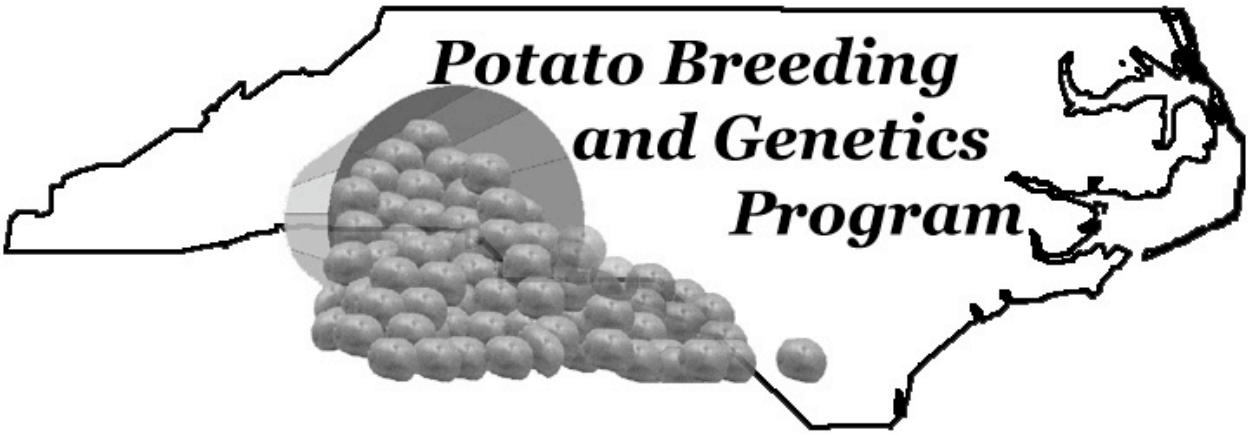
NC STATE UNIVERSITY

NORTH CAROLINA
POTATO VARIETY TRIAL AND BREEDING REPORT

2017



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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) Northeast Region 1231 Multistate Potato Variety Development and Evaluation Project, the USDA NIFA Potato Special Research Grants Program, the NC Potato Association, Potatoes USA and Snacking, Nutrition and Convenience International (SNAC), 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. In the first cycle of selection materials are planted as single hills unless they were developed in the Colorado potato beetle resistance breeding plots or the specialty plots, these start as 4 hills. Planting, selection and advancement to 6-hill or 12-hill (for clones from the specialty 4-hill trial), 20-hill (and 60-hills for specialty clones), 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 2017, we planted 14,506 single-hills and selected 406 clones resulting in a 2.8% selection rate. This is near our average selection rate of 2.5%. Out of the 1362 clones in our 6-hill and 12-hill plots, 286 (21**%**) were selected for future evaluation. In the 20-hill, specialty 60-hill plots, and 60-hill plots 202 clones were planted with 83 (41%) being selected for further evaluation.

In our Colorado potato beetle (CPB) nursery we continued our project to select and screen specific families with potential CPB resistance. We planted 952 4-hill plots for selection

selection. We selected 216 clones that 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 2018. In this year's 2by3 trial, 330 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 44 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 2018. In this years 3by5 trial we evaluated 7 clones for CPB resistance and for adaptation in our non-replicated 20-hill plots simultaneously. We selected 3 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 4 clones and 2 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 12 yield trials, we evaluated 250 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 1-12. 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. 2017 PROMISING LINES:
Chip-stock clones

AF5040-8

Developed by: Univ. of Maine
Released: N/A
 # trials evaluated: 5 (since 2013)
Merit Score: 2 (since 2016)
Skin Color: Tan to Light Brown
Flesh Color: White

Historical Data;
Maturity: medium maturing
% Standard (Atlantic): MKTB YLD 99%
% Standard (Snowden): MKTB YLD 93%
Specific Gravity: 1.073
Chip score: 2 (excellent)
Overall Appearance: 5 (fair)

Other Attributes or Comments: *This clone has moved fast through the national screening process coming up through the National Chip Processors Trial and is now in the SNAC Trial. It has performed reasonably well with no significant internal defects. Maturity is similar to Atlantic for us in NC though maybe slightly later.*

Chip-stock clones cont.

B3084-3

Developed by: USDA-ARS Beltsville
Released: N/A
 # trials evaluated: 4 since (2015)
Merit Score: 2 (since 2016)
Skin Color: Tan to Light Brown
Flesh Color: White

Historical Data;
Maturity: later than medium
% Standard (Atlantic): MKTB YLD 104%
% Standard (Snowden): MKTB YLD 89%
Specific Gravity: 1.072
Chip score: 1.4 (excellent to exceptional)
Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *This is a later than mid maturing clone with good yield, gravity and very good chip scores. Its maturity places it between Atlantic and Snowden and fills the need for an Atlantic like potato that holds up better in a longer season.*

NC470-3

Developed by: NC State Univ
Released: N/A
 # trials evaluated: 3 since (2017)
Merit Score: 2 (since 2017)
Skin Color: Brown
Flesh Color: White

Historical Data;
Maturity: late
% Standard (Atlantic): MKTB YLD 136%
% Standard (Snowden): MKTB YLD 109%
Specific Gravity: 1.070
Chip score: 1.5 (excellent to exceptional)
Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *The vine maturity is late, yields have been excellent, the gravity while appearing low has always been within 2 to 4 points of Atlantic within the same trial and chip scores have been very good. It also appears this clone begins to bulk early so with the strong top that it has late in the season it has excellent potential for the southern chip market. This clone carries the Ryadg PVY resistance gene.*

NCB3171-7

Developed by: NC State Univ
Released: N/A
 # trials evaluated: 2 since (2017)
Merit Score: 2 (since 2017)
Skin Color: tan to light brown
Flesh Color: White

Historical Data;
Maturity: mid-season
% Standard (Atlantic): MKTB YLD 119%
% Standard (Snowden): MKTB YLD 99%
Specific Gravity: 1.074
Chip score: 1.75 (excellent to exceptional)
Overall Appearance: 7 (good)

Other Attributes or Comments: *This is a mid maturing clone with good yield, gravity and chip scores. Its maturity places it between Atlantic is similar to Atlantic. The size profile on this clone also tends to be small to medium so it could possibly be used for smaller chip bags This clone carries the Ryadg PVY resistance gene.*

Chip-stock clones cont.

Sebec(AF0338-17)

Developed by: Univ. of Maine
Released: 2013
 # trials evaluated: 29 since (2006)
Merit Score: 2 (since 2016)
Skin Color: Tan to Light Brown
Flesh Color: White

Historical Data;
Maturity: medium to late
% Standard (Atlantic): MKTB YLD 96%
% Standard (Snowden): MKTB YLD 88%
Specific Gravity: 1.073
Chip score: 2.0 (excellent)
Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *This is a later than mid maturing clone with good yield, gravity and chip scores. Its maturity places it between Atlantic and Snowden and fills the need for an Atlantic like potato that holds up better in a longer season. We have seen rot issues associated with late season rains and so this is something to keep in mind with this clone*

Red Skin Table-stock clones

BNC201-1

Developed by: USDA-ARS Beltsville
Released: N/A
 # trials evaluated: 11 since (2009)
Merit Score: 2 (since 2016)
Skin Color: Red
Flesh Color: Light Yellow

Historical Data;
Maturity: later than medium maturing
% Standard (Chieftain): MKTB YLD 86%
% Standard (Dark Red Norland): MKTB YLD 98%
Specific Gravity: 1.075
Skin Texture: Moderately Smooth
Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *This is an attractive red skin light yellow flesh clone though the yellow flesh is light enough it may still be able to go for a main crop red. Yields have been good across all trials and while this clone is attractive a close watch should be kept on it in years with sporadic large rain events as it can growth crack significantly. This clone is slated for release and PVP soon.*

NCB2607-3

Developed by: NC State Univ.
Released: N/A
 # trials evaluated: 10 since (2008)
Merit Score: 2 (since 2016)
Skin Color: Red
Flesh Color: Yellow

Historical Data;
Maturity: early to medium maturing
% Standard (Chieftain): MKTB YLD 49%
% Standard (Dark Red Norland): MKTB YLD 55%
Specific Gravity: 1.071
Skin Texture: Smooth
Overall Appearance: 7 (good)

Other Attributes or Comments: *This is a small size potato with 87% of its yield below 2 ½". It has a smooth skin and rich red skin color. Also because it is reasonably early the skin typically sets well. Culls for this variety typically stay below 10% and it is very uniform in size profile.*

Red Skin Table-stock clones cont.

Red Endeavor

Developed by: Univ. of Wisconsin
Released: 2015
 # trials evaluated: 3 since (2017)
Merit Score: 2 (since 2017)
Skin Color: Red
Flesh Color: White

Historical Data;
Maturity: mid to late maturing
% Standard (Chieftain): MKTB YLD 108%
% Standard (Dark Red Norland): MKTB YLD 124%
Specific Gravity: 1.059
Skin Texture: Moderately Smooth
Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *This is the first year we have evaluated this clone but we believe its performance was good enough to merit comment under the promising varieties section. It is later than both Dark Red Norland and Chieftain but it is a very uniform variety with 85% of its yield between 1 7/8 and 3 ¼" and it out yielded Chieftain which is impressive for any variety.*

Yellow Skin Table-stock clones

Natascha

Developed by: Solana
Released: 2012
 # trials evaluated: 6 since (2015)
Merit Score: 2 (since 2016)
Skin Color: Yellow
Flesh Color: Yellow

Historical Data;
Maturity: slightly later than medium maturing
% Standard (Atlantic): MKTB YLD 115%
% Standard (Yukon Gold): MKTB YLD 210%
Specific Gravity: 1.058
Skin Texture: Smooth
Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *This variety has been evaluated in 6 trials over the last 3 years. It is an attractive yellow skin potato with a deep yellow flesh it is later than Yukon Gold and the flesh color is a more rich yellow. It is also resistant to nematodes Ro1 and Ro4, potato Wart race 1, late blight, Rhizoctonia, black leg, bruising, PVY and PVY ntn.*

Soraya

Developed by: Norika
Released: N/A
 # trials evaluated: 16 since (2012)
Merit Score: 2 (since 2016)
Skin Color: Yellow
Flesh Color: Yellow

Historical Data;
Maturity: late maturing
% Standard (Atlantic): MKTB YLD 111%
% Standard (Yukon Gold): MKTB YLD 292%
Specific Gravity: 1.053
Skin Texture: Smooth
Overall Appearance: 5 (fair)

Other Attributes or Comments: *This is a late maturing, high yielding yellow flesh clone. This clone is resistant to internal bruising, PVY, PLRV, Nematodes Ro1 and Ro2, Rhizoctonia, late blight and common scab.*

Specialty Table-stock clones

NC509-16

Developed by: NC State Univ.
Released: N/A
 # trials evaluated: 2 since (2016)
Merit Score: 2 (since 2016)
Skin Color: Purple
Flesh Color: Purple

Historical Data;
Maturity: slightly later than medium maturing
% Standard (Atlantic): MKTB YLD 64%
% Standard (Dark Red Norland): MKTB YLD 97%
Specific Gravity: 1.061
Skin Texture: Moderately Smooth
Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *This is an attractive purple skin and flesh clone for the table market. Most of the marketable yield falls in the 1 7/8 to 2 ½" category but it is an oblong potato so if we sized by ounces the profile might indicate a larger size.*

Russet clones

ND8068-5Russ

Developed by: ND State Univ.
Released: N/A
 # trials evaluated: 2 since (2016)
Merit Score: 2 (since 2016)
Skin Color: Brown
Flesh Color: White

Historical Data;
Maturity: early maturing
% Standard (Russet Norkotah): MKTB YLD 122%
% Standard (Russet Burbank): MKTB YLD 175%
Specific Gravity: 1.071
Skin Texture: Light Russet
Overall Appearance: 6 (better than fair)

Other Attributes or Comments: *This is a very early maturing russet potato, earlier than Dark Red Norland and it may be suited for our NC market. We look forward to future trials to access its potential.*

Early Generation Watch List

NC502-10

Specialty Type

Developed by: NC State Univ.
Released: N/A
 # trials evaluated: 1 since (2017)
Merit Score: 2 (since 2017)
Skin Color: Purple
Flesh Color: Purple

Historical Data;
Maturity: slightly later than medium maturing
% Standard (Atlantic): MKTB YLD 70%
% Standard (Dark Red Norland): MKTB YLD 105%
Specific Gravity: 1.077
Skin Texture: Smooth
Overall Appearance: 5 (fair)

Other Attributes or Comments: *Even though this clone is not as pretty as NC509-16 we believe its worth mentioning because of how well it chipped when we sent it to UTZ for testing. This clone had the most even and consistent chip of all the purples sent this year a picture of the chips is available in Figure 2. Also this clone (1.077) had a higher specific gravity than Atlantic (1.074) in the specialty trial this year.*

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.)
James Brothers Farms, Weeksville, NC (Pasquotank Co.)

V. PROCEDURES:

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

Site	Soil Type	Planting Date	Harvest Date	Days to Harvest
Black Gold	Weeksville silt loam	Mar 8	Jun 20,Jun 29	104, 113
James Brothers	Hyde mucky silt loam	Mar 7	Jun 19	104
TRS/VGJREC	Portsmouth fine sandy loam	Mar 24, 28	Jul 5 to Jul 25	Variable 99 - 123

EXPERIMENTAL DESIGN: All yield trials were planted in a randomized complete block design with 4 replications except the Potatoes USA/Snack Nutrition and Convenience International Chip Trial (SNAC) Trial that had 5 replications per clone. Forty-three clones in three trials were evaluated on-farm at Black Gold Farms and twenty-four clones at James Brothers. Plots at the TRS and Black Gold consisted of one row with 25 hills spaced 10 inches apart. Plots with James Brothers consisted of one row with 28 hills spaced 9 inches apart. Spacing between rows was 34 inches at Black Gold Farms, 40 inches at James Brothers and 38 inches for all other trials at the TRS. Planting on farm was done by hand, planting at the TRS/VGJREC was done using a two row carousel planter. 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. All trials were graded at the TRS/VGJREC to five classes: 1's < 1 ⅞"; 2's > 1 ⅞ to 2 ½"; 3's > 2 ½ to 3 ¼"; 4's > 3 ¼ to 4"; 5's > 4". Culls were removed and weighed separately in all trials. Each clone was evaluated for tuber quality and appearance during grading using standardized NE-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 SNAC trial. The tubers were cut and scored for the presence of hollow heart, internal heat necrosis (IHN) and any other internal defects. A second sub-sample of marketable tubers from each replication was taken for specific gravity readings and a third sub-sample was collected and bulked by entry for 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.

Merit Score: The merit score is a composite rating of 5 traits associated with variety performance. This rating combines yield, percent culls, internal quality, the overall appearance score assigned to each clone during grading, chip score and specific gravity. The merit score scale ranges from 1 to 4; where 1 = outstanding, advance, 2 = keep evaluating, 3 = marginal

performance and 4 = drop. The merit score rating is used in the National Chip Processors trial to evaluate a clone's overall performance in a given trial. We have decided to use the merit score in all our trials as it helps us to present the data more concisely. However, it must be noted that when the same clone appears in multiple trials it may have a different merit score assigned to it depending on its individual performance in that specific trial. Also since this is a composite score within a trial, it needs to be noted that all traits are weighted equally; however, a specific trait can trigger a drop recommendation if it is excessively bad. For example Atlantic is a standard variety that was included in 9 of our 12 trials this year. In two of the trials, it received a merit score of 2, in five it received a 3 and in one trial it received a 4. Atlantic was given ratings of 3 and 4 due to poor internal quality and grader appearance. Overall this averages to roughly a 2.9 merit score with and overall marginal rating, owing primarily to internal issues.

VI. RESULTS:

Environmental Summary

Planting began on the 7th of March this year and while temperatures overall stayed above freezing for most of the planting window rain events beginning the second full week of March pushed planting back by as much as 10 days causing us to finish up planting on the 28th of March. The season overall was favorable for growth, day time temperatures never rose above 95^{0}F though nighttime lows crept into the lower 80's toward the end of the season. Harvest begin on time and while rot issues did occur late in the season overall incidence was low and trial site specific.

A. Yield Trials

1. On-Farm Trials

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

Seven of the eleven clones in this trial received a merit score of 2 (keep): B2152-17, BNC201-1, Dark Red Chieftain, Natascha, NCB2607-3, Red Endeavor and Soraya. The marketable yields in this trial were compared to Chieftain (363 cwt/a) for the red skins and Yukon Gold (123 cwt/a) for the yellow flesh clones. One red skin clone had a higher marketable yield than Chieftain, Red Endeavor (392 cwt/A). All yellow flesh clones had higher marketable yields than Yukon Gold the two with the highest marketable yields were Soraya (439 cwt/a) and Natascha (428 cwt/a). Two clones had an overall appearance rating of 7 (good) these were, B2152-17 and Natascha. No significant internal defects were recorded. External defects observed in the trial were sunscald, misshapes, soft rot, growth cracks, common scab and skin blemishes due to Rhizoctonia.

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

Thirteen of the seventeen varieties in the trial received a merit score of 2, the only two clones to receive a merit of 4 (drop) were BD982-15 and NC0349-3FT. Atlantic, the standard, had a marketable yield of 277 cwt/a, nine others had higher marketable yields: NC470-3 (333 cwt/a), NCB3171-7 (322 cwt/a), BNC426-2 (320 cwt/a), NC0349-3 (308 cwt/a), B3084-3 (301 cwt/a), NC472-1 (300 cwt/a), BNC182-5 (293 cwt/a), Snowden (289 cwt/a) and Pike (286 cwt/a), though none were significantly greater. Gravities in the trial ranged from a low of 1.065

to 1.085, Atlantic had a gravity of 1.071 and all but three clones had higher gravities. Clones with specific gravities of 1.080 or higher were: BD985-12 (1.085), B2869-29 (1.082 and NCB3171-7 (1.080). Two clones had a chip score rating of 1 (exceptional): B2869-29 and B3084-3. One clone had an overall appearance score of 8 (better than good), BNC182-5 and three clones: BNC182-5, NC473-2 and NCB3171-7 had overall appearance scores of 7 (good). In this trial only Pike had 10% incidence of Internal Heat Necrosis (IHN), the severity rating was 7.3. No other internal defects were recorded at incidence levels greater than 10%. External defects observed in the trial were sunscald, growth cracks, misshapes, common scab, soft rot and skin blemishes due to Rhizoctonia.

SNaC Trial at Black Gold Farms (Tables 3a and 3b)

Six clones in this trial received a merit score of 2 (keep): AF5040-8, Atlantic, CO07070-13W, MSV358-3, NY152 and Snowden. Atlantic had a marketable yield of 389 cwt/a and no other clones had higher marketable yields, close behind Atlantic was W9968-5 (384 cwt/a). Atlantic had a gravity of 1.079 only W9968-5 had an equal gravity all others were less than Atlantic. One clone in the trial received a chip score rating of 1 (exceptional) in the 24 to 48 hour chip test; CO07070-13W. Three clones: AF5040-8, B2727-2 and CO07070-13W received a chip score rating of 1.5 (excellent to exceptional) in the 5 to 7 day chip test. Two clones received an overall appearance rating of 8 (good to excellent): MSV358-3 and NY152 and two clones rated a 7 for overall appearance: AC01144-1W and CO07070-13W. No internal defects were observed at levels equal to or greater than 10%. External defects observed were: sunscald, misshapes, growth cracks, soft rot, common scab and skin blemishes due to Rhizoctonia.

James Brothers Variety Trial (Tables 4a and 4b)

One clone, Vivaldi received a merit score of 1 (outstanding), and fourteen clones received merit scores of 2. In this trial three yield standards were chosen: Atlantic (round white standard), Chieftain (red standard) and Yukon Gold (yellow flesh standard). Across all clones only Yukon Gold (145 cwt/a) had a lower marketable yield than Atlantic (291 cwt/a) Within the red class only Dark Red Chieftain (301 cwt/a) had a lower marketable yield than Chieftain (319 cwt/a). Overall marketable yields in this trial were exceptional with the highest marketable weights belonging to 7four7 (548 cwt/a), Vivaldi (505 cwt/a), Soraya (450 cwt/a), Red Endeavor (436 cwt/a) and Envol (426 cwt/a), all five of these clones had marketable yields that were significantly greater than all standards. Clones with an overall appearance score of 7 were: BNC201-1, Dark Red Chieftain, Red Endeavor and Tuscona. The specific gravity for Atlantic in this trial was 1.074, of the chip stock clones only Snowden (1.078) had a higher gravity. Two clones: Atlantic and Snowden had chip score ratings of 1.0 (exceptional). Three clones, but four entrees expressed hollow heart (HH) at greater than 10% incidence: NC0349-3FT (80%), NC0349-3 (48%), NC503-50 (15%) and NC470-3 (13%). No other internal defects of 10% or greater incidence were recorded in this trial. Culls were primarily due to misshapes, common scab, soft rot, sun scald, growth cracks, heat sprouts, infected lenticels, and skin blemishes due to Rhizoctonia.

2. TRS/VGJREC Yield Trials

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

Six of twenty-one clones received a merit score of 2 these were: B3168-3, BNC470-13, BNC470-16, NC475-3, NCB3199-4 and Snowden. Atlantic had a marketable yield of 298 cwt/a. Five clones in this trial had greater marketable yields than Atlantic, though none were significantly greater: BNC470-13 (338 cwt/a), BNC470-16 (328 cwt/a), NCB3199-4 (327 cwt/a), Snowden (310 cwt/a) and B3168-3 (301 cwt/a). Atlantic had a gravity of 1.079, three clones had equal to or higher gravities: NC475-3 (1.080), NC540-10 (1.079) and Snowden (1.079). One clone, B3168-3 had a chip score of 1.0. One clone, BNC470-16 had an overall appearance score of 8 and three clones had overall appearance scores of 7: B3168-3, BNC470-16 and NCB3199-4. No internal defects of 10% or greater incidence were recorded in this trial. Common external defects were soft rot, infected lenticels, misshapes, sunscald, common scab, growth cracks, secondary growth, virus and skin blemishes attributed to Rhizoctonia.

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

None of the eleven clones in this trial received a merit rating greater than a 3 (marginal) this was largerly because of poor grader performance, high levels of culls or low specific gravity. Atlantic had a marketable yield of 260 cwt/a. Two clones in this trial had slightly greater marketable yields than Atlantic: Envol (270 cwt/a) and NCB3171-4 (262 cwt/a). Atlantic had a gravity of 1.076, only NCB3171-4 (1.080) had a higher gravity. Two clones had a chip score of 1.5: AF5682-3 and B2834-8Two clones had an overall appearance score of 6 (better than fair): AF4157-6 and NDAF113470C-3. One clone expressed IHN at 10% or greater incidence, Atlantic (13% IHN with an HNR of 8.2). Atlantic also had internal incidence of soft rot (SR) at 23%. No other internal defects of 10% or greater incidence were recorded in this trial. Common external defects were lots of soft rot, infected lenticels, misshapes, sunscald, common scab, growth cracks, and skin blemishes attributed to Rhizoctonia.

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

Of the sixteen clones in this trial, seven received merit scores of 2: B3084-3, BNC426-2, NC470-3, NC473-2, NCB3165-3, NCB3171-7 and Sebec. Atlantic had an average marketable yield of 209 cwt/A, all but two clones had greater average marketable yields, the five highest were: NC472-1 (366 cwt/a), NC473-2 (364 cwt/a), NC470-3 (361 cwt/a), BNC426-2 (327 cwt/a) and NC369-4 (310 cwt/a). Atlantic had a specific gravity of1.072, two clones had higher gravity: NCB3165-3 (1.074) and BNC426-2 (1.073). Three clones received a chip rating of 1.5: NC470-3, NC473-2 and Snowden. One clone, NC473-2 received an overall appearance rating of 8 and three clones received overall appearance score of 7: BNC182-5, NC470-3 and NC472-1. Two clones expressed IHN at 10% or greater incidence: NC472-1 (25% incidence with an heat necrosis rating (HNR) of 7.1) and Atlantic (15% incidence with an HNR of 8.1). One clone expressed 10% incidence of brown center (BC), AF5635-8. Three clones expressed SR at 10% or greater incidence: NC472-1 (20%), B3084-3 (10%) and BNC426-2 (10%). No other internal defects were expressed at levels of 10% or greater. Common external defects were misshapes, soft rot, sunscald, secondary growth, growth cracks, common scab, infected lenticels and skin blemishes attributed to Rhizoctonia.

NE-1231 Round White Trial. (Tables 8a and 8b)

Five clones received a merit score of 2: AF4648-2, Atlantic, BNC364-1, NY158 and Snowden. Of the fifteen clones in this trial eight had greater marketable yield than Atlantic (226 cwt/A), though only one had a significantly higher marketable yield, NY158 (379 cwt/a). Atlantic had a specific gravity of 1.074 and only AF4050-8 (1.076) had a greater gravity, all others were lower than Atlantic. Three clones had a chip rating of 1.5: AF4648-2, Atlantic and NY158. The only clone to rate an overall appearance rating of 7 in the trial was Snowden. Two clones expressed IHN at 10% or greater incidence: AF5225-1 (15% incidence with an HNR of 7.3) and Atlantic (13% incidence with an HNR of 7.6). No other internal defects were expressed at levels of 10% or greater. The most common culls were misshapes, sunscald, soft rot, growth cracks, common scab and virus.

NE-1231 Red Trial. (Tables 9a and 9b)

Only one of the fourteen clones in this trial received a merit score of 2: NDAF102696C-1. The standard, Chieftain, had a marketable yield of 303 cwt/a, none of the other clones had higher marketable yields. Two clones received an overall appearance score of 7: NC566-6 and NDAF102696C-1. Three clones expressed IHN at 10% or greater incidence: Chieftain (45% incidence with an HNR of 7.2), AF4831-2 (20% incidence with an HNR of 8.1) and AF5245-1 (13% incidence with an HNR of 7.9). No other internal defects were expressed at levels of 10% or greater. Culls were due mostly to soft rot, misshapes, sunscald and growth cracks.

NE-1231 Russet Trial. (Tables 10a and 10b)

This trial was in a poor location this year and as a result the yields between reps and within all clones were highly variable. During the season there was a noticeable vigor gradient that appears to be due to poor fertilizer distribution. This should be taken into account when reading the summary below and looking at the data tables.

Four of the nineteen clones in this trial received a merit score of 2: AF5071-2, AF5164-19, ND8068-5Russ and Russet Norkotah. The standard, Russet Norkotah, had a marketable yield of 153 cwt/A. Three clones in the trial had equal or greater average marketable yields though none were significantly greater: AF3001-6 (191 cwt/a), AF5312-1 (153 cwt/a) and WAF10073-3 (146 cwt/a). The highest overall appearance rating given in the trial was 6 and two clones received this score: AF5164-19 and ND8068-5Russ. One clones expressed IHN at 10% or greater incidence: AF5312-1 (28% incidence with an HNR of 7.8). The only clone to express vascular ring discoloration (VR) at 10% or greater incidence Shepody (50%). The only clone to express BC at 10% or greater incidence Russet Burbank (10%). No other internal defects were expressed at levels of 10% or greater. Culls were mostly soft rot, misshapes, sunscald, growth cracks, secondary growth, common scab and skin blemishes attributed to Rhizoctonia.

Yellow Flesh Trial. (Tables 11a and 11b)

Eight of nineteen clones received a merit score of 2: AF5450-7, Francisca, Natascha, NC606-23, NCB2607-3, Peter Wilcox, Queen Anne and Wendy. Because of poor stands in Yukon Gold (32 cwt/a) Atlantic (145 cwt/a) was used as the standard for yield evaluation this year and of the clones in the trial had higher average marketable yields. Eight of these were significantly greater in average marketable yield: NC606-4 (347 cwt/a), Alegria (251 cwt/a), AF5450-7 (250 cwt/a), Soraya (247 cwt/a), NC600-10 (244 cwt/a), Natascha (239 cwt/a), Allora (226 cwt/a) and Vivaldi (212 cwt/a). Only NCB2607-3 received an overall appearance rating of 8. Two received an overall appearance rating of 7: Peter Wilcox and Queen Anne. Four clones

expressed IHN at 10% or greater incidence: French Fingerling (78% incidence with an HNR of 6.5), NC600-10 (33% incidence with an HNR of 7.0), Atlantic (25% incidence with an HNR of 7.6) and NC606-4 (10% incidence with an HNR of 8.3). Atlantic also expressed 23% incidence of HH. No other internal defects were expressed at levels of 10% or greater. Culls were mostly soft rot, infected lenticels, misshapes, sunscald, growth cracks, common scab and skin blemishes attributed to Rhizoctonia.

Specialty Trial (Tables 12a and 12b, Figure 1)

This trial contains clones that have pigmented flesh although Atlantic is included in this trial as a standard for yield and chipping. Four of the twenty-one clones in the trial received a merit score of 2: Atlantic, NC502-10, NC509-16 and NDAF113458-2. Only one clone, NDAF113458-2 (368 cwt/a) had greater average marketable yields than Atlantic (311 cwt/a). Three clones in the trial had gravities that were greater than Atlantic (1.074): NC503-50 (1.081), NC502-10 (1.077) and NC414-2 (1.075). All clones in the trial except Dark Red Norland and Chieftain were chipped at the TRS and many of the NC clones were sent to UTZ for chipping as well pictures of these chips can be seen in Figure 1 and Figure 2. Skin textures for all clones in this trial were smooth or moderately smooth with the exception of Atlantic and NC414-2 that were slightly netted. For overall appearance two clones were rated 7: NC509-16 and NDAF113458-2. Four clones expressed IHN at 10% or greater incidence: NC503-50 (93% incidence with an HNR of 5.9), Chieftain (33% incidence with an HNR of 7.5), NC499-14 (33% incidence with an HNR of 7.2) and Atlantic (15% incidence with an HNR of 7.9). One clone expressed SR at equal to or greater than 10% incidence: NC508-17 (10%). No other internal defects were expressed at levels of 10% or greater. Common external defects included soft rot, misshapes, growth cracks, sun scald common scab, silver scurf and secondary growth.

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 in year 5 and sometimes a 320-hill plot in year 6 before entering into yield trials. Our single-hill materials come from the USDA-ARS and our own crosses made at the TRS. This year we also had materials from Cornell University as well. 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, 14,506 single-hills were planted and 406 clones were selected averaging a 2.8% selection rate.

In our second to fourth year selection plots out of the 1276 clones planted in our 6-hill plots (Yr. 2), 256 (20%) were selected for future evaluation. While in the 20-hill plots (Yr. 3), 137 clones were planted with 51 (37%) being selected for further evaluation. In our 60-hill plots (Yr. 4), 57 clones were planted and 24 (42%) were selected.

Specialty Clone Evaluation

We begin selection with 4-hill plots each year to give us a better look at these clones and typically only plant out around 50 to 60 tubers per family. Because we start with 4 hills we have more seed in the 2nd year so instead of planting a 6-hill plot we plant a 12-hill plot for each clone in year 2. In year 3 we move into a specialty 60-hill plot that is distinct from our other 60-hill plot for more traditional types of potatoes. This effectively allows us to skip one cycle of selection because in year 4 these materials are included in our 160-hill increase plots in preparation for yield trials. This year we evaluated 699 clones and selected 24 (3.4%) as 4-hill plots. In our 12-hill plots we evaluated 86 and selected 30 (35%) and in the specialty 60-hill plot 8 were evaluated and 8 were selected (100%). The 8 clones that remain from the Specialty 60-hill plot will be advanced as breeding material because of intense virus pressure in these clones, under normal evaluation these would be dropped completely for this reason.

Germplasm Enhancement for CPB Resistance

Parental material used in crosses to generate the families come from one or more of three species of potato: *Solanum tubersosum*, *S. chacoense*, and *S. berthaltii*. Like the specialty trials these clones are selected from 4-hill plot in year one. Unlike the specialty trials though, their primary trait of interest is unable to be evaluated in year one so effectively the 4-hill plots are used to increase this set of materials so that in year two we can plant both a CPB resistance screen plot and a selection plot. The only clones removed from the set are those that are low yielding or have other extremely poor agronomic traits. We planted roughly 952 clones to evaluate resistance and selected 216 clones. These will be advanced next year in both our CPB nursery as two 3-hill plots and as 6 hill plots for selection purposes. In our 6 hill plots this year, 330 of the 1276 clones came from this CPB resistance project. From the 330 CPB clones, 44 were selected for advancement to the 20 hill selection plots and the next cycle of CPB resistance screening. Of the 137 clones in our 20 hill plots 7 clones were part of the CPB

resistance screen and 3 of those were selected for advancement to the 60 hills. Of the 57 clones in this year's 60 hill plots 6 were CPB clones and one 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 253 ME clones and 33 of them received a merit score of 2 none received a 1 this year. These will be evaluated in 2018 in a non-replicated 25-hill plot in a yield trial.

Observational Trial.

Thirty-sevn clones were evaluated in this trial as well as the standards: Atlantic, Chieftain, Dark Red Norland, Russet Norkotah and Yukon Gold. Each 25-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 assigned a merit score of 1 or 2 to 15 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), Pennsylvania State University (PA) and the University of Maine (ME). Each state received 8 hills of the same 202 clones. All were weighed for total yield, rated for the nine standard NE1231 external ratings, and ten tubers from each plot were cut for internal evaluations as well. At our location we gave 40 clones a merit score of 1 or 2. Next year we will reevaluate these clones in our non-replicated 25-hill yield trial (Unreplicated trial).

Unreplicated Trial.

Forty-two clones were evaluated in this trial as well as the standards: Atlantic, Chieftain, Dark Red Norland, Snowden, Superior and Yukon Gold. Each 25-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. A total of 14 clones received a merit score of 2. We will evaluate some of these clones in a replicated yield trial next year.

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; and Dr. Kathleen Haynes, USDA/ARS, Beltsville, MD. Also a special thanks goes to Mr. Dan Peers, Mr. Tyler Bradley and the rest staff at Maine Farmers Exchange, Presque Isle, ME for their efforts to procure small amounts of seed for shipment to NC. This project is funded in part by The North Carolina Potato Growers Association, the Potatoes USA, SNAC International, the USDA-NIFA Potato Special Research Grants program, UTZ Quality Foods Inc, Real Potatoes Ltd and Hanse Seed. 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 104 DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2017

						Size Distribution by Class[3] (% of total yield)								
	Merit[2]	Total Yield	Marketable Yield									1 7/8	2 1/2	Specific
Clone	Score	cwt/A	cwt/A	%Chf.	%Yuk.	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[4]
B2152-17	2	368	326	98	286	9	39	49	0	0	2	89	50	1.065
BNC201-1	2	309	279	83	229	7	30	59	1	0	3	91	60	1.083
Chieftain	4	449	363	100	329	5	25	49	6	0	15	80	55	1.067
Colorado Rose	4	440	250	76	204	7	32	23	2	0	36	57	25	1.068
Dark Red Chieftain	2	384	336	102	299	9	38	48	1	0	4	87	49	1.066
Dark Red Norland	3	390	331	101	294	4	21	58	7	0	11	85	65	1.064
Natascha	2	482	428	128	384	7	58	30	0	0	4	89	30	1.066
NCB2607-3	2	304	234	70	210	17	61	16	0	0	6	77	16	1.079
Red Endeavor	2	450	392	118	342	10	37	47	3	0	3	87	50	1.063
Soraya	2	549	439	135	381	2	30	50	0	0	18	80	50	1.061
Yukon Gold	4	167	123	38	100	6	19	41	13	0	21	73	54	1.078
Grand Mean		390	318											
CV(%)		15	18											
LSD(k=100)		97	96											

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

[4] 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 104 DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
B2152-17	6	8	8	5	2	7	6	6	3	7	5	8	7	0	9	0	0	0	0	MS,SS,SR,GC
BNC201-1	8	8	9	6	2	7	6	6	2	7	6	8	6	0	9	3	0	0	0	RZ,SS,MS,SR
Chieftain	9	8	7	6	3	7	5	4	4	7	7	8	3	0	9	0	0	0	0	RZ,SS,SG,CS,MS,GC
Colorado Rose	6	8	9	6	2	7	5	6	5	8	5	4	3	0	9	0	0	0	0	^CS,MS,SS
Dark Red Chieftain	9	7	8	6	2	7	7	6	2	7	5	8	6	0	9	0	0	0	0	SISC,MS,CS,RZ
Dark Red Norland	5	8	8	3	2	7	5	7	5	8	7	7	4	0	9	0	0	0	0	GC,MS,SS,SISC,RZ
Natascha	8	8	8	6	7	8	6	7	6	8	6	8	7	0	9	0	0	0	0	RZ,MS,SS,HS
NCB2607-3	5	7	8	4	2	7	7	7	2	8	3	8	6	0	9	0	0	0	0	GC,SS,MS,SR
Red Endeavor	9	8	8	7	2	8	6	6	4	8	7	8	6	0	9	0	0	0	0	MS,SS,RZ,GC,SR
Soraya	8	8	8	7	7	8	5	7	7	8	7	7	5	0	9	0	0	0	0	MS,SS,SR,CS,IL,SS,GC
Yukon Gold	8	7	8	5	7	7	7	6	3	7	8	7	4	0	9	0	0	0	0	CS,MS,SS,SR

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

[2] See NE1231 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 104 DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2017

Clone	Merit[2] Score	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class[3] (% of total yield) 1's	2's	3's	4's	5's	Culls	1 7/8 to 4"	2 1/2 to 4"	Specific Gravity[4]	Chip Color[5]
Atlantic	2	307	277	100	4	17	62	12	0	5	90	74	1.071	1.5
B2869-29	2	337	275	99	15	46	35	0	0	4	81	35	1.082	1.0
B3084-3	2	345	301	110	3	11	64	13	0	9	88	77	1.072	1.0
BD982-15	4	258	111	41	54	40	3	0	0	2	43	3	1.085	2.5
BNC182-5	2	316	293	107	4	27	59	7	0	3	93	66	1.068	2.0
BNC426-2	2	378	320	116	10	39	44	2	0	5	85	46	1.076	1.5
NC0349-3FT[6]	4	316	122	44	4	10	25	3	0	58	39	28	1.073	1.5
NC0349-3	2	355	308	112	7	25	60	1	0	6	87	61	1.077	1.5
NC470-3	2	348	333	120	3	23	66	6	0	1	95	72	1.071	1.5
NC472-1	2	322	300	113	3	19	57	17	0	3	94	74	1.073	2.0
NC473-2	2	287	272	99	22	11	57	9	1	1	76	66	1.065	1.5
NC475-3	3	279	236	86	6	29	47	9	0	9	85	56	1.069	2.0
NCB3165-3	3	223	201	71	7	33	55	2	0	3	90	57	1.074	2.0
NCB3171-7	2	386	322	119	13	57	27	0	0	4	84	27	1.080	1.5
Pike	2	314	286	104	3	17	63	11	0	6	91	74	1.077	1.5
Sebec	2	259	239	89	4	20	50	22	0	4	92	72	1.076	2.0
Snowden	2	316	289	105	4	19	67	5	0	4	92	72	1.072	1.5
Grand Mean		313	264											
CV(%)		19	21											
LSD(k=100)		96	89											

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

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

[5] 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

[6] NC0349-3FT is the same as NC0349-3 only the seed came from the Potatoes USA fasttrack program instead of the NCSU potato breeding program

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 104 DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
Atlantic	6	8	8	5	6	6	6	6	3	7	7	8	6	0	9	8	0	5	0	RZ,GC,SS,MS,SR
B2869-29	6	8	9	5	9	7	5	7	2	8	4	8	7	0	9	0	0	0	0	SS,RZ,MS,GC,CS
B3084-3	7	8	8	6	6	6	6	5	3	7	7	8	5	0	9	3	0	0	0	RZ,SS,MS
BD982-15	9	8	8	7	6	7	7	5	1	7	2	8	5	0	9	0	0	0	0	MS,RZ,SS,CS,STST,SG
BNC182-5	9	8	8	8	8	6	6	6	2	7	7	8	8	0	9	0	0	0	0	MS,SS,RZ
BNC426-2	9	8	9	8	6	6	5	7	4	8	5	8	6	0	9	0	0	0	0	MS,SS,RZ,GC
NC0349-3FT[5]	7	8	8	6	6	5	7	6	2	7	6	4	2	0	9	8	0	8	0	^^CS,SS
NC0349-3	8	8	8	6	6	5	7	6	2	7	6	8	6	0	9	3	0	0	0	SS,CS,MS
NC470-3	9	8	8	9	5	6	6	6	4	8	6	8	6	0	9	0	0	0	0	SS,RZ
NC472-1	8	8	8	8	6	6	6	5	2	7	7	8	6	0	9	0	0	0	0	MS,SS,RZ
NC473-2	7	8	8	9	6	6	7	5	2	7	6	8	7	0	9	0	0	0	0	SS,RZ
NC475-3	8	8	9	8	9	6	6	6	2	7	7	7	5	0	9	0	0	0	0	SS,RZ,MS,GC
NCB3165-3	6	6	8	5	9	7	6	7	2	6	6	8	5	3	8.8	0	0	0	0	SS,MS,RZ
NCB3171-7	6	8	8	5	9	8	5	7	3	7	5	8	7	0	9	0	0	0	0	SS,RZ,CS
Pike	6	8	8	6	6	6	6	7	2	7	7	8	6	10	7.3	0	0	0	0	SS,MS,RZ,GC
Sebec	8	8	8	6	6	6	6	6	5	8	8	8	6	0	9	0	0	0	0	SS,SR,MS,RZ,GC
Snowden	9	8	8	7	5	5	6	5	3	6	7	8	6	0	9	0	0	0	0	CS,SS,MS,RZ

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

[2] See NE1231 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

[5] NC0349-3-FT is the same as NC0349-3 only the seed came from the Potatoes USA fasttrack program instead of the NCSU potato breeding program

Table 3a. SNAC Trial. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones of potato clones harvested 113DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2017

					Size Distribution by Class[3] (% of total yield)									Chip Color[5]	
Clone	Merit[2] Score	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	1's	2's	3's	4's	5's	Culls	1 7/8 to 4"	2 1/2 to 4"	Specific Gravity[4]	24 to 48hrs	5 to 7Days
AC01144-1W	3	375	328	85	10	41	46	1	0	3	88	47	1.064	2.0	2.0
AF5040-8	2	346	327	85	3	20	69	6	0	2	95	75	1.075	2.0	1.5
Atlantic	2	412	389	100	2	16	73	6	0	3	94	78	1.079	1.5	2.0
B2727-2	3	236	201	52	6	47	37	0	0	10	84	37	1.074	1.5	1.5
CO07070-13W	2	263	212	54	18	57	24	0	0	2	81	24	1.076	1.0	1.5
MSR127-2	3	321	286	74	7	41	48	0	0	3	89	48	1.069	2.0	2.5
MSV358-3	2	313	289	75	6	40	52	0	0	2	92	52	1.074	2.0	2.0
MSW485-2	3	318	261	67	11	48	34	0	0	6	82	34	1.070	2.0	2.5
MSX540-4	3	272	250	65	6	30	61	0	0	2	92	61	1.072	2.0	2.5
NDTX081648C8-13W	3	414	338	88	6	26	56	0	0	12	82	56	1.065	2.5	2.5
NY152	2	396	360	94	7	33	58	0	0	3	91	58	1.069	2.0	2.0
Snowden	2	390	372	97	4	26	70	0	0	0	95	70	1.075	2.0	2.0
W9968-5	3	453	384	100	5	23	62	0	0	10	85	62	1.079	2.0	2.0
Grand Mean		347	308												
CV(%)		12	13												
LSD(k=100)		66	60												

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

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

[5] 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 3b. SNAC 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 113 DAP[1] at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AC01144-1W	9	8	8	8	6	7	7	7	2	8	5	9	7	0	9	0	0	0	0	MS,SS,STST,HS
AF5040-8	8	8	8	6	6	7	6	7	3	8	8	8	6	0	9	0	0	0	0	CS,SS,MS,RZ,STST,BL,SR
Atlantic	6	8	7	5	6	5	6	5	3	7	7	8	5	6	8	0	0	0	2	CS,SS,MS,CG
B2727-2	5	7	7	5	6	5	6	6	4	7	5	8	5	0	9	8	0	0	0	CS,RZ,SS
CO07070-13W	6	8	8	4	6	6	7	7	1	8	4	8	7	0	9	0	0	0	0	GC,MS,SS,SR
MSR127-2	7	8	8	8	5	5	5	5	3	7	5	8	4	0	9	0	0	0	0	RZ,GC,MS,SS
MSV358-3	7	8	8	6	6	6	7	6	1	8	5	9	8	0	9	0	0	0	0	SS,MS
MSW485-2	8	8	8	8	6	6	7	6	2	7	5	7	5	0	9	2	0	4	0	^RZ
MSX540-4	7	8	7	7	6	6	6	6	3	8	6	9	6	2	8	0	0	0	0	MS,SS
NDTX081648C8-13W	9	8	9	9	6	6	4	7	3	8	7	8	3	0	9	0	0	0	0	HS,SG,SS,SR
NY152	6	8	7	5	6	6	7	6	2	7	5	9	8	0	9	2	0	0	0	MS,SS
Snowden	9	8	8	7	5	5	5	6	3	6	6	8	6	0	9	0	0	0	0	SS,CS,DSE,DAE
W9968-5	9	8	8	8	5	6	6	6	4	8	7	8	3	6	7.5	0	0	0	4	CS,SS,SG,MS,GC,PVY,SR

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

[2] See NE1231 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. James Brothers Variety Trial. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones harvested 104 DAP[1] at James Brothers Farm, Weeksville, Pasquotank Co., NC - 2017

							Size Distribution by Class[3] (% of total yield)									
	Merit[2]	Total Yield	Marketable Yield										1 7/8	2 1/2	Specific	Chip
Clone	Score	cwt/A	cwt/A	%Atl	%Chf.	%Yuk.	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[4]	Color[5]
7four7	2	636	548	197	172	393	8	44	42	0	0	6	86	42	1.041	.
Atlantic	2	345	291	100	92	202	8	38	41	5	0	9	84	46	1.074	1.0
Belmonda	2	462	410	151	128	305	9	45	43	1	0	3	89	44	1.067	.
BNC201-1	2	357	332	121	104	241	5	20	69	4	0	2	93	73	1.068	.
Chieftain	4	381	319	116	100	231	7	25	56	3	0	9	84	59	1.056	.
Colorado Rose	4	429	338	123	106	245	8	38	38	3	0	13	79	41	1.061	.
Dark Red Chieftain	2	342	301	106	95	211	8	40	48	1	0	3	89	49	1.054	.
Dark Red Norland	3	394	337	123	105	243	7	25	58	1	0	8	85	59	1.051	.
Envol	3	464	426	154	134	307	4	19	65	8	0	4	92	73	1.066	.
Natascha	2	477	399	143	126	289	9	40	43	0	0	7	84	43	1.049	.
NC0349-3FT[6]	4	415	365	131	115	261	7	25	57	6	0	5	88	63	1.072	1.5
NC0349-3	4	447	381	134	120	268	11	36	49	0	0	4	85	49	1.068	1.5
NC470-3	2	398	360	134	112	267	8	35	53	2	0	2	90	55	1.072	1.5
NC503-50	2	446	380	138	119	275	14	48	37	0	0	1	85	37	1.083	.
Red Endeavor	2	494	436	161	137	325	9	32	51	4	0	3	88	55	1.059	.
Sebec	2	367	335	122	105	243	4	26	60	5	0	5	91	65	1.072	1.5
Snowden	2	425	385	136	121	273	6	36	50	4	0	3	91	54	1.078	1.0
Soraya	2	522	450	159	141	316	5	37	48	1	0	9	86	49	1.059	.
Strawberry Paw	2	400	361	135	113	272	6	30	55	5	0	4	90	59	1.070	.
Superior	3	390	348	123	109	244	4	18	59	12	0	7	89	71	1.066	.
Tuscona	2	498	346	126	108	251	30	63	6	0	0	1	69	6	1.059	.
Vivaldi	1	561	503	180	158	359	7	43	46	2	0	3	90	47	1.063	.
Yukon Gold	4	175	145	50	46	100	4	17	54	11	0	13	82	65	1.072	.
Grand Mean		427	369													
CV(%)		14	16													
LSD(k=100)		97	98													

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

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

[5] 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

[6] NC0349-3-FT is the same as NC0349-3 only the seed came from the Potatoes USA fasttrack program instead of the NCSU potato breeding program

Table 4b. James Brothers 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 104 DAP[1] at James Brothers Farm, Weeksville, Pasquotank Co., NC – 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
7four7	6	7	9	5	8	8	4	7	7	8	8	7	5	0	9	0	0	0	0	MS,RZ,SS,CS,HS
Atlantic	6	8	9	5	6	6	6	5	3	7	6	7	6	0	9	5	0	3	3	SS,MS,RZ,GC,SR
Belmonda	9	9	8	9	7	8	4	4	5	8	5	9	6	0	9	0	0	3	3	MS,SS
BNC201-1	8	8	9	6	2	7	6	6	2	8	6	8	7	0	9	0	0	0	0	MS,GC,RZ
Chieftain	9	8	8	6	3	8	5	4	5	8	6	7	4	0	9	0	0	3	0	SS,MS,RZ,SR,GC,HS
Colorado Rose	8	9	9	6	2	7	4	5	5	8	6	6	3	0	9	3	0	0	0	SR,^MS,^CS,RZ,SS,AC,GC
Dark Red Chieftain	9	8	7	7	2	7	7	7	2	7	5	7	7	0	9	0	0	0	0	MS,GC,RZ
Dark Red Norland	5	7	7	3	2	7	5	8	4	8	7	7	5	0	9	0	3	0	0	SS,SR,MS,GC,EL,SISC
Envol	6	8	9	4	8	7	4	7	4	6	8	7	4	0	9	0	0	3	0	MS,SS,SR,V
Natascha	7	9	9	7	7	8	6	6	6	8	5	8	6	0	9	0	0	5	0	SS,MS,SR,RZ,SG,HS,IL
NC0349-3FT[5]	9	8	8	6	6	6	7	5	2	7	5	7	6	0	9	80	0	0	0	CS,SS,MS
NC0349-3	9	8	8	6	6	6	7	5	2	7	5	8	6	0	9	48	0	5	0	MS,SS,RZ,CS
NC470-3	9	9	9	9	6	6	6	6	3	8	5	7	6	0	9	13	0	0	0	SS,MS,RZ
NC503-50	9	9	8	7	2	8	7	8	3	5	6	8	4	0	9	15	0	0	0	SR,MS,LUMPY
Red Endeavor	9	8	8	7	2	7	6	6	3	8	6	8	7	0	9	0	0	0	0	MS,RZ,SR,GC
Sebec	9	8	8	7	6	6	6	6	3	7	6	9	5	0	9	0	0	0	0	SS,MS
Snowden	9	8	8	7	6	5	6	7	2	6	5	7	6	0	9	3	0	0	0	MS,SS,SR,CS
Soraya	9	8	8	7	7	8	6	7	6	8	8	8	6	0	9	0	0	0	0	MS,SS,RZ,SG
Strawberry Paw	9	8	9	7	2	8	7	4	2	7	8	8	5	0	9	0	0	0	0	MS,RZ,GC,SS,SR
Superior	6	8	8	4	6	7	6	6	4	6	8	8	4	0	9	0	0	0	0	SS,SR,MS
Tuscona	7	9	9	7	7	8	6	7	5	8	4	8	7	0	9	0	0	0	0	SS,MS,RZ
Vivaldi	9	8	7	7	7	7	6	7	7	8	7	7	6	0	9	0	0	0	0	CS,MS,SS,RZ
Yukon Gold	8	7	8	5	7	8	6	7	3	7	7	8	3	0	9	0	0	0	0	MS,GC,SS,SR

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

[2] See NE1231 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

[5] NC0349-3-FT is the same as NC0349-3 only the seed came from the Potatoes USA fasttrack program instead of the NCSU potato breeding program

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 99 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

					Size Distribution by Class[3] (% of total yield)									
	Merit[2]	Total Yield	Marketable Yield								1 7/8	2 1/2	Specific	Chip
Clone	Score	cwt/A	cwt/A	% Atl.	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[4]	Color[5]
Atlantic	3	330	298	100	5	24	66	0	0	5	90	66	1.079	1.5
B3168-3	2	336	301	103	8	34	56	0	0	2	89	56	1.071	1.0
BNC469-11	3	289	239	80	12	47	35	0	0	6	82	35	1.063	2.5
BNC470-13	2	388	338	115	10	56	31	0	0	3	87	31	1.073	1.5
BNC470-16	2	357	328	113	4	18	69	4	0	4	92	74	1.072	2.0
COAF10018-2	3	249	195	66	12	48	30	0	0	10	78	30	1.064	2.5
COAF10055-6	3	141	121	41	8	51	34	0	0	6	85	34	1.065	1.5
Envol	4	230	212	72	3	27	65	1	0	5	92	65	1.072	2.0
Montreal	4	251	157	52	8	25	37	0	0	31	61	37	1.060	2.5
NC475-3	2	319	244	84	6	27	49	1	0	17	76	50	1.080	2.0
NC540-10	3	236	186	64	8	30	45	3	1	13	78	48	1.079	2.0
NC540-18	4	283	233	79	4	20	54	8	0	14	82	62	1.070	2.0
NC543-3	3	207	180	60	5	29	57	0	0	9	86	57	1.065	2.0
NC545-6	3	323	272	94	5	27	57	0	0	11	84	57	1.075	2.5
NC547-16	4	247	168	57	4	19	50	0	0	27	69	50	1.078	2.0
NC606-11	3	375	295	98	5	19	59	0	0	17	78	59	1.069	2.5
NCB3199-4	2	351	327	112	5	17	76	0	0	2	93	76	1.073	2.0
NDAF102629C-4	3	178	132	44	12	55	19	0	0	14	74	19	1.065	2.0
Snowden	2	347	310	105	4	23	65	1	0	6	89	66	1.079	1.5
Superior	4	198	185	63	4	31	62	0	0	3	93	62	1.071	2.5
WAF10664-3	3	287	260	89	5	28	59	3	0	4	91	62	1.066	1.5
Grand Mean		282	237											
CV(%)		13	18											
LSD(k=100)		62	68											

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

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

[5] 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 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 99 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
Atlantic	6	8	8	5	6	6	6	6	3	7	6	6	5	8	8.6	0	0	3	3	MS,CS,SS,SR,GC
B3168-3	9	8	8	6	6	6	6	7	2	8	5	7	7	0	9	0	0	0	0	GC,SR,SS
BNC469-11	8	8	7	7	6	6	7	7	2	5	7	8	4	0	9	0	0	0	0	SG,MS,SS,GC,RZ,SR
BNC470-13	8	8	8	6	6	7	6	7	3	8	5	8	8	0	9	0	0	0	0	SS,SR,CS,MS,IL
BNC470-16	7	8	8	7	5	6	7	7	3	8	6	8	7	0	9	0	0	0	0	SS,SR,RZ,CS
COAF10018-2	7	8	7	5	9	8	7	7	1	7	5	6	5	0	9	0	0	0	0	SR,SG,GC,SS,IL,V
COAF10055-6	7	8	7	5	8	8	7	7	1	7	5	7	6	0	9	0	0	0	0	SR,SS,GC,MS,RZ
Envol	5	6	8	4	8	7	4	7	5	6	8	7	3	0	9	0	0	0	0	MS,SR,IL,V,LUMPY
Montreal	8	8	8	8	6	8	6	7	4	8	6	5	3	5	8.3	0	5	0	0	SR,SG,SS,CS,V
NC475-3	7	8	8	6	6	6	6	5	2	8	5	7	6	0	9	0	0	0	0	SS,SR,RZ,IL,V
NC540-10	9	8	8	8	6	6	6	6	3	7	5	7	5	0	9	0	0	0	0	SR,SS,MS,GC
NC540-18	9	7	8	6	6	6	6	6	3	7	7	7	4	0	9	3	0	0	3	SR,SS,^GC,RZ,CS,IL
NC543-3	9	5	8	7	6	6	6	7	4	7	6	8	5	0	9	0	0	8	0	MS,SR,GC,SS
NC545-6	8	8	8	7	6	7	7	7	3	8	7	6	5	0	9	0	0	0	0	SG,GC,SS,MS,CS,RZ
NC547-16	8	8	8	6	6	7	5	6	3	7	5	8	4	0	9	0	0	0	0	GC,MS,SS,RZ
NC606-11	8	8	8	7	6	7	6	7	3	8	7	7	5	0	9	0	0	5	0	SS,MS,GC,SG,IL
NCB3199-4	9	8	8	6	5	5	6	6	2	7	9	8	7	0	9	0	0	0	0	GC,MS,SS,SR
NDAF102629C-4	8	7	7	6	8	8	7	7	3	8	3	8	5	0	9	0	0	0	0	^GC,MS,SR,SS
Snowden	9	8	8	7	5	5	6	6	3	6	7	8	6	0	9	0	0	0	0	CS,SS,MS,DAE,DSE
Superior	5	7	8	4	6	7	5	7	4	6	6	8	3	0	9	0	0	0	0	MS,IL,SR
WAF10664-3	7	8	8	6	6	7	7	7	2	6	6	8	6	0	9	0	0	0	0	SS,SR,MS,SG

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

[2] See NE1231 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 of potato clones harvested 99 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

					Size Distribution by Class[3] (% of total yield)									
Clone	Merit[2] Score	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	1's	2's	3's	4's	5's	Culls	1 7/8 to 4"	2 1/2 to 4"	Specific Gravity[4]	Chip Color[5]
AF4157-6	3	321	258	102	11	35	45	0	0	9	80	45	1.065	2.0
AF5677-4	3	248	213	84	5	25	53	8	1	8	86	61	1.065	2.0
AF5682-3	4	229	171	69	5	27	47	2	0	20	75	48	1.067	1.5
Atlantic	4	312	260	100	5	19	59	3	0	12	82	63	1.076	2.0
B2834-8	3	223	198	79	4	24	65	0	0	7	89	65	1.072	1.5
Envol	3	295	270	106	4	23	66	2	0	6	91	68	1.067	2.0
NCB3146-1	3	310	247	99	13	38	41	0	0	7	79	41	1.069	2.0
NCB3171-4	3	310	262	102	11	51	32	0	0	5	84	32	1.083	2.5
NDAF113470C-3	3	291	247	101	10	54	30	0	0	5	85	30	1.070	2.0
NDAF113490C-6	4	299	223	93	6	25	49	0	0	20	74	49	1.067	2.0
Superior	3	222	199	82	4	25	65	0	0	6	89	65	1.066	2.0
Grand Mean		278	232											
CV(%)		17	23											
LSD(k=100)		81	87											

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

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

[5] 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 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 99 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AF4157-6	6	8	8	4	6	6	6	7	2	7	4	7	6	0	9	0	0	0	0	SS,GC,MS,SR
AF5677-4	6	8	8	5	9	8	6	7	2	7	7	6	5	0	9	3	0	5	0	SS,SR,MS,IL,RZ
AF5682-3	9	8	8	7	6	7	6	7	5	8	6	4	3	0	9	0	0	3	0	SS,CS,SR,IL,GC
Atlantic	6	8	8	5	6	6	6	6	3	7	7	7	5	13	8.2	8	0	3	23	SR,SS,GC,CS,MS,RZ,FS
B2834-8	5	8	8	4	6	6	7	7	1	7	6	6	5	0	9	0	0	0	5	SR,SS,GC,MS,IL
Envol	5	6	8	4	9	7	4	7	5	7	8	7	4	0	9	0	0	0	3	MS,SS,SR,V
NCB3146-1	5	8	8	4	6	7	7	7	2	8	5	6	5	5	8.5	0	0	0	0	SR,CS,IL,MS,SS
NCB3171-4	6	8	8	5	9	7	7	7	2	6	3	5	4	0	9	0	0	0	0	SS,SR,IL
NDAF113470C-3	6	8	8	5	6	7	6	7	2	7	4	8	6	0	9	0	0	3	0	SS,MS,GC,SR
NDAF113490C-6	6	8	8	5	6	7	6	7	3	6	6	5	4	5	7.5	3	0	5	0	SS,CS,MS,SR
Superior	5	7	8	4	6	6	5	7	5	6	7	8	4	0	9	0	0	0	0	SR,MS

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

[2] See NE1231 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 123 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

Clone	Merit[2] Score	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class[3] (% of total yield) 1's	2's	3's	4's	5's	Culls	1 7/8 to 4"	2 1/2 to 4"	Specific Gravity[4]	Chip Color[5]
AAF10577-1	3	340	256	138	14	52	23	0	0	10	75	23	1.060	2.5
AF5635-8	3	249	187	87	10	34	39	0	0	17	72	39	1.061	2.0
Atlantic	4	241	209	100	4	18	58	9	0	10	85	67	1.072	2.0
B3084-3	2	294	259	136	4	18	66	3	0	8	88	70	1.067	2.0
BNC182-5	3	337	288	142	6	24	59	2	0	9	85	61	1.063	2.5
BNC369-4	3	344	310	164	3	21	68	1	0	7	90	69	1.064	2.5
BNC426-2	2	377	327	171	6	24	63	0	0	7	87	63	1.073	2.0
NC470-3	2	407	361	190	3	16	65	7	0	8	88	72	1.068	1.5
NC472-1	4	415	366	194	5	18	60	10	3	4	88	70	1.064	2.0
NC473-2	2	400	364	191	2	9	66	17	3	4	91	82	1.056	1.5
NCB3165-3	2	258	228	116	9	47	41	0	0	3	88	41	1.074	2.0
NCB3171-7	2	336	257	130	12	44	32	0	0	12	76	32	1.068	2.0
NDAF113491C-6	4	298	232	128	4	25	50	1	0	19	77	51	1.060	2.0
Sebec	2	335	301	148	4	23	65	1	0	6	89	66	1.066	2.0
Snowden	3	342	297	156	3	21	61	4	0	12	85	64	1.065	1.5
WAF12065-8	4	222	135	77	4	14	36	10	0	37	60	46	1.062	2.5
Grand Mean		325	274											
CV(%)		15	21											
LSD(k=100)		82	93											

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

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

[5] 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 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 123 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AAF10577-1	8	9	8	9	6	8	7	7	2	7	4	7	4	0	9	3	0	0	5	SG,SS,GC,V,MS,RZ
AF5635-8	9	9	9	8	6	6	7	7	2	7	5	7	5	5	8	0	0	10	0	MS,SS,GC,RZ,SR
Atlantic	6	8	8	5	6	5	6	6	3	7	6	7	6	15	8.1	8	0	3	10	SS,GC,CS,MS,SR
B3084-3	6	8	8	5	6	6	5	6	2	7	8	8	6	0	9	0	0	0	0	SS,MS,GC,RZ,CS,SR
BNC182-5	8	8	8	8	8	6	7	7	2	8	6	8	7	0	9	5	0	0	3	SR,SS,MS,GC,RZ
BNC369-4	7	8	9	6	6	6	6	7	3	7	7	8	6	0	9	0	0	0	0	MS,V,SS,GC,SR
BNC426-2	9	8	8	6	6	6	7	6	4	7	6	8	6	0	9	0	0	3	10	SS,SR,MS,GC,V,FS
NC470-3	9	9	8	9	5	5	7	7	3	8	7	8	7	0	9	3	0	0	3	GC,MS,SS,SR
NC472-1	8	8	8	8	5	5	7	7	2	8	7	8	7	25	7.1	0	0	3	20	SS,SR,MS,CS
NC473-2	7	9	8	8	5	5	7	6	2	7	7	8	8	3	8.75	0	0	0	3	SS,SR
NCB3165-3	5	7	7	4	6	7	6	7	2	6	5	8	6	0	9	0	0	0	0	GC,SR,SS,CS
NCB3171-7	6	7	8	6	6	7	6	7	3	7	5	7	6	0	9	0	0	0	0	SS,SR,CS,GC,MS
NDAF113491C-6	6	8	8	6	6	5	6	7	4	7	5	6	3	0	9	0	0	0	0	SS,SR,SG,RZ,CS
Sebec	8	9	8	7	6	6	6	6	4	7	7	8	6	0	9	0	0	0	3	SR,MS,SS,GC,RZ
Snowden	9	9	8	7	5	5	6	7	3	6	5	6	5	3	8.75	0	0	0	0	SS,SR,CS,MS
WAF12065-8	7	8	9	8	6	6	6	6	2	7	7	8	3	0	9	0	0	5	8	GC,MS,SS,SR,RZ

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

[2] See NE1231 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-1231 Round White Trial. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 112 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

					Size Distribution by Class[3] (% of total yield)									
Clone	Merit[2] Score	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	1's	2's	3's	4's	5's	Culls	1 7/8 to 4"	2 1/2 to 4"	Specific Gravity[4]	Chip Color[5]
AF4552-5	3	266	234	106	4	21	59	8	0	9	88	67	1.064	2.0
AF4648-2	2	251	211	100	8	28	53	2	0	9	84	55	1.071	1.5
AF5040-8	3	228	182	87	6	32	45	2	0	15	79	47	1.076	2.0
AF5225-1	3	402	348	162	8	35	49	3	0	6	87	52	1.056	4.0
AF5280-5	3	273	230	107	5	21	53	10	0	11	84	64	1.056	2.0
Atlantic	2	271	226	100	4	12	56	15	1	12	83	71	1.074	1.5
BNC364-1	2	259	229	108	3	38	49	2	0	8	89	50	1.068	2.0
Katahdin	4	174	143	66	8	44	38	0	0	10	82	38	1.053	2.5
Kennebec	3	242	193	87	4	30	48	2	0	17	79	49	1.055	3.5
NY157	3	303	265	125	3	21	61	6	0	9	87	66	1.067	2.0
NY158	2	424	379	181	5	30	57	2	0	7	89	59	1.069	1.5
NY161	3	343	256	119	11	36	37	1	0	14	74	38	1.062	3.5
Snowden	2	335	302	147	6	26	57	8	0	4	90	64	1.069	2.0
Superior	3	231	203	94	3	20	58	9	0	9	88	67	1.059	3.0
Yukon Gold	4	161	133	65	4	20	60	3	0	14	83	63	1.063	.
Grand Mean		277	236											
CV(%)		17	20											
LSD(k=100)		77	78											

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

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

[5] 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 8b. NE-1231 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 112 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AF4552-5	8	8	8	6	6	6	6	7	2	7	7	8	5	3	8.8	0	0	0	3	SR,SS,GC,V,MS
AF4648-2	8	8	7	7	6	7	7	7	3	7	7	8	6	0	9	0	0	0	0	GC,SS,SR,MS
AF5040-8	7	8	8	6	6	7	6	7	3	8	5	5	4	0	9	0	0	0	3	^SR,CS,SS
AF5225-1	9	8	9	8	6	7	7	7	3	7	6	8	6	15	7.3	0	0	0	0	MS,GC,RZ,SS,SR
AF5280-5	6	8	8	5	6	8	5	7	4	6	7	8	5	0	9	0	0	0	3	SR,GC,MS,SS
Atlantic	6	8	8	5	6	6	6	7	3	7	6	8	6	13	7.6	5	0	5	0	SR,MS,SS,GC
BNC364-1	6	8	8	5	6	7	6	7	5	7	7	8	6	0	9	0	0	0	0	GC,MS,RZ,SS,SR,V
Katahdin	7	8	8	6	8	8	5	7	5	7	5	8	4	8	8.3	0	0	0	0	SR,CS,SS,MS
Kennebec	9	8	8	9	8	8	5	7	7	6	8	8	3	3	8.5	0	0	0	0	SG,SR,MS,SS,GC
NY157	9	8	8	7	6	6	6	7	3	8	6	8	4	0	9	0	0	0	3	SS,MS,SR
NY158	9	9	8	8	6	7	6	7	5	6	5	8	5	0	9	0	0	3	5	MS,SS,SR,SG
NY161	9	8	8	8	7	8	6	7	4	8	6	8	6	0	9	0	0	3	0	PSPEC,SR,SG,MS,SS,GC
Snowden	9	8	8	7	6	5	6	7	2	6	5	8	7	0	9	0	0	5	0	DAE,DSE,SR,SS,MS
Superior	5	8	8	4	6	7	5	7	5	7	5	8	4	0	9	0	0	5	0	SR,MS,SS
Yukon Gold	8	7	7	5	7	8	6	7	5	7	6	7	4	0	9	5	0	3	5	SR,CS,MS,SS

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

[2] See NE1231 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-1231 Red Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 105 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC – 2017

					Size Distribution by Class[3] (% of total yield)								
	Merit[2]	Total Yield	Marketable Yield								1 7/8	2 1/2	Specific
Clone	Score	cwt/A	cwt/A	%Chf.	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[4]
AF4831-2	4	219	134	46	14	43	18	0	0	25	61	18	1.049
AF5245-1	3	295	255	86	9	48	39	0	0	4	86	39	1.066
BNC481-6	3	266	150	51	29	50	6	0	0	15	56	6	1.056
Chieftain	4	376	303	100	6	26	53	2	0	14	80	55	1.053
Colorado Rose	4	266	193	66	5	54	16	1	0	23	72	17	1.062
Dark Red Norland	4	253	191	65	10	37	37	0	0	15	75	38	1.053
NC551-1	3	263	201	68	7	31	39	5	0	17	76	44	1.040
NC554-1	3	324	281	97	7	30	55	1	0	7	87	57	1.049
NC560-2	4	162	124	43	6	57	19	0	0	17	76	19	1.039
NC563-3	3	230	194	65	7	67	17	0	0	9	84	17	1.044
NC566-6	3	169	119	41	21	57	12	1	0	10	70	13	1.050
NDAF102696C-5	2	305	213	74	28	60	9	0	0	4	69	9	1.069
NDAF113484B-1	3	233	182	61	11	41	36	2	0	11	78	37	1.052
Red Endeavor	3	296	236	77	14	50	29	0	0	7	78	29	1.054
Grand Mean		261	198										
CV(%)		15	23										
LSD(k=100)		68	74										

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

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

Table 9b. NE-1231 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 105 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AF4831-2	7	8	7	5	2	8	6	7	4	7	5	4	4	20	8.1	0	0	0	5	^SR,SS,GC
AF5245-1	9	8	8	6	1	7	6	7	3	7	6	6	5	13	7.9	0	0	0	0	SISC,SS,SR,MS,GC
BNC481-6	6	8	8	4	1	8	6	5	2	7	4	6	5	0	9	0	0	0	3	^SR,SISC,SG
Chieftain	8	8	8	6	3	8	5	5	5	7	6	7	3	45	7.2	0	0	0	0	SR,SG,GC,SS
Colorado Rose	8	8	8	6	2	6	6	7	5	7	6	4	3	0	9	0	0	0	0	^CS,SS,SR,MS
Dark Red Norland	5	8	8	3	2	7	5	7	4	7	7	5	4	0	9	0	0	0	5	^SR,SS,MS,GC
NC551-1	5	7	8	6	2	8	6	6	5	7	6	6	4	3	8.5	0	0	0	0	SR,SS,SG,GC
NC554-1	6	7	8	5	2	8	7	6	3	8	5	7	5	5	7.8	0	0	3	3	GC,SS,MS,SR
NC560-2	5	7	8	5	2	8	6	7	5	5	5	6	3	3	8.8	0	0	0	0	^SR,SS,MS,SG
NC563-3	6	8	8	5	3	8	7	6	7	7	4	7	6	0	9	0	0	0	5	SR,SS,MS
NC566-6	5	5	7	5	2	8	7	6	2	7	3	8	7	0	9	0	0	0	5	SR,SS,MS
NDAF102696C-5	7	8	8	5	2	7	7	6	2	7	4	8	7	0	9	0	0	0	3	SR,CS,SS
NDAF113484B-1	6	8	8	5	2	8	6	7	3	7	6	8	5	0	9	0	0	0	0	GC,SS,SR,MS
Red Endeavor	9	8	8	7	2	7	6	7	2	8	4	7	6	5	8.5	0	0	0	3	SR,SS,MS

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

[2] See NE1231 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-1231 Russet Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 119 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

					Size Distribution by Class[3] (% of total yield)								
	Merit[2]	Total Yield	Marketable Yield								1 7/8	2 1/2	Specific
Clone	Score	cwt/A	cwt/A	%R.Nor	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[4]
AAF08434-1	4	135	99	78	25	64	4	0	0	7	68	4	1.053
AF3001-6	3	227	191	154	7	36	42	0	0	16	77	42	1.053
AF4124-7	4	169	121	100	8	54	18	0	0	20	72	18	1.057
AF4172-2	4	213	147	122	24	52	13	0	0	11	65	13	1.067
AF4615-5	4	152	97	80	5	34	26	2	0	34	61	28	1.062
AF4872-2	3	179	112	94	19	43	19	0	0	19	62	19	1.060
AF5071-2	2	199	137	106	19	57	7	0	0	17	64	7	1.068
AF5091-8	4	118	85	68	12	49	15	0	0	24	64	15	1.049
AF5164-19	2	184	144	109	10	58	20	0	0	13	77	20	1.059
AF5179-4	4	194	107	80	5	37	16	0	0	42	53	16	1.065
AF5312-1	4	220	153	117	7	49	19	0	0	24	68	19	1.056
AF5406-10	4	163	111	91	7	57	11	0	0	25	68	11	1.067
AF5406-7	4	176	134	111	8	70	6	0	0	16	76	6	1.051
AF5468-5	4	100	70	55	10	52	17	0	0	21	68	17	1.049
ND8068-5Russ	2	178	153	114	7	60	24	2	0	7	86	26	1.069
Russet Burbank	4	149	93	76	21	51	3	0	0	25	54	3	1.076
Russet Norkotah	2	163	136	100	7	63	20	0	0	9	83	20	1.056
Shepody	4	148	89	68	6	38	21	0	0	35	59	21	1.060
WAF10073-3RUS	4	196	146	126	6	61	14	0	0	19	74	14	1.046
Grand Mean		172	122										
CV(%)		43	51										
LSD(k=100)		120	102										

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

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

Table 10b. NE-1231 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 119 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AAF08434-1	6	8	8	5	5	3	6	7	6	8	5	4	3	0	9	0	0	0	0	SR,SS,GC,MS,RZ
AF3001-6	7	8	8	7	6	4	5	7	7	8	7	6	4	8	8.3	0	0	0	5	MS,SS,SR,CS,GC
AF4124-7	6	8	7	5	5	3	5	7	7	8	5	8	3	3	8.8	0	0	0	5	SG,SR,SS,MS
AF4172-2	9	8	8	9	5	4	6	7	6	7	3	6	3	0	9	3	0	0	8	SS,MS,SG,SR,GC
AF4615-5	7	8	8	7	5	4	7	7	7	9	7	5	3	0	9	0	0	0	0	KNOBS,MS,SS,^SR,SG,GC
AF4872-2	8	7	8	8	6	4	6	7	6	7	7	6	4	0	9	0	0	0	3	SR,MS,SS,CS
AF5071-2	6	7	8	5	5	3	6	7	7	8	5	5	4	0	9	0	0	0	0	MS,KNOBS,SR,SG,SS,IL,GC
AF5091-8	5	8	8	6	5	4	7	7	6	7	6	6	4	0	9	0	5	0	5	SR,SG,GC,MS,SS,CS
AF5164-19	9	8	9	8	5	4	6	7	6	8	6	8	6	0	9	0	0	0	0	SR,SS,GC,V
AF5179-4	6	8	8	5	5	4	6	7	7	8	7	3	1	0	9	0	0	0	3	^^SR,^SG,SS,CS,MS
AF5312-1	6	8	8	6	4	3	7	7	6	8	6	6	5	28	7.8	3	0	0	0	SR,MS,SS,SG,GC
AF5406-10	9	8	7	8	6	4	5	7	7	8	6	5	4	5	8.3	0	0	0	5	SR,SS,MS,SG,GC
AF5406-7	6	8	9	7	6	4	5	7	8	7	7	6	3	0	9	0	8	3	3	SR,CS,RZ,MS,SS
AF5468-5	9	7	8	9	5	3	6	7	6	8	7	5	3	3	8.8	0	0	0	0	SR,HS,MS,RZ,CS,SS
ND8068-5Russ	5	7	8	3	5	4	6	7	6	8	5	7	6	0	9	0	3	0	0	SR,MS,GC,SS
Russet Burbank	9	8	8	9	5	4	6	7	6	8	6	7	3	5	7.8	0	0	10	0	MS,SR,SS,GC
Russet Norkotah	7	8	8	5	5	4	6	7	7	8	6	6	5	0	9	0	0	0	3	MS,SR,SS,GC
Shepody	8	8	8	8	6	7	6	7	7	7	7	6	2	0	9	0	50	3	0	GC,SG,MS,SR,SS
WAF10073-3RUS	8	8	8	7	4	3	5	7	8	8	7	7	3	0	9	0	0	0	0	MS,KNOBS,SR,MS,SS

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

[2] See NE1231 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. Yellow Flesh Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 112 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

					Size Distribution by Class[3] (% of total yield)								
	Merit[2]	Total Yield	Marketable Yield								1 7/8	2 1/2	Specific
Clone	Score	cwt/A	cwt/A	%Atl	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[4]
AF5450-7	2	286	250	175	6	30	53	4	0	6	87	57	1.063
AF5677-6	3	212	180	126	4	19	53	13	0	11	85	66	1.069
Alegria	4	332	251	181	3	19	52	4	0	22	75	56	1.061
Allora	4	317	226	159	10	35	35	1	0	19	72	36	1.056
Atlantic	4	178	145	100	4	18	52	12	0	14	82	64	1.070
Francisca	2	243	183	125	8	34	40	0	0	18	74	40	1.049
French Fingerling	4	219	110	79	34	50	0	0	0	17	50	0	1.060
Natascha	2	310	239	165	10	49	28	1	0	13	77	28	1.057
NC556-4	4	182	140	100	6	36	41	0	0	18	76	41	1.052
NC600-10	4	300	244	170	3	14	57	11	0	16	81	68	1.061
NC606-23	2	260	204	141	6	29	49	0	0	16	78	49	1.051
NC606-4	3	428	347	253	7	20	50	9	0	13	79	59	1.068
NCB2607-3	2	148	107	75	21	61	11	0	0	7	72	11	1.064
Peter Wilcox	2	205	172	121	5	28	55	1	0	12	84	56	1.060
Queen Anne	2	231	167	116	15	64	8	0	0	13	72	8	1.049
Soraya	4	380	247	175	4	30	36	0	0	31	65	36	1.044
Vivaldi	3	266	212	147	5	30	48	2	0	16	79	49	1.051
Wendy	2	246	176	123	20	60	12	0	0	8	72	12	1.052
Yukon Gold	4	45	32	22	10	21	41	12	0	16	74	54	1.059
Grand Mean		252	191										
CV(%)		15	21										
LSD(k=100)		61	66										

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

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

Table 11b. Yellow Flesh 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 112 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AF5450-7	9	8	8	8	6	6	6	7	2	6	6	7	6	0	9	0	0	0	0	SR,SS,MS
AF5677-6	9	8	9	7	7	7	6	7	3	8	6	8	5	5	8.3	3	3	5	0	SR,MS,IL,SS
Alegria	8	8	7	8	7	8	5	7	4	7	6	8	4	0	9	0	0	0	3	KNOBS,PTS,MS,SR,SS
Allora	7	8	8	6	7	8	6	7	5	8	7	7	3	0	9	5	0	0	0	MS,SG,SR,PTS
Atlantic	6	8	8	5	6	6	6	6	3	7	6	7	4	25	7.6	23	0	5	0	SR,GC,SS,CS,MS
Francisca	8	8	8	8	7	8	6	7	6	8	5	6	5	0	9	0	0	3	0	SR,MS,SG,SS
French Fingerling	9	8	9	9	3	8	5	7	7	8	3	8	4	78	6.5	0	0	0	0	MS,SR,GC
Natascha	8	8	8	7	7	7	6	7	4	8	5	8	6	5	8.5	0	0	0	3	SG,MS,SS,SR,CS
NC556-4	6	3	9	6	7	8	7	7	2	7	4	7	4	0	9	0	0	3	3	GC,MS,SS,SR
NC600-10	7	8	7	6	7	8	7	7	3	6	7	8	5	33	7.0	0	0	8	0	PISPECS,GC,MS,SR
NC606-23	6	8	8	5	7	8	5	7	5	8	5	7	6	3	8.8	0	0	3	5	SR,SS,MS
NC606-4	9	8	9	9	7	7	7	7	2	7	7	8	5	10	8.3	8	0	0	0	SR,SS,GC,SG,RZ,IL
NCB2607-3	5	7	8	4	2	7	7	7	2	8	3	8	8	0	9	0	0	0	0	SS,SR,GC,CS
Peter Wilcox	6	8	8	4	1	7	6	7	5	8	5	7	7	0	9	0	0	0	3	SR,MS,CS,SS,GC
Queen Anne	8	8	8	7	7	8	6	7	6	8	5	7	7	0	9	0	0	0	3	SR,SG,GC,MS
Soraya	9	9	8	8	7	8	6	7	6	7	8	8	5	0	9	0	0	3	3	SG,SR,MS,SS,GC
Vivaldi	8	8	7	7	7	8	7	7	7	8	6	7	6	5	8.5	0	0	3	3	^CS,MS,SR,GC,SS
Wendy	9	8	8	8	7	8	6	7	4	8	4	8	7	0	9	0	0	0	0	SR,MS,CS
Yukon Gold	8	7	8	5	7	7	6	7	4	7	6	5	4	5	8.8	0	0	3	3	^SR,CS

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

[2] See NE1231 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 12a. Specialty Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 105 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

					Size Distribution by Class[3] (% of total yield)								
	Merit[2]	Total Yield	Marketable Yield								1 7/8	2 1/2	Specific
Clone	Score	cwt/A	cwt/A	%Atl	1's	2's	3's	4's	5's	Culls	to 4"	to 4"	Gravity[4]
AAF08155-1	3	299	200	66	17	43	23	0	0	16	66	23	1.054
Adirondack Blue	4	205	186	62	4	36	53	1	0	5	90	54	1.057
Adirondack Red	3	195	155	52	13	65	15	0	0	7	80	15	1.057
AF5412-3	3	280	231	75	5	32	48	2	0	13	82	51	1.052
AF5414-1	3	296	238	81	15	54	26	0	0	5	80	26	1.060
Atlantic	2	338	311	100	2	16	62	14	2	3	92	76	1.074
Chieftain	4	284	202	67	6	23	44	3	0	23	71	48	1.052
Dark Red Norland	4	199	153	50	7	37	38	3	0	16	77	40	1.051
NC414-2	3	306	239	77	16	45	29	4	0	6	78	33	1.075
NC499-14	4	286	205	70	17	39	32	0	0	11	72	33	1.059
NC499-31	3	140	76	24	42	49	5	0	0	4	54	5	1.069
NC502-10	2	290	248	82	10	57	26	1	0	6	84	27	1.077
NC503-50	4	317	257	83	12	42	39	0	0	8	81	39	1.081
NC507-15	3	161	85	29	37	49	1	1	0	13	51	1	1.068
NC508-17	3	178	137	44	7	69	7	0	0	16	77	7	1.044
NC508-37	3	266	234	76	7	48	37	3	0	4	89	40	1.073
NC509-16	2	241	194	63	12	50	29	0	0	7	80	30	1.065
NC597-25	3	92	46	14	52	45	0	0	0	2	45	0	1.069
NDAF113458-2	2	436	368	123	12	50	33	1	0	4	84	34	1.052
Purple Majesty	3	222	153	54	21	63	5	0	0	11	68	5	1.066
Purple Pelisse	3	144	34	11	65	24	0	0	0	11	24	0	1.057
Grand Mean		243	185										
CV(%)		20	23										
LSD(k=100)		80	71										

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

[2] Merit Score (4 point scale): 1 = Outstanding; 2 = Keep; 3 = Marginal; 4 = Drop.

[3] 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.

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

Table 12b. Specialty Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 105 DAP[1] at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2017

	Plant Data[2]				Tuber Data[2]									% Internal Defects[3]						
Clone	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	Comments[4]
AAF08155-1	9	8	9	9	9	8	4	7	3	7	6	8	5	3	8.8	0	0	0	3	SR,V,MS,^SG,RZ,KNOBS
Adirondack Blue	6	8	8	5	1	7	5	7	6	5	6	6	3	0	9	0	0	0	3	SR,GC,RZ,MS,SISC
Adirondack Red	5	8	8	5	2	7	4	7	7	7	5	8	5	3	8.75	0	0	0	0	SR,SISC,SS,MS
AF5412-3	8	8	9	7	1	8	6	7	7	6	8	7	4	0	9	0	0	0	3	MS,SR,SISC,SG,GC
AF5414-1	6	8	8	5	2	8	6	7	3	7	4	7	5	3	8.5	0	0	0	0	SR,SS,MS,SG,SISC,STST
Atlantic	6	8	8	5	6	6	6	7	3	7	7	8	6	15	7.9	8	0	5	0	GC,CS,SS,MS,SR
Chieftain	9	8	8	6	3	8	6	5	5	8	6	7	3	33	7.5	0	0	3	0	SG,SS,SR,CS,RZ
Dark Red Norland	5	7	8	3	2	7	5	7	4	7	5	7	4	0	9	3	0	0	3	SR,MS,GC,SS,SG
NC414-2	9	8	8	8	1	6	7	7	2	6	5	8	5	8	8.5	0	0	0	0	SISC,MS,SS,SR,SG,YSPECS
NC499-14	8	8	8	6	2	8	5	7	5	8	5	7	5	33	7.2	0	0	0	3	SG,MS,SR,SS,YSPECS
NC499-31	5	4	9	5	1	7	7	7	2	7	3	8	6	5	8.5	5	0	3	3	SS,SR,SG,MS,YSPECS
NC502-10	6	8	8	6	1	8	5	7	5	5	5	7	5	0	9	0	0	0	0	SR,MS,SISC,PEARS
NC503-50	9	8	9	7	2	7	7	7	3	5	5	6	4	93	5.9	0	0	0	3	YSPEC,SR,MS,SISC
NC507-15	5	7	7	3	2	8	6	7	7	7	3	8	5	0	9	5	0	0	5	MS,SR,SISC
NC508-17	8	8	8	6	1	7	6	7	6	8	6	7	6	0	9	3	0	0	10	SR,MS,SISC,SG
NC508-37	6	8	8	5	1	7	6	7	7	5	6	6	5	0	9	3	0	3	8	DAE,STST,SISC,SR,MS
NC509-16	7	8	8	5	1	7	6	7	6	7	5	8	7	0	9	0	0	0	3	SR,SISC,SS,SG,MS
NC597-25	5	3	9	4	6	7	6	7	4	8	3	8	5	3	8.5	0	0	0	0	SR,V,SS,MS
NDAF113458-2	9	8	8	7	7	7	6	6	3	8	5	8	7	0	9	0	3	0	0	MS,GC,RZ,SR,SS
Purple Majesty	7	8	8	5	1	7	6	7	5	7	5	7	6	0	9	0	0	3	3	SISC,SR,STST,SG,MS
Purple Pelisse	6	8	7	6	1	8	6	7	6	7	4	7	5	0	9	0	0	0	8	MS,KNOBS,SR,SISC

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

[2] See NE1231 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 Chip Images TRS Chips.

AAF08155-1

Adirondack Blue

Adirondack Red

AF5412-3

AF5414-1

Atlantic

NC414-2

NC499-14

NC499-31

NC502-10

NC503-50

NC507-15

Figure 1. continued.

NC508-17

NC508-37

NC509-16

NC597-25

NDAF113458-2

Purple Majesty

Purple Pelisse

Figure 2. Replicated Specialty Trial Chip Images UTZ Chips.

Adirondack Blue

Adirondack Red

NC414-2

NC502-10

NC503-50

NC507-15

NC508-17

NC508-37

NC509-16

Purple Majesty

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, 25 hills per row

Seed piece Treatment:	None
Weed Control:	Matrix SG 1 oz/A
	Metribuzin 1.3 lbs/A
	Intensity 1 pt/A
Fertilizer:	234N, 90P, 200K, 1 lb/A citraplex 25% zinc
Insect Control:	Wrangler 9 fl oz/A in furrow
	Blackhawk 3 oz/A
Disease Control:	Quadris in furrow 8 fl oz/A
	Bravo 2 pt/A (3 applications)
	Revus Top 6.2 fl oz/A
Vine Kill:	None

Location: Black Gold Farms, Gum Neck, Tyrrell Co., NC
Trial Title: Black Gold Farms Variety Table Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Twelve 21' rows at 34' row spacing, 25 hills per row

Seed piece Treatment:	None
Weed Control:	Matrix SG 1 oz/A
	Metribuzin 1.3 lbs/A
	Intensity 1 pt/A
Fertilizer:	234N, 90P, 200K, 1 lb/A citraplex 25% zinc
Insect Control:	Wrangler 9 fl oz/A in furrow
	Blackhawk 3 oz/A
Disease Control:	Quadris in furrow 8 fl oz/A
	Bravo 2 pt/A (3 applications)
	Revus Top 6.2 fl oz/A
Vine Kill:	None

Location: Black Gold Farms, Gum Neck, Tyrrell Co., NC
Trial Title: SNaC Trial
Trial Design: Randomized complete block, five replications
Plot Dimensions: thirteen 21' rows at 34' row spacing, 25 hills per row

Seed piece Treatment:	None
Weed Control:	Matrix SG 1 oz/A
	Metribuzin 1.3 lbs/A
	Intensity 1 pt/A
Fertilizer:	234N, 90P, 200K, 1 lb/A citraplex 25% zinc
Insect Control:	Wrangler 9 fl oz/A in furrow
	Blackhawk 3 oz/A
Disease Control:	Quadris in furrow 8 fl oz/A
	Bravo 2 pt/A (3 applications)
	Revus Top 6.2 fl oz/A
Vine Kill:	None

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

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

Seed piece Treatment:	None
Weed Control:	Boundry 2.3 pt/A
	Matrix 1 oz/A
Fertilizer:	1185lbs, 16-07-17
Insect Control:	Capture 1pt/A
	Platinum 2.6 oz/A
Disease Control:	Quadris 8 oz/A
	Echo 2 pt/A (2 applications)
	Revustop 9 oz/A
Vine Kill:	None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: Round White Variety Trial One
Trial Design: Randomized complete block, four replications
Plot Dimensions: Twenty-one 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment:	None
Weed Control:	Dual 2 pts/A
	Clethodim 10 oz/A – 1 application
Fertilizer:	19-19-21, 800 lbs/A
	25%N, 30 gal/A
Insect Control:	Admire Pro 8 oz/A
	Permethrin 3.2 AC 8 oz/A (2 Applications)
Disease Control:	Bravo 24 oz/A (2 Applications)
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: Eleven 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment:	None
Weed Control:	Dual 2 pts/A
	Clethodim 10 oz/A – 1 application
Fertilizer:	19-19-21, 800 lbs/A
	25%N, 30 gal/A
Insect Control:	Admire Pro 8 oz/A
	Permethrin 3.2 AC 8 oz/A (2 Applications)
Disease Control:	Bravo 24 oz/A (2 Applications)
Vine Kill:	None

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

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: Round White Variety Trial Three
Trial Design: Randomized complete block, four replications
Plot Dimensions: Sixteen 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment:	None
Seed piece Treatment:	None
Weed Control:	Dual 2 pts/A
	Clethodim 10 oz/A – 1 application
Fertilizer:	19-19-21, 800 lbs/A
	25%N, 30 gal/A
Insect Control:	Admire Pro 8 oz/A
	Permethrin 3.2 AC 8 oz/A (2 Applications)
Disease Control:	Bravo 24 oz/A (2 Applications)
Vine Kill:	None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: NE 1231 White Variety Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Fifteen 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment:	None
Weed Control:	Dual 2 pts/A
	Clethodim 10 oz/A – 1 application
Fertilizer:	19-19-21, 800 lbs/A
	25%N, 30 gal/A
Insect Control:	Admire Pro 8 oz/A
	Permethrin 3.2 AC 8 oz/A (2 Applications)
Disease Control:	Bravo 24 oz/A (2 Applications)
Vine Kill:	None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: NE 1231 Red Variety Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Fourteen 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment:	None
Weed Control:	Dual 2 pts/A
	Clethodim 10 oz/A – 1 application
Fertilizer:	19-19-21, 800 lbs/A
	25%N, 30 gal/A
Insect Control:	Admire Pro 8 oz/A
	Permethrin 3.2 AC 8 oz/A (2 Applications)
Disease Control:	Bravo 24 oz/A (2 Applications)
Vine Kill:	None

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

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: NE 1231 Russet Variety Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Nineteen 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment:	None
Weed Control:	Dual 2 pts/A
	Clethodim 10 oz/A – 1 application
Fertilizer:	19-19-21, 800 lbs/A
	25%N, 30 gal/A
Insect Control:	Admire Pro 8 oz/A
	Permethrin 3.2 AC 8 oz/A (2 Applications)
Disease Control:	Bravo 24 oz/A (2 Applications)
Vine Kill:	None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: Yellow Flesh Variety Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Nineteen 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment:	None
Weed Control:	Dual 2 pts/A
	Clethodim 10 oz/A – 1 application
Fertilizer:	19-19-21, 800 lbs/A
	25%N, 30 gal/A
Insect Control:	Admire Pro 8 oz/A
	Permethrin 3.2 AC 8 oz/A (2 Applications)
Disease Control:	Bravo 24 oz/A (2 Applications)
Vine Kill:	None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: Specialty Variety Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Twenty-two 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment:	None
Weed Control:	Dual 2 pts/A
	Clethodim 10 oz/A – 1 application
Fertilizer:	19-19-21, 800 lbs/A
	25%N, 30 gal/A
Insect Control:	Admire Pro 8 oz/A
	Permethrin 3.2 AC 8 oz/A (2 Applications)
Disease Control:	Bravo 24 oz/A (2 Applications)
Vine Kill:	None

Appendix 2: STANDARDIZED NE1231 RATING CODES FOR PLANT AND TUBER CHARACTERISTICS

Tuber Color

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

Tuber Texture

1. partial russet
2. heavy russet
3. moderate russet
4. light russet
5. netted
6. slight net
7. moderately smooth
8. smooth
9. very smooth

Tuber Cross-section

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

Tuber Skin Set

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

Tuber Shape

1. very round
2. mostly round
3. round to oblong
4. mostly oblong
5. oblong
6. oblong to long
7. mostly long
8. long
9. cylindrical

Tuber Eye Depth

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

Tuber Size (GCY Scale)

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

Tuber Appearance

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

Tuber Disease Rating

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

Plant Type

1. decumbent-poor canopy
2. decumbent-fair canopy
3. decumbent-good canopy
4. spreading-poor canopy
5. spreading-fair canopy
6. spreading-good canopy
7. upright-poor canopy
8. upright-fair canopy
9. upright-good canopy

Plant Disease and Pollution Reaction

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

Maturity

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

Appendix 3: COMMENT CODES FOR TABLE B

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

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

Heat Necrosis

10 tubers/replication are sampled, typically there are 4 replications in each trial (40 tubers total), SNAC 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.