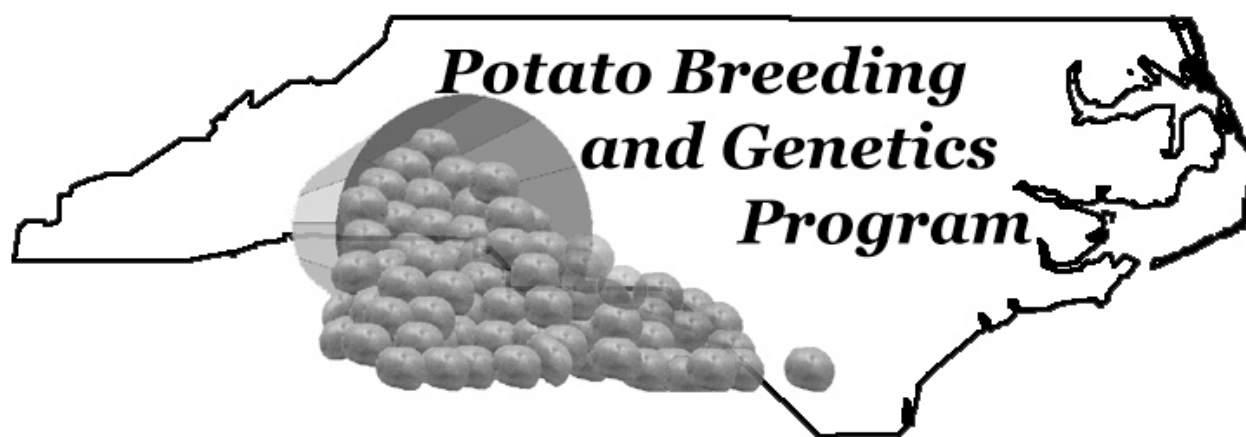


NC STATE UNIVERSITY

NORTH CAROLINA POTATO VARIETY TRIAL AND BREEDING REPORT

2020



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I. OBJECTIVES AND RESEARCH SPONSORS:

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

Our variety development research efforts are supported by the USDA National Institute of Food and Agriculture (NIFA) Northeast Region 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. This year to maximize the number of first year material in the field we decided to plant both single hill and 3-hill plots of our general material. We have continued the separate trial for Colorado potato beetle resistance breeding as 4-hill plots in cycle one. Planting, selection and advancement to 6-hill or 12-hill (Traditionally used for advancement of the specialty plots in cycle two. From 2020 on, will be used to push those that have a higher set ahead faster.), 20-hill, and 60-hill plots depend on relative performance at each of these stages over a period of four years. Clones that survive the first four cycles of selection are entered into a 160-hill increase plot to generate enough seed for preliminary yield trials conducted at the TRS/VGJREC the following year. In subsequent years all surviving clones are maintained in 320-hill plots and included in preliminary and advanced yield trials conducted at the TRS/VGJREC and on-farm.

During 2020, we planted 15,768 cycle one clones and selected 1028 clones resulting in a 6.5% selection rate (this includes our single and 3-hill plots, CPB 4-hill plots and single hills from Cornell University). Out of the 928 clones in our cycle two plots (this includes 6-hills, 12-hills and bulk plots), 261 (28.1%) were selected for future evaluation. In the 20-hill, specialty 60-hill plots, and 60-hill plots 138 clones were planted with 34 (24.6%) being selected for further evaluation.

Due to COVID-19 and initial restrictions placed on the programs activities we were only able to plant our selection plots along with our general material and not our screening trials in our Colorado potato beetle nursery this year. We planted 718 4-hill plots for selection and we selected 102 clones. Out our 6-hill 214 clones were developed for the CPB resistance trials. After making our selections, we decided to advance 39 clones to 20-hill plots in 2020. In the 20 hill plots we evaluated 37 clones for the CPB resistance project and selected 12 clones for advancement to next 60-hill trial. In this year's 60-hill plots we had a total of 7 clones and 3 of those were selected for evaluation next year.

Yield Trials

In our 14 yield trials, we evaluated 165 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 1-14. 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. 2020 PROMISING LINES:

Chip-stock clones

NC470-3

Developed by: NC State Univ.

Released: N/A

trials evaluated: 12 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 93%

Specific Gravity: 1.068 (Atlantic 1.071)

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 so with the strong top that it has late in the season it has excellent potential for the southern chip market. This clone carries the Ryadg PVY resistance gene and has shown some tolerance of common scab in Wisconsin and Pennsylvania and foliar resistance to late blight in Pennsylvania as well.*

Chip-stock clones cont.

NY162

Developed by: Cornell Univ.

Released: N/A

trials evaluated: 5 since (2018)

Merit Score: 2.2 (since 2018)

Skin Color: tan to light brown

Flesh Color: White

Historical Data;

Maturity: mid to late season

% Standard (Atlantic): MKTB YLD 96%

% Standard (Snowden): MKTB YLD 97%

Specific Gravity: 1.067 (Atlantic 1.071)

Chip score: 1.4 (exceptional to excellent)

Overall Appearance: 6 (better than fair)

Other Attributes or Comments: This is a mid to late maturing clone with good yield, gravity and chip scores. Its maturity is similar to Snowden. The size profile on this clone also tends to be mostly medium, we saw in one trial this past season a slight amount of internal heat necrosis but not enough to raise alarm. This clone is in the SNaC trial and has just finished it's 3rd year of testing with promising results.

White Skin Table-stock clones

Brodie

Developed by: Cornell Univ.

Released: 2012

trials evaluated: 20 since (2005)

Merit Score: 2.5 (since 2020)

Skin Color: White

Flesh Color: White

Historical Data;

Maturity: mid to late maturing

% Standard (Superior): MKTB YLD 117%

% Standard (Envol): MKTB YLD 118%

Specific Gravity: 1.070

Skin Texture: Smooth

Overall Appearance: 6 (better than fair)

Other Attributes or Comments: This is a mid to late maturing clone with good yield. It is a bit later than we like for table varieties but typically produces an "A" size crop skewed to larger sizes. We have also noticed in the past that seed spacing has little effect on the size profile and distribution.

Red Skin Table-stock clones

CO99076-6R

Developed by: Colorado State Univ.

Released: N/A

trials evaluated: 4 since (2019)

Merit Score: 2.1 (since 2019)

Skin Color: Red

Flesh Color: White

Historical Data;

Maturity: mid - maturing

% Standard (Chieftain): MKTB YLD 90%

% Standard (Dark Red Norland): MKTB YLD 93%

Specific Gravity: 1.060

Skin Texture: Smooth

Overall Appearance: 7 (good)

Other Attributes or Comments: This is the second year we have evaluated this clone but we believe its performance was good enough to merit comment under the promising varieties section. It is later than Dark Red Norland and similar to Chieftain but it is a very uniform variety with 78% of yield between 1 7/8 and 3 1/4". Tubers are round to oblong with shallow eyes. We look forward to trialing this clone in the future.

Yellow Skin Table-stock clones

Belmonda

Developed by: Solana

Released: 2016

trials evaluated: 6 since (2017)

Merit Score: 2.1 (since 2017)

Skin Color: Yellow

Flesh Color: Lt Yellow

Historical Data;

Maturity: very late maturing

% Standard (Yukon Gold): MKTB YLD 211%

Specific Gravity: 1.060

Skin Texture: Smooth

Overall Appearance: 6 (better than fair)

Other Attributes or Comments: This variety has been evaluated in 6 trials over the last 4 years, it is a yellow skin potato with a light yellow flesh. It is also resistant to nematodes Ro1 and Ro4, potato Wart race 1, late blight, Rhizoctonia, common scab, PVYntn and moderately resistant to PLRV. While it is a bit on the late side each of the last 4 years it has been quite attractive and in spite of it's lateness it bares a solid crop of A size potatoes

Natascha

Developed by: Solana

Released: 2012

trials evaluated: 14 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 176%

Specific Gravity: 1.057

Skin Texture: Moderately Smooth

Overall Appearance: 6 (better than fair)

Other Attributes or Comments: This variety has been evaluated in 14 trials over the last 6 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.

Specialty Table-stock clones

Peter Wilcox

Developed by: USDA/ARS – Beltsville MD

Released: 2007

trials evaluated: 55 since (2000)

Merit Score: 2.1 (since 2016)

Skin Color: Purple

Flesh Color: Yellow

Historical Data;

Maturity: slightly early to mid maturing

% Standard (Atlantic): MKTB YLD 77%

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

% Standard (Yukon Gold): MKTB YLD 98%

Specific Gravity: 1.068

Skin Texture: Moderately Smooth

Overall Appearance: 6 (better than fair)

Other Attributes or Comments: This is an attractive purple skin and yellow flesh variety for the table market. Most of the marketable yield falls in the 1 7/8 to 3 1/4" category but it is an oblong potato so if we sized by ounces the profile might indicate a larger size. Over the years this variety has been evaluated by a number of organizations and without exception Peter Wilcox is a top variety for eating quality.

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 3	Jun 18,23	107, 112
James Brothers	Barclay silt loam	Mar 9	Jun 24	107
Sackett Potatoes	Belhaven Muck	Mar 19	Jul 7	109
TRS/VGJREC	Portsmouth fine sandy loam	Mar 17, 20	Jul 2 - 22	Variable 104 - 122

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 two-row digger and hand harvested. All trials were graded at the TRS/VGJREC to five classes: 1's < 1 ⅞"; 2's > 1 ⅞" to 2 ½"; 3's > 2 ½" to 3 ¼"; 4's > 3 ¼" to 4"; 5's > 4". Culls were removed and weighed separately in all trials. Each clone was evaluated for tuber quality and appearance during grading using standardized NE-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 6 traits associated with variety performance. This rating combines yield, percent culls, internal quality, the overall appearance score assigned to each clone during grading, chip score and specific gravity. The merit 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 14 trials this year. In five trials it received a merit score between 2.0 and 2.4 (all "keeps"), three trials received either a 2.5 or 2.6 (marginal) and the final two received a merit score of 4 (drop). Atlantic was given ratings of 4 due largely to poor internal quality. Overall this averages to 2.7 equating to a marginal merit score. It also should be noted that two years ago Atlantic averaged 2.3 (keep) and last year 3.5 (drop). 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 3rd of March this year and was completed by the 20th of March. Rainfall ahead of and during planting only delayed us at the Pamlico county location this season though the 19th of March is still within the historically normal time frame. Overall air temperatures and rainfall amounts throughout the season were beneficial for plant growth and tuber development within the yield trials. As we moved into harvest temperatures picked up beginning on the 22nd of June with daytime temps more consistently in the 90's and nighttime temps in or near then low 70's. It's also worthy of note this season we buried soil temperature probes in several trials with variety Atlantic. In those trials harvested the final day of digging soil temps reached a high of 105°F. In fact as the tops went down in the crop and soil became more directly exposed to sunlight in the last harvest week at the TRS we saw soil temperatures spike causing high levels of rot in those final yield trials at the TRS. Given these interesting results we intend in the coming field season to put soil temperature probes in more of the trial locations and under several different lines to get a feel for how soil temperature is effecting the crop and possibly how the crop is responding.

A. Yield Trials

1. On-Farm Trials

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

As with last year this year all of the trials at Black Gold farms in Gum Neck were located on land with sub-surface irrigation. This technology not only allowed Black Gold to increase soil moisture but also enabled the drawing off of excess moisture as well. This ability to control the

water table beneath the plants is evident in the yields with regard to the other trials, both on-farm and at the TRS where yields even though yields overall were above normal this season.

Overall the lines in this trial received positive scores evidence of this is twenty-two of the twenty-six clones in this trial received a merit score between 1.6 and 2.4 rounding to 2 (keep). Among those the three clones with scores of 1.6 were all yellow flesh: Arizona, Belmonda and Constance. The marketable yields in this trial were compared to Chieftain (374 cwt/a) for the red skins, Yukon Gold (246 cwt/a) for the yellow flesh clones and Superior (224 cwt/a) for the white skins. None of the eleven red skin clones in this trial had a higher average marketable yield than Chieftain the closest was Red LaSoda (373 cwt/a). Ten of the eleven yellow flesh clones had significantly higher average marketable yield than Yukon Gold: Arizona(493 cwt/a), Constance (484 cwt/a), Paroli (462 cwt/a), Belmonda (442 cwt/a), Alegria (422 cwt/a), Soraya (421 cwt/a), Natascha (399 cwt/a), Captain (373 cwt/a), Prada (359 cwt/a) and Golden Globe (311 cwt/a). Only two other clones were compared to Superior and both Brodie (361 cwt/a) and Envol (317 cwt/a) had higher average. Two clones had an overall appearance rating of 8 (better than good): CO99076-6R and Strawberry Paw and twelve received overall appearance scores of 7. The only clone to express incidence of an internal defect at levels greater than or equal to 10% was Red LaSoda, 13% Brown Center (BC). External defects observed in the trial were soft rot, growth cracks, misshapes, sunscald, common scab, and skin blemishes due to Rhizoctonia.

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

Nine of the Seventeen lines in the trial received a merit score between 1.8 and 2.4 (rounded to 2). The two highest were AF4157-6 (1.8) and Snowden (1.9). Three clones had equal or greater average marketable yields than Atlantic (348 cwt/a): BNC182-5 (361 cwt/a), Snowden (359 cwt/a) and NC470-3 (348 cwt/a), though none were significantly greater. Gravities in the trial ranged from a low of 1.059 to 1.075, Atlantic had a gravity of 1.072, four clones had higher gravity: NCB3259-1 (1.075), NCB3260-1 (1.074), NC636-5 (1.073) and NC470-3 (1.073) all other clones in the trial were lower. Two clones had exceptional (1.0) chip scores: AF4157-6 and Waneta. Three clones had chip ratings of 1.5 (excellent to exceptional): Atlantic, MSAFB605-4 and Snowden. Two clones had overall appearance scores of 8 (better than good), AF4157-6 and MSAFB605-4. Five clones: Atlantic, BNC182-5, MSAFB635-15, NC470-3 and NCB3259-2 had overall appearance scores of 7 (good). Atlantic expressed 18% incidence of BC. No other internal defects were recorded at incidence levels greater than 10%. External defects observed in the trial were soft rot, sunscald, growth cracks, misshapes, common scab, enlarged lenticels, black leg and skin blemishes due to Rhizoctonia.

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

Ten of the twelve clones in this trial received a merit score between 1.5 and 2.4 rounded to 2 (keep), Snowden had a merit score of 1.5. Atlantic had a marketable yield of 300 cwt/a and five clones had higher average marketable yields though only two were significantly greater: BNC182-5 (388 cwt/a) and MSZ063-2 (365 cwt/a). Atlantic had a gravity of 1.074, four clones had equal or greater gravity: B2869-29 (1.080), MSZ242-13 (1.076), ND7519-1 (1.076) and Snowden (1.074). Two clones in the trial received a chip score rating of 1 (exceptional) in the 24 to 48 hour chip test: CO11023-2W and NY163. Four clones received chip score ratings of 1.5 (excellent to exceptional): MSW474-1, ND7519-1, NY162 and

Snowden. Five clones received an overall appearance rating of 7 (good): Atlantic, CO11023-2W, MSZ063-2, MSZ242-13 and NY163. Two clones expressed 10% or greater incidence of internal heat necrosis: ND7519-1 48% (heat necrosis severity rating (HNR) of 7.4) and MSZ063-2 14% (HNR of 8.0). Two clones expressed BC at 10% or greater incidence: Atlantic (16%) and ND7519-1 (10%). No other internal defects were observed at levels equal to or greater than 10%. External defects observed were: soft rot, sunscald, misshapes, growth cracks, common scab, enlarged lenticels, infected lenticels and skin blemishes due to Rhizoctonia. Chip defects included vascular ring discoloration and internal heat necrosis.

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

This season our trial at the James Brothers location had some stand establishment issues in some of the plot rows. It appears to have most negatively affected the yellow flesh lines as they were grouped on one side of the field but some of the white skin lines also suffered. Even still overall yields this year in the trial were greater than last year. Of the Thirty-two clones in the trial sixteen received a merit score between 2.0 and 2.4 rounded to 2 (keep) the four of those with the highest scores were: Audrey (2.0), Atlantic (2.2), Fenway Red (2.2) and Snowden (2.2). Three marketable yield standards were chosen: Atlantic (279 cwt/a, round white standard), Chieftain (210 cwt/a, red standard) and Yukon Gold (68 cwt/a, yellow flesh standard). Across all clones Atlantic had the highest marketable yield Snowden (250 cwt/a) had the 2nd highest marketable yield for round whites. Red Endeavor (265 cwt/a) and Fenway Red (234 cwt/a) had the highest average marketable yields for reds but were not significantly greater than Chieftain. Red Endeavor however was significantly greater than Dark Red Norland (130 cwt/a). As mentioned above the yellow flesh clones were heavily impacted by poor stands and so yields across these eleven lines in this trial must be looked be reviewed carefully. That said it is not uncommon for Yukon Gold to have poor marketable yield due to soft rot, common scab or other external defects. Belmonda (24 cwt/a) the lowest marketable yield in the trial however performed better in prior years and in other trial locations this year, going back and looking at stand establishment data (not reported here) average stands were about 25% across the four replications. The specific gravity for Atlantic in this trial was 1.074, of the chip stock clones none had a higher gravity, though one yellow flesh clone was higher, Tokio (1.077). Only three clones were chipped in this trial and the best rated a 2 (excellent) these were Atlantic and Snowden, NC470-3 rated a 2.5 (good to excellent). One clone NC606-23 expressed soft rot (SR) at 10% incidence, no other internal defects of 10% or greater incidence were recorded in this trial. Culls were primarily due to misshapes, soft rot, sun scald, growth cracks, common scab, enlarged lenticels, infected lenticels, black leg and skin blemishes due to Rhizoctonia.

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

It has been 5 years since we had a trial with Sackett Potatoes and its good to re-establish a presence in Pamlico county. This year sixteen chip lines were evaluated and of those four received a merit score between 2.0 and 2.3 rounded to 2 (keep): Snowden (2.0), MSZ242-13 (2.1), NC470-3 (2.2) and MSW474-1 (2.3). Atlantic had a marketable yield of 275 cwt/a, six clones had higher average marketable yields though none were significantly greater: NC470-3 (345 cwt/a), Snowden (325 cwt/a), MSZ063-2 (315 cwt/a), NY162 (301 cwt/a), Mackinaw (281 cwt/a) and MSW474-1 (277 cwt/a). Atlantic had a gravity of 1.076, four clones had equal or greater gravity: MSZ242-13 (1.081), Snowden (1.077), ND7519-1 (1.076) and BNC182-5 (1.076). Three clones in the trial received a chip score rating of 1.5 (excellent to exceptional): ND7519-1, NY163 and Snowden. Two clones received an overall appearance rating of 7 (good): AF4157-6 and NC470-3. One clone expressed 10% or greater incidence of

IHN: ND7519-1 (13% with an HNR of 7.4). No other internal defects were observed at levels equal to or greater than 10%. External defects observed were: soft rot, sunscald, misshapes, growth cracks, common scab, misshapes, infected lenticels and skin blemishes due to Rhizoctonia.

2. TRS/VGJREC Yield Trials

Yield trial planting at the TRS occurred the first week of April this year and while we typically plant mid to late March this delayed planting, lack of moisture and high late May heat caused these trial to suffer in plant growth and yield.

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

Three of twenty clones in this trial received a merit score between 2.2 and 2.4 rounded to 2(keep): MSAFB605-4 (2.2), B3379-2 (2.4) and MSAFB635-12 (2.4). Atlantic had a marketable yield of 241 cwt/a and seven clones in the trial had higher average marketable yield though only NC669-48 (383 cwt/a) was significantly greater. One clone MSAFB605-4 received an overall appearance score of 8 (better than good). Two clones received an overall appearance score of 7 (good): Atlantic and B3379-1. Atlantic had a specific gravity of 1.085, only one clone had higher gravity, B3379-2 (1.089). Five clones chipped rated 1.5 (excellent to exceptional): BNC821-9, MSAFB605-4, MSAFB609-12, NC727-6 and NC744-4. Two clones expressed 10% or greater incidence of IHN: Atlantic (15% IHN with an HNR of 6.8) and MSAFB635-3 (15% IHN with an HNR of 7.4). Six clones expressed 10% or greater incidence of SR: NC733-7 (13%), NC733-8 (10%) 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 and skin blemishes attributed to Rhizoctonia.

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

Two of seventeen clones in this trial received a merit score between 2.1 and 2.3 rounded to 2(keep): B3403-6 (2.1) and Atlantic (2.3). Atlantic had a marketable yield of 274 cwt/a all other clones in the trial had lower average marketable yields the next highest was Snowden (264 cwt/a. One clone BNC816-3 received an overall appearance score of 8 (better than good) and one clone, B3292-5, received an overall appearance score of 7 (good). Atlantic had a specific gravity of 1.080, three clones had equal or greater gravity: B3403-6 (1.082), BNC811-22 (1.080) and B2869-29 (1.080). Eight clones chipped rated 1.5 (excellent to exceptional): B2904-2, B3382-8, B3403-6, BNC723-4, BNC811-15, Snowden and Waneta. Two clones expressed 10% or greater incidence of hollow heart (HH): BNC811-35 (20%) and B2869-29 (13%). Two clones expressed 10% or greater incidence of BC: B2869-29 (25%) and BNC816-5 (10%). Two clones expressed 10% or greater incidence of SR: B2869-29 (28%) and Snowden (13%). 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, infected lenticels and skin blemishes attributed to Rhizoctonia.

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

All ten clones in this trial received a merit score less than 2.5 and, for this trial, considered either marginal (3) or drop (4). The only clone with a 2.5 was B3381-4 the next lowest merit rating was BNC815-7 (2.9). Atlantic had a marketable yield of 240 cwt/a and three clones in

the trial had higher average marketable yield though none were significantly greater: BNC819-2 (316 cwt/a), Snowden (254 cwt/a) and Brodie (244 cwt/a). One clone MSAFB605-4 received an overall appearance score of 8 (better than good). Two clones received an overall appearance score of 7 (good): B3381-4 and BNC819-2. Atlantic had a specific gravity of 1.076, two clones had higher gravity: BNC819-2 (1.085) and B3381-4 (1.083). Two clones chipped rated 1.5 (excellent to exceptional): B3390-6 and BNC819-2. Only Atlantic (23% IHN with an HNR of 6.7) expressed 10% or greater incidence of IHN. Two clones expressed 10% or greater incidence of HH: BNC819-2 (25%) and BNC726-5 (15%). Atlantic expressed 13% BC and seven clones expressed 10% or incidence of SR: B3385-2 (23%), Brodie (18%), Atlantic (15%), B3390-6 (15%), BNC726-5 (10%), Snowden (10%) and Superior (10%). No other internal defects of 10% or greater incidence were recorded in this trial. Common external defects were soft rot, misshapes, sunscald, growth cracks and secondary.

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

None of the fifteen clones in this trial received a merit score better than 2.6 (round to 3). This was primarily due to high levels of soft rot when grading, no better than good chip scores and some internal defect issues. Six clones had equal or greater average marketable yield than Atlantic (201 cwt/a): Snowden (262 cwt/a), B3012-1 (221 cwt/a), AF5677-4 (206 cwt/a), Kennebec (205 cwt/a), WAF10664-3 (2-5 cwt/a), AF5280-5 (201 cwt/a). Atlantic had a specific gravity of 1.082, all other clones in the trial were lower AF5677-4 was the next highest with a gravity of 1.078. Six of ten clones chipped had a chip rating of 2.0 (good): AF5563-5, AF5677-4, Atlantic, NDAF102629C-4, NY165 and Snowden. Only two clones rated an overall appearance of 7: NDAF102629C-4 and WAF10664-3. Atlantic (65% incidence with an HNR of 6.8) was the only clone to express IHN at 10% or greater incidence. Three clones expressed 10% or greater internal incidence of HH: AF5563-5 (25%), Atlantic (18%) and Yukon Gold (10%). One clone expressed 10% or greater incidence internal incidence of VR, AF5677-4 (28%). Two clones expressed 10% or greater incidence of BC: Katahdin (13%) and NY151 (10%). Four clones expressed SR at 10% or greater incidence: B3012-1 (13%), NY151 (13%), Kennebec (10%) and NDAF102629C-4 (10%). The most common culls were soft rot, misshapes, secondary growth, growth cracks, common scab, sunscald and skin blemishes due to Rhizoctonia.

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

Three of the eighteen clones in this trial received a merit score of less than or equal to 2.4 which rounds to 2: Peter Wilcox (1.8), BNC718-1 (2.2) and Red Endeavor (2.4). The standard, Chieftain, had a marketable yield of 279 cwt/a, six clones had higher average marketable yields: Rosi (413 cwt/a), Peter Wilcox (355 cwt/a), Carolina (319 cwt/a), Red Endeavor (318 cwt/a), Strawberry Paw (316 cwt/a) and BNC718-1 (302 cwt/a). Two clones received an overall appearance scores of 7: Red Endeavor and Strawberry Paw all others were lower. BNC716-1 (45% incidence with an HNR of 6.3) was the only clone to express IHN at 10% or greater incidence. Red LaSoda (25%) was the only clone to express BC at 10% or greater incidence. Three clones expressed SR at 10% or greater incidence: Fenway Red (15%), Strawberry Paw (13%) and BNC839-5 (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)

Three of eleven clones had merit scores of 2.4 or higher: AAF10736-2 (2.3), AF4872-5 (2.4) and Gold Rush (2.4). The standard, Russet Norkotah, had a marketable yield of 129 cwt/A, seven clones had greater average marketable yield and 4 of those were significantly higher: AAF10736-2 (259 cwt/a), NDAF113476CB-3 (260 cwt/a), Gold Rush (234 cwt/a) and AF4872-2 (231 cwt/a). Three clones had appearance scores of 7 (good): AF4872-2, AF6110-3 and TX08352-5Ru. One clone expressed IHN at 10% or greater incidence: Russet Burbank (15% incidence with an HNR of 7.5). One clone, Reveille Russet (10%), expressed BC at 10% or greater incidence. Five clones expressed SR at 10% or greater incidence: Shepody (25%), Russet Norkotah (13%), TX08352-5Ru (13%), AF6110-3 (10%) and NDAF113476CB-3 (10%). No other internal defects were expressed at levels of 10% or greater. Culls were mostly soft rot, misshapes, sunscald, secondary growth, growth cracks and infected lenticels.

Specialty Trial. (Tables 12a and 12b)

One of seventeen clones received a merit score of 2.4, Peter Wilcox. Given the diversity of clones in this trial we included Atlantic (297 cwt/a) as the yield standard but also have Adirondack Blue, Chieftain and Dark Red Norland. None of the clones in the trial had higher average marketable yields than Atlantic. An overall appearance score of 7 (good) was only given to Atlantic. Two clones expressed IHN at 10% or greater incidence: Atlantic (18% incidence with an HNR of 7.5) and Chieftain (13% incidence with an HNR of 7.6). Six clones expressed 10% or greater incidence of SR: Purple Majesty (23%), Purple Pelisse (23%), NC674-32 (18%), Adirondack Blue (10%), All Blue (10%) and Atlantic (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, black leg and secondary growth.

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

Two of fifteen clones received a merit score greater than or equal to 2.4: Vivaldi (2.2) and Soraya (2.3). Yukon Gold the standard yellow flesh only had a marketable yield of 93 cwt/a. Eight of the clones in this trial had significantly higher average marketable yields: Soraya (426 cwt/a), Belmonda (385 cwt/a), Colomba (380 cwt/a), Vivaldi (344 cwt/a), Tyson (278 cwt/a), Arizona (236 cwt/a) and Prada (235 cwt/a). Four clones had overall appearance scores of 7 (good): Baby Loo, Belmonda, Natascha and Soraya. Two clones expressed IHN at 10% or greater incidence: Soraya (18% incidence with an HNR of 7.5) and YP-14-156-1 (13% incidence with an HNR of 7.0). Three clones expressed 10% or greater incidence of HH: Natascha (20%), NC708-3 (20%) and Belmonda (18%). Two clones expressed 10% or greater incidence of BC: Belmonda (20%) and Natascha (18%). Two clones expressed 10% or greater incidence of SR: Colomba (13%) and YP-14-156-1 (10%). No other internal defects were expressed at levels of 10% or greater. Culls were mostly soft rot, misshapes, sunscald, common scab, secondary growth and skin blemishes due to Rhizoctonia.

Two-Replication Trial (Tables 14 and 14b)

All of the experimental clones for this trial came from the University of ME this year. The two-replication trial was designed to gain more robust information on clones that are too early in the pipeline to supply the full amount of seed necessary for a yield trial with four replications but have been trialed in our non-replicated yield trials.

There were twenty-two clones in this trial, ten clones had merit scores at or better than 2.4. Atlantic was chosen as a universal standard for the trial and had an average marketable yield of 252 cwt/a, four clones had higher average marketable yields: WAF14096-5 (324 cwt/a), AF6183-12 (321 cwt/a), NDAF13273-1 (284 cwt/a) and Superior (273 cwt/a). Both Atlantic and NDAF13136Y-5 received a 7 for overall appearance. Only Atlantic expressed IHN in this trial (10% Incidence with an HNR of 8.5. Atlantic (15%) was also the only clone to express incidence of BC. Four clones expressed 10% or greater incidence of SR: Adirondack Blue (15%), AF6287-6 (10%), Snowden (10%) and Superior (10%). No other internal defects were expressed at levels of 10% or greater. Culls were mostly soft rot, misshapes, sunscald, growth cracks, secondary growth, silver scurf, and skin blemishes attributed to Rhizoctonia.

B. Breeding and Early Generation Selection Efforts

NCSU Potato Variety Development Efforts

This year our 1st generation material were divided into single and 3 hill plots depending on tuber quantities coming out of the greenhouse. In our single hill plots we also added the unselected families from Cornell University. The final group of families added to our 1st generation is the Colorado potato beetle(CPB) 4-hill plots, as of this 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 5426 clones, our in-house generated single hill plots included 5256 plots, our CPB 4-hills had 718 plots and the Cornell single hill plots had 4368 for a total of 15768 clones. . In all we selected 1028 (6.5%) 1st generation clones, 397 clones came from our 3-hills, 157 clones from our in-house singles, 102 from the CPB 4-hills and 372 from the Cornell derived materials. Post-harvest selected materials were divided into two groups based on tuber quantity from these counts we will augment our second year plots in 2021 to 10 and 20 hill plots instead of 6 and 12 hills. 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 928 clones in our 6 and 12 hill plots and selected a total of 261 clones (28.1%). In our year 3 plots, we planted 109 clones and selected 34 (31.2%) and in our year 4 plots we planted 29 clones and selected 19 (65.5%).

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

This year because of a difficult 2019 growing season we did not have an 8-hill trial with the University of Maine. We hope 2020 will be better for production in Northern Maine and we will be able to continue this trial in 2021.

Observational Trial.

Sixty-three 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 study 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 eighteen clones (3 out of 52 received a “keep” in 2019). Next year we will see some of the survivors from this trial in replicated yield trials provided they survive selection in ME.

USDA-ARS Trial

This is a multistate selection trial initiated by the USDA-ARS, the institutions/states involved are: The University of Florida (FL), NC State University (NC), USDA-ARS (MD, trial location in ME), Pennsylvania State University (PA) and the University of Maine (ME). Each state received 8 hills of the same 57 clones. All were weighed for total yield, rated for the nine standard NE1731 external ratings, and ten tubers from each plot were cut for internal evaluations as well. At our location we gave 18 clones a merit score of 2.4 (keep) or better (as opposed to only 1 receiving a “keep” rating in 2019 out of 29 clones). Next year we will reevaluate these clones in our non-replicated 25-hill yield trial (Unreplicated trial).

Unreplicated Trial.

Six 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. Only one experimental clone 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

As with the other early generation projects we received 8 hills of 133 clones as well as our battery of 8 standard varieties listed in the other trials. Fifty-eight of the clones evaluated received a merit score of “keep”. Data was returned to Cornell University to aid in the decision for advancement with in their 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, HZPC, Douglas Chemicals and Hanse Seed. Their continuing support is very much appreciated.

Table 1a. Black Gold Farms Tablestock Variety Trial. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 107 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2020

Clone	Merit ² Score	Total Yield cwt/A	Size Distribution by Class ³												1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ⁴
			Marketable Yield				(% of total yield)										
			cwt/A	%Chf.	%Sup.	%Yuk.	1's	2's	3's	4's	5's	Culls					
Alegria	1.7	462	422	114	200	173	8	54	38	0	0	1	91	38	1.072		
Arizona	1.6	518	493	133	231	201	3	38	56	1	0	2	95	57	1.051		
Belmonda	1.6	485	432	117	199	176	10	74	15	0	0	0	89	15	1.072		
Brodie	1.9	386	361	97	168	147	5	44	49	1	0	2	93	50	1.070		
Captain	2.5	444	373	101	173	152	3	24	59	1	0	13	84	60	1.051		
Chieftain	1.8	424	374	100	174	153	8	46	42	0	0	4	88	42	1.063		
CO99076-6R	1.8	365	300	81	138	122	16	54	28	0	0	2	82	28	1.070		
Constance	1.6	544	484	130	224	197	10	61	28	0	0	1	89	28	1.066		
Dark Red Norland	2.8	350	309	83	147	127	10	53	35	0	0	3	88	35	1.063		
Envol	1.9	346	317	86	148	129	7	47	44	0	0	1	92	44	1.073		
Fenway Red	2.1	405	323	87	151	132	17	52	28	0	0	4	80	28	1.061		
Golden Globe	1.9	357	311	84	142	126	10	51	36	0	0	3	87	36	1.062		
Natascha	1.9	471	399	107	185	163	14	73	11	0	0	2	85	11	1.054		
NC587-10	2.3	262	144	39	68	59	43	55	0	0	0	2	55	0	1.076		
NCB2607-3	2.3	203	135	36	62	55	30	66	0	0	0	4	66	0	1.070		
NDAF113484B-1	2.4	343	294	80	136	119	11	51	35	0	0	4	86	35	1.063		
NDAF12143-1	2.4	364	276	74	126	112	21	73	3	0	0	4	76	3	1.067		
Paroli	1.8	551	462	124	215	188	8	50	33	1	0	8	84	33	1.058		
Peter Wilcox	1.9	409	367	99	171	150	7	51	39	0	0	3	90	39	1.071		
Prada	1.9	386	359	98	164	146	5	63	30	0	0	2	93	30	1.055		
Red Endeavor	1.9	414	354	96	164	144	14	59	26	0	0	1	85	26	1.058		
RedLaSoda	2.6	405	373	100	173	152	7	29	60	3	0	1	92	63	1.064		
Soraya	2.0	459	421	114	193	171	7	56	36	0	0	2	92	36	1.056		
Strawberry Paw	1.8	366	329	88	151	134	9	41	49	0	0	1	90	49	1.066		
Superior	2.6	253	224	61	100	90	9	38	50	0	0	3	88	50	1.073		
Yukon Gold	2.4	286	246	67	113	100	8	33	53	0	0	6	86	53	1.074		
Grand Mean		395	342														
CV(%)		10	12														
LSD(k=100)		65	65														

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 107 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2020

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	8	6	7	8	5	7	4	8	6	9	7	0	9.0	0	0	0	0	SS,MS,YF2
Arizona	8	9	9	5	8	8	6	7	5	8	8	8	7	0	9.0	0	0	0	0	SS,SR,MS,GC,YF1
Belmonda	9	9	9	8	7	7	6	7	3	8	5	8	7	0	9.0	3	0	0	0	SS,MS,GC,SR,YF2
Brodie	8	9	9	8	8	7	5	7	5	7	8	8	6	0	9.0	0	0	0	0	GC,SR,SS,CS,MS
Captain	8	9	9	5	8	7	6	7	5	8	8	6	5	3	8.8	0	0	0	0	MS,SS,CS,Pears
Chieftain	9	9	8	6	3	8	5	5	5	7	6	9	6	0	9.0	0	0	0	0	GC,SS,MS
CO99076-6R	6	9	9	5	2	8	7	6	1	7	5	8	8	0	9.0	0	0	0	0	SS,GC,MS,SR,CS,RZ
Constance	8	9	8	6	7	8	6	7	4	8	5	8	6	0	9.0	0	0	0	3	MS,SR,SS,CS,YF1
Dark Red Norland	5	9	8	3	3	8	6	7	5	7	6	7	4	3	8.3	0	5	0	0	SR,MS,SS,GC,varclr
Envol	8	9	8	4	8	8	4	7	4	8	7	8	7	0	9.0	0	0	0	0	SR,SS,GC,CS
Fenway Red	6	9	9	4	2	7	7	7	2	7	5	7	6	0	9.0	0	0	0	3	SS,SR,GC,CS
Golden Globe	5	9	8	4	7	8	6	7	4	8	7	9	7	0	9.0	0	0	0	0	MS,SS,YF1
Natascha	6	9	9	5	7	7	6	7	5	7	6	8	7	0	9.0	0	0	3	0	SS,CS,SR,YF2
NC587-10	6	7	9	4	7	7	5	7	4	8	3	8	7	0	9.0	0	0	0	0	SR,MS,SS,CS,RZ,YF1
NCB2607-3	5	5	8	4	2	8	7	7	2	7	4	9	7	0	9.0	0	0	0	0	GC,SS,MS,YF1
NDAF113484B-1	7	9	8	5	2	8	6	6	3	5	7	8	5	0	9.0	0	0	0	0	GC,MS,SS,SR
NDAF12143-1	9	8	9	7	2	8	6	6	3	7	5	9	5	0	9.0	0	0	0	0	^GC,SS,MS
Paroli	9	9	9	5	7	7	7	7	5	8	8	8	6	0	9.0	0	0	0	0	^GC,SS,MS,SR,YF1.5
Peter Wilcox	6	9	8	5	1	7	6	7	5	8	6	8	7	0	9.0	0	0	0	0	GC,MS,CS,pears,YF1.5
Prada	6	9	8	5	8	8	6	7	8	8	8	9	7	0	9.0	0	0	0	0	SS,MS,YF1
Red Endeavor	9	9	9	5	2	7	7	6	3	8	5	8	7	0	9.0	0	3	0	0	RZ,GC,MS
RedLaSoda	6	9	8	5	3	8	5	7	4	4	7	9	3	0	9.0	0	0	13	3	SS,MS,GC
Soraya	8	9	9	7	7	8	6	7	6	8	7	8	7	8	7.8	5	0	5	0	MS,SS,RZ,GC,YF2
Strawberry Paw	9	9	9	7	2	7	7	6	3	8	6	8	8	0	9.0	0	0	0	3	MS,SS,SR
Superior	5	9	8	4	6	7	5	7	4	6	6	7	5	0	9.0	0	0	5	3	SS,MS,CS,SR
Yukon Gold	8	9	8	5	7	8	6	7	5	8	6	7	6	0	9.0	0	0	0	3	SR,MS,SS,GC,CS,YF1

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 107 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2020

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					
AF4157-6	1.8	346	300	87	11	52	34	0	0	2		87	34	1.069	1.0
AF5040-8	2.5	388	332	96	6	24	60	1	0	9		85	61	1.069	2.0
Atlantic	2.3	384	348	100	7	38	52	0	0	2		91	52	1.072	1.5
BNC182-5	2.4	411	361	104	10	40	47	0	0	2		88	48	1.063	2.0
Elkton	2.4	365	325	94	7	34	53	3	0	4		89	55	1.064	2.0
MSAFB605-4	2.2	324	275	79	14	62	23	0	0	1		85	23	1.065	1.5
MSAFB609-5	2.8	362	304	88	11	46	38	0	0	5		84	38	1.065	2.5
MSAFB635-15	2.0	374	338	98	7	39	52	0	0	2		90	52	1.071	2.0
NC470-3	2.2	381	348	101	7	32	54	5	0	2		91	59	1.073	2.5
NC636-5	2.5	413	317	92	12	45	31	0	0	11		77	31	1.073	2.5
NCB3171-7	2.7	193	115	34	34	57	2	0	0	6		60	2	1.071	2.0
NCB3259-1	2.5	153	73	20	53	43	1	0	0	3		43	1	1.075	2.0
NCB3259-2	2.5	260	215	62	17	52	30	1	0	1		82	30	1.068	2.0
NCB3260-1	2.4	191	128	37	32	59	8	0	0	1		67	8	1.074	2.0
NCB3260-2	3.3	270	169	49	32	57	5	0	0	6		62	5	1.064	2.5
Snowden	1.9	396	359	104	8	39	52	0	0	1		91	52	1.070	1.5
Waneta	2.3	336	299	87	5	24	65	0	0	6		89	65	1.059	1.0
Grand Mean		326	271												
CV(%)		9	11												
LSD(k=100)		47	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; 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 107 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2020

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	
AF4157-6	6	9	9	5	6	6	6	7	3	7	5	8	8	0	9.0	0	0	0	0	SS,CS,RZ,GC
AF5040-8	9	8	8	7	6	6	6	7	4	7	7	7	6	0	9.0	0	0	5	0	MS,SS,CS,GC,SR
Atlantic	6	9	8	5	6	5	6	7	3	7	6	8	7	0	9.0	0	0	18	0	MS,GC,SS,SR
BNC182-5	7	9	8	6	8	7	7	7	2	8	5	8	7	3	8.5	0	0	0	0	SR,MS,SS,CS
Elkton	9	8	8	6	5	5	6	6	5	7	7	8	6	0	9.0	0	0	0	0	SS,GC,CS,RZ
MSAFB605-4	8	8	8	6	6	5	7	7	2	7	5	9	8	0	9.0	0	0	0	0	SS,MS,GC
MSAFB609-5	9	9	8	6	9	7	6	7	7	7	6	8	5	0	9.0	0	0	0	0	SS,MS,GC,SR
MSAFB635-15	8	9	8	6	6	5	6	7	2	7	5	8	7	0	9.0	0	0	0	0	SS,SR
NC470-3	9	9	8	8	5	5	6	6	5	8	7	8	7	0	9.0	0	0	0	0	GC,SS,MS
NC636-5	6	9	9	6	6	6	7	7	3	8	5	5	6	0	9.0	0	0	0	0	CS,SS,SR
NCB3171-7	5	9	9	5	6	7	6	7	3	7	3	6	5	0	9.0	0	0	0	3	CS,RZ,SS
NCB3259-1	5	9	8	7	6	6	6	6	3	8	3	8	6	0	9.0	0	0	0	0	CS,SS,SR,SS
NCB3259-2	6	9	9	9	8	7	7	7	2	7	5	9	7	0	9.0	0	0	0	0	MS,SS,EL
NCB3260-1	5	9	9	7	6	6	6	7	3	8	4	8	6	0	9.0	0	0	0	0	SS,CS,MS,
NCB3260-2	6	9	8	7	8	8	4	7	4	7	4	8	4	3	8.5	0	0	0	0	MS,SS,CS,SR
Snowden	9	9	8	7	5	5	7	7	2	6	6	8	6	0	9.0	0	0	0	0	SS,MS,SR,CS,DAE,DSE
Waneta	7	9	8	5	6	7	6	6	5	8	7	8	6	0	9.0	0	0	0	0	GC,MS,SR,SS,BL

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 of potato clones harvested 112DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2020

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	24 to 48hrs				5 to 7Days	
Atlantic	2.0	346	300	100	10	41	44	2	0	3	87	46	1.074	2.0	3.0	
B2869-29	1.7	366	238	80	34	59	6	0	0	1	65	6	1.080	2.0	2.5	
BNC182-5	1.7	453	388	130	10	42	43	1	0	4	86	44	1.070	2.0	2.0	
CO11023-2W	1.9	318	257	87	14	43	38	0	0	5	81	38	1.064	1.0	2.0	
CO11023-9W	2.5	315	272	92	8	35	49	2	0	6	86	51	1.058	2.0	2.5	
MSW474-1	1.9	413	342	115	15	46	37	0	0	3	83	37	1.065	1.5	2.5	
MSZ063-2	1.9	416	365	122	10	34	52	1	0	3	88	53	1.068	2.0	2.5	
MSZ242-13	1.8	318	277	93	8	33	53	1	0	5	87	54	1.076	2.0	3.5	
ND7519-1	4.0	400	333	112	13	51	32	0	0	4	83	32	1.076	1.5	2.0	
NY162	2.1	314	252	86	10	36	44	0	0	9	81	44	1.065	1.5	2.0	
NY163	1.9	303	253	86	10	48	35	0	0	6	83	35	1.066	1.0	2.0	
Snowden	1.5	392	339	115	11	54	32	0	0	3	87	32	1.074	1.5	2.0	
Grand Mean		363	301													
CV(%)		9	10													
LSD(k=100)		47	46													

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 112 DAP¹ at Black Gold Farms, Gum Neck, Tyrrell Co., NC - 2020

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	6	8	7	0	9.0	6	0	16	0	GC,SS,MS,RZ,Chp(SR)
B2869-29	6	9	8	5	6	7	6	7	2	7	4	8	6	0	9.0	0	0	0	0	MS,CS,SS,Chp(VR)
BNC182-5	9	9	8	7	6	7	6	7	3	7	6	7	6	0	9.0	0	0	0	0	SS,SR,MS,CS,BL
CO11023-2W	6	9	8	4	5	6	5	7	2	8	6	8	7	0	9.0	0	0	0	2	GC,SS,CS,MS
CO11023-9W	8	9	8	7	8	7	6	7	2	8	7	7	5	2	8.8	6	4	4	0	IL,SR,EL,SS,CS,GC,MS
MSW474-1	9	9	8	6	6	5	6	7	2	6	5	8	6	0	9.0	6	0	8	0	SS,MS,CS,SR,Lumpy
MSZ063-2	8	9	8	6	8	7	5	7	3	6	6	8	7	14	8.0	0	4	2	4	SS,SR,GC,MS, Chp(IHN,VR)
MSZ242-13	8	9	8	7	6	5	7	6	2	7	6	9	7	0	9.0	0	0	2	0	GC,SS,MS,Chp(VR)
ND7519-1	7	9	8	6	6	6	5	7	4	8	5	8	6	48	7.4	6	0	10	0	MS,GC,SS,SR
NY162	8	9	8	6	6	6	6	6	5	8	6	8	6	0	9.0	0	0	0	0	MS,SS,CS,SS,pears
NY163	8	9	8	6	8	7	6	7	3	8	6	8	7	0	9.0	0	2	2	2	SS,GC,MS,SR,CS
Snowden	9	9	8	7	5	6	6	7	2	5	5	8	6	0	9.0	0	0	0	0	SS,SR,CS,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 (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 107 DAP¹ at James Brothers Farm, Weeksville, Pasquotank Co., NC - 2020

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	Chip Color ⁵
			cwt/A	%Atl	%Chf.	%Yuk.	1's	2's	3's	4's	5's	Culls				
AF5280-5	2.8	238	174	61	93	282	18	52	20	0	0	11	72	20	1.051	.
AF5819-2	2.8	273	210	75	110	391	13	52	25	0	0	10	77	25	1.053	.
Atlantic	2.2	332	279	100	146	515	9	32	52	0	0	7	84	52	1.074	2.0
Audrey	2.0	259	196	69	107	316	17	55	20	0	0	7	75	20	1.045	.
Belmonda	3.3	41	24	8	13	40	24	37	19	0	0	21	55	19	1.054	.
Brodie	2.6	229	176	66	88	427	16	38	35	1	0	10	74	36	1.056	.
Chieftain	2.4	271	210	77	100	469	19	59	18	0	0	4	77	18	1.060	.
CO99076-6R	2.4	168	130	47	69	266	20	52	22	0	0	6	74	22	1.060	.
Dark Red Norland	2.7	211	130	48	66	272	31	54	8	0	0	8	62	8	1.061	.
Envol	2.8	170	130	47	70	238	13	46	30	0	0	11	76	30	1.065	.
Fenway Red	2.2	290	234	85	128	446	12	35	41	5	0	7	80	46	1.057	.
Golden Globe	2.6	128	86	29	50	109	26	52	7	0	0	15	59	7	1.054	.
Natascha	2.6	146	105	37	59	166	24	58	11	0	0	7	69	11	1.055	.
NC470-3	2.7	231	180	66	96	377	16	51	25	0	0	8	75	25	1.069	2.5
NC587-10	2.4	81	36	12	19	54	51	41	0	0	0	8	41	0	1.066	.
NC606-23	2.4	322	232	84	116	453	19	58	14	0	0	9	72	14	1.064	.
NCB2607-3	2.4	125	64	22	37	94	43	46	1	0	0	10	47	1	1.065	.
ND081571-2R	2.3	255	171	61	93	295	27	59	7	0	0	7	66	7	1.056	.
NDAF102629C-4	2.6	226	163	59	91	300	23	57	14	0	0	6	71	14	1.055	.
NDAF113484B-1	2.3	219	174	63	91	336	18	61	18	0	0	3	79	18	1.057	.
Norland RP	2.4	240	177	65	88	379	21	59	14	0	0	6	73	14	1.057	.
Peter Wilcox	2.3	257	191	68	106	338	22	67	6	0	0	5	73	6	1.064	.
Red Endeavor	2.4	352	265	97	130	572	17	56	18	0	0	8	75	19	1.054	.
Snowden	2.2	288	250	89	136	436	9	50	36	0	0	5	86	36	1.071	2.0
Soraya	2.5	264	187	68	91	402	13	52	16	0	0	19	67	16	1.050	.
Strawberry Paw	2.3	256	204	73	107	360	17	58	21	0	0	4	79	21	1.059	.
Superior	2.4	156	125	43	70	181	15	51	27	0	0	7	78	27	1.061	.
Tacoma	2.5	253	186	64	103	263	16	56	14	0	0	14	70	14	1.054	.
Tokio	2.8	260	170	60	98	268	27	58	5	0	0	10	63	5	1.077	.
Vivaldi	2.6	112	81	29	41	142	19	69	2	0	0	10	71	2	1.055	.
WAF10664-3	3.1	313	222	79	116	403	9	34	36	0	0	20	71	36	1.063	.
Yukon Gold	2.9	85	68	24	39	100	8	52	29	0	0	11	81	29	1.066	.
Grand Mean		220	136													
CV(%)		30	36													
LSD(k=100)		106	96													

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

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

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

⁴ Determined by weight in air / water method.

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 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 107 DAP¹ at James Brothers Farm, Weeksville, Pasquotank Co., NC – 2020

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	9	5	9	8	7	7	2	6	5	7	5	0	9.0	0	0	0	0	SR,BL,SS,RZ,MS
AF5819-2	6	9	9	8	9	8	7	7	4	6	6	8	5	0	9.0	0	0	0	0	SS,SR,MS,GC,RZ,GC
Atlantic	6	9	9	5	6	5	6	7	3	7	6	8	7	0	9.0	0	0	5	0	SR,BL,SS,GC,RZ,MS
Audrey	6	9	9	4	7	8	6	7	5	8	5	8	8	0	9.0	0	0	0	0	SS,RZ,GC,MS,SR,YF2
Belmonda	7	9	9	8	7	8	7	7	5	8	6	8	4	0	9.0	0	0	0	0	^MS,SS,SR,GC,SG,YF2
Brodie	8	9	9	8	9	8	7	7	6	7	7	8	5	0	9.0	0	0	0	0	SS,GC,RZ,MSI
Chieftain	8	9	9	6	3	8	5	7	5	7	5	7	5	3	8.5	0	0	0	0	MS,IL,SR,SS,GC,RZ
CO99076-6R	6	9	9	7	2	7	7	6	2	8	5	8	7	0	9.0	0	0	0	3	MS,SS,SR,GC
Dark Red Norland	5	9	9	3	2	7	7	7	5	7	4	6	5	0	9.0	0	0	0	0	SS,MS,GC,RZ,IL,CS
Envol	5	9	9	5	9	7	5	7	5	8	6	8	5	0	9.0	0	0	0	3	SS,GC,MS,RZ,SR
Fenway Red	5	9	9	6	2	7	7	6	2	7	8	8	7	0	9.0	0	0	0	0	SS,MS,SR,RZ,GC,CS
Golden Globe	5	9	8	4	7	8	7	7	4	8	5	8	6	0	9.0	0	0	0	0	SS,MS,SR,RZ,YF1
Natascha	6	9	8	6	7	7	6	7	5	7	5	8	6	0	9.0	0	0	0	8	MS,SS,EL,IL,SR,YF2.5
NC470-3	7	9	9	8	5	5	6	6	5	8	7	8	7	0	9.0	0	0	0	0	SS,MS,GC,RZ,SR
NC587-10	4	9	9	7	7	8	5	7	5	8	3	8	6	0	9.0	0	0	0	0	SS,MS,CS,RZ,GC,YF1
NC606-23	6	9	9	5	7	8	5	7	5	8	5	7	7	0	9.0	0	0	0	10	SS,MS,SR,YF1.5
NCB2607-3	4	8	8	4	2	7	7	6	2	8	3	8	7	0	9.0	0	0	0	0	GC,SS,RZ,YF1.5
ND081571-2R	7	9	9	5	2	8	7	7	2	7	4	7	7	0	9.0	0	0	0	0	SS,SR,RZ,GC
NDAF102629C-4	8	9	9	6	8	8	7	7	2	6	5	8	5	0	9.0	0	0	0	0	SS,SR,MS,GC,RZ
NDAF113484B-1	7	9	8	5	2	7	6	6	3	7	5	8	6	0	9.0	0	0	0	0	SS,MS,SR,EL
Norland RP	5	9	9	3	2	7	6	7	5	7	5	8	6	0	9.0	0	0	0	0	SS,RZ,GC,SR
Peter Wilcox	5	9	9	6	1	7	6	6	5	8	5	8	7	0	9.0	0	0	0	0	GC,MS,SS,RZ,MS,YF1.5
Red Endeavor	8	9	9	7	2	8	7	6	2	8	6	6	5	0	9.0	0	0	0	0	SR,GC,MS,SR,RZ,SS
Snowden	8	9	9	7	5	5	7	6	3	5	6	8	6	0	9.0	0	0	0	0	SR,MS,SS,RZ,GC,DAE,DSE
Soraya	8	9	9	6	7	8	6	7	6	7	6	8	6	0	9.0	5	0	0	0	SS,SR,RZ,GC,MS,CS,YF2
Strawberry Paw	8	9	8	7	2	7	7	5	3	7	5	8	6	0	9.0	0	0	0	0	SS,MS,RZ,GC
Superior	5	9	8	4	6	7	5	7	4	6	5	8	6	0	9.0	0	0	0	0	MS,SS,SR
Tacoma	9	9	8	5	7	8	5	7	5	8	6	7	7	0	9.0	0	0	0	0	SS,MS,SR,GC,RZ,YF2
Tokio	8	9	9	7	7	7	6	7	5	8	4	8	5	0	9.0	0	0	0	5	MS,SR,SS,EL,GC,CS,RZ,IL,YF1
Vivaldi	7	9	8	7	7	7	7	7	6	8	5	8	6	0	9.0	0	0	0	3	SR,SS,MS,EL,RZ,YF1
WAF10664-3	9	9	9	5	6	6	7	7	2	6	6	8	4	0	9.0	0	0	0	0	^GC,SR,SS,EL,MS,RZ
Yukon Gold	7	9	8	6	7	8	6	7	4	7	6	8	5	0	9.0	0	0	3	0	GC,MS,SS,SR,RZ,YF1

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 109 DAP¹ at Sackett Potatoes, Vandemere, Pamlico Co., NC - 2020

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					
AF4157-6	2.8	331	260	97	12	50	28	0	0	9		78	28	1.070	2.5
Atlantic	2.5	357	275	100	10	42	34	0	0	14		76	34	1.076	2.0
B2869-29	3.0	338	222	83	21	52	13	0	0	13		65	13	1.070	2.5
BNC182-5	3.0	364	231	86	12	39	24	0	0	24		64	24	1.076	2.0
CO011023-2W	2.8	330	239	89	12	39	33	0	0	15		72	33	1.069	2.0
CO011023-9W	3.0	343	258	97	10	30	45	0	0	15		75	45	1.064	2.0
Mackinaw	2.8	385	281	104	11	38	35	0	0	16		73	35	1.073	2.5
MSW474-1	2.3	396	277	103	21	49	20	0	0	10		70	20	1.073	2.0
MSZ063-2	2.5	401	315	119	13	41	38	0	0	9		79	38	1.071	2.5
MSZ242-13	2.1	351	272	102	9	35	43	0	0	13		78	43	1.081	2.0
NC470-3	2.2	462	345	130	17	40	34	1	0	8		75	35	1.075	2.0
NCB3259-2	2.6	287	206	78	21	36	36	0	0	8		72	36	1.072	2.5
ND7519-1	2.5	375	270	104	14	43	30	0	0	14		72	30	1.076	1.5
NY162	2.5	391	301	115	10	34	42	2	0	13		77	44	1.072	2.0
NY163	2.6	347	266	102	11	44	31	2	0	13		76	33	1.069	1.5
Snowden	2.0	408	325	117	15	49	30	0	0	7		78	30	1.077	1.5
Grand Mean		367	271												
CV(%)		12	16												
LSD(k=100)		70	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 109 DAP¹ at Sackett Potatoes, Vandemere, Pamlico Co., NC - 2020

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	
AF4157-6	6	9	9	4	6	6	6	7	3	7	5	8	7	0	9.0	0	0	0	8	SS,SR,MS,CS,RZ
Atlantic	6	8	8	6	6	5	6	7	3	7	6	6	5	3	8.8	0	0	0	3	SS,SR,CS,IL,MS
B2869-29	6	9	8	4	9	7	6	7	3	7	4	6	5	0	9.0	0	0	8	0	SS,SR,GC,MS,IL
BNC182-5	6	9	8	7	7	7	6	7	2	7	5	4	3	0	9.0	0	0	0	8	SR,SS,IL
CO011023-2W	7	9	8	6	6	7	7	7	2	7	6	8	6	3	8.8	0	0	3	3	SS,SR,GC
CO011023-9W	8	9	8	8	9	7	6	7	3	7	6	5	4	0	9.0	3	0	0	0	SS,SR,^IL
Mackinaw	9	9	8	8	6	6	5	7	3	7	6	6	4	0	9.0	0	0	5	3	SR,MS,SS,GC,IL,CS,RZ
MSW474-1	9	9	7	9	5	6	7	7	2	7	5	7	6	0	9.0	0	0	0	3	SS,MS,SR
MSZ063-2	8	9	8	7	9	7	7	7	2	7	6	7	6	3	8.5	0	0	0	5	SR,SS,MS,CS,GC,IL
MSZ242-13	9	9	8	9	5	5	6	7	2	7	6	8	6	0	9.0	0	0	0	0	SS,SR,MS,GC
NC470-3	9	9	9	8	5	5	6	7	5	7	6	8	7	0	9.0	3	0	0	5	SS,SR,GC,MS,IL
NCB3259-2	8	9	9	9	8	7	7	7	2	7	5	8	6	0	9.0	0	0	0	3	SR,MS,SS,IL,RZ,CS
ND7519-1	8	9	9	7	6	6	6	7	5	7	4	7	5	13	8.4	0	0	8	0	SS,SR,MS,GC
NY162	6	9	9	7	6	6	6	7	3	7	7	8	6	0	9.0	0	0	3	8	MS,SS,SR
NY163	7	9	8	7	6	7	6	7	4	8	5	7	5	3	8.5	5	0	8	0	MS,SS,SR
Snowden	9	9	8	7	5	5	7	6	3	5	5	8	6	0	9.0	0	0	0	5	SS,SR,DAE,DSE

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 118 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	2.7	367	299	91	4	24	52	0	0	20		76	52	1.058	.
Atlantic	2.5	270	241	100	5	37	39	0	0	19		76	39	1.085	2.0
B3379-1	2.5	232	210	66	27	62	1	0	0	10		63	1	1.081	2.0
B3379-2	2.4	344	304	97	13	55	21	0	0	11		75	21	1.089	2.0
BNC821-9	2.5	296	232	76	6	30	40	0	0	23		71	40	1.075	1.5
MSAFB605-4	2.2	213	196	68	13	60	19	0	0	8		79	19	1.077	1.5
MSAFB609-12	2.4	349	308	96	11	54	24	0	0	12		78	24	1.078	1.5
MSAFB635-15	2.8	338	275	84	7	35	39	0	0	19		74	39	1.081	2.0
MSAFB635-3	3.5	239	130	47	6	25	20	0	0	50		45	20	1.074	2.5
NC663-21	2.7	392	331	118	12	43	28	0	0	17		71	28	1.067	2.0
NC669-48	2.6	432	383	118	11	43	34	0	0	12		77	34	1.066	2.0
NC727-6	2.9	269	161	60	9	41	9	0	0	41		50	9	1.080	1.5
NC732-4	3.5	185	137	46	16	48	6	0	0	30		54	6	1.060	3.0
NC733-7	3.1	148	106	30	9	50	9	0	0	32		59	9	1.076	2.0
NC733-8	3.1	333	173	66	3	20	25	0	0	52		45	25	1.075	2.0
NC744-4	3.1	206	117	30	6	19	31	0	0	45		50	31	1.076	1.5
NCB3307-9	3.2	266	146	40	10	41	4	0	0	46		44	4	1.076	2.0
NCB3321-2	3.1	177	151	44	19	66	0	0	0	15		66	0	1.071	2.0
Snowden	2.5	333	280	99	8	51	25	0	0	16		76	25	1.076	2.0
Superior	3.0	225	149	58	3	30	28	0	0	39		57	28	1.068	.
Grand Mean		281	216												
CV(%)		24	36												
LSD(k=100)		111	128												

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 118 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	9	6	9	7	5	7	5	6	6	7	5	0	9.0	0	0	0	5	MS,SS,SR,SG
Atlantic	6	9	8	5	6	6	6	6	3	7	6	7	7	15	6.8	0	0	0	8	SR,SS,GC
B3379-1	7	9	9	5	5	5	6	7	2	7	3	8	7	0	9.0	0	0	0	0	SR,SS
B3379-2	9	9	9	7	6	7	6	7	2	8	4	7	5	0	9.0	3	0	0	0	SS,SR,RZ
BNC821-9	8	9	9	9	6	6	5	7	3	7	7	7	6	0	9.0	0	0	0	0	SS,SR,MS,CS
MSAFB605-4	9	9	7	9	5	6	6	7	2	8	4	8	8	5	8.5	0	0	0	0	SR,SS,RZ
MSAFB609-12	9	9	8	8	9	8	6	7	3	7	5	7	5	0	9.0	0	0	0	0	SS,MS,SR
MSAFB635-15	9	9	9	7	5	7	6	7	2	7	6	7	5	0	9.0	0	0	0	5	SS,SR,MS,GC
MSAFB635-3	8	9	8	7	6	6	7	7	2	8	6	4	3	15	7.4	0	0	0	0	SR,SS
NC663-21	6	9	8	8	6	7	6	7	4	6	5	6	5	0	9.0	0	0	0	0	SR,SS,MS,SG
NC669-48	7	9	8	8	6	7	6	7	3	7	6	7	6	0	9.0	3	0	0	5	MS,SS,SR,CS,SG
NC727-6	6	9	9	5	6	7	6	7	4	8	5	4	4	0	9.0	0	0	0	3	^SR,SS,MS
NC732-4	8	9	9	8	6	7	6	7	4	6	4	6	3	0	9.0	0	3	0	0	^SR,MS,SS
NC733-7	5	9	9	6	5	7	6	7	5	8	5	6	5	0	9.0	0	0	0	13	SR,SS,SG
NC733-8	7	9	9	6	6	6	5	7	4	7	7	4	3	0	9.0	0	0	0	10	^SR,SS,MS
NC744-4	7	8	9	8	6	7	6	7	3	7	5	5	4	3	8.5	0	0	3	5	SS,SR,RZ,MS,SG
NCB3307-9	6	9	8	5	6	6	7	7	5	8	5	5	4	0	9.0	0	0	3	3	SS,SR,CS
NCB3321-2	7	6	8	7	6	7	4	7	6	8	4	7	5	0	9.0	0	0	0	8	MS,SR,SS,CS
Snowden	9	9	8	7	5	5	6	7	3	5	5	8	6	0	9.0	0	0	0	10	SS,SR,MS
Superior	5	9	8	4	6	7	4	7	4	6	6	7	5	0	9.0	0	0	0	5	SR,MS,SS,RZ

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

² See NE1231 Standard Potato Rating System for key to scores in Appendix 2.

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

⁴ See Appendix 3 for Comment Codes

Table 7a. Round White Two 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 - 2020

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	2.3	335	274	100	4	28	53	1	0	14	82	54	1.080	2.0
B2869-29	4.0	211	151	55	11	31	29	0	0	29	60	29	1.080	2.0
B2904-2	2.9	277	208	76	6	25	46	3	0	20	74	49	1.074	1.5
B3292-5	2.9	297	252	91	7	32	53	0	0	9	85	53	1.061	2.5
B3382-8	2.8	336	206	77	15	44	17	0	0	24	61	17	1.074	1.5
B3403-6	2.1	334	244	91	14	50	22	0	0	14	72	22	1.082	1.5
BNC723-4	3.0	327	207	77	7	33	27	0	0	33	60	27	1.068	1.5
BNC811-15	2.6	314	221	84	13	55	15	0	0	17	70	15	1.076	1.5
BNC811-17	3.3	280	166	59	5	20	34	2	0	38	57	37	1.069	2.5
BNC811-22	2.6	323	192	69	11	36	22	0	0	31	58	22	1.080	2.0
BNC811-33	3.1	292	157	61	7	24	28	0	0	41	52	28	1.070	1.5
BNC811-35	3.0	340	216	78	5	25	36	0	0	33	61	36	1.067	2.0
BNC816-3	2.6	276	214	74	9	44	32	0	0	15	77	32	1.068	2.0
NC636-5	2.9	258	155	56	10	40	19	0	0	30	59	19	1.077	2.5
Snowden	2.7	334	264	99	5	41	38	1	0	16	79	39	1.074	1.5
Superior	3.2	215	163	61	6	32	43	0	0	19	75	43	1.067	.
Waneta	2.7	257	173	65	4	28	39	0	0	29	67	39	1.070	1.5
Grand Mean		299	200											
CV(%)		23	36											
LSD(k=100)		116	116											

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 115 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	9	6	6	5	6	6	3	7	6	6	6	0	9.0	0	0	0	0	SR,SS,MS,GC
B2869-29	6	9	8	5	6	7	7	7	2	7	4	5	5	0	9.0	13	0	25	28	SS,SR,MS,CS,RZ
B2904-2	6	9	8	5	8	6	6	7	3	7	6	7	5	0	9.0	8	0	8	3	SS,SR,MS,GC,SG
B3292-5	8	7	8	8	6	6	6	7	2	8	5	8	7	0	9.0	5	0	5	0	SR,GC,MS,SS,SG
B3382-8	6	9	8	5	6	7	6	7	2	8	4	6	5	0	9.0	0	3	0	3	SS,SR,MS,GC,SG,CS
B3403-6	8	9	9	8	6	6	6	7	2	7	3	7	6	0	9.0	0	0	0	3	SR,SS,RZ,SG,GC
BNC723-4	9	9	8	7	6	6	5	7	5	7	6	5	3	0	9.0	3	0	0	3	SR,SS,MS,IL,CS
BNC811-15	7	7	9	6	6	7	5	7	4	8	5	7	5	0	9.0	0	0	0	0	SR,SS,MS,IL,RZ
BNC811-17	6	8	9	6	6	6	5	7	5	8	8	7	5	0	9.0	3	0	0	0	SG,SR,MS,SS,CS,GC
BNC811-22	6	7	9	7	6	6	6	7	5	7	5	7	6	0	9.0	0	0	3	0	SS,SR,MS,RZ
BNC811-33	6	9	8	6	5	6	6	7	4	7	6	5	3	0	9.0	0	0	5	5	MS,SR,SS,GC
BNC811-35	8	9	8	7	6	6	7	7	2	7	5	7	6	0	9.0	20	0	0	3	SR,SS,IL,MS
BNC816-3	8	8	9	7	5	5	7	7	2	7	5	8	8	0	9.0	0	0	10	3	SR,SS
NC636-5	6	9	8	6	6	6	6	7	3	7	5	8	6	0	9.0	0	0	0	0	SR,SS,CS
Snowden	9	9	8	7	5	6	5	6	3	6	5	7	5	0	9.0	0	0	3	13	SR,SS,MS,DAE,DSE
Superior	5	8	8	4	6	7	4	7	4	6	5	6	4	0	9.0	0	0	0	3	SR,MS,SS,BL
Waneta	6	9	8	6	6	8	5	7	5	8	8	7	6	0	9.0	3	0	3	0	SR,SS,MS

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

² See NE1231 Standard Potato Rating System for key to scores in Appendix 2.

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

⁴ See Appendix 3 for Comment Codes

Table 8a. Round White Three Trial. Total and marketable yield, percentage of total yield by size class, specific gravity and chip scores of potato clones of potato clones harvested 122 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	4.0	358	240	100	6	29	36	0	0	28	65	36	1.076	2.0
B3381-4	2.5	338	219	97	11	43	22	0	0	24	64	22	1.083	2.0
B3385-2	3.5	255	115	50	7	28	17	0	0	49	44	17	1.072	2.0
B3390-6	3.2	281	165	85	6	30	27	0	0	36	57	27	1.068	1.5
BNC726-5	3.3	247	115	57	14	35	11	0	0	40	46	11	1.074	2.0
BNC815-7	2.9	223	120	50	21	47	5	0	0	27	52	5	1.070	2.0
BNC819-2	4.0	414	316	148	12	44	33	0	0	12	76	33	1.085	1.5
Brodie	3.0	362	244	127	5	28	34	3	0	30	65	38	1.071	2.5
Snowden	3.0	362	254	118	7	44	26	0	0	23	69	26	1.073	2.0
Superior	3.5	289	178	85	6	31	30	0	0	34	61	30	1.064	2.5
Grand Mean		313	196											
CV(%)		19	32											
LSD(k=100)		103	120											

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 122 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	5	7	5	23	6.7	3	0	13	15	SR,SS,MS,GC
B3381-4	6	9	9	6	5	5	7	7	2	7	4	7	7	0	9.0	0	0	0	8	SR,SS,MS,YF1
B3385-2	6	9	9	5	6	7	5	7	4	8	5	5	3	0	9.0	3	0	0	23	SR,GC,MS,SS
B3390-6	6	9	8	6	6	6	6	7	5	8	6	7	4	0	9.0	3	0	3	15	SR,SS,MS,GC
BNC726-5	6	9	8	6	6	7	6	7	4	7	4	6	3	0	9.0	15	0	0	10	SR,MS,SS,SG,V
BNC815-7	7	9	8	7	6	7	6	7	3	8	4	7	6	3	8.8	0	0	0	0	SR,SS
BNC819-2	9	9	9	9	5	5	7	7	2	7	5	8	7	3	8.8	25	3	0	0	MS,SS,GC,SR
Brodie	9	9	8	7	9	7	5	7	4	7	6	7	6	0	9.0	0	0	0	18	SR,SS,MS,CS
Snowden	9	9	8	7	5	5	6	6	3	5	6	5	4	0	9.0	0	0	0	10	SR,SS,MS,DAE,DSE
Superior	5	9	8	4	6	7	4	7	5	6	5	6	3	0	9.0	0	0	5	10	SR,SS,MS

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

² See NE1231 Standard Potato Rating System for key to scores in Appendix 2.

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

⁴ See Appendix 3 for Comment Codes

Table 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 122 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	2.9	307	201	101	6	24	40	0	0	31	63	40	1.061	.
AF5563-5	3.0	267	169	86	2	14	49	0	0	34	63	49	1.073	2.0
AF5677-4	2.8	287	206	101	5	20	49	0	0	26	69	49	1.078	2.0
Atlantic	4.0	317	201	100	5	25	38	0	0	32	63	38	1.082	2.0
B3012-1	2.9	303	221	113	11	45	27	0	0	17	72	27	1.074	2.5
Katahdin	3.1	215	129	66	7	27	30	0	0	36	57	30	1.060	.
Kennebec	3.1	322	205	101	3	23	38	0	0	36	61	38	1.068	.
NDAF102629C-4	3.0	240	163	79	6	30	35	0	0	29	65	35	1.067	2.0
NY149	2.7	209	128	64	12	42	18	0	0	29	59	18	1.072	.
NY151	3.8	258	129	64	4	16	33	0	0	46	49	33	1.063	2.5
NY165	3.1	250	137	69	8	33	21	0	0	38	54	21	1.074	2.0
Snowden	2.6	356	262	130	4	27	46	0	0	23	73	46	1.076	2.0
Superior	3.2	245	174	88	5	31	41	0	0	24	71	41	1.069	3.0
WAF10664-3	3.0	288	205	104	7	35	36	0	0	21	71	36	1.070	2.5
Yukon Gold	3.2	210	138	69	2	13	51	2	0	32	66	53	1.071	.
Grand Mean		272	178											
CV(%)		20	33											
LSD(k=100)		87	99											

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 122 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	7	9	8	6	9	7	6	7	3	7	5	6	5	0	9.0	5	0	0	8	SR,MS,SS,SG,RZ
AF5563-5	8	9	8	7	6	8	5	7	3	6	7	7	6	0	9.0	25	0	0	5	SR,SS,MS,GC
AF5677-4	8	9	8	6	8	7	6	7	3	7	6	6	6	0	9.0	0	28	0	3	SR,SS,MS,RZ
Atlantic	6	9	8	5	6	5	6	6	3	7	6	7	5	65	6.8	18	0	5	3	SR,SS,GC,MS
B3012-1	6	9	8	5	6	6	5	7	4	7	5	7	6	0	9.0	0	0	0	13	SR,RZ,MS,SS,SG
Katahdin	9	9	7	8	9	7	5	7	5	6	6	7	5	0	9.0	0	0	13	3	SR,SS,MS
Kennebec	9	9	8	9	8	7	5	7	6	7	7	7	3	0	9.0	0	0	0	10	MS,SR,SG,SS,GC,RZ
NDAF102629C-4	8	9	8	8	9	8	6	7	3	7	5	7	7	0	9.0	0	3	0	10	SR,SS,GC,MS
NY149	8	9	8	6	7	7	5	7	4	8	5	7	6	0	9.0	0	0	3	3	SR,SS,IL,SG,MS
NY151	8	9	8	8	6	7	6	7	2	7	6	5	4	8	8.7	0	0	10	13	SR,SS,MS,GC,RZ,CS
NY165	9	9	8	8	6	6	5	7	3	8	4	6	5	3	8.8	0	0	0	8	SR,SS,MS
Snowden	9	9	8	7	5	5	5	6	3	5	6	7	5	5	8.5	0	0	3	0	SR,SS,MS,CS,DAE,DSE
Superior	5	9	8	4	6	7	4	7	4	6	5	8	5	0	9.0	0	0	0	3	SR,MS,SS,GC
WAF10664-3	7	9	8	8	6	7	6	7	2	6	5	7	7	8	7.6	0	3	8	0	SR,MS,SS,SG
Yukon Gold	8	9	8	6	7	7	6	7	5	8	6	7	5	0	9.0	10	3	3	3	SR,MS,SS,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 10a. NE-1731 Red Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 115 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC – 2020

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			
B2152-17	2.8	263	176	66	13	54	12	0	0	20	66	12	1.063
BNC559-1	2.3	316	257	96	11	52	28	0	0	8	81	28	1.057
BNC716-1	4.0	262	183	66	3	23	46	0	0	27	69	46	1.048
BNC718-1	2.2	345	302	110	3	31	56	0	0	10	87	56	1.062
BNC839-5	3.1	244	154	62	9	41	21	0	0	29	62	21	1.056
Carolina	2.8	437	319	108	5	39	29	0	0	27	67	29	1.053
Chieftain	3.2	378	279	100	5	28	45	0	0	22	73	45	1.057
Dark Red Norland	3.3	268	163	55	5	36	21	0	0	38	57	21	1.057
Elmo	2.8	370	278	99	5	37	34	0	0	25	70	34	1.048
Fenway Red	3.4	416	256	100	6	32	27	0	0	34	59	27	1.058
NC709-2	3.1	153	114	46	10	71	3	0	0	16	74	3	1.064
NCB2607-3	2.8	178	88	34	25	49	0	0	0	26	49	0	1.066
NDAF113484B-1	2.7	258	175	67	7	49	18	0	0	26	67	18	1.055
Peter Wilcox	1.8	401	355	136	7	50	38	0	0	5	88	38	1.063
Red Endeavor	2.4	401	318	124	9	55	23	0	0	13	78	23	1.053
RedLaSoda	3.5	329	251	94	4	25	50	0	0	21	75	50	1.055
Rosi	2.5	543	413	152	5	55	21	0	0	19	76	21	1.060
Strawberry Paw	2.5	388	316	119	6	40	41	0	0	13	81	41	1.062
Grand Mean		331	244										
CV(%)		23	34										
LSD(k=100)		125	139										

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 115DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	
B2152-17	6	8	8	5	2	7	7	7	2	7	4	6	6	0	9.0	0	0	3	3	SR,SS,MS,SG,RZ,YF1
BNC559-1	6	9	8	7	1	7	5	6	5	7	5	7	6	0	9.0	0	0	0	3	SR,SS,MS,GC,RZ
BNC716-1	8	9	9	7	2	6	6	7	5	8	6	8	5	45	6.3	0	0	5	0	SS,SR,GC,SG,YF1.5
BNC718-1	8	9	9	7	1	7	6	6	4	7	7	8	6	0	9.0	0	0	0	0	SS,SR,GC,MS,YF1
BNC839-5	9	9	9	7	2	8	5	6	3	8	4	6	5	0	9.0	0	0	0	10	SR,SS,MS
Carolina	8	9	9	6	3	8	5	7	6	7	8	7	3	0	9.0	0	0	0	0	SG,HS,MS,SS,SR
Chieftain	9	9	8	6	3	8	6	6	5	7	6	7	4	8	8.5	0	0	0	0	SR,SS,SG,MS,GC
Dark Red Norland	5	9	7	4	2	7	6	7	6	7	5	5	4	0	9.0	0	0	0	5	SR,SS,MS,GC
Elmo	6	9	8	6	3	7	4	7	5	7	6	7	5	3	8.8	0	0	5	5	SR,SS,MS
Fenway Red	6	9	9	6	2	6	7	6	2	7	6	6	4	0	9.0	0	0	3	15	SR,SS,MS,SG
NC709-2	5	9	8	5	7	6	4	7	5	8	5	8	5	3	8.3	0	0	0	8	SR,SS,CS
NCB2607-3	6	6	8	4	2	7	7	7	2	8	3	8	6	0	9.0	0	0	0	3	SISC,MS,SR,SS,GC,YF1.5
NDAF113484B-1	6	8	8	5	2	8	7	6	3	7	6	7	6	3	8.5	0	0	0	0	SR,MS,SS
Peter Wilcox	6	9	8	5	1	7	6	6	5	7	6	8	6	0	9.0	0	0	0	0	SR,SS,MS,SISC,YF2
Red Endeavor	6	9	8	6	2	7	7	7	2	8	5	7	7	0	9.0	0	0	0	5	SR,SS
RedLaSoda	6	9	6	5	3	7	5	6	5	5	7	8	3	0	9.0	5	0	25	8	SR,SS,MS
Rosi	9	9	8	8	3	8	6	7	7	8	7	7	5	0	9.0	0	0	3	3	SR,MS,SS,RZ
Strawberry Paw	9	9	9	7	2	7	6	5	5	8	6	8	7	0	9.0	0	0	0	13	SS,SR,MS,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 11a. NE-1731 Russet Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 122 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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			
AAF10736-2	2.3	352	259	292	7	60	12	0	0	21	72	12	1.068
AF4872-2	2.4	316	231	195	4	36	37	0	0	24	73	37	1.064
AF5406-7	2.6	262	178	150	3	62	6	0	0	29	68	6	1.061
AF6110-3	2.8	273	158	176	3	38	19	0	0	40	57	19	1.066
Gold Rush	2.4	306	234	195	6	40	35	0	0	19	75	35	1.060
NDAF113476CB-3	2.9	342	260	171	3	48	28	0	0	21	76	28	1.071
Reveille Russet	3.4	210	97	95	4	26	16	0	0	54	42	16	1.054
Russet Burbank	3.6	203	74	57	7	36	0	0	0	57	36	0	1.059
Russet Norkotah	2.8	217	129	100	4	35	23	0	0	38	58	23	1.061
Shepody	3.5	237	121	108	4	38	12	0	0	46	50	12	1.063
TX08352-5Ru	2.5	261	177	162	4	45	22	0	0	30	66	22	1.055
Grand Mean		270	166										
CV(%)		20	35										
LSD(k=100)		88	102										

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

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

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

⁴ Determined by weight in air / water method.

Table 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 122 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	
AAF10736-2	8	9	9	7	5	3	6	7	6	7	5	7	6	0	9.0	0	0	0	0	SR,MS
AF4872-2	6	9	9	6	5	3	7	7	6	8	7	7	7	0	9.0	0	0	0	3	SR,SS,GC,MS
AF5406-7	9	9	8	8	5	4	6	7	8	8	6	7	6	0	9.0	3	0	0	5	MS,SR,SS,GC,MS,RZ,SG
AF6110-3	9	9	8	8	5	3	7	7	6	8	7	8	7	0	9.0	0	0	0	10	SR,MS,SS
Gold Rush	6	9	8	5	4	2	5	7	7	8	7	8	6	0	9.0	0	0	0	8	SS,SR,MS,GC
NDAF113476CB-3	8	9	9	7	5	2	6	7	7	8	6	8	5	0	9.0	0	0	0	10	SR,SS,SG,MS
Reveille Russet	8	9	8	9	5	3	6	6	7	7	8	7	4	0	9.0	3	0	10	5	MS,SR,SS,GC,SG
Russet Burbank	9	9	9	9	6	1	6	7	7	8	6	8	2	15	7.5	0	0	0	3	MS,SS,SR,SG,GC
Russet Norkotah	6	9	8	5	4	3	6	7	8	8	7	7	6	0	9.0	0	3	0	13	SR,SS,MS
Shepody	6	9	8	6	9	7	6	7	8	8	8	6	4	0	9.0	3	0	0	25	SR,MS,IL,SS,SG
TX08352-5Ru	7	9	8	6	5	3	7	7	7	7	7	8	7	0	9.0	0	0	0	13	SR,MS,SS,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 12a. Specialty Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 118 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	3.3	202	140	53	7	55	14	0	0	24	69	14	1.061
Adirondack Red	2.7	209	154	54	12	68	6	0	0	14	73	6	1.064
All Blue	3.3	219	113	44	32	51	0	0	0	17	51	0	1.062
Amarosa	3.3	256	47	18	41	18	0	0	0	41	18	0	1.060
Atlantic	2.6	390	297	100	5	26	56	0	0	13	82	56	1.080
B3355-6	2.5	200	131	46	25	65	0	0	0	11	65	0	1.063
B3364-3	3.1	229	154	60	10	66	0	0	0	24	66	0	1.059
BNC833-2	2.6	168	118	36	8	63	0	0	0	29	63	0	1.065
Chieftain	3.3	313	209	77	8	28	37	0	0	27	66	37	1.058
Dark Red Norland	3.1	280	173	58	7	34	23	0	0	36	57	23	1.058
NC509-16	2.5	216	158	60	10	66	6	0	0	18	72	6	1.069
NC674-32	3.5	295	144	49	11	42	3	0	0	45	44	3	1.075
NC738-2	2.8	223	129	49	7	35	23	0	0	36	58	23	1.076
NC754-5	2.8	62	20	6	60	28	0	0	0	12	28	0	1.073
Peter Wilcox	1.9	313	256	84	12	63	17	0	0	8	80	17	1.065
Purple Majesty	3.4	165	96	42	26	54	0	0	0	20	54	0	1.064
Purple Pelisse	3.4	108	34	15	52	31	0	0	0	17	31	0	1.062
Grand Mean		236	141										
CV(%)		25	44										
LSD(k=100)		96	101										

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 118 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	6	8	8	5	1	7	5	7	5	6	7	6	4	0	9.0	3	0	0	10	SISC,SR,BL,MS
Adirondack Red	6	9	7	5	2	8	4	7	6	7	7	7	5	0	9.0	0	0	0	3	SR,SISC,SS,CS,BL,MS
All Blue	8	9	8	8	1	7	6	7	8	6	5	7	3	0	9.0	0	0	0	10	SS,SR,CS,MS,SISC,BL
Amarosa	9	9	8	9	1	8	6	7	8	7	5	6	1	0	9.0	0	0	0	3	SG,MS,SR,SS
Atlantic	6	9	8	5	6	5	6	6	3	7	6	7	7	18	7.5	0	0	5	10	SS,SR,GC
B3355-6	6	9	8	5	1	8	6	7	3	6	4	8	6	0	9.0	0	0	0	5	SR,CS,MS
B3364-3	8	7	9	7	1	8	7	7	6	6	5	7	4	0	9.0	0	0	0	3	SR,MS,SISC,GC,SS
BNC833-2	5	9	7	5	1	7	7	7	5	8	5	6	6	0	9.0	0	0	0	3	SR,SISC
Chieftain	9	9	8	6	3	8	6	7	5	7	7	7	4	13	7.6	0	0	3	8	SR,SG,MS,SS,GC
Dark Red Norland	5	9	7	4	3	7	6	7	4	7	5	5	3	0	9.0	0	0	0	5	SS,SR,MS
NC509-16	7	9	8	6	1	8	6	7	4	7	5	8	6	0	9.0	0	0	0	5	SR,MS,SG
NC674-32	6	9	8	7	1	7	4	7	3	7	5	4	2	0	9.0	3	0	0	18	SG,MS,SR,PF2
NC738-2	6	9	8	5	7	7	6	7	4	7	6	6	6	5	8.5	0	0	0	8	SR,SS,GC,MS
NC754-5	7	8	8	7	1	8	6	7	3	8	3	8	5	0	9.0	0	0	0	0	SR,SISC,MS,PF3
Peter Wilcox	6	9	9	5	1	7	6	7	5	7	6	8	6	0	9.0	0	0	0	0	SR,MS,SS,YF2
Purple Majesty	6	8	7	5	1	7	6	7	5	7	5	6	4	0	9.0	0	0	0	23	SR,SS,SISC,MS,SG,PF2
Purple Pelisse	6	9	8	6	1	8	6	7	7	8	3	6	5	0	9.0	0	0	0	23	SR,SISC,MS,PF2

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

² See NE1231 Standard Potato Rating System for key to scores in Appendix 2.

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

⁴ See Appendix 3 for Comment Codes

Table 13a. Yellow Flesh Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 115 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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			
Arizona	2.5	335	236	513	4	34	34	0	0	28	68	34	1.046
BabyLoo	2.5	231	73	119	62	31	0	0	0	7	31	0	1.061
Belmonda	2.5	474	385	771	6	42	38	0	0	13	80	38	1.060
Colomba	2.8	524	380	764	4	35	36	0	0	25	71	36	1.048
Constance	3.1	232	174	303	5	47	29	0	0	20	76	29	1.059
Natascha	2.9	338	249	445	9	63	10	0	0	18	73	10	1.052
NC606-23	3.1	242	154	292	12	62	1	0	0	25	63	1	1.061
NC708-3	3.0	223	168	180	9	75	0	0	0	16	75	0	1.070
Paroli	2.6	318	201	404	6	36	30	0	0	29	66	30	1.054
Prada	2.6	304	235	508	4	77	0	0	0	19	77	0	1.055
Soraya	2.3	510	426	748	6	54	29	0	0	11	83	29	1.047
Tyson	3.3	490	278	577	6	29	28	0	0	37	57	28	1.059
Vivaldi	2.2	430	344	573	4	43	36	0	0	17	79	36	1.058
YP-14-156-1	3.6	326	126	342	2	36	0	0	0	62	36	0	1.069
Yukon Gold	3.5	158	93	100	12	28	22	0	0	37	50	22	1.065
Grand Mean		346	237										
CV(%)		20	39										
LSD(k=100)		112	128										

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 115 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	
Arizona	6	9	8	7	7	8	5	7	6	8	8	6	6	0	9.0	0	0	3	3	SR,SS,MS
BabyLoo	6	9	6	5	7	8	7	7	5	8	2	7	7	0	9.0	0	5	0	0	IL,SR,MS
Belmonda	9	9	9	8	7	8	6	7	3	7	6	7	7	0	9.0	18	0	20	0	SR,SS,SG,HS
Colomba	6	9	7	5	7	8	6	7	5	8	6	5	5	3	8.8	0	0	0	13	^SR,SS,SG,HS,MS
Constance	6	9	7	7	7	7	6	7	4	8	6	7	5	8	8.5	0	0	0	3	^SR,SS
Natascha	6	9	8	6	7	7	6	7	5	7	5	8	7	0	9.0	20	0	18	0	SS,SR,SG
NC606-23	5	9	8	5	7	6	4	7	5	8	5	7	5	3	8.8	3	0	3	0	SR,SS,CS
NC708-3	6	9	9	6	7	7	6	7	7	8	7	8	6	0	9.0	20	0	0	0	SR,SS,MS
Paroli	6	9	8	5	7	8	6	7	4	8	7	6	6	0	9.0	0	0	0	3	SR,SS
Prada	5	9	7	5	7	8	5	7	7	8	7	7	6	0	9.0	0	3	3	5	SR,SS,MS
Soraya	6	9	8	7	7	8	6	7	6	8	6	8	7	18	7.5	3	0	3	0	SR,SS,MS,SG,RZ
Tyson	8	9	8	8	7	7	6	7	4	8	7	8	3	8	8.4	0	0	8	3	SG,SR,SS
Vivaldi	9	9	7	7	7	7	6	7	6	8	5	7	6	3	8.8	0	0	0	0	SR,SS,MS,CS
YP-14-156-1	9	9	8	9	7	8	6	7	7	8	7	6	3	13	7.0	0	3	0	10	SR,MS,SS,SG,HS,RZ
Yukon Gold	8	9	7	5	7	7	6	7	5	8	5	6	4	0	9.0	8	0	3	5	CS,SS,SR,MS,SG

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

² See NE1231 Standard Potato Rating System for key to scores in Appendix 2.

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

⁴ See Appendix 3 for Comment Codes

Table 14a. Two Replication Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity, of potato clones harvested 104 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	%Atl.	1's	2's	3's	4's	5's	Culls			
Adirondack Blue	3.3	222	174	71	13	62	16	0	0	10	78	16	1.057
AF6183-12	2.1	393	321	127	10	33	46	3	0	9	81	49	1.065
AF6194-4	2.3	237	208	82	7	36	52	0	0	6	87	52	1.062
AF6199-5	2.6	254	177	72	20	53	15	0	0	11	68	15	1.061
AF6251-3	2.9	139	87	34	24	57	5	0	0	14	63	5	1.084
AF6286-1	2.1	286	245	98	11	53	32	0	0	3	86	32	1.054
AF6287-6	2.6	182	145	58	15	71	9	0	0	6	80	9	1.058
AF6289-2	2.3	150	128	52	14	76	10	0	0	1	86	10	1.060
Atlantic	2.4	304	252	100	8	37	43	3	0	9	83	46	1.076
Chieftain	2.5	295	247	99	8	39	44	0	0	8	84	44	1.058
COAF14107-1	2.6	321	234	93	14	54	19	0	0	13	73	19	1.064
Dark Red Norland	3.0	230	167	66	12	42	30	0	0	16	73	30	1.055
Envol	2.3	259	228	92	6	24	62	3	0	5	89	65	1.066
NDAF13136Y-5	2.3	263	224	88	8	37	46	0	0	8	84	46	1.065
NDAF13176CB-2	3.0	153	83	33	33	48	5	0	0	13	53	5	1.067
NDAF13273-1	2.0	359	284	113	9	45	34	0	0	12	79	34	1.058
NDAF13296Y-3	3.0	308	220	88	7	27	41	4	0	21	72	45	1.058
NDAF13296Y-4	2.5	216	174	66	17	37	37	0	0	9	74	37	1.060
Snowden	2.9	256	200	79	16	57	20	0	0	6	78	20	1.075
Superior	2.4	308	273	109	6	34	55	0	0	6	88	55	1.067
WAF14096-5	1.9	386	324	129	11	46	38	0	0	5	84	38	1.067
Yukon Gold	3.0	63	53	21	8	14	70	0	0	8	84	70	1.071
Grand Mean		254	202										
CV(%)		23	28										
LSD(k=100)		141	136										

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 14b. Two Replication Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, and external and internal tuber attributes of potato clones harvested 104 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2020

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	7	8	4	1	7	5	7	6	6	7	5	4	0	9.0	0	0	0	15	SR,MS,GC,SISC,PF2
AF6183-12	9	9	9	9	3	7	6	7	3	7	5	9	4	0	9.0	0	0	0	0	SG,GC,MS,SS,EL
AF6194-4	9	9	7	7	6	7	6	7	4	7	6	8	6	0	9.0	0	0	0	0	MS,SS,SR,GC
AF6199-5	9	9	7	8	6	8	6	7	3	7	4	6	5	0	9.0	0	0	0	0	SR,SS,SG,HS,YF2
AF6251-3	8	7	8	7	6	7	5	7	4	7	4	7	5	0	9.0	0	0	0	0	SR,SS,MS,IL,BL
AF6286-1	6	8	8	8	1	7	7	7	3	6	5	8	5	0	9.0	0	0	0	0	SR,MS,SS,RZ,PF1
AF6287-6	8	8	9	6	1	6	6	7	2	7	4	8	6	0	9.0	0	0	0	10	SR,SS,MS,PF1
AF6289-2	5	8	7	5	2	8	6	7	5	7	4	8	6	0	9.0	0	0	0	5	SR,SS
Atlantic	6	9	8	5	6	5	6	6	3	7	6	8	7	10	8.5	5	0	15	0	SR,SS,MS,GC,RZ
Chieftain	9	8	8	6	3	8	5	6	5	8	5	8	4	0	9.0	0	0	0	0	MS,SS,SG,RZ
COAF14107-1	8	9	8	8	2	7	6	6	2	7	4	6	5	0	9.0	0	0	0	0	SR,MS,SS,GC,SISC
Dark Red Norland	5	7	7	4	2	7	7	7	4	7	7	8	5	0	9.0	0	0	0	0	SR,SS,MS,GC
Envol	6	8	8	4	8	7	5	7	5	8	6	8	5	0	9.0	0	0	0	0	SS,SR,MS
NDAF13136Y-5	6	9	9	5	2	7	6	7	2	8	5	8	7	0	9.0	0	0	0	0	SS,SR,GC,SISC
NDAF13176CB-2	9	8	8	7	2	8	7	7	2	8	3	8	5	0	9.0	0	0	0	5	MS,SS,SR,RZ
NDAF13273-1	6	9	9	7	2	8	6	6	5	8	4	8	6	0	9.0	0	0	0	0	MS,GC,SS,SR
NDAF13296Y-3	8	8	8	9	3	8	6	6	4	7	7	8	3	0	9.0	0	0	0	0	^GC,^MS,SS,SR
NDAF13296Y-4	7	8	9	6	2	7	6	6	5	8	5	8	5	0	9.0	0	0	0	0	SG,SR,SS
Snowden	9	9	7	7	5	5	7	7	2	5	4	8	5	0	9.0	0	0	0	10	MS,SS,SR
Superior	5	8	7	4	6	6	5	7	4	6	6	8	5	0	9.0	0	0	0	10	MS,SS,SR
WAF14096-5	9	9	9	9	7	8	7	7	2	8	5	9	6	0	9.0	0	0	0	5	SG,SS,YF2
Yukon Gold	7	8	7	5	7	7	6	7	4	7	7	8	3	0	9.0	0	0	0	0	SR,SS,MS,CS,YF2

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

Appendix 1: LAND MANAGEMENT CONDITIONS

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

Trial Title: Black Gold Farms Variety Chip Trial

Trial Design: Randomized complete block, four replications

Plot Dimensions: Seventeen 21' rows at 34' row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Gramoxone SL 3.0, 32oz/A (preplant)

LeadOff, 1.5 oz/A (preplant)

Dual II Magnum 32 fl oz/A (pre-emerge)

Metribuzin 75DF 0.5 lbs/A (pre-emerge)

Matrix SG 1 oz/A

Fertilizer: 32%N 59.7 Gal/A, 60%K 283 lbs/A, 25%Zn 0.5 lbs/A

Insect Control: Wrangler 9 fl oz/A in furrow

Disease Control: Elatus in furrow 6.5 fl oz/A

Curzate 60DF 3.2 oz/A

Revus Top 6.2 floz/A

Bravo 2pt/A

Initiate 720 1.5 pt/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-Six 21' rows at 34' row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Gramoxone SL 3.0, 32oz/A (preplant)

LeadOff, 1.5 oz/A (preplant)

Dual II Magnum 32 fl oz/A (pre-emerge)

Metribuzin 75DF 0.5 lbs/A (pre-emerge)

Matrix SG 1 oz/A

Fertilizer: 32%N 59.7 Gal/A, 60%K 283 lbs/A, 25%Zn 0.5 lbs/A

Insect Control: Wrangler 9 fl oz/A in furrow

Disease Control: Elatus in furrow 6.5 fl oz/A

Curzate 60DF 3.2 oz/A

Revus Top 6.2 floz/A

Bravo 2pt/A

Initiate 720 1.5 pt/A

Vine Kill: None

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

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

Trial Title: SNaC Trial

Trial Design: Randomized complete block, five replications

Plot Dimensions: Twelve 21' rows at 34' row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Gramoxone SL 3.0, 32oz/A (preplant)

LeadOff, 1.5 oz/A (preplant)

Dual II Magnum 32 fl oz/A (pre-emerge)

Metribuzin 75DF 0.5 lbs/A (pre-emerge)

Matrix SG 1 oz/A

Fertilizer: 32%N 59.7 Gal/A, 60%K 283 lbs/A, 25%Zn 0.5 lbs/A

Insect Control: Wrangler 9 fl oz/A in furrow

Disease Control: Elatus in furrow 6.5 fl oz/A

Curzate 60DF 3.2 oz/A

Revus Top 6.2 floz/A

Bravo 2pt/A

Initiate 720 1.5 pt/A

Vine Kill: None

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

Trial Design: Randomized complete block, four replications

Plot Dimensions: Thirty-Two 21' rows at 40' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Boundry 2.3 pt/A

Tricor 1 lb/A

Fertilizer: 180N – 85P – 180K

Insect Control: Capture 1pt/A

Platinum 2.7 oz/A

Velum Prime 6.8 floz/A

Disease Control: Quadris 7 oz/A

Elatus 6 oz/A

Ridomil Gold 5.4 oz/A

Echo 0.75 pt/A

Vine Kill: None

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

Trial Design: Randomized complete block, four replications

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

Seed piece Treatment: None

Weed Control: not provided

Fertilizer: 2lbs/A 20–20–20

Elemex Ca 1qt/A

Elemex 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

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

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

Trial Title: Round White Variety Trial One

Trial Design: Randomized complete block, four replications

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

Seed piece Treatment: None

Weed Control: Glory 1 lb/A
MeTooLachlor 32 oz/A

Fertilizer: 921lbs/A 19-19-19

Insect Control: Verimark 12 oz/A
Regent 3 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: Seventeen 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Glory 1 lb/A
MeTooLachlor 32 oz/A

Fertilizer: 921lbs/A 19-19-19

Insect Control: Verimark 12 oz/A
Regent 3 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: Ten 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Glory 1 lb/A
MeTooLachlor 32 oz/A

Fertilizer: 921lbs/A 19-19-19

Insect Control: Verimark 12 oz/A
Regent 3 oz/A

Disease Control: None

Vine Kill: None

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

Trial Title: NE 1731 White Variety Trial

Trial Design: Randomized complete block, four replications

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

Seed piece Treatment: None

Weed Control: Glory 1 lb/A
MeTooLachlor 32 oz/A

Fertilizer: 921lbs/A 19-19-19

Insect Control: Verimark 12 oz/A
Regent 3 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 Red Variety Trial

Trial Design: Randomized complete block, four replications

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

Seed piece Treatment: None

Weed Control: Glory 1 lb/A
MeTooLachlor 32 oz/A

Fertilizer: 921lbs/A 19-19-19

Insect Control: Verimark 12 oz/A
Regent 3 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: Eleven 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Glory 1 lb/A
MeTooLachlor 32 oz/A

Fertilizer: 921lbs/A 19-19-19

Insect Control: Verimark 12 oz/A
Regent 3 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: Seventeen 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Glory 1 lb/A
MeTooLachlor 32 oz/A

Fertilizer: 921lbs/A 19-19-19

Insect Control: Verimark 12 oz/A
Regent 3 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: Fifteen 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Glory 1 lb/A
MeTooLachlor 32 oz/A

Fertilizer: 921lbs/A 19-19-19

Insect Control: Verimark 12 oz/A
Regent 3 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: Two Replication Trial

Trial Design: Randomized complete block, two replications

Plot Dimensions: Twenty-two 21' rows at 38' row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Glory 1 lb/A
MeTooLachlor 32 oz/A

Fertilizer: 921lbs/A 19-19-19

Insect Control: Verimark 12 oz/A
Regent 3 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	RZ=Rhizoctonia
BL=black leg	SEB=stem end browning
BR=bruise	SC = star cracking
CPB=Colorado potato beetle	SG=secondary growth
CS=common scab	SISC=silver scurf
CT=chain tubers	SKN=skins
DAE=deep apical eyes	SS=sun scald
DSE=deep stolen end	SR=soft rot
EB=early blight	STST=sticky stolons, tight stolon attachment
ECB= European corn borer	TSWV=Tomato Spotted Wilt Virus
EL= enlarged lenticels	VW=Verticillium wilt
FS=fusarium wilt	WSTD=weak stand
GC=growth cracks	WW=wire worm
HI= herbicide injury	YF=yellow flesh (YF scale: 1=light yellow to 3=dark yellow)
HN = Heat Necrosis (see below)	RF=red flesh (RF scale: 1=light red or pink to 3 = dark red)
HS=heat sprouts	
IL=infected lenticels	
LB=late blight	
LHD=leaf hopper damage	
MS=misshaped tubers	
PE=pink eye	
PR=pink rot	
PLRV=potato leaf roll virus	
PTS=very pointed tubers	
PS=powdery scab	
PVA, PVX, PVY=potato viruses A, X, Y	

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.