTIC	318	100	383	83	3	87	6	14	1.095		70.5		
2010	Z	ATLANTIC	443	100	472	94	9	82	12	0	1.082	62.9		4	
2010	QM	ATLANTIC	506	100	542	93	7	93	0	0	1.081	72			
2010	NC	ATLANTIC	299	100	340	88	10	88	-	2	1.072	59.5		2	2
2010	PA	ATLANTIC	215	100	279	1	6	77	4	10	1.089	58			
2010	RRV	ATLANTIC	667	100	684	86	0.3	85	1.4	2.1	1.09				
2010	N	ATLANTIC	312	100	425	73	2	73	20	5	1.087				
2009	CA	ATLANTIC	383	100	499	17	7	77	14	1.6	1.088				
2009	FL	ATLANTIC	226	100	350	65	7	80	13	30	1.066			2	
2009	D	ATLANTIC	329	100	427	77	19	63	14	4	1.094				
2009	ME	ATLANTIC	270	100	376	72	5	<b>0</b> 6	5	23.2	1.093	70			
2009	Σ	ATLANTIC	498	100	523	96	2	80	16	2	1.087	58.6		3	
2009	MO	ATLANTIC	270	100	287	94	6	94	0	NA	1.092	64			
2009	NC	ATLANTIC	372	100	404	92	6	89	3	2	1.079			2	3
2009	PA	ATLANTIC	151	100	222	68	1	68	4	26	1.083	58			
2009	<b>RRV-I</b>	ATLANTIC	370	100	398	93	7	77	16	NA	1.093	73			
2009	<b>RRV-D</b>	ATLANTIC	172	100	187	92	7	74	17	NA	1.110				
2009	M	ATLANTIC	321	100	430	75	2	72	3	23	1.091				
2008	CA	ATLANTIC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2008	님	ATLANTIC	285	100	343	83	12	84	2	S	1.088			3.9	
2008	₽	ATLANTIC	489	100	559	87	4	62	26	6	1.096				
2008	ШΣ	ATLANTIC	361	100	389	93	10	81	7	S	1.080	69.1			
2008	M	ATLANTIC	414	100	443	93	5	80	13	1	1.077	64.9		3	
2008	QM	ATLANTIC	248	100	308	80	20	80	0	NA	1.082	67			
2008	S	ATLANTIC	324	100	375	86	10	85	2	4	1.097	65.3		-	-
2008	ΡA	ATLANTIC	287	100	336	85	9	85	ი	7	1.096	44			
2008	RRV	ATLANTIC	339	100	355	96	5	96	0	0	1.104	42		4	
2008	ž	ATLANTIC	447	100	508	88	ო	88	8	-	1.086				
	2010 ave	erage:	389	100	445	86	7	83	6	4	1.084	63.1	70.5	2.7	2.0
	2009 ave	erage:	306	100	373	82	9	79	10	14	1.089	64.7		2.3	3.0
	2008 ave	erage:	355	100	402	88	8	82	7	4	1.090	58.7		3.0	1.0
	three yes	ar average:	348	100	406	85	7	81	8	7	1.087	61.9	70.5	2.7	2.0

TABL	E 11 -	<b>SNOWDEN IN</b>	THREE	Ε ΥΕΑΓ	S OF I	<b>JSPB</b> -	SFA C	HIP TRI	ALS - 2	008-20	010				
YEAR	STATE	CLONE or	No. 1 Y	IELD	TOTAL		PERCEN	IT OF CATE	GORIES		SPECIFIC	AGTRO	N VALUE	SFA S	CORES
		VARIETY	YIELD	% ATL.	YIELD	No.1	SMALL	<b>MID-SIZE</b>	LARGE	CULLS	GRAVITY	FIELD	1 WEEK	FIELD	1 WEEK
2010	CA	SNOWDEN	432	110	479	<b>0</b> 0	10	<b>0</b> 6	0	0	1.100				
2010	Ę	SNOWDEN	389	137	482	82	16	82	1	2	1.073			4	
2010	Q	SNOWDEN	326	72	436	75	25	70	5	0	1.094				
2010	ШΣ	SNOWDEN	287	06	340	84	2	86	6	10	1.097		70.3		
2010	Σ	SNOWDEN	463	105	510	60	10	82	œ	0	1.077	63.5		7	
2010	QM	SNOWDEN	398	79	424	94	9	94	0	0	1.074	70			
2010	NC	SNOWDEN	333	111	393	85	15	84	-	-	1.071	65.6		7	2
2010	PA	SNOWDEN	265	123	319	83	11	83	-	4	1.085	60			
2010	RRV	SNOWDEN	651	98	664	86	0.3	92	0.7	1.6	1.086				
2010	ž	SNOWDEN	535	171	613	87	9	87	9	2	1.088				
2009	CA	SNOWDEN	401	105	468	86	6	86	4	1.1	1.081				
2009	F	SNOWDEN	224	66	280	80	11	85	3	10	1.069			2	
2009	₽	SNOWDEN	270	82	385	20	26	58	12	4	1.092				
2009	ШΣ	SNOWDEN	299	111	359	83	7	92	1	10.2	1.093	70			
2009	Σ	SNOWDEN	488	86	512	95	5	89	9	0	1.088	61.5		2	
2009	MO	SNOWDEN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2009	NC	SNOWDEN	380	102	412	92	7	91	1	1	1.074			2	3
2009	PA	SNOWDEN	304	201	355	86	2	86	2	11	1.090	57			
2009	<b>RRV-I</b>	SNOWDEN	383	104	421	91	6	06	2	NA	1.093	72			
2009	<b>RRV-D</b>	SNOWDEN	188	109	224	84	16	17	9	NA	1.114				
2009	Z	SNOWDEN	499	155	526	95	2	93	2	3	1.089				
2008	CA	SNOWDEN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2008	님	SNOWDEN	333	117	402	83	14	85	0	3	1.086			3.4	
2008	₽	SNOWDEN	333	68	449	74	25	71	4	-	1.092				
2008	ME	SNOWDEN	390	108	406	94	10	89	0	1	1.085	70.8			
2008	M	SNOWDEN	569	137	598	95	4	85	10	1	1.081	61.3		2	
2008	QM	SNOWDEN	180	73	249	72	28	72	0	NA	1.077	68			
2008	NC	SNOWDEN	261	81	315	83	17	83	0	0	1.094	64.5		2	1
2008	ΡA	SNOWDEN	291	101	362	80	16	80	-	3	1.099	50			
2008	RRV	SNOWDEN	290	86	307	95	9	94	0	0	1.094	48		7	
2008	M	SNOWDEN	493	110	526	94	2	94	٦	3	1.080				
	2010 ave	rage:	408	110	466	87	10	85	3	2	1.085	64.8	70.3	2.7	2.0
	2009 ave	rage:	344	117	394	86	9	85	4	5	1.088	65.1		2.0	3.0
	2008 ave	erage:	349	98	402	86	14	84	2	2	1.088	60.4		2.4	1.0
	three yes	ar average:	367	108	421	86	11	84	ო	ო	1.087	63.0	70.3	2.3	2.0

Atlantic, 1985-2010 and Snowden, 1988-2010 as Standards

WNC672-2, 1985-1987 WNC521-12, 1985-1986 W879, 1985-1986 W833, 1985 TXA17-1, 1985-1986 A70369-2, 1985-1986 ND860-2, 1985-1986 G670-11, 1985 BR7093-24 (Gemchip), 1986-1988 W848 (Niska), 1986-1987 NY71 (Kanona), 1986-1988 NY81 (Steuben), 1986-1988 NY72 (Allegany), 1987-1989 AF236-1 (Somerset), 1987-1989 MS700-70, 1987-1989 AC80545-1 (Chipeta), 1987-1989 LA01-38 (LaBelle), 1988-1990 MS716-15, 1988-1990 MS700-83 (Spartan Pearl), 1988-1990 W855 (Snowden), 1988-1990 Saginaw Gold, 1988-1990 AF875-16 (Mainechip), 1989-1991 D195-24, 1989 ND2008-2, 1990 Coastal Chip, 1990 CS7232-4, 1990-1992 Andover, 1991-1993 Pike, 1991-1993 NY87 (Reba), 1991 W887, 1991-1993 W870, 1991-1993 A80559-2, 1991-1993 NDA2031-2, 1992-1994 Suncrisp, 1992-1994 B0178-34, 1992-1994 NDO1496-1 (Ivory Crisp), 1993-1995 NY95, 1993 AF875-15, 1994-1996 ND2417-6 (NorValley), 1994-1996 ND2471-8, 1994-1996 NY102 (Monticello), 1994-1995 NY103 (Eva), 1995-1997 BCO894-2, 1995-1997

ATX85404-8, 1996-1998 AF1433-4, 1996-1998 ND2676-10 (Dakota Pearl), 1997-1999 B0564-8 (Harley Blackwell), 1997-1999 B0564-9, 1997-1999 NY115, 1997-1999 W1313, 1999 NY112 (Marcy), 1998-2000 AF1668-60, 1998-2000 MSNT-1, 1998-2000 MSA091-1 (Liberator), 1999-2001 B0766-3, 2000-2002 AF1775-2, 2000-2002 W1431, 2000-2002 NY120, 2000-2002 AF1424-7, 2001-2003 MSG227-2, 2001-2003 W1355-1 (White Pearl), 2001-2003 NDTX4930-5W, 2001-2003 ND2470-27 (Dakota Crisp), 1999, 2003-2004 A91790-13, 2002-2004 MSF099-3, 2002-2004 B1240-1, 2004 W1773-7, 2004 ND5822C-7 (Dakota Diamond), 2003-2005 W1201( Megachip), 2003-2005 AF2211-9, 2004-2006 MSJ461-1, 2004-2006 NY132, 2004-2006 MSJ316-A, 2005-2007 W2133-1, 2005-2007 BEACON CHIPPER, 2006-2008 CO95051-7W, 2006-2008 MSJ147-1, 2006-2008 W2324-1, 2006-2008 (4 Southern trials 2009) CO96141-4W, 2007-2009 MSJ036-A (Kalkaska), 2008-2009 AF2291-10, 2008-2010 CO97043-14W. 2008-2010 CO97065-7W, 2008-2010 NY138 (Waneta), 2008-2010 NY139 (Lamoka), 2008-2010 W2717-5, 2008-2010