Dr. Donald Halseth, Coordinator<br>Department of Horticulture<br>Cornell University<br>Ithaca, New York 14853

# 2010 USPB/SFA <br> Chip Variety Trials 

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

## Cooperators:

Mr. Don Crosier, Black Gold Farms, Charleston, MO
Dr. Nick David, North Dakota State University, Fargo, ND
Mr. Doug Gergela, University of Florida, Hastings, FL
Mr. Brian Kirschenmann, Kirschenmann Farms, Inc., Bakersfield, CA
Dr. William Lamont, Pennsylvania State University, University Park, PA
Ms. Mary LeMere, University of Wisconsin, Hancock, WI
Mr. Chris Long, Michigan State University, East Lansing, MI
Dr. Greg Porter, University of Maine, Orno, ME
Dr. Jeff Stark, University of Idaho, Aberdeen, ID
Dr. Craig Yencho, North Carolina State University, Raleigh, NC

## TABLE OF CONTENTS

Page
Introduction, Procedure and Overview ..... 3
Table 1. Seed Acreage of Current Chipping Varieties ..... 4
Table 2. Characteristics of the 2008 USPB-SFA Chip Trial Entries ..... 5
Regional Trial Reports:
California ..... 8
Florida ..... 10
Idaho ..... 14
Maine ..... 17
Michigan ..... 26
Missouri ..... 36
North Carolina ..... 39
Pennsylvania ..... 48
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<br>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 20102011 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 W501512 , 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 $5^{\text {th }}$ 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.

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

| Variety | Year <br> Released | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1. Atlantic | 1976 | 3635 | 2592 | 2693 | 2806 | 2604 | 2824 | 2844 |
| 2. Snowden | 1990 | 1627 | 1664 | 1847 | 1794 | 1477 | 1640 | 1735 |
| 3. Dakota Pearl | 1999 | 1868 | 1348 | 1388 | 1194 | 992 | 1344 | 1522 |
| 4. Reba | 1992 | 898 | 808 | 764 | 828 | 853 | 759 | 795 |
| 5. Pike | 1995 | 883 | 878 | 730 | 669 | 613 | 647 | 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. C096141-4W |  | na | na | na | 1.2 | 6.4 | 10 | 0.2 |

Seed acreage obtained from the PAA seed certification section.

\begin{tabular}{|c|c|c|}
\hline Advanced Seedlings \& Characteristics \& Seed Provided By <br>
\hline AF2291-10

Year 3 \& Parentage: SA8211-6 x EB8109-1. Mid-season maturity, round tubers, some misshapen tubers, with medium yield potential. Moderate to good resistance to internal heat necrosis, early blight and common scab. High specific gravity, chips from field and warm storage (50F), not a cold storage chipper. Averaged $91 \%$ of Atlantic's marketable yield, had the same specific gravity as Atlantic, and good out-of-field chip scores in three years of trials. \& Dr. Greg Porter University of Maine Orono, ME <br>
\hline C097043-14W

Year 3 \& Parentage: AC91817-5W x AC87340-2W. Midseason maturity, round tubers, low levels of external and internal defects. Medium-long tuber dormancy, blackspot resistant, and few defects. Good out of field chip color and some potential to recondition out of 40 F . Averaged $92 \%$ of Atlantic's marketable yield, was eight specific gravity units (0.008) lower than Atlantic, and had the best out-of-field chip scores in three years of trials. \& Dr. David Holm Colorado State Univ. Center, CO <br>
\hline C097065-7W

Year 3 \& Parentage: AC92513-3 x Chipeta. Early to midseason maturity, round tubers, low levels of external and internal defects. Long tuber dormancy, blackspot resistant, and some potential to recondition out of 40F. Averaged $86 \%$ of Atlantic's marketable yield, was 5 specific gravity units (0.005) lower than Atlantic and had good out-of-field chip scores in three years of trials. \& Dr. David Holm Colorado State Univ. Center, CO <br>

\hline | MSJ126-9Y |
| :--- |
| Year 2 | \& Parentage: Penta OP. Mid-season maturity, scab resistance, low internal defects, low sugars and long-term storage potential. Intermediate specific gravity, small vine size and yellow flesh. Averaged 74\% of Atlantic's marketable yield, was 10 specific gravity units ( 0.010 ) lower than Atlantic and had good out-of-field chip scores in two years of trials. \& Dr. Dave Douches Michigan State Univ. East Lansing, MI <br>

\hline MSL292-A \& Parentage: Snowden x MSH098-2. Mid-season maturity, uniform tuber size, high yield potential, relatively high specific gravity, low sugars, low internal defects and long-term storage potential. \& Dr. Dave Douches Michigan State Univ. East Lansing, MI <br>
\hline
\end{tabular}

| Year 1 | No scab resistance. Averaged 103\% of <br> Atlantic's marketable yield, was three specific <br> gravity units (0.003) lower than Atlantic, and had <br> good out-of-field chip scores. |  |
| :--- | :--- | :--- |
| MSQ086-3 | Parentage: Onway x Missaukee. Early maturity, <br> early bulking, good chip color, good internal <br> quality and late blight resistance. Lower specific <br> gravity and no scab resistance. Best for southern <br> trial testing only. In four southern trials (CA, FL, <br> MO and NC) in 2010 it averaged 91\% of <br> Atlantic's marketable yield, was four specific <br> gravity units (0.004) lower than Atlantic, and had <br> excellent out-of-field chip scores. | Dr. Dave Douches <br> Michigan State Univ. <br> East Lansing, MI |
| Year 1 | Mid-season maturity, good specific gravity <br> (similar to Atlantic), moderate yield potential, <br> and prone to hollow heart and brown center. <br> In 14 trials from 2008 to 2010 it averaged 88\% of <br> Year 3 | Atlantic's marketable yield, was two specific <br> gravity units (0.002) lower than Atlantic, and had <br> very good out-of-field chip scores. |
| (only ND) |  |  |

\begin{tabular}{|c|c|c|}
\hline \begin{tabular}{l}
W2324-1 \\
Year 5 \\
(only CA, FL, \\
MO and NC)
\end{tabular} \& A selection from a cross between Snowden and RHL166. Late maturity, round uniform tubers, and relatively high specific gravity. Strong vigor and large vine type. Some hollow heart in large tubers and moderate scab susceptibility. Chip color variable, ranging from poor to excellent, depending upon the trial site. This clone had the highest average marketable yield 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 averaged \(104 \%\) of Atlantic's marketable yield, was two specific gravity units (0.002) below Atlantic, and had on average good out-of-field chip scores. \& \begin{tabular}{l}
Dr. Jiwan Palta and \\
Dr. Felix Navarro \\
University of \\
Wisconsin \\
Rhinelander, WI
\end{tabular} \\
\hline \begin{tabular}{l}
W2717-5 \\
Year 3
\end{tabular} \& Parentage: S440 x ND3828-15. Late maturity, round tubers of medium size, medium yield potential, medium to high specific gravity. Good internal quality, low sugars, medium term storability, good chipping ability. Moderate scab susceptibility. Averaged 78\% of Atlantic's marketable yield, was two specific gravity units (0.002) above Atlantic, and had good out-of-field chip scores in three years of trials. \& \begin{tabular}{l}
Dr. Jiwan Palta and \\
Dr. Felix Navarro \\
University of \\
Wisconsin \\
Rhinelander, WI
\end{tabular} \\
\hline \begin{tabular}{l}
W2978-3 \\
Year 1
\end{tabular} \& Parentage: Monticello (NY102) x Dakota Pearl (ND2676-10. Relative early maturity, high tuber set, attractive white skin, moderate scab tolerance, dual purpose (chip/fresh), with good long term storage chipping from 48F. Medium specific gravity and medium yield potential. Averaged \(83 \%\) of Atlantic's marketable yield, was ten specific gravity units ( 0.010 ) lower than Atlantic, and had good out-of-field chip scores in 2010 trials. \& \begin{tabular}{l}
Dr. Jiwan Palta and \\
Dr. Felix Navarro \\
University of \\
Wisconsin \\
Rhinelander, WI
\end{tabular} \\
\hline W5015-12

Year 1 \& Parentage: Brodick x White Pearl Mid-season maturity, relatively high specific gravity, late blight resistance, strong vigor and large vine type. Medium-high yield potential, chips from field or long term 48F storage, but with flat tuber shape not suitable for tablestock. Averaged 96\% of Atlantic's marketable yield, was one specific gravity unit ( 0.001 ) lower than Atlantic, and had good out-of-field chip scores in 2010 trials. \& | Dr. Jiwan Palta and |
| :--- |
| Dr. Felix Navarro |
| University of Wisconsin Rhinelander, WI | <br>

\hline
\end{tabular}

# 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
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

| Entry: | Total <br> Yield | Mkt. <br> Yield | Percent Size Distribution for Yield |  |  | Percent Size Distribution for Tuber Count |  |  | Tuber Averages |  | Specific Gravity |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | <17/8" | 17/8 to $21 / 2^{\prime \prime}$ | 21/2 to 4" | <17/8" | $17 / 8$ to $21 / 2^{\prime \prime}$ | $21 / 2$ to 4" | Wt. (oz) | \#/hill |  |
| 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 |
| C097043-14W | 563 | 466 | 17.3 | 34.3 | 48.4 | 15.7 | 48.3 | 36.1 | 4.6 | 6.5 | 1.088 |
| C097065-7W | 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 |

Mr. Doug Gergela
Research Coordinator University of Florida/IFAS Hastings Demonstration Unit
Hastings, FL 32145-0728

University of Florida/IFAS
Hastings Demonstration Unit, Hastings, FL

Wise Snacks Inc.
Berwick, Pa

Utz Quality Foods Inc. Hanover, PA

## Trial Data:

Planting Site:

Planting Date:
Harvest Date:
Growing Conditions:

Experimental Design:

Row Spacing:
Fertilizer:
Pest Control:

Chip Ratings:

University of Florida/IFAS, Hastings Demonstration Unit Research Farm, Hastings, FL

February 1, 2010
May 25, 2010 (113 days)
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 negatively affected total and marketable yields.

Each variety/clone was planted in a single 250 ft row as directed by the SFA protocol. Four 20 ft sections of each row were harvested and graded. This was not a randomized and replicated experiment. Only means were calculated.

Machine planted. Approx. 8 inches in-row, 40 inches between-rows.
pre-plant: 50-100-150/A; side-dress: 2 applications of 75-0-64/A (lb N-P-K/A)
Pic-Clor 6011 G/A, pre-plant
Temik 15G, $20 \mathrm{lb} / \mathrm{A}$, at planting
Boundary $1.5 \mathrm{pt} / \mathrm{A}$ at hilling for weed control
Fungicides and Insecticides as needed. IPM program used.
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.

Table 1. Production statistics for USPB-SFA clones.

| Clone | Tuber Yield |  |  | \% Culls | Size Class Distribution ${ }^{3,4}$ (\%) |  |  |  |  | Size Class Range ${ }^{4}$ (\%) |  | Specific Gravity |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\overline{\text { No. } 1^{1}}$ cwt/A | Total cwt/A | $\begin{gathered} \% \\ \text { No. } 1^{2} \end{gathered}$ |  | 1 | 2 | 3 | 4 | 5 | 2 to 4 | 3 to 4 |  |
| Atlantic | 283 | 393 | 74 | 3 | 22 | 63 | 7 | 4 | 0 | 74 | 11 | 1.065 |
| Harley <br> Blackwell | 296 | 406 | 75 | 3 | 20 | 60 | 10 | 4 | 0 | 75 | 15 | 1.072 |
| Snowden | 389 | 482 | 82 | 2 | 16 | 78 | 4 | 1 | 0 | 82 | 5 | 1.073 |
| AF2291-10 | 224 | 360 | 65 | 5 | 31 | 64 | 1 | 0 | 0 | 65 | 1 | 1.070 |
| C097065-7W | 204 | 307 | 73 | 8 | 23 | 60 | 10 | 3 | 0 | 73 | 13 | 1.065 |
| CO97043-14W | 163 | 292 | 57 | 3 | 34 | 53 | 3 | 1 | 0 | 57 | 4 | 1.066 |
| MSJ126-9Y | 208 | 288 | 75 | 5 | 24 | 70 | 5 | 0 | 0 | 75 | 5 | 1.068 |
| MSL292-A | 321 | 411 | 81 | 3 | 17 | 69 | 10 | 1 | 0 | 81 | 12 | 1.071 |
| MSQ086-3 | 217 | 390 | 57 | 3 | 31 | 21 | 6 | 0 | 1 | 57 | 6 | 1.067 |
| NY138 | 263 | 383 | 71 | 3 | 25 | 63 | 7 | 1 | 0 | 71 | 8 | 1.060 |
| NY139 | 175 | 408 | 57 | 25 | 36 | 51 | 5 | 1 | 0 | 57 | 6 | 1.064 |
| W2310-3 | 167 | 271 | 63 | 2 | 34 | 60 | 2 | 0 | 0 | 63 | 2 | 1.075 |
| W2324-1 | 348 | 415 | 87 | 4 | 12 | 64 | 17 | 6 | 0 | 87 | 22 | 1.071 |
| W2717-5 | 269 | 367 | 77 | 5 | 19 | 69 | 7 | 2 | 0 | 77 | 9 | 1.074 |
| W2978-3 | 178 | 350 | 57 | 6 | 34 | 21 | 2 | 0 | 0 | 57 | 3 | 1.062 |
| W5015-12 | 255 | 389 | 69 | 6 | 26 | 62 | 6 | 2 | 0 | 69 | 8 | 1.066 |
| Average | 247 | 369 |  |  |  |  |  |  |  |  |  | 1.068 |

${ }^{1}$ No. 1 Yield: marketable yield, size classes 2 to 4
${ }^{2}$ Percent No. 1: calculated based on weight using the formula, No. $1 \mathrm{Wt} /$ Total Yield Wt
${ }^{3}$ Size Class Distribution: calculated based on weight using the formula, Class Wt / (Total Yield Wt - Cull Wt).
${ }^{4}$ Size Classes: $1=1.5$ to $17 / 8$ ", $2=17 / 8$ to 2.5 ", $3=2.5$ to $3.25^{\prime \prime}, 4=3.25$ to 4 ", $5=>4$ "; Class size $C\left(<1.5^{\prime \prime}\right)$ was recorded and is included in Total Yield but is not shown as a separate size category.

Table 2. Plant growth and tuber characteristics for USPB-SFA clones.

| Clone | Plant Growth Characteristics ${ }^{1}$ |  |  |  | Tuber Characteristics ${ }^{2}$ |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Percent <br> Stand | Early <br> Vigor | Vine Type | Vine Maturity | IFC | SC | ST | TS | ED | APP | Chip <br> Rating ${ }^{3}$ |
| 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 |

## ${ }^{1}$ Plant Growth Characteristics.

Percent Stand: based on machine planted 8 inch in-row spacing, 20 ft plot.
Early Vigor: 1 = no emergence, $2=$ leaves in rosette, $3=$ plants $<2$ in., $4=$ plants 2 to 4 in., $5=$ plants 4 to 6 in., $6=$ plants 6 to 8 in., $7=$ plants 8 to 10 in., $8=$ plants 10 to 12 in., $9=$ plants $>12$ inches.
Vine Type: 1 = decumbent - poor canopy, 2 = decumbent - fair canopy, 3 = decumbent - good canopy, 4 = spreading poor canopy, $5=$ spreading - fair canopy, $6=$ spreading - good canopy, $7=$ upright - poor canopy, $8=$ upright - fair canopy, 9 = upright - good canopy.
Vine Maturity: 1 = completely dead, $3=$ yellow and dying, $5=$ moderately senesced, $7=$ starting to senesce, $9=$ green and vigorous.

## ${ }^{2}$ Tuber Characteristics.

Internal Flesh Color (IFC): $1=$ white, $2=$ cream, $3=$ light yellow, $4=$ medium yellow, $5=$ dark yellow, $6=$ pink, $7=$ red, 8 =blue, 9 = purple.
Skin Color (SC): $1=$ purple, $2=$ red, $3=$ pink, $4=$ dark brown, $5=$ brown, $6=\tan , 7=$ buff, $8=$ white, $9=$ cream.
Skin Texture (ST): $1=$ partially russet, $2=$ heavy russet, $3=$ moderate russet, $4=$ light russet, $5=$ netted, $6=$ slightly netted, $7=$ moderately smooth, $8=$ smooth, $9=$ very smooth.
Eye Depth (ED): $1=$ very deep, $3=$ deep, $5=$ intermediate, $7=$ shallow, $9=$ very shallow
Overall Appearance (APP): 1 = very poor, 3 = poor, 5 = fair, 7 = good, 9 = excellent.
${ }^{3}$ Chip Rating: Chips were prepared and rated following the procedures outlined in the Snack Food Association Chipping Potato Handbook (1995). 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.

| Clone | \% External Tuber Defects ${ }^{1}$ |  |  |  |  | \% Internal Tuber Defects ${ }^{2}$ |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Growth <br> Cracks | Misshapen | Sun- <br> Burned | Rotten <br> \& misc. | Total 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 |
| C097065-7W | 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 |

${ }^{1}$ External Tuber Defects: Total Culls is sum of growth cracks, misshapen, sunburned and rotten/miscellaneous.
${ }^{2}$ Percent Internal Tuber Defects: percent of tubers showing defects; HH = hollow heart, BR = brown rot, CRS = corky ringspot, IHN = internal heat necrosis.

# Idaho Regional Trial 

Local Coordinator:<br>Jeff Stark<br>Peggy Bain<br>Melvin Chappell

University of Idaho

Aberdeen R\&E Center

Aberdeen, Idaho

## Trial Data

PLANTED

VINE KILLED

HARVESTED

3-May-10

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

PLOT LENGTH
HILL SPACING
HILLS PER PLOT
REPS

18' HARVEST LENGTH 18'

20 ROWS/ PLOT 1
4

METHOD OF HARVEST Grimme Machine
IRRIGATION

## FERTILIZER

$115 \mathrm{~N}-115 \mathrm{P}$ - 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

| Clone | Yield (cwt/A) |  | Percent Size Distribution |  |  |  | \% <br> Unusable | Specific Gravity |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | US No1 | Total | $<1^{7 / 8}$ | $1^{7 / 8}-2.51$ | 2.5-4" | >4" |  |  |
| 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 TRIAL 2010, Vine and tuber characteristics.

| Clone | Vine Size ${ }^{1}$ | Vine Maturity ${ }^{2}$ | Tubers/ Plant | Fresh Merit Score ${ }^{3}$ | $\begin{gathered} \text { Avg. } \\ \text { Tuber } \\ \text { Size (oz.) } \end{gathered}$ | Tuber Shape ${ }^{4}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 |
| Mean | 1.5 | 2.0 | 7.4 | 2.7 | 5.6 | 1.8 |
| ${ }^{1}(1-5) 5=$ Large |  |  |  |  |  |  |
| ${ }^{2}(1-5) 5=$ Late |  |  |  |  |  |  |
| ${ }^{3}(1-5) 5=$ Best Preference Score |  |  |  |  |  |  |
| ${ }^{4}(1-5) 1=$ Round |  |  |  |  |  |  |

Table 3. IDAHO TRIAL 2010, External and Internal Defects.

| Clone | External defects ${ }^{4}$ |  |  | $\begin{gathered} \text { Eye } \\ \text { Depth }{ }^{5} \end{gathered}$ | Internal Defects ${ }^{6}$ |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Growth |  |  |  | \% | \% | \% | \% |
|  | Scab | Cracks | Knobs |  | 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 |
| ${ }^{4}$ (1-5) 5=None |  |  |  |  |  |  |  |  |
| ${ }^{6}$ Percent of defects on 10 large tubers | ${ }^{5}$ (1-5) 1=deep, 5=shallow. |  |  |  |  |  |  |  |
| HH=hollow hear | rown c | er, IBS=i | nternal br | pot, VD=v | scolo |  |  |  |

Table 4. IDAHO TRIAL 2010, Harvest Quality Report and Field Diseases.

| 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 <br> ${ }^{7}$ (1-5) 1=severe. |  |  | 1.8 | 1.4 |

# Maine Regional Trial <br> **YIELD, GRADE, AND OUT-OF-FIELD QUALITY REPORT** US POTATO BOARD/SNACK FOOD ASSOCIATION POTATO CHIP VARIETY TRIAL, MAINE 2010 

## Cooperators:

| Local Coordinator: | Cooperating Grower(s): |
| :--- | :--- |
| Greg Porter | Aroostook Research Farm |
| 5722 Deering Hall, Room 114 | University of Maine |
| University of Maine <br> Orono, ME 04469-5722 <br> (207) 581-2943 <br> porter@maine.edu | 59 Houlton Road <br> Presque Isle, ME 04769 |
|  | Aroostook Produce Distributors <br> Gerry Miller |
|  | Houlton, ME 04730 |
| Cooperating Processor: | SFA Coodinator: |
| Frito-Lay, Inc | Donald E. Halseth |
| Dennis Deary, Process Mgr. | Cornell University |
| 1886 Upper Maple Street | 150 Plant Science Building |
| Dayville, CT 06241 <br> (860)779-0200x2304 <br> Deary.Dennis@Fritolay.com | Ithaca, NY 14853 <br> (607)255-5460 <br> deh3@cornell.edu |

## Variety Entries:

Atlantic (Field Std.)
Snowden (Storage Std.)
AF2291-10 ME, University of Maine, Greg Porter
CO97065-7W
CO97043-14W
MSJ126-9Y
MSL292-A
NY138
NY139
W2310-3
W2717-5
W2978-3
W5015-12

CO, San Luis Valley Res. Ctr., David Holm
CO, San Luis Valley Res. Ctr., David Holm
MI, Michigan State Univ., David Douches
MI, Michigan State Univ., David Douches
NY, Cornell University, Walter DeJong
NY, Cornell University, Walter DeJong
WI, University of Wisconsin, Jiwan Palta
WI, University of Wisconsin, Jiwan Palta
WI, University of Wisconsin, Jiwan Palta
WI, University of Wisconsin, Jiwan Palta

## Trial Information:

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

## Trial Information (continued):

| Soil Test: | pH 5.5 $\quad$Avail P (MH), K (VH), Ca (ML), Mg (MH) <br>  <br> Previous Crop: |
| :--- | :--- |
| oats (2009), potatoes (2008) <br> Planting Date: | May 13, 2010 |
| Plot size/design: | 36" row spacing, plots 2 rows x 30' <br>  <br> Randomized (RCBD), four replicates per variety |
| Fertilization: | $140-140-140$ at planting |
|  | Foliar boron applied June 24 |

## 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 $50-\mathrm{lb}$ 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 $5-\mathrm{kg}$ sample using the weight-in-air/weight-in-water method. A 50-lb sample was collected at harvest and shipped to Frito-Lay's Dayville 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, AF229110, 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, MSJ1269Y, 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.

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

| Month | Week (inches) |  |  |  | Total |  |  | Average $\left({ }^{\circ} \mathrm{F}\right)$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :---: |
|  | 1 | 2 | 3 | 4 |  | (inches) |  | High |  |
| May | 0.58 | 0.45 | 0.62 | 0.92 | 2.57 |  | 68.5 | 44.5 |  |
| Mune | 2.77 | 0.02 | 1.02 | 1.32 | 5.13 |  | 73.8 | 51.4 |  |
| Juny | 0.09 | 1.74 | 0.64 | 0.50 | 2.97 | 81.3 | 59.6 |  |  |
| July | 1.97 | 0.00 | 0.08 | 0.58 | 2.63 |  | 79.3 | 54.7 |  |
| August | 1.76 | 1.06 | 0.25 | 1.98 | 5.05 |  | 68.5 | 50.4 |  |
| September |  |  |  |  | 18.35 |  |  |  |  |

Grand total
18.35

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

| Variety/Clone | \% <br> Plant <br> Stand | Vigor <br> Early | Late <br> Lator | Vine <br> Mat. | Foliage Color |
| :--- | :---: | :--- | :--- | :--- | :--- | :---: | | Foliar Disease |
| :---: |
| Problems |

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

| Variety/Clone | Yield (cwt/A) ${ }^{1}$ |  |  | Size Distribution (\% by weight) ${ }^{2}$ |  |  |  |  |  |  | Spec. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 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 |
| Mean | 365 | 310 |  |  |  |  |  |  | 94 | 37 | 1.089 |
| CV(\%) | 10.0 |  |  |  |  |  |  |  | 2.5 | 24.3 | 0.41 |
| LSD(k=100) | 68 | 72 |  |  |  |  |  |  | 4 | 12 | 0.006 |

${ }^{1}$ US\#1 yield was calculated as yield from $17 / 8$ to 4 " diameter, minus tubers with external defects.
${ }^{2}$ Size Classes: $1=1 \frac{1}{2}$ to $17 / 8 " ; 2=17 / 8$ to $2^{1 / 2 "} ; 3=2 \frac{1}{2}$ to $31 / 4 " ; 4=31 / 4$ to $4 " ; 5=$ over $4 "$

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

| Variety/Clone | External Defects (\% by weight) |  |  |  |  |  | Hollow Heart by Size Class ${ }^{1}$ (\%) |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 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 | $\mathrm{n} / \mathrm{a}$ |
| NY139 | 7.4 | 4.5 | 2.1 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | $\mathrm{n} / \mathrm{a}$ |
| 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 | $\mathrm{n} / \mathrm{a}$ |
| 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 | $\mathrm{n} / \mathrm{a}$ |


| Mean | 9.4 |
| :--- | ---: |
| $\operatorname{CV}(\%)$ | 49.5 |
| $\operatorname{LSD}(\mathrm{k}=100)$ | 8.5 |

${ }^{1}$ Size Classes: $1=1 \frac{1}{2}$ to $17 / 8{ }^{\prime \prime} ; 2=17 / 8$ to $2 \frac{1}{2}{ }^{\prime \prime} ; 3=2^{1 / 2}$ to $31 / 4^{\prime \prime} ; 4=31 / 4$ to $4 " ; 5=$ over $4^{\prime \prime} ; n /$ a indicates that no tubers were examined for hollow heart in this size category.

Table 5. Tuber characteristics, UPSB/SFA Chip Variety Trial, Maine, 2010.
Variety/Clone Shape Skin Eye Gen. Flesh
Tex- Depth Appear. Col. Comments ture

| 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 |  <br> apical ends |
| W2978-3 |  |  |  |  |  | OW |
| bright, russet scab |  |  |  |  |  |  |
| W5015-12 | R-O | S | M-S | G | 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 <br> W2717-5 |
|  | R-O | M-S | M-S | F | Wh | sright, russet scab, black <br> bcurf |
|  |  |  |  |  |  |  |

Shape: $\mathrm{R}=$ mostly round; $\mathrm{R}-\mathrm{O}=$ round to oblong; $\mathrm{O}-\mathrm{R}=$ oblong to round; $\mathrm{O}=$ oblong Skin Texture: $\mathrm{S}=$ smooth; $\mathrm{M}-\mathrm{S}=$ 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; $\mathrm{OW}=$ off white; $\mathrm{YF}=$ yellow fleshed, higher numbers indicate brighter yellow.

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

Frito-Lay Plant Data, Dayville, CT (September 24, 2010)

| Variety/Clone | Total | Color $^{1}$ |  | Defects (\%) |  |  | 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 |  |

${ }^{1}$ 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 W501512 (2.66).

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

| Variety/Clone | Skinning \& Bruise (tumble method) ${ }^{1}$ |  |  |  |  |
| :--- | :--- | :--- | :--- | ---: | :--- |

${ }^{1}$ 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:

NY138: 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.

NY139: 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.

C097065-7W: 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.

C097043-14W: 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.

Atlantic: 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.

MSJ126-9Y: 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.

W2978-3: 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.

W5015-12: 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.

AF2291-10: 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.

MSL292-A: 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.

Snowden: 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.

W2310-3: 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.

W2717-5: 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:<br>Chris Long<br>Dave Douches<br>Michigan State University<br>East Lansing, MI

Cooperating Grower:

Tim \& Todd Young
Sandyland Farms LLC
Howard City, MI

## 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)
$34 " \times 10^{\prime \prime}$; 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 $24^{\text {th }}$ and September $7^{\text {th }}$, 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 $48^{\circ} \mathrm{F}$ or $55^{\circ} \mathrm{F}$ 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 $21^{\text {st }}$. 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 $20^{\text {th }}$ through September $8^{\text {th }}$ was approximately 9.83 ". The daytime temperatures during this growing period did not exceeded $90^{\circ} \mathrm{F}$. The nighttime temperatures during this period, May through September, were the highest in six years. The nights with temperatures over $70^{\circ} \mathrm{F}$ 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 Distribution*, Specific Gravity

| Entry | Yield (cwt/A) |  | Percent Size Distribution |  |  |  |  | Specific Gravity |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | US\#1 | TOTAL | US\#1 | Small | Mid-Size | Large | Culls |  |
| 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. Sandyland Farms, Howard City, Michigan.

|  | Internal Defects ${ }^{\mathbf{1}}$ |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Entry | HH | VD | IBS | BC | Total Cut |
| AF2291-10 | 2 | 5 | 0 | 0 | 30 |
| W5015-12 | 3 | 5 | 6 | 0 | 30 |
| Snowden | $\mathbf{1}$ | $\mathbf{7}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{3 0}$ |
| MSL292-A | 0 | 5 | 0 | 0 | 30 |
| NY138 | 1 | 5 | 0 | 0 | 30 |
| Atlantic | $\mathbf{8}$ | $\mathbf{3}$ | $\mathbf{2}$ | $\mathbf{0}$ | $\mathbf{3 0}$ |
| 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 |

${ }^{1}$ Internal Defects. HH = hollow heart, VD = vascular discoloration, IBS = internal brown spot, BC = brown center.

Table 3 shows the post-harvest chip quality based on samples collected at harvest on October $8^{\text {th }}$ and processed at Herr Foods, Inc. on October $11^{\text {th }}$. 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 Quality ${ }^{1}$.

|  | Agtron <br> Color | SFA $^{2}$ <br> Color | Specific <br> Gravity |  | Percent Chip Defects ${ }^{3}$ |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 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 | $\mathbf{6 3 . 5}$ | $\mathbf{2}$ | 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 | $\mathbf{4}$ | 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 |

[^0]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 $50^{\circ} \mathrm{F}$, 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 Bruise Test

| Entry | A. Check Samples ${ }^{1}$ |  |  |  |  |  |  |  | B. Simulated Bruise Samples ${ }^{2}$ |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | \# of Bruises Per Tuber |  |  |  |  | Total Tubers | Percent <br> Bruise <br> Free | Average Bruises Per Tuber | \# of Bruises Per Tuber |  |  |  |  |  | Total Tubers | Percent Average <br> Bruise Bruises Per <br> Free Tuber <br> $8 y$  |  |
| AF2291-10 | 10 | 13 | 2 |  |  | 25 | 40 | 0.7 | 2 | 10 | 5 | 5 | 2 | 1 | 25 | 8 | 1.9 |
| W5015-12 | 11 | 5 | 53 | 1 |  | 25 | 44 | 1.1 | 1 | 4 | 5 | 6 | 3 | 6 | 25 | 4 | 3.0 |
| Snowden | 14 | 8 | 21 |  |  | 25 | 56 | 0.6 | 3 | 2 | 7 | 8 | 1 | 4 | 25 | 12 | 2.6 |
| MSL292-A | 12 | 6 | 32 | 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 | 45 | 1 | 1 | 25 | 8 | 1.8 | 3 | 7 | 7 | 2 | 3 | 3 | 25 | 12 | 2.2 |
| NY139 | 14 | 9 | 11 |  |  | 25 | 56 | 0.6 | 9 | 10 | 5 |  | 1 |  | 25 | 36 | 1.0 |
| W2310-3 | 8 | 10 | 52 |  |  | 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 |
| C097065-7W | 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 |

${ }^{1}$ Tuber samples collected at harvest and held at room temperature for later abrasive peeling and scoring.
${ }^{2}$ Tuber samples collected at harvest, held at $50^{\circ} \mathrm{F}$ 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 $5 A$ and $5 B$ 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-Harvest Panels, 8/24/10

| Entry | Specific Glucose ${ }^{1}$ Sucrose ${ }^{2}$ |  |  | Canopy |  | Number of |  | Average ${ }^{5}$ <br> Tuber <br> Weight |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Gravity | \% | Rating | Rating ${ }^{3}$ | Uniform. ${ }^{4}$ | Hills | Stems |  |
| 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 |

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

Table 5B. Pre-Harvest Panels, 9/7/10

| Entry | Specific Glucose ${ }^{1}$ Sucrose $^{2}$ |  |  | Canopy |  | Number of |  | Average ${ }^{5}$ <br> Tuber <br> Weight |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Gravity | \% | Rating | Rating ${ }^{3}$ | Uniform. ${ }^{4}$ | Hills | Stems |  |
| 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 |

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

## Variety Comments:

AF2291-10: 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 $11^{\text {th }}$, 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.

W5015-12: 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 $5^{\text {th }}$ 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 $7^{\text {th }}$ pre-harvest panel.

Snowden: 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.

MSL292-A: 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 $7^{\text {th }}$ where the sucrose rating was 0.452 and glucose level was 0.002 .

NY138: 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.

Atlantic: 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 $11^{\text {th }}$ 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.

NY139: 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 $13^{\text {th }}$ 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.

W2310-3: 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.

W2978-3: 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.

CO97065-7W: 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 $11^{\text {th }}$ 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.

MSJ126-9Y: 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 $9^{\text {th }}$ at Herr's in the chip quality. The bruise free rating was 60 percent which ranked MSJ126-9Y second in black spot bruise tolerance.

CO97043-14W: 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.

W2717-5: 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 $4^{\text {th }}$ 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: | $\mathbf{p H}: 6.7$ | $\mathbf{P}: 24 \mathrm{ppm}$ | K: 118 ppm | OM: $0.80 \%$ |
| :--- | :--- | ---: | ---: | ---: |
|  | $\mathbf{B}: 0.1 \mathrm{ppm}$ | $\mathbf{M g}: 78 \mathrm{ppm}$ | Ca: 693 ppm | CEC: 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:

| Fertilizer Applied: | 258N- 112P- 257K-15Mg-106S-1B-.5Zn |
| :---: | :---: |
| Herbicides Applied: | Prowl 3.3 EC, Medal(S-metolachlor), Matrix, Intensity(clethodim); all applied at label rates |
| Fungicides Applied: | Quadris, Ridomil Gold/Bravo SC, Revus Top, Bravo Weather Stik, Curzate 60DF, Manzate 75DF; all applied a |
| Insecticides Applied: | Advise 2FL(Imidacloprid); 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 <br> Emergence Dry and cool <br> Tuber Initiation Warm and damp-good growing weather <br> Tuber Bulk Warm and dry, late bulking was very hot <br> Harvest Hot and dry |
| Irrigation: | Full season irrigation when needed |
| Cultural Notes: | Cool, cloudy and wet the first half of the season <br> Very hot week around June 15th. Soil temps at 1" were ranging from 108 F to 110F degrees <br> After the hot week, there were 3 nights of 50 F temps and that helped the crop rejuvenate new growth |

## MISSOURI REGIONAL TRIAL

## Charleston, Missouri - Black Gold Farms - 2010

Planting Date: 3/19/2010 Harvest Date: 7/9/2010 (112 DAP)

| Variety | Vine \& Vigor <br> Rating |  |  | Marketable Yield <br> 1 7/8" $-4 "$ |  | > 4" <br> cwt/ac | Total Yield cwt/ac | \% of Standard's Marketable Yield |  | Specific Gravity |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 1" - 1 7/8" |  |  |  |  |  |  |  |  |
|  |  | $\begin{array}{\|c\|} \hline \text { \# of } \\ \text { tubers } \end{array}$ | cwt/ac | \# of tubers | cwt/ac |  |  |  |  |  |
|  |  |  |  |  |  |  |  | Atlantic | Snowden |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 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 |
| C097043-14W | 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: |
| :--- | :--- |$\quad$| 1 | $=100 \%$ dead vines |
| :--- | :--- |
| 2 | $=90 \%$ defoliated, $80-90 \%$ dead vines |
| 3 | $=75 \%$ defoliated, $25-50 \%$ dead vines |
| 4 | $=25 \%$ defoliated, $10 \%$ dead vines |

[^1]Harvested Sample: 4 Replications of 25 feet

## MISSOURI REGIONAL TRIAL

## Charleston, Missouri - Black Gold Farms - 2010

QC Monitoring

| VARIETY | RAW GRADE |  |  |  |  |  |  |  |  |  | COOK SAMPLE |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Solids and Specific Gravity |  |  | External Defects |  |  |  | Internal Defects |  |  | CLR | UC | GRN | ID | ED | TOTAL |
|  | F-L <br> Solids | \% of Standard Atlantic Solids | Specific Gravity | GRN | GC | WB | SC | HN | Other | HH |  |  |  |  |  |  |
| 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 |
| C097043-14W | 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 |
| C097065-7W | 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
UC= Undesirable Color
$\begin{aligned} \text { ID } & =\text { Internal Defects } \\ E D & =\text { External Defects }\end{aligned}$

## North Carolina Regional Trial

| Local Coordinators |  | Cooperating Grower: | Cooperating Chip Processor: |
| :---: | :---: | :---: | :---: |
| Dr. Craig Yencho |  | Chris Hopkins | Utz Quality Foods |
| North Carolina State U | rsity | Black Gold Farms | Hanover, PA |
| 214A Kilgore Hall |  | 2815 N Gum Neck Road |  |
| Raleigh NC, 27695 |  | Columbia, NC 27925 |  |
| Mr. Mark Clough North Carolina State University 207 Research Station Rd. Plymouth NC 27962 |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Trial Data: |  |  |  |
| Planting Site: | Black Gold Farms, Gum Neck, Tyrrell County, NC |  |  |
| Planting Date: | March 18, 2010 |  |  |
| Harvest Date: | June 28, 2010 (102 days) |  |  |
| Growing Conditions: | Planting was slightly delayed by wet weather but still within the normal time frame. Wet conditions persisted through March tapering off in April. Rainfall was adequate in April and Early May. By mid-May the rainfall ended followed by high temperatures. In-fact. May - July 2010 was the hottest spring/summer season on record in NC. Rainfall was also well below normal for the state (http://www.noaanews.noaa.gov/stories2010/20100809_julytemps.html $11 / 10$ ). |  |  |
| Soil Type: | Cape Fear silt loam |  |  |
| Experimental Design: | Randomized complete 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 $1.25 \mathrm{lbs} / \mathrm{A}$ Volunteer $8 \mathrm{fl} \mathrm{oz} / \mathrm{A}$ |  |  |
|  |  |  |  |
| Insect Control: | Actara $3 \mathrm{oz} / \mathrm{A}$ |  |  |
| Disease Control: | Manzate Pro-stick $7.0 \mathrm{lb} / \mathrm{A}$ Curzate 60 DF 3.2 oz/A Revus Top $6.2 \mathrm{fl} \mathrm{oz} / \mathrm{A}$ |  |  |
|  |  |  |  |
|  |  |  |  |

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

| Clone | $\frac{\text { Total Yield }}{\text { cwt/A }}$ | Marketable Yield cwt/A | \% Size Distribution by Class ${ }^{1}$ |  |  |  |  |  | $\begin{aligned} & 1^{7} / 8 \\ & \text { to } 4 " \end{aligned}$ | $\begin{aligned} & 2^{1 / 2} \\ & \text { to } 4 \end{aligned}$ | Specific Gravity ${ }^{2}$ | Chip Color ${ }^{3}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  | 24 to |  |  | $5 \text { to }$ |
|  |  |  | 1 | 2 | 3 | 4 | 5 | Culls |  |  |  | 48 hrs | 7 days |
| AF2291-10 | 260 | 192 | 7 | 23 | 48 | 3 | 0 | 19 |  | 73 | 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 |
| C097065-7W | 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( $\mathrm{K}=100$ ) | 64.7 | 62.8 |  |  |  |  |  |  |  |  |  |  |  |
| ${ }^{1}$ Size Classes: |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1's < $17 / 8$ "; 2's $17 / 8$ to 2 1/2"; 3's 2 1/2 to 3 1/4"; 4's 3 1/4 to 4"; 5's $\geq 4$ "; Culls = all defective potatoes. <br> ${ }^{2}$ Specific Gravity |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Determined by weight in air/water method. |  |  |  |  |  |  |  |  |  |  |  |  |  |

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.

${ }^{1}$ Plant Data:
Vine Type: 1 = decumbent -poor canopy, $2=$ decumbent - fair canopy, $3=$ decumbent - good canopy, $4=$ spreading - poor canopy, $5=$ spreading - fair canopy,
$6=$ spreading - good canopy, $7=$ upright - poor canopy, $8=$ upright - fair canopy, $9=$ upright good canopy.
Vine Disease: $1=$ very severe, $5=$ moderate, $9=$ none.
Vine Pollution: $1=$ very severe, $5=$ moderate, $9=$ none.
Vine Maturity: $1=$ very early, 5 = mid-season, 9 = very late.
${ }^{2}$ Tuber Data:
Skin Color: 1 = purple, $2=$ red, $3=$ pink, $4=$ dark brown, $5=$ brown, $6=$ tan to light brown, $7=$ buff, $8=$ white, $9=$ cream.
Skin Texture: $1=$ partial russet, $2=$ heavy russet, $3=$ moderate russet, $4=$ light russet, $5=$ netted, $6=$ slight net, $7=$ moderately smooth, $8=$ smooth, $9=$ very smooth.
Cross Section: $1=$ very flat, $3=$ flat, $5=$ intermediate to oval, $7=$ mostly round, $9=$ very round.
Skin Set: 1 = very poor, 5 = fair, 9 = excellent.
Shape: 1 = very round, $2=$ mostly round, $3=$ round to oblong, $4=$ mostly oblong, $5=$ oblong, $6=$ oblong to long, $7=$ mostly long, $8=$ long, $9=$ cylindrical.
Eye Depth: $1=$ very deep, $5=$ medium, $9=$ very shallow.
Size: $1=$ small, $5=$ medium, $9=$ large.
Tuber Disease: $1=$ very severe, $5=$ moderate, $9=$ none.
Overall Appearance: $1=$ very poor, 5 = fair, $9=$ excellent.

## ${ }^{3}$ Internal Defects:

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

Table 3. UTZ Quality Foods Chip Data.

| Clone | \% Defects |  | \%Total Defects | Specific Gravity | Defect Descriptions ${ }^{1}$ | Chip Color ${ }^{2}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Internal | External |  |  |  | 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 |

## ${ }^{1}$ Defect Descriptions:

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

## ${ }^{2}$ Chip Color:

## Hunter Lab Scores

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

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


CO97065-7W
NC 5 to 7 day chip


AF2291-10


Atlantic


CO97043-14W


MSJ126-9Y


MSL292-A

NC 24 to 48 hr chip


NY138
MSQ086-3


NY139

Snowden
NC 5 to 7 day chip


W2310-1


W2324-1

NC 24 to 48 hr chip


NC 5 to 7 day chip


W2717-5


W2978-3


W5015-12

## Pennsylvania Regional Trial

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

Cooperative Grower:
James Hite
Patton, PA 16668
Report Preparation: B. Dye and I. Huerta

## Trial Data:

Planting Date: 21-May-10
Vine Kill Date: $\quad 15-$ Sep-10
Harvest Date: 22-Sep-10
Soil Temperature: $70^{\circ}{ }^{\circ} \mathrm{F}$
(117 growing days)
Soil Temperature: $73^{\circ} \mathrm{F}$
Row and plant spacing: 34 inch rows, 10.5 inches between plants; Plot length 25 feet, 4 replications.
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.

|  | *Avg. High ${ }^{\circ} \mathrm{F}$ | *Avg. Low ${ }^{\circ} \mathrm{F}$ | *Rain (inches) | Grow Deg Days |
| :--- | :---: | :---: | :---: | :---: |
| May | 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 September) |  | 17.92 | 2184 |  |

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

## Trial Procedure:

Previous crop: Wheat Soil Type: shaley loam

Fertilizer: $\quad 13-13-131,300$ pounds
Irrigation: Rainfall 17.92 inches
Herbicides: $\quad$ Before planting: Round-up ( 0.67 quart) Sencor (2/3 pound) / Medal (1 pint)

Insecticides: Baythroid (2 ounces) / Thionex (1.3 quarts) Admire, Coragen (label rates)

Fungicides: Manzate®, Curzate, Previcur (all at label rates)
Vine Kill: $\quad$ Reglone (1 pint)

## Pennsylvania Regional Trial

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

| Entry | Yield (cwt/A) |  | Percent Size Distribution |  |  |  |  | Characteristics |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | No. 1 | Total | No. 1 | Small | MidSize | Large | Culls | Agtron Score ${ }^{\text {a }}$ | Specific Gravity ${ }^{\text {a }}$ | Internal <br> Defects | Major <br> 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 Isd 0.05 CV\% | $\begin{aligned} & \hline 252 \\ & 79.8 \\ & 17.3 \end{aligned}$ | $\begin{aligned} & \hline 318 \\ & 73.0 \\ & 19.9 \\ & \hline \end{aligned}$ |  |  |  |  |  |  | $1.084$ <br> processe | d 23-Sep- | -10 by Snyder |

Defects:
SB = Sunburn
MS = Mis-shapen
PC = Pressure Crack
GC = Growth Cracks
SG = Secondary Growth
PS = Pitted Scab
ST = Stone Damage
FR = Fusarium Rot
RH = Rhizoctonia

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

## Red River Valley Regional Trial

Table 1. Total, Usable, and Unusable Yield \& Size Profile of 2010 Minnesota Irrigated Chip Trial

| Variety/ Nitrogen Rate | Total Yield (cwt/a) | US No. 1 (cwt/a) | US No. 1 (\%) | Rot <br> (\%) | Misshapen (\%) | Green <br> (\%) | $\begin{gathered} <17 / 8 " \\ (\%) \end{gathered}$ | $\begin{gathered} 17 / 8-2 \frac{1}{4} " \\ (\%) \end{gathered}$ | $\begin{gathered} 214-31 / 2 " \\ (\%) \end{gathered}$ | $\begin{gathered} 31 / 2-4 " \\ (\%) \end{gathered}$ | $\begin{aligned} & >4 " \\ & (\%) \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| AF2291-10 | 608 | 597 | 98 | 0.0 | 1.2 | 0.1 | 0.5 | 16.0 | 78.8 | 0.3 | 0.0 |
| 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 | 668 | 656 | 98 | 0.2 | 0.3 | 0.5 | 0.8 | 13.3 | 82.8 | 0.2 | 0.0 |
| 180N | 645 | 630 | 98 | 0.3 | 0.7 | 0.7 | 0.7 | 13.4 | 83.3 | 0.1 | 0.0 |
| 280N | 691 | 683 | 99 | 0.0 | 0.0 | 0.4 | 0.8 | 13.2 | 82.3 | 0.3 | 0.0 |
| C097065-7W | 533 | 520 | 98 | 0.1 | 0.2 | 1.3 | 0.9 | 11.6 | 85.7 | 0.0 | 0.0 |
| 180N | 544 | 527 | 97 | 0.1 | 0.3 | 1.8 | 0.9 | 11.0 | 85.5 | 0.0 | 0.0 |
| 280N | 519 | 510 | 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 |
| 180N | 608 | 588 | 97 | 0.7 | 1.6 | 0.4 | 0.5 | 31.5 | 65.3 | 0.0 | 0.0 |
| 280N | 694 | 682 | 98 | 0.0 | 1.0 | 0.1 | 0.4 | 21.8 | 76.6 | 0.0 | 0.0 |
| NY138 | 634 | 625 | 99 | 0.2 | 0.2 | 0.6 | 0.4 | 11.3 | 82.7 | 0.5 | 0.0 |
| 180N | 595 | 586 | 98 | 0.5 | 0.0 | 0.6 | 0.5 | 12.0 | 84.6 | 0.2 | 0.0 |
| 280 N | 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 |
| 280N | 717 | 706 | 98 | 0.0 | 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 | 611 | 597 | 98 | 0.4 | 0.4 | 1.2 | 0.3 | 9.7 | 83.2 | 0.5 | 0.0 |
| 280 N | 716 | 706 | 99 | 0.4 | 0.5 | 0.2 | 0.4 | 7.4 | 83.1 | 0.8 | 0.0 |
| W2310-3 | 528 | 519 | 98 | 0.0 | 0.5 | 0.6 | 0.7 | 21.4 | 76.9 | 0.0 | 0.0 |
| 180N | 524 | 517 | 99 | 0.0 | 0.3 | 0.5 | 0.5 | 23.3 | 75.4 | 0.0 | 0.0 |
| 280N | 532 | 521 | 98 | 0.0 | 0.6 | 0.7 | 0.9 | 19.5 | 78.4 | 0.0 | 0.0 |
| W2717-5 | 531 | 521 | 98 | 0.2 | 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 |
| 280 N | 554 | 547 | 99 | 0.0 | 0.1 | 0.2 | 0.9 | 18.5 | 77.4 | 0.3 | 0.0 |
| 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

| Table 2. | Specific Gravity |  | Vas. Discoloration |  | Brown Center |  | Hollow Heart |  | Int. Brown Spot |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Variety/ Nitrogen Rate | $\begin{gathered} 17 / 8-21 / 4 " \\ (\%) \end{gathered}$ | $\begin{gathered} 2114-312{ }^{\prime \prime} \\ (\%) \end{gathered}$ | $17 / 8-21 / 4 "$ <br> (\%) | $2114-31 / 2 "$ <br> (\%) | $17 / 8-21 / 4 "$ <br> (\%) | $\begin{gathered} 2114-312 "^{2} \\ (\%) \end{gathered}$ | $\begin{gathered} 17 / 8-2 \frac{1}{4} "^{\prime \prime} \\ (\%) \end{gathered}$ | $\begin{aligned} & 31 / 2 " \\ & (\%) \\ & \hline \end{aligned}$ | $\begin{gathered} 17 / 8-2^{1 / 4 "} \\ (\%) \end{gathered}$ | $\begin{gathered} 21 / 4-31 / 2 " \\ (\%) \end{gathered}$ |
| 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 |
| 280 N | 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 |
| C097043-14W | 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 |
| C097065-7W | 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 |

# U.S. Potato Board/Snack Food Association National Chip Trial - 2010 <br> 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 $38^{\circ} \mathrm{F}$ until cutting. Seed was moved to $55^{\circ} \mathrm{F}$ 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 $21 / 2$ oz in weight. Cut seed was placed in well-ventilated plastic crates and held at $55^{\circ} \mathrm{F}$ 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 planted in single-row plots 250 ft . in length. Rows were spaced 36 in . apart. Seed pieces 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 ProStick, 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.

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

|  | Specific <br> Gravity | Total Yield |  |  | U. S. No. 1 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Variety | (cwt) | (cwt) | $(\%)$ | $(\%$ in. | Culls |  |
| 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 |

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

Table 2. U. S No. 1 size distribution, 2010.

|  | U. S. No. 1 Size Distribution (\% of U. S. No. 1 Yield) |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 2-4 oz. | $4-6$ oz. | 6 -10 oz. | $10-13$ oz. | $13-16$ oz. | >16 oz. |
| AF2291-10 | 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 |

Table 3. External and internal defects, 2010.

| Variety | External Defects (\%) |  |  |  | Internal Defects (\%) |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 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 |
| C097065-7W | 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 |

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

| fourteen clones and two standards grown in CA, FL, ID, ME, MI, MO, NC, PA, RRV and WI in 2010. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | CLONE or | No. 1 | TOTAL | PERCENT OF CATEGORIES |  |  |  |  | SPECIFIC GRAVITY | AGTRON VALUE |  | SFA SCORE |  |
| STATE | VARIETY | YIELD | YIELD | NO. 1 | SMALL | MID-SIZE | LARGE | CULLS |  | FIELD | 1 WEEK | FIELD | 1 WEEK |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CA | AF2291-10 | 433 | 443 | 98 | 2 | 98 | 0 | 0 | 1.102 |  |  |  |  |
| FL | AF2291-10 | 224 | 360 | 65 | 31 | 65 | 0 | 5 | 1.070 |  |  | 3.5 |  |
| ID | AF2291-10 | 322 | 377 | 85 | 8 | 75 | 17 | 7 | 1.095 |  |  |  |  |
| ME | AF2291-10 | 297 | 369 | 80 | 3 | 85 | 13 | 17 | 1.093 |  | 68.3 |  |  |
| MI | AF2291-10 | 506 | 565 | 90 | 4 | 74 | 16 | 6 | 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 | 3 | 19 | 1.069 | 62.9 |  | 3.0 | 3.0 |
| PA | AF2291-10 | 259 | 326 | 80 | 7 | 80 | 7 | 6 | 1.088 | 56.0 |  |  |  |
| RRV | AF2291-10 | 597 | 608 | 98 | 0.5 | 95 | 0.3 | 1.3 | 1.086 |  |  |  |  |
| WI | AF2291-10 | 298 | 359 | 83 | 4 | 83 | 11 | 2 | 1.085 |  |  |  |  |
|  | average: | 354 | 410 | 85 | 7 | 82 | 7 | 6 | 1.085 | 62.8 | 68.3 | 3.2 | 3.0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CA | ATLANTIC | 392 | 409 | 96 | 4 | 96 | 0 | 0 | 1.080 |  |  |  |  |
| FL | ATLANTIC | 283 | 393 | 74 | 22 | 70 | 4 | 3 | 1.065 |  |  | 2.0 |  |
| ID | ATLANTIC | 453 | 519 | 87 | 10 | 78 | 12 | 3 | 1.094 |  |  |  |  |
| ME | ATLANTIC | 318 | 383 | 83 | 3 | 87 | 9 | 14 | 1.095 |  | 70.5 |  |  |
| MI | ATLANTIC | 443 | 472 | 94 | 6 | 82 | 12 | 0 | 1.082 | 62.9 |  | 4.0 |  |
| MO | ATLANTIC | 506 | 542 | 93 | 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 |
| PA | ATLANTIC | 215 | 279 | 77 | 9 | 77 | 4 | 10 | 1.089 | 58.0 |  |  |  |
| RRV | ATLANTIC | 667 | 684 | 98 | 0.3 | 85 | 1.4 | 2.1 | 1.090 |  |  |  |  |
| WI | ATLANTIC | 312 | 425 | 73 | 2 | 73 | 20 | 5 | 1.087 |  |  |  |  |
|  | average: | 389 | 445 | 86 | 7 | 83 | 6 | 4 | 1.084 | 63.1 | 70.5 | 2.7 | 2.0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CA | CO97043-14W | 466 | 563 | 83 | 17 | 83 | 0 | 0 | 1.088 |  |  |  |  |
| FL | C097043-14W | 163 | 292 | 57 | 34 | 56 | 1 | 3 | 1.066 |  |  | 1.0 |  |
| ID | C097043-14W | 388 | 436 | 89 | 10 | 77 | 13 | 1 | 1.086 |  |  |  |  |
| ME | CO97043-14W | 328 | 373 | 88 | 5 | 89 | 7 | 7 | 1.083 |  | 71.2 |  |  |
| MI | CO97043-14W | 265 | 305 | 87 | 13 | 80 | 7 | 0 | 1.065 | 63.5 |  | 3.0 |  |
| MO | C097043-14W | 402 | 429 | 94 | 6 | 94 | 0 | 0 | 1.064 | 73.0 |  |  |  |
| NC | C097043-14W | 264 | 317 | 83 | 16 | 83 | 0 | 1 | 1.066 | 61.8 |  | 2.0 | 1.0 |
| PA | CO97043-14W | 210 | 277 | 76 | 9 | 76 | 5 | 11 | 1.085 | 64.0 |  |  |  |
| RRV | CO97043-14W | 656 | 668 | 98 | 0.8 | 96 | 0.2 | 1 | 1.079 |  |  |  |  |
| WI | C097043-14W | 374 | 527 | 71 | 3 | 71 | 20 | 7 | 1.073 |  |  |  |  |
|  | average: | 352 | 419 | 83 | 11 | 81 | 5 | 3 | 1.076 | 65.6 | 71.2 | 2.0 | 1.0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |



| fourteen clones and two standards grown in CA, FL, ID, ME, MI, MO, NC, PA, RRV and WI in 2010. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | CLONE or | No. 1 | TOTAL | PERCENT OF CATEGORIES |  |  |  |  | SPECIFIC | AGTRON VALUE |  | SFA SCORE |  |
| STATE | VARIETY | YIELD | YIELD | NO. 1 | SMALL | MID-SIZE | LARGE | CULLS | GRAVITY | FIELD | 1 WEEK | FIELD | 1 WEEK |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CA | MSQ086-3 | 429 | 477 | 90 | 10 | 90 | 0 | 0 | 1.094 |  |  |  |  |
| FL | MSQ086-3 | 217 | 390 | 57 | 31 | 27 | 1 | 3 | 1.067 |  |  | 2.0 |  |
| MO | MSQ086-3 | 448 | 500 | 90 | 10 | 90 | 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 |  |  |  |  |
| FL | NY138 | 263 | 383 | 71 | 25 | 70 | 1 | 3 | 1.060 |  |  | 1.5 |  |
| ID | NY138 | 401 | 444 | 90 | 9 | 77 | 14 | 1 | 1.087 |  |  |  |  |
| ME | NY138 | 366 | 405 | 90 | 5 | 89 | 6 | 5 | 1.080 |  | 71.6 |  |  |
| MI | NY138 | 444 | 471 | 94 | 6 | 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 | 6 | 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 | 99 | 0.4 | 94 | 0.5 | 1 | 1.076 |  |  |  |  |
| WI | 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 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CA | NY139 | 431 | 456 | 95 | 5 | 95 | 0 | 0 | 1.105 |  |  |  |  |
| FL | NY139 | 175 | 408 | 57 | 36 | 56 | 1 | 25 | 1.064 |  |  | 5.0 |  |
| ID | NY139 | 341 | 435 | 78 | 19 | 76 | 5 | 3 | 1.093 |  |  |  |  |
| ME | NY139 | 343 | 395 | 87 | 7 | 93 | 1 | 7 | 1.094 |  | 70.8 |  |  |
| MI | NY139 | 428 | 469 | 91 | 8 | 80 | 11 | 1 | 1.076 | 62.0 |  | 2.0 |  |
| MO | NY139 | 400 | 437 | 92 | 9 | 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 | 6 | 81 | 1 | 13 | 1.084 | 58.0 |  |  |  |
| RRV | NY139 | 644 | 657 | 98 | 0.7 | 95 | 0.3 | 1.3 | 1.084 |  |  |  |  |
| WI | NY139 | 402 | 533 | 75 | 3 | 75 | 19 | 4 | 1.084 |  |  |  |  |
|  | average: | 376 | 449 | 84 | 10 | 83 | 4 | 6 | 1.083 | 63.5 | 70.8 | 3.0 | 3.0 |



| fourteen clones and two standards grown in CA, FL, ID, ME, MI, MO, NC, PA, RRV and WI in 2010. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | CLONE or | No. 1 | TOTAL | PERCENT OF CATEGORIES |  |  |  |  | SPECIFIC GRAVITY | AGTRON VALUE |  | SFA SCORE |  |
| STATE | VARIETY | YIELD | YIELD | NO. 1 | SMALL | MID-SIZE | LARGE | CULLS |  | FIELD | 1 WEEK | FIELD | 1 WEEK |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CA | W2717-5 | 374 | 406 | 92 | 8 | 92 | 0 | 0 | 1.108 |  |  |  |  |
| FL | W2717-5 | 269 | 367 | 77 | 19 | 76 | 2 | 5 | 1.074 |  |  | 2.0 |  |
| ID | W2717-5 | 290 | 352 | 82 | 14 | 75 | 11 | 3 | 1.089 |  |  |  |  |
| ME | W2717-5 | 260 | 314 | 83 | 6 | 93 | 1 | 12 | 1.096 |  | 70.8 |  |  |
| MI | W2717-5 | 258 | 300 | 86 | 13 | 84 | 2 | 1 | 1.080 | 60.3 |  | 3.0 |  |
| MO | W2717-5 | 314 | 343 | 92 | 9 | 91 | 0 | 0 | 1.075 | 71.0 |  |  |  |
| NC | W2717-5 | 236 | 279 | 85 | 9 | 85 | 0 | 7 | 1.075 | 70.4 |  | 1.0 | 2.0 |
| PA | W2717-5 | 241 | 346 | 69 | 8 | 69 | 0 | 22 | 1.088 | 60.0 |  |  |  |
| RRV | W2717-5 | 521 | 531 | 98 | 0.8 | 95 | 0.3 | 1.2 | 1.081 |  |  |  |  |
| WI | W2717-5 | 307 | 382 | 80 | 4 | 80 | 6 | 9 | 1.080 |  |  |  |  |
|  | average: | 307 | 362 | 84 | 9 | 84 | 2 | 6 | 1.085 | 65.4 | 70.8 | 2.0 | 2.0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CA | W2978-3 | 389 | 416 | 94 | 6 | 94 | 0 | 0 | 1.096 |  |  |  |  |
| FL | W2978-3 | 178 | 350 | 57 | 34 | 23 | 0 | 6 | 1.062 |  |  | 3.5 |  |
| ID | W2978-3 | 280 | 387 | 72 | 25 | 73 | 2 | 3 | 1.082 |  |  |  |  |
| ME | W2978-3 | 304 | 358 | 85 | 6 | 91 | 3 | 9 | 1.080 |  | 72.0 |  |  |
| MI | W2978-3 | 392 | 434 | 91 | 9 | 82 | 9 | 0 | 1.064 | 64.2 |  | 2.0 |  |
| MO | W2978-3 | 400 | 455 | 88 | 12 | 88 | 0 | 0 | 1.064 | 70.0 |  |  |  |
| NC | W2978-3 | 260 | 329 | 79 | 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 |  |  |  |  |
| WI | 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 |  |  |  |  |
| FL | W5015-12 | 255 | 389 | 69 | 26 | 68 | 2 | 6 | 1.066 |  |  | 2.5 |  |
| ID | W5015-12 | 241 | 365 | 66 | 33 | 65 | 2 | 1 | 1.093 |  |  |  |  |
| ME | W5015-12 | 302 | 376 | 80 | 10 | 84 | 5 | 10 | 1.087 |  | 61.3 |  |  |
| MI | 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 |  |  |  |  |
| WI | W5015-12 | 512 | 605 | 85 | 5 | 85 | 4 | 6 | 1.083 |  |  |  |  |
|  | average: | 375 | 456 | 81 | 14 | 80 | 2 | 5 | 1.083 | 64.4 | 61.3 | 2.5 | 3.0 |


| TABLE 4 - AF2291-10 COMPLETING THREE YEARS OF USPB-SFA CHIP TRIALS - 2008-2010 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| YEAR | STATE | CLONE or | No. 1 YIELD |  | TOTAL | PERCENT OF CATEGORIES |  |  |  |  | $\begin{aligned} & \text { SPECIFIC } \\ & \text { GRAVITY } \\ & \hline \end{aligned}$ | AGTRON VALUE |  | SFA SCORES |  |
|  |  | VARIETY | YIELD | \% ATL. | YIELD | No. 1 | SMALL | MID-SIZE | LARGE | CULLS |  | FIELD | 1 WEEK | FIELD | 1 WEEK |
| 2010 | CA | AF2291-10 | 433 | 110 | 443 | 98 | 2 | 98 | 0 | 0 | 1.102 |  |  |  |  |
| 2010 | FL | AF2291-10 | 224 | 79 | 360 | 65 | 31 | 65 | 0 | 5 | 1.070 |  |  | 3.5 |  |
| 2010 | ID | AF2291-10 | 322 | 71 | 377 | 85 | 8 | 75 | 17 | 7 | 1.095 |  |  |  |  |
| 2010 | ME | AF2291-10 | 297 | 93 | 369 | 80 | 3 | 85 | 13 | 17 | 1.093 |  | 68.3 |  |  |
| 2010 | MI | AF2291-10 | 506 | 114 | 565 | 90 | 4 | 74 | 16 | 6 | 1.081 | 62.4 |  | 3.0 |  |
| 2010 | MO | AF2291-10 | 407 | 80 | 435 | 94 | 7 | 93 | 0 | 0 | 1.078 | 70.0 |  |  |  |
| 2010 | NC | AF2291-10 | 192 | 64 | 260 | 74 | 7 | 71 | 3 | 19 | 1.069 | 62.9 |  | 3.0 | 3.0 |
| 2010 | PA | AF2291-10 | 259 | 120 | 326 | 80 | 7 | 80 | 7 | 6 | 1.088 | 56.0 |  |  |  |
| 2010 | RRV | AF2291-10 | 597 | 90 | 608 | 98 | 0.5 | 95 | 0.3 | 1.3 | 1.086 |  |  |  |  |
| 2010 | WI | AF2291-10 | 298 | 96 | 359 | 83 | 4 | 83 | 11 | 2 | 1.085 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2009 | CA | AF2291-10 | 287 | 75 | 324 | 89 | 9 | 89 | 2 | 0.7 | 1.088 |  |  |  |  |
| 2009 | FL | AF2291-10 | 205 | 91 | 262 | 78 | 10 | 85 | 6 | 14 | 1.073 |  |  | 3.0 |  |
| 2009 | ID | AF2291-10 | 283 | 86 | 327 | 87 | 9 | 69 | 17 | 5 | 1.093 |  |  |  |  |
| 2009 | ME | AF2291-10 | 314 | 116 | 365 | 86 | 5 | 91 | 4 | 9.8 | 1.092 | 70.0 |  |  |  |
| 2009 | MI | AF2291-10 | 466 | 94 | 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 | 6 | 88 | 1 | 6 | 1.080 |  |  | 3.0 | 2.0 |
| 2009 | PA | AF2291-10 | 306 | 203 | 335 | 91 | 2 | 91 | 2 | 4 | 1.082 | 56.0 |  |  |  |
| 2009 | RRV-I | AF2291-10 | 337 | 91 | 351 | 96 | 4 | 88 | 9 | NA | 1.094 | 73.0 |  |  |  |
| 2009 | RRV-D | AF2291-10 | 192 | 112 | 211 | 91 | 9 | 78 | 14 | NA | 1.108 |  |  |  |  |
| 2009 | WI | 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 | 2 | 1.092 |  |  |  |  |
| 2008 | FL | AF2291-10 | 219 | 77 | 273 | 80 | 15 | 82 | 2 | 4 | 1.091 |  |  | 3.6 |  |
| 2008 | ID | AF2291-10 | 305 | 62 | 400 | 76 | 4 | 44 | 33 | 19 | 1.095 |  |  |  |  |
| 2008 | ME | AF2291-10 | 303 | 84 | 311 | 97 | 5 | 86 | 9 | 0.3 | 1.085 | 70.7 |  |  |  |
| 2008 | MI | AF2291-10 | 394 | 95 | 414 | 95 | 3 | 79 | 17 | 2 | 1.078 | 64.4 |  | 1.0 |  |
| 2008 | MO | AF2291-10 | 202 | 81 | 281 | 72 | 28 | 72 | 0 | NA | 1.077 | 69.0 |  |  |  |
| 2008 | NC | AF2291-10 | 256 | 79 | 284 | 90 | 8 | 89 | 1 | 2 | 1.095 | 66.0 |  | 2.0 | 2.0 |
| 2008 | PA | AF2291-10 | 204 | 71 | 262 | 78 | 5 | 78 | 11 | 6 | 1.094 | 51.0 |  |  |  |
| 2008 | RRV | AF2291-10 | 242 | 71 | 260 | 93 | 7 | 93 | 0 | 0 | 1.098 | 50.0 |  | 3.0 |  |
| 2008 | WI | AF2291-10 | 347 | 78 | 411 | 84 | 1 | 84 | 10 | 4 | 1.082 |  |  |  |  |
|  | 2010 ave | rage: | 354 | 92 | 410 | 85 | 7 | 82 | 7 | 6 | 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 | rage: | 273 | 78 | 320 | 85 | 9 | 77 | 10 | 4 | 1.089 | 61.9 |  | 2.4 | 2.0 |
|  | three yea | $r$ average: | 303 | 91 | 348 | 87 | 8 | 82 | 8 | 5 | 1.087 | 62.9 | 68.3 | 2.7 | 2.3 |


| YEAR | STATE | CLONE or VARIETY | No. 1 YIELD |  | $\begin{aligned} & \hline \text { TOTAL } \\ & \hline \text { YIELD } \end{aligned}$ | PERCENT OF CATEGORIES |  |  |  |  | $\begin{aligned} & \hline \text { SPECIFIC } \\ & \hline \text { GRAVITY } \end{aligned}$ | AGTRON VALUE |  | SFA SCORES |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | YIELD | \% ATL. |  | No. 1 | SMALL | MID-SIZE | LARGE | CULLS |  | FIELD | 1 WEEK | FIELD | 1 WEEK |
| 2010 | CA | C097043-14W | 466 | 119 | 563 | 83 | 17 | 83 | 0 | 0 | 1.088 |  |  |  |  |
| 2010 | FL | C097043-14W | 163 | 58 | 292 | 57 | 34 | 56 | 1 | 3 | 1.066 |  |  | 1 |  |
| 2010 | ID | C097043-14W | 388 | 86 | 436 | 89 | 10 | 77 | 13 | 1 | 1.086 |  |  |  |  |
| 2010 | ME | C097043-14W | 328 | 103 | 373 | 88 | 5 | 89 | 7 | 7 | 1.083 |  | 71.2 |  |  |
| 2010 | MI | C097043-14W | 265 | 60 | 305 | 87 | 13 | 80 | 7 | 0 | 1.065 | 63.5 |  | 3 |  |
| 2010 | MO | C097043-14W | 402 | 79 | 429 | 94 | 6 | 94 | 0 | 0 | 1.064 | 73 |  |  |  |
| 2010 | NC | C097043-14W | 264 | 88 | 317 | 83 | 16 | 83 | 0 | 1 | 1.066 | 61.8 |  | 2 | 1 |
| 2010 | PA | C097043-14W | 210 | 98 | 277 | 76 | 9 | 76 | 5 | 11 | 1.085 | 64 |  |  |  |
| 2010 | RRV | C097043-14W | 656 | 98 | 668 | 98 | 0.8 | 96 | 0.2 | 1 | 1.079 |  |  |  |  |
| 2010 | WI | C097043-14W | 374 | 120 | 527 | 71 | 3 | 71 | 20 | 7 | 1.073 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2009 | CA | C097043-14W | 342 | 89 | 385 | 89 | 8 | 89 | 3 | 0.4 | 1.084 |  |  |  |  |
| 2009 | FL | C097043-14W | 301 | 133 | 346 | 87 | 8 | 80 | 11 | 4 | 1.066 |  |  | 1 |  |
| 2009 | ID | C097043-14W | 316 | 96 | 409 | 77 | 23 | 75 | 2 | 0 | 1.088 |  |  |  |  |
| 2009 | ME | C097043-14W | 236 | 87 | 295 | 80 | 5 | 90 | 5 | 16.2 | 1.081 | 70 |  |  |  |
| 2009 | MI | C097043-14W | 455 | 91 | 472 | 96 | 3 | 85 | 11 | 1 | 1.073 | 62.7 |  | 2 |  |
| 2009 | MO | C097043-14W | 201 | 74 | 239 | 84 | 16 | 84 | 0 | NA | 1.083 | 64 |  |  |  |
| 2009 | NC | C097043-14W | 330 | 89 | 373 | 88 | 9 | 88 | 0 | 2 | 1.071 |  |  | 1 | 2 |
| 2009 | PA | C097043-14W | 144 | 95 | 169 | 85 | 3 | 85 | 0 | 11 | 1.074 | 59 |  |  |  |
| 2009 | RRV-I | C097043-14W | 359 | 97 | 390 | 92 | 8 | 77 | 15 | NA | 1.084 | 73 |  |  |  |
| 2009 | RRV-D | C097043-14W | 189 | 110 | 222 | 85 | 15 | 76 | 10 | NA | 1.096 |  |  |  |  |
| 2009 | WI | C097043-14W | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2008 | CA | C097043-14W | 286 | NA | 339 | 84 | 15 | 59 | 25 | 1 | 1.083 |  |  |  |  |
| 2008 | FL | C097043-14W | 243 | 85 | 307 | 79 | 15 | 82 | 1 | 4 | 1.084 |  |  | 3.7 |  |
| 2008 | ID | C097043-14W | 432 | 88 | 492 | 88 | 10 | 70 | 17 | 2 | 1.086 |  |  |  |  |
| 2008 | ME | C097043-14W | 314 | 87 | 341 | 92 | 6 | 76 | 13 | 5 | 1.072 | 69.4 |  |  |  |
| 2008 | MI | C097043-14W | 379 | 92 | 402 | 94 | 6 | 86 | 8 | 0 | 1.068 | 65.2 |  | 2 |  |
| 2008 | MO | C097043-14W | 196 | 79 | 261 | 75 | 25 | 75 | 0 | NA | 1.067 | 69 |  |  |  |
| 2008 | NC | C097043-14W | 284 | 88 | 347 | 82 | 16 | 81 | 0 | 2 | 1.085 | 70.4 |  | 2 | 2 |
| 2008 | PA | C097043-14W | 271 | 94 | 324 | 84 | 7 | 84 | 4 | 5 | 1.089 | 50 |  |  |  |
| 2008 | RRV | C097043-14W | 291 | 86 | 315 | 92 | 8 | 93 | 0 | 0 | 1.093 | 68 |  | 1 |  |
| 2008 | WI | C097043-14W | 371 | 83 | 408 | 91 | 3 | 91 | 3 | 4 | 1.074 |  |  |  |  |
|  | 2010 average: |  | 352 | 91 | 419 | 83 | 11 | 81 | 5 | 3 | 1.076 | 65.6 | 71.2 | 2.0 | 1.0 |
|  | 2009 average: |  | 287 | 96 | 330 | 86 | 10 | 83 | 6 | 5 | 1.080 | 65.7 |  | 1.3 | 2.0 |
|  | 2008 average: |  | 307 | 87 | 354 | 86 | 11 | 80 | 7 | 3 | 1.080 | 65.3 |  | 2.2 | 2.0 |
|  | three year average: |  | 315 | 92 | 367 | 85 | 11 | 81 | 6 | 3 | 1.079 | 65.5 | 71.2 | 1.9 | 1.7 |


| TABLE 6 - CO97065-7W COMPLETING THREE YEARS OF USPB-SFA CHIP TRIALS - 2008-2010 |  |  |  |  |  |  |  |  |  |  |  |  |  | SFA SCORES |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| YEAR | STATE | CLONE or VARIETY | No. 1 YIELD |  | $\begin{gathered} \hline \text { TOTAL } \\ \hline \text { YIELD } \\ \hline \end{gathered}$ | PERCENT OF CATEGORIES |  |  |  |  | SPECIFIC GRAVITY | AGTRON VALUE |  | SFA SCORES |  |
|  |  |  | YIELD | \% ATL. |  | No. 1 | SMALL | MID-SIZE | LARGE | CULLS |  | FIELD | 1 WEEK | FIELD | 1 WEEK |
| 2010 | CA | C097065-7W | 449 | 115 | 480 | 94 | 6 | 94 | 0 | 0 | 1.101 |  |  |  |  |
| 2010 | FL | C097065-7W | 204 | 72 | 307 | 73 | 23 | 70 | 3 | 8 | 1.065 |  |  | 1 |  |
| 2010 | ID | C097065-7W | 330 | 73 | 384 | 86 | 14 | 84 | 2 | 0 | 1.093 |  |  |  |  |
| 2010 | ME | C097065-7W | 336 | 106 | 389 | 86 | 6 | 91 | 3 | 9 | 1.089 |  | 69.7 |  |  |
| 2010 | MI | C097065-7W | 344 | 78 | 377 | 91 | 8 | 81 | 10 | 1 | 1.070 | 61.0 |  | 3 |  |
| 2010 | MO | C097065-7W | 449 | 89 | 481 | 93 | 7 | 93 | 0 | 0 | 1.067 | 70 |  |  |  |
| 2010 | NC | C097065-7W | 260 | 87 | 313 | 83 | 16 | 83 | 0 | 1 | 1.065 | 60.4 |  | 3 | 2 |
| 2010 | PA | C097065-7W | 302 | 140 | 359 | 84 | 5 | 84 | 1 | 10 | 1.076 | 56 |  |  |  |
| 2010 | RRV | CO97065-7W | 520 | 78 | 533 | 98 | 0.9 | 97 | 0 | 1.6 | 1.081 |  |  |  |  |
| 2010 | WI | C097065-7W | 324 | 104 | 442 | 73 | 3 | 73 | 14 | 11 | 1.07 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2009 | CA | CO97065-7W | 303 | 79 | 380 | 80 | 12 | 80 | 8 | 0.4 | 1.087 |  |  |  |  |
| 2009 | FL | C097065-7W | 288 | 127 | 325 | 89 | 7 | 91 | 1 | 5 | 1.075 |  |  | 1 |  |
| 2009 | ID | C097065-7W | 213 | 65 | 393 | 54 | 46 | 54 | 0 | 0 | 1.089 |  |  |  |  |
| 2009 | ME | CO97065-7W | 258 | 96 | 322 | 80 | 5 | 93 | 2 | 16.1 | 1.090 | 70 |  |  |  |
| 2009 | MI | C097065-7W | 404 | 81 | 420 | 96 | 3 | 81 | 15 | 1 | 1.078 | 58.5 |  | 2 |  |
| 2009 | MO | C097065-7W | 136 | 50 | 147 | 93 | 7 | 93 | 0 | NA | 1.085 | 64 |  |  |  |
| 2009 | NC | C097065-7W | 323 | 87 | 363 | 89 | 7 | 88 | 1 | 4 | 1.072 |  |  | 1 | 1 |
| 2009 | PA | C097065-7W | 200 | 132 | 218 | 92 | 3 | 92 | 0 | 5 | 1.086 | 57 |  |  |  |
| 2009 | RRV-I | CO97065-7W | 368 | 99 | 396 | 93 | 7 | 88 | 5 | NA | 1.056 | 73 |  |  |  |
| 2009 | RRV-D | C097065-7W | 84 | 49 | 112 | 75 | 25 | 71 | 5 | NA | 1.113 |  |  |  |  |
| 2009 | WI | C097065-7W | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
|  |  | C097065-7W |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2008 | FL | C097065-7W | 242 | 85 | 314 | 77 | 18 | 77 | 0 | 1 | 1.088 |  |  | 3.5 |  |
| 2008 | ID | C097065-7W | 278 | 57 | 358 | 78 | 21 | 77 | 1 | 1 | 1.086 |  |  |  |  |
| 2008 | ME | C097065-7W | 279 | 77 | 349 | 80 | 8 | 76 | 0 | 17 | 1.077 | 69.1 |  |  |  |
| 2008 | MI | C097065-7W | 363 | 88 | 408 | 89 | 10 | 89 | 0 | 1 | 1.079 | 64.4 |  | 3 |  |
| 2008 | MO | C097065-7W | 228 | 92 | 280 | 82 | 18 | 82 | 0 | NA | 1.075 | 67 |  |  |  |
| 2008 | NC | C097065-7W | 265 | 82 | 304 | 87 | 10 | 87 | 0 | 2 | 1.096 | 71.2 |  | 2 | 2 |
| 2008 | PA | C097065-7W | 107 | 37 | 144 | 75 | 8 | 75 | 2 | 15 | 1.092 | 49 |  |  |  |
| 2008 | RRV | C097065-7W | 247 | 73 | 275 | 90 | 10 | 90 | 0 | 0 | 1.096 | 64 |  | 2 |  |
| 2008 | WI | C097065-7W | 378 | 85 | 403 | 94 | 2 | 94 | 0 | 5 | 1.077 |  |  |  |  |
|  | 2010 average: |  | 352 | 94 | 407 | 86 | 9 | 85 | 3 | 4 | 1.078 | 61.9 | 69.7 | 2.3 | 2.0 |
|  | 2009 average: |  | 258 | 87 | 308 | 84 | 12 | 83 | 4 | 5 | 1.083 | 64.5 |  | 1.3 | 1.0 |
|  | 2008 average: |  | 264 | 75 | 316 | 83 | 13 | 81 | 2 | 5 | 1.085 | 64.1 |  | 2.6 | 2.0 |
|  | three year average: |  | 291 | 86 | 343 | 84 | 11 | 83 | 3 | 5 | 1.082 | 63.6 | 69.7 | 2.2 | 1.7 |


| YEAR | STATE | CLONE or VARIETY | No. 1 YIELD |  | $\begin{aligned} & \hline \text { TOTAL } \\ & \hline \text { YIELD } \end{aligned}$ | PERCENT OF CATEGORIES |  |  |  |  | $\begin{aligned} & \hline \text { SPECIFIC } \\ & \hline \text { GRAVITY } \end{aligned}$ | AGTRON VALUE |  | SFA SCORES |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | YIELD | \% ATL. |  | No. 1 | SMALL | MID-SIZE | LARGE | CULLS |  | FIELD | 1 WEEK | FIELD | 1 WEEK |
| 2010 | CA | NY138 | 396 | 101 | 416 | 95 | 5 | 95 | 0 | 0 | 1.098 |  |  |  |  |
| 2010 | FL | NY138 | 263 | 93 | 383 | 71 | 25 | 70 | 1 | 3 | 1.060 |  |  | 1.5 |  |
| 2010 | ID | NY138 | 401 | 89 | 444 | 90 | 9 | 77 | 14 | 1 | 1.087 |  |  |  |  |
| 2010 | ME | NY138 | 366 | 115 | 405 | 90 | 5 | 89 | 6 | 5 | 1.080 |  | 71.6 |  |  |
| 2010 | MI | NY138 | 444 | 100 | 471 | 94 | 6 | 82 | 12 | 0 | 1.071 | 65.4 |  | 3 |  |
| 2010 | MO | NY138 | 458 | 91 | 490 | 93 | 7 | 93 | 0 | 0 | 1.059 | 71 |  |  |  |
| 2010 | NC | NY138 | 292 | 98 | 359 | 81 | 6 | 80 | 2 | 12 | 1.060 | 68.1 |  | 2 | 3 |
| 2010 | PA | NY138 | 268 | 125 | 334 | 80 | 3 | 80 | 2 | 14 | 1.086 | 57 |  |  |  |
| 2010 | RRV | NY138 | 625 | 94 | 634 | 99 | 0.4 | 94 | 0.5 | 1 | 1.076 |  |  |  |  |
| 2010 | WI | NY138 | 355 | 114 | 435 | 82 | 2 | 82 | 12 | 4 | 1.071 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2009 | CA | NY138 | 354 | 92 | 426 | 83 | 6 | 83 | 11 | 0.5 | 1.078 |  |  |  |  |
| 2009 | FL | NY138 | 331 | 146 | 395 | 84 | 5 | 64 | 30 | 10 | 1.062 |  |  | 1 |  |
| 2009 | ID | 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 | MI | NY138 | 444 | 89 | 458 | 97 | 3 | 78 | 19 | 0 | 1.073 | 63.1 |  | 1 |  |
| 2009 | MO | NY138 | 226 | 84 | 252 | 90 | 10 | 90 | 0 | NA | 1.075 | 64 |  |  |  |
| 2009 | NC | NY138 | 314 | 84 | 349 | 90 | 4 | 81 | 9 | 6 | 1.065 |  |  | 2 | 2 |
| 2009 | PA | NY138 | 250 | 166 | 357 | 70 | 3 | 70 | 7 | 21 | 1.074 | 58 |  |  |  |
| 2009 | RRV-I | NY138 | 386 | 104 | 420 | 92 | 6 | 74 | 18 | NA | 1.063 | 75 |  |  |  |
| 2009 | RRV-D | NY138 | 186 | 108 | 200 | 93 | 7 | 92 | 2 | NA | 1.096 |  |  |  |  |
| 2009 | WI | NY138 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2008 | CA | NY138 | 358 | NA | 395 | 91 | 8 | 37 | 54 | 2 | 1.082 |  |  |  |  |
| 2008 | FL | NY138 | 244 | 86 | 300 | 81 | 15 | 80 | 2 | 2 | 1.080 |  |  | 3.6 |  |
| 2008 | ID | 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 | 9 | 87 | 0 | 3 | 1.093 | 56 |  |  |  |
| 2008 | RRV | NY138 | 285 | 84 | 301 | 95 | 5 | 95 | 0 | 0 | 1.086 | 62 |  | 2 |  |
| 2008 | WI | NY138 | 347 | 78 | 372 | 93 | 3 | 93 | 1 | 2 | 1.073 |  |  |  |  |
|  | 2010 average: |  | 387 | 102 | 437 | 88 | 7 | 84 | 5 | 4 | 1.075 | 65.4 | 71.6 | 2.2 | 3.0 |
|  | 2009 average: |  | 307 | 106 | 359 | 85 | 7 | 80 | 11 | 9 | 1.075 | 66.0 |  | 1.3 | 2.0 |
|  | 2008 average: |  | 319 | 88 | 353 | 90 | 9 | 81 | 9 | 2 | 1.079 | 65.3 |  | 2.4 | 1.0 |
|  | three year average: |  | 337 | 99 | 383 | 88 | 7 | 82 | 8 | 5 | 1.076 | 65.5 | 71.6 | 2.0 | 2.0 |


| TABLE 8 - NY139 COMPLETING THREE YEARS OF USPB-SFA CHIP TRIALS - 2008-2010 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| YEAR | STATE | CLONE or VARIETY | No. 1 YIELD |  | $\begin{aligned} & \hline \text { TOTAL } \\ & \text { YIELD } \\ & \hline \end{aligned}$ | PERCENT OF CATEGORIES |  |  |  |  | $\begin{aligned} & \hline \text { SPECIFIC } \\ & \hline \text { GRAVITY } \end{aligned}$ | AGTRON VALUE |  | SFA SCORES |  |
|  |  |  | YIELD | \% ATL. |  | No. 1 | SMALL | MID-SIZE | LARGE | CULLS |  | FIELD | 1 WEEK | FIELD | 1 WEEK |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2010 | CA | NY139 | 431 | 110 | 456 | 95 | 5 | 95 | 0 | 0 | 1.105 |  |  |  |  |
| 2010 | FL | NY139 | 175 | 62 | 408 | 57 | 36 | 56 | 1 | 25 | 1.064 |  |  | 5 |  |
| 2010 | ID | 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 | MI | NY139 | 428 | 97 | 469 | 91 | 8 | 80 | 11 | 1 | 1.076 | 62.0 |  | 2 |  |
| 2010 | MO | NY139 | 400 | 79 | 437 | 92 | 9 | 91 | 0 | 0 | 1.076 | 70 |  |  |  |
| 2010 | NC | NY139 | 318 | 106 | 361 | 88 | 10 | 88 | 0 | 2 | 1.067 | 64.1 |  | 2 | 3 |
| 2010 | PA | NY139 | 273 | 127 | 338 | 81 | 6 | 81 | 1 | 13 | 1.084 | 58 |  |  |  |
| 2010 | RRV | NY139 | 644 | 97 | 657 | 98 | 0.7 | 95 | 0.3 | 1.3 | 1.084 |  |  |  |  |
| 2010 | WI | NY139 | 402 | 129 | 533 | 75 | 3 | 75 | 19 | 4 | 1.084 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2009 | CA | NY139 | 379 | 99 | 437 | 87 | 5 | 87 | 8 | 0.3 | 1.083 |  |  |  |  |
| 2009 | FL | NY139 | 246 | 109 | 314 | 78 | 7 | 82 | 10 | 15 | 1.065 |  |  | 1 |  |
| 2009 | ID | NY139 | 372 | 113 | 488 | 76 | 23 | 73 | 3 | 1 | 1.094 |  |  |  |  |
| 2009 | ME | NY139 | 251 | 93 | 318 | 79 | 7 | 90 | 3 | 14.6 | 1.090 | 70 |  |  |  |
| 2009 | MI | NY139 | 455 | 91 | 462 | 99 | 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 | RRV-I | NY139 | 299 | 81 | 340 | 88 | 12 | 85 | 4 | NA | 1.095 | 73 |  |  |  |
| 2009 | RRV-D | NY139 | 163 | 95 | 185 | 88 | 12 | 83 | 5 | NA | 1.106 |  |  |  |  |
| 2009 | WI | 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 | FL | NY139 | 214 | 75 | 259 | 82 | 11 | 84 | 4 | 4 | 1.083 |  |  | 4.8 |  |
| 2008 | ID | NY139 | 393 | 80 | 462 | 85 | 12 | 84 | 2 | 3 | 1.095 |  |  |  |  |
| 2008 | ME | NY139 | 259 | 72 | 278 | 96 | 6 | 90 | 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 | 90 | 0 | 2 | 1.09 | 70.5 |  | 2 | 1 |
| 2008 | PA | NY139 | 257 | 90 | 302 | 85 | 8 | 85 | 2 | 5 | 1.094 | 42 |  |  |  |
| 2008 | RRV | NY139 | 253 | 75 | 277 | 91 | 9 | 92 | 0 | 0 | 1.094 | 62 |  | 2 |  |
| 2008 | WI | NY139 | 383 | 86 | 416 | 92 | 3 | 92 | 5 | 3 | 1.082 |  |  |  |  |
|  | 2010 average: |  | 376 | 99 | 449 | 84 | 10 | 83 | 4 | 6 | 1.083 | 63.5 | 70.8 | 3.0 | 3.0 |
|  | 2009 average: |  | 302 | 105 | 351 | 87 | 8 | 84 | 7 | 6 | 1.085 | 65.7 |  | 1.3 | 2.0 |
|  | 2008 average: |  | 312 | 83 | 351 | 88 | 10 | 83 | 6 | 2 | 1.085 | 62.8 |  | 3.0 | 1.0 |
|  | three year average: |  | 330 | 96 | 383 | 86 | 9 | 83 | 6 | 5 | 1.084 | 64.0 | 70.8 | 2.5 | 2.0 |


| TABLE 9 - W2717-5 COMPLETING THREE YEARS OF USPB-SFA CHIP TRIALS - 2008-2010 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| YEAR | STATE | CLONE or | No. 1 YIELD |  | TOTAL | PERCENT OF CATEGORIES |  |  |  |  | SPECIFIC | AGTRON VALUE |  | SFA SCORES |  |
|  |  | VARIETY | YIELD | \% ATL. | YIELD | No. 1 | SMALL | MID-SIZE | LARGE | CULLS | GRAVITY | FIELD | 1 WEEK | FIELD | 1 WEEK |
| 2010 | CA | W2717-5 | 374 | 95 | 406 | 92 | 8 | 92 | 0 | 0 | 1.108 |  |  |  |  |
| 2010 | FL | W2717-5 | 269 | 95 | 367 | 77 | 19 | 76 | 2 | 5 | 1.074 |  |  | 2 |  |
| 2010 | ID | W2717-5 | 290 | 64 | 352 | 82 | 14 | 75 | 11 | 3 | 1.089 |  |  |  |  |
| 2010 | ME | W2717-5 | 260 | 82 | 314 | 83 | 6 | 93 | 1 | 12 | 1.096 |  | 70.8 |  |  |
| 2010 | MI | W2717-5 | 258 | 58 | 300 | 86 | 13 | 84 | 2 | 1 | 1.080 | 60.3 |  | 3 |  |
| 2010 | MO | W2717-5 | 314 | 62 | 343 | 92 | 9 | 91 | 0 | 0 | 1.075 | 71 |  |  |  |
| 2010 | NC | W2717-5 | 236 | 79 | 279 | 85 | 9 | 85 | 0 | 7 | 1.075 | 70.4 |  | 1 | 2 |
| 2010 | PA | W2717-5 | 241 | 112 | 346 | 69 | 8 | 69 | 0 | 22 | 1.088 | 60 |  |  |  |
| 2010 | RRV | W2717-5 | 521 | 78 | 531 | 98 | 0.8 | 95 | 0.3 | 1.2 | 1.081 |  |  |  |  |
| 2010 | WI | W2717-5 | 307 | 98 | 382 | 80 | 4 | 80 | 6 | 9 | 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 | ID | W2717-5 | 275 | 84 | 388 | 71 | 27 | 65 | 6 | 2 | 1.094 |  |  |  |  |
| 2009 | ME | W2717-5 | 227 | 84 | 348 | 65 | 5 | 92 | 3 | 31.5 | 1.097 | 70 |  |  |  |
| 2009 | MI | W2717-5 | 361 | 72 | 395 | 91 | 4 | 82 | 9 | 5 | 1.085 | 60.6 |  | 3 |  |
| 2009 | MO | W2717-5 | 168 | 62 | 187 | 90 | 10 | 90 | 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 | RRV-I | W2717-5 | 333 | 90 | 354 | 94 | 6 | 89 | 4 | NA | 1.096 | 73 |  |  |  |
| 2009 | RRV-D | W2717-5 | 127 | 74 | 155 | 82 | 18 | 76 | 4 | NA | 1.114 |  |  |  |  |
| 2009 | WI | 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 | FL | W2717-5 | 244 | 86 | 312 | 78 | 16 | 82 | 1 | 5 | 1.101 |  |  | 4.8 |  |
| 2008 | ID | W2717-5 | 242 | 49 | 331 | 73 | 22 | 63 | 10 | 5 | 1.091 |  |  |  |  |
| 2008 | ME | W2717-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2008 | MI | W2717-5 | 318 | 77 | 354 | 90 | 9 | 88 | 2 | 2 | 1.085 | 63.1 |  | 2 |  |
| 2008 | MO | W2717-5 | 198 | 80 | 273 | 73 | 27 | 73 | 0 | NA | 1.083 | 69 |  |  |  |
| 2008 | NC | W2717-5 | 229 | 71 | 264 | 87 | 9 | 87 | 0 | 4 | 1.095 | 70.8 |  | 1 | 2 |
| 2008 | PA | W2717-5 | 106 | 37 | 152 | 70 | 5 | 70 | 7 | 18 | 1.099 | 45 |  |  |  |
| 2008 | RRV | W2717-5 | 263 | 78 | 290 | 91 | 9 | 91 | 0 | 0 | 1.107 | 62 |  | 2 |  |
| 2008 | WI | W2717-5 | 348 | 78 | 389 | 90 | 4 | 90 | 1 | 5 | 1.087 |  |  |  |  |
|  | 2010 ave | rage: | 307 | 82 | 362 | 84 | 9 | 84 | 2 | 6 | 1.08 | 65.4 | 70.8 | 2.0 | 2.0 |
|  | 2009 aver | rage: | 239 | 81 | 296 | 81 | 10 | 82 | 3 | 12 | 1.09 | 65.1 |  | 2.0 | 1.0 |
|  | 2008 aver | rage: | 232 | 69 | 290 | 79 | 16 | 77 | 3 | 5 | 1.09 | 62.0 |  | 2.5 | 2.0 |
|  | three year | $r$ average: | 260 | 78 | 316 | 81 | 12 | 81 | 3 | 8 | 1.089 | 64.1 | 70.8 | 2.2 | 1.7 |


| TABLE 10 - ATLANTIC IN THREE YEARS OF USPB-SFA CHIP TRIALS - 2008-2010 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| YEAR | STATE | CLONE or | No. 1 YIELD |  | TOTAL | PERCENT OF CATEGORIES |  |  |  |  | SPECIFIC | AGTRON VALUE |  | SFA SCORES |  |
|  |  | VARIETY | YIELD | \% ATL. | YIELD | No. 1 | SMALL | MID-SIZE | LARGE | CULLS | GRAVITY | FIELD | 1 WEEK | FIELD | 1 WEEK |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2010 | CA | ATLANTIC | 392 | 100 | 409 | 96 | 4 | 96 | 0 | 0 | 1.080 |  |  |  |  |
| 2010 | FL | ATLANTIC | 283 | 100 | 393 | 74 | 22 | 70 | 4 | 3 | 1.065 |  |  | 2 |  |
| 2010 | ID | ATLANTIC | 453 | 100 | 519 | 87 | 10 | 78 | 12 | 3 | 1.094 |  |  |  |  |
| 2010 | ME | ATLANTIC | 318 | 100 | 383 | 83 | 3 | 87 | 9 | 14 | 1.095 |  | 70.5 |  |  |
| 2010 | MI | ATLANTIC | 443 | 100 | 472 | 94 | 6 | 82 | 12 | 0 | 1.082 | 62.9 |  | 4 |  |
| 2010 | MO | ATLANTIC | 506 | 100 | 542 | 93 | 7 | 93 | 0 | 0 | 1.081 | 72 |  |  |  |
| 2010 | NC | ATLANTIC | 299 | 100 | 340 | 88 | 10 | 88 | 1 | 2 | 1.072 | 59.5 |  | 2 | 2 |
| 2010 | PA | ATLANTIC | 215 | 100 | 279 | 77 | 9 | 77 | 4 | 10 | 1.089 | 58 |  |  |  |
| 2010 | RRV | ATLANTIC | 667 | 100 | 684 | 98 | 0.3 | 85 | 1.4 | 2.1 | 1.09 |  |  |  |  |
| 2010 | WI | ATLANTIC | 312 | 100 | 425 | 73 | 2 | 73 | 20 | 5 | 1.087 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2009 | CA | ATLANTIC | 383 | 100 | 499 | 77 | 7 | 77 | 14 | 1.6 | 1.088 |  |  |  |  |
| 2009 | FL | ATLANTIC | 226 | 100 | 350 | 65 | 7 | 80 | 13 | 30 | 1.066 |  |  | 2 |  |
| 2009 | ID | ATLANTIC | 329 | 100 | 427 | 77 | 19 | 63 | 14 | 4 | 1.094 |  |  |  |  |
| 2009 | ME | ATLANTIC | 270 | 100 | 376 | 72 | 5 | 90 | 5 | 23.2 | 1.093 | 70 |  |  |  |
| 2009 | MI | 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 | RRV-I | ATLANTIC | 370 | 100 | 398 | 93 | 7 | 77 | 16 | NA | 1.093 | 73 |  |  |  |
| 2009 | RRV-D | ATLANTIC | 172 | 100 | 187 | 92 | 7 | 74 | 17 | NA | 1.110 |  |  |  |  |
| 2009 | WI | 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 | FL | ATLANTIC | 285 | 100 | 343 | 83 | 12 | 84 | 2 | 3 | 1.088 |  |  | 3.9 |  |
| 2008 | ID | ATLANTIC | 489 | 100 | 559 | 87 | 4 | 62 | 26 | 9 | 1.096 |  |  |  |  |
| 2008 | ME | ATLANTIC | 361 | 100 | 389 | 93 | 10 | 81 | 7 | 3 | 1.080 | 69.1 |  |  |  |
| 2008 | MI | ATLANTIC | 414 | 100 | 443 | 93 | 5 | 80 | 13 | 1 | 1.077 | 64.9 |  | 3 |  |
| 2008 | MO | ATLANTIC | 248 | 100 | 308 | 80 | 20 | 80 | 0 | NA | 1.082 | 67 |  |  |  |
| 2008 | NC | ATLANTIC | 324 | 100 | 375 | 86 | 10 | 85 | 2 | 4 | 1.097 | 65.3 |  | 1 | 1 |
| 2008 | PA | ATLANTIC | 287 | 100 | 336 | 85 | 6 | 85 | 3 | 7 | 1.096 | 44 |  |  |  |
| 2008 | RRV | ATLANTIC | 339 | 100 | 355 | 96 | 5 | 96 | 0 | 0 | 1.104 | 42 |  | 4 |  |
| 2008 | WI | ATLANTIC | 447 | 100 | 508 | 88 | 3 | 88 | 8 | 1 | 1.086 |  |  |  |  |
|  | 2010 ave | rage: | 389 | 100 | 445 | 86 | 7 | 83 | 6 | 4 | 1.084 | 63.1 | 70.5 | 2.7 | 2.0 |
|  | 2009 ave | rage: | 306 | 100 | 373 | 82 | 6 | 79 | 10 | 14 | 1.089 | 64.7 |  | 2.3 | 3.0 |
|  | 2008 ave | rage: | 355 | 100 | 402 | 88 | 8 | 82 | 7 | 4 | 1.090 | 58.7 |  | 3.0 | 1.0 |
|  | three yea | average: | 348 | 100 | 406 | 85 | 7 | 81 | 8 | 7 | 1.087 | 61.9 | 70.5 | 2.7 | 2.0 |


| TABLE 11-SNOWDEN IN THREE YEARS OF USPB-SFA CHIP TRIALS - 2008-2010 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| YEAR | STATE | CLONE or | No. 1 YIELD |  | TOTAL | PERCENT OF CATEGORIES |  |  |  |  | SPECIFIC GRAVITY | AGTRON VALUE |  | SFA SCORES |  |
|  |  | VARIETY | YIELD | \% ATL. | YIELD | No. 1 | SMALL | MID-SIZE | LARGE | CULLS |  | FIELD | 1 WEEK | FIELD | 1 WEEK |
| 2010 | CA | SNOWDEN | 432 | 110 | 479 | 90 | 10 | 90 | 0 | 0 | 1.100 |  |  |  |  |
| 2010 | FL | SNOWDEN | 389 | 137 | 482 | 82 | 16 | 82 | 1 | 2 | 1.073 |  |  | 4 |  |
| 2010 | ID | SNOWDEN | 326 | 72 | 436 | 75 | 25 | 70 | 5 | 0 | 1.094 |  |  |  |  |
| 2010 | ME | SNOWDEN | 287 | 90 | 340 | 84 | 5 | 86 | 9 | 10 | 1.097 |  | 70.3 |  |  |
| 2010 | MI | SNOWDEN | 463 | 105 | 510 | 90 | 10 | 82 | 8 | 0 | 1.077 | 63.5 |  | 2 |  |
| 2010 | MO | SNOWDEN | 398 | 79 | 424 | 94 | 6 | 94 | 0 | 0 | 1.074 | 70 |  |  |  |
| 2010 | NC | SNOWDEN | 333 | 111 | 393 | 85 | 15 | 84 | 1 | 1 | 1.071 | 65.6 |  | 2 | 2 |
| 2010 | PA | SNOWDEN | 265 | 123 | 319 | 83 | 11 | 83 | 1 | 4 | 1.085 | 60 |  |  |  |
| 2010 | RRV | SNOWDEN | 651 | 98 | 664 | 98 | 0.3 | 92 | 0.7 | 1.6 | 1.086 |  |  |  |  |
| 2010 | WI | SNOWDEN | 535 | 171 | 613 | 87 | 6 | 87 | 6 | 2 | 1.088 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2009 | CA | SNOWDEN | 401 | 105 | 468 | 86 | 9 | 86 | 4 | 1.1 | 1.081 |  |  |  |  |
| 2009 | FL | SNOWDEN | 224 | 99 | 280 | 80 | 11 | 85 | 3 | 10 | 1.069 |  |  | 2 |  |
| 2009 | ID | SNOWDEN | 270 | 82 | 385 | 70 | 26 | 58 | 12 | 4 | 1.092 |  |  |  |  |
| 2009 | ME | SNOWDEN | 299 | 111 | 359 | 83 | 7 | 92 | 1 | 10.2 | 1.093 | 70 |  |  |  |
| 2009 | MI | SNOWDEN | 488 | 98 | 512 | 95 | 5 | 89 | 6 | 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 | RRV-I | SNOWDEN | 383 | 104 | 421 | 91 | 9 | 90 | 2 | NA | 1.093 | 72 |  |  |  |
| 2009 | RRV-D | SNOWDEN | 188 | 109 | 224 | 84 | 16 | 77 | 6 | NA | 1.114 |  |  |  |  |
| 2009 | WI | 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 | FL | SNOWDEN | 333 | 117 | 402 | 83 | 14 | 85 | 0 | 3 | 1.086 |  |  | 3.4 |  |
| 2008 | ID | SNOWDEN | 333 | 68 | 449 | 74 | 25 | 71 | 4 | 1 | 1.092 |  |  |  |  |
| 2008 | ME | SNOWDEN | 390 | 108 | 406 | 94 | 10 | 89 | 0 | 1 | 1.085 | 70.8 |  |  |  |
| 2008 | MI | SNOWDEN | 569 | 137 | 598 | 95 | 4 | 85 | 10 | 1 | 1.081 | 61.3 |  | 2 |  |
| 2008 | MO | 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 | PA | SNOWDEN | 291 | 101 | 362 | 80 | 16 | 80 | 1 | 3 | 1.099 | 50 |  |  |  |
| 2008 | RRV | SNOWDEN | 290 | 86 | 307 | 95 | 6 | 94 | 0 | 0 | 1.094 | 48 |  | 2 |  |
| 2008 | WI | SNOWDEN | 493 | 110 | 526 | 94 | 2 | 94 | 1 | 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 | rage: | 349 | 98 | 402 | 86 | 14 | 84 | 2 | 2 | 1.088 | 60.4 |  | 2.4 | 1.0 |
|  | three yea | $r$ average: | 367 | 108 | 421 | 86 | 11 | 84 | 3 | 3 | 1.087 | 63.0 | 70.3 | 2.3 | 2.0 |

# Table12. USPB-SFA Chip Trial Entry Summary: 1985-2010 

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


[^0]:    ${ }^{1}$ Samples collected at harvest October $8^{\text {th }}$ and processed by Herr Foods, Inc., Nottingham, PA on October 11, 2010 (3 days).
    Chip defects are included in Agtron and SFA samples.
    ${ }^{2}$ SFA Color: $1=$ lightest, 5 = darkest
    ${ }^{3}$ Percent Chip Defects are a percentage by weight of the total sample; comprised of undesirable color, greening, internal defects and external defects.

[^1]:    $5=0-10 \%$ defoliated, yellowing leaves common
    6 = Green, no new growth, some lower leaves yellowing.
    7 = Green, no flowering
    8 = Green, vigorous, $0-10 \%$ flowering

