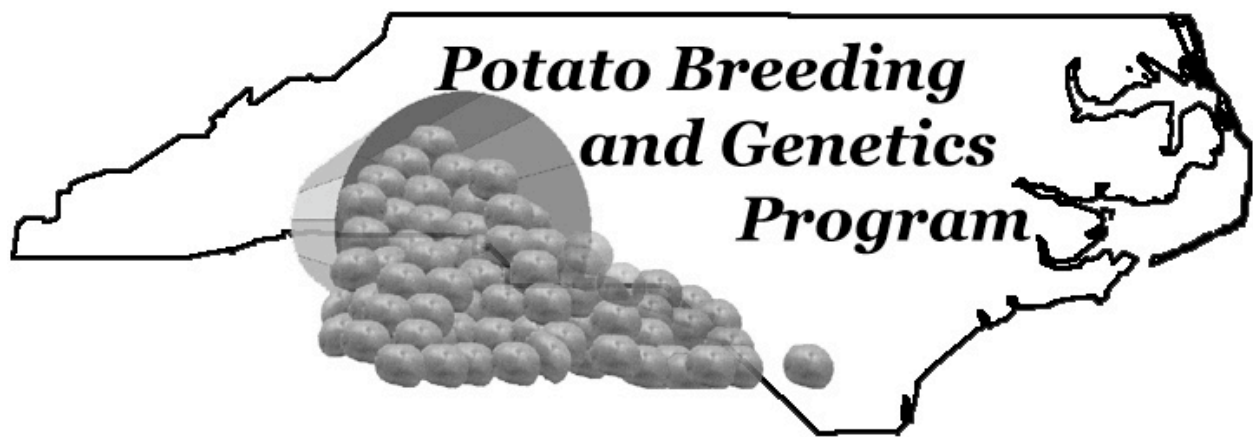


NC STATE UNIVERSITY

NORTH CAROLINA POTATO VARIETY TRIAL AND BREEDING REPORT

2013



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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 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, 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 a 160-hill increase plot to generate enough seed for preliminary yield trials conducted at the TRS/VGJREC the following year. In subsequent years all surviving clones are maintained in 320-hill plots and included in preliminary and advanced yield trials conducted at the TRS/VGJREC and on-farm.

During 2013, we planted 12,455 single-hills and selected 324 clones resulting in a 2.6% selection rate. This is on par with our average selection rate. Out of the 334 clones in our 6-hill plots, 95 (28%) were selected for future evaluation. In the 20-hill plots, 55 clones were planted with 24 (44%) being selected for further evaluation. In our 60-hill plots, 10 clones were planted and 5 (50%) 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 867 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 47 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 2014. In this year's

2by3 trial, 36 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 7 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 2014. In this year's 3by5 trial we evaluated 17 clones for CPB resistance and for adaptation in our non-replicated 20-hill plots simultaneously. We selected 8 clones for advancement to next year's four replications by 10-hills (4by10) and our non-replicated 60-hill trial. In this year's 4by10 we had a total of 11 clones and eight 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 complete, also some of the clones with promise will be placed in yield trials if they have the appropriate agronomic characteristics.

Yield Trials

In our 11 yield trials, we evaluated 355 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 1-11. 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. 2013 PROMISING LINES:

Chip-stock clones

Accumulator

Developed by: Univ. of Wisconsin

Released: 2012

trials evaluated: 7 since (2006)

Skin Color: Tan to Light Brown

Flesh Color: White

Historical Data;

Maturity: medium to late

% Standard (Atlantic): MKTB YLD 108%

% Standard (Snowden): MKTB YLD 114%

Specific Gravity: 1.077

Chip score: 2.0 (excellent)

Overall Appearance: 4 (less than fair)

Other Attributes or Comments: *Maturity is slightly later than mid season. Tubers are round to oblong and slightly larger than medium size, and chip color is excellent. Skin texture is slightly netted and overall appearance is less than fair. This clone has been tested in the NCPT trials from 2010 to 2012. Most of the data collected on this clone is from the United States Potato Board / Snack Food Association (USPB/SFA) trial from 2006 to 2010.*

AF0338-17*Developed by: Univ. of Maine**Released: N/A**# trials evaluated: 16 since (2006)**Skin Color: Tan to Light Brown**Flesh Color: White**Historical Data;**Maturity: medium to late**% Standard (Atlantic): MKTB YLD 95%**% Standard (Snowden): MKTB YLD 91%**Specific Gravity: 1.077**Chip score: 2.0 (excellent)**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. This is a fast track clone with the NCPT program.*

AF4157-6*Developed by: Univ. of Maine**Released: N/A**# trials evaluated: 7 since (2010)**Skin Color: Tan to Light Brown**Flesh Color: White**Historical Data;**Maturity: Medium**% Standard (Atlantic): MKTB YLD 100%**Specific Gravity: 1.078**Chip score: 2.0 (excellent)**Overall Appearance: 6 (better than fair)*

Other Attributes or Comments: *This is a mid-season chipper with good yield and gravity. While its marketable yield is equal to Atlantic the size profile is smaller. At emergence this clone has consistently come up uniformly early and vigorous. The clone was tested in a half-acre trial in 2013 and was comparable to Atlantic in yield, specific gravity and chip scores. While this clone is mid-season it may actually be a shade earlier than Atlantic. Also when senescence occurs the vines appear to go down rapidly.*

NC0349-3*Developed by: North Carolina State Univ.**Released: N/A**# trials evaluated: 12 since (2007)**Skin Color: Tan to Light Brown**Flesh Color: White**Historical Data;**Maturity: medium to late**% Standard (Atlantic): MKTB YLD 93%**% Standard (Snowden): MKTB YLD 84%**Specific Gravity: 1.074**Chip score: 2.0 (excellent)**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 has been low overall. Yields have always been similar to Atlantic and it has consistently chipped well.*

Chip-stock clones cont.

NC268-1

Developed by: North Carolina State Univ.

Released: N/A

trials evaluated: 4 since (2012)

Skin Color: Tan to Light Brown

Flesh Color: White

Skin Texture: Netted

Historical Data:

Maturity: late maturing

% Standard (Atlantic): MKTB YLD 98%

% Standard (Snowden): MKTB YLD 102%

Specific Gravity: 1.078

Chip score: 2.0 (excellent)

Overall Appearance: 5 (fair)

Other Attributes or Comments: We evaluated this clone for the first year in 2012 and because of its exceptional performance in its first replicated yield trial we included it in 3 trials in 2013. While it's performance wasn't as stellar this year it was worthy of note. This clone is late and like Accumulator not very pretty but even in a year like this one where the gravities were low across the board this clones gravity was comparable the Atlantic. This clone was also included in the Southern NCPT trials in 2013. While it does need further testing we still see this as a promising clone.

Dual-Use (Chip/Table) clones

BNC182-5

Developed by: USDA/ARS-Beltsville

Released: N/A

trials evaluated: 10 since (2008)

Skin Color: Tan to Light Brown

Flesh Color: White

Historical Data:

Maturity: late

% Standard (Atlantic): MKTB YLD 109%

% Standard (Snowden): MKTB YLD 98%

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.

NC182-5

Developed by: North Carolina State Univ.

Released: N/A

trials evaluated: 8 since (2009)

Skin Color: Tan to Light Brown

Flesh Color: White

Historical Data:

Maturity: late

% Standard (Atlantic): MKTB YLD 103%

% Standard (Snowden): MKTB YLD 90%

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.

Table-stock clones

Augusta

Developed by: Europlant

trials evaluated: 7 since (2011)

Skin Color: Yellow, Red Blush in eyes

Flesh Color: Yellow (YF2)

Historical Data:

Maturity: medium

% Standard (Yukon Gold): MKTB YLD 107%

Specific Gravity: 1.071

Skin Texture: Smooth

Overall Appearance: 8 (better than fair)

Other Attributes or Comments: This is a mid-season variety with a good resistance package including: late blight, black leg, PVY, PVA, PLRV and potato wart. We have seen some heat sprouts in this variety and the red blush in the eyes can be a bit too prominent but we think the positives certainly outweigh the negatives and that this clone may have a place in NC production.

Dark Red Chieftain

Developed by: Real Potatoes

trials evaluated: 4 since (2012)

Skin Color: Dark Red

Flesh Color: White

Historical Data:

Maturity: medium to late maturing

% Standard (Chieftain): MKTB YLD 66%

% Standard (Dark Red Norland): MKTB YLD 84%

Specific Gravity: 1.055

Skin Texture: Moderately Smooth

Overall Appearance: 7 (good)

Other Attributes or Comments: This variety is a progeny of Chieftain with a tighter skin and better color. We saw it in one trial in 2012 and it looked promising so we included it in 3 trials in 2013. Its yields were disappointing this year and even though overall the skin texture appears to be moderately smooth we have noticed a tendency toward a slight net in at least one of the trials. This is a round clone unlike Chieftain that has a more oblong shape and the color is certainly better than Dark Red Norland. We placed this in the promising clones section because of these positive aspects and look forward to trialing this clone in the future.

Soraya

Developed by: Norika

trials evaluated: 4 since (2012)

Skin Color: Yellow

Flesh Color: Yellow (YF2)

Historical Data:

Maturity: medium to late maturing

% Standard (Yukon Gold): MKTB YLD 148%

Specific Gravity: 1.050

Skin Texture: Smooth

Overall Appearance: 6 (better than fair)

Other Attributes or Comments: This variety, like Dark Red Chieftain, attracted our attention in 2012 and while yields were no where near the phenomenal performance of 2012 in 2013 they were still good beating Yukon Gold in all cases for marketable and total yield. Like Augusta this variety brings along a nice resistance package for growers to exploit: PVY, PLRV, GNRo1, Ro4, late blight and common scab. The biggest detraction of this variety is its shape which tends to be oblong to long in stead of the more round to oblong shapes that fit into our production system in NC. We intend to evaluate this variety again in 2014.

Table-stock clones cont.

Strawberry Paw (NY136)

Developed by: Cornell Univ.

Released: 2013

trials evaluated: 28 since (2005)

Skin Color: Dark Red

Flesh Color: White

Historical Data;

Maturity: slightly later than medium

% Standard (Chieftain): MKTB YLD 80%

% Standard (Dark Red Norland): MKTB YLD 101%

Specific Gravity: 1.064

Skin Texture: Moderately Smooth

Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *We have evaluated this clone for 9 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. Seed is available for commercial production for 2014.*

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.

C002321-4W

Developed by: Colorado State Univ.

Released: N/A

trials evaluated: 2 since (2012)

Skin Color: Tan to Light Brown

Flesh Color: White

Historical Data;

Maturity: medium to late

% Standard (Atlantic): MKTB YLD 108%

% Standard (Snowden): MKTB YLD 102%

Specific Gravity: 1.078

Chip score: 2.0 (excellent)

Overall Appearance: 8 (better than good)

Other Attributes or Comments: *This clone has been included in the USBP/SFA trial in both 2012 and 2013 and has performed well. It will be tested at least one more year in the USBP/SFA trial and if it performs well in 2014 we may continue testing.*

NC264-7

Developed by: North Carolina State Univ.

Released: N/A

trials evaluated: 1 since (2013)

Skin Color: Cream

Flesh Color: White

Historical Data;

Maturity: medium to late

% Standard (Atlantic): MKTB YLD 410%

% Standard (Snowden): MKTB YLD 197%

Specific Gravity: 1.060

Chip score: 2.0 (excellent)

Overall Appearance: 4 (less than fair)

Other Attributes or Comments: *This is not pretty but yields are outstanding and chip scores were excellent. We make mention of this clone because of these traits and will test it in multiple trials in 2014 to get a better sense of its specific gravity. The reasons for its poor appearance rating relate to the presence of common scab and misshapes.*

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	Hyde loam	Mar 11	Jun 24, 26	105,107
Bright's	Barclay silt loam	Mar 18	Jul 8	107
TRS/VGJREC	Portsmouth fine sandy loam	Mar 20-27	Jul 9-26	Variable 107 - 126

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 trials, which had only one plot per clone. Forty-five clones in three trials were evaluated on-farm at Black Gold Farms, and twenty-four 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 $\geq 1 \frac{7}{8}$ "; and C's $< 1 \frac{7}{8}$ ". Black Gold, Snack Food and the TRS/VGJREC trials were graded to five classes: 1's $< 1 \frac{7}{8}$ "; 2's $> 1 \frac{7}{8}$ to $2 \frac{1}{2}$ "; 3's $> 2 \frac{1}{2}$ to $3 \frac{1}{4}$ "; 4's $> 3 \frac{1}{4}$ 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-1231 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.

VI. RESULTS:

Environmental Summary

Planting was within the later part of the normal timeframe this year. Our on-farm trials were planted about 10 days after our average historic planting dates in March and the TRS trials were planted from March 20 - 27. Delays in timing were due to rains in late February through early March. Temperatures at planting were also cold. When beginning to plant at the TRS we experienced snow flurries one morning. Following planting rains were intermittent throughout the season prior to bulking. Largely rainfall was insufficient during the bulking phase and did not increase until harvest. Throughout harvest rains delayed us one to two weeks with some trials, the adverse effects increasing incidence of soft rot and decreasing specific gravity across all plots at the TRS.

A. Yield Trials

1. On-Farm Trials

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

The marketable yields of the 12 clones in this trial were compared to Chieftain (323 cwt/a). One of the clones had significantly higher a marketable yield, Soraya (386 cwt/A). One other clone Strawberry Paw, (NY136), had an almost equal marketable yield of 324 cwt/A. One clone, NC201-1 had an overall appearance rating of 8 (better than good) and four clones: Augusta, Dark Red Chieftain, NC293-7 and Soraya had overall appearance ratings of 7 (good). None of the clones in this trial had incidence any internal defect greater than 10%. Other external defects observed in the trial were sunscald, misshapes, soft rot, silver scurf, growth cracks, common scab, secondary growth, heat sprouts and skin blemishes due to Rhizoctonia.

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

Atlantic, the standard, had a marketable yield of 269 cwt/a and five of the clones in the trial had greater marketable yields: Lamoka (299 cwt/a), Beacon Chipper (286 cwt/a), Accumulator (285 cwt/a), AF0338-17 (276 cwt/a) and NC182-5 (272 cwt/a), though none significantly greater for marketable yield. BNC182-5 (269 cwt/a) had an equal marketable yield. Atlantic had a gravity of 1.079, the only clone with an equal gravity was NC268-1. One clone, Andover had a chip score rating of 1 (exceptional) and three others: AF0338-17, NC0349-3 and NC182-5 had a chip score rating of 1.5 (excellent to exceptional). Five clones: AF0338-17, BNC182-5, Lamoka, NC0349-3 and NC182-5 had overall appearance scores of 7 (good). None of the clones had 10% or greater symptoms of internal heat necrosis (IHN), hollow heart (HH), or soft rot (SR). Lamoka expressed 28% vascular ring discoloration (VR). Atlantic expressed 18% brown center (BC). External defects observed in the trial were sunscald, growth cracks, skin blemishes due to Rhizoctonia, misshapes, common scab and heat sprouts.

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

Atlantic had a marketable yield of 255 cwt/a. Nine clones had greater marketable yields though only two clones: NY140 (352 cwt/a) and AF0338-17 (301 cwt/a) had a significantly greater marketable yield. Atlantic had a gravity of 1.079 and three clones had equal or greater gravities: Snowden (1.080), AF4157-6 (1.079) and NY148 (1.079). Nine clones: AF0338-17, Atlantic, CO03243-3W, MSL292-A, NY148, Snowden, W4980-1, W5955-1 and W6483-5 received a chip color rating of 1 (exceptional) in the 24 to 48 hour chip test. Three clones:

NY148, W4980-1 and W6483-1 received a chip score rating of 1.5 (excellent to exceptional) in the 5 to 7 day chip test. Three clones rated an 8 for overall appearance: AF0338-17, CO03243-3W and W4980-1. Four clones received an appearance rating of 7: AF4157-6, CO02321-4W, NY140 and W5955-1. Two clones expressed IHN at 10% or greater incidence: W4980-1 (14% with an heat necrosis rating (HNR) of 8.2) and CO00197-3W (10% with an HNR of 8.1). Two clones had BC at levels greater than 10% incidence: Atlantic (24%) and W6483-5 (20%). No other internal defects were observed at levels greater than 10%. Other external defects observed were: sunscald, misshapes, growth cracks, soft rot, heat sprouts 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). Two clones had marketable yields greater than Atlantic (321 cwt/a): Eva (335 cwt/a) and Accumulator (333 cwt/a) neither was significantly greater. Within the class of reds, none of the clones had higher marketable yields than Chieftain (279 cwt/a). Three yellow flesh clones had higher marketable yields than Yukon Gold (220 cwt/a): Augusta (294 cwt/a), Peter Wilcox (264 cwt/a) and Soraya (236 cwt/a). Clones with an overall appearance score of 7 were: Atlantics and Augusta. The specific gravity for Atlantic in this trial was 1.072 and the only other clone with an equal or greater specific gravity was NCB2645-11 (1.073). Four clones: Accumulator, NC247-11, NC268-1 and Snowden had a chip score rating of 1.5 (excellent to exceptional). Four clones had incidence of VR at 10% or greater levels: Dark Red Norland (18%), AF0338-17 (14%), Augusta (10%) and B2538-5 (10%). No other internal defects of 10% or greater incidence were recorded in this trial. Culls were primarily due to misshapes, common scab, soft rot, silver scurf, infected lenticels, sun scald, growth cracks, heat sprouts, Fusarium dry rot, and skin blemishes due to Rhizoctonia.

2. TRS/VGJREC Yield Trials

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

Atlantic had a marketable yield of 50 cwt/a. Fifteen of the eighteen clones in this trial had greater marketable yields and twelve of these were significantly greater than Atlantic. Atlantic had a gravity of 1.066 and one clone, NCB2901-3 had an equal specific gravity all others were lower. One clone, B2904-2 had a chip scores of 1 and eight clones had a chip score of 1.5: AF4421-4, AF4573-2, Atlantic, NC264-7, NCB2890-2, NCB2901-3, NCH6-10 and Snowden. One clone, B2904-1 had an overall appearance rating of 7. Two clones expressed VR at 10% or greater incidence: N2820-4 (18%) and Superior (43%). No other internal defects of 10% or greater incidence were recorded in this trial. Common external defects were misshapes, sunscald, soft rot, common scab, growth cracks, secondary growth and skin blemishes attributed to Rhizoctonia.

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

Of the twenty-four clones in this trial, twenty-one had higher average marketable yields higher than Atlantic (67 cwt/A) eight were statistically significant: B2876-7 (160 cwt/a), B2814-14 (155 cwt/a), AF4430-1 (133 cwt/a), AF4454-3 (121 cwt/a), AF5012-1 (120 cwt/a), AF4614-2 (118 cwt/a) and B2869-29 (111 cwt/a). Atlantic had a specific gravity of (1.069) and five clones had greater specific gravity: B2891-13 (1.079), Andover (1.074), B2834-8 (1.073), B2869-25 (1.071) and B2876-7 (1.070). Two clones: Andover and B2869-25 received a chip rating of 1.5. Two clones: B2814-14 and B2876-7 received an overall appearance score of 8 (better than good). Two clones: AF4430-1 and B2869-20 received an appearance score of 7. Two clones expressed IHN at levels equal to or greater than 10% incidence: B2908-3 (15% with an HNR of 7.5) and Atlantic (10% with an HNR of 6.5). Two clones expressed BC at levels greater than 10% incidence: B2908-3 (48%) and Superior (38%). No other internal defects were expressed at levels of 10% or greater. Common defects were misshapes, soft rot, sunscald, growth cracks, common scab, star cracking, infected lenticels, secondary growth, heat sprouts and skin blemishes attributed to Rhizoctonia.

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

Of the twenty four clones in this trial, fourteen had higher average marketable yields higher than Atlantic (66 cwt/A) and two were significantly greater: NC268-1 (121 cwt/a) and AF4220-4 (111 cwt/a). Atlantic had a specific gravity of (1.067) four clones had a greater gravity: B2833-16 (1.070), NC268-1 (1.070), B2833-8 (1.069) and B2872-9 (1.069). four clones: AF4386-16, Atlantic, B2833-16 and Snowden received a chip rating of 1.5. No internal defects were expressed at levels of 10% or greater. Common defects were misshapes, soft rot, sunscald, growth cracks, common scab, secondary growth, heat sprouts, infected lenticels and skin blemishes attributed to Rhizoctonia.

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

Four of 16 clones in this trial had greater marketable yield than Atlantic (151 cwt/A), though none were significantly higher. Atlantic had a specific gravity of 1.068 two clones had higher or equal gravities: NY150(NYF52-1) (1.069) and NY148(NYE106-4) (1.068). Three clones: AF4157-6, Atlantic and NY148(NYE106-4) received a chip rating of 1.5. One clone, BNC182-5, had overall appearance ratings of 8. Three clones had overall appearance ratings of 7: AF4138-8, Atlantic and NY150(NYF52-1). One clone expressed IHN at levels at 10% or greater incidence: Atlantic (13% with an HNR of 8.3). One clone expressed VR at 10% or greater incidence: AF4013-3 (10%). One clone expressed BC at 10% or greater incidence: Superior (18%). No other internal defects were expressed at levels of 10% or greater. The most common culls were misshapes, sunscald, soft rot, growth cracks, secondary growth, heat sprouts, common scab, star cracking and skin blemishes attributed to Rhizoctonia.

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

The standard, Chieftain, had a marketable yield of 156 cwt/a and all other clones had lower marketable yields. One clone, AF4550-2, received an overall appearance score of 7. One clone expressed IHN at levels at 10% or greater incidence: Chieftain (70% with an HNR of 7.1). No other internal defects were expressed at levels of 10% or greater. Culls were due mostly to misshapes, sunscald, soft rot, growth cracks, silver scurf, heat sprouts, secondary growth and skin blemishes attributed to Rhizoctonia.

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

The standard, Russet Norkotah 3117, had a marketable yield of 68 cwt/A. Of the seventeen clones in the trial five had higher marketable yields and three of those were significantly greater: AF4702-2 (128cwt/a) AF3001-6 (127 cwt/a) and AF4347-1 (102 cwt/a). Seven clones had an equal or higher specific gravity than Russet Norkotah 3117 (1.060): AF4172-2 (1.071), AF4788-1 (1.069), AF4532-9 (1.068), Dakota Trailblazer (1.066), AF4882-3 (1.063), AF4342-3 and Shepody (1.060). One clone AF4532-8 expressed SR at 10% incidence. No other internal defects were expressed at levels of 10% or greater. Culls were mostly soft rot, misshapes, sunscald, growth cracks, secondary growth, heat sprouts, enlarged lenticels and skin blemishes attributed to Rhizoctonia.

Low Input Trial. (Tables 11a and 11b)

This trial was established in response to cooperators request to evaluate several clones for nitrogen (N) response. Ten clones were planted under two rates of N one at 192 lbs/A and the other at 65 lbs/A, for a total of 20 plots per replication with four replications. The experimental design for this plot was a split plot design. Overall there was no statistical difference between rates on N in terms of yield or specific gravity. In terms internal defects, there was a tendency for clones with the low rate of N to express greater incidence of IHN. Nadine expressed 23% IHN with an HNR of 8.1, low N, and 5% with an HNR of 8.6. Argos: 15% IHN with an HNR of 7.9 (low N), 3% with and HNR of 8.8 (high N). Atlantic: 15% IHN with an HNR of 8.4 (low N), 3% with and HNR of 8.5 (high N). Soft rot also was more prevalent in the low N. In both cases (IHN and SR) this is likely attributable to environmental stress due to insufficient N. If interest exists among stakeholders we may repeat this test next year.

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 60-hill plot in year four for a final cycle of selection and then increased in a 160-hill plot the next year before entering into yield trials. Our single-hill materials have come from the USDA-ARS, Virginia Tech University and our own crosses made at the TRS. 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. Mini-tubers, which are planted in the field as single-hills, are generated in the TRS greenhouses. This year, 12,455 single-hills were planted and 324 clones were selected averaging a 2.6% selection rate.

In our second to fourth year selection plots out of the 334 clones planted in our 6-hill plots (Yr. 2), 95 (28%) were selected for future evaluation. While in the 20-hill plots (Yr. 3), 55 clones were planted with 24 (44%) being selected for further evaluation. In our 60-hill plots (Yr. 4), 10 clones were planted and 5 (50%) were selected.

Specialty Clone Evaluation

Each year our program plants at least one trial with specialty types. These are a loosely defined set of materials that have traits that place them into a niche market, such as tuber flesh color,

pigmentation around the eyes, or fingerling shapes. We begin selection at a 3-hill stage each year to give us a better look at these clones and typically only plant out around 50 to 60 tubers per family. After the first year of selection they are incorporated into our normal selection routine at the 6-hill stage. This year we evaluated 978 clones and selected 49 (5%). In addition to this we also conducted a small replicated trial (Table 12, Figure 1) with 20 clones from various breeding programs in the US (USDA-ARS Beltsville, University of Michigan, Texas A&M, Colorado State University, and materials of our own, as well as several released varieties). Yield data was taken but this plot was in an extremely wet location of the field and most of the plots had significant soft rot so we place little weight on the value of this data.

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 tuberosum*, *S. chacoense*, and *S. berthaultii*. 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 867 clones to evaluate resistance and selected 47 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, 36 of the 334 clones came from this CPB resistance project. From the 36 CPB clones, 7 were selected for advancement to the 20 hill selection plots and the next cycle of CPB resistance screening. Of the 55 clones in our 20 hill plots 17 clones were part of the CPB resistance screen and 8 of those were selected for advancement to the 60 hills. Of the 10 clones in this year's 60 hill plots 1 was a CPB clone and it was selected for further evaluation.

Early Generation Selection Trials

Early generation selection involves selection and evaluation of materials at early stages in the 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 313 ME clones and selected 23. These will be evaluated in 2013 in a non-replicated 28-hill plot in a yield trial.

Observational Trial.

Fifty-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 UME and is our 2nd opportunity to evaluate them. Last year we selected these clones in an 8-hill non-replicated format. 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. 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 342 clones. All were weighed for total yield, rated for the nine standard NE1231 external ratings, and specific gravities were measured. At our location we selected a total of 94 clones. Next year we will reevaluate these clones in our non-replicated 28-hill yield trial (Unreplicated trial).

Unreplicated Trial.

Fifty-six 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. 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 16 clones. We will evaluate these clones in a trial with two replications next year (2by20 Trial).

2by20 Trial.

Forty-seven 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. Out of the 47 in this trial we kept a total of 27 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. Creighton Miller, Texas A&M; 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 and Megan Gerritsen, Bridgewater 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, UTZ Quality Foods Inc and Real Potatoes Ltd. 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 105 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2013

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ² (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³
		cwt/A	%Chf.	1's	2's	3's	4's	5's	Culls			
Augusta	373	302	96	16	51	29	0	0	4	81	30	1.068
BNC201-1	320	274	86	9	40	45	1	0	6	86	46	1.079
Chieftain	389	323	100	16	59	24	1	0	1	83	24	1.061
Dark Red Chieftain	258	186	58	27	61	11	0	0	1	72	11	1.061
Dark Red Norland	346	297	94	12	61	25	0	0	2	86	25	1.059
NC201-1	282	152	48	43	53	2	0	0	2	54	2	1.065
NC293-7	380	191	60	48	48	2	0	0	2	50	2	1.063
ND8555-8R	343	214	67	37	58	4	0	0	1	62	4	1.064
Peter Wilcox	361	289	90	14	70	10	0	0	6	80	10	1.074
Soraya	509	386	121	22	73	3	0	0	2	75	3	1.055
Strawberry Paw(NY136)	374	324	101	12	56	30	0	0	1	86	30	1.064
Yukon Gold	253	215	68	11	44	40	1	0	4	85	42	1.078
Grand Mean	349	263										
CV(%)	7.9	11.8										
LSD (k=100)	35.1	40.8										

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 105 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2013

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
Augusta	5	9	8	5	7	8	6	7	5	8	5	9	7	5	8.5	0	0	0	0	GC,SS,SG,MS,2IHN(2-8)
BNC201-1	9	9	9	7	2	7	5	6	2	6	6	7	6	0	9	0	0	0	0	MS,RZ,SS
Chieftain	9	9	8	6	3	7	4	5	4	7	5	8	6	5	8.5	0	0	0	0	GC,RZ,SG,MS,HS,SS,2IHN(2-7)
Dark Red Chieftain	9	9	8	6	2	7	6	6	2	7	5	8	7	0	9	0	0	0	0	MS,RZ,SR
Dark Red Norland	5	9	8	3	2	7	5	5	5	8	5	9	5	0	9	0	0	0	0	RZ,SS,MS,GC
NC201-1	5	9	8	3	1	7	6	6	6	7	4	8	8	0	9	0	0	0	0	MS,SS,SISC,PTS
NC293-7	6	9	8	4	1	8	5	7	3	7	3	8	7	0	9	0	0	0	0	SISC,MS,RZ
ND8555-8R	9	9	7	6	2	8	5	5	2	7	4	8	6	0	9	0	0	0	0	SISC,MS,GC,SS,RZ
Peter Wilcox	6	9	8	4	1	7	6	5	5	8	6	8	5	0	9	0	0	0	0	SISC,MS,SS,PTS,RZ,YF2
Soraya	9	9	8	8	7	8	5	8	5	8	5	8	7	5	8.6	0	0	0	0	MS,RZ,SS,2IHN(1-8,1-7),YF2
Strawberry Paw(NY136)	9	9	8	7	2	7	6	5	3	8	6	8	6	0	9	0	0	0	0	MS,GC,SS,RZ
Yukon Gold	8	7	8	4	7	8	6	7	3	7	7	8	6	0	9	0	0	0	0	GC,SS,MS,CS,YF1

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 105 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2013

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ² (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³	Chip Color ⁴
				1's	2's	3's	4's	5's	Culls				
Accumulator	337	285	110	14	59	25	1	0	1	84	26	1.077	2
AF0338-17	316	276	106	11	44	43	0	0	2	87	43	1.072	1.5
Andover	254	173	66	26	64	4	0	0	5	68	4	1.074	1
Atlantic	340	269	100	13	54	24	0	0	8	79	24	1.079	2
Beacon Chipper	330	286	109	11	53	33	0	0	2	87	33	1.074	2
BNC182-5	348	269	100	22	63	14	0	0	1	77	14	1.072	3
Eva	317	257	96	4	39	41	0	0	15	80	41	1.063	3
Lamoka	345	299	115	9	56	30	0	0	5	87	30	1.068	2.5
NC0349-3	353	262	102	25	62	12	0	0	1	74	12	1.076	1.5
NC182-5	393	272	102	30	62	7	0	0	1	69	7	1.073	1.5
NC247-114	237	163	63	10	41	28	0	0	22	69	28	1.077	2
NC268-1	284	216	84	20	55	20	0	0	4	76	20	1.079	2
NCB2645-11	271	206	78	19	60	17	0	0	5	76	17	1.074	2
NCB2833-7	303	122	46	16	37	4	0	0	44	40	4	1.070	2
NCG84-1	144	78	30	25	42	13	0	0	20	55	13	1.073	2
Snowden	315	239	90	22	62	13	0	0	2	76	13	1.077	2.5
Grand Mean	304	230											
CV(%)	10.6	14.8											
LSD (k=100)	42.3	44.9											

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 105 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2013

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
Accumulator	9	9	8	8	6	6	5	5	2	5	4	8	4	0	9	0	0	0	0	CS,MS,GC,SS
AF0338-17	9	9	8	7	6	6	5	6	2	7	5	8	7	0	9	0	0	0	0	CS,SS,MS,RZ
Andover	8	8	8	4	6	5	6	7	4	8	3	6	5	0	9	0	5	0	0	GC,RZ,SS
Atlantic	6	9	8	5	6	5	6	5	3	7	6	6	6	0	9	0	0	18	0	RZ,SR,SS,MS
Beacon Chipper	9	9	8	6	6	6	5	6	3	7	6	8	6	0	9	0	0	0	0	MS,SS,HS,RZ
BNC182-5	9	9	8	8	6	5	8	5	1	6	3	9	7	0	9	0	0	0	0	SS
Eva	6	9	8	6	6	6	6	7	5	8	6	5	5	0	9	5	0	0	3	CS,GC,SS,SR,MS,RZ
Lamoka	9	9	7	7	9	7	6	6	5	8	6	9	7	0	9	0	28	0	0	SS,MS
NC0349-3	6	9	8	6	6	5	7	5	1	7	4	8	7	0	9	0	0	0	0	MS,SS,RZ
NC182-5	9	9	8	8	9	6	7	6	1	6	3	9	7	0	9	0	0	0	0	SS,MS
NC247-114	9	9	8	8	6	8	6	7	4	7	6	3	2	0	9	0	0	0	0	^RZ,^GC,SS,^MS
NC268-1	9	9	8	9	6	5	5	6	2	7	4	8	5	0	9	0	0	0	0	RZ,SS
NCB2645-11	5	9	8	5	6	6	6	7	3	8	5	8	6	0	9	0	0	0	0	SS,RZ
NCB2833-7	6	9	8	5	9	7	6	7	5	8	3	8	2	0	9	0	0	5	0	^GC
NCG84-1	7	6	8	6	6	5	5	7	3	8	2	7	4	0	9	0	0	0	0	SS,GC,RZ,MS
Snowden	9	7	8	7	5	5	6	5	2	6	4	8	5	0	9	0	0	0	0	GC,SS,MS,RZ

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 107DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2013

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ² (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³	Chip Color ⁴	
				1's	2's	3's	4's	5's	Culls				24 to 48 hrs	5 to 7 Days
A01143-3C	291	170	67	41	58	0	0	0	1	58	0	1.067	2	3
AF0338-17	361	301	118	15	60	24	0	0	1	83	24	1.072	1	3
AF4157-6	356	257	101	26	66	6	0	0	1	72	6	1.079	2	2
Atlantic	310	255	100	12	46	35	2	0	5	82	37	1.079	1	3
CO00197-3W	316	251	100	18	62	18	0	0	3	79	18	1.068	1.5	3
CO02321-4W	331	262	103	17	53	27	0	0	4	79	27	1.073	1.5	2
CO03243-3W	337	280	111	15	61	22	0	0	2	83	22	1.068	1	2.5
MSL007-B	254	170	68	32	64	3	0	0	1	67	3	1.074	1.5	2.5
MSL292-A	228	190	75	8	38	45	0	0	10	83	45	1.073	1	2
MSQ086-3	260	192	76	25	60	14	0	0	1	74	14	1.064	1.5	3
NY140	402	352	139	11	48	40	0	0	1	88	40	1.065	1.5	2.5
NY148	399	266	106	33	62	4	0	0	1	66	4	1.079	1	1.5
Snowden	316	230	91	26	67	6	0	0	1	73	6	1.080	1	3
W4980-1	327	258	102	19	66	13	0	0	2	79	13	1.073	1	1.5
W5955-1	308	259	102	14	54	30	0	0	2	84	30	1.068	1	2
W6483-5	330	281	111	8	37	48	0	0	7	85	48	1.063	1	1.5
W6609-3	302	227	89	23	60	16	0	0	1	75	16	1.072	1.5	2
Grand Mean	319	247												
CV(%)	7.14	10.36												
LSD (k=100)	26.06	29.45												

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 107 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2013

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
A01143-3C	9	9	9	9	6	6	7	5	1	6	3	9	5	0	9	0	0	0	0	HS,MS,DAE
AF0338-17	9	9	8	7	6	6	6	6	2	7	5	8	8	0	9	0	0	0	0	RZ,MS,SS
AF4157-6	6	9	8	4	6	7	5	7	2	7	4	8	7	0	9	0	2	0	0	MS,SS,RZ
Atlantic	6	9	8	5	6	5	6	5	3	7	6	7	6	2	8.8	0	0	24	0	MS,GC,SS,RZ,1INN(8)
CO00197-3W	9	9	7	8	9	8	4	7	4	8	5	9	4	10	8.1	2	0	0	0	SS,MS,HS,5IHN(1-8,2-7,2-6)
CO02321-4W	8	9	8	7	9	8	7	7	2	8	6	9	7	0	9	0	0	0	0	SS,MS
CO03243-3W	9	9	9	9	6	7	7	7	1	8	5	9	8	6	8.6	0	0	0	0	SS,MS,RZ,3IHN(1-8,1-7,1-6)
MSL007-B	8	9	8	7	5	5	6	6	2	8	3	8	6	0	9	0	0	0	0	RZ,SS,MS
MSL292-A	9	9	8	8	6	5	3	5	2	6	6	6	3	0	9	0	0	0	0	SS,MS,RZ
MSQ086-3	9	9	8	9	8	8	7	8	1	7	4	7	6	0	9	0	2	0	0	SS,MS,RZ
NY140	9	9	8	8	6	7	5	7	4	8	7	7	7	0	9	0	0	0	0	SS,SR
NY148	6	9	7	5	6	6	7	7	2	7	4	7	6	0	9	0	0	0	0	SS,~DSE
Snowden	9	8	7	7	5	5	7	6	2	6	5	8	6	0	9	0	0	0	0	SS,MS
W4980-1	6	9	8	5	5	5	7	7	3	6	6	8	8	14	8.15	0	0	0	2	^SS,SR,MS,6IHN(3-8,2-7,1-6)
W5955-1	9	9	7	9	5	5	7	7	7	7	7	6	7	0	9	0	0	2	0	PTS, SS, RZ
W6483-5	5	9	8	3	9	9	5	7	4	7	7	8	4	0	9	2	6	20	0	^PTS, MS, SS
W6609-3	8	9	8	7	6	6	7	7	2	7	6	7	6	0	9	0	0	0	0	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 (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 107 DAP¹ at Bright's Farm, Weeksville, Pasquotank Co., NC - 2013

Clone	Total Yield cwt/A	Marketable Yield				Size Distribution by Class ² (% of total yield)			Specific Gravity ³	Chip Color ⁴
		cwt/A	% Atl.	%Chf.	%Yuk	A's + B's	C's	Culls		
Accumulator(W2324-1)	372	333	105	120	154	90	9	2	1.064	1.5
AF0338-17	305	261	82	93	121	86	7	8	1.068	2
Atlantic	351	321	100	116	148	92	6	2	1.072	2
Augusta	393	294	93	107	138	75	20	6	1.064	.
B2538-5	303	264	83	96	124	87	6	7	1.062	.
Chieftain	369	279	89	100	130	76	12	12	1.056	.
Dark Red Chieftain	237	163	50	58	73	68	26	6	1.050	.
Dark Red Norland	274	195	62	71	92	71	17	12	1.049	.
Eva	389	335	105	122	155	87	3	10	1.063	3
NC0349-3	320	240	76	88	111	75	24	1	1.064	2
NC182-5	394	289	92	104	136	73	22	5	1.069	2.5
NC201-1	256	127	40	45	58	49	44	7	1.060	.
NC247-114	294	242	76	88	112	82	5	13	1.068	1.5
NC268-1	301	256	80	92	118	85	13	2	1.070	1.5
NC293-7	272	134	44	49	64	48	49	3	1.062	3
NCB2645-11	259	186	58	67	87	72	14	13	1.073	2
NCB2833-7	302	179	56	65	82	60	16	25	1.062	2
ND8555-8R	304	148	47	54	70	49	45	6	1.059	.
Peter Wilcox	344	264	82	95	120	77	19	4	1.068	.
Snowden	339	287	92	104	136	85	10	4	1.065	1.5
Soraya	430	236	74	85	108	55	32	13	1.048	.
Strawberry Paw(NY136)	345	264	82	97	123	75	10	15	1.053	.
Superior	278	225	72	82	106	81	13	6	1.065	3
Yukon Gold	253	220	69	79	100	87	6	7	1.065	.
Grand Mean	320	239								
CV(%)	14.6	17.0								
LSD (k=100)	66.0	54.2								

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 107 DAP¹ at Bright's Farm, Weeksville, Pasquotank Co., NC – 2013

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
Accumulator(W2324-1)	9	8	9	7	6	6	5	7	2	7	7	9	5	0	9	0	3	0	0	RZ,lumpy,MS
AF0338-17	9	9	9	7	6	5	7	6	2	7	7	8	6	0	9	0	13	0	0	FS,GC,MS,RZ,CS,SR
Atlantic	6	9	8	5	6	5	6	5	3	7	6	8	7	3	8	0	3	0	0	MS,SR,SS,FS,1IHN(5)
Augusta	6	9	9	5	7	8	6	7	4	8	5	8	7	3	8.5	0	10	0	0	SS,HS,MS,SR,GC,RZ,1IHN(7)
B2538-5	7	9	9	5	1	7	5	7	5	7	6	8	5	0	9	0	10	0	0	SR,SS,knobs,HS,MS,SISC
Chieftain	9	9	8	6	3	7	6	5	3	7	6	7	5	5	8.5	0	0	0	0	RZ,MS,SR,HS,SS,2IHN(2-7)
Dark Red Chieftain	9	9	8	8	2	7	6	7	2	8	4	8	6	0	9	0	8	0	0	SR,RZ,SS,SISC
Dark Red Norland	5	9	9	3	2	7	6	7	3	8	4	8	4	0	9	0	18	0	0	MS,SISC,SS,HS,SR
Eva	9	9	7	6	6	6	7	6	3	8	8	8	5	0	9	0	0	0	0	CS,GC,SR,IL,SS,MS
NC0349-3	8	9	9	6	6	5	7	6	2	7	4	8	6	0	9	0	0	0	0	knobs,HS,RZ,GC,FS,SR
NC182-5	7	9	8	8	6	5	7	6	1	8	4	8	6	0	9	0	0	0	0	FS,MS,SS,SR
NC201-1	5	9	9	3	1	7	6	7	6	8	6	6	6	0	9	0	0	0	0	SISC,MS,SS,YF2
NC247-114	9	9	8	8	6	6	6	5	4	7	7	8	5	0	9	0	0	0	0	GC,MS,IL,SS
NC268-1	8	9	9	8	6	6	6	6	2	7	5	8	5	0	9	0	0	0	0	FS,MS,SR
NC293-7	6	9	9	4	1	7	4	7	3	7	3	8	6	0	9	0	0	0	3	SR,HS,knobs,MS,SISC
NCB2645-11	5	9	9	4	6	6	7	7	3	8	5	6	5	0	9	0	0	0	0	FS,SR,RZ,SS,MS
NCB2833-7	5	9	9	4	6	6	7	6	3	7	5	8	3	0	9	0	0	3	0	^GC,MS,SR,SS
ND8555-8R	8	9	9	7	2	8	6	7	3	7	4	8	6	0	9	0	0	0	5	SR,SS,SISC,RZ,HS,MS,FS
Peter Wilcox	5	9	9	4	1	7	6	7	5	8	5	8	6	0	9	0	0	0	0	MS,HS,SISC,YF2
Snowden	9	8	8	7	5	5	6	6	2	6	4	8	5	0	9	0	0	0	0	MS,CS,RZ,STST,DAE,DSE
Soraya	9	9	9	7	7	8	6	7	6	8	4	8	5	0	9	0	3	0	0	^HS,MS,YF2
Strawberry Paw(NY136)	9	9	9	8	2	7	7	5	4	7	8	8	5	0	9	0	0	0	0	MS,HS,AC,SR,SISC
Superior	5	9	9	4	6	6	5	7	3	7	5	8	5	0	9	0	3	3	3	SR,CS,RZ,FS
Yukon Gold	8	8	8	5	7	8	7	7	4	8	6	7	6	0	9	0	3	0	0	HS,MS,SS,SR,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 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 115 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ² (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³	Chip Color ⁴
				1's	2's	3's	4's	5's	Culls				
AF4376-3	163	137	294	11	56	28	0	0	4	84	28	1.049	2
AF4421-4	134	85	186	34	62	2	0	0	2	64	2	1.060	1.5
AF4552-5	138	107	240	20	66	12	0	0	2	78	12	1.065	2
AF4573-2	116	93	210	17	67	13	0	0	3	80	13	1.056	1.5
AF4640-1	151	123	263	17	62	19	0	0	3	81	19	1.052	2
Atlantic	61	50	100	13	50	33	0	0	4	83	33	1.066	1.5
B2820-4	160	65	138	57	40	0	0	0	2	41	0	1.063	2
B2890-11	112	90	208	14	60	20	0	0	5	81	20	1.058	2.5
B2904-2	138	98	213	28	63	8	0	0	1	71	8	1.058	1
NC264-7	267	205	451	14	53	24	0	0	9	77	24	1.060	1.5
NCB2890-2	110	67	157	37	55	6	0	0	3	61	6	1.058	1.5
NCB2901-3	98	41	91	56	41	2	0	0	2	42	2	1.066	1.5
NCH4-3	137	86	195	35	60	3	0	0	3	63	3	1.062	2
NCH6-10	132	94	206	23	61	11	0	0	6	71	11	1.062	1.5
NCH6-4	134	98	227	22	64	9	0	0	5	73	9	1.062	2
Snowden	154	104	233	26	61	5	0	0	7	66	5	1.064	1.5
Superior	118	75	153	33	59	4	0	0	4	63	4	1.062	2.5
Yukon Gold	85	46	114	32	44	10	0	0	14	54	10	1.061	.
Grand Mean	134	93											
CV(%)	17.4	23.4											
LSD (k=100)	30.6	28.5											

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 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 115 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
AF4376-3	7	9	8	8	6	5	5	5	3	6	5	9	5	0	9	0	0	0	0	SS,MS,GC
AF4421-4	6	9	7	4	5	5	7	7	2	7	3	8	6	0	9	0	0	0	0	GC,MS,SR,SS
AF4552-5	9	9	8	5	6	6	7	6	1	6	5	8	6	0	9	0	0	0	0	MS,SR
AF4573-2	8	9	8	7	9	6	5	7	3	8	5	7	4	0	9	0	0	0	0	STST,RZ,SS,MS,SG,SR
AF4640-1	8	9	8	8	6	5	6	6	2	8	4	8	6	0	9	0	0	0	0	MS(PARS),SS,CS
Atlantic	5	9	8	5	5	5	6	5	3	7	7	8	6	0	9	0	0	0	0	SS,SR,CS,RZ,GC
B2820-4	9	9	7	5	9	7	7	7	2	7	2	8	6	0	9	0	18	0	0	SR,GC,RZ,SS
B2890-11	7	9	7	4	5	6	5	7	3	8	4	8	6	0	9	0	0	0	3	SR,SS,GC,MS
B2904-2	8	9	8	6	5	5	7	6	2	6	5	8	7	0	9	0	0	0	0	SS,SR,SG
NC264-7	9	9	9	9	9	7	6	5	4	8	6	7	4	0	9	0	0	0	0	GC,^CS,MS,SS,SR
NCB2890-2	6	9	8	5	6	5	7	7	3	8	4	8	5	0	9	0	0	0	0	MS,SS,CS
NCB2901-3	6	9	8	5	6	6	7	7	1	7	2	8	5	0	9	0	0	0	0	SR,SS,MS,GC
NCH4-3	9	9	8	5	9	6	5	6	3	7	3	9	5	3	8.8	0	0	0	0	MS,SS,1IHN(8)
NCH6-10	6	9	8	5	5	6	5	6	4	7	5	8	5	0	9	0	0	0	0	MS,SS,SR,GC,FLATS
NCH6-4	7	9	8	6	6	5	6	6	5	7	5	8	5	0	9	0	0	0	0	SR,SS,GC,MS(PARS)
Snowden	9	9	7	7	5	5	6	6	2	6	5	7	4	0	9	0	0	0	0	CS,SR,MS
Superior	5	9	7	3	6	6	4	7	3	7	4	7	4	0	9	3	43	0	0	CS,SS,MS,SR
Yukon Gold	8	9	7	4	7	7	6	7	3	7	5	7	6	0	9	0	0	0	0	SR,SS,CS,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 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 112 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ² (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³	Chip Color ⁴
				1's	2's	3's	4's	5's	Culls				
AF4138-8	162	116	176	27	68	3	0	0	2	71	3	1.057	2
AF4430-1	182	133	202	27	63	9	0	0	0	73	9	1.052	3
AF4454-3	163	121	190	21	65	10	0	0	4	74	10	1.054	2
AF4614-2	156	118	180	21	71	5	0	0	3	76	5	1.062	3
AF4838-1	103	57	87	37	50	6	0	0	7	56	6	1.067	2.5
AF4885-1	142	87	133	38	59	2	0	0	1	61	2	1.068	3
AF4917-3	187	109	170	40	56	2	0	0	2	58	2	1.057	2
AF4920-3	110	77	117	29	68	0	0	0	2	69	0	1.068	2
AF5012-1	169	120	181	20	63	8	0	0	9	71	8	1.058	2
Andover	122	80	121	31	64	2	0	0	3	65	2	1.074	1.5
Atlantic	80	67	100	13	46	38	0	0	3	85	38	1.069	2
B2814-14	197	155	223	23	58	18	0	0	1	76	18	1.059	2
B2817-2	154	75	118	48	48	1	0	0	3	48	1	1.066	3.5
B2834-8	126	93	139	24	69	5	0	0	2	74	5	1.073	2
B2869-20	141	105	161	23	64	11	0	0	2	75	11	1.068	2
B2869-25	96	52	81	42	53	1	0	0	4	54	1	1.071	1.5
B2869-28	90	68	102	19	52	25	0	0	3	77	25	1.052	2.5
B2869-29	137	111	172	16	61	22	0	0	2	82	22	1.066	2
B2876-7	195	160	247	17	69	13	0	0	2	82	13	1.070	2
B2883-2	132	92	144	25	59	10	0	0	6	69	10	1.065	2
B2891-13	147	80	125	45	54	0	0	0	1	54	0	1.079	2
B2908-3	131	99	151	20	71	4	0	0	5	75	4	1.064	2
Superior	134	87	132	27	61	4	0	0	8	65	4	1.067	3
Yukon Gold	111	89	137	14	65	16	0	0	6	80	16	1.069	.
Grand Mean	140	98											
CV(%)	23.9	29.8											
LSD (k=100)	49.5	43.5											

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 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 112 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
AF4138-8	6	9	8	5	6	5	6	7	2	6	5	7	6	0	9	0	0	0	0	SR,MS
AF4430-1	9	9	7	5	6	5	6	7	2	7	7	8	7	5	8.8	0	0	0	5	2IHN(2-8)
AF4454-3	6	9	8	5	6	5	6	7	3	7	7	8	6	0	9	0	0	0	3	SR,RZ,SC
AF4614-2	8	9	7	5	9	6	6	7	2	7	5	6	5	0	9	0	0	0	3	SR,MS
AF4838-1	6	9	7	5	9	7	7	7	2	6	6	7	4	0	9	0	0	0	8	SR,MS
AF4885-1	6	9	9	6	6	5	7	7	7	3	3	7	4	0	9	0	3	0	0	MS,SR,
AF4917-3	7	9	8	5	6	5	7	7	2	7	3	7	6	0	9	0	0	0	0	SR,IL
AF4920-3	8	9	8	6	6	5	6	7	2	6	4	8	5	0	9	0	0	0	0	MS
AF5012-1	6	9	8	6	5	5	7	7	2	7	5	6	5	0	9	0	0	0	3	MS,SR, SG
Andover	8	9	8	4	6	5	6	7	3	7	4	6	6	0	9	0	0	0	5	SR,MS
Atlantic	6	9	8	5	6	5	7	7	2	6	7	6	6	10	6.5	0	0	3	3	MS,SR,GC,4IHN(1-8,1-7,1-6,1-5)
B2814-14	5	9	7	4	5	5	7	7	2	6	6	8	8	0	9	0	0	0	0	SR
B2817-2	7	9	7	4	5	5	6	7	2	7	3	8	5	0	9	0	0	0	0	HS,SR,SS
B2834-8	7	9	8	4	6	5	7	7	2	6	5	7	6	0	9	0	0	0	3	SR
B2869-20	9	9	8	5	6	5	7	7	2	7	5	8	7	0	9	0	0	0	0	SG,MS,SR
B2869-25	5	9	8	5	6	6	6	7	3	7	3	7	4	0	9	0	0	0	0	MS,SR,SS,GC
B2869-28	5	9	8	5	9	7	7	7	2	6	6	8	6	0	9	0	0	0	0	SG,SR,GC
B2869-29	5	9	8	5	6	7	4	7	3	7	6	7	5	0	9	0	0	0	0	SR
B2876-7	6	9	8	5	6	6	5	7	4	8	7	7	8	0	9	0	0	0	0	SS,SR
B2883-2	7	9	8	4	6	6	7	7	2	6	6	7	6	0	9	0	0	3	5	SR,MS
B2891-13	8	9	8	5	6	5	6	5	2	7	3	8	4	0	9	0	0	0	0	SR,MS,LUMPY
B2908-3	9	9	9	6	6	6	6	6	4	8	4	8	5	15	7.5	3	0	48	0	GC,RZ,SR,SS,6IHN(4-8,1-7,1-5)
Superior	5	9	8	4	6	6	5	7	3	6	4	6	4	0	9	0	0	38	0	MS,CS,SR,RZ
Yukon Gold	8	9	8	5	7	8	6	7	3	7	5	8	6	0	9	0	0	0	0	SR,MS,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 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 120 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ² (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³	Chip Color ⁴
				1's	2's	3's	4's	5's	Culls				
AF4220-4	147	111	181	13	41	33	2	0	12	75	35	1.058	3.5
AF4227-2	108	64	101	31	59	1	0	0	9	60	1	1.047	2.5
AF4386-16	126	64	107	42	51	0	0	0	7	51	0	1.063	1.5
AF4442-4	106	65	97	31	59	1	0	0	9	60	1	1.051	2
AF4463-8	115	83	134	16	51	20	0	0	12	72	20	1.050	2
AF4730-2	100	74	116	20	65	10	0	0	5	75	10	1.060	2
AF4852-2	96	37	64	23	33	6	0	0	38	39	6	1.042	3
AF4852-4	94	37	54	24	36	1	0	0	39	37	1	1.042	3
AF4914-4	93	32	50	22	29	5	0	0	44	33	5	1.048	3.5
AF4983-1	91	67	108	17	59	14	0	0	10	73	14	1.051	2
Atlantic	86	66	100	16	60	16	0	0	8	75	16	1.067	1.5
B2833-16	112	76	121	28	64	4	0	0	4	68	4	1.070	1.5
B2833-8	97	43	75	53	44	1	0	0	2	44	1	1.069	2
B2869-15	88	67	106	18	62	13	0	0	7	75	13	1.062	3
B2872-9	102	74	121	24	64	9	0	0	3	73	9	1.069	3.5
B2882-4	95	77	126	11	47	33	1	0	9	81	34	1.057	2
B2883-12	130	80	129	20	56	5	0	0	18	62	5	1.066	2
B2895-8	113	58	104	31	50	1	0	0	18	51	1	1.065	2.5
B2903-2	116	77	118	25	57	8	0	0	10	65	8	1.061	2
BNC266-6	205	86	132	10	50	7	0	0	33	57	7	1.063	2
NC268-1	167	121	188	24	58	14	0	0	4	72	14	1.070	2
Snowden	129	83	138	32	47	9	0	0	11	57	9	1.063	1.5
Soraya	133	87	129	29	63	1	0	0	7	64	1	1.045	3.5
Yukon Gold	93	65	111	21	50	16	0	0	12	66	16	1.064	.
Grand Mean	114	71											
CV(%)	35.0	32.4											
LSD (k=100)	51.8	34.9											

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 120 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHF	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
AF4220-4	6	9	8	6	6	5	5	7	2	7	5	6	5	5	8	0	0	3	0	SR,SG,MS,SS,2IHN(2-7)
AF4227-2	8	9	8	8	6	5	6	7	2	7	3	7	4	0	9	0	0	0	0	SR,STST,MS
AF4386-16	7	9	8	6	5	5	7	7	2	8	3	6	4	0	9	0	0	0	0	SS,SR,MS
AF4442-4	8	9	8	7	6	5	7	7	2	7	3	6	4	0	9	0	0	0	0	SR
AF4463-8	8	9	8	8	6	5	6	7	2	7	6	5	3	0	9	0	0	0	3	SR,SS,MS
AF4730-2	8	9	8	8	6	5	6	7	2	7	4	7	4	0	9	0	0	0	0	SR,GC,RZ,CS
AF4852-2	9	9	8	8	9	7	6	7	2	7	3	8	2	0	9	0	3	0	3	CS,SR,SS,^SG,HS,GC
AF4852-4	9	9	7	8	6	6	6	7	2	6	4	7	2	0	9	0	5	0	5	^SG,CS,RZ,MS,IL
AF4914-4	9	9	9	9	9	6	5	7	3	6	4	3	1	0	9	3	0	0	8	^SR,SG
AF4983-1	8	9	8	6	9	7	6	7	3	6	5	6	5	0	9	3	0	0	5	DAE,DSE,SR
Atlantic	5	9	7	5	6	5	6	7	2	7	5	7	6	3	8.8	0	3	0	3	SR,CS,1IHN(8)
B2833-16	7	9	7	5	5	5	6	7	2	7	4	7	5	0	9	0	0	0	3	EL,CS,SG,SR,SS
B2833-8	5	9	7	5	6	6	6	7	2	7	3	8	5	0	9	0	0	0	0	SR,SS,DAE
B2869-15	7	9	8	7	6	6	6	7	2	7	5	8	6	0	9	0	0	0	0	SR,HS,SS
B2872-9	6	9	8	7	6	5	6	6	3	7	4	8	5	0	9	0	3	0	0	SR
B2882-4	8	9	8	7	6	6	6	7	3	7	5	7	5	0	9	0	0	0	0	^GC,SR
B2883-12	6	9	9	8	6	5	7	7	3	7	4	4	2	0	9	0	0	0	3	^SR,SS,EL
B2895-8	7	9	8	8	6	5	7	7	2	7	4	4	2	0	9	0	0	0	0	^^SR,IL
B2903-2	6	9	8	8	6	5	6	7	2	7	5	6	5	0	9	0	0	0	0	SR,SS
BNC266-6	9	9	8	9	6	5	6	7	2	6	5	8	4	5	8.5	0	0	0	0	SR,^SG,2IHN(2-7)
NC268-1	6	9	9	9	6	5	6	7	2	6	5	7	5	0	9	0	0	0	0	SR,MS,SS
Snowden	9	9	7	7	5	5	5	7	2	5	4	6	5	0	9	0	0	0	3	^CS,SS
Soraya	7	9	7	7	7	7	6	7	5	8	4	8	5	0	9	0	0	0	0	SR,HS,MS(KNOBS),YF2
Yukon Gold	8	9	7	4	7	7	6	7	3	7	5	7	5	0	9	0	0	3	3	SS,CS,^SR,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 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 111 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ² (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³	Chip Color ⁴
				1's	2's	3's	4's	5's	Culls				
AF0338-17	149	112	77	20	58	17	0	0	6	75	17	1.066	2
AF4013-3	156	113	75	22	69	3	0	0	5	73	3	1.066	2
AF4138-8	189	143	95	23	70	6	0	0	2	75	6	1.053	2
AF4157-6	140	85	57	35	60	1	0	0	3	61	1	1.065	1.5
Atlantic	180	151	100	14	74	10	0	0	3	84	10	1.068	1.5
B2833-16	142	100	67	27	67	3	0	0	3	70	3	1.075	2
BNC182-5	223	166	112	25	70	5	0	0	1	74	5	1.067	2
Dakota Crisp	210	162	112	18	60	17	0	0	5	77	17	1.060	2
Katahdin	131	94	63	26	68	4	0	0	3	72	4	1.051	2.5
Kennebec	108	72	49	17	60	7	0	0	16	67	7	1.053	3
NY148 (NYE106-4)	206	154	104	18	70	5	0	0	7	75	5	1.068	1.5
NY150 (NYF52-1)	146	37	25	73	25	0	0	0	2	25	0	1.069	2
Rochdale Gold-Doree	167	125	84	20	62	12	0	0	6	74	12	1.059	.
Snowden	205	142	96	29	62	6	1	0	2	69	7	1.067	2
Superior	118	80	53	26	65	2	0	0	7	68	2	1.065	2.5
Yukon Gold	102	85	56	12	56	26	0	0	6	82	26	1.062	.
Grand Mean	161	114											
CV(%)	15.2	20.4											
LSD (k=100)	32.9	31.0											

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.

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 111 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
AF0338-17	6	9	8	7	6	5	6	6	3	8	6	6	6	0	9	0	0	0	0	^SC,SR
AF4013-3	6	9	8	6	7	7	6	6	4	7	5	7	4	0	9	0	10	0	0	SG,SR,SC,HS,SC,YF1
AF4138-8	6	9	8	5	6	5	7	7	1	7	4	8	7	0	9	0	0	0	3	SR
AF4157-6	6	9	8	5	6	6	7	7	1	7	4	8	6	0	9	3	8	0	3	SG,SR,GC
Atlantic	6	9	8	5	6	5	6	6	3	7	6	7	7	13	8.3	3	0	3	5	SR,CS,5IHN(5-8)
B2833-16	7	9	7	5	6	6	7	6	2	7	5	7	6	0	9	0	5	3	3	SR,MS
BNC182-5	6	9	9	8	6	5	7	6	1	7	6	8	8	0	9	0	0	0	3	SS,SR
Dakota Crisp	6	9	9	6	6	6	6	7	2	8	5	8	5	0	9	0	0	3	3	MS,SR,SS
Katahdin	7	9	8	6	9	8	5	7	3	7	4	8	6	0	9	0	8	0	0	SR,MS,SS
Kennebec	9	9	8	8	8	8	4	7	7	6	6	8	2	0	9	0	3	0	5	MS,SG,SR,SS,RZ
NY148 (NYE106-4)	7	9	8	7	6	5	7	6	2	7	5	6	5	0	9	0	0	0	5	^SR,SS,MS
NY150 (NYF52-1)	8	9	8	5	8	8	7	7	1	7	2	8	7	0	9	0	3	0	0	SR,SS
Rochdale Gold-Doree	9	9	8	6	7	6	6	7	2	7	6	8	5	0	9	0	0	0	0	SG,SR,SS,MS,YF1
Snowden	9	9	8	7	5	5	6	6	2	5	5	8	6	0	9	0	0	0	0	SR,MS,SS,DAE,DSE
Superior	5	9	8	4	6	7	5	7	3	7	5	7	4	0	9	0	0	18	0	MS,CS,SR,SS
Yukon Gold	8	9	8	5	7	7	6	7	3	8	6	8	6	0	9	0	3	0	0	SR,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 9a. NE-1031 Red Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 111 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC – 2013

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Chieftain	Size Dist. by Class (%) ² (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³
				1's	2's	3's	4's	5's	Cull's			
AF4550-2	144	74	50	49	49	1	0	0	1	50	1	1.067
AF4565-1	114	71	45	36	56	3	0	0	5	59	3	1.055
AF4566-4	136	81	53	36	53	5	0	0	5	58	5	1.059
AF4815-1	164	120	79	23	66	8	0	0	4	73	8	1.052
AF4831-2	172	92	61	45	51	2	0	0	1	53	2	1.049
AF4831-3	148	108	71	20	62	10	0	0	7	72	10	1.048
AF4841-1	124	48	32	53	39	0	0	0	8	40	0	1.056
AF4845-3	138	100	66	23	57	13	0	0	7	69	13	1.044
AF4963-5	184	129	85	25	60	11	0	0	4	70	11	1.042
AF4985-1	166	135	89	16	63	19	0	0	3	82	19	1.053
B2676-2	118	57	36	48	47	0	0	0	4	48	0	1.066
Chieftain	197	156	100	16	59	20	0	0	5	79	20	1.052
Dark Red Chieftain	108	79	53	23	67	6	0	0	3	74	6	1.049
Dark Red Norland	139	104	65	19	63	12	0	0	6	75	12	1.053
Strawberry Paw(NY136)	149	108	68	21	60	10	0	0	10	70	10	1.053
Grand Mean	147	97										
CV(%)	26.6	33.5										
LSD (k=100)	59.0	50.6										

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 111 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
AF4550-2	6	9	7	3	1	7	6	6	2	7	3	8	7	0	9	0	0	0	0	SR,FS,MS,EL
AF4565-1	7	9	7	6	3	8	6	5	3	7	4	8	5	0	9	0	3	0	3	SR,MS,LUMPY,GC
AF4566-4	6	9	8	4	2	8	7	6	2	6	3	8	6	0	9	0	0	0	8	SR,SG,MS
AF4815-1	5	9	7	4	2	7	7	6	4	7	5	8	6	0	9	0	0	0	0	SR,MS,PEARS
AF4831-2	9	9	8	5	2	7	7	6	5	8	3	8	6	5	8.8	0	0	0	0	SS,SR,MS,2IHN(1-8,1-7)
AF4831-3	6	9	8	6	2	7	7	4	3	7	5	8	4	0	9	0	0	0	0	SR,MS,RZ,GC,SISC,SG,SS
AF4841-1	7	9	7	3	3	8	5	7	1	8	2	8	4	0	9	0	0	0	0	^SG,MS,SR,SS
AF4845-3	8	9	8	5	2	7	6	6	5	8	6	6	4	0	9	0	0	0	5	^SR,MS,GC
AF4963-5	7	9	8	5	3	7	7	6	3	7	5	8	4	0	9	0	0	0	5	SR,RZ,GC,SG,MS
AF4985-1	8	9	8	5	2	7	6	6	2	7	5	8	5	0	9	0	0	3	0	STST,SG,SR,SISC,MS
B2676-2	6	9	7	5	3	6	6	7	5	8	3	8	4	0	9	0	0	0	0	SR,MS(KNOBS)
Chieftain	9	9	8	6	3	6	6	5	3	7	6	8	4	70	7.1	0	0	0	0	SG,SS,SR,28IHN(12-8,8-7,6-6,2-5)
Dark Red Chieftain	9	9	8	7	2	6	7	7	2	7	5	8	5	0	9	0	0	0	0	STST,RZ,GC,MS,SR
Dark Red Norland	5	9	7	3	3	7	6	7	4	8	5	7	3	0	9	0	0	0	0	SR,RZ,SG,MS,SS,GC
Strawberry Paw(NY136)	9	9	8	6	2	7	6	5	4	8	7	9	6	0	9	0	0	0	0	MS,SS,RZ,SR,GC

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 120 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% R.Nor	Size Distribution by Class ² (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³
				1's	2's	3's	4's	5's	Culls			
AF3001-6	166	127	197	8	65	11	0	0	17	76	11	1.051
AF3362-1	105	61	93	25	51	2	0	0	22	53	2	1.046
AF4124-7	114	59	89	15	47	5	0	0	34	51	5	1.054
AF4172-2	95	40	58	54	41	0	0	0	6	41	0	1.071
AF4320-17	93	64	94	26	67	1	0	0	6	68	1	1.057
AF4342-3	75	54	83	8	60	11	0	0	20	72	11	1.061
AF4347-1	136	102	150	13	72	2	0	0	13	74	2	1.055
AF4445-3	39	27	39	21	50	8	0	0	21	59	8	1.049
AF4532-8	86	57	83	19	64	0	0	0	16	65	0	1.055
AF4532-9	84	45	65	37	53	2	0	0	7	55	2	1.068
AF4702-2	158	128	192	14	68	13	0	0	5	81	13	1.057
AF4788-1	104	70	108	28	67	1	0	0	4	68	1	1.069
AF4882-3	82	30	46	51	37	0	0	0	12	37	0	1.063
Dakota Trailblazer	105	86	131	8	74	8	0	0	10	82	8	1.066
Russet Burbank (#400)	111	37	56	15	33	0	0	0	52	33	0	1.048
Russet Norkotah 3117	102	68	100	28	66	0	0	0	7	66	0	1.060
Shepody	93	45	64	11	44	2	0	0	44	45	2	1.060
Grand Mean	103	65										
CV(%)	26.1	37.0										
LSD (k=100)	38.5	33.1										

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 120 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
AF3001-6	9	9	8	8	6	5	5	5	8	7	7	5	4	0	9	0	0	0	3	^SR,MS,RZ,EL
AF3362-1	9	9	8	8	6	5	6	6	6	7	5	6	4	3	8.5	0	8	0	5	SR,SG,MS,1IHN(7)
AF4124-7	8	9	8	8	6	5	5	7	7	8	5	4	2	0	9	0	0	0	0	^SG,MS,^SR
AF4172-2	6	9	8	6	6	7	5	7	5	8	3	6	5	0	9	0	0	0	3	SR,EL,YF1
AF4320-17	7	9	8	7	5	4	5	7	5	8	4	7	4	0	9	3	0	0	5	HS,SG,SR,EL
AF4342-3	9	9	8	9	6	4	4	6	4	7	5	6	2	0	9	0	0	0	0	MS,SG,SR
AF4347-1	9	9	8	8	5	4	6	7	7	7	6	6	3	0	9	0	0	0	0	EL,^SR,^SG,MS,HS
AF4445-3	8	9	9	8	5	4	6	5	5	8	4	6	4	0	9	0	3	0	5	SR,SG,MS,EL
AF4532-8	8	9	8	7	6	4	7	7	6	8	5	7	5	0	9	0	0	0	15	SR,EL
AF4532-9	8	9	8	8	6	4	7	5	6	7	3	8	5	0	9	0	0	0	3	SR,EL,GC
AF4702-2	7	9	8	8	6	5	6	7	4	8	6	8	6	0	9	0	3	0	0	SR,SS,MS,GC
AF4788-1	9	9	8	7	5	4	4	7	6	7	5	8	5	0	9	3	0	0	3	SR,MS,EL,SS
AF4882-3	9	9	8	6	6	5	5	7	5	7	3	7	4	0	9	0	0	0	0	SR,EL,RZ
Dakota Trailblazer	9	9	9	9	5	4	5	6	5	8	6	7	4	3	8.8	0	0	0	3	GC,EL,MS,RZ,SR,1IHN(8)
Russet Burbank (#400)	9	9	8	8	5	4	5	6	7	6	4	7	1	3	8.5	0	0	0	5	SR,^SG,HS,MS,1IHN(7)
Russet Norkotah 3117	6	9	8	6	4	3	5	7	6	7	4	8	6	0	9	0	0	0	0	SR,MS,EL,SS
Shepody	8	9	8	8	9	6	5	7	6	7	6	4	2	0	9	0	3	0	3	^SR,EL

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 11a. Low Input Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 126 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	N+/-	Total Yield cwt/A	Marketable Yield cwt/A	% Atl	Size Distribution by Class ² (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³
					1's	2's	3's	4's	5's	Culls			
Accumulator	N+	265	232	210	10	46	40	1	0	4	87	40	1.064
Accumulator	N-	218	188	173	10	38	48	1	0	3	87	49	1.066
AF0338-17	N+	183	151	120	11	50	32	0	0	6	82	32	1.062
AF0338-17	N-	147	117	106	8	42	38	0	0	12	80	38	1.063
Argos	N+	226	193	148	6	36	47	1	0	9	84	48	1.043
Argos	N-	139	98	88	9	35	34	0	0	22	69	34	1.039
Atlantic	N+	165	135	100	15	69	12	0	0	4	81	12	1.069
Atlantic	N-	139	111	100	16	64	15	0	0	4	80	15	1.068
La Norma	N+	162	141	111	8	44	43	0	0	6	87	43	1.047
La Norma	N-	140	119	109	7	49	36	0	0	8	85	36	1.045
Nadine	N+	96	54	53	31	51	0	0	0	18	51	0	1.047
Nadine	N-	101	57	52	35	54	1	0	0	9	55	1	1.048
NC182-5	N+	249	191	146	21	64	12	0	0	3	76	12	1.063
NC182-5	N-	176	114	109	36	56	6	0	0	1	62	6	1.065
NC268-1	N+	149	122	103	15	54	29	0	0	2	82	29	1.072
NC268-1	N-	156	115	106	23	59	15	0	0	3	74	15	1.074
Soraya	N+	312	261	203	14	71	12	0	0	3	83	12	1.049
Soraya	N-	195	135	121	27	65	4	0	0	4	69	4	1.048
Yukon Gold	N+	116	80	56	10	39	28	0	0	23	67	28	1.068
Yukon Gold	N-	87	63	55	9	40	30	0	0	20	70	30	1.065
Grand Mean		171	134										

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 11b. Low Input 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 126 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	N+/-	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
		TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
Accumulator	N+	8	9	8	6	6	5	5	7	2	6	6	8	6	0	9	0	0	0	0	SS,CS,RZ,MS
Accumulator	N-	8	9	8	7	6	5	5	7	2	7	6	7	7	0	9	0	0	0	0	CS
AF0338-17	N+	8	9	8	7	6	6	5	7	2	7	6	6	6	0	9	0	0	0	3	CS,SS,SR,MS
AF0338-17	N-	7	9	8	6	6	6	5	7	2	7	7	7	7	0	9	0	0	0	0	SR,CS
Argos	N+	8	9	8	9	6	7	6	7	4	7	8	6	6	3	8.8	0	0	0	0	CS,MS,SR,GC,1IHN(8)
Argos	N-	9	9	8	8	6	7	6	7	4	7	7	6	4	15	7.9	0	0	0	0	SR,CS,SG,HS,6IHN(5-8,1-7)
Atlantic	N+	6	9	8	5	6	5	6	7	2	7	4	8	6	3	8.5	0	0	8	0	CS,SR,RZ,SS,1IHN(7)
Atlantic	N-	6	9	8	5	6	5	6	7	2	7	5	8	7	15	8.4	0	0	0	3	SR,SS,MS,GC,RZ,6IHN(5-8,1-6)
La Norma	N+	9	9	8	9	9	7	6	7	3	6	6	8	6	0	9	0	13	3	0	CS,GC,MS,SR
La Norma	N-	9	9	8	7	9	7	6	7	3	6	6	8	6	0	9	0	10	0	0	SS,CS,SR
Nadine	N+	8	9	7	4	6	6	6	7	2	7	3	6	4	5	8.6	3	0	0	3	CS,RZ,SR,MS,SS,2IHN(1-8,1-7)
Nadine	N-	8	9	8	4	6	7	6	7	3	7	3	6	4	23	8.1	0	0	3	0	HS,CS,SS,SR,8IHN(5-8,3-7)
NC182-5	N+	6	9	8	6	6	5	7	7	2	7	4	9	7	0	9	0	0	0	0	SS,MS
NC182-5	N-	6	9	8	6	6	5	7	7	2	7	3	8	6	0	9	3	0	0	3	SS,SR
NC268-1	N+	6	9	8	8	6	5	6	7	2	6	5	8	5	0	9	0	0	0	0	SR,SS,RZ
NC268-1	N-	6	9	8	7	6	5	6	7	2	6	5	8	5	0	9	0	0	0	0	SS,CS,SR
Soraya	N+	8	9	8	8	7	7	7	7	4	8	5	8	6	0	9	0	0	0	0	SR,MS,CS,EL,YF2
Soraya	N-	7	9	7	6	7	6	7	7	4	8	4	8	5	8	8.8	0	0	0	0	SR,RZ,MS,3IHN(3-8),YF2
Yukon Gold	N+	8	9	7	4	7	7	6	7	3	7	6	5	5	0	9	0	0	3	0	SR,^CS,SS
Yukon Gold	N-	8	9	8	4	7	7	6	7	3	7	5	5	5	5	8.5	3	0	3	0	SS,CS,SS,2IHN(2-8)

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 12. Specialty Trial. Total and marketable yield, specific gravity, external and internal tuber attributes of potato clones harvested 126 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2013

Clone	Total cwt/A	Marketable cwt/A	%Atl	Specific Gravity	Tuber Data ²								% Internal Defects ³						Comments ⁴
					CLR	TXT	TCX	TSS	SHP	EYE	SIZE	APP	HN	HNR	HH	VR	BC	SR	
06-30319	92	46	30	1.045	1	7	6	7	8	6	3	4	0	9	0	0	0	0	PF2
Adirondack Blue	128	64	47	1.059	1	7	5	7	5	6	5	5	0	9	0	0	0	0	PF1
Adirondack Red	172	86	60	1.056	2	7	4	7	6	8	5	6	0	9	0	0	0	0	RF0.5
All Blue	102	51	33	1.057	1	5	4	7	6	6	4	4	0	9	0	0	0	0	PF1 White cortex
All Red	243	122	91	1.047	2	7	6	7	5	6	6	5	0	9	0	0	0	0	RF0.5
Atlantic	292	146	100	1.065	6	5	6	6	3	7	6	6	0	9	0	0	0	0	WHT
Blackberry	225	112	85	1.047	1	7	5	7	5	8	5	6	0	9	0	0	0	0	PF2
BNC429-1	310	155	106	1.062	1	6	3	7	3	7	4	4	0	9	0	10	0	0	RF0.5
Bora Valley	170	85	55	1.057	1	7	5	7	4	7	4	3	0	9	0	0	0	0	PF0.5
Chieftain	322	161	115	1.049	3	6	6	5	5	6	6	4	10	8	0	0	10	0	WHT
COTX05082-2P/P	148	74	48	1.051	1	7	6	7	3	7	5	5	0	9	0	0	0	0	PF3
COTX088046-8P/P	43	22	14	1.065	1	6	6	7	4	7	3	5	0	9	0	0	0	0	PF2
Guincho Negra	2	1	1	1.046	1	7	7	5	4	8	1	3	0	9	0	0	0	0	Highly variable PF1 to PF3
Mountain Rose	134	67	43	1.057	1	6	6	7	3	8	4	6	0	9	0	0	0	0	PF0.5
NC276-2	250	125	87	1.063	7-3	7	6	7	3	7	3	6	0	9	0	0	0	10	YF1, Small, pink spectacle
NC396-38	105	53	36	1.054	1	6	6	7	3	8	4	6	0	9	0	0	0	10	PF3
NCH85-2	182	91	66	1.057	1-7	7	7	7	2	6	3	7	0	9	0	0	0	10	YF2, Small, yellow spectacle
Purple Majesty	158	79	50	1.059	1	6	6	7	4	7	5	5	0	9	0	0	0	0	PF1
Raspberry	219	110	77	1.051	2	7	5	7	5	8	5	6	0	9	0	0	0	0	RF1
TX09406-3P/P	199	99	64	1.058	1	6	6	7	4	8	5	6	0	9	0	0	0	0	PF2
Grand Mean	175	87																	

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

Figure 1. Replicated Specialty Trial Images. Quarters of tubers sliced while evaluating internal quality of specialty potatoes.

06-30319



Adirondack Blue



Adirondack Red



All Blue



All Red



Atlantic



Blackberry



BNC429-1



Bora Valley



Chieftain



COTX05082-2P/P



COTX088046-8P/P



Guincho Negra



Mountain Rose



NC276-2



NC369-38



NCH85-2



Purple Majesty



Raspberry



TX09406-3P/P



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: Sixteen 21' rows at 34' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Metribuzin 1 lbs/A

Intensity 8 fl oz/A

Matrix 1 fl oz/A

Fertilizer: 212 N, 147 P, 150 K, 1.5lbs Zn 20%

Insect Control: Admire Pro in-furrow 8 oz/A

Coragen 4 oz/A

Disease Control: Quadris in furrow 6.2/A

Bravo 6 pt/A (total across 3 applications)

Revus Top 6.2 fl oz/A

Manzate 0.5 lb/A

Curzate 3.2 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: Twelve 21' rows at 34' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Metribuzin 1 lbs/A

Intensity 8 fl oz/A

Matrix 1 fl oz/A

Fertilizer: 212 N, 147 P, 150 K, 1.5lbs Zn 20%

Insect Control: Admire Pro in-furrow 8 oz/A

Coragen 4 oz/A

Disease Control: Quadris in furrow 6.2/A

Bravo 6 pt/A (total across 3 applications)

Revus Top 6.2 fl oz/A

Manzate 0.5 lb/A

Curzate 3.2 oz/A

Vine Kill: None

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

Location: Black Gold Farms, Gum Neck, Tyrrell Co., NC

Trial Title: Snack Food Association Trial

Trial Design: Randomized complete block, five replications

Plot Dimensions: Seventeen 21' rows at 34' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Metribuzin 1 lbs/A

Intensity 8 fl oz/A

Matrix 1 fl oz/A

Fertilizer: 212 N, 147 P, 150 K, 1.5lbs Zn 20%

Insect Control: Admire Pro in-furrow 8 oz/A

Coragen 4 oz/A

Disease Control: Quadris in furrow 6.2/A

Bravo 6 pt/A (total across 3 applications)

Revus Top 6.2 fl oz/A

Manzate 0.5 lb/A

Curzate 3.2 oz/A

Vine Kill: None

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: metolachlor 1.5 pt/A

Metribuzen 1 lb/A

Fertilizer: 1100lbs, 14-5-18 broadcast

Insect Control: Mocap 10G 1 gal/A

Leverage 3.5 fl oz/A

Disease Control: Quadris 12fl oz/A

Headline 6 fl 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: Eighteen 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Sencor DF 1 lbs/A

Dual Magnum 1.5 pts/A

Select EC 8 oz/A

Fertilizer: 18-18-18, 800 lbs/A

30%N 20 gal/A

Insect Control: Agri-Mek 0.15EC 14 oz/A

Disease Control: None

Vine Kill: None

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

Location: Tidewater Research Station, Plymouth, Washington Co., NC

Trial Title: Round White Variety Trial Two

Trial Design: Randomized complete block, four replications

Plot Dimensions: Twenty-four 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Sencor DF 1 lbs/A
Dual Magnum 1.5 pts/A
Select EC 8 oz/A

Fertilizer: 18-18-18, 800 lbs/A
30%N 20 gal/A

Insect Control: Agri-Mek 0.15EC 14 oz/A

Disease Control: None

Vine Kill: None

Location: Tidewater Research Station, Plymouth, Washington Co., NC

Trial Title: Round White Variety Trial Three

Trial Design: Randomized complete block, four replications

Plot Dimensions: Twenty-four 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Sencor DF 1 lbs/A
Dual Magnum 1.5 pts/A
Select EC 8 oz/A

Fertilizer: 18-18-18, 800 lbs/A
30%N 20 gal/A

Insect Control: Agri-Mek 0.15EC 14 oz/A

Disease Control: None

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: Sencor DF 1 lbs/A
Dual Magnum 1.5 pts/A
Select EC 8 oz/A

Fertilizer: 18-18-18, 800 lbs/A
30%N 20 gal/A

Insect Control: Agri-Mek 0.15EC 14 oz/A

Disease Control: None

Vine Kill: None

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

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: Fifteen 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Sencor DF 1 lbs/A
Dual Magnum 1.5 pts/A
Select EC 8 oz/A

Fertilizer: 18-18-18, 800 lbs/A
30%N 20 gal/A

Insect Control: Agri-Mek 0.15EC 14 oz/A

Disease Control: None

Vine Kill: None

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: Sencor DF 1 lbs/A
Dual Magnum 1.5 pts/A
Select EC 8 oz/A

Fertilizer: 18-18-18, 800 lbs/A
30%N 20 gal/A

Insect Control: Agri-Mek 0.15EC 14 oz/A

Disease Control: None

Vine Kill: None

Location: Tidewater Research Station, Plymouth, Washington Co., NC

Trial Title: Low Input Trial

Trial Design: Split plot design with 4 replications and 2 treatments (N+ & N-)

Plot Dimensions: Twenty 12' rows at 38' row spacing, 16 hills per row

Seed piece Treatment: None

Weed Control: Sencor DF 1 lbs/A
Dual Magnum 1.5 pts/A
Select EC 8 oz/A

Fertilizer: N+ plots 192N, 130P, 195K
N- plots 65N, 130P, 195K

Insect Control: Agri-Mek 0.15EC 14 oz/A

Disease Control: None

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	RZ=Rhizoctonia
BR=bruise	SEB=stem end browning
CPB=Colorado potato beetle	SC = star cracking
CS=common scab	SG=secondary growth
CT=chain tubers	SIS=silver scurf
DAE=deep apical eyes	SKN=skins
DSE=deep stolen end	SS=sun scald
EB=early blight	SR=soft rot
ECB= European corn borer	STST=sticky stolons, tight stolon attachment
EL= enlarged lenticels	TSWV=Tomato Spotted Wilt Virus
FS=fusarium wilt	VW=Verticillium wilt
GC=growth cracks	WSTD=weak stand
HI= herbicide injury	WW=wire worm
HN = Heat Necrosis (see below)	YF=yellow flesh (YF scale: 1=light yellow to 3=dark yellow)
HS=heat sprouts	RF=red flesh (RF scale: 1=light red or pink to 3 = dark red)
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	

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.