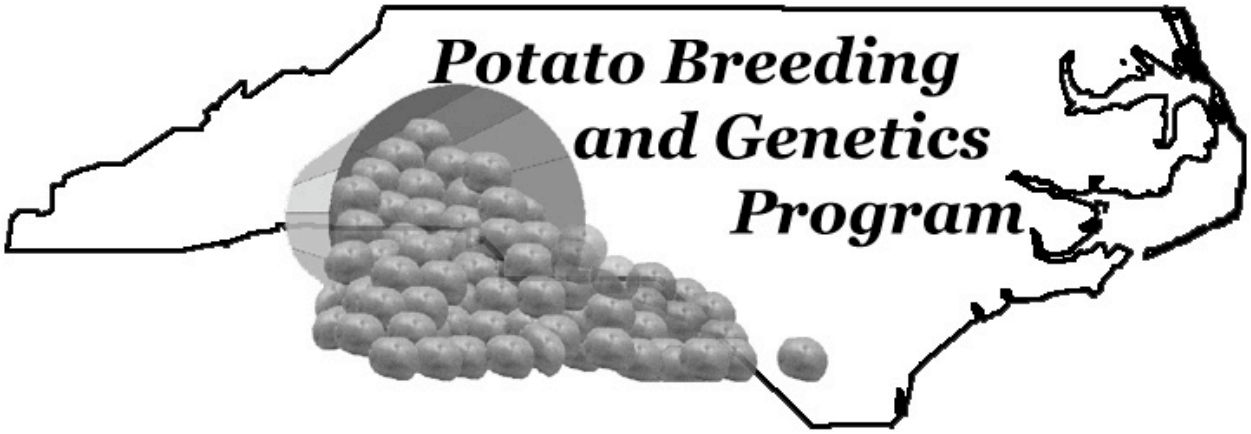
NC STATE UNIVERSITY

NORTH CAROLINA
POTATO VARIETY TRIAL AND BREEDING REPORT

2012



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I. OBJECTIVES AND RESEARCH SPONSORS:

The objective of the NC State University potato breeding and genetics program is to develop new potato varieties that contribute to a more sustainable and economically viable potato production system for North Carolina. To achieve this objective, we collaborate extensively with the eastern US potato breeding and variety development community, and also with programs around the US and internationally. A common goal of all our project collaborations is the development of high yielding, disease and insect resistant, table- and chip-stock potato varieties for potato growers in the eastern US. Because our research sites are primarily located in the hot, humid, lower coastal areas of the mid-Atlantic, we expect that the materials selected and developed in our environment will also perform well in the broader southeastern US geographic region.

Our variety development research efforts are supported by the USDA National Institute of Food and Agriculture (NIFA) 1231 (formerly NE1031) Multistate Potato Variety Development and Evaluation Project, the USDA NIFA Potato Special Research Grants Program, the NC Potato Association, and the US Potato Board and the Snack Food Association, as well as several other industry members.

II. PROJECT SUMMARY

Our program focuses on three areas: the development of new potato germplasm and varieties through our own breeding efforts; collaborative early-generation breeding and selection projects with the USDA-ARS, Cornell University and the University of Maine; and the evaluation of preliminary and advanced breeding clones for adaptation to NC from a wide range of potato breeding programs in the US and Canada.

Breeding Program

Our in-house efforts to develop varieties begin with crossing in the greenhouses at the NC Department of Agriculture and Consumer Services Tidewater Research Station/NC State University Vernon G. James Research and Extension Center (TRS/VGJREC) in Plymouth. NC. Planting, selection and advance to 6-hill, 20-hill, and 60-hill plots depend on relative performance at each of these stages over a period of four years. Clones that survive the first four cycles of selection are entered into preliminary and advanced yield trials conducted at the TRS/VGJREC and on-farm, and are also maintained in 160-hill plots for seed increase.

During 2012, we planted 13,000 single-hills and selected 287 clones resulting in a 2.2% selection rate. This was a lower selection percentage of single-hills than many years but about the same as last year. The lower selection rate, like last year, was influenced greatly by the families generated in USDA-ARS crossing blocks as many of the crosses were designated as germplasm enhancement and these types of crosses typically result in fewer progeny being selected. When looking at materials from our own crosses in the first cycle of selection independently from the rest of the trial a selection rate of 3.6% was achieved. Out of the 338 clones in our 6-hill plots, 53 (16%) were selected for future evaluation. In the 20-hill plots, 29 clones were planted with 11 (38%) being selected for further evaluation. In our 60-hill plots, 26 clones were planted and 14 (53%) were selected.

In our Colorado potato beetle (CPB) nursery we continued our project to select and screen specific families with potential CPB resistance. We planted 839 2-hill plots for selection

purposes and also planted a duplicate set in our CPB nursery for resistance screening. The data collected in the nursery was used as a major but not exclusive selection criteria, resulting in 36 clones which will be advanced for CPB screening as two replicated 3-hill plots (2by3 trial), and for parallel horticultural adaptation selection as non-replicated 6-hill plots in 2012. In this year's 2by3 trial, 59 clones were evaluated for CPB resistance and adaptation in our non-replicated 6-hill plots simultaneously. After making our selections in both of these trials, we decided to advance 15 clones to next year's screening trial of three replications with 5-hills each (3by5 trial) and for parallel horticultural adaptation selection as non-replicated 20-hill plots in 2012. In this years 3by5 trial we evaluated 3 clones for CPB resistance and for adaptation in our non-replicated 20-hill plots simultaneously. We selected 1 clone for advancement to next year's three replications by 10-hills (4by10) and our non-replicated 60-hill trial. The 4by10 trial is open to collaborators in other states to submit materials for screening this years trial included clones from North Dakota State University, a clone submitted for evaluation by the University of Maine that was developed by a private breeder, and our own materials. In this year's 4by10 we had a total of 19 clones, 11 were from NC and four of those were selected for evaluation next year. The 4by10 trial is our most advanced screening trial and the most advanced clones will remain in this trial until testing is determined complete

Yield Trials

In our 10 yield trials, we evaluated 314 preliminary and advanced clones. The evaluations were conducted either on-farm, and/or at the TRS/VGJREC. We typically evaluate advanced clones at more than one site in NC. The results of the yield trials are summarized later in this report, and in Tables 1-10. Each table has two parts, the first (a) being devoted to yield information, specific gravity measurements, and chip color scores, and the second (b) providing potato plant and tuber quality characteristics. This report can also be viewed and downloaded at our website http://potatoes.ncsu.edu

III. 2012 PROMISING LINES:
Chip-stock clones

AF0338-17

Developed by: Univ. of Maine
Released: N/A
 # trials evaluated: 11 since (2006)
Skin Color: Tan to Light Brown
Flesh Color: White

Historical Data;
Maturity: medium to late
% Standard (Atlantic): MKTB YLD 97%
% Standard (Snowden): MKTB YLD 86%
Specific Gravity: 1.080
Chip score: 2.0 (good)
Overall Appearance: 7 (good)

Other Attributes or Comments: *This is a mid to late maturing clone with good yield, gravity and chip scores. Because of its maturity this may be a good alternative to Snowden.* ***This clone is available for testing on a larger scale if growers are interested.*** *In 2012 it was grown in a half-acre trial and compared with Atlantic in an adjacent cut of land. Yields were similar and gravities were in line with the above data.*

AF4157-6

Developed by: Univ. of Maine
Released: N/A
 # trials evaluated: 5 since (2010)
Skin Color: Tan to Light Brown
Flesh Color: White

Historical Data;
Maturity: Medium
% Standard (Atlantic): MKTB YLD 104%
Specific Gravity: 1.081
Chip score: 2.0 (good)
Overall Appearance: 5 (fair)

Other Attributes or Comments: *This is a mid-season chipper with good yield and gravity. It does show promise and needs further evaluation to confirm what we have seen so far.*

Beacon Chipper

Developed by: Michigan State Univ. & Maine Potato Board
Released: 2006
 # trials evaluated: 10 since (2006)
Skin Color: Tan to Light Brown
Flesh Color: White

Historical Data;
Maturity: mid to late
% Standard (Atlantic): MKTB YLD 85%
Specific Gravity: 1.081
Chip score: 2.0 (good)
Overall Appearance: 5 (fair)

Other Attributes or Comments: *This is a mid to late season chipper with good chip scores and gravity. While yields for this clone have averaged only about 85% of Atlantic the gravities have been similar and this clone is not susceptible to internal heat necrosis (IHN).* ***Beacon Chipper is available from a number of seed growers.***

Dakota Crisp

Developed by: North Dakota State Univ.
Released: 2005
 # trials evaluated: 13 since (1998)
Skin Color: Tan to Light Brown
Flesh Color: White

Historical Data;
Maturity: medium
% Standard (Atlantic): MKTB YLD 128%
Specific Gravity: 1.077
Chip score: 2.0 (good)
Overall Appearance: 5 (fair)

Other Attributes or Comments: *We recommend this variety as a substitute for Atlantic but like Atlantic it is susceptible to IHN but incidence and severity have been lower overall.* ***Dakota Crisp is available from a number of seed growers.***

NC0349-3

Developed by: North Carolina State Univ.
Released: N/A
 # trials evaluated: 10 since (2007)
Skin Color: Tan to Light Brown
Flesh Color: White

Historical Data;
Maturity: medium to late
% Standard (Atlantic): MKTB YLD 95%
Specific Gravity: 1.075
Chip score: 2.0 (good)
Overall Appearance: 7 (good)

Other Attributes or Comments: *This is a promising clone from our program with good performance overall since 2007. This clone has shown susceptibility to IHN but incidence and severity have been low overall. Yields have always been similar to Atlantic and it has consistently chipped well.*

Dual-Use (Chip/Table) clones

BNC182-5

Developed by: USDA/ARS-Beltsville
Released: N/A
 # trials evaluated: 7 since (2008)
Skin Color: Tan to Light Brown
Flesh Color: White

Historical Data;
Maturity: late
% Standard (Atlantic): MKTB YLD 103%
Specific Gravity: 1.071
Chip score: 2 (good)
Overall Appearance: 7 (good)

Other Attributes or Comments: *This is a late maturing clone with good yield and overall appearance. Because of its maturity it fits into a later season for table but will also chip at an acceptable level for the chip market. In 2011 its solids were definitely in the acceptable chip range and yields remained high compared to Atlantic.*

NC182-5

Developed by: North Carolina State Univ.
Released: N/A
 # trials evaluated: 6 since (2009)
Skin Color: Tan to Light Brown
Flesh Color: White

Historical Data;
Maturity: late
% Standard (Atlantic): MKTB YLD 107%
Specific Gravity: 1.072
Chip score: 2.0 (good)
Overall Appearance: 7 (good)

Other Attributes or Comments: *This is a full-sibling as BNC182-5 and not the same clone. Like its sibling this clone is late maturing, yields have consistently been good and the shapes are very round. Even though the skin nets the conformity of this clone and the gravity suggest it may have a place as a dual-purpose clone.*

NY140

Developed by: Cornell Univ.
Released: N/A
 # trials evaluated: 16 since (2005)
Skin Color: White
Flesh Color: White

Historical Data:
Maturity: mid to late
% Standard (Atlantic): MKTB YLD 115%
Specific Gravity: 1.071
Chip Score: 2.0 (good)
Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *This is mid to late season clone with good chip scores. Internal heat necrosis was seen in this clone in 2005 at low levels, but not since. Its size has been medium large and shape is mostly oblong with an intermediate to oval cross-section.*

Table-stock clones

NC293-7

Developed by: North Carolina State Univ.
Released: N/A
 # trials evaluated: 4 since (2010)
Skin Color: Purple
Flesh Color: White

Historical Data;
Maturity: slightly later than medium
% Standard (Chieftain): MKTB YLD 81%
Specific Gravity: 1.064
Skin Texture: Smooth
Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *This clone has a beautiful purple skin that holds on tight. It receives a 6 for overall appearance predominately for poor shape conformity. This clone also will set a high number of tubers to the hill and in really dry years will have a high 'B' crop. We will continue to trial this clone as we believe it shows promise for a niche market.*

NY136

Developed by: Cornell Univ.
Released: N/A
 # trials evaluated: 25 since (2005)
Skin Color: Dark Red
Flesh Color: White

Historical Data;
Maturity: slightly later than medium
% Standard (Chieftain): MKTB YLD 78%
Specific Gravity: 1.065
Skin Texture: Moderately Smooth
Overall Appearance: 7 (good)

Other Attributes or Comments: *We have evaluated this clone for 8 years, and have been impressed by its rich dark red skin. Darker than Dark Red Norland with typically higher yields, this clone may have a place in Southern growing conditions where the warmer temperatures often cause other red-skinned varieties to washout. We have not seen any IHN or hollow heart in any of our trials.* ***Currently seed from this clone is being increased and the first availability will likely be for the 2013 season****.*

Early Generation Watch List

These are clones that are too early in the trialing process to give a strong recommendation for but we believe deserve a little extra attention.

Dark Red Chieftain

Developed by: Real Potatoes

 # trials evaluated: 1 since (2012)
Skin Color: Dark Red
Flesh Color: White

Historical Data;
Maturity: medium to late maturing
% Standard (Chieftain): MKTB YLD 81%
Specific Gravity: 1.059
Skin Texture: Moderately Smooth
Overall Appearance: 8 (better than good)

Other Attributes or Comments: *This variety is a progeny of Chieftain with a tighter skin and better color. In the one trial we had it in it was equally dark red as NY136 if not a shade darker. Tuber shapes were very consistent. We did see a few heat sprouts, like Chieftain, and the internals were good. We look forward to evaluating this clone in more trials in 2013 to confirm the 2012 results.*

NC201-1

Developed by: NC State Univ.

 # trials evaluated: 1 since (2012)
Skin Color: Purple
Flesh Color: Yellow (YF2)

Historical Data;
Maturity: early to medium maturing
% Standard (Chieftain): MKTB YLD 73%
Specific Gravity: 1.066
Skin Texture: Smooth
Overall Appearance: 7 (good)

Other Attributes or Comments: *This clone is a progeny of Peter Wilcox and Red Maria with a smooth skin and better color than Peter Wilcox. This clone has a better size profile that Peter Wilcox and tuber shapes were consistently oblong to long. Like Peter Wilcox and most purples this clone is susceptible to Silver Scurf. We look forward to evaluating this clone in more trials in 2013 to confirm the 2012 results.*

NC268-1

Developed by: North Carolina State Univ.

 # trials evaluated: 1 since (2012)
Skin Color: Tan to Light Brown
Flesh Color: White

Historical Data;
Maturity: late maturing
% Standard (Atlantic): MKTB YLD 125%
Specific Gravity: 1.092
Skin Texture: Netted
Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *This clone was a surprise to us this year having looked good but not outstanding in our breeding and selection plots in prior years. We checked the gravity on it five times to confirm what we were seeing. The internals were clear of significant defects and it chipped well. We will make every effort to fast track this clone in our program to evaluate it in more trials in NC as well as with collaborators in other states.*

Soraya

Developed by: Norika

 # trials evaluated: 1 since (2012)
Skin Color: Yellow
Flesh Color: Yellow (YF2)

Historical Data;
Maturity: medium to late maturing
% Standard (Yukon Gold): MKTB YLD 159%
Specific Gravity: 1.050
Skin Texture: Smooth
Overall Appearance: 8 (better than good)

Other Attributes or Comments: *This variety is had higher yields (both total and marketable) than all other clones evaluated this year. This being the first year of evaluation and only in one trial we are hesitant to fully endorse this clone but what we saw in the trial was certainly promising. The flesh color of this clone in a solid medium yellow, shapes were oblong to long and the size profile was large. We will hopefully continue evaluation of this clone in 2013 with enough seed to place it in more than one trial.*

IV. RESEARCH STATION AND ON-FARM COOPERATOR LOCATIONS:

Tidewater Research Station (NCDA&CS)/Vernon G. James Research and Extension Center, (NCSU), Plymouth, NC (Washington Co.)
Black Gold Farms, Gum Neck, NC (Tyrrell Co.)
Bright Farms, Weeksville, NC (Pasquotank Co.)

COOPERATING COUNTY EXTENSION AGENTS:

Tom Campbell, Elizabeth City, Pasquotank Co.
Frank Winslow, Columbia, Tyrrell Co.

V. PROCEDURES:

SITE, SOIL TYPE, PLANTING AND HARVEST DATES FOR YIELD TRIALS

Site	Soil Type	Planting Date	Harvest Date	Days to Harvest
Black Gold	Weeksville silt loam	Mar 2	Jun 18-19	108,109
Bright's	Perquimans silt loam	Mar 1	Jun 14	105
TRS/VGJREC	Portsmouth fine sandy loam	Mar 14-16	Jun 25, 26, 28 Jul 2, 5, 6, 9, 11	Variable 102 - 118

EXPERIMENTAL DESIGN: All yield trials were planted in a randomized complete block design with 4 replications except the US Potato Board/Snack Food Association (USPB/SFA) Trial that had 5 replications and the preliminary evaluation trial, which had only one plot per clone. Forty-six clones in three trials were evaluated on-farm at Black Gold Farms, and twenty-eight clones at Bright's Farm. Plots consisted of one row with 28 hills spaced 9 inches apart. Spacing between rows was 34 inches at Black Gold Farms, 40 inches at Bright's and 38 inches for all trials at the TRS. Weed and pest control practices for on-farm trials were in accordance with those practiced by the cooperators (Appendix 1).

The on-farm trials were dug using a single-row digger and hand harvested. The TRS/VGJREC trials were harvested using a two-row harvester modified to dig one row at a time. Bright's, was graded using a portable Lockwood Grader which sorts to two grades: A+B's ≥ 1 ⅞ "; and C's < 1 ⅞". Black Gold, Snack Food and the TRS/VGJREC trials were graded to five classes: 1's < 1 ⅞ "; 2's > 1 ⅞ to 2 ½"; 3's > 2 ½ to 3 ¼"; 4's > 3 ¼ to 4"; 5's > 4". Culls were removed and weighed separately in all trials. Each clone was evaluated for tuber quality and appearance during grading using standardized NE-1031 rating codes. A description of the rating codes is provided in Appendix 2.

After grading and weighing, 40 marketable tubers (10 tubers/replication) were randomly sampled from each entry, and 50 tubers were sampled from the USPB/SFA trial. The tubers were cut and scored for the presence of hollow heart, IHN and any other internal defects. A second sub-sample of marketable tubers from each replication was taken and bulked by entry for specific gravity readings and chipping tests. Specific gravity was determined using the weight-in-air/weight-in-water method. Chip evaluations were conducted at the TRS/VGJREC for all trials. Chipping at the TRS/VGJREC was done with in 48 hrs of harvest and again 5 to 7 days later.

VI. RESULTS:

Environmental Summary

Planting was within the normal timeframe this year. Our on-farm trials were planted the 1st two days in March and the TRS trials were planted from March 14 - 16. Conditions were favorable for growth early in the season with adequate rainfall throughout. Rains tapered off in mid-June just prior to harvest and it remained relatively dry until completion of harvest on July 11th. Temperatures during the growing season were conducive to production of a good crop and marketable yields across the trials are within a more normal range than they have been the past two seasons. Temperatures started the season with a warm March and then a moderate April and May. By the middle to the end of June temperatures rose quickly and were more normal.

A. Yield Trials

1. On-Farm Trials

Black Gold Tablestock Variety Trial (Tables 1a and 1b)

The marketable yields of the 14 clones in this trial were compared to Chieftain (366 cwt/a). None of the clones had higher marketable yield. Three clones: NC201-1, NY136, and Yukon Gold had overall appearance ratings of 7 (good). Two of the clones in this trial had greater than 10% incidence of IHN, these were Chieftain (20% with a heat necrosis rating (HNR) of 7.3). Yukon Gold had 23% hollow heart (HH), other clones with this defect were less than 10%. No incidence of vascular ring discoloration (VR), brown center (BC) or soft rot (SR) were greater than 10%. Other external defects observed in the trial were sunscald, misshapes, soft rot, silver scurf, growth cracks, common scab and skin blemishes due to Rhizoctonia.

Black Gold Chip Variety Trial (Tables 2a and 2b)

Atlantic, the standard, had a marketable yield of 302 cwt/a and three of the clones in the trial had greater marketable yields: Snowden (386 cwt/a), NC182-5 (337 cwt/a) and AF4130-7 (325 cwt/a), though only Snowden was significantly greater in terms of marketable yield. Atlantic had a gravity of 1.082, the only clone with higher gravity was BNC202-7 (1.086). Three clones: Andover, Beacon Chipper and Snowden had a chip score rating of 1 (exceptional) in the 24 to 48 hour chip test. Five clones: Andover, B2738-3, BNC202-7, NC0349-3 and NC182-5 had overall appearance scores of 7 (good). None of the clones had 10% or greater symptoms of IHN or BC. B2628-10 expressed 30% HH and 15% SR no other clone had 10% or greater incidence of either issue. The only clone to have 10% or greater incidence of VR was Lamoka (30%). External defects observed in the trial were sunscald, growth cracks, skin blemishes due to Rhizoctonia and misshapes.

US Potato Board/Snack Food Association Trial at Black Gold Farms (Tables 3a and 3b)

Atlantic had a marketable yield of 280 cwt/a. Ten clones had greater marketable yields though only NY140 (439 cwt/a) had a significantly greater marketable yield. Atlantic had a gravity of 1.077 and eight other clones had equal or greater gravities: ND8305-1 (1.088), CO02321-4W (1.082), AF4157-6 (1.080), MSL007-B (1.080), CO00188-4W (1.078), NY148 (1.078), Snowden (1.078) and AF0338-17 (1.077). None of the clones in the trial received a chip color rating of less than a 2 (excellent) in the 24 to 48 hour chip test. Six clones: A01143-3C, AF4157-6, MSQ086-3, ND8305-1, NY148 and Snowden received a chip score rating of 1 at the 24 to 48 hour chip test. Three clones rated an 8 for overall appearance: AF0338-17,

CO02321-4W and W4980-1. Four clones received an appearance rating of 7: Atlantic, CO00188-4W, NY148 and Snowden. One clone had BC at levels greater than 10% incidence: W5955-1 (14%). No other internal defects were observed at levels greater than 10%. Other external defects observed were: sunscald, common scab, misshapes, growth cracks, soft rot, second growth and skin blemishes due to Rhizoctonia.

Bright Farms Variety Trial (Tables 4a and 4b)

In this trial three yield standards were chosen: Atlantic (round white standard), Chieftain (red standard) and Yukon Gold (yellow flesh standard). Three clones had marketable yields greater than Atlantic (338 cwt/a): NC0349-3 (362 cwt/a), Snowden (360 cwt/a) and NC182-5 (357 cwt/a), though none were significantly greater. Within the class of reds, none of the clones had higher marketable yields than Chieftain (436 cwt/a). Five yellow flesh clones had higher marketable yields than Yukon Gold (305 cwt/a): Soraya (485 cwt/a), Smiley (342 cwt/a), Peter Wilcox (331 cwt/a), BNC201-1 (322 cwt/a) and Augusta (310 cwt/a). Soraya was also significantly higher yielding clone than all other clones in the trial for both total and marketable yields. Clones with an overall appearance score of 8 were: Dark Red Chieftain and Soraya. Clones with an overall appearance score of 7 were: Dark Red Norland, NC0349-3, NY136 and Peter Wilcox. The specific gravity for Atlantic in this trial was 1.082 and all other clones had lower specific gravities. Snowden had a chip score rating of 1 in the 24 to 48 hour and the 5 to 7 day chip test. NC0349-3 had 10% incidence of HH, no other internal defects of 10% or greater incidence were recorded in this trial. Culls were primarily due to misshapes, common scab, sun scald, growth cracks, heat sprouts and skin blemishes due to Rhizoctonia.

Dark Red Chieftain and Soraya both performed very well in this trial. Since this is the first year of evaluation and we only screened these two clones in one trial we will not make a recommendation on these clones. However, a brief summary of these clones is provided below for those who might be approached by seed companies interested in testing these new materials on a larger scale in 2013.

Dark Red Chieftain (DRC): The marketable yield of DRC was significantly lower than Chieftain (CHF) (CHF (436 cwt/a) vs DRC (355 cwt/a)) but DRC yielded more than Dark Red Norland (338 cwt/a), though not significantly. In the past we have steered away from CHF because of internal problems, poor skin set and pale skin color. For CHF, internal defects and skin color this year were not issues but skin set in CHF was. In comparison, DRC had a nice dark red skin rivaling NY136 that in the past has had the darkest skin color of all of the reds that we test. CHF was rated 3 or poor for skin set and DRC was rated 6 or better than fair. Shapes and cross-section were more round in DRC than CHF as well as the skin texture appeared to be smoother compared to CHF. Specific gravity was the same for the two (1.059). In general the potatoes of DRC were more uniform in shape and size though both clones had some growth cracks and heat sprouts.

Soraya: In terms of yield this clone bested all other clones in the trial. Soraya has a nice medium to dark yellow flesh compared to Yukon Gold's light to medium yellow flesh. Shapes were oblong to long versus the mostly oblong Yukon, cross sections for both were intermediate to oval and texture for Soraya was smooth, Yukon was moderately smooth. Specific gravity was 0.027 points less for Soraya (1.050) than Yukon (1.077). Both clones had misshapes though Soraya's were identified as points, Yukon's were just in general. Both clones also had growth cracks. Soraya also had some culls due to sunscald.

2. TRS/VGJREC Yield Trials

Round White Trial One (Tables 5a and 5b)

Atlantic had a marketable yield of 184 cwt/a. Thirteen of the twenty-two clones in this trial had greater marketable yields and four of these were significantly greater than Atlantic: LaNorma (266 cwt/a), Nectar (262 cwt/a), AF4449-2 (252 cwt/a) and AF2227-2 (242 cwt/a). Atlantic had a gravity of 1.083 and six clones had higher specific gravity: NC168-1 (1.092), AF4157-6 (1.086), AF4386-16 (1.086), NC229-96 (1.086), NCG84-1 (1.086) and AF4441-8 (1.084). Three clones had chip scores of 1 in the 24 to 48 hour fry. These were: AF4227-2, AF4441-8 and Snowden. Four clones had an overall appearance rating of 7: AF0338-17, LaNorma, NCB2833-7 and Yukon Gold. Two clones expressed IHN at 10% or greater incidence: Nectar (25% with an HNR of 7.0) and Atlantic (23% with an HNR of 7.8). Eight clones expressed SR at 10% or greater incidence: AF4430-2 (25%), AF4449-2 (18%), AF4463-7 (18%), Atlantic (15%), AF4441-8 (13%), AF4454-3 (13%), Yukon Gold (13%) and NC268-1 (10%). No other internal defects of 10% or greater incidence were recorded in this trial. Common external defects were misshapes, sunscald, soft rot, growth cracks, Fusarium dry rot and skin blemishes attributed to Rhizoctonia.

Round White Trial Two (Tables 6a and 6b)

Of the fourteen clones in this trial, seven had higher average marketable yields higher than Atlantic (126 cwt/A) though none were statistically significant: B2817-2 (160 cwt/a), Harley Blackwell (159 cwt/a), B2834-11 (158 cwt/a), BNC233-3 (158 cwt/a), B2828-1 (155cwt/a), Superior (149 cwt/a) and B2833-16 (134 cwt/a). Atlantic had a specific gravity of (1.081) and five clones had equal or greater gravity: B2833-16 (1.082), BNC233-3 (1.082), B2828-1 (1.081), B2834-8 and Beacon Chipper (1.081). One clone, Andover received a chip rating of 1 in the 24 to 48 hour chip test. B2834-8 had an appearance score of 7. One clone expressed IHN at levels greater than 10% incidence: Atlantic (25% with an HNR of 7.0). One clone expressed BC at levels greater than 10% incidence: Superior (13%). Two clones expressed SR at levels greater than 10% incidence: BNC233-3 (20%) and Atlantic (10%). No other internal defects were expressed at levels of 10% or greater. Common defects were misshapes, soft rot, sunscald, Fusarium dry rot, growth cracks, common scab and skin blemishes attributed to Rhizoctonia.

Round White Trial Three (Tables 7a and 7b)

Of the fourteen clones in this trial,nine had higher average marketable yields higher than Atlantic (122 cwt/A) and seven were significantly greater: BNC236-9 (308 cwt/a), BNC245-5 (258 cwt/a), AF4702-2 (253 cwt/a), AF4521-1 (250 cwt/a), AF4463-8 (240 cwt/a), Snowden (235 cwt/a) and BNC236-14 (220 cwt/a). Atlantic had a specific gravity of (1.080) two clonea had a greater gravity: B2833-8 (1.083) and BNC236-9 (1.082). One clone, B2834-14, received a chip rating of 1 in the 24 to 48 hour chip test. B2834-8 had an appearance score of 7. Two clones expressed IHN at levels at 10% or greater incidence: BNC236-9 (55% with an HNR of 6.3) and Atlantic (10% with an HNR of 6.0). Two clones expressed HH at levels greater than 10% incidence: AF4614-2 (35%) and BNC236-14 (13%). Three clones expressed VR at levels of 10% or greater incidence: B2834-14 (20%), B2827-12 (10%) and B2833-8 (10%). No other internal defects were expressed at levels of 10% or greater. Common defects were misshapes, soft rot, sunscald, growth cracks, common scab and skin blemishes attributed to Rhizoctonia.

NE-1031 Round White Trial. (Tables 8a and 8b)

Seven of 16 clones in this trial had greater marketable yield than Atlantic (222 cwt/A), two of these were significantly greater: Dakota Crisp (300 cwt/a) and BNC182-5 (269 cwt/a). Atlantic had a specific gravity of 1.083 seven clones had higher or equal gravities: AF4157-6 (1.086), B2727-2 (1.085), NYE106-4 (1.085), Snowden (1.085), AF4013-3 (1.084), B2731-11 (1.084) and NY150 (1.083). One clone, AF4157-6, received a chip rating of 1 in both the 24 to 48 hour and 5 to 7 day chip tests. Two clones had overall appearance ratings of 8: B2731-11 and BNC182-5. Four clones had overall appearance ratings of 7: AF0338-17, Atlantic, NY150 and Yukon Gold. Two clones expressed IHN at levels at 10% or greater incidence: NYE106-4 (15% with an HNR of 7.0) and Atlantic (10% with an HNR of 7.0). No other internal defects were expressed at levels of 10% or greater. The most common culls were misshapes, sunscald, soft rot, growth cracks an skin blemishes attributed to Rhizoctonia.

NE-1031 Red Trial. (Tables 9a and 9b)

The standard, Chieftain, had a marketable yield of 296 cwt/a and all other clones had significantly less marketable yields. Two clones received an overall appearance score of 7: Modoc and Red Sunset. One clone expressed IHN at levels at 10% or greater incidence: NCB2812-2 (10% with an HNR of 8.0). One clone Modoc (40%) expressed VR at greater than 10% incidence. Five clones expressed SR at levels of 10% or greater incidence: AF4543-2 (20%), AF4543-3 (13%), AF4565-1 (13%), AF4550-2 (10%) and NCB2812-2 (10%). Culls were due mostly to misshapes, sunscald, soft rot, growth cracks, silver scurf, and skin blemishes attributed to Rhizoctonia.

NE-1031 Russet Trial. (Tables 10a and 10b)

The standard, Russet Norkotah 3117, had a marketable yield of 210 cwt/A. Of the seventeen clones in the trial seven had high marketable yields and four had marketable yields that were significantly greater: AF3001-6 (321cwt/a), AF4347-1 (280 cwt/a), Dakota Trailblazer (275 cwt/a) and AF4320-17 (254 cwt/a). Eleven clones had an equal or higher specific gravity than Russet Norkotah 3117 (1.073). Two clones had overall appearance scores of 7: AF4320-7 and Russet Norkotah 3117. One clone AF4532-8 expressed HH at 10% incidence. One clone AF3001-6 expressed VR at 10% incidence. Twelve clones expressed SR at 10% or greater incidence: AF4532-8 (53%), AF4532-9 (35%), Russet Burbank (35%), Russet Norkotah 3117 (30%), AF4347-1 (25%), AF4320-17 (23%), AF4609-1 (23%), AF4538-3 (13%), Classic Russet (13%), Goldrush (13%), Shepody (13%), and AF4430-1 (10%). Culls were mostly soft rot, misshapes, sunscald, growth cracks and skin blemishes attributed to Rhizoctonia.

B. Breeding and Early Generation Selection Efforts

NCSU Potato Variety Development Efforts

Our efforts to develop varieties in North Carolina begin with selection as single-hill plots in year one. Because potatoes are clonally propagated via tubers each hill selected has the potential to become a new variety. The single-hill selections are advanced to 6-hill and 20-hill plots with selection in years two and three, respectively. Following this, materials are placed in a sixty-hill plot in year four for a final cycle of selection before entering into yield trials. Our single-hill materials have come from the USDA-ARS, Cornell University, Virginia Tech University and our own crosses made at the TRS. Mini-tubers, which are planted in the field as single-hills, are generated in the TRS greenhouses. This year, 13,000 single-hills were planted and 287 clones

were selected averaging a 2.2% selection rate. In our single hill plots this year we had materials from our own program and those from crosses by the USDA-ARS, and Virginia Tech. Evaluation of germplasm from different breeding programs allows us to review a wider breadth of materials increasing the likelihood of developing varieties suitable not only for NC and the Southeast, but with broad adaptability overall.

In our second to fourth year selection plots out of the 338 clones planted in our 6-hill plots (Yr. 2), 53 (16%) were selected for future evaluation. While in the 20-hill plots (Yr. 3), 29 clones were planted with 11 (38%) being selected for further evaluation. In our 60-hill plots (Yr. 4), 26 clones were planted and 14 (53%) were selected.

Germplasm Enhancement for CPB Resistance

Parental material used in crosses to generate the families come from one or more of three species of potato: *Solanum tubersosum*, *S. chacoense*, and *S. berthaltii*. Unlike our other variety development work, the CPB resistance project requires two identical plots to be planted the first year materials go to the field. To get a better look at the clones, we plant 2-hill plots in both the CPB screen and selection trials. This year we planted roughly 839 clones to evaluate resistance and selected 36 clones for resistance and for agronomic traits. These will be advanced next year in both our CPB nursery and as 6 hill plots for selection purposes. In our 6 hill plots this year, 59 of the 338 clones came from this CPB resistance project. From the 59 CPB clones, 15 were selected for advancement to the 20 hill selection plots and the next cycle of CPB resistance screening. Of the 29 clones in our 20 hill plots 3 clones were part of the CPB resistance screen and 1 of those were selected for advancement to the 60 hills. Of the 26 clones in this year's 60 hill plots 6 were CPB clones and 4 was selected for further evaluation.

Early Generation Selection Trials

Early generation selection involves selection and evaluation of materials at early stages in breeding/variety development process. By selecting early generation materials in multiple environments we hope to identify materials that are broadly adapted. Early generation selection efforts also promote collaboration and reduce overall breeding costs, and they are especially important when the success of a variety depends on seed being produced in the north while the crop is produced in the south as is the case with all varieties grown in NC.

University of Maine Trial

In this trial, we evaluate clones from Maine as 8-hill plots in NC and make selections. These clones have already been through two cycles of selection in Maine. After selection in NC, we send a list of selected clones to our cooperators at the University Maine (UME) and they use the information when they select their materials. This year we evaluated 327 ME clones and selected 122. These will be evaluated in 2012 in a non-replicated 28 hill plot in a yield trial.

Observational Trial.

Sixty-five clones were evaluated in this trial as well as the standards: Atlantic, Chieftain, Dark Red Norland, Snowden and Superior. Each 28-hill plot was non-replicated. This trial is part of an early generation study we are conducting with the UME and is our 2nd opportunity to evaluate them. Last year we selected these clones in an 8-hill non-replicated format and the 65 clones represent those both Dr. Craig Yencho and Mr. Mark Clough selected. This year we made notes on these clones and indicated which ones we thought had potential as cultivars and made another round of selections. We selected a total of 39 clones. Next year we will

see some of the survivors from this trial in replicated yield trials provided they survive selection in ME.

USDA-ARS Trial

This is a multistate selection trial initiated by the USDA-ARS The institutions/states involved are: The University of Florida (FL), NC State University (NC), USDA-ARS (MD, trial location in ME), The University of Maryland (MD), Pennsylvania State University (PA), Cornell University (NY) and the University of Maine (ME). Each state received 8 hills of the same 228 clones. All were weighed for total yield, rated for the nine standard NE1031 external ratings, and specific gravities were measured. In addition each location had two principle evaluators that independently selected on the set. At our location, Craig Yencho and Mark Clough had 82.0% agreement on clones overall to drop or keep. Selecting a total of 62 clones. Next year we will reevaluate these clones in our non-replicated 28-hill yield trial (Unreplicated trial).

Unreplicated Trial.

Thirty-eight clones were evaluated in this trial as well as the standards: Atlantic, Chieftain, Dark Red Norland, Snowden, Superior and Yukon Gold. Each 28-hill plot was non-replicated. This trial is part of an early generation study we are conducting with the USDA-ARS and is our 2nd opportunity to evaluate them. Last year we selected these clones in an 8-hill non-replicated format and the 38 clones represent those both Dr. Craig Yencho and Mr. Mark Clough selected. This year we made notes on these clones and indicated which ones we thought had potential as cultivars and made another round of selections. We selected a total of 18 clones, 12 we both liked and selected, 5 that Craig liked that Mark did not and 1 that Mark liked that Craig did not. We will evaluate all clones that either of us selected in a trial with two replications next year (2by20 Trial).

2by20 Trial.

Sixty-nine clones were evaluated in this trial along with the standards: Atlantic, Chieftain, Dark Red Norland and Snowden. This is the 3rd cycle of evaluation and selection of these USDA-ARS early generation materials. Like the 8 hills and the unreplicated trial all clones that either Yencho or Clough select are kept. Out of the 69 in this trial we kept a total of 37 clones. Next year these will be evaluated in one of our standard replicated trials (4 reps, 28 hills, randomized complete block design).

VII. ACKNOWLEDGMENTS

This work could not be conducted without the assistance of the growers, county extension agents and NCDA&CS TRS staff. We are grateful for their continued support and assistance. Seed for the trials was provided by: Dr. Walter De Jong Cornell University; Dr. Dave Douches, Michigan State University; Dr. Greg Porter, University of Maine; Dr. Richard Veilleux, Virginia Tech University; and Dr. Kathleen Haynes, USDA/ARS, Beltsville, MD. Also a special thanks goes to Mr. Todd Bradley and the staff at Maine Farmers Exchange, Presque Isle, ME for their efforts to procure small amounts of seed for shipment to NC. Another very special thank you is extended to Dan Corey, Monticello, ME, for taking the time to send small amounts of seed. This project is funded in part by The North Carolina Potato Growers Association, the U.S. Potato Board, the

Snack Food Association, the USDA-NIFA Potato Special Research Grants program and UTZ Quality Foods Inc. Their continuing support is very much appreciated.

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Table 1a. Black Gold Farms Tablestock Variety Trial. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 108 DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2012

						Size Distribution by Class[2] (% of total yield)								
	Total Yield	Marketable Yield										1 7/8	2 1/2	Specific
Clone	cwt/A	cwt/A	%Chf.	%Yuk	%GDR	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[3]
Augusta	274	191	53	91	63	13	43	25	2	0	17	70	27	1.070
B2538-5	311	273	75	128	90	6	29	58	0	0	7	88	59	1.063
B2810-8	243	166	45	76	54	18	62	6	0	0	14	68	6	1.058
B2814-14	426	351	98	161	114	12	31	49	3	0	5	82	52	1.061
Chieftain	415	366	100	170	120	7	35	52	2	0	5	88	53	1.065
Classic Russet	303	224	61	106	74	8	54	20	0	0	18	73	20	1.060
Dark Red Norland	299	228	64	106	75	10	37	39	0	0	13	76	39	1.063
Emma	474	263	71	123	86	14	32	23	0	0	30	55	23	1.068
Goldrush	350	306	85	141	100	8	38	48	2	0	5	88	49	1.068
NC201-1	343	268	73	125	88	16	69	9	0	0	6	78	9	1.066
NC293-7	389	267	75	123	87	25	61	8	0	0	6	68	8	1.062
NY136	302	236	65	109	77	17	51	26	0	0	5	77	27	1.065
Superior	354	303	84	141	99	11	46	38	1	0	3	86	40	1.072
Yukon Gold	267	217	60	100	71	10	41	40	0	0	8	82	40	1.079
Grand Mean	339	261												
CV (%)	13.6	17.9												
LSD(K=100)	62.9	66.2												

[1] DAP= Day After Planting; DVK= Days of Vine Kill

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

[3] Determined by weight in air / water method.

Table 1b. Black Gold Farms Tablestock Variety Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 108 DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2012

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
Augusta	5	8	8	5	7	8	6	7	5	7	7	6	5	25	7.3	0	0	0	0	SS,RZ,MS,GC,YF2
B2538-5	7	9	8	6	1	8	5	6	5	7	8	7	6	0	9.0	3	0	0	3	SISC,RZ,MS,SR,SG
B2810-8	5	6	7	3	1	6	6	7	6	7	7	5	4	0	9.0	3	0	0	0	MS,^PTS,SISC,SS,YF1
B2814-14	6	9	7	4	6	6	7	7	2	8	9	8	8	0	9.0	0	0	0	0	SS,SR,YF1
Chieftain	9	9	7	6	3	7	7	6	3	7	8	6	6	20	7.3	0	0	0	0	SS,^RZ,CS
Classic Russet	9	9	9	8	5	3	7	6	7	8	5	7	3	0	9.0	5	0	0	0	^^MS,SS,RZ,SG,GC
Dark Red Norland	5	7	8	4	2	8	6	7	3	7	6	6	6	0	9.0	0	0	0	0	SS,RZ,GC,SR,SISC
Emma	6	9	8	6	7	8	7	7	2	8	7	3	3	45	6.3	0	0	0	0	^^CS,SS,SR,SG,YF1
Goldrush	6	9	8	6	4	2	4	7	7	8	7	7	6	0	9.0	0	0	0	0	MS,SS,RZ
NC201-1	6	9	9	4	1	8	7	6	7	8	5	7	7	0	9.0	0	0	0	0	MS,SS,SISC,YF2
NC293-7	6	8	9	4	1	8	4	7	3	8	5	4	6	0	9.0	0	0	0	0	MS,SISC
NY136	8	8	8	7	2	7	7	7	2	8	6	5	7	0	9.0	0	0	0	0	SISC,MS,RZ,SR
Superior	5	9	8	4	6	7	7	7	2	6	7	7	6	0	9.0	0	0	0	0	SS,MS,SR,CS
Yukon Gold	8	7	7	5	7	8	5	7	3	8	7	6	7	0	9.0	23	0	0	8	SS,GC,MS,SR,CS

[1] DAP= Day After Planting; DVK= Days of Vine Kill

[2] See NE1031 Standard Potato Rating System for to scores in Appendix 2.

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

[4] See Appendix 3 for comments codes

Table 2a. Black Gold Farms Chip Variety Trial. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 109 DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2012

				Size Distribution by Class[2] (% of total yield)									Chip Color[4]	
	Total Yield	Marketable Yield								1 7/8	2 1/2	Specific	24 to	5 to
Clone	cwt/A	cwt/A	% Atl.	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[3]	48 hrs	7 Days
AF4130-7	370	325	110	7	28	55	5	0	6	88	59	1.073	2	2
AF4147-1	400	277	94	28	62	7	0	0	3	69	7	1.081	1.5	2
Andover	313	273	94	8	42	44	0	0	5	87	45	1.077	1	2
Atlantic	365	302	100	8	29	52	1	0	10	82	53	1.082	1.5	2
B2628-10	347	267	91	7	32	45	0	0	16	77	45	1.070	2	3
B2738-3	339	289	98	6	25	59	2	0	8	85	61	1.064	1.5	2
Beacon Chipper	325	268	90	5	27	52	4	0	12	83	56	1.081	1	2
BNC202-7	332	254	87	17	45	32	0	0	6	77	32	1.086	1.5	2
Lamoka(NY139)	359	295	101	6	25	56	1	0	12	82	57	1.071	1.5	2.5
NC0349-3	345	293	98	12	38	45	1	0	3	85	46	1.080	1.5	2
NC182-5	423	337	113	18	48	31	0	0	3	79	31	1.080	1.5	1.5
NCB2497-17	328	264	90	15	45	35	0	0	5	80	35	1.073	2	2
Snowden	435	385	131	10	50	39	0	0	2	89	39	1.077	1	1.5
Grand Mean	357	293												
CV(%)	12.1	14.6												
LSD (k=100)	68.0	70.1												

[1] DAP= Day After Planting; DVK= Days of Vine Kill

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

[3] Determined by weight in air / water method.

[4] Chip Color Ratings conducted by NCSU Potato Breeding Program at TRS/VGJREC:
1= no defects, exceptionally bright; 2= excellent, bright; 3= good, light or golden; 4= dark defects, marginal; 5= not acceptable

Table 2b. Black Gold Farms Chip Variety Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 109 DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2012

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AF4130-7	9	9	9	9	6	6	7	4	3	5	8	8	4	0	9.0	0	0	0	0	SS,RZ,MS,STST
AF4147-1	6	9	8	5	7	6	4	7	2	7	5	7	6	0	9.0	0	0	0	0	SS,RZ,SR
Andover	8	7	7	5	6	6	7	7	4	7	7	8	7	0	9.0	0	0	0	0	SS,RZ,GC,MS
Atlantic	6	8	7	5	5	5	7	7	3	6	7	7	6	5	8.0	0	0	0	0	SS,RZ,GC,SR
B2628-10	9	9	9	8	6	6	4	5	5	7	7	5	3	0	9.0	30	0	0	15	^SR,SS,RZ,MS,FS
B2738-3	8	7	6	6	6	6	7	7	3	7	7	7	7	0	9.0	5	0	0	0	SS,RZ,MS,IL
Beacon Chipper	8	9	8	8	5	6	5	6	3	7	8	7	6	0	9.0	0	0	0	0	SS,RZ,GC
BNC202-7	6	9	8	5	7	7	7	7	2	8	6	6	7	0	9.0	0	0	0	0	SS,SR,RZ
Lamoka(NY139)	9	9	7	7	9	7	6	6	4	7	8	7	6	0	9.0	0	30	0	0	SS,RZ,MS
NC0349-3	8	8	8	6	6	6	7	7	2	6	6	7	7	0	9.0	5	0	0	3	SS,RZ
NC182-5	6	9	8	7	6	5	7	6	2	7	7	7	7	0	9.0	3	0	0	3	SR,SS
NCB2497-17	6	8	7	7	6	6	5	7	4	7	7	8	6	0	9.0	0	0	0	0	RZ,SS
Snowden	9	9	7	7	5	5	7	6	2	5	7	8	5	0	9.0	0	0	0	0	SS,MS

[1] DAP= Day After Planting; DVK= Days of Vine Kill

[2] See NE1031 Standard Potato Rating System for to scores in Appendix 2.

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

[4] See Appendix 3 for comments codes

Table 3a. US Potato Board/Snack Food Association Trial. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones of potato clones harvested 108DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2012

				Size Distribution by Class[2] (% of total yield)									Chip Color[4]	
Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	1's	2's	3's	4's	5's	Culls	1 7/8 to 4"	2 1/2 to 4"	Specific Gravity[3]	24 to 48 hrs	5 to 7 Days
A01143-3C	396	292	106	13	52	22	0	0	13	73	22	1.069	1	2
AF0338-17	337	282	98	12	34	45	2	0	7	81	47	1.077	1.5	2
AF4157-6	383	314	115	14	56	26	0	0	4	82	26	1.080	1	2
Atlantic	322	280	100	7	35	49	2	0	6	87	52	1.077	1.5	2
CO00188-4W	281	202	74	24	54	18	0	0	5	72	18	1.078	1.5	2
CO00197-3W	388	308	112	16	53	26	0	0	5	79	26	1.075	1.5	2
CO02321-4W	400	316	116	8	25	50	3	0	13	79	53	1.082	1.5	2
MN99380-1	415	302	118	12	37	34	1	0	15	72	35	1.072	2	2
MSL007-B	201	138	53	18	53	16	0	0	13	69	16	1.080	2	2
MSL292-A	263	205	77	7	33	44	1	0	15	78	45	1.075	1.5	2
MSQ086-3	316	228	85	20	43	28	1	0	8	72	29	1.066	1	2
MSR127-2	277	179	70	18	55	10	0	0	17	65	10	1.075	2	2.5
ND 8305-1	333	235	87	27	68	2	0	0	3	70	2	1.088	1	1.5
ND8304-2	318	225	86	19	57	14	0	0	11	71	14	1.073	1.5	2
NY140	494	439	167	7	25	64	0	0	5	89	64	1.071	2	2.5
NY148	414	326	123	19	66	13	0	0	3	79	13	1.078	1	1.5
Snowden	373	339	127	8	53	38	0	0	1	91	38	1.078	1	2
W2978-3	356	276	106	12	44	34	0	0	11	77	34	1.070	1.5	2
W4980-1	367	300	111	9	38	43	0	0	10	82	43	1.072	1.5	2
W5955-1	388	277	105	6	20	50	2	0	22	71	51	1.069	2	2
W6483-5	338	272	102	4	16	64	0	0	15	80	64	1.067	1.5	2.5
Grand Mean	350	273												
CV(%)	14.6	18.8												
LSD (k=100)	61.4	61.5												

[1] DAP = Days After Planting; DVK = Days to Vine Kill

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

[3] Determined by weight in air/water method.

[4] Chip Color Ratings conducted by the NCSU potato breeding program at the TRS/VGJREC and by Utz Quality Foods in Hanover PA: 1 = no defects, exceptionally bright; 2 = excellent, bright; 3 = good, light or golden; 4 = dark defects, marginal; 5 = not acceptable.

Table 3b. US Potato Board/Snack Food Association Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 108 DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2012

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
A01143-3C	7	9	8	7	6	6	4	5	2	6	6	8	5	0	9.0	0	0	0	0	^SG,S,MS,RZ
AF0338-17	8	7	8	6	6	5	5	7	2	7	7	8	8	0	9.0	0	0	0	0	SS,MS,VN
AF4157-6	7	8	8	5	6	6	7	7	2	7	5	6	6	0	9.0	0	0	0	0	^RZ,SS,MS
Atlantic	5	7	7	5	5	5	7	7	2	6	8	8	7	0	9.0	2	0	2	0	GC,RZ,MS,SS
CO00188-4W	5	5	7	4	8	7	5	7	2	7	5	8	7	0	9.0	0	0	0	0	SS,GC,MS,RZ
CO00197-3W	6	8	7	6	6	6	4	7	4	7	7	8	6	0	9.0	0	0	6	0	SS,MS,SR
CO02321-4W	6	8	8	5	9	7	7	7	2	7	8	9	8	2	8.0	0	0	0	0	^^SS,VN
MN99380-1	7	8	8	6	7	7	7	7	2	7	7	8	5	0	9.0	2	0	2	0	^SS,SG,~PTS,MS
MSL007-B	6	6	6	6	4	5	7	7	2	7	6	5	6	0	9.0	4	0	0	0	RZ,SS,^CS
MSL292-A	9	9	9	8	5	6	5	7	2	5	7	6	3	0	9.0	0	0	0	0	SS,CS,RZ,MS
MSQ086-3	9	8	8	9	9	8	7	5	2	6	7	6	5	0	9.0	0	0	2	0	^^CS,^RZ,SS,MS,GC
MSR127-2	9	9	8	9	6	6	7	6	2	7	7	3	3	0	9.0	2	0	0	0	^PWD,^RZ,SS,GC
ND8305-1	8	8	6	5	9	7	5	7	3	4	5	7	4	0	9.0	0	0	0	0	SS,CS,RZ,MS
ND8304-2	5	8	8	5	6	7	7	7	2	6	6	7	5	0	9.0	0	0	0	0	^SS,MS,GC,DAE,DSE
NY140	9	9	8	8	6	7	5	7	5	7	8	7	6	0	9.0	0	0	0	0	SS,RZ
NY148	7	7	7	6	6	6	7	7	2	7	6	8	7	0	9.0	0	0	0	0	SS,RZ
Snowden	9	9	7	7	5	5	7	6	2	5	7	8	7	0	9.0	0	0	0	0	SS,SR,MS
W2978-3	9	8	8	6	9	7	7	7	2	7	7	6	6	0	9.0	0	0	0	0	SS,GC,CS,RZ
W4980-1	8	8	7	5	5	7	7	6	2	7	8	7	8	4	8.0	0	0	0	0	SS,SR,RZ
W5955-1	9	8	7	8	5	5	6	6	3	7	9	6	5	0	9.0	0	0	14	0	SS,^RZ,^CS,MS
W6483-5	6	7	6	4	9	8	5	7	3	6	9	8	4	0	9.0	2	0	4	8	CS,SS,GC,MS,SR

[1] DAP = Days After Planting; DVK = Days to Vine Kill

[2] See NE1031 Standard Potato Rating System for key to scores in Appendix 2.

[3] Percentage determined from 10 randomly selected potatoes /rep (50 total) in size classes 3 and 4. HN=heat necrosis; HNR=average heat necrosis rating (Rating Scale: 1= very severe to 9 = absent); HH=hollow heart; VR=vascular ring discoloration; BC=brown center; SR=soft rot

[4] See Appendix 3 for Comment Codes

Table 4a. Bright's Farm Variety Trial. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones harvested 105 DAP[1] at Bright's Farm, Weeksville, Pasquotank Co., NC - 2012

Clone	Total Yield	Marketable Yield				Size Distribution by Class[2] (% of total yield)			Specific	Chip Color[4]	
	cwt/A	cwt/A	% Atl.	%Chf.	%Yuk	A's + B's	C's	Culls	Gravity[3]	24 to 48 hrs	5 to 7 Days
Alegria	407	259	81	60	85	64	7	30	1.063	.	.
Atlantic	379	338	100	77	111	89	5	6	1.082	1.5	1.5
Augusta	365	310	94	71	102	85	11	4	1.066	.	.
B2676-2	398	320	99	73	105	80	11	9	1.074	.	.
BNC182-5	374	324	99	74	106	86	10	4	1.065	2	2.5
BNC201-1	362	322	97	74	106	89	8	3	1.069	.	.
Cascada	437	230	73	53	76	52	47	1	1.058	.	.
Chieftain	487	436	133	100	143	90	6	4	1.059	.	.
Dark Red Chieftain	385	355	110	81	117	92	7	1	1.059	.	.
Dark Red Norland	349	338	103	77	111	97	3	0	1.063	.	.
NC0349-3	403	362	109	83	119	90	10	0	1.073	2	2
NC182-5	416	357	109	82	117	86	13	1	1.074	1.5	2
NC293-7	454	396	123	91	130	87	11	1	1.057	.	.
NCB2497-17	336	293	90	67	97	87	12	1	1.068	1.5	1.5
Nectar	385	304	92	70	100	79	17	4	1.052	.	.
NY136	383	351	107	80	115	92	7	1	1.062	.	.
Peter Wilcox	365	331	101	76	109	91	8	1	1.068	.	.
Red Maria	436	328	99	75	109	76	6	18	1.054	.	.
Smiley	440	342	105	78	112	78	9	14	1.062	.	.
Snowden	391	360	111	83	118	92	6	2	1.072	1	1
Soraya	554	485	148	111	159	88	9	3	1.050	.	.
Superior	341	321	98	74	105	94	4	2	1.067	1.5	2
Talent	366	263	80	60	86	72	23	5	1.073	.	.
Yukon Gold	332	305	93	70	100	92	4	4	1.077	.	.
Grand Mean	398	335									
CV(%)	9.6	11.9									
LSD (k=100)	51.5	53.8									

[1] DAP = Days After Planting; DVK = Days to Vine Kill

[2] Size classes: A's + B's > 1 7/8"; C's ≤ 1 7/8"; Culls = all defective potatoes

[3] Determined by weight in air/water method.

[4] Chip Color Ratings conducted by the NCSU Potato Breeding Program at the TRS/VGJREC: 1 = no defects, exceptionally bright; 2 = excellent, bright; 3 = good, light or golden; 4 = dark defects, marginal; 5 = not acceptable.

Table 4b. Bright's Farm Variety Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 105 DAP[1] at Bright's Farm, Weeksville, Pasquotank Co., NC - 2012

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
Alegria	6	.	.	6	7	8	5	7	5	7	7	9	6	3	8.0	0	0	0	0	MS,^^KNOBS,SS,FS,YF2
Atlantic	6	.	.	5	7	5	5	7	3	6	7	9	6	3	7.0	0	0	0	3	GC,SS
Augusta	6	.	.	5	8	8	5	7	5	7	8	9	5	5	7.0	0	0	0	0	^GC,HS,SS,MS,YF2
B2676-2	5	.	.	5	2	8	2	6	3	7	6	8	5	0	9.0	0	0	0	0	^MS,^PTS,FS,SR
BNC182-5	9	.	.	9	8	6	2	6	2	6	6	9	6	5	7.0	0	0	0	0	MS,PTS,SS,SR,FS
BNC201-1	8	.	.	5	2	7	2	7	2	7	6	9	6	0	9.0	0	0	0	0	GC,SS, YF1.5
Cascada	9	.	.	9	7	8	5	6	6	7	3	8	5	3	8.0	0	0	0	0	MS,PTS,SS,YF2
Chieftain	9	.	.	6	2	6	4	3	5	6	7	9	5	0	9.0	0	0	0	0	MS,GC,HS,DAE
Dark Red Chieftain	9	.	.	6	2	7	2	6	2	6	6	8	8	0	9.0	0	0	0	0	GC,HS
Dark Red Norland	5	.	.	3	2	7	2	7	4	3	6	8	7	0	9.0	0	0	0	0	GC
NC0349-3	9	.	.	6	7	6	2	7	2	6	6	9	7	0	9.0	10	0	0	0	SS,DAE,DSE
NC182-5	9	.	.	9	7	7	3	7	3	7	7	9	6	3	8.0	0	0	0	8	SR,SS
NC293-7	6	.	.	5	1	8	6	6	5	8	6	9	5	3	7.0	0	0	0	3	MS
NCB2497-17	9	.	.	8	7	7	6	7	5	8	6	7	6	0	9.0	0	0	0	0	GC,SS
Nectar	9	.	.	9	8	8	6	5	6	8	5	8	4	0	9.0	3	0	0	0	IL,RZ,PE,YF1
NY136	9	.	.	7	2	7	3	5	3	7	6	8	7	0	9.0	0	0	0	0	MS
Peter Wilcox	6	.	.	5	1	7	3	7	7	3	6	8	7	0	9.0	0	0	0	0	MS,PTS,GC,YF2
Red Maria	9	.	.	7	2	6	2	6	3	8	7	3	4	0	9.0	0	0	0	0	^^RZ OR ^^CS
Smiley	6	.	.	6	3	8	3	8	6	8	9	8	5	0	9.0	0	0	0	0	^^HS,MS,CS,SG
Snowden	9	.	.	7	7	6	3	7	3	5	6	9	6	0	9.0	0	0	0	0	MS,DAE,DSE
Soraya	9	.	.	7	7	8	5	6	6	8	8	8	8	3	8.0	3	0	0	0	MS,SS,GC,PTS,YF2
Superior	5	.	.	4	7	6	5	6	5	6	7	8	6	3	8.0	0	3	0	0	MS,SS,SR
Talent	9	.	.	9	7	8	5	7	7	8	6	9	5	0	9.0	5	0	0	0	MS,SS,CS,PTS,YF2
Yukon Gold	8	.	.	5	7	7	5	6	4	6	7	9	6	3	8.0	0	0	0	0	MS,GC,SR,YF1.5

[1] DAP = Days After Planting; DVK = Days to Vine Kill

[2] See NE1031 Standard Potato Rating System for key to scores in Appendix 2.

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

[4] See Appendix 3 for Comment Codes

Table 5a. Round White Trial One. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones of potato clones harvested 102 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

				Size Distribution by Class[2] (% of total yield)									Chip Color[4]	
	Total Yield	Marketable Yield								1 7/8	2 1/2	Specific	24 to	5 to
Clone	cwt/A	cwt/A	% Atl.	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[3]	48 hrs	7 Days
AF0338-17	220	196	110	10	43	44	2	0	1	89	47	1.080	1.5	2
AF4157-6	241	196	109	16	66	14	1	0	3	81	15	1.086	1.5	2.5
AF4227-2	267	242	137	7	43	46	1	0	2	91	47	1.072	1	1.5
AF4363-5	199	179	100	6	32	51	6	0	5	90	57	1.079	1.5	2.5
AF4386-16	220	174	100	18	59	20	0	0	3	79	20	1.086	1.5	1.5
AF4430-2	215	188	107	11	51	36	0	0	1	88	36	1.058	1.5	2
AF4441-8	189	146	79	17	62	15	0	0	6	77	15	1.084	1	2.5
AF4442-4	234	208	118	9	54	35	0	0	2	89	35	1.075	2	2
AF4449-2	273	252	143	7	42	49	1	0	1	92	51	1.077	2.5	3
AF4454-3	212	167	94	12	55	24	0	0	9	79	24	1.064	2	2
AF4463-7	247	204	115	7	50	31	1	0	11	82	32	1.072	1.5	2
Atlantic	205	184	100	6	32	56	2	0	4	89	58	1.083	1.5	2
LaNorma	303	266	152	12	54	33	1	0	1	88	33	1.067	.	.
Nadine	165	125	70	23	61	14	0	0	3	75	14	1.057	.	.
NC229-96	197	147	81	23	70	5	0	0	3	74	5	1.086	1.5	2
NC268-1	264	230	128	11	41	45	1	0	2	87	46	1.092	1.5	2
NCB2833-7	222	194	107	10	44	42	1	0	3	87	43	1.081	2	2
NCG84-1	165	129	71	11	47	30	0	0	11	78	30	1.086	2	2
Nectar	316	262	150	16	73	10	0	0	1	83	10	1.078	.	.
Snowden	220	200	113	7	43	47	1	0	2	91	48	1.082	1	1.5
Superior	217	195	111	8	44	45	1	0	2	90	46	1.073	2.5	3
Yukon Gold	176	148	84	9	40	44	0	0	8	84	44	1.077	.	.
Grand Mean	226	192												
CV(%)	16.4	18.4												
LSD (k=100)	52.7	49.8												

[1] DAP = Days After Planting; DVK = Days to Vine Kill

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

[3] Determined by weight in air/water method.

[4] Chip Color Ratings conducted by the NCSU Potato Breeding Program at the TRS/VGJREC: 1 = no defects, exceptionally bright; 2 = excellent, bright; 3 = good, light or golden; 4 = dark defects, marginal; 5 = not acceptable.

Table 5b. Round White Trial One. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 102 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AF0338-17	9	7	8	7	6	6	6	7	3	7	7	8	7	0	9.0	0	0	0	0	SS,GC,SR,FS,RZ
AF4157-6	6	8	7	5	6	6	5	7	3	7	5	7	6	0	9.0	0	0	0	0	SR,FS,MS,SS
AF4227-2	6	8	8	8	6	6	6	6	3	7	6	7	6	3	8.0	0	0	5	0	RZ,SR,FS,SS,MS
AF4363-5	9	8	8	9	9	7	4	6	4	7	8	6	5	0	9.0	0	0	0	0	MS,RZ,GC,SS
AF4386-16	6	7	8	6	6	5	6	7	2	7	3	8	6	0	9.0	0	0	0	0	RZ,GC,SS
AF4430-2	7	5	7	5	8	6	6	6	3	7	5	8	6	0	9.0	0	0	0	25	SR,SS
AF4441-8	9	8	7	7	6	6	6	5	2	7	3	6	4	5	7.0	0	0	0	13	GC,RZ,CS,SR,FS,MS
AF4442-4	8	7	8	7	6	6	4	7	3	7	5	8	6	0	9.0	0	0	0	0	SS,GC,SR,RZ
AF4449-2	9	8	8	7	6	6	5	4	2	7	5	9	6	0	9.0	0	3	0	18	SR,MS,SS
AF4454-3	6	8	8	5	6	6	5	6	3	8	5	6	4	0	9.0	0	0	3	13	GC,SC,SR,SS,RZ
AF4463-7	6	8	8	7	8	7	5	7	3	7	5	6	3	0	9.0	0	0	3	18	GC,MS,SS,RZ,SR,FS
Atlantic	6	7	7	5	5	6	5	6	3	6	8	8	6	23	7.8	5	0	5	15	MS,GC,RZ
LaNorma	9	8	8	9	6	7	5	6	5	7	6	8	7	0	9.0	0	3	0	0	GC,SS,MS,RZ,SR
Nadine	5	6	6	3	6	6	6	7	5	8	3	8	5	5	8.0	3	0	0	8	GC,SS,SR,MS
NC229-96	6	7	7	6	5	6	6	6	3	8	3	8	5	0	9.0	0	0	0	8	SS,GC,SR,FS
NC268-1	6	8	8	8	6	5	6	6	2	7	6	8	6	0	9.0	8	0	0	10	GC,SR,MS,SS,FS
NCB2833-7	6	8	8	7	6	5	6	6	2	6	5	8	7	0	9.0	0	0	0	0	MS
NCG84-1	8	8	8	8	6	5	5	7	2	7	5	6	5	3	8.0	0	0	0	8	GC,RZ,SS
Nectar	9	8	9	9	8	8	4	5	5	8	5	7	6	25	7.0	0	0	0	0	CS,SS,MS,SR,RZ,YF1,PE
Snowden	9	8	7	7	5	5	5	5	3	5	7	8	6	0	9.0	0	0	0	3	SR,FS,MS
Superior	5	7	7	4	6	6	5	7	3	6	7	9	5	0	9.0	0	0	3	8	MS
Yukon Gold	8	4	7	4	7	7	5	7	4	8	6	7	7	0	9.0	0	0	0	13	MS,SR,CS,RZ

[1] DAP = Days After Planting; DVK = Days to Vine Kill.

[2] See NE1031 Standard Potato Rating System for key to scores in Appendix 2.

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

[4] See Appendix 3 for Comment Codes

Table 6a. Round White Trial Two. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones harvested 102 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class[2] (% of total yield) 1's	2's	3's	4's	5's	Culls	1 7/8 to 4"	2 1/2 to 4"	Specific Gravity[3]	Chip Color[4] 24 to 48 hrs	5 to 7 Days
AF4125-1	115	77	62	25	57	9	0	0	8	67	9	1.077	2	2
Andover	149	124	101	8	48	34	0	0	10	82	34	1.080	1	1.5
Atlantic	153	126	100	6	34	46	2	0	12	82	49	1.081	2	2
Augusta	134	104	85	14	50	28	0	0	9	77	28	1.070	.	.
B2817-2	201	160	129	13	42	34	1	0	9	78	35	1.076	1.5	1.5
B2828-1	193	155	125	12	48	32	0	0	7	81	32	1.081	2	2.5
B2833-16	165	134	109	6	38	42	1	0	12	82	44	1.082	3	3
B2834-11	190	158	127	8	42	40	0	0	10	82	40	1.080	2.5	2.5
B2834-8	149	125	100	7	51	33	0	0	8	84	33	1.081	2	1.5
Beacon Chipper	151	110	88	14	48	24	1	0	13	73	24	1.081	2	2
BNC233-3	204	158	130	16	48	27	2	0	8	77	29	1.082	2	2
Harley Blackwell	209	159	125	10	39	36	0	0	15	75	36	1.077	2	2
Superior	178	149	118	7	39	44	0	0	10	83	44	1.072	2	2.5
Yukon Gold	148	117	94	8	45	34	0	0	13	79	34	1.077	.	.
Grand Mean	167	133												
CV(%)	17.7	24.5												
LSD (k=100)	44.8	55.7												

[1] DAP = Days After Planting; DVK = Days to Vine Kill

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

[3] Determined by weight in air/water method.

[4] Chip Color Ratings conducted by the NCSU Potato Breeding Program at the TRS/VGJREC: 1 = no defects, exceptionally bright; 2 = excellent, bright; 3 = good, light or golden; 4 = dark defects, marginal; 5 = not acceptable.

Table 6b. Round White Trial Two. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 102 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AF4125-1	5	7	8	6	6	6	7	7	2	7	3	6	5	3	8.0	0	3	0	5	RZ,FS,MS
Andover	8	7	7	5	6	5	6	7	4	7	6	6	6	3	7.0	0	0	0	8	FS,RZ,SR,GC
Atlantic	6	7	7	5	5	5	5	7	3	7	7	7	5	25	7.0	0	0	0	10	SR,RZ,GC,SS
Augusta	5	6	8	5	7	8	6	7	5	7	5	8	6	0	9.0	0	0	0	0	MS,RZ,SR,SG,GC,YF2
B2817-2	6	8	7	5	6	5	5	7	2	7	5	7	6	8	8.0	0	0	0	5	FS,SS,GC,RZ
B2828-1	6	7	7	6	6	5	4	7	2	8	4	7	6	0	9.0	0	5	0	15	SR,SS,FS,RZ,GC
B2833-16	7	6	8	6	6	6	7	7	2	7	6	6	6	0	9.0	3	0	8	8	FS,MS,RZ,SR,BS
B2834-11	6	8	8	6	6	7	7	7	3	7	6	7	6	0	9.0	0	0	0	5	MS,RZ,GC,SR,FS
B2834-8	5	5	7	4	6	6	7	7	3	7	6	8	7	0	9.0	8	0	3	8	FS,RZ,SR
Beacon Chipper	6	8	7	7	6	6	6	5	3	7	4	5	4	0	9.0	3	0	0	3	SCB,RZ,FS,SR
BNC233-3	6	8	8	7	6	7	7	7	2	7	7	8	6	0	9.0	0	0	0	20	FS,SR,MS,GC
Harley Blackwell	8	7	8	6	6	5	7	7	2	7	5	5	6	0	9.0	0	0	0	5	FS,RZ,MS,SC,SR,CS
Superior	5	7	7	4	6	7	4	7	4	6	5	8	5	0	9.0	0	0	13	3	FS,SR,RZ,MSCS
Yukon Gold	8	5	8	5	7	8	5	7	4	7	6	8	6	0	9.0	0	0	0	15	CS,MS,GC,RZ,FS,YF1

[1] DAP = Days After Planting; DVK = Days to Vine Kill

[2] See NE1031 Standard Potato Rating System for key to scores in Appendix 2.

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

[4] See Appendix 3 for Comment Codes

Table 7a. Round White Trial Three. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones harvested 115 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

				Size Distribution by Class[2] (% of total yield)									Chip Color[4]	
	Total Yield	Marketable Yield								1 7/8	2 1/2	Specific	24 to	5 to
Clone	cwt/A	cwt/A	% Atl.	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[3]	48 hrs	7 Days
AF4463-8	262	240	197	7	47	44	0	0	2	91	44	1.067	2	2
AF4521-1	280	250	211	4	22	63	4	0	8	89	67	1.076	1.5	2
AF4614-2	196	168	140	4	33	52	1	0	11	86	53	1.065	2	2.5
AF4702-2	276	253	213	5	45	47	0	0	4	91	47	1.076	2.5	2
Atlantic	159	122	100	4	22	52	2	0	20	76	54	1.080	2	2
B2827-12	128	102	86	5	55	23	1	0	16	79	24	1.078	2	2
B2827-14	136	110	94	7	46	35	0	0	13	80	35	1.074	2	2.5
B2833-8	189	161	135	10	51	33	0	0	7	84	33	1.083	2.5	2
B2834-14	162	116	98	26	63	8	0	0	3	71	8	1.067	1	2
BNC236-14	246	220	181	5	36	52	0	0	7	88	52	1.076	1.5	1.5
BNC236-9	332	308	260	3	19	67	7	0	4	93	73	1.082	3	3
BNC245-5	294	258	222	5	25	60	2	0	8	87	62	1.070	2	2.5
Snowden	253	235	200	3	31	61	1	0	4	93	62	1.078	1.5	3
Yukon Gold	127	95	80	6	36	39	0	0	19	74	39	1.076	.	.
Grand Mean	217	188												
CV(%)	18.5	22.0												
LSD (k=100)	53.5	55.2												

[1] DAP = Days After Planting; DVK = Days to Vine Kill

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

[3] Determined by weight in air/water method.

[4] Chip Color Ratings conducted by the NCSU Potato Breeding Program at the TRS/VGJREC: 1 = no defects, exceptionally bright; 2 = excellent, bright; 3 = good, light or golden; 4 = dark defects, marginal; 5 = not acceptable.

Table 7b. Round White Trial Three. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 115 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AF4463-8	9	8	8	8	6	5	6	7	3	7	5	7	7	0	9.0	0	0	0	0	SR,SS,RZ
AF4521-1	7	7	8	7	6	5	5	6	4	7	7	7	5	0	9.0	0	0	0	0	GC,SS,SR,CS
AF4614-2	8	7	7	5	8	7	6	7	3	7	5	7	5	3	7.0	35	0	8	0	SR,MS,RZ,CS
AF4702-2	9	8	8	7	6	5	6	6	5	7	7	8	7	0	9.0	0	0	0	0	SR,GC,MS,RZ
Atlantic	6	7	8	5	6	5	6	6	3	7	6	6	6	10	6.0	5	0	0	0	SR,RZ,GC,SS
B2827-12	6	7	8	5	6	6	6	5	5	7	5	6	4	0	9.0	0	10	0	0	SR,RZ,GC,MS,PTS
B2827-14	5	6	8	6	6	6	5	7	3	7	4	6	4	0	9.0	3	3	0	0	MS,SS,SR,RZ,GC
B2833-8	6	7	8	6	6	5	7	6	2	7	4	7	6	0	9.0	0	10	0	0	SS,SR,MS
B2834-14	6	8	8	6	6	6	7	7	1	7	3	8	6	0	9.0	0	20	0	0	SS,SR,RZ,MS
BNC236-14	6	7	8	6	6	6	5	5	3	7	7	8	4	0	9.0	13	3	0	0	SR,MS,SS,RZ
BNC236-9	9	9	8	9	6	5	6	5	4	7	7	8	5	55	6.3	0	0	0	3	GC,SS,MS,RZ
BNC245-5	6	8	8	8	6	5	6	7	3	7	6	6	5	0	9.0	0	0	0	0	SS,GC,SR
Snowden	9	8	7	7	5	5	5	6	2	6	6	8	5	0	9.0	0	0	0	0	SR,RZ
Yukon Gold	8	5	7	4	7	7	7	7	5	8	6	5	4	0	9.0	0	0	0	0	SR,SS,CS

[1] DAP = Days After Planting; DVK = Days to Vine Kill

[2] See NE1031 Standard Potato Rating System for key to scores in Appendix 2.

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

[4] See Appendix 3 for Comment Codes

Table 8a. NE-1031 Round White Trial. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 104 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

				Size Distribution by Class[2] (% of total yield)									Chip Color[4]	
	Total Yield	Marketable Yield								1 7/8	2 1/2	Specific	24 to	5 to
Clone	cwt/A	cwt/A	% Atl.	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[3]	48 hrs	7 Days
AF0338-17	248	230	104	5	33	53	6	0	2	93	60	1.079	2	2
AF4013-3	260	224	101	12	57	29	0	0	2	86	29	1.084	2.5	3
AF4157-6	280	229	104	18	64	18	0	0	1	81	18	1.086	1	1
Atlantic	240	222	100	5	37	52	3	0	2	93	56	1.083	1.5	2
B2727-2	151	139	63	5	59	31	2	0	3	92	32	1.085	2	2
B2731-11	202	189	85	5	44	50	0	0	2	94	50	1.084	2	2
BNC182-5	289	269	121	6	33	57	2	0	1	93	60	1.081	1.5	2
Dakota Crisp	329	300	135	7	34	55	2	0	2	91	57	1.080	2	2.5
Katahdin	181	159	71	10	56	31	0	0	3	88	31	1.064	2	2.5
Kennebec	250	225	101	2	25	62	4	0	8	90	66	1.070	2	3
NY150 (NYF52-1)	212	65	30	68	31	0	0	0	1	31	0	1.083	2.5	1.5
NYE106-4	284	226	102	18	63	17	0	0	2	79	17	1.085	2	2.5
Rochdale Gold-Doree	202	175	79	11	48	37	1	0	3	86	39	1.068	.	.
Snowden	228	212	97	7	49	43	0	0	0	92	43	1.085	1.5	2
Superior	221	202	91	4	56	36	0	0	4	92	36	1.073	2	2.5
Yukon Gold	206	166	75	7	37	44	0	0	12	81	44	1.081	.	.
Grand Mean	236	202												
CV(%)	14.4	16.6												
LSD (k=100)	46.6	45.5												

[1] DAP = Days After Planting; DVK = Days to Vine Kill

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

[3] Determined by weight in air/water method.

[4] Chip Color Ratings conducted by the NCSU Potato Breeding Program at the TRS/VGJREC: 1 = no defects, exceptionally bright; 2 = excellent, bright; 3 = good, light or golden; 4 = dark defects, marginal; 5 = not acceptable.

Table 8b. NE-1031 Round White Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 104 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AF0338-17	9	7	7	8	6	6	5	7	3	7	7	8	7	0	9.0	0	0	0	0	MS,GC,RZ,SS
AF4013-3	9	8	8	8	6	6	6	7	4	7	5	8	6	0	9.0	3	0	0	0	MS,RZ,SS,YF1
AF4157-6	6	8	8	6	6	5	6	7	2	8	3	8	6	0	9.0	0	0	0	0	SS,SR,RZ
Atlantic	6	7	7	5	6	5	6	6	3	7	7	8	7	10	7.0	5	0	3	0	SR,MS,RZ,GC
B2727-2	6	8	7	5	6	6	6	6	4	7	5	8	6	0	9.0	3	0	0	0	SS,SR,RZ
B2731-11	8	7	7	6	5	5	7	6	1	7	5	8	8	0	9.0	0	0	5	0	GC,RZ,VN
BNC182-5	6	8	8	8	9	6	6	6	2	7	7	8	8	0	9.0	0	0	0	0	RZ,SS
Dakota Crisp	7	8	8	7	6	7	5	5	3	7	7	9	5	0	9.0	0	0	0	0	MS,SS
Katahdin	5	5	8	5	9	8	6	5	7	8	5	8	5	0	9.0	0	0	0	0	SS,RZ,SR
Kennebec	9	7	8	7	5	7	4	5	5	6	8	8	4	0	9.0	0	0	0	0	MS,SS,GC
NY150 (NYF52-1)	8	8	6	5	8	8	7	7	1	7	2	8	7	0	9.0	0	0	0	0	SR,SS,RZ
NYE106-4	8	7	8	8	6	5	5	6	2	7	5	8	5	15	7.0	0	0	0	0	MS,RZ,SS,SR
Rochdale Gold-Doree	8	6	8	6	7	7	7	7	2	8	6	8	6	0	9.0	0	0	0	0	GC,SG,SR,SS,MS,YF2
Snowden	9	8	7	7	5	5	6	6	2	5	6	8	5	0	9.0	0	0	0	0	MS,RZ,DAE,DSE
Superior	5	8	8	4	6	6	5	7	5	6	5	8	4	0	9.0	0	0	0	0	MS,SS
Yukon Gold	8	5	7	4	7	8	6	7	3	8	5	7	7	0	9.0	5	0	0	0	MS,SS,SR,RZ,YF2

[1] DAP = Days After Planting; DVK = Days to Vine Kill

[2] See NE1031 Standard Potato Rating System for key to scores in Appendix 2.

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

[4] See Appendix 3 for Comment Codes

Table 9a. NE-1031 Red Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 102 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

				Size Dist. by Class (%)[2] (% of total yield)								
	Total Yield	Marketable Yield								1 7/8	2 1/2	Specific
Clone	cwt/A	cwt/A	% Chieftain	1's	2's	3's	4's	5's	Cull's	to 4"	to 4"	Gravity[3]
AF4543-2	238	188	66	20	58	20	0	0	0	79	21	1.063
AF4543-3	261	220	77	11	59	25	0	0	0	84	25	1.065
AF4547-1	242	208	75	11	44	41	1	0	0	86	42	1.070
AF4550-2	224	169	57	8	59	32	0	0	0	90	32	1.077
AF4565-1	250	214	76	9	53	33	1	0	0	86	33	1.069
BNC240-1	247	213	75	7	54	33	0	0	0	86	33	1.075
Chieftain	345	296	100	5	46	39	0	0	3	85	39	1.068
Dark Red Norland	223	204	69	6	38	52	1	0	3	91	53	1.070
Modoc	234	187	65	15	69	11	0	0	5	80	11	1.069
NCB2812-2	116	88	30	24	65	11	0	0	1	76	11	1.080
Peter Wilcox	249	206	73	8	52	31	0	0	9	83	31	1.073
Red Sunset	219	146	53	32	62	5	0	0	1	67	5	1.071
Grand Mean	237	195										
CV(%)	14.5	18.9										
LSD (k=100)	47.5	51.3										

[1] DAP = Days After Planting; DVK = Days to Vine Kill

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

[3] Determined by weight in air/water method.

Table 9b. NE-1031 Red Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 102 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AF4543-2	6	8	8	4	2	7	5	6	3	8	5	8	6	0	9.0	0	3	0	20	MS,GC,RZ,SR,SS
AF4543-3	6	8	8	4	2	7	7	6	4	7	6	7	5	0	9.0	0	3	0	13	MS,CS,SS,SR,BS,GC
AF4547-1	5	7	7	4	2	7	5	6	3	6	7	8	5	0	9.0	0	0	0	8	SR,SS,SISC,MS,GC,YF1
AF4550-2	8	7	7	5	1	7	4	6	4	6	6	7	6	0	9.0	0	0	0	10	MS,CS,RZ,SS,GC,SR
AF4565-1	8	7	8	6	3	8	6	7	5	8	7	8	6	8	8.0	0	5	0	13	SR,MS,SS,GC,RZ
BNC240-1	9	6	8	4	1	6	6	5	5	7	7	4	5	0	9.0	0	0	0	8	GC,^SISC,SS,SR,AC,YF1
Chieftain	9	8	8	6	3	6	5	4	3	6	6	6	3	8	8.0	0	0	0	8	GC,MS,^RZ,SR
Dark Red Norland	5	7	7	4	2	7	5	7	4	7	6	8	4	0	9.0	0	0	0	5	MS,RZ,SISC,GC,VAR CLR
Modoc	6	8	6	4	2	7	7	7	4	7	4	8	7	0	9.0	0	40	0	8	SR,MS,RZ,SISC,GC,SS
NCB2812-2	8	8	7	6	1	7	7	7	1	7	3	8	6	10	8.0	0	0	3	10	SR,YF1
Peter Wilcox	6	8	7	4	1	7	7	6	5	8	6	7	5	0	9.0	0	0	0	3	^SISC,CS,MS,YF2
Red Sunset	6	7	7	5	1	8	6	7	4	7	4	8	7	0	9.0	0	13	0	8	SR,SS,RZ

[1] DAP = Days After Planting; DVK = Days to Vine Kill

[2] See NE1031 Standard Potato Rating System for key to scores in Appendix 2.

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

[4] See Appendix 3 for Comment Codes

Table 10a. NE-1031 Russet Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 115 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

				Size Distribution by Class[2] (% of total yield)								
	Total Yield	Marketable Yield								1 7/8	2 1/2	Specific
Clone	cwt/A	cwt/A	% R.Nor	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[3]
AF3001-6	350	321	155	3	72	19	0	0	5	92	19	1.074
AF3362-1	208	184	88	3	52	36	1	0	9	88	37	1.070
AF4040-2	238	187	90	3	58	21	0	0	18	79	21	1.082
AF4222-5	193	168	82	7	65	22	0	0	6	87	22	1.068
AF4320-17	289	254	122	6	78	10	0	0	6	88	10	1.079
AF4347-1	308	280	133	4	61	30	0	0	5	91	30	1.076
AF4430-1	228	177	87	14	54	24	0	0	9	77	24	1.073
AF4532-8	201	172	83	5	69	16	0	0	9	85	16	1.078
AF4532-9	203	165	79	15	78	3	0	0	4	81	3	1.088
AF4538-3	194	154	75	8	65	13	1	0	12	79	14	1.070
AF4609-1	234	204	99	5	83	4	0	0	8	87	4	1.081
Classic Russet	250	231	110	2	49	43	0	0	6	92	43	1.068
Dakota Trailblazer	298	275	134	4	78	14	0	0	4	92	14	1.088
Goldrush	275	246	118	3	59	30	0	0	8	89	30	1.070
Russet Burbank	269	226	110	11	77	6	0	0	5	84	6	1.080
Russet Norkotah #3117	245	210	100	5	49	37	1	0	8	86	37	1.073
Shepody	262	208	100	4	62	17	0	0	17	79	17	1.077
Grand Mean	250	215										
CV(%)	13.0	13.8										
LSD (k=100)	44.3	40.0										

[1] DAP = Days After Planting; DVK = Days to Vine Kill

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

[3] Determined by weight in air/water method.

Table 10b. NE-1031 Russet Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 115 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2012

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AF3001-6	9	8	9	9	6	4	5	5	8	8	7	7	4	0	9.0	0	10	0	0	RZ,MS,SS,SR
AF3362-1	9	7	8	5	5	3	5	6	7	7	8	8	5	5	7.0	0	0	0	0	SS,SR,RZ,SC,MS
AF4040-2	6	7	7	5	6	4	5	7	8	7	8	6	3	0	9.0	0	3	3	5	SR,MS,GC,RZ,CS
AF4222-5	6	8	8	7	5	3	5	6	7	8	6	7	5	0	9.0	0	0	0	3	MS,SR,SS
AF4320-17	9	7	8	6	5	3	6	7	7	8	5	8	7	0	9.0	0	0	0	23	SS,SR
AF4347-1	9	8	9	9	5	2	6	6	7	5	6	8	3	0	9.0	0	0	0	25	MS,GC,RZ,SR
AF4430-1	9	7	7	6	6	5	5	6	2	8	6	6	5	0	9.0	0	0	0	10	SR,SS,RZ
AF4532-8	6	8	9	7	4	2	6	7	6	8	5	7	3	0	9.0	10	0	3	53	SR,SS
AF4532-9	6	8	8	7	5	3	6	7	6	8	4	7	6	0	9.0	3	0	0	35	SR,SS,BS
AF4538-3	6	7	8	7	5	4	6	6	7	8	6	7	5	0	9.0	0	3	0	13	MS,SS,SR,HS,GC,RZ
AF4609-1	9	8	8	7	5	4	6	7	7	7	5	7	4	0	9.0	3	3	0	23	GC,MS,SR,SS,RZ
Classic Russet	6	8	8	7	5	3	6	6	7	7	7	7	6	0	9.0	0	0	0	13	SR,GC,MS
Dakota Trailblazer	9	8	9	9	5	4	5	5	6	7	6	8	5	0	9.0	3	0	0	5	GC,SS,MS,SR
Goldrush	6	7	8	5	4	2	4	7	8	7	6	7	5	0	9.0	0	0	0	13	RZ,MS,SR,SS
Russet Burbank	9	8	8	8	5	3	6	6	7	7	4	7	4	0	9.0	0	0	0	35	MS,SR,SS,SG
Russet Norkotah #3117	9	8	8	6	4	3	6	7	7	8	6	7	7	0	9.0	0	0	0	30	CS,SR,MS
Shepody	6	8	7	6	8	8	4	7	8	8	7	5	4	0	9.0	0	0	0	13	MS,SR,SS,SG

[1] DAP = Days After Planting; DVK = Days to Vine Kill

[2] See NE1031 Standard Potato Rating System for key to scores in Appendix 2.

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

[4] See Appendix 3 for Comment Codes

Appendix 1: LAND MANAGEMENT CONDITIONS

Location: Black Gold Farms, Gum Neck, Tyrrell Co., NC
Trial Title: Black Gold Farms Variety Chip Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Thirteen 21' rows at 34' row spacing, 28 hills per row

Seed piece Treatment:	None
Weed Control:	Metribuzin 1 lbs/A
	Intensity 10 fl oz/A
Fertilizer:	228 N, 123 P, 121 K,
Insect Control:	Admire Pro in-furrow 8 oz/A
Disease Control:	Quadris in furrow 6.2/A
	Bravo 7 pt/A (total across 4 applications)
	Revus Top 6.2 fl oz/A
Vine Kill:	None

Location: Black Gold Farms, Gum Neck, Tyrrell Co., NC
Trial Title: Black Gold Farms Variety Table Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Fourteen 21' rows at 34' row spacing, 28 hills per row

Seed piece Treatment:	None
Weed Control:	Metribuzin 1 lbs/A
	Intensity 10 fl oz/A
Fertilizer:	228 N, 123 P, 121 K,
Insect Control:	Admire Pro in-furrow 8 oz/A
Disease Control:	Quadris in furrow 6.2/A
	Bravo 7 pt/A (total across 4 applications)
	Revus Top 6.2 fl oz/A
Vine Kill:	None

Location: Black Gold Farms, Gum Neck, Tyrrell Co., NC
Trial Title: Snack Food Association Trial
Trial Design: Randomized complete block, five replications
Plot Dimensions: Twenty-one 21' rows at 34' row spacing, 28 hills per row

Seed piece Treatment:	None
Weed Control:	Metribuzin 1 lbs/A
	Intensity 10 fl oz/A
Fertilizer:	228 N, 123 P, 121 K,
Insect Control:	Admire Pro in-furrow 8 oz/A
Disease Control:	Quadris in furrow 6.2/A
	Bravo 7 pt/A (total across 4 applications)
	Revus Top 6.2 fl oz/A
Vine Kill:	None

Appendix 1: LAND MANAGEMENT CONDITIONS (Cont'd.)

Location: Bright Farms, Weeksville, Pasquotank Co., NC
Trial Design: Randomized complete block, four replications
Plot Dimensions: Twenty-four 21' rows at 40' row spacing, 28 hills per row

Seed piece Treatment:	None
Weed Control:	metoalochlor 1pt/A
	Metribuzen 0.3 lb/A
Fertilizer:	1200lbs, 14-5-17 broadcast
Insect Control:	Leverage 3 fl oz/A
	Baythroid 2fl oz/A
Disease Control:	Quadris 12fl oz/A
	Bravo 2lbs/A
	Curzate 3.2 oz/A
	Ranman 2.75 oz/A
Vine Kill:	None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: Round White Variety Trial One
Trial Design: Randomized complete block, four replications
Plot Dimensions: Twenty-two 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment:	None
Weed Control:	Round-Up PowerMax 20oz/A pre-plant
	Dual Magnum1.5 pt/A pre-emergence
	Sencor DF 1 lb/A pre-emergence
Fertilizer:	800 lbs, 15-15-15 broadcast
	30-0-0 20 gal
Insect Control:	Admire Pro 8.7 oz/A
Disease Control:	Quadris 12oz/A
	Chloronyl 720 1qt/A
Vine Kill:	None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: Round White Variety Trial Two
Trial Design: Randomized complete block, four replications
Plot Dimensions: Fourteen 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment:	None
Weed Control:	Round-Up PowerMax 20oz/A pre-plant
	Dual Magnum1.5 pt/A pre-emergence
	Sencor DF 1 lb/A pre-emergence
Fertilizer:	800 lbs, 15-15-15 broadcast
	30-0-0 20 gal
Insect Control:	Admire Pro 8.7 oz/A
Disease Control:	Quadris 12oz/A
	Chloronyl 720 1qt/A
Vine Kill:	None

Appendix 1: LAND MANAGEMENT CONDITIONS (Cont'd.)

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: Round White Variety Trial Three
Trial Design: Randomized complete block, four replications
Plot Dimensions: Fourteen 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment:	None
Weed Control:	Round-Up PowerMax 20oz/A pre-plant
	Dual Magnum1.5 pt/A pre-emergence
	Sencor DF 1 lb/A pre-emergence
Fertilizer:	800 lbs, 15-15-15 broadcast
	30-0-0 20 gal
Insect Control:	Admire Pro 8.7 oz/A
Disease Control:	Quadris 12oz/A
	Chloronyl 720 1qt/A
Vine Kill:	None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: NE 10-31 White Variety Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Sixteen 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment:	None
Weed Control:	Round-Up PowerMax 20oz/A pre-plant
	Dual Magnum1.5 pt/A pre-emergence
	Sencor DF 1 lb/A pre-emergence
Fertilizer:	800 lbs, 15-15-15 broadcast
	30-0-0 20 gal
Insect Control:	Admire Pro 8.7 oz/A
Disease Control:	Quadris 12oz/A
	Chloronyl 720 1qt/A
Vine Kill:	None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: NE 10-14 Red Variety Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Twelve 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment:	None
Weed Control:	Round-Up PowerMax 20oz/A pre-plant
	Dual Magnum1.5 pt/A pre-emergence
	Sencor DF 1 lb/A pre-emergence
Fertilizer:	800 lbs, 15-15-15 broadcast
	30-0-0 20 gal
Insect Control:	Admire Pro 8.7 oz/A
Disease Control:	Quadris 12oz/A
	Chloronyl 720 1qt/A
Vine Kill:	None

Appendix 1: LAND MANAGEMENT CONDITIONS (Cont'd.)

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: NE 10-14 Russet Variety Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Seventeen 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment:	None
Weed Control:	Round-Up PowerMax 20oz/A pre-plant
	Dual Magnum1.5 pt/A pre-emergence
	Sencor DF 1 lb/A pre-emergence
Fertilizer:	800 lbs, 15-15-15 broadcast
	30-0-0 20 gal
Insect Control:	Admire Pro 8.7 oz/A
Disease Control:	Quadris 12oz/A
	Chloronyl 720 1qt/A
Vine Kill:	None

Appendix 2: STANDARDIZED NE1031 RATING CODES FOR PLANT AND TUBER CHARACTERISTICS

Tuber Color

1. purple
2. red
3. pink
4. dark brown
5. brown
6. tan/light brown
7. buff
8. white
9. cream

Tuber 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

Tuber Cross-section

1. very flat
2. --
3. flat
4. --
5. intermediate/oval
6. --
7. mostly round
8. --
9. very round

Tuber Skin Set

1. very poor
2 --
3. poor
4 --
5. fair
6 --
7. good
8 --
9. excellent

Tuber 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

Tuber Eye Depth

1. -
2. deep
3. +
4. -
5. medium
6. +
7. -
8. shallow
9. +

Tuber Size (GCY Scale)

1. small
2. --
3. small-medium
4. --
5. medium
6. --
7. medium-large
8. --
9. large

Tuber Appearance

1. very poor
2. --
3. poor
4. --
5. fair
6. --
7. good
8. --
9. excellent

Tuber Disease Rating

1. very severe
2. --
3. severe
4. --
5. moderate
6. borderline
7. slight
8. very slight
9. none

Plant 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

Plant Disease and Pollution Reaction

1. Dead
2. -
3. severe
4. +
5. moderate
6. -
7. +
8. slight
9. none

Maturity

1. -
2. early
3. +
4. -
5. medium
6. +
7. -
8. late
9. +

Appendix 3: COMMENT CODES FOR TABLE B

AC=air cracks
BR=bruise
CPB=Colorado potato beetle
CS=common scab
CT=chain tubers
DAE=deep apical eyes
DSE=deep stolen end
EB=early blight
ECB= European corn borer
EL= enlarged lenticels
FS=fusarium wilt
GC=growth cracks
HI= herbicide injury
HN = Heat Necrosis (see below)
HS=heat sprouts
IL=infected lenticels
LB=late blight
LHD=leaf hopper damage
MS=misshaped tubers
PE=pink eye
PR=pink rot
PLRV=potato leaf roll virus
PTS=very pointed tubers
PS=powdery scab
PVA, PVX, PVY=potato viruses A, X, Y
RZ=Rhizoctonia
SEB=stem end browning
SC = star cracking
SG=secondary growth
SIS=silver scurf
SKN=skins
SS=sun scald
SR=soft rot
STST=sticky stolons, tight stolon attachment
TSWV=Tomato Spotted Wilt Virus
VW=Verticillium wilt
WSTD=weak stand
WW=wire worm
YF=yellow flesh (YF scale: 1=light yellow to 3=dark yellow)
RF=red flesh (RF scale: 1=light red or pink to 3 = dark red)

Note: ^ before code = high levels; ^^ = very high; ~ = moderate or some

Heat Necrosis

10 tubers/replication are sampled, typically there are 4 replications in each trial (40 tubers total), USPB/SFA trial has 5 reps (50 tubers) and the observational and unreplicated trials have 1 rep (10 tubers), rating is on a 1 to 9 scale, a rating of 9 indicates no incidence a rating of 1 indicates severe incidence

Reading the HN notation: e.g. 12IHN(2-6,5-7,5-8) - The '12' in this case, is the total number of tubers expressing incidence. The number after the dashes (6,7,and 8) are severity ratings. The sum of the numbers before each dash equals the number before the 'IHN', these are the number of tubers with a particular severity rating. So there were 2 tubers with a severity of 6, 5 with a severity of 7, and 5 with a severity of 8.