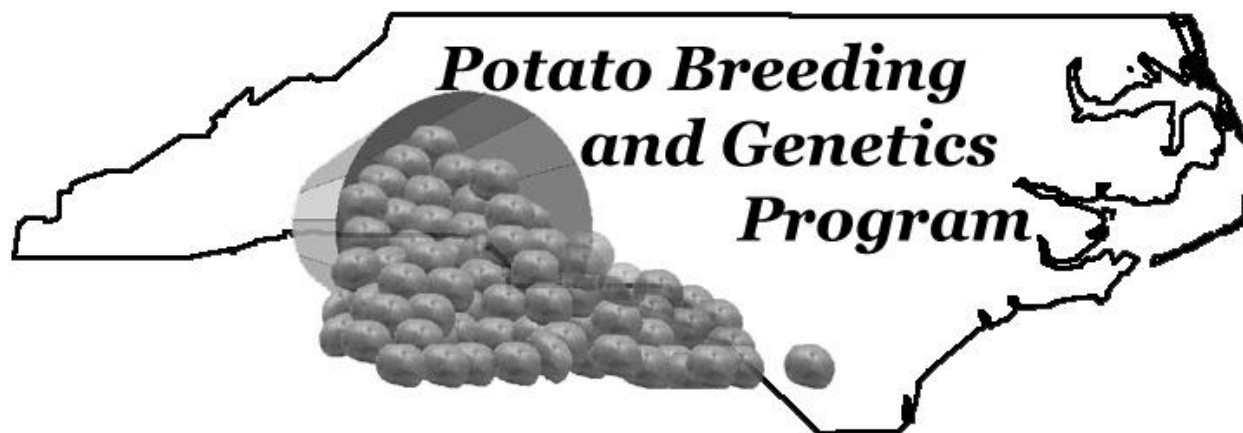


NC STATE UNIVERSITY
NORTH CAROLINA
POTATO VARIETY TRIAL AND BREEDING REPORT

2021



G. C. Yencho, Professor and Leader, Potato and Sweetpotato Breeding and Genetics Programs
Department of Horticultural Science
North Carolina State University
214A Kilgore Hall, Raleigh NC, 27695
Tel: 919-513-7417
Fax: 919-515-2505
Email: Craig_Yencho@ncsu.edu

M. E. Clough, Research Scholar and Extension Associate, Potato Breeding and Genetics Program
Department of Horticultural Science
North Carolina State University
Vernon G. James Research and Extension Center
207 Research Station Rd., Plymouth NC 27962
Tel: 252-793-4428 Ext 156
Fax: 252-793-5142
Email: Mark_Clough@ncsu.edu

Web Address: <http://potatoes.ncsu.edu>

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 mid-Atlantic and southeastern US geographic regions.

Our variety development research efforts are supported by the USDA National Institute of Food and Agriculture (NIFA) Northeast Region 1731 Multistate Potato Variety Development and Evaluation Project, the USDA NIFA Potato Special Research Grants Program, the NC Potato Association, Potatoes USA and Snack Nutrition and Convenience International (SNaC), as well as other industry members.

II. PROJECT SUMMARY

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

Breeding Program

Our in-house efforts to develop varieties begin with crossing in the greenhouses at the NC Department of Agriculture and Consumer Services Tidewater Research Station/NC State University Vernon G. James Research and Extension Center (TRS/VGJREC) in Plymouth, NC. The best lines are grown out to produce mini-tubers in the greenhouse and then are taken to the field as first generation or first cycle material. These first cycle plots can be single hills, three hills or four hills in number depending on origins and numbers of tubers available. Total number of first cycle lines this year was down significantly from last to 9,905 (15,768 in 2020). This reduction was a result of not receiving mini-tubers from Cornell University as well as a reduction in productivity in the greenhouse of our own lines. For our program 2020 was a good year for yield trials and breeding trials. Yields and quality were high across most plots so in 2021 we were able to capitalize on this and increase the size of our breeding plots. For second year lines we were able to expand from the usual 6 or 12-Hills (6-hills from single hills and 12-hills from 3 and 4 hill first generation lines) to 10 and 20-hill plots respectively. Third year plots were increased from 20-hill plots to 30 and 60-hill plots. Fourth year plots were maintained at 60 hills allowing more wide-spread trialing of breeding materials and early entry into yield trials at the TRS/VGJREC. After year four lines are maintained at 160, 320 and 640-hill increase plots depending on generation and intended purpose of a line as well as trialed extensively in NC and other locations to assess more broad adaptation.

During 2021, we planted 9,905 cycle one clones and selected 630 clones resulting in a 6.4% selection rate (this includes our single, 3-hill plots and 4-hill plots). Out of the 1028 clones in our cycle two plots (this includes 10 and 20-hills), 319 (31%) were selected for future evaluation. In the 30-hill to 60-hill plots (years 3 and 4) 287 clones were planted with 79 (27.5%) being selected for further evaluation.

Yield Trials

In our 13 yield trials, we evaluated 161 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 1-13. 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. 2021 PROMISING LINES:

Chip-stock lines

NC470-3

Developed by: NC State Univ.

Released: N/A

trials evaluated: 13 since (2017)

Merit Score: 2.2 (since 2017)

Skin Color: Brown

Flesh Color: White

Historical Data:

Maturity: late

% Standard (Atlantic): MKTB YLD 103%

% Standard (Snowden): MKTB YLD 97%

Specific Gravity: 1.067 (Atlantic 1.070)

Chip score: 2.0 (excellent)

Overall Appearance: 7 (good)

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 good. It also appears this clone begins to bulking mid-season with a strong top later in the season than Atlantic suggesting excellent potential for the southern chip market. This clone carries the Ryadg PVY resistance gene and has shown some tolerance to early blight and foliar resistance to late blight in Pennsylvania. This clone has gone through the NCPT trialing program and has been entered into the PotatoesUSA Fasttrack program for clean-up and evaluation as a SNaC trial candidate as well as entry into the Nextgen program.

MSAFB635-15

Developed by: Univ. of Maine

Released: N/A

trials evaluated: 6 since (2017)

Merit Score: 2.2 (since 2017)

Skin Color: tan to light brown

Flesh Color: White

Historical Data:

Maturity: mid to late season

% Standard (Atlantic): MKTB YLD 99%

% Standard (Snowden): MKTB YLD 97%

Specific Gravity: 1.074 (Atlantic 1.076)

Chip score: 1.9 (excellent)

Overall Appearance: 7 (good)

Other Attributes or Comments: This is a mid to late maturing clone with good yield, gravity and chip scores. Its maturity is similar to Snowden. The size profile on this clone also tends to be mostly medium (81% between 1 7/8 and 3 1/4"), we saw in one trial this past season a slight amount of internal heat necrosis but not enough to raise alarm (3% = 1/40 cut tubers). This clone is in the SNaC trial and was in the NCPT program as well.

Red Skin Table-stock clones

CO99076-6R

Developed by: Colorado State Univ.

Released: N/A

trials evaluated: 7 since (2019)

Merit Score: 2.1 (since 2019)

Skin Color: Red

Flesh Color: White

Historical Data:

Maturity: mid - maturing

% Standard (Chieftain): MKTB YLD 85%

% Standard (Dark Red Norland): MKTB YLD 98%

Specific Gravity: 1.059 (1.056 for Dark Red Norland)

Skin Texture: Smooth

Overall Appearance: 7 (good)

Other Attributes or Comments: This line has been evaluated for 3 years in seven trials and each year has risen to the top of the list for reds. Maturity is later than Dark Red Norland and similar to Chieftain, it is a very uniform variety with 79% of yield between 1 7/8 and 3 1/4" and low numbers of culls (7% as opposed to 10% for Dark Red Norland). Tubers are mostly round with shallow eyes. We look forward to trialing this clone in the future.

Yellow Skin Table-stock lines

Natascha

Developed by: Solana

Released: 2012

trials evaluated: 17 since (2015)

Merit Score: 2.3 (since 2016)

Skin Color: Yellow

Flesh Color: Yellow

Historical Data;

Maturity: slightly later than medium maturing

% Standard (Yukon Gold): MKTB YLD 174%

Specific Gravity: 1.057

Skin Texture: Moderately Smooth

Overall Appearance: 6 (better than fair)

Other Attributes or Comments: This variety has been evaluated in 17 trials over the last 7 years. It is an attractive yellow skin potato with a deep yellow flesh it is slightly 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. This variety is not the highest yielding yellow however it is very uniform in size and shape providing a medium-small A size crop.

Preliminary NC line watch list

NC821-30

Developed by: NC State Univ.

Released: N/A

trials evaluated: 3 since (2021)

Merit Score: 2.1 (since 2021)

Skin Color: Tan to Light Brown

Flesh Color: White

Historical Data;

Maturity: mid to late

% Standard (Atlantic): MKTB YLD 90%

% Standard (Snowden): MKTB YLD 86%

Specific Gravity: 1.074 (Atlantic 1.070)

Chip score: 1.8 (excellent)

Overall Appearance: 8 (better than good)

Other Attributes or Comments: This is an attractive mostly round chipping line with a maturity that appears similar to Snowden. The size profile is slightly smaller than Atlantic with 53% being between 1 7/8 and 2 1/2" (34% for Atlantic). This line carries the Ryadg marker for PVY resistance and the H1 marker for Golden Nematode resistance as well.

NC821-41

Developed by: NC State Univ.

Released: N/A

trials evaluated: 3 since (2021)

Merit Score: 2.1 (since 2021)

Skin Color: Brown

Flesh Color: White

Historical Data;

Maturity: slightly later than mid-season

% Standard (Atlantic): MKTB YLD 88%

% Standard (Snowden): MKTB YLD 85%

Specific Gravity: 1.071 (Atlantic 1.070)

Chip score: 1.2 (excellent to exceptional)

Overall Appearance: 6 (better than fair)

Other Attributes or Comments: This is an attractive mostly round chipping line with a maturity that is between Atlantic and Snowden. The size profile is slightly smaller than Atlantic with 51% being between 1 7/8 and 2 1/2" (34% for Atlantic). This line carries the Ryadg marker for PVY resistance and the H1 marker for Golden Nematode resistance as well.

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.)
Sackett Potatoes, Vandemere, NC (Pamlico 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 5	Jun 14,15	101, 102
James Brothers	Barclay silt loam	Mar 23	Jul 6	105
Sackett Potatoes	Belhaven Muck	Mar 9	Jun 25	108
TRS/VGJREC	Portsmouth fine sandy loam	Mar 29, 30	Jul 7 – Jul 26	Variable 100 - 119

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 and two preliminary yield trials at the TRS that each have 2 replications. Fifty-five clones in three trials were evaluated on-farm at Black Gold Farms, thirty-two clones at James Brothers and sixteen were evaluated at Sackett Potatoes. Plots at the TRS consisted of one row with 25 hills spaced 10 inches apart. Unless the plots were russet trials then they had one row with 21 hills spaced 12 inches apart. Plots at Black Gold consisted of one row with 25 hills spaced 10 inches apart. Plots with James Brothers and Sackett Potatoes 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 Sackett Potatoes and 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 single row plot harvester. All trials were graded at the TRS/VGJREC to five 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 were removed and weighed separately in all trials. Each clone was evaluated for tuber quality and appearance during grading using standardized NE-1731 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 within 48 hours of harvest.

Merit Score: The merit score is a composite rating of 7 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, specific gravity and vine maturity. The merit scale ranges from 1 to 4; where 1 = outstanding, advance; 2 = keep evaluating; 3 = marginal performance and 4 = drop. The merit 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 poor. For example, Atlantic is a standard variety that was included in 10 of our 13 trials this year. In two trials it received a merit score between 2.0 and 2.4 (keep), four trials received a score between 2.5 and 3.4 (marginal) and the final four received a merit score of 3.6 to 4 (drop). Atlantic was given ratings of 4 due largely to poor internal quality. Overall this averages to 3.1 equating to a marginal merit score. It also should be noted that two years ago Atlantic averaged 2.3 (keep) and

last year 2.7 (marginal). This underscores the importance of multi-year/location trialing as well as the importance of replication when making determinations on the quality of a new variety or experimental line.

VI. RESULTS:

Environmental Summary

Planting began on the 5th of March this year and was completed by the 30th of March. Rainfall ahead of and during planting only delayed us at the Pasquotank county location this season though ending on the 30th of March while on the late end of the spectrum is still within the historically normal time frame. Overall air temperatures throughout the season were not excessively high or low though precipitation was less than ideal from the middle of April to the Memorial Day weekend roughly 1.5 to 2" total for that timeframe in most locations. The two weeks beginning with the Memorial Day weekend ushered in a significant change in the weather with 7 to 10 inches recorded at weather stations. At the TRS within the potato plots we received 15 inches of rain in that timeframe. Poor drainage at the TRS resulted in the loss of roughly 1/3 of our breeding plots and negatively impacted the yield trials as well. As we moved into harvest high temperatures remained moderate in the upper 80's and low temperatures were near 70.

A. Yield Trials

1. On-Farm Trials

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

Overall the lines in this trial received positive scores evidence of this is eighteen of the twenty clones in this trial received a merit score between 1.6 and 2.4 rounding to 2 (keep). The marketable yields in this trial were compared to Chieftain (392 cwt/a) for the red skins, Yukon Gold (285 cwt/a) for the yellow flesh clones and Superior (244 cwt/a) for the white skins. None of the six red skin other clones in this trial had a higher average marketable yield than Chieftain the closest was Strawberry Paw (378 cwt/a). Six of the seven other yellow flesh clones had significantly higher average marketable yield than Yukon Gold: Captain (505 cwt/a), Soraya (465 cwt/a), Arizona (436 cwt/a), Colomba (403 cwt/a), Alegria (387 cwt/a) and Natascha (381 cwt/a). The remaining three clones were all had higher marketable yields than Superior and both Brodie (359 cwt/a) and Envol (318 cwt/a) had significantly higher average. One clone, CO99076-6R had an overall appearance rating of 8 (better than good) and three received overall appearance scores of 7: Arizona, Soraya and Strawberry Paw. No significant internal defects were recorded. External defects observed in the trial were soft rot, secondary growth, heat sprouts, infected lenticels, growth cracks, misshapes, sunscald, common scab, and skin blemishes due to Rhizoctonia.

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

Seven of the ten lines in the trial received a merit score between 2.0 and 2.4 (rounded to 2). The three highest were Atlantic (2.0), B2869-29 (2.0) and Snowden (2.0). One clone, NC470-3 (362 cwt/a) had a greater average marketable yield than Atlantic (352 cwt/a). Gravities in the trial ranged from a low of 1.059 to 1.076, Atlantic had a gravity of 1.070, three clones had equal or higher gravity: B2869-29 (1.076), NC821-30 (1.075) and Snowden (1.070) all other clones in the trial were lower. Two clones had exceptional (1.0) chip scores: NC821-41 and Snowden. Two clones had chip ratings of 1.5 (excellent to exceptional): B2869-29 and NC818-26. Two clones had overall appearance scores of 8 (better than good), NC470-3 and NC821-30 and Snowden had an overall appearance score of 7 (good). No significant internal defects were recorded. External defects observed in the trial were soft rot, sunscald, misshapes, common scab, enlarged lenticels and skin blemishes due to Rhizoctonia.

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

Five of the eight clones in this trial received a merit score between 1.5 and 2.4 rounded to 2 (keep), Snowden (2.0), Atlantic (2.1), MSAFB635-15 (2.2), NY165 (2.3) and MSZ242-13 (2.4). Atlantic had a marketable yield of 296 cwt/a none of the other clones had equal or higher average marketable yields. Atlantic had a specific gravity of 1.071, two clones had higher specific gravity: Snowden (1.074) and Mackinaw (1.072). Three clones in the trial received a chip score rating of 1.0 (exceptional) in the chip test: NY165, Snowden and W12078-76. Two clones received chip score ratings of 1.5 (excellent to exceptional): MSAFB635-15 and MSZ242-13. One clone, MSAFB635-15 received an overall appearance rating of 7 (good). Overall incidence of internal defects was low. MSAFB635-15 expressed 10% incidence of brown center (BC). No other internal defects were observed at levels equal to or greater than 10%. External

defects observed were: soft rot, sunscald, misshapes, common scab, infected lenticels and skin blemishes due to Rhizoctonia.

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

Of the Twenty clones in the trial eight received a merit score between 1.5 and 2.4 rounded to 2 (keep): CO99076-6R (1.9), Brodie (2.0), NDAF113484B-1 (2.0), Fenway Red (2.1), Natascha (2.2), NC708-3 (2.3), NC663-21 (2.4) and Superior (2.4). Three marketable yield standards were chosen: Superior (208 cwt/a, table round white standard), Dark Red Norland (147 cwt/a, red standard) and Yukon Gold (151 cwt/a, yellow flesh standard). This year we elected not to place any chipping clones in the trial in order to be able to focus on table clones. Of the five varieties compared to Superior, three had higher average marketable yields: Brodie (251 cwt/A), NC669-48 (224 cwt/A) and NC663-21 (212 cwt/A). Seven clones were compared to Dark Red Norland and five had greater average marketable yields: Fenway Red (281 cwt/A), Rosemara (278 cwt/A), NDAF113484B-1 (260 cwt/A), CO99076-6R (217 cwt/a) and BNC559-1 (216 cwt/A). All five yellow clones compared to Yukon Gold had higher average marketable yields. Of these the highest was Soraya (265 cwt/a). Four clones received an overall appearance rating of 7 (good): Natascha, NCB2607-3, NDAF113484B-1 and Prada. Two clones expressed 10% or greater incidence of IHN: Yukon Gold (18% IHN with an HNR of 7.3) and Soraya (10% IHN with an HNR of 80). Four clones expressed 10% or greater incidence of BC: Yukon Gold (20%), NorlandRP (15%), Soraya (15%) and Prada (10%). No other internal defects of 10% or greater incidence were recorded in this trial. Culls were primarily due to misshapes, soft rot, sun scald, secondary growth, heat sprouts, common scab, infected lenticels and skin blemishes due to Rhizoctonia.

Sackett Potatoes Variety Trial (Tables 5a and 5b)

This year eleven chip lines were evaluated and of those six received a merit score between 1.5 and 2.4 rounded to 2 (keep): NY165 (1.8), MSZ242-13 (2.1), NC821-41 (2.1), MSAFB635-15 (2.2), Snowden (2.3) and NC821-30 (2.4) . Atlantic had a marketable yield of 179 cwt/a, four clones had equal or higher average marketable yields though none were significantly greater: Snowden (189 cwt/a), MSW474-1 (184 cwt/a), MSZ242-13 (184 cwt/a) and NY165 (179 cwt/a). Atlantic had a gravity of 1.065, six clones had equal or greater gravity: NC821-41 (1.069), NY165 (1.069), Mackinaw (1.068), W12078-76 (1.068), MSAFB635-15 (1.067) and NC818-24 (1.065). Two clones in the trial received a chip score rating of 1.0 (exceptional): NC821-41 and NY165. MSAFB635-15 received an overall appearance score of 8 (better than good) and two clones received an overall appearance rating of 7 (good): MSZ242-13 and NC821-30. No significant internal defects were recorded. External defects observed were: soft rot, sunscald, misshapes, growth cracks, common scab and skin blemishes due to Rhizoctonia.

2. TRS/VGJREC Yield Trials

Drainage issues this season at the TRS caused greater than normal variability for yield between plot rows depending on placement of trials in the field.

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

Two of thirty-two clones in this trial received a merit score between 1.5 and 2.4 rounded to 2(keep): NC821-30 (1.8) and NC818-24 (2.3). Atlantic had a marketable yield of 219 cwt/a, two clones in the trial had higher average marketable yield: Snowden (293 cwt/a) and NC818-24 (222 cwt/a). Two clones received an overall appearance score of 8 (better than good): NC821-30 and NCT37-01. Three clones received an overall appearance score of 7 (good): AF5931-1, AF6551-4 and NCB3401-1. Atlantic had a specific gravity of 1.075, two clones had equal or higher gravity, AF6582-1 (1.076) and NC890-4 (1.075). Snowden and AF6582-1 had chip scores of exceptional (1.0). Five clones expressed 10% or greater incidence of IHN: Atlantic (35% IHN with an HNR of 6.6), Snowden (23% IHN with an HNR of 7.2), NC957-03 (20% IHN with an HNR of 6.7), NC818-26 (10% IHN with an HNR of 7.6) and AF6526-3 (10% IHN with an HNR of 8.6). Seven clones expressed 10% or greater incidence of BC: NC957-03 (40%), Atlantic (30%), NCT37-01 (20%), AF6582-1 (18%), Envoy (18%), AF6598-6 (15%) and Snowden (10%). No other internal defects of 10% or greater incidence were recorded in this trial. Common external defects were soft rot, misshapes, sunscald, common scab, growth cracks, secondary growth, heat sprouts, Fusarium dry rot and skin blemishes attributed to Rhizoctonia.

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

Two of twelve clones in this trial received a merit score between 1.5 and 2.4 rounded to 2(keep): Snowden (2.1) and NCB3307-9 (2.3). Atlantic had a marketable yield of 283 cwt/a all other clones in the trial had lower average marketable yields; the next highest was Snowden (244 cwt/a). B3379-1 received an overall appearance score of 7 (good) all other clones were rated lower in terms of appearance. Atlantic had a specific gravity of 1.076; three clones had equal or greater gravity: B3379-1 (1.081), BNC811-15 (1.079) and NC727-6 (1.079). Three of the nine clones

chipped were rated 1.5 (excellent to exceptional): NC727-6, NCB3307-9 and Snowden. Two clones expressed 10% or greater incidence of IHN: Atlantic (20% IHN with an HNR of 6.4) and NC727-6 (13% IHN with an HNR of 8.4). Seven clones expressed 10% or greater incidence of BC: Atlantic (35%), Nadine (25%), BNC811-33 (18%), B3379-1 (13%), BNC811-15 (13%), Envol (13%) and NCB3307-9 (10%). No other internal defects of 10% or greater incidence were recorded in this trial. Common external defects were soft rot, misshapes, sunscald, common scab, growth cracks, Fusarium dry rot and skin blemishes attributed to Rhizoctonia.

Round White Three Trial (Tables 8a and 8b)

One of the seventeen clones in this trial received a merit score less than 2.5: NC470-3 (2.3) keep. All others were considered either marginal (3) or drop (4). Atlantic had a marketable yield of 54 cwt/a and all but three clones in the trial had a higher average marketable yield. One clone received an overall appearance score of 7 (good): NC470-3. Atlantic had a specific gravity of 1.067, four clones had higher gravity: B3379-2 (1.076), NCB811-22 (1.074), B3403-6 (1.070) and BNC821-9 (1.068). Four clones chipped, rated 1.5 (excellent to exceptional): Atlantic, BNC811-22, BNC821-9 and Snowden. One clone expressed a 10% or greater incidence of hollow heart (HH): NC669-48 (10%). Four clones expressed a 10% or greater incidence of BC: BNC811-22 (25%), Envol (23%), NC669-48 (20%) and NC663-21 (10%). Twelve clones expressed a 10% or greater incidence of soft rot (SR), the five clones that were below that threshold were: B3379-2 (0%), NC663-21 (0%), BNC815-7 (3%), NCB3259-2 (3%) and NC669-48 (8%). No other internal defects of 10% or greater incidence were recorded in this trial. Common external defects were soft rot, misshapes, sunscald, growth cracks, secondary growth, and infected lenticels.

NE-1731 Round White Trial. (Tables 9a and 9b)

Two of the thirteen clones in this trial received a merit score between 1.5 and 2.4 rounded to 2(keep): MSAFB609-12 (2.2) and Snowden (2.3). None of the clones in the trial had equal or greater average marketable yield than Atlantic (213 cwt/a), the next closest was Snowden (203 cwt/a). Atlantic had a specific gravity of 1.082, only CO10098-5W/Y was equal; all other clones in the trial were lower. Four of the five clones chipped had a chip rating of 1.5 (excellent to exceptional): Atlantic, MSB609-12, NY165 and Snowden. For overall appearance, one clone, MSAFB609-12 rated an 8 (better than good) and four clones rated an overall appearance of 7: AF5819-2, Atlantic, MSAFB635-15 and NDAF102629C-4. Atlantic (20% incidence with an HNR of 6.7) was the only clone to express IHN at 10% or greater incidence. Four clones expressed 10% or greater incidence of BC: Atlantic (25%), Katahdin (18%), Yukon Gold (13%) and MSAFB635-15 (10%). The most common culls were soft rot, misshapes, secondary growth, infected lenticels, growth cracks, common scab, sunscald and skin blemishes due to Rhizoctonia.

NE-1731 Red Trial. (Tables 10a and 10b)

Six of the nineteen clones in this trial received a merit score of less than or equal to 2.4 which rounds to 2: NDAF141Y-3 (2.1), AF6289-2 (2.2), NC981-01 (2.2), Strawberry Paw (2.3), CO14032-6R (2.4) and CO14040-3R (2.4). The standard, Chieftain, had a marketable yield of 206 cwt/a, two clones had higher average marketable yields: NC981-01 (321 cwt/a) and AF6289-2 (213 cwt/a). Two clones received an overall appearance scores of 7: CO14040-3R and NCB2607-3; all others were lower. Five clones expressed IHN at 10% or greater incidence: Dark Red Norland (35% incidence with an HNR of 7.4), CO14032-6R (18% incidence with an HNR of 7.5), NDAF13136Y-5 (15% incidence with an HNR of 7.3), NDAF12143-1 (13% incidence with an HNR of 7.3) and Fenway Red (10% incidence with an HNR of 7.8). Five clones expressed 10% or greater incidence of BC: NDAF13296Y-4 (18%), Fenway Red (15%), B2152-7 (13%), Chieftain (10%) and NDAF13136Y-5 (10%). No other internal defects were expressed at levels of 10% or greater. Culls were due mostly to high levels of soft rot, misshapes, sunscald, growth cracks, common scab, secondary growth and skin blemishes due to Rhizoctonia.

NE-1731 Russet Trial. (Tables 11a and 11b)

None of the twenty-four clones in this trial had merit scores in the “keep” range (1.5 to 2.4). The two best were AF6110-3 (2.7) and Meister (2.9). The standard, Russet Norkotah, had a marketable yield of 74 cwt/a, seventeen clones had greater average marketable yield and two of those were significantly higher: AF5736-16 (176 cwt/a) and AF5407-13 (166 cwt/a). One clone, AF5736-16, had appearance scores of 8 (better than good). All others rated a 6 or lower score for overall appearance. Six clones expressed IHN at 10% or greater incidence: Russet Burbank (45% incidence with an HNR of 7.3), AF5407-13 (18% incidence with an HNR of 7.7), AF5406-7 (15% incidence with an HNR of 7.4), AF6503-2 (13% incidence with an HNR of 8.5), AAF10615-1 (10% incidence with an HNR of 7.9) and NDAF1415Y-2 (10% incidence with an HNR of 8.4). One clone, NDAF1415Y-2 (23%), expressed HH at 10% or greater incidence. Five clones expressed BC at 10% or greater incidence: AF5492-6 (20%), NDAF1415Y-2 (20%), NDAF113476CB-3 (18%), AF5406-7 (10%) and Russet Norkotah (10%). All but three clones expressed SR at incidence 10% or greater: AAF10736-2 (8%), AF6110-3 (8%) and Meister (8%). No other internal defects were expressed at

levels of 10% or greater. Culls were mostly soft rot, misshapes, sunscald, secondary growth, growth cracks, common scab, Fusarium dry rot and infected lenticels.

Specialty Trial. (Tables 12a and 12b)

None of the twenty-one clones in this trial had merit scores in the “keep” range (1.5 to 2.4). The four best were BNC833-2 (2.5), Adirondack Red (2.6), Atlantic (2.6) and Peter Wilcox (2.6). Given the diversity of clones in this trial we included Atlantic (67 cwt/a) as the average marketable yield standard but also have Adirondack Blue (30 cwt/a), Chieftain (91 cwt/a) and Dark Red Norland (73 cwt/a). The two highest average marketable yields in the trial were BNC833-2 (107 cwt/a) and Adirondack Red (101 cwt/a). An overall appearance score of 7 (good) was only given to B3295-5. One clone expressed IHN at 10% or greater incidence: Chieftain (13% incidence with an HNR of 8.1). One clone, Yukon Gold, expressed 10% incidence of HH. Three clones expressed 10% or greater incidence of BC: Yukon Gold (20%), NC868-1 (16%) and Chieftain (15%). Two clones expressed 10% or greater incidence of SR: All Blue (13%) and BNC916-3 (10%). No other internal defects were expressed at levels of 10% or greater. Culls were mostly soft rot, misshapes, sunscald, growth cracks, common scab, silver scurf, infected lenticels, heat sprouts, Fusarium dry rot and secondary growth.

Yellow Flesh Trial. (Tables 13a and 13b)

Three of twenty-four clones received a merit score greater than or equal to 2.4: AF6566-1 (2.0), Belmonda (2.2) and NC738-2 (2.4). Yukon Gold, the standard yellow flesh, had a marketable yield of 86 cwt/a. Seven of the clones in this trial had higher average marketable yields: Belmonda (224 cwt/a), AF6606-2 (208 cwt/a), Prada (119 cwt/a), Vivaldi (178 cwt/a), AF6566-1 (106 cwt/a), Paroli (91 cwt/a) and Natascha (90 cwt/a). None of the clones had overall appearance scores of 7 (good), though seven were rated 6 (better than fair): AF6566-1, Belmonda, NC587-10, NC738-2, NDAF1489-4, Prada and Vivaldi. Four clones expressed IHN at 10% or greater incidence: Clairette (30% incidence with an HNR of 6.9), AF6606-2 (18% incidence with an HNR of 5.3), AF6608-4 (18% incidence with an HNR of 8.5) and Colomba (18% incidence with an HNR of 8.0). Eight clones expressed 10% or greater incidence of BC: Vivaldi (25%), NC587-10 (20%), AAF11611-2 (18%), AF6602-10 (15%), AF6610-2 (15%), Belmonda (13%), Prada (13%) and Vivaldi (13%). No other internal defects were expressed at levels of 10% or greater. Culls were mostly soft rot, misshapes, sunscald, common scab, growth cracks, infected lenticels, heat sprouts, secondary growth, Fusarium dry rot and skin blemishes due to Rhizoctonia.

B. Breeding and Early Generation Selection Efforts

NCSU Potato Variety Development Efforts

This year our 1st generation material was divided into single and 3 hill plots depending on tuber quantities coming out of the greenhouse. The final group of families added to our 1st generation is the Colorado potato beetle (CPB) 4-hill plots, as of last year we have decided to discontinue the CPB program because of our inability to advance high levels of resistance without advancing high tuber glycoalkaloids. Our 3-hill plots contained 3935 clones, our single hill plots included 4839 plots and our CPB 4-hills had 1131 plots for a total of 9905 clones. In all we selected 630 (6.4%) 1st generation clones, 460 clones came from our 3-hills, 130 clones from our singles, 40 from the CPB 4-hills. Post-harvest selected materials were divided into two groups based on tuber quantity; from these counts we will augment our second-year plots in 2022 to 10 and 20 hill plots. The higher number of tubers per clone is largely due to a better than average season for tuber development. In year 2 we planted a total of 1028 clones in our 10 and 20 hill plots and selected a total of 319 clones (31.0%). In our year 3 plots, we planted 261 clones and selected 105 (40.2%) and in our year 4 plots we planted 26 clones and selected 21 (80.8%).

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 240 ME clones plus the standards Atlantic, Snowden, Superior, Envol, Chieftain, Dark Red Norland, Yukon Gold, Adirondack Blue and Russet Norkotah, 27 of them received a merit score better than or equal to 2.4. These will be evaluated in 2022 in a non-replicated 25-hill plot in a yield trial.

Observational Trial.

Fifty-seven clones were evaluated in this trial as well as the standards: Atlantic, Chieftain, Dark Red Norland, Snowden, Adirondack Blue, Envol, Russet Norkotah, Superior and Yukon Gold. Each 25-hill plot was non-replicated. This trial is part of an early generation project we are conducting with the UME and is our 2nd opportunity to evaluate them. Last year we evaluated 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 selection. We assigned a merit score of 2.4 (keep) or better to eleven 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 year we did not conduct an 8-Hill trial with the USDA-ARS as a result of transition years between breeders running the program. We anticipate next season we will restart this early generation screening program.

Unreplicated Trial.

Forty-four clones were evaluated in this trial as well as the standards: Atlantic, Chieftain, Dark Red Norland, Envol, 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 evaluated 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. Four experimental clones received a merit score of 2.4 or better. We will evaluate some of these clones in a replicated yield trial next year.

Cornell University Trial

This season because of the COVID restrictions in NY for 2020 we did not conduct an 8-hill trial with clones from the Cornell program. We hope this will be corrected in 2022 and we are able to restart this early screening program.

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. Isabel Vales, Texas A&M; Dr. Dave Douches, Michigan State University; Dr. Greg Porter, University of Maine; the USDA/ARS, Beltsville, MD; and Dr. Asunta Thompson, North Dakota State University. 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 Association, Potatoes USA, SNAC International, the USDA-NIFA Potato Special Research Grants program, UTZ Quality Foods Inc, Real Potatoes Ltd and HZPC. 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 101 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield				Size Distribution by Class ³ (% of total yield)							1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴
			cwt/A	%Chf.	%Sup.	%Yuk.	1's	2's	3's	4's	5's	Culls				
Alegria	2.0	422	387	99	158	136	5	47	45	0	0	3	92	45	1.067	
Alta Rose	2.3	393	340	87	139	119	11	68	18	0	0	3	87	18	1.055	
Arizona	2.0	473	436	111	178	153	3	33	56	3	0	4	92	59	1.047	
Brodie	2.1	395	359	91	147	126	5	50	41	0	0	4	91	41	1.060	
Captain	1.8	559	505	129	207	177	5	45	44	2	0	5	90	45	1.052	
Chieftain	2.1	457	392	100	161	138	10	59	27	0	0	4	85	27	1.058	
CO99076-6R	2.3	346	298	76	122	104	9	36	49	1	0	5	86	50	1.060	
Colomba	2.0	499	403	103	165	141	6	36	45	0	0	14	80	45	1.048	
Dark Red Norland	2.1	388	331	84	136	116	8	53	32	0	0	6	86	32	1.059	
Envol	1.6	357	318	81	130	111	7	47	42	0	0	4	89	42	1.065	
MSW343-2R	2.8	310	264	67	108	93	7	33	52	0	0	8	85	52	1.046	
Nadine	2.2	373	282	72	115	99	15	62	14	0	0	9	76	14	1.054	
Natascha	2.0	441	381	97	156	134	9	66	20	0	0	5	86	20	1.058	
NC708-3	2.0	397	299	76	122	105	16	72	3	0	0	9	75	3	1.070	
NCB2607-3	2.4	273	140	36	57	49	44	51	0	0	0	5	51	0	1.073	
NDAF113484B-1	2.1	400	330	84	135	116	13	58	25	0	0	5	82	25	1.054	
Soraya	1.9	528	465	119	190	163	7	60	28	0	0	5	88	28	1.056	
Strawberry Paw	1.9	427	378	96	155	132	7	47	42	0	0	4	88	42	1.063	
Superior	1.9	289	244	62	100	86	11	61	24	0	0	4	85	24	1.069	
Yukon Gold	2.6	347	285	73	117	100	5	28	54	0	0	13	82	54	1.071	
Grand Mean		404	342													
CV(%)		11	13													
LSD(k=100)		70	72													

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 101 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³					Comments ⁴	
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC		SR
Alegria	9	9	9	7	7	7	4	6	4	8	5	7	6	0	9.0	0	0	0	0	SR,SS,IL,EL,RZ
Alta Rose	8	9	9	6	2	6	5	6	5	7	4	9	5	0	9.0	0	0	0	0	SS,HS,MS,PTS
Arizona	8	9	8	7	6	7	5	5	5	8	8	7	7	0	9.0	0	0	0	0	RZ,SS,IL
Brodie	9	9	8	8	9	8	6	6	4	7	7	6	5	0	9.0	0	0	0	0	SR,SS,IL,RZ
Captain	8	9	8	6	6	8	6	5	3	8	6	7	6	0	9.0	0	0	0	0	SS,MS,HS,CS,PTS
Chieftain	9	9	8	6	3	7	6	4	5	8	5	7	4	3	8.8	0	0	3	0	SR,SS,RZ,HS
CO99076-6R	8	9	9	7	2	8	7	5	2	7	6	7	8	0	9.0	0	0	0	0	SR,SS,IL,RZ
Colomba	6	9	9	5	7	7	6	6	5	7	7	7	6	0	9.0	0	0	0	0	SS,SG,HS,SR,RZ,IL
Dark Red Norland	6	9	8	4	2	7	5	7	5	7	5	7	6	0	9.0	0	0	0	0	SS,SR,GC,RZ,SISC
Envol	5	9	9	4	6	7	5	7	5	8	5	7	6	0	9.0	0	0	0	0	SR,IL,RZ,SS
MSW343-2R	8	9	8	6	3	7	6	4	2	5	7	7	3	0	9.0	0	0	0	0	SS,MS,SR,GC
Nadine	8	9	9	5	6	8	5	6	5	8	5	8	5	0	9.0	0	0	3	0	SS,SG,GC.SR
Natascha	9	9	8	6	7	7	5	6	5	8	5	7	6	0	9.0	0	0	0	0	MS,SS,RZ,SR,CS,SG,IL
NC708-3	6	9	9	5	7	8	6	7	7	8	5	7	6	0	9.0	3	0	0	0	SS,MS,SR,SG,IL
NCB2607-3	5	4	9	3	2	8	7	7	2	8	3	7	6	0	9.0	0	0	0	0	MS,GC,SS,RZ,SR
NDAF113484B-1	6	9	9	6	2	8	7	5	2	6	6	7	6	0	9.0	0	0	0	0	SR,MS,SS,IL,RZ
Soraya	9	9	8	8	7	8	5	6	5	7	7	7	7	0	9.0	0	0	0	0	SR,SS,MS,RZ,IL
Strawberry Paw	9	9	8	7	2	7	6	6	3	7	6	7	7	0	9.0	0	0	0	0	MS,SS,SR
Superior	5	9	9	4	6	6	5	6	4	7	5	7	6	0	9.0	0	0	3	0	SR,SS,FS
Yukon Gold	8	9	8	5	7	7	6	7	5	8	7	6	4	0	9.0	5	0	5	5	SR,SS,IL,RZ,MS,CS

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 102 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ³ (% of total yield)							1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴	Chip Color ⁵
					1's	2's	3's	4's	5's	Culls					
Atlantic	2.0	389	352	100	5	46	44	0	0	5	90	44	1.070	2.0	
B2869-29	2.0	370	269	76	25	68	4	0	0	3	72	4	1.076	1.5	
NC470-3	2.1	402	362	103	8	55	35	0	0	2	90	35	1.065	2.5	
NC818-24	2.5	369	311	89	9	57	27	0	0	6	84	27	1.062	2.0	
NC818-26	2.4	399	324	92	13	51	30	0	0	6	81	30	1.059	1.5	
NC821-30	2.2	387	296	84	17	58	19	0	0	6	76	19	1.075	2.0	
NC821-41	2.0	423	322	91	18	64	12	0	0	6	76	12	1.069	1.0	
NCB3259-2	2.8	244	195	56	18	64	16	0	0	2	80	16	1.064	2.0	
NCB3260-2	3.1	298	208	59	27	66	4	0	0	3	70	4	1.060	2.5	
Snowden	2.0	367	294	84	16	67	14	0	0	3	80	14	1.070	1.0	
Grand Mean		356	288												
CV(%)		8	10												
LSD(k=100)		36	43												

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; p1 = light purple, p2 = medium purple color, p3 = dark purple

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 102 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³					Comments ⁴	
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC		SR
Atlantic	6	9	8	5	6	6	5	6	3	7	5	7	6	0	9.0	3	0	0	0	SS,SR,MS,IL,RZ
B2869-29	6	9	9	5	8	7	5	7	3	7	3	7	6	0	9.0	0	0	0	0	SS,MS,RZ,SR,CS
NC470-3	9	9	8	9	5	5	7	6	3	8	6	9	8	0	9.0	0	0	0	0	SS,SR
NC818-24	9	9	8	9	6	6	6	6	3	8	4	7	6	0	9.0	0	0	0	0	CS,SS,SR,RZ
NC818-26	6	9	9	7	6	6	5	7	2	7	5	6	5	0	9.0	0	0	0	3	^CS,SS,SR,MS
NC821-30	8	9	9	8	6	6	6	6	2	7	5	7	8	0	9.0	3	0	0	0	SS,CS,SR,MS
NC821-41	7	9	9	8	6	6	6	5	2	7	5	7	6	0	9.0	0	0	3	0	CS,SS,MS,SR
NCB3259-2	9	9	9	9	9	7	5	4	3	7	4	8	5	0	9.0	0	0	0	0	SR,SS,MS
NCB3260-2	6	9	9	6	9	7	4	5	5	8	4	8	4	0	9.0	0	0	0	0	MS,SS,SR
Snowden	9	9	8	7	5	5	6	6	2	6	5	8	7	0	9.0	0	0	0	0	SR,SS

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 3a. SNaC Trial. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones harvested 102DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ³							1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴	Chip Color ⁵
					(% of total yield)										
			cwt/A	% Atl.	1's	2's	3's	4's	5's	Culls					
Atlantic	2.1	347	296	100	7	43	42	0	0	8	85	42	1.071	2.0	
Mackinaw	2.5	259	226	78	7	45	43	0	0	5	87	43	1.072	2.0	
MSAFB635-15	2.2	332	288	98	10	47	39	0	0	3	87	39	1.068	1.5	
MSW474-1	2.5	333	269	91	14	68	13	0	0	6	80	13	1.063	2.0	
MSZ242-13	2.4	283	244	83	8	47	40	0	0	6	86	40	1.069	1.5	
NY165	2.3	323	267	91	12	59	23	0	0	5	82	23	1.066	1.0	
Snowden	2.0	340	276	94	14	65	16	0	0	5	81	16	1.074	1.0	
W12078-76	3.1	235	195	66	8	35	48	0	0	10	82	48	1.070	1.0	
Grand Mean		303	252												
CV(%)		10	13												
LSD(k=100)		42	48												

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 102 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³					Comments ⁴	
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC		SR
Atlantic	6	9	7	5	6	6	6	7	3	7	5	6	6	0	9.0	0	0	6	0	SR,RZ,SS,MS,IL
Mackinaw	9	9	8	8	6	6	4	6	3	7	5	6	5	0	9.0	0	0	0	2	SR,RZ,SS,MS,IL
MSAFB635-15	9	9	9	8	6	6	6	6	2	8	5	7	7	0	9.0	0	0	10	0	SS,RZ,MS
MSW474-1	6	9	7	8	6	5	6	6	2	8	5	8	4	0	9.0	2	0	2	0	SS,SR,MS
MSZ242-13	6	9	8	8	5	5	6	6	2	7	5	6	4	0	9.0	0	0	0	0	^RZ,SS,SR
NY165	8	9	8	7	6	7	4	7	4	8	4	8	5	0	9.0	0	0	0	0	SS,RZ,MS
Snowden	9	9	8	7	5	5	6	6	2	6	4	7	6	0	9.0	0	0	0	0	SS,SR,RZ,CS,IL
W12078-76	9	9	8	9	6	7	6	6	3	8	7	5	4	0	9.0	0	0	8	4	SR,MS,SS,CS

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 105 DAP¹ at James Brothers Farm, Weeksville, Pasquotank Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield			Size Distribution by Class ³ (% of total yield)							1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴
			cwt/A	%DRN.	%Sup.	%Yuk.	1's	2's	3's	4's	5's	Culls			
BNC559-1	2.9	334	216	147	104	143	13	39	25	0	0	23	64	25	1.056
Brodie	2.0	285	251	170	120	166	8	31	54	4	0	4	88	58	1.056
CO99076-6R	1.9	287	217	147	104	143	21	51	24	1	0	3	76	25	1.055
Colomba	2.9	354	195	132	94	129	10	29	25	0	0	35	54	25	1.048
Dark Red Norland	2.7	214	147	100	71	97	14	36	30	3	0	18	68	32	1.050
Envol	2.7	262	195	132	94	129	10	30	42	3	0	16	75	44	1.061
Fenway Red	2.1	359	281	191	135	186	11	35	39	5	0	11	78	43	1.047
Nadine	3.0	245	162	110	78	107	18	44	21	1	0	16	66	22	1.042
Natascha	2.2	330	231	156	111	152	22	41	27	1	0	9	69	28	1.048
NC663-21	2.4	322	212	144	102	140	33	51	14	0	0	2	65	14	1.058
NC669-48	2.7	341	224	152	108	148	31	50	15	0	0	3	65	15	1.060
NC708-3	2.3	256	191	129	91	126	17	61	12	0	0	10	73	12	1.065
NCB2607-3	2.5	137	82	56	39	54	36	55	5	0	0	5	60	5	1.065
NDAF113484B-1	2.0	316	260	176	125	172	11	40	41	1	0	7	82	43	1.051
NorlandRP	3.1	239	145	98	69	96	13	33	26	0	0	27	60	26	1.052
Prada	2.6	301	248	168	119	164	7	41	41	1	0	10	82	42	1.050
Rosemara	2.6	393	278	189	134	184	19	39	32	0	0	11	71	32	1.056
Soraya	2.5	361	265	180	127	175	21	59	13	0	0	7	73	13	1.043
Superior	2.4	235	208	141	100	138	7	36	53	0	0	5	89	53	1.061
Yukon Gold	3.6	213	151	103	73	100	9	26	44	2	0	20	72	46	1.064
Grand Mean		289	208												
CV(%)		20	26												
LSD(k=100)		93	86												

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 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 105 DAP¹ at James Brothers Farm, Weeksville, Pasquotank Co., NC – 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴	
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR		
BNC559-1	8	9	8	6	1	8	5	5	5	7	6	8	4	0	9.0	0	0	0	0	0	SG,MS,SS,RZ
Brodie	8	8	7	7	6	8	4	7	3	8	7	8	6	0	9.0	0	0	0	0	0	SR,SS,MS,IL
CO99076-6R	6	9	9	6	2	8	6	7	2	7	4	8	8	0	9.0	0	0	0	0	0	SR,MS,SS,EL
Colomba	6	9	7	5	7	8	6	6	3	7	5	8	4	0	9.0	0	0	0	0	0	SR,SS, SG,HS
Dark Red Norland	5	9	8	3	2	7	5	6	5	7	6	8	5	0	9.0	0	0	3	3	0	SS,SG,HS,GC,SR
Envol	5	9	9	4	6	7	5	7	4	8	6	8	5	0	9.0	0	0	0	0	0	SS,SR,MS,SG
Fenway Red	6	9	8	5	3	7	6	7	2	7	5	8	6	3	8.8	0	0	3	0	0	SS,IL,SR,MS,GC,HS,SG
Nadine	6	8	7	5	9	7	6	7	4	7	4	8	5	0	9.0	0	0	8	0	0	GC,SS,MS,SG,HS
Natascha	6	9	8	6	7	7	6	7	5	7	5	8	7	0	9.0	3	0	3	0	0	HS,SS,SR,SG,MS
NC663-21	7	9	9	8	8	7	6	7	3	7	4	8	5	0	9.0	0	0	0	0	0	MS,CS,SR,SS
NC669-48	6	9	9	7	6	8	5	6	4	8	4	8	4	0	9.0	0	0	8	0	0	MS,CS,SR,SS
NC708-3	6	9	8	5	7	7	6	7	7	7	6	8	6	0	9.0	0	0	0	0	0	MS,SS,SR,HS
NCB2607-3	5	4	8	3	2	7	7	7	2	8	3	8	7	0	9.0	0	0	0	0	0	SS,SR,GC,SISC,MS
NDAF113484B-1	8	9	8	5	2	8	6	7	5	7	6	8	7	0	9.0	0	0	3	0	0	SS,SR,MS,IL,SISC
NorlandRP	5	9	8	3	3	7	5	7	5	7	7	8	5	0	9.0	0	0	15	0	0	SS,SG,HS,SR
Prada	6	9	7	5	7	7	5	7	6	7	7	8	7	0	9.0	0	0	10	0	0	SR,MS,SS
Rosemara	8	9	7	7	3	7	5	7	4	7	6	8	3	0	9.0	0	0	0	0	0	SS,RZ,MS,SG
Soraya	7	9	8	6	7	8	6	6	5	8	4	8	6	10	8.0	3	0	15	0	0	MS,SS,SR,RZ,IL
Superior	6	9	8	4	6	7	5	7	3	7	5	8	5	0	9.0	0	0	3	0	0	MS,SS,SR,RS,HS
Yukon Gold	8	9	7	5	7	7	6	7	4	8	6	6	4	18	7.3	0	0	20	3	0	SS,HS,SG,MS,RZ,CS

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

Table 5a. Sackett Potatoes Variety Trial. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 108 DAP¹ at Sackett Potatoes, Vandemere, Pamlico Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ³ (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴	Chip Color ⁵
					1's	2's	3's	4's	5's	Culls				
Atlantic	3.1	206	179	100	9	30	52	3	0	6	85	56	1.065	2.0
Mackinaw	2.6	158	127	71	12	44	35	1	0	8	80	36	1.068	2.0
MSAFB635-15	2.2	193	156	87	17	57	24	0	0	3	81	24	1.067	2.0
MSW474-1	2.5	250	184	103	21	56	17	0	0	6	73	17	1.063	2.0
MSZ242-13	2.1	202	181	101	6	36	48	6	0	4	89	54	1.062	1.5
NC818-24	3.0	185	140	79	8	27	45	2	0	17	75	48	1.065	2.0
NC821-30	2.4	219	162	91	23	54	19	0	0	3	74	19	1.063	2.0
NC821-41	2.1	246	163	91	22	52	14	0	0	13	66	14	1.069	1.0
NY165	1.8	243	179	100	22	59	15	0	0	5	74	15	1.069	1.0
Snowden	2.3	224	189	106	9	48	35	1	0	7	84	36	1.064	2.0
W12078-76	2.5	134	107	60	15	48	30	1	0	6	79	31	1.068	2.0
Grand Mean		203	159											
CV(%)		21	27											
LSD(k=100)		71	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.

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; p1 = light purple, p2 = medium purple color, p3 = dark purple

Table 5b. Sackett Potatoes Variety Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 108 DAP¹ at Sackett Potatoes, Vandemere, Pamlico Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
Atlantic	5	9	9	5	6	5	6	5	3	7	7	8	6	28	6.6	0	3	3	0	SG,SS,MS,CS, GC
Mackinaw	9	8	8	8	6	6	5	6	3	7	5	8	5	0	9.0	0	0	0	0	SS,MS,GC,RZ,SR
MSAFB635-15	8	9	9	7	6	6	6	6	2	6	5	8	8	0	9.0	0	0	0	0	SS,GC,SG,CS,MS
MSW474-1	8	9	8	8	5	5	5	6	2	7	4	8	5	0	9.0	0	0	0	0	MS,SS,RZ,SG,SR
MSZ242-13	8	9	9	9	5	5	6	6	4	7	7	8	7	0	9.0	0	0	0	0	SS,MS,GC,RZ
NC818-24	8	9	9	9	6	6	6	5	4	7	6	6	5	0	9.0	0	0	8	0	^CS,SS,MS,RZ
NC821-30	6	9	9	7	6	6	7	6	2	7	4	8	7	0	9.0	0	0	0	3	CS,SR,SG
NC821-41	6	8	9	5	5	6	5	6	3	7	4	6	5	0	9.0	0	0	0	0	SS,SG,SR,MS,CS
NY165	6	8	9	6	6	6	5	5	3	7	4	8	6	0	9.0	0	0	0	0	SR,MS,RZ,SS,CS
Snowden	6	9	8	8	5	5	6	5	3	6	5	8	6	0	9.0	0	0	0	0	SS,MS,SR,GC,SG,CS
W12078-76	8	9	8	8	6	6	6	6	3	7	5	8	6	0	9.0	0	0	5	0	MS,SR,SS,CS

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 6a. Round White One Trial. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones of potato clones harvested 115 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ³ (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴	Chip Color ⁵
					1's	2's	3's	4's	5's	Culls				
AF5931-1	2.7	274	196	90	10	36	34	0	0	20	70	34	1.060	.
AF6526-3	3.2	161	97	45	18	42	11	0	0	28	53	11	1.073	2.0
AF6541-3	2.7	197	131	60	21	25	26	0	0	29	50	26	1.069	.
AF6551-4	3.0	227	169	77	7	32	39	2	0	21	73	41	1.056	.
AF6552-2	2.8	204	113	52	21	35	13	0	0	31	48	13	1.070	1.5
AF6555-2	3.2	114	64	29	18	42	10	0	0	30	52	10	1.068	.
AF6562-1	3.5	151	91	42	6	22	37	0	0	34	59	37	1.056	.
AF6582-1	3.1	224	170	78	9	46	30	0	0	15	76	30	1.076	1.0
AF6598-6	3.2	154	108	50	16	33	20	0	0	31	53	20	1.064	1.5
Atlantic	3.6	293	219	100	5	26	44	1	0	23	72	45	1.075	1.5
Envol	3.5	259	151	69	8	28	28	0	0	36	56	28	1.061	.
NC818-24	2.3	282	222	102	15	36	35	0	0	14	71	35	1.068	1.5
NC818-26	3.1	235	138	63	11	31	26	0	0	32	58	26	1.068	2.0
NC821-30	1.8	316	213	98	19	47	19	0	0	15	66	19	1.084	1.5
NC821-41	2.5	247	171	78	14	38	29	1	0	18	68	30	1.074	1.5
NC890-4	4.0	240	145	66	12	43	16	0	0	29	59	16	1.075	2.5
NC892-6	3.0	200	107	49	20	41	9	0	0	30	50	9	1.073	2.0
NC894-2	2.8	157	99	45	26	52	8	0	0	15	60	8	1.073	1.5
NC896-4	3.0	164	100	46	18	36	20	0	0	26	56	20	1.067	1.5
NC902-10	2.7	121	55	25	35	40	6	0	0	19	46	6	1.074	2.0
NC933-01	3.0	243	146	67	17	42	11	0	0	29	54	11	1.065	2.0
NC957-03	4.0	306	214	98	14	49	18	0	0	19	67	18	1.066	2.0
NC958-17	3.1	225	112	51	15	34	11	0	0	40	45	11	1.065	2.0
NC959-13	3.1	268	152	70	21	40	17	0	0	23	56	17	1.064	2.0
NC980-11	2.8	315	199	91	16	49	14	0	0	21	63	14	1.067	2.0
NCB3401-1	2.9	80	38	17	37	36	6	0	0	21	42	6	1.068	2.0
NCB3404-A	2.9	161	78	36	30	38	4	0	0	28	42	4	1.072	2.0
NCB3479-06	3.4	166	90	41	18	50	4	0	0	29	53	4	1.057	2.0
NCT37-01	3.1	270	211	97	8	37	41	0	0	14	78	41	1.068	1.5
Snowden	2.9	360	293	134	6	35	45	0	0	14	80	45	1.071	1.0
Superior	2.8	142	107	49	8	42	30	0	0	21	71	30	1.062	.
WAF16220-2	3.1	281	180	82	8	37	27	0	0	29	64	27	1.062	.
Grand Mean		220	143											
CV(%)		42	52											
LSD(k=100)		147	121											

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 One Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 115 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³					Comments ⁴	
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC		SR
AF5931-1	8	9	8	6	9	8	7	7	2	7	5	7	7	0	9.0	0	3	0	0	SR,MS,SS,FS,SG
AF6526-3	7	9	8	7	6	7	6	7	3	7	4	7	5	10	8.6	0	0	3	0	SR,MS,SS,HS,SG
AF6541-3	6	9	9	5	9	8	6	7	5	8	5	6	6	0	9.0	0	0	0	0	CS,MS,SR,SG
AF6551-4	7	9	8	7	6	7	6	7	3	8	6	8	7	0	9.0	0	0	5	0	CS,SR,SS,MS,GC
AF6552-2	9	9	8	8	6	6	5	7	3	7	5	8	6	0	9.0	0	0	0	5	SR,SS,CS,RZ
AF6555-2	8	9	9	8	6	6	6	7	2	7	4	7	5	5	8.1	0	0	3	3	SR,MS,SS,CS
AF6562-1	9	9	9	8	9	7	5	7	5	8	7	8	3	3	8.5	0	0	0	0	GC,CS,MS,SR,SS,RZ
AF6582-1	6	9	7	6	6	7	4	7	5	8	6	7	4	5	8.5	5	0	18	0	SR,RZ,SS,MS,SG,GC
AF6598-6	9	9	8	7	6	7	6	7	5	8	4	8	5	0	9.0	3	3	15	0	SR,GC,SS,RZ,IL,MS
Atlantic	6	9	8	5	6	6	6	7	3	7	6	7	6	35	6.6	8	0	30	0	SR,SS,GC,SG,CS,MS
Envol	5	9	8	4	9	7	5	7	5	8	5	7	3	0	9.0	5	0	18	0	SR,SS,MS,CS,SG,HS
NC818-24	8	9	8	8	5	5	7	7	2	7	6	7	6	0	9.0	0	0	5	0	SR,CS
NC818-26	7	9	8	7	6	5	5	7	3	8	6	7	4	10	7.6	0	0	0	0	CS,SG,SR,SS,HS,MS
NC821-30	6	9	8	6	5	5	7	7	2	7	5	7	8	0	9.0	0	0	0	0	SR,CS,SS
NC821-41	7	9	8	6	5	5	6	7	2	7	5	7	6	0	9.0	0	0	3	3	SR,CS,SS
NC890-4	7	9	8	5	7	8	5	7	5	7	5	7	4	0	9.0	0	0	3	0	SS,SR,MS,SG,HS,CS
NC892-6	6	9	8	6	6	6	4	7	4	8	3	6	4	5	8.5	3	0	8	0	SS,SR,MS,CS,SG
NC894-2	6	9	9	8	6	7	6	7	5	8	4	8	5	5	8.3	3	0	3	3	SS,SR,CS,MS
NC896-4	6	9	8	6	5	6	6	7	3	7	4	6	4	0	9.0	0	3	3	3	SR,MS,RZ,GC,SG,CS,SS
NC902-10	8	9	8	6	5	6	6	7	4	6	4	6	5	0	9.0	0	3	0	0	SR,SS,CS,SG
NC933-01	6	9	8	6	6	6	6	7	3	8	5	6	5	0	9.0	0	3	0	3	SS,SR,MS,CS,SG
NC957-03	9	9	8	7	6	6	5	7	5	8	6	7	5	20	6.7	0	0	40	0	SR,MS,SS,SG,CS
NC958-17	8	9	8	6	9	8	6	7	3	8	5	7	3	0	9.0	0	3	0	0	MS,SR,GC,SS,SG
NC959-13	6	9	8	7	5	6	6	7	4	8	5	7	5	3	8.5	0	0	0	0	SR,SS
NC980-11	5	9	8	5	6	8	6	7	4	6	5	7	5	0	9.0	0	0	0	0	SR,SS,MS,GC,CS,IL
NCB3401-1	5	9	8	4	9	8	6	7	3	8	5	8	7	0	9.0	0	0	5	3	SR,SS,FS,CS
NCB3404-A	6	9	8	5	5	6	6	7	3	7	4	7	5	0	9.0	0	0	0	0	SR,CS,SS,IL,MS,SG
NCB3479-06	6	9	8	5	9	8	4	7	5	8	5	7	4	3	8.8	0	0	5	0	MS,SS,GC,SR,CS,HS,SG
NCT37-01	6	9	9	7	5	5	7	7	2	7	5	8	8	3	8.5	5	0	20	0	SR,SS,GC,RZ
Snowden	9	9	8	7	5	5	5	7	3	5	5	8	7	23	7.2	3	0	10	0	SR,SS,MS,FS,CS,DAE,DSE
Superior	5	9	8	4	6	7	4	7	4	6	6	8	5	0	9.0	0	0	0	0	SR,MS,SS,CS
WAF16220-2	8	9	8	7	5	6	5	7	5	8	5	8	4	3	8.8	0	0	3	0	SR,SG,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 7a. Round White Two Trial. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones harvested 100 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ³ (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴	Chip Color ⁵
					1's	2's	3's	4's	5's	Culls				
Atlantic	3.0	333	283	100	7	25	59	0	0	9	84	59	1.076	2.0
B3379-1	2.8	225	150	53	31	62	4	0	0	3	66	4	1.081	2.0
BNC811-15	2.8	224	172	61	18	59	17	0	0	6	76	17	1.079	2.0
BNC811-33	2.6	258	208	73	12	37	43	0	0	8	80	43	1.073	2.0
Envol	3.3	255	174	62	7	27	40	0	0	26	68	40	1.061	.
Eramosa	4.0	115	80	28	12	39	26	0	0	24	64	26	1.066	2.5
Nadine	3.8	223	123	44	16	41	14	0	0	29	54	14	1.042	.
NC727-6	2.9	187	124	44	26	61	2	0	0	11	63	2	1.079	1.5
NC733-7	4.0	260	190	67	11	51	21	0	0	17	72	21	1.070	2.5
NCB3307-9	2.3	287	213	75	15	62	11	0	0	11	74	11	1.074	1.5
Snowden	2.1	283	244	86	11	47	38	0	0	4	86	38	1.075	1.5
Superior	2.7	165	136	48	9	49	32	0	0	9	82	32	1.067	.
Grand Mean		235	175											
CV(%)		20	30											
LSD(k=100)		75	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

Table 7b. Round White Two 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 100 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³					Comments ⁴	
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC		SR
Atlantic	6	9	8	5	6	5	6	6	3	7	7	7	6	20	6.4	3	0	35	0	SR,SS,GC,CS
B3379-1	6	9	8	5	6	6	6	7	2	8	3	8	7	3	8.5	0	0	13	0	SR,SS,GC
BNC811-15	6	9	8	5	6	6	6	6	4	8	5	8	6	0	9.0	3	0	13	0	SS,SR,MS,RZ
BNC811-33	6	9	8	5	6	6	6	7	3	8	7	8	5	3	8.5	8	0	18	3	SS,SR,RZ,GC,MS,FS
Envol	7	9	8	4	9	7	4	7	5	8	7	7	3	3	8.8	0	0	13	0	SG,SR,MS,HS,SS
Eramosa	6	9	8	3	6	7	6	7	4	7	6	7	5	0	9.0	0	0	3	0	MS,SR,SS,RZ,CS
Nadine	7	9	8	5	9	8	6	7	3	8	5	8	3	5	7.5	5	0	25	0	SG,HS,MS,SS,GC,SR
NC727-6	6	9	8	5	6	7	6	7	4	8	4	7	5	13	8.4	3	3	0	3	SR,SS,MS,FS
NC733-7	6	9	8	5	6	7	5	7	4	8	5	8	4	0	9.0	0	0	8	0	SS,SR,MS,RZ,GC,HS,SG
NCB3307-9	6	9	8	4	6	5	6	7	4	8	4	7	5	3	8.5	0	0	10	0	SR,SS,IL,MS,CS
Snowden	9	9	8	7	5	5	6	6	3	5	6	8	6	3	8.0	0	0	8	0	SS,SR,MS,GC,DSE,DAE
Superior	5	9	8	4	6	7	5	7	5	6	5	8	5	0	9.0	3	0	5	0	MS,SS,SR,RZ,FS

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. Round White Three Trial. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones harvested 118 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield cwt/A % Atl.		Size Distribution by Class ³ (% of total yield)							1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴	Chip Color ⁵
					1's	2's	3's	4's	5's	Culls					
Atlantic	2.8	101	54	100	36	16	21	0	0	27	37	21	1.067	1.5	
B3379-2	2.6	92	35	64	49	25	0	0	0	25	25	0	1.076	2.0	
B3403-6	4.0	178	101	187	23	49	5	0	0	23	54	5	1.070	2.5	
BNC811-22	2.8	145	74	137	26	44	6	0	0	24	50	6	1.074	1.5	
BNC815-7	4.0	120	67	125	32	47	3	0	0	18	50	3	1.057	3.0	
BNC816-3	2.9	115	61	114	33	52	0	0	0	15	52	0	1.060	2.0	
BNC821-9	2.7	115	57	106	33	43	3	0	0	21	46	3	1.068	1.5	
Brodie	3.3	74	40	74	26	23	9	0	0	42	32	9	1.051	.	
Envol	3.4	93	60	113	15	38	22	0	0	25	60	22	1.058	.	
NC470-3	2.3	154	115	214	21	51	13	0	0	15	64	13	1.065	2.0	
NC663-21	3.3	129	54	100	37	39	1	0	0	23	40	1	1.058	.	
NC669-48	3.5	151	70	131	30	44	0	0	0	25	44	0	1.058	.	
NC732-4	4.0	157	72	133	39	45	0	0	0	17	45	0	1.052	.	
NCB3259-2	2.7	160	106	198	24	37	14	0	0	25	51	14	1.063	2.0	
NCB3260-2	3.2	96	51	94	33	33	4	0	0	31	37	4	1.066	2.0	
Snowden	2.9	119	73	136	21	41	17	0	0	21	57	17	1.064	1.5	
Superior	2.9	113	85	158	6	47	29	0	0	18	76	29	1.064	.	
Grand Mean		124	69												
CV(%)		56	78												
LSD(k=100)		N/A	N/A												

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. Round White Three 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 118 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³					Comments ⁴	
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC		SR
Atlantic	6	9	8	5	6	6	6	7	3	7	5	7	5	0	9.0	8	0	8	10	SR,SS,FS,SG,GC,IL,MS
B3379-2	8	9	8	6	6	7	6	7	2	7	3	7	6	0	9.0	0	0	5	0	SR,IL,FS,SS,SG,GC
B3403-6	6	9	7	7	6	5	6	7	2	7	3	7	5	0	9.0	0	0	5	15	SR,IL,FS
BNC811-22	6	9	8	6	6	7	6	7	3	7	4	6	4	0	9.0	0	0	25	10	SR,IL,SS
BNC815-7	7	9	8	5	6	7	6	5	4	8	4	7	5	0	9.0	0	0	8	3	SR,SS,FS
BNC816-3	5	9	8	5	6	6	5	7	3	8	3	7	5	0	9.0	0	0	0	15	SS,SR,HS,SG
BNC821-9	6	9	8	8	6	6	6	7	3	7	4	8	6	0	9.0	0	0	0	18	SR,IL,SS
Brodie	8	9	8	7	9	8	6	7	4	8	6	7	5	0	9.0	0	0	0	25	SR,SS,MS,IL,SG
Envol	5	9	8	3	9	8	4	7	4	8	6	8	4	0	9.0	0	0	23	20	MS,SR,SS,SG
NC470-3	6	9	8	8	5	5	6	7	4	8	6	8	7	0	9.0	0	0	0	10	SS,SR,MS,FS
NC663-21	6	9	9	8	6	8	5	7	3	7	3	7	4	0	9.0	0	0	10	0	SR,SS,FS,MS,IL
NC669-48	6	9	9	7	6	8	6	7	3	7	3	7	4	3	7.8	10	0	20	8	SR,SS,IL,FS,MS,SG
NC732-4	6	9	9	7	6	8	6	7	3	7	4	8	4	5	8.3	0	0	0	28	SR,MS,SS,SG
NCB3259-2	9	9	9	8	9	8	6	7	3	6	5	8	5	0	9.0	0	0	0	3	SR,SS,MS,STST,CS,IL
NCB3260-2	6	9	9	7	6	8	5	7	5	7	4	7	3	0	9.0	0	0	3	10	SR,MS,SS,CS,SG
Snowden	9	9	8	7	5	5	6	7	3	6	6	7	5	8	8.8	0	0	0	13	SR,MS,SS,GC,DAE,DSE
Superior	5	9	8	4	6	7	4	7	4	7	6	8	5	0	9.0	0	0	0	20	SR,SS,MS,RZ,SG,FS

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-1731 Round White Trial. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 100 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ³ (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴	Chip Color ⁵
					1's	2's	3's	4's	5's	Culls				
AF5280-5	2.6	149	105	49	17	43	26	0	0	13	70	26	1.062	.
AF5819-2	2.7	162	122	57	17	55	19	0	0	8	75	19	1.065	.
Atlantic	3.5	252	213	100	12	37	47	0	0	3	84	47	1.082	1.5
CO10098-5W/Y	3.0	92	16	8	46	18	0	0	0	36	18	0	1.082	.
Katahdin	3.1	149	102	49	26	59	9	0	0	6	68	9	1.058	.
Kennebec	2.8	191	147	70	15	71	6	0	0	8	77	6	1.059	.
MSAFB609-12	2.2	200	128	61	32	62	1	0	0	4	64	1	1.074	1.5
MSAFB635-15	2.7	187	132	59	22	57	13	0	0	7	70	13	1.075	2.0
NDAF102629C-4	2.8	170	106	51	28	56	6	0	0	10	62	6	1.066	.
NY165	2.6	222	162	75	19	50	22	0	0	9	72	22	1.054	1.5
Snowden	2.3	242	203	97	11	40	44	0	0	5	83	44	1.069	1.5
Superior	3.0	145	122	60	9	33	51	0	0	7	84	51	1.051	.
Yukon Gold	3.4	127	91	42	13	47	25	0	0	16	71	25	1.037	.
Grand Mean		172	122											
CV(%)		21	27											
LSD(k=100)		59	55											

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 9b. NE-1731 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 100 DAP¹ at the NCSU VGJREC/NCSU TRS, Plymouth, Washington Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³					Comments ⁴	
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC		SR
AF5280-5	6	9	8	4	6	8	5	7	4	7	5	8	5	0	9.0	0	0	0	3	MS,SR,CS,SS
AF5819-2	5	9	8	5	6	8	7	7	2	6	6	8	7	0	9.0	0	0	0	3	SS,SR,FS,MS
Atlantic	5	9	8	6	6	5	6	6	3	7	7	8	7	20	6.7	0	0	25	0	SR,FS,MS,SS,GC,SG
CO10098-5W/Y	5	9	8	5	7	7	6	6	3	7	3	8	4	0	9.0	0	0	0	0	SG,HS,SS,MS,SR
Katahdin	6	9	8	7	9	7	6	7	4	8	4	8	5	3	8.5	0	0	18	0	SS,SR,MS,GC,RZ
Kennebec	6	9	9	7	6	7	5	6	5	7	5	8	4	0	9.0	0	0	0	0	MS,SR,SS,SG,GC
MSAFB609-12	6	9	8	6	6	7	7	7	2	7	4	8	8	5	8.3	0	0	0	0	SS,SR,MS,CS
MSAFB635-15	6	9	9	6	5	6	7	7	2	7	4	8	7	3	8.8	0	3	10	0	MS,SR,MS,SS
NDAF102629C-4	6	9	8	5	8	8	7	7	3	8	4	8	7	0	9.0	0	0	5	3	MS,SS,SR,RZ,GC
NY165	6	9	9	7	6	7	5	7	4	8	5	7	5	0	9.0	0	0	0	0	MS,SR,SS,IL
Snowden	9	9	8	7	5	5	6	7	3	6	7	8	6	0	9.0	0	0	3	3	SS,MS,SR,DAE,DSE
Superior	5	9	8	4	6	7	5	7	5	6	6	8	4	0	9.0	0	0	3	3	MS,SR,RZ,GC,IL
Yukon Gold	8	9	8	6	7	7	6	7	5	8	6	5	4	0	9.0	0	0	13	0	SR,GC,IL,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-1731 Red Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 100 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC – 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ³ (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴
			cwt/A	%Chf.	1's	2's	3's	4's	5's	Culls			
AF6289-2	2.2	267	213	103	10	53	26	0	0	11	80	26	1.058
B2152-17	2.6	243	172	83	26	53	17	0	0	5	70	17	1.063
Baltic Rose	3.3	227	103	50	24	43	1	0	0	32	44	1	1.060
Chieftain	2.8	283	206	100	13	57	15	0	0	16	72	15	1.057
CO14032-6R	3.6	217	108	52	35	50	0	0	0	16	50	0	1.058
CO14040-3R	2.4	171	48	23	66	28	0	0	0	7	28	0	1.058
COAF15129-3	2.4	223	153	75	28	64	3	0	0	5	67	3	1.049
Dark Red Norland	3.5	261	173	84	11	40	27	0	0	22	67	27	1.057
Fenway Red	3.5	240	164	80	20	47	20	0	0	13	67	20	1.055
NC981-01	2.2	387	321	156	7	35	48	0	0	10	83	48	1.066
NCB2607-3	2.5	125	66	32	35	52	1	0	0	11	53	1	1.069
NDAF113484B-1	2.5	252	193	94	12	57	19	0	0	12	76	19	1.055
NDAF12143-1	2.7	185	115	56	30	61	0	0	0	9	61	0	1.061
NDAF12238Y-2	2.7	229	147	71	29	62	3	0	0	6	64	3	1.056
NDAF13136Y-5	3.4	222	157	76	15	49	23	0	0	14	72	23	1.063
NDAF13273-1	2.5	201	126	61	34	62	0	0	0	4	62	0	1.057
NDAF13296Y-4	3.6	224	128	62	15	44	13	0	0	28	57	13	1.051
NDAF141Y-3	2.1	306	194	94	32	61	2	0	0	5	63	2	1.062
Strawberry Paw	2.3	248	192	93	16	70	8	0	0	7	78	8	1.061
Grand Mean		143	157										
CV(%)		21	28										
LSD(k=100)		79	75										

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-1731 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 100 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³					Comments ⁴	
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC		SR
AF6289-2	7	9	8	5	2	7	4	5	5	7	6	8	5	0	9.0	0	0	0	0	SS,GC,MS,SR,SISC,SG
B2152-17	6	9	8	5	2	7	5	7	3	8	4	7	6	0	9.0	0	0	13	0	SS,MS,SR
Baltic Rose	9	9	9	8	3	7	4	7	5	8	3	8	3	0	9.0	3	0	3	0	HS,MS,SS,SG,RZ,GC
Chieftain	9	9	8	6	3	8	6	6	5	8	5	8	3	0	9.0	0	0	10	0	MS,HS,SG,SS,SR,RZ
CO14032-6R	9	9	6	6	2	7	5	6	3	8	3	7	5	18	7.5	0	0	0	0	SR,MS,SS
CO14040-3R	5	9	7	4	2	7	6	6	2	8	3	8	7	0	9.0	0	0	0	0	SR,SS,MS
COAF15129-3	6	8	8	6	2	8	5	4	5	8	5	8	5	0	9.0	0	0	3	3	SR,SS,MS,GC
Dark Red Norland	5	9	8	3	2	7	5	6	5	7	6	8	4	35	7.4	0	0	8	3	SG,GC,SR,MS,SS
Fenway Red	6	9	8	5	2	7	6	7	3	8	5	8	5	10	7.8	0	0	15	0	SR,MS,SS,CS,SG,HS
NC981-01	6	9	8	6	3	6	6	7	3	8	6	7	5	0	9.0	0	0	5	0	CS,SS,SR,MS
NCB2607-3	5	5	7	4	2	8	6	7	2	8	3	7	7	0	9.0	0	0	0	0	SS,SR,SISC,MS,CS,GC
NDAF113484B-1	7	9	8	6	2	8	5	6	3	7	5	8	5	3	8.5	0	0	3	0	MS,SS,SR,SISC,CS,IL
NDAF12143-1	7	8	7	5	2	8	6	6	5	7	4	7	6	13	7.3	0	0	0	0	MS,SR,CS,GC,RZ
NDAF12238Y-2	6	9	8	5	2	8	5	7	4	8	4	8	5	0	9.0	0	0	3	0	SG,SS,MS,SR
NDAF13136Y-5	7	9	8	6	2	8	5	7	3	7	5	7	5	15	7.3	0	0	10	0	CS,SR,SS,SISC,IL
NDAF13273-1	6	9	8	5	2	7	6	6	4	7	4	8	5	0	9.0	0	0	3	0	CS,MS,SR,GC
NDAF13296Y-4	8	9	8	6	2	7	6	5	3	7	4	8	3	0	9.0	5	0	18	0	SG,HS,SS,MS,CS,SR
NDAF141Y-3	6	9	8	6	2	8	5	5	3	8	4	8	5	0	9.0	0	0	0	0	SR,SS,MS,CS
Strawberry Paw	9	9	7	7	2	7	6	6	4	8	6	8	5	0	9.0	0	0	3	0	MS,GC,SR,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. NE-1731 Russet Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 119 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ³ (% of total yield)							1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴
			cwt/A	%R.Nor	1's	2's	3's	4's	5's	Culls				
AAF10615-1	3.4	201	146	201	12	52	11	0	0	24	63	11	1.068	
AAF10736-2	3.1	228	127	176	22	53	2	0	0	22	55	2	1.064	
AAF12147-6	3.7	205	146	201	12	60	9	0	0	19	70	9	1.063	
AF5406-7	3.2	180	134	185	19	60	9	0	0	12	69	9	1.057	
AF5407-13	4.0	232	166	229	16	69	1	0	0	14	70	1	1.059	
AF5492-6	3.0	188	117	162	26	59	4	0	0	12	62	4	1.067	
AF5707-1	3.2	52	26	36	22	38	0	0	0	40	38	0	1.102	
AF5735-8	3.4	130	93	128	14	64	8	0	0	15	72	8	1.064	
AF5736-16	4.0	203	176	244	8	68	16	0	0	7	84	16	1.074	
AF5762-8	3.7	206	158	218	16	74	2	0	0	7	76	2	1.073	
AF5770-7	3.8	151	114	157	19	59	3	0	0	18	63	3	1.066	
AF6110-3	2.7	105	66	91	12	53	2	0	0	33	55	2	1.069	
AF6443-12	3.1	99	57	79	13	59	4	0	0	24	63	4	1.067	
AF6465-7	4.0	109	86	119	9	75	6	0	0	10	81	6	1.067	
AF6471-2	3.3	121	84	116	12	60	6	0	0	22	66	6	1.068	
AF6495-16	3.7	172	113	157	14	64	1	0	0	22	64	1	1.069	
AF6495-6	3.2	112	66	91	17	55	0	0	0	28	55	0	1.059	
AF6503-2	3.7	146	97	134	8	60	6	0	0	26	65	6	1.059	
Meister	2.9	227	152	210	15	47	20	0	0	19	67	20	1.070	
NDAF113476CB-3	3.7	101	61	84	22	55	2	0	0	21	57	2	1.069	
NDAF1415Y-2	3.6	245	142	197	8	34	22	0	0	36	56	22	1.068	
Russet Burbank	4.0	198	98	136	20	51	0	0	0	29	51	0	1.064	
Russet Norkotah	3.0	102	72	100	20	62	5	0	0	14	66	5	1.063	
Shepody	3.2	191	117	161	11	59	1	0	0	28	60	1	1.062	
Grand Mean		163	109											
CV(%)		43	53											
LSD(k=100)		113	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.

Table 11b. NE-1731 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 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³					Comments ⁴	
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC		SR
AAF10615-1	6	9	9	7	6	7	6	7	7	8	5	7	5	10	7.9	0	0	0	15	SR,MS,SS,CS
AAF10736-2	6	9	8	7	6	4	5	7	7	7	5	7	3	0	9.0	0	0	5	8	SR,MS,SS,SG,FS,RZ
AAF12147-6	6	9	8	6	5	7	6	7	6	8	5	7	4	0	9.0	0	0	0	48	SR,MS,SS,FS,SG
AF5406-7	7	9	8	7	6	4	5	7	9	7	6	8	5	15	7.4	5	0	10	15	MS,SR,GC,SS,FS
AF5407-13	8	9	8	7	5	4	5	7	7	8	4	8	3	18	7.7	3	3	3	45	SR,SS,MS,SG,IL
AF5492-6	8	9	8	6	6	4	5	7	6	8	5	8	5	0	9.0	3	0	20	18	SR,SS,IL,FS
AF5707-1	7	9	9	7	5	4	5	7	7	8	4	6	4	0	9.0	0	0	0	10	SR,SS,CS
AF5735-8	6	9	9	6	5	3	5	7	7	8	6	8	3	0	9.0	0	0	3	25	MS,RZ,SS,SR,IL
AF5736-16	9	9	8	8	5	3	6	7	6	8	6	8	8	0	9.0	0	0	0	43	SR,SS,MS
AF5762-8	8	9	9	7	5	3	5	7	7	8	5	7	6	5	8.3	3	0	8	35	SS,MS,SR,FS
AF5770-7	9	9	9	7	6	4	6	7	6	8	5	7	3	3	8.8	3	0	0	33	SR,MS,GC,RZ,SS,IL
AF6110-3	6	9	8	6	6	4	6	7	7	8	6	8	5	0	9.0	0	0	0	8	GC,MS,SS,SR,CS
AF6443-12	8	9	8	7	5	4	6	7	7	8	5	6	3	0	9.0	0	0	0	18	SR,MS,IL,^CS
AF6465-7	6	9	8	5	5	4	5	7	6	8	5	8	4	0	9.0	0	0	5	38	SR,MS,FS
AF6471-2	5	9	8	5	6	4	6	7	6	8	4	8	3	0	9.0	0	0	3	25	GC,SS,SR,MS,RZ
AF6495-16	8	9	8	7	6	4	6	7	7	8	5	7	4	0	9.0	5	3	5	30	SR,IL,MS,CS
AF6495-6	7	9	8	7	6	4	7	7	6	8	5	6	4	0	9.0	5	0	0	23	SS,MS,SR,IL,CS,FS
AF6503-2	6	9	8	8	6	4	6	7	8	7	7	8	3	13	8.5	3	0	3	33	SR,MS,SS
Meister	6	9	8	7	9	7	4	7	5	8	7	8	3	0	9.0	0	0	0	8	SS,SR,MS,SG,HS
NDAF113476CB-3	8	9	8	7	5	3	6	7	6	8	5	8	4	5	8.6	5	0	18	30	SR,MS,SG,SS
NDAF1415Y-2	6	9	8	7	6	4	5	7	6	8	5	5	3	10	8.4	23	0	20	15	CS,SR,SS,MS
Russet Burbank	6	9	9	8	6	1	6	7	7	7	5	7	2	45	7.3	0	0	5	15	MS,SS,SR,SG
Russet Norkotah	6	9	8	5	4	3	6	6	6	8	5	7	5	0	9.0	3	0	10	23	SR,MS,SS,FS
Shepody	6	9	8	6	9	8	4	7	7	7	6	7	2	0	9.0	0	5	0	15	MS,SR,SS,SG,CS

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 12a. Specialty Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 105 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ³ (% of total yield)						1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴
			cwt/A	%Chf	1's	2's	3's	4's	5's	Culls			
Adirondack Blue	3.2	49	30	45	39	44	4	0	0	13	48	4	1.051
Adirondack Red	2.6	174	101	150	28	55	3	0	0	15	57	3	1.059
AF6286-1	2.8	65	33	50	63	26	1	0	0	10	27	1	1.048
AF6287-6	2.7	73	28	42	50	37	0	0	0	13	37	0	1.054
All Blue	3.5	22	2	3	73	4	0	0	0	23	4	0	1.059
Atlantic	2.6	105	67	100	36	25	20	0	0	20	44	20	1.069
B3292-5	2.9	70	48	72	23	35	16	0	0	26	51	16	1.053
BNC718-1	2.9	100	66	98	23	58	8	0	0	12	66	8	1.052
BNC833-2	2.5	146	107	160	15	64	9	0	0	12	73	9	1.058
BNC916-3	3.2	67	33	49	49	35	1	0	0	15	36	1	1.066
BNC917-2	3.1	122	75	113	18	52	9	0	0	21	61	9	1.050
Chieftain	2.8	157	91	136	25	50	7	0	0	18	56	7	1.052
Dark Red Norland	2.8	116	73	109	16	37	22	0	0	25	59	22	1.058
NC502-10	3.3	59	30	45	36	41	1	0	0	22	42	1	1.069
NC508-37	3.2	57	35	52	26	42	5	0	0	27	47	5	1.061
NC509-16	2.9	105	57	85	31	48	7	0	0	14	55	7	1.057
NC868-1	3.4	81	42	63	40	37	2	0	0	21	39	2	1.060
Peter Wilcox	2.6	117	72	108	29	55	3	0	0	13	58	3	1.060
Purple Majesty	3.3	92	28	42	47	22	1	0	0	31	23	1	1.070
WAF14096-5	3.0	184	73	109	38	37	0	0	0	25	37	0	1.057
Yukon Gold	3.5	79	50	75	22	31	21	0	0	25	53	21	1.053
Grand Mean		93	52										
CV(%)		58	72										
LSD(k=100)		88	59										

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 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³					Comments ⁴	
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC		SR
Adirondack Blue	5	9	8	5	1	7	6	7	5	5	5	7	3	0	9.0	0	0	5	5	SR,SG,MS,SS
Adirondack Red	8	9	8	4	2	7	4	7	6	8	5	7	5	0	9.0	0	0	0	0	SISC,MS,SR,SS,SG
AF6286-1	5	9	8	4	1	8	6	7	2	6	4	7	5	0	9.0	0	0	0	0	SR,SG,MS,SS,IL
AF6287-6	8	9	8	4	1	8	6	7	2	7	3	7	6	0	9.0	0	0	0	5	SR,MS,SR
All Blue	6	9	8	7	1	7	5	7	6	6	3	6	3	0	9.0	0	0	0	13	SG,MS,SR,IL,SS,HS
Atlantic	6	9	8	5	6	6	6	7	3	7	5	7	6	8	7.6	0	0	8	3	SR,SG,GC,MS,SS,FS,HS
B3292-5	6	9	8	5	6	6	7	7	2	8	5	7	7	5	8.5	0	0	3	0	SS,SR,GC,IL,FS,HS,MS
BNC718-1	8	9	8	6	1	8	6	7	4	8	3	7	4	3	8.5	0	0	0	0	SS,SR,GC,FS,IL,MS,SISC
BNC833-2	7	9	8	3	1	7	5	7	5	7	5	6	5	0	9.0	3	0	0	5	SR,SS,MS,IL,CS,SISC,HS
BNC916-3	6	9	8	5	1	8	6	6	4	7	4	7	5	0	9.0	0	0	0	10	SR,SS,MS,IL,CS,SG,SISC
BNC917-2	9	9	8	5	1	8	6	6	5	7	5	7	3	0	9.0	0	0	5	5	SS,SR,IL,SISC,SG,GC,RZ
Chieftain	9	9	8	6	3	7	6	5	4	7	5	8	5	13	8.1	0	0	15	0	SS,HS,SG,MS,IL,SR,FS
Dark Red Norland	5	9	8	3	2	8	5	7	5	6	6	8	4	8	8.3	0	0	5	3	SR,MS,SG,FS,HS,SS,CS
NC502-10	6	9	8	4	1	8	5	7	4	7	5	7	3	0	9.0	0	0	0	7	SR,CS,MS,SG,FS
NC508-37	5	9	9	4	1	8	6	7	5	7	5	7	5	0	9.0	3	0	0	8	MS,SR,GC,FS,CS,SISC
NC509-16	6	9	9	5	1	8	6	7	5	7	4	8	5	0	9.0	3	0	0	3	SR,SISC,CS,MS,SG,HS
NC868-1	8	9	8	5	6	7	6	7	3	8	4	7	4	1	8.8	3	0	16	4	SS,MS,SG,SR,HS,FS,IL
Peter Wilcox	6	9	8	4	1	7	6	5	5	8	4	8	5	0	9.0	0	0	0	0	MS,IL,SS,SR,FS,GC
Purple Majesty	6	9	8	5	1	7	6	7	3	7	4	7	3	0	9.0	0	0	0	3	SR,SG,FS,MS,HS
WAF14096-5	6	9	8	6	7	7	7	7	2	7	4	7	4	0	9.0	0	0	0	0	HS,SR,MS,FS,SG,IL,SS
Yukon Gold	8	9	8	6	7	7	6	7	4	7	5	8	5	3	6.3	10	0	20	0	SR,SS,FS,MS,SG,CS,GC

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 13a. Yellow Flesh Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 100 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Merit ² Score	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ³ (% of total yield)							1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴
			cwt/A	%Yuk	1's	2's	3's	4's	5's	Culls				
AAF11611-2	3.4	110	36	42	50	32	0	0	0	18	32	0	1.053	
AF6542-16	3.1	165	76	88	39	44	2	0	0	15	46	2	1.071	
AF6566-1	2.0	174	106	123	16	46	12	0	0	26	58	12	1.076	
AF6602-10	3.3	134	58	67	33	41	1	0	0	25	43	1	1.072	
AF6606-2	3.2	208	134	155	21	56	9	0	0	14	64	9	1.064	
AF6608-4	3.3	118	51	59	49	37	0	0	0	14	37	0	1.072	
AF6610-2	3.3	94	53	62	24	36	4	0	0	37	40	4	1.059	
Belmonda	2.2	224	138	160	34	54	3	0	0	8	58	3	1.065	
Caprice	2.7	67	12	14	78	14	0	0	0	8	14	0	1.071	
Christel	2.8	126	74	86	26	48	5	0	0	21	53	5	1.044	
Clairette	3.8	64	18	21	66	9	1	0	0	25	9	1	1.062	
Colomba	3.3	114	65	76	31	32	7	0	0	30	39	7	1.053	
Maggie	2.8	150	85	99	38	39	3	0	0	19	43	3	1.050	
MaryAnn	2.6	91	13	15	82	13	0	0	0	4	13	0	1.068	
Natascha	2.5	161	90	104	34	43	8	0	0	16	50	8	1.061	
NC587-10	3.3	88	39	45	52	35	0	0	0	14	35	0	1.081	
NC708-3	2.7	91	46	53	48	45	0	0	0	7	45	0	1.072	
NC738-2	2.4	119	68	80	42	45	3	0	0	9	49	3	1.071	
NDAF1489-4	2.6	65	40	46	27	31	26	0	0	16	57	26	1.055	
Paroli	2.7	148	91	105	19	45	13	0	0	24	57	13	1.048	
Prada	2.5	158	119	139	16	55	13	0	0	16	68	13	1.034	
Soraya	2.6	111	74	87	48	28	6	0	0	18	34	6	1.037	
Vivaldi	2.5	178	111	129	33	53	0	0	0	13	53	0	1.051	
Yukon Gold	3.1	135	86	100	23	41	14	0	0	22	55	14	1.041	
Grand Mean		129	70											
CV(%)		57	77											
LSD(k=100)		119	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.

Table 13b. 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 100 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2021

Clone	Plant Data ²				Tuber Data ²									% Internal Defects ³						Comments ⁴
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR	
AAF11611-2	9	9	8	7	3	7	5	7	5	7	3	8	3	0	9.0	0	0	18	0	MS,SS,SG,RZ,SR,HS
AF6542-16	8	9	7	6	7	7	7	7	2	8	4	6	3	0	9.0	0	0	5	0	MS,SS,IL,RZ,SR,FS
AF6566-1	8	9	9	8	7	8	6	7	3	8	5	8	6	0	9.0	0	0	0	0	SR,MS,SS,FS
AF6602-10	9	9	8	6	7	7	6	7	2	6	4	6	5	0	9.0	0	0	15	3	SR,SS,SG,FS,CS
AF6606-2	7	9	8	7	7	8	6	7	3	7	5	8	4	18	5.3	0	0	0	0	MS,SS,GC,FS,SR,SG
AF6608-4	8	9	8	7	7	7	5	7	5	8	3	7	3	18	8.5	0	0	3	0	SR,MS,SS,FS
AF6610-2	6	9	8	6	7	8	6	7	3	8	3	7	3	3	8.8	0	0	15	5	GC,SS,MS,SG,SR,RZ
Belmonda	6	9	9	7	7	7	5	7	4	8	5	8	6	0	9.0	0	0	13	0	SR,MS,SS,CS
Caprice	9	9	9	8	7	8	5	7	5	8	3	8	5	0	9.0	0	0	0	3	IL,MS,FS,SG
Christel	5	9	8	5	7	7	5	7	5	8	5	7	5	3	8.5	0	3	5	5	SR,MS,SS,SG
Clairette	5	9	8	6	7	7	6	7	3	7	4	7	4	30	6.9	0	0	0	0	SR,SS,GC,RZ,
Colomba	5	9	8	4	7	8	6	7	5	8	3	8	4	18	8.0	0	0	3	0	SG,SS,MS,SR
Maggie	5	9	8	5	7	7	6	7	3	7	5	6	4	0	9.0	0	0	0	0	SR,SG,SS,MS,IL,FS
MaryAnn	6	9	8	7	7	8	6	7	3	7	4	7	5	0	9.0	0	0	0	3	SS,SR,SG,MS,FS
Natascha	6	9	8	6	7	7	5	7	5	8	2	8	5	0	9.0	0	0	0	0	MS,SG,IL,RZ
NC587-10	5	7	8	5	7	7	6	7	5	8	5	8	6	3	8.5	0	0	20	0	MS,SR,SS,FS,SG,HS
NC708-3	5	9	8	5	7	7	7	7	2	7	3	7	5	0	9.0	0	0	8	3	SS,MS,SR,CS,FS,SG,HS
NC738-2	5	9	8	5	7	7	6	7	7	7	5	8	6	0	9.0	0	0	5	0	MS,SR,FS,SS
NDAF1489-4	6	9	8	4	7	8	6	7	3	7	5	7	6	0	9.0	0	0	3	3	SR,SG,SS,MS
Paroli	6	9	7	5	7	8	6	7	3	7	4	8	5	0	9.0	0	0	3	0	MS,SR,SS,FS,SG
Prada	6	9	8	6	7	7	6	7	6	8	6	8	6	0	9.0	0	0	13	0	SR,SS,GC,SG,IL,HS
Soraya	6	9	8	6	7	7	5	7	5	8	5	8	5	0	9.0	0	0	0	0	MS,SS,SR,FS,SG
Vivaldi	9	9	7	7	7	8	6	7	6	8	5	8	6	3	8.5	0	0	13	0	SR,IL,SG,HS,SS,FS,CS
Yukon Gold	8	9	8	6	7	7	6	7	4	7	6	8	5	5	7.9	0	0	25	0	SR,CS,GC,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

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: Ten 21' rows at 34' row spacing, 25 hills per row

Seed piece Treatment: None

Seed piece Treatment: None

Weed Control: Dual II Magnum 1.24 gal/A (pre-emerge)

Metribuzin 75DF 2 lbs/A (pre-emerge)

Fertilizer: 32%N 25 Gal/A, 117lbs/A N, 0 lbs/A P, 122 lbs/A K

Insect Control: ReTurn XL 34 fl oz/A

Disease Control: Bravo 2pt/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: Twenty-eight 21' rows at 34' row spacing, 25 hills per row

Seed piece Treatment: None

Seed piece Treatment: None

Weed Control: Dual II Magnum 1.24 gal/A (pre-emerge)

Metribuzin 75DF 2 lbs/A (pre-emerge)

Fertilizer: 32%N 25 Gal/A, 117lbs/A N, 0 lbs/A P, 122 lbs/A K

Insect Control: ReTurn XL 34 fl oz/A

Disease Control: Bravo 2pt/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: Nine 21' rows at 34' row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Dual II Magnum 1.24 gal/A (pre-emerge)

Metribuzin 75DF 2 lbs/A (pre-emerge)

Fertilizer: 32%N 25 Gal/A, 117lbs/A N, 0 lbs/A P, 122 lbs/A K

Insect Control: ReTurn XL 34 fl oz/A

Disease Control: Bravo 2pt/A

Vine Kill: None

Location: James Brothers Farms, Weeksville, Pasquotank Co., NC

Trial Design: Randomized complete block, four replications

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

Seed piece Treatment: None

Weed Control: Brawl 1 1/3 pt/A

Tricor 1/2 lb/A

Fertilizer: 966lbs 10N-8P-17K

Insect Control: Capture 1pt/A

Platinum 2.7 oz/A

Velum Prime 6.8 fl oz/A

Disease Control: Quadris 7 oz/A

Elatus 6 oz/A

Echo 1 pt/A

Boron 1qt/A 2x

Vine Kill: None

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

Location: Sackett Farms, Vandemere, Pamlico Co., NC

Trial Design: Randomized complete block, four replications

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

Seed piece Treatment: None
Weed Control: not provided
Fertilizer: 2lbs/A 20-20-20
Elemax Ca 1qt/A
Elemax B 1pt/A
Micro Leaf 1.5 qt/A (2 applications)
Insect Control: not provided
Disease Control: Bravo 1 pt/A & 2 pt/A
Revus top 5.5 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: Thirty-two 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment: None
Weed Control: Omni 1 lb/A
Medal II EC 32 oz/A
Fertilizer: 800lbs/A 18-18-18
Insect Control: Admire 8 oz/A
Disease Control: None
Vine Kill: None

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

Trial Title: Round White Variety Trial Two

Trial Design: Randomized complete block, four replications

Plot Dimensions: Thirteen 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment: None
Weed Control: Omni 1 lb/A
Medal II EC 32 oz/A
Fertilizer: 800lbs/A 18-18-18
Insect Control: Admire 8 oz/A
Disease Control: None
Vine Kill: None

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

Trial Title: Round White Variety Trial Three

Trial Design: Randomized complete block, four replications

Plot Dimensions: Seventeen 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment: None
Weed Control: Omni 1 lb/A
Medal II EC 32 oz/A
Fertilizer: 800lbs/A 18-18-18
Insect Control: Admire 8 oz/A
Disease Control: None
Vine Kill: None

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

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

Trial Title: NE 1731 White 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: Omni 1 lb/A
Medal II EC 32 oz/A

Fertilizer: 800lbs/A 18-18-18

Insect Control: Admire 8 oz/A

Disease Control: None

Vine Kill: None

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

Trial Title: NE 1731 Red 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: Omni 1 lb/A
Medal II EC 32 oz/A

Fertilizer: 800lbs/A 18-18-18

Insect Control: Admire 8 oz/A

Disease Control: None

Vine Kill: None

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

Trial Title: NE 1731 Russet 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: Omni 1 lb/A
Medal II EC 32 oz/A

Fertilizer: 800lbs/A 18-18-18

Insect Control: Admire 8 oz/A

Disease Control: None

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: Omni 1 lb/A
Medal II EC 32 oz/A

Fertilizer: 800lbs/A 18-18-18

Insect Control: Admire 8 oz/A

Disease Control: None

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: Twenty 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Omni 1 lb/A
Medal II EC 32 oz/A

Fertilizer: 800lbs/A 18-18-18

Insect Control: Admire 8 oz/A

Disease Control: None

Vine Kill: None

Appendix 2: STANDARDIZED NE1731 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	PVA, PVX, PVY=potato viruses A, X, Y
BL=black leg	RZ=Rhizoctonia
BR=bruise	SEB=stem end browning
CPB=Colorado potato beetle	SC = star cracking
CS=common scab	SG=secondary growth
CT=chain tubers	SISC=silver scurf
DAE=deep apical eyes	SKN=skins
DSE=deep stolen end	SS=sun scald
EB=early blight	SR=soft rot
ECB= European corn borer	STST=sticky stolons, tight stolon attachment
EL= enlarged lenticels	TSWV=Tomato Spotted Wilt Virus
FS=fusarium wilt	VW=Verticillium wilt
GC=growth cracks	WSTD=weak stand
HI= herbicide injury	WW=wire worm
HN = Heat Necrosis (see below)	YF=yellow flesh (YF scale: 1=light yellow to 3=dark yellow)
HS=heat sprouts	RF=red flesh (RF scale: 1=light red or pink to 3 = dark red)
IL=infected lenticels	
LB=late blight	
LHD=leaf hopper damage	
MS=misshaped tubers	
PE=pink eye	
PR=pink rot	
PLRV=potato leaf roll virus	
PTS=very pointed tubers	
PS=powdery scab	

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.