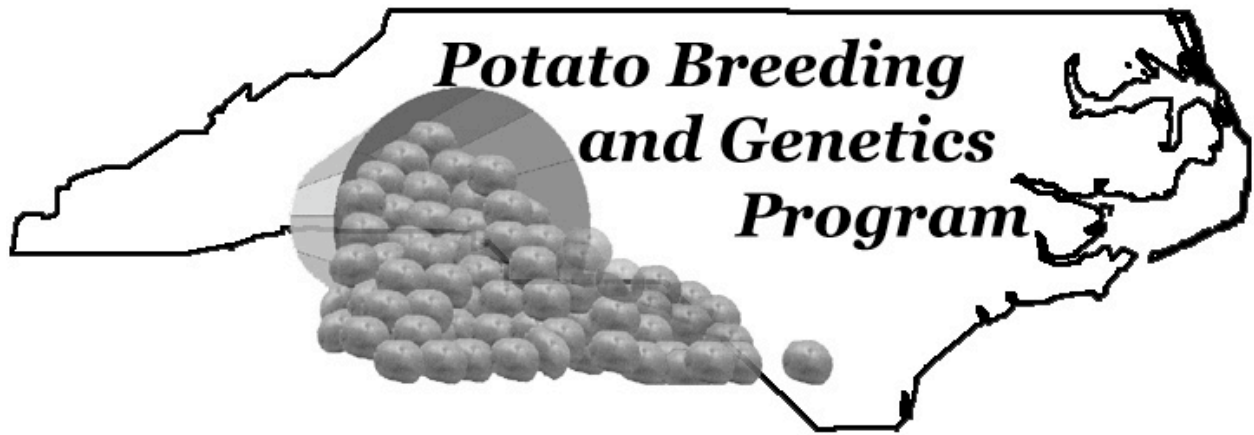


NC STATE UNIVERSITY

NORTH CAROLINA POTATO VARIETY TRIAL AND BREEDING REPORT

2011



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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 Cooperative States Research, Extension and Education Service State Agricultural Experiment Station (CSREES SAES) NE1031 Regional Potato Variety Development and Evaluation Project, the USDA National Institute of Food and Agriculture Potato Special Research Grants Program, the NC Potato Association, and the US Potato Board and the Snack Food Association, as well as several other industry members.

II. PROJECT SUMMARY

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

Breeding Program

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

During 2011, we planted 12,966 single-hills and selected 270 clones resulting in a 2.1% selection rate. This was a lower selection percentage of single-hills than many years but not less than last year which was an extremely difficult year and resulted in a selection rate of only 0.8%. This year's lower selection rate was largely influenced by the families generated in ours and our collaborator's crossing blocks (USDA-ARS) as many of the crosses this year were designated as germplasm enhancement crosses and these type of crosses typically result in fewer progeny being selected. Due to carryover from last year's accidental aerial applicator exposure to glyphosate spray drift in our field trials we relaxed our selection pressure for the 6-hills, 20-hills and 60-hills. Out of the 180 clones in our 6-hill plots, 25 (14%) were selected for future evaluation. In the 20-hill plots, 62 clones were planted with 26 (42%) being selected for further evaluation. In our 60-hill plots, 13 clones were planted and 9 (69%) 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 637 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 61 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 2011. In this year's 2by3 trial, 76 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 3 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 2011. In this year's 3by5 trial we evaluated 11 clones for CPB resistance and for adaptation in our non-replicated 20-hill plots simultaneously. We selected 6 clones for advancement to next year's three replications by 10-hills (3by10) and our non-replicated 60-hill trial. The 3by10 trial is open to collaborators in other states to submit materials for screening this year's trial included clones from North Dakota State University, a clone submitted for evaluation by the University of Maine that was developed by a private breeder, and our own materials. In this year's 3by10 we had a total of 14 clones, 6 were from NC and four of those were selected for evaluation next year. The 3by10 trial is our most advanced screening trial and the most advanced clones will remain in this trial until testing is determined complete

Yield Trials

In our 10 yield trials, we evaluated 317 preliminary and advanced clones. The evaluations were conducted either on-farm, and/or at the TRS/VGJREC. We typically evaluate advanced clones at more than one site in NC. The results of the yield trials are summarized later in this report, and in Tables 1-10. Each table has two parts, the first (a) being devoted to yield information, specific gravity measurements, and chip color scores, and the second (b) providing potato plant and tuber quality characteristics. This report can also be viewed and downloaded at our website <http://potatoes.ncsu.edu> Also please note the absence of clones from our own breeding program in this trial report. We elected to remove all NC clones because of carryover from the 2010 glyphosate exposure in our selection and maintenance plots. The effects were delayed emergence by as much as 3 or 4 weeks and subsequently low yields. We believe inclusion of this data would unfairly weigh against the NC clones and did not want that data to prejudice our decisions on advancement or rejection.

III. 2011 PROMISING LINES:

Chip-stock clones

AF0338-17

Developed by: Univ. of Maine

Released: N/A

trials evaluated: 9 since (2006)

Skin Color: Tan to Light Brown

Flesh Color: White

Historical Data:

Maturity: medium to late

% Standard (Atlantic): MKTB YLD 96%

Specific Gravity: 1.080

Chip score: 2.0 (good)

Overall Appearance: 6 (better than fair)

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 may be available for testing on a larger scale if growers are interested.*

AF4130-7

Developed by: Univ. of Maine

Released: N/A

trials evaluated: 3 since (2009)

Skin Color: Tan to Light Brown

Flesh Color: White

Historical Data:

Maturity: late

% Standard (Atlantic): MKTB YLD 105%

Specific Gravity: 1.081

Chip score: 2.0 (good)

Overall Appearance: 6 (better than fair)

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

B1992-106

Developed by: USDA/ARS-Beltsville

Released: N/A

trials evaluated: 11 since (2003)

Skin Color: Brown

Flesh Color: White

Historical Data:

Maturity: mid to late

% Standard (Atlantic): MKTB YLD 80%

Specific Gravity: 1.077

Chip score: 2.0 (good)

Overall Appearance: 5 (fair)

Other Attributes or Comments: *This is a mid to late season chipper with good chip scores. While yields for this clone have averaged only about 80% of Atlantic the gravities have been similar and this clone is not susceptible to internal heat necrosis. B1992-106 is expected to be released in 2012 by the USDA/ARS in Beltsville, MD.*

Beacon Chipper

*Developed by: Michigan State Univ.
& Maine Potato Board*

Released: 2006

trials evaluated: 8 since (2006)

Skin Color: Tan to Light Brown

Flesh Color: White

Historical Data;

Maturity: mid to late

% Standard (Atlantic): MKTB YLD 83%

Specific Gravity: 1.082

Chip score: 2.0 (good)

Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *This is a mid to late season chipper with good chip scores and gravity. While yields for this clone have averaged only about 83% of Atlantic the gravities have been similar and this clone is not susceptible to internal heat necrosis.*

Dakota Crisp

Developed by: North Dakota State Univ.

Released: 2005

trials evaluated: 12 since (1998)

Skin Color: Tan to Light Brown

Flesh Color: White

Historical Data;

Maturity: medium

% Standard (Atlantic): MKTB YLD 128%

Specific Gravity: 1.077

Chip score: 2.0 (good)

Overall Appearance: 5 (fair)

Other Attributes or Comments: *We recommend this variety as a substitute for Atlantic but like Atlantic it is susceptible to IHN but incidence and severity have been lower overall.*

Harley Blackwell

Developed by: USDA-ARS-Beltsville

Released: 2003

trials evaluated: 54 since (1995)

Skin Color: Tan to Light Brown

Flesh Color: White

Historical Data;

Maturity: medium

% Standard (Atlantic): MKTB YLD 100%

Specific Gravity: 1.072

Chip score: 2.0 (good)

Overall Appearance: 7 (good)

Other Attributes or Comments: *This variety stands out because its yield is equal to Atlantic, it is very attractive, resistant to IHN, and typically has low incidence of other internal defects. It is primarily a chip-stock potato, but its SG and appearance are also suitable for table-stock use. It's major flaw however, is the expression of a suspected physiological skin disorder known as star cracking. The disorder is expressed by cracking sometimes as much as 1/8 inch deep that radiates in 3 to 5 directions from a central point. We believe lack of adequate moisture is the causal agent.*

Dual-Use (Chip/Table) clones

AF4047-2

*Developed by: Univ. of Maine
Released: N/A
trials evaluated: 5 since (2008)
Skin Color: Tan to Light Brown
Flesh Color: White*

*Historical Data:
Maturity: medium
% Standard (Atlantic): MKTB YLD 142%
Specific Gravity: 1.066
Chip score: 2.5 (good to acceptable)
Overall Appearance: 7 (good)*

Other Attributes or Comments: *This is a mid-maturing clone with good yield and overall appearance. While later than Superior it looks to have potential as a dual purpose clone that will chip but has solids that are better suited for table consumption.*

BNC182-5

*Developed by: USDA/ARS-Beltsville
Released: N/A
trials evaluated: 6 since (2008)
Skin Color: Tan to Light Brown
Flesh Color: White*

*Historical Data:
Maturity: late
% Standard (Atlantic): MKTB YLD 129%
Specific Gravity: 1.071
Chip score: 2.5 (good to acceptable)
Overall Appearance: 7 (good)*

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

NY140

*Developed by: Cornell Univ.
Released: N/A
trials evaluated: 15 since (2005)
Skin Color: White
Flesh Color: White*

*Historical Data:
Maturity: mid to late
% Standard (Atlantic): MKTB YLD 111%
Specific Gravity: 1.070
Chip Score: 2.0 (good)
Overall Appearance: 6 (better than fair)*

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

Table-stock clones

Augusta

Developed by: Europlant

Released: 2004

trials evaluated: 2 since (2011)

Skin Color: Buff

Flesh Color: Light Yellow (YF2)

Historical Data;

Maturity: medium

% Standard (Yukon Gold): MKTB YLD 92%

Specific Gravity: 1.079

Skin Texture: Smooth

Overall Appearance: 7 (good)

Other Attributes or Comments: *This variety tends to be mostly oblong and yields are good. We will be evaluating this clone in the future to collect more data. This was the first year we evaluated this clone but it was so attractive that we have decided to mention it here.. During our May field tour it was the best looking clone in the Black Gold table trial. Being a European variety we weren't sure at the time if we would see a good product in the end without secondary growth and heat sprouts. Indeed in Bright's variety trial we did see some secondary growth, but not significant amounts. Stay tuned for more information.*

NY136

Developed by: Cornell Univ.

Released: N/A

trials evaluated: 22 since (2005)

Skin Color: Dark Red

Flesh Color: White

Historical Data;

Maturity: slightly later than medium

% Standard (Chieftain): MKTB YLD 85%

Specific Gravity: 1.065

Skin Texture: Moderately Smooth

Overall Appearance: 7 (good)

Other Attributes or Comments: *We have evaluated this clone for 7 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. A half-ton of seed was planted out this past season (2011) with a grower and all indications are this clone will have a place in NC. NY136's quality, yield and color were deemed acceptable and fit well into the demands of the harvest window. Currently seed from this clone is being increased and the first availability will likely be for the 2013 season.*

Russet-type clones

Goldrush

Developed by: North Dakota State Univ.

Released: 1992

trials evaluated: 16 since (1996)

Skin Color: Brown

Flesh Color: White

Historical Data:

Maturity: medium

% Standard (Russet Nokotah): MKTB YLD 119%

Specific Gravity: 1.062

Skin Texture: Moderate Russet

Overall Appearance: 5 (fair)

Other Attributes or Comments: *This variety was developed primarily for table use. It has a tough brown skin and shapes tend to be oblong to long. Size is a step better than medium overall. One of the traits that make this russet attractive to our region is its mid-season maturity. While not perfect this is a reasonable choice for a grower interested in this type of market.*

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	Cape Fear silt loam	Mar 9	Jun 20-22	110,111,112
Bright's	Gertie silt loam	Mar 8	Jun 23	114
TRS/VGJREC	Portsmouth fine sandy loam	Mar 15, 18, 22	Jun 27, 29 Jul 1, 5, 7, 11, 12, 18	Variable 107 - 128

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

The on-farm trials were dug using a single-row digger and hand harvested. The TRS/VGJREC trials were harvested using a two-row harvester modified to dig one row at a time. Bateman'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-1031 rating codes. A description of the rating codes is provided in Appendix 2.

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

VI. RESULTS:

Environmental Summary

Planting was within the normal timeframe this year. Our on-farm trials were planted the 2nd week in March and the TRS trials were planted during March 15 - 22. Conditions were favorable for growth early in the season with adequate rainfall through April until the 1st week in May at which point we began to get dry. This was similar to last year but it was about a week earlier. Dry conditions persisted until late July limiting the opportunity for the tubers to bulk. The trials planted last on the research station had some of the lowest yields we have ever seen in our plots. This appears to have been a season where early planting was critical to maximize yield allowing the crop to more effectively utilize the moisture that was available early on.

A. Yield Trials

1. On-Farm Trials

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

The marketable yields of the 13 clones in this trial were compared to Chieftain (168 cwt/a). Three clones had significantly higher marketable yield, these were: Superior (243 cwt/a), Yukon Gold (204 cwt/a) and Dark Red Norland (201 cwt/a). Goldrush (183 cwt/a) also had a higher marketable yield than Chieftain. Five clones (Augusta, BNC201-1, NY136, Red Maria (NY129) and Yukon Gold had overall appearance ratings of 7 (good). None of the clones in this trial had greater than 10% incidence of internal heat necrosis (IHN), hollow heart (HH), or vascular ring discoloration (VR). Clones with 10% or greater incidence of brown center (BC) were Superior (18%) and Yukon Gold (13%). Clones with 10% or greater incidence of soft rot (SR) were B2676-2 (28%) and Dark Red Norland (10%). Other external defects observed in the trial were sunscald, misshapes, soft rot, silver scurf, growth cracks, common scab and skin blemishes due to Rhizoctonia.

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

Atlantic, the standard, had a marketable yield of 212 cwt/a and two of the clones in the trial had greater marketable yields: Marcy (247 cwt/a) and Dakota Crisp (234 cwt/a), though these yields were not statistically significant. Atlantic had a gravity of 1.086, four clones with high gravities were: B1992-106 (1.092), Snowden (1.091), Beacon Chipper (1.090) and AF4130-7 (1.089). Three clones: B1992-106, Dakota Crisp and Marcy had a chip score rating of 1 (exceptional) in the 24 to 48 hour chip test. One clone, Atlantic had a chip score of 1 in the 5 to 7 day chip test. Three clones: BNC182-5, Harley Blackwell and Marcy had overall appearance scores of 7 (good). Only one clone, Atlantic expressed symptoms of IHN (28%). It also had 13% BC and no other clones had incidence of BC over 10%. No other internal defects were expressed. External defects observed in the trial were sunscald, growth cracks, skin blemishes due to Rhizoctonia, common scab, heat sprouts and misshapes.

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

Atlantic had a marketable yield of 182 cwt/a. Though not significantly greater marketable yields of two clones with higher yields were: W4089-1 (190 cwt/a) and NY140 (184 cwt/a). Atlantic had a gravity of 1.087 and six other clones had equal or greater gravities: W2310-3 (1.099), ND7519-1 (1.094), Snowden (1.094), ND8305-1 (1.092), AF0338-17 (1.088) and ND8331-CB2 (1.087). None of the clones in the trial received a chip color rating of less than a

2 (excellent). One clone, ND8305-1, received a chip score rating of 1 at the 24 to 48 hour chip test. One clone also scored a 1 in the 5 to 7 day chip tests, MSL292-A. One clone, W4980-1, rated a 9 for overall appearance, the highest score possible and W2978-3 rated an 8 for overall appearance as well. Three clones received an appearance rating of a 7: AF0338-17, Atlantic and NY140. One clone expressed IHN at levels greater than 10% incidence: Atlantic (18% with an HNR of 7.2). Atlantic also expressed BC at 16%. No other internal defects were expressed at levels greater than 10%. Other external defects observed were: sunscald, common scab, misshapes, growth cracks, soft rot 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 Russet Norkotah (russet skin types). Snowden (238 cwt/a) had a marketable yield significantly greater than Atlantic (146 cwt/a). Within the class of reds, none of the clones had significantly higher marketable yields than Chieftain (156 cwt/a). None of the russets had significantly higher marketable yields than Russet Norkotah (102 cwt/a). The specific gravity for Atlantic in this trial was 1.085 and all other clones had lower specific gravities. Dakota Crisp had a chip score rating of 1 in the 24 to 48 hour fry test and none had a chip score rating of 1 in the 5 to 7 day chip test. Clones with an overall appearance score of 7 were; AF0338-17, AF4013-3, AF4047-2, Augusta, Dakota Crisp, Harley Blackwell and Yukon Gold. No internal defects of 10% or greater incidence were recorded in this trial. Culls were primarily due to misshapes, soft rot, common scab, sun scald, heat sprouts, secondary growth and skin blemishes due to Rhizoctonia.

2. TRS/VGJREC Yield Trials

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

Atlantic had the highest marketable yield at 115 cwt/a. Atlantic had a gravity of 1.089 and one clone, AF4363-2 (1.094), had a gravity that was greater. Five clones had chip scores of 1 in the 24 to 48 hour chip test. These were: AF4129-2, AF4147-1, Atlantic, B2628-10 and B2735-2. Two clones had an overall appearance rating of 7: AF4241-1 and Yukon Gold. Only Atlantic expressed IHN at 10% or greater incidence (10% with an HNR of 8.0). Two clones expressed BC at 10% or greater incidence: Atlantic (13%) and Superior (10%). No other internal defects of 10% or greater incidence were recorded in this trial. Common external defects were misshapes, sunscald, soft rot, common scab and skin blemishes attributed to Rhizoctonia.

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

Of the ten clones in this trial three had higher average marketable yields higher than Atlantic (91 cwt/A) though none were statistically significant: AF4220-4 (108 cwt/a), Yukon Gold (97 cwt/a) and AF4203-4 (96 cwt/a). Two other clones had higher specific gravity than Atlantic (1.089) these were: AF4254-2 (1.096) and BNC202-7 (1.095). None of the clones received a chip rating of 1 in the 24 to 48 hour or 5 to 7 day chip tests. AF4203-4 had an overall appearance score of 8 and Yukon Gold had an appearance score of 7. No internal defects were expressed at levels of 10% or greater. Common defects were misshapes, soft rot, sunscald and skin blemishes attributed to Rhizoctonia.

NE-1031 Round White Trial. (Tables 7a and 7b)

Five of 16 clones in this trial had greater marketable yield than Atlantic (23 cwt/A) though none were significantly greater these were: AF4047-2 (41 cwt/a), Snowden (37 cwt/a), BNC182-5 (33 cwt/a), Superior (30 cwt/a) and JOMA (28 cwt/a). Atlantic had a specific gravity of 1.090 two clones, AF0338-17 (1.099) and NYE106-4 (1.097), had higher gravities. One clone, Snowden, received a chip rating of 1 in the 24 to 48 hour chip tests. Both AF4047-2 and BNC202-7 had overall appearance ratings of 7. No internal defects were expressed at levels of 10% or greater. The most common culls were misshapes, sunscald and soft rot.

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

The standard, Chieftain, had a marketable yield of 65 cwt/a and only Dark Red Norland (75 cwt/a) had a higher marketable yield, though not statistically significant. Two clones received an overall appearance score of 7: ND8555-8R and NY136. None of the clones in this trial expressed significant levels of any internal defects. Culls were due mostly to misshapes, sunscald, soft rot and skin blemishes attributed to Rhizoctonia.

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

The standard, Russet Norkotah 3117, had a marketable yield of 22 cwt/A. Of the eight clones in the trial three had marketable yields that were significantly greater: AF4040-2 (49cwt/a) AF3362-1 (43 cwt/a) and Premier Russet (31 cwt/a). Three clones had an equal or higher specific gravity than Russet Norkotah 3117 (1.079), these were: Shepody (1.094), AF4040-2 (1.082) and Russet Burbank (1.079). The highest overall appearance scores were fair (5), four clones receiving this rating were: AF4040-2, Classic Russet, Premier Russet and Russet Norkotah. None of the clones in this trial expressed significant levels of any internal defects. Culls were mostly soft rot, misshapes and skin blemishes attributed to Rhizoctonia.

Observational Trial. (Tables 10a and 10b)

Eighty-four clones were evaluated in this trial along with the standards: Atlantic, Snowden and Superior. Each 28-hill plot was non-replicated. Clones with promising attributes such as high yield, high specific gravity (for chipping lines), exceptional appearance and/or high disease resistance will be evaluated in following years in replicated trials.

B. Breeding and Early Generation Selection Efforts

NCSU Potato Variety Development Efforts

Our efforts to develop varieties in North Carolina begin with selection as single-hill plots in year one. Because potatoes are clonally propagated via tubers each hill selected has the potential to become a new variety. The single-hill selections are advanced to 6-hill and 20-hill plots with selection in years two and three, respectively. Following this, materials are placed in a sixty-hill plot in year four for a final cycle of selection before entering into yield trials. Our single-hill materials have come from the USDA-ARS, Cornell University, Virginia Tech University and our own crosses made at the TRS. Mini-tubers, which are planted in the field as single-hills, are generated in the TRS greenhouses. This year, 12,966 single-hills were planted and 270 clones were selected averaging a 2.1% selection rate. In our single hill plots this year we had materials from our own program and those from crosses by the USDA-ARS. Evaluation of germplasm from different breeding programs allows us to review a wider breadth of materials increasing the likelihood of developing varieties suitable not only for NC and the Southeast, but with broad adaptability overall.

In our second to fourth year selection plots out of the 180 clones planted in our 6-hill plots (Yr. 2), 25 (14%) were selected for future evaluation. While in the 20-hill plots (Yr. 3), 62 clones were planted with 26 (42%) being selected for further evaluation. In our 60-hill plots (Yr. 4), 13 clones were planted and 9 (69%) were selected.

Germplasm Enhancement for CPB Resistance

This is the fifth year of a selection and screening program to develop CPB resistant materials. 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 637 clones to evaluate resistance and selected 61 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, 76 of the 180 clones came from this CPB resistance project. From the 76 CPB clones, 3 were selected for advancement to the 20 hill selection plots and the next cycle of CPB resistance screening. Of the 62 clones in our 20 hill plots 11 clones were part of the CPB resistance screen and 6 of those were selected for advancement to the 60 hills. Of the 13 clones in this year's 60 hill plots 6 were CPB clones and 4 was selected for further evaluation.

Early Generation Selection Trials

Early generation selection involves selection and evaluation of materials at early stages in breeding/variety development process. By selecting early generation materials in multiple

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

University of Maine Trial

In this trial, we evaluate clones from Maine as 8-hill plots in NC and make selections. These clones have already been through two cycles of selection in Maine. After selection in NC, we send a list of selected clones to our cooperators at the University of Maine (UME) and they use the information when they select their materials. This year we evaluated 38 ME clones and selected 6. Craig Yencho and Mark Clough each selected the materials they believed had merit and warranted further evaluation. We kept a total of 6 clones, 2 we both selected 3 Craig selected Mark did not and 1 Mark selected that Craig did not. These will be evaluated in 2012 in a non-replicated 28 hill plot in a yield trial.

USDA-ARS Trial

This is the fourth year that we have participated in this USDA-ARS multistate selection trial. The institutions/states involved are: The University of Florida (FL), NC State University (NC), USDA-ARS (MD, trial location in ME), Rutgers University (NJ), Pennsylvania State University (PA), Cornell University (NY) and the University of Maine (ME). Each state received 8 hills of the same 354 clones. All were weighed for total yield, rated for the nine standard NE1031 external ratings, and specific gravities were measured. In addition each location had two principle evaluators that independently selected on the set. At our location, Craig Yencho and Mark Clough had 77.0% agreement on clones overall to drop or keep. Next year we will reevaluate these clones in our non-replicated 28-hill yield trial (Unreplicated trial).

Unreplicated Trial.

One hundred eighteen clones were evaluated in this trial as well as the standards: Atlantic, Chieftain, Dark Red Norland, Snowden and Superior. Each 28-hill plot was non-replicated. This trial is part of an early generation study we are conducting with the USDA-ARS and is our 2nd opportunity to evaluate them. Last year we selected these clones in an 8-hill non-replicated format and the 118 clones represent those both Dr. Craig Yencho and Mr. Mark Clough selected. This year we made notes on these clones and indicated which ones we thought had potential as cultivars and made another round of selections. We selected a total of 62 clones, 32 we both liked and selected, 23 that Craig liked that Mark did not and 7 that Mark liked that Craig did not. We will evaluate all clones that either of us selected in a trial with two replications next year (2by20 Trial).

2by20 Trial.

Twenty-seven clones were evaluated in this trial along with the standards: Atlantic, Chieftain, Dark Red Norland, Snowden, Superior and Yukon Gold. This is the 3rd cycle of evaluation and selection of these USDA-ARS early generation materials. Like the 8 hills and the unreplicated trial all clones that either Yencho or Clough select are kept. Out of the 27 in this trial we kept a total of 18 clones: 9 we both selected, 6 Craig liked that Mark did not and 3 Mark liked that Craig did not. Next year these will be evaluated in one of our standard replicated trials (4 reps, 28 hills, randomized complete block design).

VII. ACKNOWLEDGMENTS

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

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 110 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2011

Clone	Total Yield cwt/A	Marketable Yield				Size Distribution by Class ² (% of total yield)							Specific Gravity ³	
		cwt/A	%Chf.	%RusNor	%Yuk	1's	2's	3's	4's	5's	Culls	1 7/8 to 4"		2 1/2 to 4"
Augusta	228	154	92	95	76	26	51	16	0	0	7	67	16	1.082
B2676-2	238	131	78	80	65	40	48	7	0	0	6	54	7	1.082
BNC201-1	221	136	83	85	69	35	56	5	0	0	4	61	5	1.074
Chieftain	271	168	100	104	83	33	56	6	0	0	5	62	6	1.085
Classic Russet	190	141	84	87	70	24	70	4	0	0	3	73	4	1.076
Dark Red Norland	273	201	121	124	99	16	49	25	0	0	11	74	25	1.068
Goldrush	239	183	110	113	91	21	58	18	0	0	3	77	18	1.079
NY136	224	105	61	65	52	52	44	1	0	0	2	46	1	1.080
Peter Wilcox	257	166	98	103	82	20	59	6	0	0	15	64	6	1.082
Red Maria (NY129)	256	135	80	83	66	45	48	4	0	0	2	52	4	1.070
Russet Norkotah	217	162	99	100	80	23	66	8	0	0	2	75	8	1.076
Sifra	253	159	94	98	78	36	53	9	0	0	2	63	9	1.083
Superior	290	243	147	150	120	13	49	34	0.5	0	3	84	35	1.084
Yukon Gold	264	204	124	126	100	14	42	35	0.6	0	9	77	36	1.082
Grand Mean	244	163												
CV (%)	9.3	14.3												
LSD(K=100)	32.3	32.0												

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 110 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2011

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	8	8	8	6	7	8	6	7	4	8	6	7	7	5	8	0	0	0	8	SR,SS,RZ,YF2
B2676-2	8	9	8	5	2	8	5	7	3	8	4	8	6	3	9	0	0	3	28	SR,MS,SS
BNC201-1	8	9	8	5	2	8	7	7	2	8	4	7	7	0	9	0	5	0	0	RZ,MS,SISC,SS,GC,YF1
Chieftain	8	9	9	7	3	7	7	6	4	7	5	6	5	3	9	0	3	0	5	SS,RZ,MS
Classic Russet	8	9	8	5	5	4	5	7	5	7	5	8	5	0	9	0	0	3	5	MS,RZ,SS
Dark Red Norland	8	9	8	6	2	8	7	7	3	6	6	7	6	0	9	0	0	3	10	CLR VAR,SS,MS,SR,SISC
Goldrush	8	9	8	6	5	4	7	7	6	8	6	8	6	0	9	0	0	0	0	RZ,SS,MS
NY136	7	8	8	6	2	8	6	7	2	7	5	8	7	0	9	0	0	0	3	MS,SR,SS
Peter Wilcox	7	9	8	4	1	7	7	7	3	8	5	3	4	0	9	0	3	0	3	^^SISC,RZ,SS,YF2
Red Maria (NY129)	7	8	8	5	1	8	7	7	3	8	5	8	7	0	9	0	0	0	3	SS,MS,RZ,SR,GC
Russet Norkotah	8	9	8	5	5	3	5	7	7	7	5	8	5	0	9	0	0	0	3	SS,MS
Sifra	7	9	8	5	9	7	7	7	2	6	6	8	4	0	9	0	0	0	0	CS,STST,MS,LUMPY
Superior	7	9	8	5	6	7	5	6	3	6	7	7	5	0	9	0	3	18	3	SS,SR,MS
Yukon Gold	7	9	8	5	7	8	7	7	3	8	7	7	7	3	8	3	3	13	5	SR,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 111 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2011

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	
AF4125-1	221	129	60	39	51	6	0	0	4	57	6	1.084	2	2	
AF4130-7	205	147	71	25	61	11	0	0	3	72	11	1.089	2	2	
AF4157-6	256	164	77	32	56	7	0	0	6	63	7	1.084	2	2	
Atlantic	284	212	100	15	45	28	1	0	10	75	29	1.086	2	1	
B1992-106	201	123	58	30	48	13	0	0	9	61	13	1.092	1	2	
Beacon Chipper	230	162	78	23	58	12	0	0	7	70	12	1.090	2	2	
BNC182-5	287	176	85	36	55	6	0	0	3	61	6	1.084	2	2	
Dakota Crisp	326	234	113	19	46	24	2	0	10	72	26	1.083	1	2	
Harley Blackwell	296	209	100	26	58	11	1	0	4	70	12	1.081	2	2	
Marcy	309	247	119	14	51	28	1	0	6	80	29	1.083	1	2	
Snowden	284	178	83	34	55	7	0	0	4	62	7	1.091	2	2	
Grand Mean	206	133													
CV (%)	13.3	20.5													
LSD(K=100)	34.9	35.1													

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

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

³ Determined by weight in air / water method.

⁴ Chip Color Ratings conducted by NCSU Potato Breeding Program at TRS/VGJREC:

1= no defects, exceptionally bright; 2= excellent, bright; 3= good, light or golden; 4= dark defects, marginal; 5= not acceptable

Table 2b. Black Gold Farms Chip Variety Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 111 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2011

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
AF4125-1	6	9	8	5	9	8	7	7	2	7	2	7	6	0	9	0	0	3	0	MS,SR,SS,RZ
AF4130-7	9	9	8	8	6	6	6	5	1	7	5	8	6	0	9	0	0	0	0	SS,RZ,MS
AF4157-6	7	9	9	4	6	7	5	7	2	7	5	6	5	0	9	0	0	0	0	^RZ,MS,SS,GC,SR
Atlantic	6	8	8	5	6	6	6	6	2	7	7	6	4	28	7	0	0	13	0	SS,RZ,MS,SR,GC
B1992-106	8	9	8	6	6	5	5	5	3	7	6	5	3	0	9	0	0	2.5	0	^RZ,SS,SR,GC
Beacon Chipper	9	9	8	6	8	7	6	7	3	6	4	7	5	0	9	0	0	0	0	MS,SR,GC, RZ
BNC182-5	6	9	8	8	6	6	7	6	1	7	5	8	7	0	9	0	0	3	0	MS,RZ,SS,SR
Dakota Crisp	9	8	9	5	6	7	5	7	3	7	7	6	5	0	9	0	0	0	0	MS,CS,SR,SS,GC,RZ
Harley Blackwell	9	8	8	5	6	6	7	7	2	6	7	6	7	0	9	0	0	0	0	RZ,SC,SR,RZ,SS
Marcy	9	9	8	7	6	6	7	7	3	8	7	6	7	0	9	0	0	0	0	RZ,FS,SS,SR
Snowden	9	9	8	7	6	6	7	7	2	5	5	7	6	0	9	0	0	0	0	STST,SS,CS,MS,SS,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 110 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2011

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	
AF0338-17	240	172	97	23	53	19	0	0	5	72	19	1.088	2	2	
Atlantic	245	182	100	18	53	22	0	0	7	75	22	1.087	2	2	
CO00188-4W	237	140	77	36	47	11	0	0	5	59	11	1.074	2	2	
CO00197-3W	232	133	72	38	52	4	0	0	5	56	4	1.081	2	2	
MSL292-A	236	147	82	28	56	6	0	0	10	62	6	1.086	2	1	
MSQ086-3	219	105	59	44	46	2	0	0	9	48	2	1.081	2	2	
ND7519-1	161	72	40	52	43	2	0	0	4	44	2	1.094	2	2	
ND8305-1	118	39	22	68	28	2	0	0	2	31	2	1.092	1	2	
ND8331Cb-2	62	7	4	86	9	1	0	0	4	10	1	1.087	2	2	
NY140	236	184	103	19	57	21	0	0	4	78	21	1.083	2	3	
Snowden	237	147	79	38	55	5	0	0	2	60	5	1.094	2	2	
W2310-3	210	135	74	28	59	6	0	0	8	64	6	1.099	2	2	
W2978-3	183	112	62	37	53	8	0	0	2	61	8	1.075	2	2	
W4980-1	275	190	106	27	54	15	0	0	4	69	15	1.082	2	2	
Grand Mean	207	125.9													
CV(%)	12.5	19.0													
LSD(K=100)	29.9	27.7													

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

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

³ Determined by weight in air/water method.

⁴ Chip Color Ratings conducted by the NCSU potato breeding program at the TRS/VGJREC 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 110 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2011

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	9	9	9	5	6	7	5	7	3	6	5	7	7	0	9	0	0	0	2	MS,SS,RZ,SR
Atlantic	6	7	8	6	7	6	7	7	3	6	7	8	7	18	7.2	6	0	16	4	^SS,MS,RZ,GC
CO00188-4W	8	9	8	6	9	7	5	7	2	6	3	8	6	0	9	0	0	2	0	SS,SR,MS,MIXED SIZES
CO00197-3W	7	9	9	6	9	7	5	7	2	8	2	8	5	0	9	0	0	0	0	SS,SR,RZ,MS
MSL292-A	7	9	8	6	6	6	5	5	2	2	4	4	4	0	9	0	0	0	0	^MS,DAE,DSE,CS,SS
MSQ086-3	8	8	8	6	8	9	7	8	2	8	3	6	6	0	9	0	0	0	0	^^SCB,^RZ,SR,SS
ND7519-1	9	9	8	7	9	8	5	7	3	8	2	7	4	0	9	6	0	6	0	SS,RZ,LATE,MS
ND8305-1	7	9	8	6	8	9	5	7	2	7	1	8	6	0	9	0	0	0	0	SS,SR,LATE,MS
ND8331Cb-2	8	9	8	6	9	6	7	7	2	6	2	8	4	0	9	0	0	0	0	STSTL^,SS,RZ
NY140	7	9	8	5	7	7	5	8	4	8	5	7	7	0	9	0	0	0	0	SR,MS,SS
Snowden	9	9	8	6	6	6	7	7	2	4	5	7	6	0	9	0	0	0	0	SS,DAE,DSE,CS,SR,RZ
W2310-3	6	8	9	6	6	6	5	8	3	7	5	6	5	2	8.8	0	0	0	0	^RZ,SR,CS,SS
W2978-3	6	8	9	6	8	9	7	7	2	8	5	8	8	0	9	2	0	4	0	SS,MS,CS,SR
W4980-1	6	9	9	8	5	7	7	5	3	6	7	8	9	2	8.2	0	0	0	0	SS,CS,RZ,SR

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

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

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

⁴ See Appendix 3 for Comment Codes

Table 4a. Bright's Farm Variety Trial. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones harvested 114 DAP¹ at Bright's Farm, Weeksville, Pasquotank Co., NC - 2011

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.	%RusNor	%Yuk	A's + B's	C's	Culls		24 to 48 hrs	5 to 7 Days
AF0338-17	156	120	82	78	121	94	74	22	5	1.081	2	2
AF4013-3	191	135	90	85	140	103	68	25	7	1.075	3	2
AF4047-2	218	177	118	110	189	133	79	18	3	1.072	2	3
Atlantic	175	146	100	95	157	113	83	14	3	1.085	2	2
Augusta	208	155	107	101	170	120	75	20	5	1.075	.	.
Chieftain	208	156	106	100	170	119	74	23	3	1.064	.	.
Classic Russet	130	87	60	57	93	69	67	22	12	1.067	.	.
Dakota Crisp	232	186	129	123	196	148	80	16	4	1.065	1	2
Dark Red Norland	213	167	115	109	180	131	78	17	5	1.058	.	.
Goldrush	196	144	98	93	153	112	73	23	5	1.073	.	.
Harley Blackwell	229	175	120	113	194	135	76	22	2	1.074	2	2
NC293-7	101	25	17	17	26	20	23	76	0	1.069	.	.
NY136	161	79	54	50	96	59	46	53	1	1.067	.	.
Peter Wilcox	184	128	87	82	137	98	69	21	10	1.074	.	.
Red Maria (NY129)	150	79	53	50	85	60	52	41	7	1.064	.	.
Russet Norkotah	168	102	73	70	100	86	60	28	12	1.070	.	.
Sifra	212	96	65	61	103	74	46	26	28	1.069	4	5
Snowden	284	237	158	148	269	175	81	15	4	1.072	2	2
Superior	167	140	98	94	152	111	84	7	9	1.079	2	2
Yukon Gold	171	131	89	84	145	100	76	13	11	1.076	.	.
Grand Mean	187.6	133										
CV(%)	17.9	25.9										
LSD(K=100)	46.1	46.7										

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 114 DAP¹ at Bright's Farm, Weeksville, Pasquotank Co., NC - 2011

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	9	9	9	7	8	6	7	7	2	7	5	8	7	0	9	0	0	0	0	MS, SR, FS,RZ
AF4013-3	9	9	9	6	7	7	5	7	4	8	5	8	7	0	9	0	0	0	3	CS,MS,RZ,SR,GC,YF2
AF4047-2	9	8	9	5	6	5	7	6	3	7	7	8	7	0	9	0	0	0	3	MS,SS,GC,CS
Atlantic	6	7	9	5	6	5	7	6	3	6	7	8	6	0	9	0	0	0	5	MS,CS
Augusta	6	9	9	4	7	8	7	7	5	4	6	8	7	0	9	0	0	0	0	MS,SG,PTS,CS,YF2
Chieftain	9	9	9	6	3	8	7	7	2	6	6	8	5	0	9	0	0	0	3	MS, SR, RZ
Classic Russet	6	9	9	7	6	4	7	7	6	8	5	8	5	0	9	0	0	0	0	MS, ^PTS
Dakota Crisp	9	8	8	6	6	7	7	7	2	7	6	7	7	0	9	0	0	0	0	CS,MS,PTS,SR
Dark Red Norland	6	9	9	3	2	7	7	7	7	7	5	8	5	0	9	0	0	0	0	SISC,SR,MS,SS
Goldrush	6	9	9	5	6	4	7	7	5	8	3	8	5	0	9	0	0	0	0	MS,SR,HS,SG,RZ
Harley Blackwell	9	8	9	6	6	6	7	7	2	7	6	8	7	0	9	0	0	0	0	SR,SS,MS,CS
NC293-7	6	9	9	7	1	8	5	6	5	8	1	8	6	0	9	0	0	0	0	MS
NY136	9	9	9	7	2	8	7	6	2	8	3	8	6	0	9	0	0	0	0	MS,PTS,RZ,SR
Peter Wilcox	6	9	9	4	1	6	7	7	4	8	4	6	5	0	9	0	0	0	0	MS, ^SISC, SS
Red Maria (NY129)	9	9	9	6	2	6	7	7	2	8	4	7	6	0	9	0	0	0	0	MS,SR,IL
Russet Norkotah	7	9	9	5	6	3	7	6	6	8	6	8	5	0	9	0	0	0	5	MS,PTS,SG,SS
Sifra	6	8	9	9	9	7	7	7	3	7	7	8	4	0	9	0	0	0	0	^HS,SG,RZ,MS
Snowden	9	9	9	8	6	6	7	5	2	5	5	8	5	0	9	0	0	0	0	MS,SS
Superior	6	9	9	4	6	7	7	7	3	6	6	7	6	0	9	0	0	3	0	MS,SR,IL,SS
Yukon Gold	9	9	9	5	7	8	7	7	4	7	6	7	7	0	9	0	0	0	0	SR,MS,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 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 107 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2011

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	
AF4129-2	107	43	36	62	33	2	0	0	3	35	2	1.085	1	3	
AF4130-13	88	51	48	41	47	6	0	0	6	53	6	1.085	2	3	
AF4130-3	128	57	53	47	44	1	0	0	8	45	1	1.088	2	3	
AF4138-8	111	46	45	57	39	2	0	0	1	41	2	1.071	2	2	
AF4147-1	133	58	56	55	42	1	0	0	2	43	1	1.088	1	2	
AF4236-1	113	61	53	40	48	6	0	0	7	53	6	1.072	2	2	
AF4241-1	86	55	49	34	59	5	0	0	2	64	5	1.088	2	3	
AF4360-5	148	84	79	41	51	5	0	0	3	56	5	1.082	2	3	
AF4363-2	99	29	23	71	26	1	0	0	2	27	1	1.094	2	2	
AF4363-5	107	57	54	43	51	2	0	0	3	53	2	1.080	2	2	
AF4372-2	130	67	60	43	50	2	0	0	6	51	2	1.085	2	2	
Atlantic	155	115	100	24	57	16	0	0	3	73	16	1.089	1	2	
B2628-10	128	90	84	27	65	5	0	0	3	70	5	1.085	1	2	
B2735-2	163	87	83	45	52	1	0	0	2	53	1	1.086	1	2	
Sifra	156	87	79	42	52	3	0	0	3	55	3	1.077	4	4	
Snowden	163	103	91	34	56	6	0	0	3	62	6	1.082	2	2	
Superior	145	104	100	19	52	20	0	0	10	71	20	1.079	2	3	
Yukon Gold	134	110	107	12	62	20	0	0	6	82	20	1.082	.	.	
Grand Mean	127	72													
CV(%)	20.4	30.1													
LSD(K=100)	40.7	31.4													

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 107 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2011

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
AF4129-2	6	9	8	6	6	7	6	7	2	7	3	7	5	0	9	0	0	0	0	SR,MS,SS,KNOBS
AF4130-13	6	9	8	6	8	7	7	7	2	8	4	8	5	0	9	0	0	0	0	SS,MS,SR,RZ,STST
AF4130-3	8	8	8	6	8	8	7	7	2	7	4	7	5	0	9	0	0	0	5	SS,SR,STST,MS,RZ,IL
AF4138-8	6	9	8	5	9	8	6	7	2	7	4	8	5	0	9	0	0	0	0	RZ,SR,GC,SS
AF4147-1	6	9	8	4	6	6	6	7	2	6	4	8	5	0	9	0	3	0	0	SR,IL,MS,LUMPY
AF4236-1	6	9	8	3	8	7	7	7	4	7	4	8	6	0	9	0	0	0	3	CS,SR,MS,RZ,SS
AF4241-1	8	8	8	6	8	8	7	7	4	8	4	8	7	0	9	0	0	0	0	SR,RZ,MS
AF4360-5	6	9	8	6	6	8	6	7	5	8	5	8	6	0	9	0	0	0	5	SR,MS
AF4363-2	6	9	8	5	8	8	7	7	1	8	3	7	5	0	9	0	0	0	0	TOO SMALL,SR,MS
AF4363-5	9	8	8	6	9	7	6	7	4	7	4	8	6	0	9	0	0	0	0	SR,RZ
AF4372-2	9	8	8	8	6	7	6	7	5	8	4	7	4	0	9	0	0	0	0	MS,SS,RZ,SR
Atlantic	6	6	8	5	6	6	7	7	3	7	5	7	6	10	8	0	0	13	0	GC,RZ,SR,MS
B2628-10	7	9	8	7	6	6	6	6	4	7	5	8	5	0	9	0	0	0	0	CS,GC,SR,MS
B2735-2	7	9	8	5	5	6	7	7	5	8	4	8	4	0	9	0	0	0	0	MS,RZ,SR
Sifra	6	9	8	8	6	7	6	7	2	7	5	7	6	0	9	0	0	0	3	RZ,SR,SS
Snowden	9	9	8	7	5	5	6	5	2	5	5	7	4	0	9	0	0	0	0	RZ,CS,MS,SR,SS
Superior	6	9	8	4	6	7	5	7	3	7	6	6	3	0	9	0	0	10	0	CS,MS,SS,SR
Yukon Gold	9	9	8	5	7	8	6	7	4	8	6	7	7	0	9	0	0	0	5	SR,MS,RZ,YF2

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

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

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

⁴ See Appendix 3 for Comment Codes

Table 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 111 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2011

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					
AF4203-4	123	95	118	20	67	11	0	0	3	77	11	1.079	2	3		
AF4220-4	162	108	139	29	60	6	0	0	4	67	6	1.074	3	4		
AF4227-4	112	67	88	34	56	4	0	0	6	60	4	1.085	2	2		
AF4240-3	105	77	100	20	59	14	0	0	7	73	14	1.084	2	2		
AF4254-2	69	21	25	63	30	0	0	0	7	30	0	1.096	2	2		
Atlantic	131	91	100	28	60	7	0	0	5	67	7	1.089	2	2		
B2738-3	149	89	107	39	56	3	0	0	2	59	3	1.080	2	2		
BNC202-7	140	79	96	43	51	4	0	0	2	55	4	1.095	2	2		
Snowden	153	86	103	41	52	4	0	0	4	55	4	1.085	2	2		
Yukon Gold	126	97	119	18	59	18	0	0	5	77	18	1.084	.	.		
Grand Mean	126.9	81.0														
CV(%)	16.7	25.7														
LSD(K=100)	31.3	31.4														

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 111 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2011

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
AF4203-4	7	9	7	8	6	5	7	6	3	7	6	8	8	0	9	0	0	0	0	SR,MS
AF4220-4	6	9	8	6	6	6	7	6	2	7	5	8	6	0	9	0	0	0	0	MS,SS,SR
AF4227-4	6	9	8	5	6	6	7	5	2	8	6	6	5	0	9	0	0	0	0	^RZ,MS,SR,CS
AF4240-3	6	7	8	7	6	6	6	7	2	7	6	7	5	3	8.5	0	0	0	0	RZ,SR,BL
AF4254-2	6	8	8	7	8	8	7	7	2	7	4	8	4	0	9	0	0	0	0	SS,SR,RZ,MS
Atlantic	6	6	8	5	6	5	6	6	2	7	6	7	6	5	7.8	0	0	3	3	SR,IL,MS,RZ
B2738-3	6	8	7	6	6	6	5	7	3	7	5	8	5	0	9	0	0	3	0	MS,SS,SR
BNC202-7	6	9	8	5	7	7	7	7	3	7	6	8	5	0	9	0	0	0	0	MS,RZ,SS,YF1
Snowden	9	9	7	7	6	5	6	6	2	6	5	7	5	0	9	0	0	0	0	SR,BS,MS,RZ,SS
Yukon Gold	9	9	8	5	7	8	6	7	4	8	6	7	7	3	8.8	0	0	0	0	SR,SS,CS,GC,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 7a. 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 109 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2011

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	
AF0338-17	47	16	69	56	31	2	0	0	12	33	2	1.099	2	3	
AF2866-3	44	10	39	72	20	0	0	0	8	20	0	1.083	3	3	
AF4047-2	71	41	165	46	44	6	0	0	3	50	6	1.078	2	3	
Atlantic	56	23	100	54	41	1	0	0	4	42	1	1.090	2	2	
BNC182-5	78	32	136	60	36	3	0	0	1	39	3	1.082	2	3	
JOMA	50	27	115	39	48	2	0	0	11	50	2	1.071	2	3	
Katahdin	42	12	57	67	28	0	0	0	5	28	0	1.074	2	3	
Kennebec	36	20	90	39	52	3	0	0	7	54	3	1.072	2	3	
NYE106-4	47	8	34	80	17	0	0	0	3	17	0	1.097	2	2	
Snowden	79	37	157	56	37	4	0	0	3	41	4	1.082	1	2	
Superior	67	30	140	51	43	1	0	0	5	44	1	1.081	2	3	
Yukon Gem	59	23	102	57	36	1	0	0	7	36	1	1.073	2	3	
Yukon Gold	41	20	83	40	43	2	0	0	15	46	2	1.077	2	2	
Grand Mean	55	23													
CV(%)	21.7	47.5													
LSD(K=100)	16.4	15.5													

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 7b. 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 109 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2011

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	9	9	8	8	6	6	2	7	7	7	3	7	6	0	9	0	0	0	0	SR,RZ
AF2866-3	7	9	9	6	6	7	6	7	2	7	2	7	4	0	9	0	0	0	0	SR,MS
AF4047-2	9	9	8	6	6	6	7	7	2	7	5	8	7	0	9	0	0	3	0	SR
Atlantic	6	9	8	5	6	6	7	6	2	7	4	8	5	0	9	0	0	5	0	SR,SS,MS
BNC182-5	6	9	8	8	6	6	7	7	7	8	5	8	7	0	9	0	0	0	0	SR
JOMA	9	9	9	6	8	7	5	7	5	7	5	8	3	0	9	0	0	0	0	CS,SR,MS
Katahdin	5	9	8	4	9	8	6	7	4	7	3	8	4	0	9	0	0	0	0	MS,SR
Kennebec	8	9	9	6	8	7	5	7	5	7	5	8	4	0	9	0	0	0	0	SR,MS
NYE106-4	8	9	8	6	6	7	6	7	2	7	2	7	3	0	9	0	0	0	0	MS,SR
Snowden	9	9	8	7	6	6	7	7	2	6	4	8	4	0	9	0	0	0	0	SR,MS
Superior	5	9	8	3	6	7	5	7	3	7	5	8	4	0	9	0	0	5	0	SR,MS,CS,BL
Yukon Gem	9	9	8	6	7	7	5	7	4	7	3	6	4	0	9	0	0	0	3	MS, [^] SR,PINK EYES,YF1
Yukon Gold	8	9	8	5	7	8	5	7	5	8	4	8	6	0	9	0	0	0	0	SR,MS,SS,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 8a. NE-1031 Red Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 107 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2011

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			
Adirondack Blue	36	22	34	34	58	1	0	0	7	59	1	1.069
B2152-17	116	42	80	60	35	1	0	0	4	36	1	1.078
B2756-7	61	31	58	42	43	5	0	0	10	48	5	1.079
Chieftain	137	65	100	50	43	2	0	0	5	45	2	1.072
Dark Red Norland	142	75	134	19	39	13	1	0	29	53	14	1.066
Modoc	96	28	46	66	27	1	0	0	5	29	1	1.066
ND8555-8R	104	26	49	72	25	0	0	0	4	25	0	1.071
NY136	118	50	81	54	40	1	0	0	5	41	1	1.078
NYB13-1	114	48	100	55	39	0	0	0	6	39	0	1.065
Peter Wilcox	109	63	111	39	54	3	0	0	4	58	3	1.078
Red Sunset	69	22	45	67	30	0	0	0	4	30	0	1.074
Grand Mean	100	43										
CV(%)	25.7	44.7										
LSD(K=100)	37.7	29.9										

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.

Table 8b. 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 107 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2011

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
Adirondack Blue	4	9	8	6	1	7	5	7	5	5	4	6	3	0	9	0	0	0	0	SISC,STST,MS
B2152-17	6	9	8	2	2	8	7	7	2	8	3	7	6	0	9	0	0	0	0	SR,SS,YF1
B2756-7	5	4	8	5	2	8	7	7	4	8	4	7	5	0	9	0	0	0	0	SR,SS,MS,YF1
Chieftain	9	9	8	7	3	7	7	7	4	7	5	8	5	0	9	0	0	0	0	MS,RZ,SR,SS
Dark Red Norland	5	9	8	3	2	7	7	7	4	7	5	8	4	0	9	0	0	0	0	MS,SR,^OFF COLORS
Modoc	5	9	7	3	2	7	7	7	4	8	4	8	6	0	9	0	0	0	0	RZ,GC,MS,SS,SR
ND8555-8R	8	9	8	4	2	8	7	7	2	8	3	7	7	0	9	0	0	0	0	VN CLR,SS,MS,RZ
NY136	9	9	7	6	2	8	7	7	2	7	4	7	7	0	9	0	0	0	3	SR,SS,MS
NYB13-1	9	9	8	4	2	8	6	7	5	7	3	7	4	0	9	0	0	0	3	SR,SS,MS,CS
Peter Wilcox	5	6	8	5	1	7	6	7	5	8	3	7	6	0	9	0	0	0	0	SS,SISC,SR,YF2
Red Sunset	5	8	8	3	2	7	6	7	4	8	3	8	4	0	9	0	0	0	0	MS,SS,RZ

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

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

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

⁴ See Appendix 3 for Comment Codes

Table 9a. NE-1031 Russet 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 - 2011

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				
AF3362-1	80	42	193	46	49	0	0	0	4	49	0	1.078	
AF4040-2	69	49	285	20	68	1	0	0	10	69	1	1.082	
Alpine Russet	49	19	77	61	35	0	0	0	4	35	0	1.063	
Classic Russet	37	12	61	60	28	0	0	0	12	28	0	1.076	
Premier Russet	63	31	157	51	46	1	0	0	2	46	1	1.078	
Russet Burbank #400	49	7	35	80	13	0	0	0	7	13	0	1.079	
Russet Norkotah #3117	61	22	100	61	35	0	0	0	4	35	0	1.079	
Shepody	58	20	110	59	36	0	0	0	5	36	0	1.094	
Grand Mean	58	25											
CV(%)	20.8	45.5											
LSD(K=100)	18.1	17.1											

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 9b. 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 111 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2011

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
AF3362-1	9	9	8	6	5	4	6	7	6	7	5	8	4	0	9	0	0	0	0	SR,MS,RZ
AF4040-2	6	9	8	5	6	7	6	7	7	8	6	7	5	0	9	0	0	0	0	SR,MS,RZ
Alpine Russet	8	9	8	8	6	6	5	6	5	7	4	8	3	0	9	0	3	0	0	MS,SS,SR,RZ
Classic Russet	9	9	9	6	5	3	6	7	5	8	4	7	5	0	9	0	0	0	0	SR,MS
Premier Russet	9	9	8	8	5	4	7	7	5	7	5	8	5	0	9	0	0	0	0	MS,SR
Russet Burbank #400	9	9	8	7	5	4	7	7	5	8	3	8	3	0	9	0	0	0	0	MS,SR,RZ,LUMPY
Russet Norkotah #3117	6	9	9	5	5	3	7	7	5	8	2	8	5	0	9	0	0	0	0	SR,MS
Shepody	6	9	8	9	8	8	6	7	6	8	4	8	2	0	9	0	0	0	0	MS,SR

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

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

³ Percentage determined from 10 randomly selected potatoes /rep (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. Observational Trial. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 109 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2011

Clone	Total Yield cwt/A	Marketable Yield cwt/A % Std		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				
AF4376-2	179	123	111	29	60	9	0	0	2	69	9	1.074	
AF4376-3	175	111	100	33	59	5	0	0	3	63	5	1.076	
AF4386-16	153	63	56	58	38	3	0	0	1	41	3	1.091	
AF4387-8	117	88	79	18	49	26	0	0	6	75	26	1.070	
AF4397-5	76	18	16	64	23	0	0	0	12	23	0	1.080	
AF4400-7	196	127	114	32	65	0	0	0	4	65	0	1.073	
AF4404-1	182	115	103	35	55	8	0	0	2	63	8	1.077	
AF4408-3	124	63	56	45	51	0	0	0	4	51	0	1.074	
AF4408-5	173	79	71	51	46	0	0	0	3	46	0	1.088	
AF4410-11	83	33	29	53	39	0	0	0	8	39	0	1.083	
AF4421-2	130	72	65	42	49	7	0	0	3	55	7	1.083	
AF4421-4	146	78	70	45	49	4	0	0	2	54	4	1.077	
AF4423-5	98	39	35	47	33	7	0	0	13	39	7	1.078	
AF4430-1	188	133	120	28	64	7	0	0	2	71	7	1.067	
AF4430-2	144	105	94	25	67	6	0	0	2	73	6	1.078	
AF4437-1	128	30	27	75	23	0	0	0	2	23	0	1.088	
AF4437-5	121	68	61	39	53	3	0	0	5	56	3	1.082	
AF4441-14	100	35	32	61	35	0	0	0	4	35	0	1.080	
AF4441-8	106	55	50	46	52	0	0	0	2	52	0	1.090	
AF4441-9	97	74	66	21	76	0	0	0	4	76	0	1.092	
AF4442-1	80	17	15	76	21	0	0	0	3	21	0	1.099	
AF4442-4	158	99	76	35	58	4	0	0	3	62	4	1.075	
AF4445-3	88	59	46	31	65	2	0	0	2	67	2	1.077	
AF4447-2	101	53	40	46	50	2	0	0	2	52	2	1.082	
AF4449-2	121	73	56	34	60	0	0	0	5	60	0	1.085	
AF4453-7	113	78	60	26	66	3	0	0	5	69	3	1.084	

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. Observational Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 109 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2011

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
AF4376-2	9	7	8	8	6	7	5	5	3	8	5	8	5	0	9	0	0	10	0	CS,SR
AF4376-3	6	9	8	5	8	8	6	7	7	8	6	8	7	0	9	0	0	0	0	SR
AF4386-16	5	9	8	4	6	7	7	7	2	7	4	8	5	0	9	0	0	0	0	MS
AF4387-8	8	9	8	7	2	8	7	7	3	7	7	8	7	0	9	0	0	0	0	MS,SR
AF4397-5	6	9	9	3	6	7	7	7	5	8	4	7	5	0	9	0	0	0	0	PINK EYES,RZ,SR
AF4400-7	6	9	8	4	8	8	7	7	5	8	6	7	5	0	9	0	0	0	0	MS,CS,RZ,PINK EYES
AF4404-1	9	9	9	5	6	7	7	7	3	8	5	8	6	0	9	0	0	0	0	RZ
AF4408-3	9	9	8	6	3	7	7	7	4	8	3	8	3	0	9	0	0	0	0	SS,MS,RZ
AF4408-5	9	9	8	5	3	8	7	7	7	7	4	8	4	0	9	0	0	0	0	MS,SR,GC
AF4410-11	8	9	6	7	8	8	6	7	6	8	5	8	4	0	9	0	0	0	0	^MS,SR
AF4421-2	6	8	8	4	6	6	7	7	2	8	5	8	6	0	9	0	0	0	0	SR,RZ
AF4421-4	6	9	9	4	9	8	7	7	2	8	5	8	6	0	9	0	0	10	0	SR
AF4423-5	9	9	8	8	8	7	6	7	3	7	4	7	3	0	9	30	0	0	0	MS,RZ,GC,SR
AF4430-1	6	8	9	6	8	7	7	7	2	7	5	8	6	0	9	0	0	0	0	SR
AF4430-2	9	9	9	7	8	8	4	7	5	8	5	8	4	0	9	0	0	0	0	RZ
AF4437-1	9	9	8	5	8	8	7	7	2	8	3	8	6	0	9	0	0	0	0	SR,MS
AF4437-5	9	8	8	5	8	8	7	7	3	7	5	8	6	0	9	0	0	0	0	SR
AF4441-14	5	9	8	4	8	7	6	7	2	7	4	8	5	0	9	0	0	0	0	SR
AF4441-8	8	9	8	5	8	8	7	7	1	7	4	8	6	0	9	0	0	0	0	MS,SR
AF4441-9	9	9	8	8	9	8	6	7	3	7	5	8	4	0	9	0	0	0	0	MS
AF4442-1	6	7	9	6	6	8	6	7	2	7	3	8	5	0	9	0	0	0	0	MS,SR
AF4442-4	6	9	7	7	9	7	6	7	4	7	6	8	7	0	9	0	0	0	0	MS,SR
AF4445-3	6	6	9	4	5	3	6	7	5	8	4	8	5	0	9	0	0	0	0	SR
AF4447-2	5	9	8	6	6	7	7	7	2	7	4	8	5	0	9	0	0	0	0	SR
AF4449-2	6	8	8	6	9	7	5	7	2	8	5	8	6	0	9	0	0	0	0	SR
AF4453-7	5	7	8	5	6	7	5	7	5	8	5	8	7	0	9	0	0	0	0	SR

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

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

³ Percentage determined from 10 randomly selected potatoes /rep (10 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. Continued.

Clone	Total Yield cwt/A	Marketable Yield cwt/A % Std		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			
AF4454-3	150	51	39	63	33	1	0	0	3	34	1	1.077
AF4458-2	78	46	35	23	52	6	0	0	18	59	6	1.079
AF4463-7	187	113	87	35	45	15	0	0	4	60	15	1.077
AF4463-8	126	54	41	54	42	0	0	0	3	42	0	1.061
AF4467-2	64	44	34	25	69	0	0	0	6	69	0	1.082
AF4469-2	128	82	63	33	64	0	0	0	3	64	0	1.079
AF4477-4	82	18	14	77	22	0	0	0	2	22	0	1.092
AF4483-2	78	26	20	65	33	0	0	0	2	33	0	1.084
AF4518-1	135	49	37	62	34	2	0	0	2	36	2	1.082
AF4521-1	165	142	109	10	66	21	0	0	4	86	21	1.084
AF4526-2	132	107	82	17	68	13	0	0	2	81	13	1.077
AF4527-3	108	46	35	51	42	0	0	0	7	42	0	1.089
AF4532-8	89	63	48	24	71	0	0	0	5	71	0	1.068
AF4532-9	72	37	28	46	51	0	0	0	3	51	0	1.093
AF4534-3	55	23	18	51	43	0	0	0	6	43	0	1.084
AF4538-3	73	34	26	54	46	0	0	0	0	46	0	1.083
AF4540-2	66	12	11	79	19	0	0	0	2	19	0	1.064
AF4540-3	103	34	31	58	33	0	0	0	8	33	0	1.065
AF4543-2	89	11	10	84	13	0	0	0	4	13	0	1.068
AF4545-1	69	16	15	63	24	0	0	0	14	24	0	1.062
AF4545-3	97	31	28	61	32	0	0	0	7	32	0	1.065
AF4547-1	131	60	54	48	46	0	0	0	6	46	0	1.076
AF4550-2	113	60	54	43	53	0	0	0	4	53	0	1.075
AF4551-1	110	42	38	60	38	0	0	0	1	38	0	1.055
AF4552-4	106	65	58	36	57	4	0	0	3	61	4	1.079
AF4552-5	109	56	51	46	52	0	0	0	2	52	0	1.085
AF4561-1	71	29	26	54	41	0	0	0	6	41	0	1.095

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. Continued.

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	
AF4454-3	9	9	8	8	8	7	6	7	2	8	5	8	5	0	9	0	0	0	0	SR
AF4458-2	9	9	7	8	6	8	5	7	2	8	6	6	4	0	9	0	0	0	0	^RZ,SR
AF4463-7	6	9	9	6	8	8	7	7	4	7	4	8	6	0	9	0	0	0	0	SR,RZ
AF4463-8	9	7	9	7	9	7	7	7	2	7	4	8	5	0	9	0	0	0	0	SR
AF4467-2	8	9	8	6	6	7	6	7	1	7	7	8	8	0	9	0	0	0	0	SR
AF4469-2	6	9	9	4	7	7	6	7	2	7	4	8	5	0	9	0	0	0	0	MS,LUMPY,YF1
AF4477-4	9	5	8	6	6	7	7	7	2	7	2	8	5	0	9	0	0	0	0	MS
AF4483-2	5	9	8	3	6	4	5	7	5	8	4	8	4	0	9	0	0	0	0	MS
AF4518-1	5	9	8	4	6	7	6	7	2	8	4	8	5	0	9	0	0	0	0	SR
AF4521-1	9	7	7	8	9	8	6	7	4	8	7	8	6	0	9	0	0	0	0	SR
AF4526-2	9	9	8	7	5	4	6	7	5	8	7	8	5	0	9	0	0	0	0	MS
AF4527-3	6	9	9	5	5	4	6	7	7	8	5	8	3	0	9	0	0	0	0	MS,YF1
AF4532-8	6	9	9	6	5	3	5	7	7	8	5	8	6	0	9	0	0	0	10	SR
AF4532-9	8	9	8	8	5	4	7	7	7	9	5	8	5	0	9	0	0	0	0	SR
AF4534-3	6	9	9	5	5	3	6	7	6	7	4	9	3	0	9	0	0	0	0	MS
AF4538-3	6	7	8	7	5	4	6	6	6	8	4	9	5	0	9	0	0	0	0	TOO SMALL
AF4540-2	5	9	8	2	3	8	7	7	1	8	2	8	5	0	9	0	0	0	0	SR,RZ
AF4540-3	9	9	8	4	3	7	7	7	1	7	3	8	5	0	9	0	0	0	0	SR,RZ
AF4543-2	5	9	8	2	2	8	5	7	3	8	3	8	6	0	9	0	0	0	0	RZ,SR
AF4545-1	9	8	8	7	2	8	7	7	2	8	3	7	3	0	9	0	0	0	0	MIXED CLRS,SR,BS
AF4545-3	5	9	8	2	2	8	6	7	3	8	3	7	5	0	9	0	0	0	0	BS,SR
AF4547-1	5	9	7	2	2	8	7	7	2	8	4	8	6	0	9	0	0	0	0	SS,SR,MS,RZ,YF1
AF4550-2	6	9	8	3	1	7	5	6	5	7	5	8	6	0	9	0	0	0	0	SR,SS
AF4551-1	6	9	7	7	6	7	7	7	2	7	5	8	5	0	9	0	0	0	10	SR
AF4552-4	7	2	6	3	6	7	7	7	4	8	5	8	5	0	9	0	0	0	0	SR
AF4552-5	8	9	8	6	6	6	5	7	2	6	5	8	3	0	9	0	0	0	0	MS,SR,LUMPY
AF4561-1	5	9	9	8	6	7	7	7	3	8	3	8	5	0	9	0	0	0	0	SR

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

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

³ Percentage determined from 10 randomly selected potatoes /rep (10 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. Continued.

Clone	Total Yield cwt/A	Marketable Yield cwt/A % Std		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			
AF4565-1	69	15	13	75	22	0	0	0	4	22	0	1.066
AF4565-2	134	55	49	57	41	0	0	0	2	41	0	1.068
AF4566-4	122	47	43	60	39	0	0	0	2	39	0	1.075
AF4573-2	102	42	38	53	38	3	0	0	6	41	3	1.084
AF4587-2	108	29	26	71	25	2	0	0	2	27	2	1.064
AF4592-1	127	67	61	43	53	0	0	0	4	53	0	1.078
AF4593-1	99	50	45	38	51	0	0	0	11	51	0	1.066
AF4594-1	94	34	31	46	36	0	0	0	18	36	0	1.066
AF4607-1	57	38	35	21	68	0	0	0	11	68	0	1.085
AF4609-1	83	51	46	26	62	0	0	0	13	62	0	1.091
AF4613-1	130	84	102	33	35	29	0	0	3	64	29	1.081
AF4614-2	121	74	90	34	56	5	0	0	5	61	5	1.080
AF4615-5	64	18	22	70	28	0	0	0	2	28	0	1.087
AF4624-1	90	39	48	50	44	0	0	0	7	44	0	1.086
AF4626-3	86	36	43	56	41	0	0	0	2	41	0	1.078
AF4631-3	70	42	51	36	60	0	0	0	4	60	0	1.086
AF4633-3	54	13	16	68	24	0	0	0	9	24	0	1.090
AF4637-1	154	54	66	29	35	0	0	0	35	35	0	1.078
AF4640-1	133	62	76	49	45	2	0	0	4	47	2	1.076
AF4648-2	69	23	28	64	33	0	0	0	3	33	0	1.089
AF4659-12	65	6	7	71	9	0	0	0	19	9	0	1.083
AF4669-3	104	64	78	37	62	0	0	0	1	62	0	1.090
AF4677-1	84	51	62	37	58	2	0	0	2	60	2	1.095
AF4681-1	79	34	41	43	43	0	0	0	14	43	0	1.085
AF4682-2	60	17	21	65	29	0	0	0	6	29	0	1.081
AF4682-3	80	36	44	48	45	0	0	0	7	45	0	1.081
AF4692-1	80	42	50	39	52	0	0	0	10	52	0	1.081

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. Continued.

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
AF4565-1	5	9	9	3	2	8	6	7	2	7	3	8	5	0	9	0	0	0	0	SR,SS
AF4565-2	9	7	8	7	3	7	6	7	3	7	3	8	3	0	9	0	0	0	0	MS,LUMPY
AF4566-4	5	9	8	3	2	8	7	7	3	7	4	8	5	0	9	0	0	0	10	MS,SR
AF4573-2	9	7	8	8	8	8	7	7	3	7	5	8	4	0	9	0	0	0	0	SR
AF4587-2	5	9	9	2	2	8	7	7	2	7	4	8	5	0	9	0	0	0	0	MS,SS
AF4592-1	5	9	8	4	6	7	7	7	1	7	4	8	5	0	9	0	0	0	0	MS,RZ,SR,CS
AF4593-1	6	9	8	6	2	8	7	7	2	7	3	8	2	0	9	0	0	0	0	GC,MS,SS,SR
AF4594-1	5	9	9	5	2	7	7	7	2	7	3	7	3	0	9	0	0	0	0	^SR
AF4607-1	6	9	8	7	6	4	6	7	6	7	4	8	3	0	9	0	0	0	0	MS,SR
AF4609-1	8	8	8	7	6	4	6	7	6	8	5	8	5	0	9	0	10	0	0	MS
AF4613-1	6	7	8	4	6	8	6	7	5	8	7	8	8	0	9	0	0	0	0	SR,RZ,YF1
AF4614-2	9	9	9	5	8	8	7	7	2	7	5	7	6	0	9	0	0	10	0	SR
AF4615-5	8	9	8	9	6	7	5	7	4	8	3	8	3	0	9	0	0	0	0	^RZ,IL
AF4624-1	9	9	8	4	8	8	6	7	5	8	4	8	6	0	9	0	0	0	0	SR,MS
AF4626-3	9	9	8	7	6	6	5	7	4	8	3	8	4	0	9	0	0	0	0	MS,SR
AF4631-3	8	7	8	7	6	7	6	7	6	8	4	8	4	0	9	0	0	0	0	^MS,CS
AF4633-3	9	9	8	6	5	4	7	7	4	8	3	8	4	0	9	0	0	0	0	SR
AF4637-1	9	9	9	3	7	7	6	7	5	8	4	8	3	0	9	0	0	0	0	MS,RZ,SR
AF4640-1	9	9	9	8	8	7	5	7	4	8	4	8	4	0	9	0	0	0	0	SR,MS
AF4648-2	5	9	7	5	9	8	7	7	2	8	3	8	4	0	9	0	0	0	0	SR,MS
AF4659-12	9	9	8	9	7/3	8	6	7	5	7	3	7	2	0	9	0	0	0	0	SR,SG,MS,YF2
AF4669-3	9	6	8	8	8	7	7	7	5	8	5	8	4	20	6	0	0	0	0	MS
AF4677-1	6	9	9	7	5	4	6	6	5	7	5	8	3	0	9	0	0	0	0	MS/PEARS
AF4681-1	6	7	8	7	6	7	6	7	7	6	5	8	3	0	9	0	10	0	0	^MS,SR
AF4682-2	5	9	8	4	7	7	7	7	5	8	4	8	5	0	9	0	0	0	0	RZ,SR,YF1
AF4682-3	5	9	8	6	6	4	4	7	5	7	5	8	3	0	9	0	0	0	0	SR,RZ,TOO FLAT
AF4692-1	8	9	8	8	6	7	6	7	6	8	5	8	5	0	9	0	0	0	0	SR

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

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

³ Percentage determined from 10 randomly selected potatoes /rep (10 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. Continued.

Clone	Total Yield cwt/A	Marketable Yield		Size Dist. by Class (%) ² (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³
		cwt/A	% Std	1's	2's	3's	4's	5's	Cull's			
AF4695-1	108	62	75	39	58	0	0	0	4	58	0	1.092
AF4696-1	90	49	59	26	54	0	0	0	20	54	0	1.079
AF4702-2	99	58	70	40	56	2	0	0	2	58	2	1.084
AF4709-2	83	32	38	60	35	3	0	0	2	38	3	1.089
Atlantic	154	109	100	24	58	12	0	0	5	71	12	1.088
Snowden	143	78	73	42	48	6	0	0	5	54	6	1.086
Superior	142	101	95	24	53	17	0	0	6	70	17	1.079

Grand Mean

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. Continued.

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	
AF4695-1	9	9	8	6	5	4	5	7	6	8	4	8	3	0	9	0	0	0	0	SR,MS
AF4696-1	9	8	9	7	6	7	7	7	6	7	6	8	3	0	9	0	0	0	0	^MS,CS,SS,HS
AF4702-2	6	9	9	7	7	7	7	7	5	7	4	8	4	0	9	0	0	0	0	MS,SR
AF4709-2	6	9	9	5	9	8	7	7	2	7	4	8	5	0	9	0	10	0	0	SR
Atlantic	6	6	8	5	6	6	6	7	2	7	6	8	6	0	9	0	0	5	0	MS,RZ,GC,SR
Snowden	9	9	8	7	6	5	7	7	2	6	5	8	5	0	9	0	0	0	0	SR,MS,RZ,SS,GC,BS
Superior	5	9	8	4	6	7	5	7	3	7	6	8	4	0	9	0	0	15	0	CS,SR,MS

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

⁴ See Appendix 3 for Comment Codes

Appendix 1: LAND MANAGEMENT CONDITIONS

Location: Black Gold Farms, Gum Neck, Tyrrell Co., NC
Trial Title: Black Gold Farms Variety Chip Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Seventeen 21' rows at 34' row spacing, 28 hills per row
Seed piece Treatment: None
Weed Control: Metribuzin 1.3 lbs/A
Volunteer 8 fl oz/A
Fertilizer: 236 N, 119 P, 101 K, 1 ZN
Insect Control: Admire Pro in-furrow 7.2oz/A
Disease Control: Quadris in furrow 6.2/A
Bravo 6 pt/A
Revus Top 6.2 fl oz/A
Vine Kill: None

Location: Black Gold Farms, Gum Neck, Tyrrell Co., NC
Trial Title: Black Gold Farms Variety Table Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Fourteen 21' rows at 34' row spacing, 28 hills per row
Seed piece Treatment: None
Weed Control: Metribuzin 1.3 lbs/A
Volunteer 8 fl oz/A
Fertilizer: 236 N, 119 P, 101 K, 1 ZN
Insect Control: Admire Pro in-furrow 7.2oz/A
Disease Control: Quadris in furrow 6.2/A
Bravo 6 pt/A
Revus Top 6.2 fl oz/A
Vine Kill: None

Location: Black Gold Farms, Gum Neck, Tyrrell Co., NC
Trial Title: Snack Food Association Trial
Trial Design: Randomized complete block, five replications
Plot Dimensions: Fourteen 21' rows at 34' row spacing, 28 hills per row
Seed piece Treatment: None
Weed Control: Metribuzin 1.3 lbs/A
Volunteer 8 fl oz/A
Fertilizer: 236 N, 119 P, 101 K, 1 ZN
Insect Control: Admire Pro in-furrow 7.2oz/A
Disease Control: Quadris in furrow 6.2/A
Bravo 6 pt/A
Revus Top 6.2 fl oz/A
Vine Kill: None

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

Location: Bright Farms, Weeksville, Pasquotank Co., NC

Trial Design: Randomized complete block, four replications

Plot Dimensions: Twenty 21' rows at 40' row spacing, 28 hills per row

Seed piece Treatment: None

Fumigant: Telone II pre-plant

Weed Control: Sencor 0.5 lb/A

Fertilizer: 1300lbs, 14-4-18 broadcast

Insect Control: Baythroid 2.5 fl. oz/A

Leverage 3.75 fl. oz/A

Disease Control: Headline 10 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: Dual Magnum 1.5 pt/A pre-emergence

Sencor DF 1 lb/A pre-emergence

Select 2E 10 oz/A, Crop Oil 1 pt/A

Fertilizer: 850 lbs, 15-15-15 broadcast

30-0-0 20 gal

Insect Control: Admire Pro 8.7 oz/A

Disease Control: None

Vine Kill: None

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

Trial Title: Round White Variety Trial Two

Trial Design: Randomized complete block, four replications

Plot Dimensions: Ten 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Dual Magnum 1.5 pt/A pre-emergence

Sencor DF 1 lb/A pre-emergence

Select 2E 10 oz/A, Crop Oil 1 pt/A

Fertilizer: 850 lbs, 15-15-15 broadcast

30-0-0 20 gal

Insect Control: Admire Pro 8.7 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 White Variety Trial

Trial Design: Randomized complete block, four replications

Plot Dimensions: Thirteen 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Dual Magnum 1.5 pt/A pre-emergence

Sencor DF 1 lb/A pre-emergence

Select 2E 10 oz/A, Crop Oil 1 pt/A

Fertilizer: 850 lbs, 15-15-15 broadcast

30-0-0 20 gal

Insect Control: Admire Pro 8.7 oz/A

Disease Control: None

Vine Kill: None

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

Trial Title: NE 10-14 Red Variety Trial

Trial Design: Randomized complete block, four replications

Plot Dimensions: Eleven 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Dual Magnum 1.5 pt/A pre-emergence

Sencor DF 1 lb/A pre-emergence

Select 2E 10 oz/A, Crop Oil 1 pt/A

Fertilizer: 850 lbs, 15-15-15 broadcast

30-0-0 20 gal

Insect Control: Admire Pro 8.7 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 Russet Variety Trial

Trial Design: Randomized complete block, four replications

Plot Dimensions: eight 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Dual Magnum 1.5 pt/A pre-emergence

Sencor DF 1 lb/A pre-emergence

Select 2E 10 oz/A, Crop Oil 1 pt/A

Fertilizer: 850 lbs, 15-15-15 broadcast

30-0-0 20 gal

Insect Control: Admire Pro 8.7 oz/A

Disease Control: None

Vine Kill: None

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

Trial Title: Observational Variety Trial

Trial Design: Randomized complete block

Plot Dimensions: Eighty-seven 21' rows (Thirty-two clones) at 38" row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Dual Magnum 1.5 pt/A pre-emergence

Sencor DF 1 lb/A pre-emergence

Select 2E 10 oz/A, Crop Oil 1 pt/A

Fertilizer: 850 lbs, 15-15-15 broadcast

30-0-0 20 gal

Insect Control: Admire Pro 8.7 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.