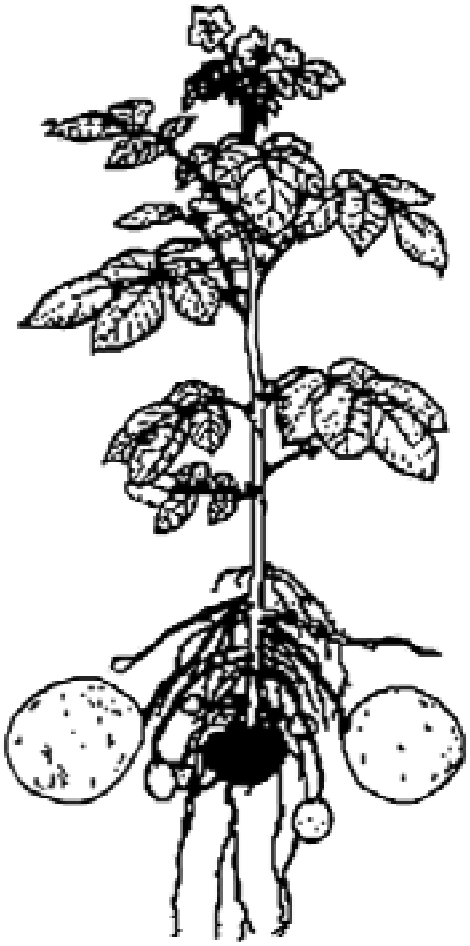
NC STATE UNIVERSITY

NORTH CAROLINA

POTATO VARIETY TRIALS REPORT

2001



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I. OBJECTIVE:

This research is part of the USDA Cooperative States Research Extension and Education Service NE 184 Regional Potato Variety Development and Evaluation Project. The objective of the NE-184 project is to develop high yielding, disease resistant tablestock and chipping potato varieties which can be used by potato growers in the eastern US. The specific objective of the NC State breeding program's effort is to determine which of these clones are most suitable for use by the North Carolina and Southeastern US potato industry.

II. RESEARCH STATION AND ON-FARM COOPERATOR LOCATIONS:

Tidewater Research Station (NCDA&CS)/Vernon G. James Research and Extension Center, (NCSU), Plymouth, NC (Washington Co.)
Cooper Farms, Gumneck, NC (Tyrrell Co.)
James Brothers Farms, Weeksville, NC (Pasquotank Co.)
McCotter Farms, Vandemere, NC (Pamlico Co.)
Tull Hill Farms, Kinston, NC (Lenoir Co.)

COOPERATING COUNTY EXTENSION SPECIALISTS:

Tom Campbell, Elizabeth City, Pasquotank Co.
Bill Jester, Kinston, Greene, Lenoir, and Wayne Co's.
Fred May, Bayboro, Pamlico Co.
Richard Rhodes, Columbia, Tyrrell Co.

III. PROCEDURES:

SITE, SOIL TYPE, PLANTING AND HARVEST DATES

Site	Soil Type	Planting Date	Harvest Date	Days to Harvest
Cooper's	Weeksville black silt loam	Mar 9	Jun 27	110
James Bros.'	Weeksville silt loam	Mar 7	Jun 28	113 (104 vine kill)
McCotter's	Yonges loamy fine sand	Mar 8	Jun 20	104
Tull Hill	Rains loamy sand	Feb. 27	Jun 13	106 (102 vine kill)
TRS/VGJREC	Portsmouth fine sandy loam	Mar 12-14,19	Jul 5,6,10-12,17	114,116

EXPERIMENTAL DESIGN: All yield trials were planted in a randomized complete block design with 4 replications except the unreplicated preliminary evaluation trial, which had only one plot per clone. For the on-farm trials sixteen clones were evaluated at Cooper's and McCotter's, while 12 and 20 clones, respectively, were evaluated at the Tull Hill and James Brother's farms. Plots consisted of 1 row with 28 hills spaced 9 inches apart**.** Spacing between rows was 38 inches at all sites, with the exception of the James Brother's Trial which was on 40 inch row spacing. 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 research station trials were harvested using a modified two harvester to dig one row at a time. All grower trials were graded using a portable Lockwood Grader which sorts to two grades: A+B's ≥ 1 1/2"; and C's < 1 1/2". The TRS/VGJREC trials were graded to five classes: 1's < 1 7/8"; 2's > 1 7/8 to 2 1/2"; 3's > 2 1/2 to 3 1/4"; 4's > 3 1/4 to 4"; 5's > 4". Culls were removed and weighed separately in all trials. Each clone was evaluated for tuber quality and appearance during grading. 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. The tubers were cut and scored for the presence of hollow heart, heat necrosis and any other internal defects. Subsamples of marketable tubers were also taken from

each replication and bulked by entry for specific gravity readings and chipping tests. Specific gravity was determined using the weight-in-air/weight-in-water method. Chip ratings were done at the TRS/VGJREC and by Wise Foods, Berwick, PA.

IV. RESULTS:

Weather Summary (Appendix 3)

Eastern North Carolina's potato season was highly variable this year. The season started with good conditions allowing us to plant on time. But then temperatures turned cool and many areas had a hard frost in the middle of April. The trials at the TRS were hit hard, burning the 3" to 6" tall plants to the ground. Our grower trials fared better, however our Weeksville plot with James Brother's farms was also burned severely. The remainder of the season consisted of periods of near drought alternating with heavy downpours.

A. Yield Trials

Yield Trial Summaries

A total of 174 clones were evaluated in yield trials by the program during the 2001 season. The data for each trial is summarized in Tables 1-10. Each table has two parts, the first (a) being devoted to yield information, specific gravity readings, and chip color scores, and the second (b) providing potato plant and tuber quality characteristics. Chip evaluations were conducted by Wise Foods and at the TRS/VGJREC for all on farm trials, and at the TRS/VGJREC for all research station trials. Chipping at the TRS/VGJREC was done at least once within 48 hrs of harvest. To transport the potatoes for chip samples at Wise Foods in Berwick, PA the potatoes (5 tubers per sample) were placed in a plastic mesh bag and loaded on the back of a truck en-route to Wise. In most cases, chip evaluations were conducted within 72-96 hrs of digging.

1. On-Farm Trials

Cooper Variety Trial (Tables 1a and 1b)

Overall yields for Cooper's trial this year were moderate. Atlantic had a marketable yield of 333 cwt/A and was bested by five others: AF1569-2 (362 cwt/A); B1870-17 (356 cwt/A); Coastal Chip (356 cwt/A); Snowden (356 cwt/A); and B0766-3 (338 cwt/A).However, no clones in this trial yielded significantly greater than Atlantic, and only three clones yielded significantly less (AF1424-7, B1240-1, and Suncrisp). Only one clone in this trial received an overall appearance score of 8 (B0766-3). Others with an appearance rating of good (7) were: AF1569-2; Atlantic; B1870-17; and B1873-6. Heat necrosis was not a problem this year as only three clones (AF1856-1, Atlantic, and Coastal Chip) had any evidence of internal heat necrosis and the average for each clone was an eight which is very slight. A greater problem this year was brown center which affected five clones: AF1856-1; Atlantic; B0178-34; Coastal Chip; and Superior. Of the five with brown center AF1856-1, and B0178-34 had the highest incidence at 32% and 30% respectively. All sixteen clones in this trial were chipped and six clones were assigned a rating of excellent or slightly better in both our chipping evaluations at the TRS and those by Wise: AF875-15 (2 TRS, 2 Wise); Atlantic (1.5 TRS, 2 Wise); B0766-3 (2 TRS, 2 Wise); NY120 (2 TRS, 2 Wise); Snowden (2 TRS, 2 Wise); Sun Crisp (2 TRS, 2 Wise).

James Bros. Variety Trial (Tables 2a and 2b)

This trial should be considered a high stress trial. In mid-April, when the plants were 3 to 6" tall a hard frost froze virtually all the plants almost to ground level. As the season progressed, it became evident we also had a nut-grass problem throughout the trial and a wire grass

problem in the first two replications. Despite these stressful conditions yields were relatively good and we were able to harvest all plots, providing us with an estimate of how well these clones perform under highly stressful conditions. With respect to marketable yields, three clones yielded slightly better than Atlantic (226 cwt/A). These were: Vivaldi (254 cwt/A); B0564-9 (237 cwt/A); and Snowden (229 cwt/A). Eight clones yielded equal to Atlantic (Table 2a.). One clone this year, Vivaldi, received an excellent overall appearance rating. Two other clones: B1752-5 and Snowden both were rated as good. B0564-8, one the promising clones tested in NC for several years yielded equal to Atlantic, had an overall appearance score of 6 and its specific gravity was only 2 points lower than Atlantic. Vascular ring discoloration (VR) was the biggest problem in this trial in terms of internal defects. Eleven of twenty clones expressed some discoloration. Those clones found to have 10% or greater VR were: AF1668-60 (43%); NY120 (17%); and Nordonna (10%). Thirteen clones were chipped by Wise in this trial and fourteen were chipped at the TRS. Four clones: NY121 (1.5 TRS, 2 Wise); AF1565-12 (2 TRS, 2 Wise); Pike (2 TRS, 2 Wise); and Snowden (2 TRS, 2 Wise) were rated at 2 or better.

McCotter Variety Trial (Tables 3a and 3b)

Yields in McCotter's trial were lower compared to last year, and no clones yielded greater than Atlantic which had a marketable yield of 266 cwt/A. However, several including Reba (259 cwt/A); MSE 149-5Y (258 cwt/A); Superior (257 cwt/A); B1497-22 (254 cwt/A); and Snowden (217 cwt/A) had statistically equal marketable yields. Only two clones, Atlantic and Pike, received overall appearance ratings of good (7). Heat necrosis was found in three clones (AF1470-6, AF1856-1, and MSE149-5Y) but was only slight with average ratings of eight for all three. Reduced yields may have been in part due to soft rot found within some clones because of heavy rains about 1 week before harvest. Most clones had some evidence of soft rot and were culled on the grader but four clones were exceptionally susceptible and had soft rot found inside when internal evaluations were done. These clones were: AF1565-12 (7%); AF1865-1 (5%); Eva (13%); and MES149-5Y (7%). Nine clones were chipped by Wise and twelve at the TRS. Only two clones chipped at both locations received a score of excellent: MSF373-8 (2 TRS, 2 Wise) and Snowden (2 TRS, 2 Wise).

Tull Hill Farms Red Variety Trial (Tables 4a and 4b)

Yields for the red variety trial were up this year from last. Dark Red Norland, the standard red, had a marketable yield of 204 cwt/A. All but two clones (Cherry Red at 201 cwt/A, and B0984-1 at 181 cwt/A) out-performed the standard. The five highest yielding clones in this trial were: B1758-3 (288 cwt/A); Michigan Purple (280 cwt/A); Superior (255 cwt/A); B1758-4 (249 cwt/A); and Dakota Rose (236 cwt/A). However, only two clones B1758-3 and Michigan Purple had marketable yields significantly greater than Dark Red Norland. Three clones were given an overall appearance rating of good: B1758-4; ND3196-1R; and Superior. Nordonna, an increasingly popular variety, yielded equal to Dark Red Norland. Other than discoloration of the vascular ring, which was not too severe, and a somewhat smallish size, Nordonna performed well with an overall appearance rating of 6. Heat necrosis was not severe in this trial and was only observed in four clones: B0984-1 (5% at 8); B1758-3 (7% at 8); B1758-4 (3% at 8); and Michigan Purple (3% at 8). The greater internal problem observed was discoloration of the vascular ring which was found in ten clones. Those with 10% or greater were: Nordonna (49%); Dakota Rose (46%); Dark Red Norland (45%); Ware's Pride (17%); B1523-4 (10%); and Superior (10%).

2. Research Station Yield Trials

We had few potato production problems on the Tidewater Research Station in 2001. The mid-April frost was our greatest set back this year, but it did not seem to impact yield too greatly. Our insect control was outstanding and required no spraying other than Admire applied in-

furrow at planting. Row coverage by the potatoes was excellent. This was probably due to the hard frost inducing increased stem numbers, resulting in low weed pressure. Climate was not favorable for late blight until late in the season, and as such no fungicide was applied. During grading we noticed that common scab was prevalent in some trials at one end of the field. This is note worthy because in typical growing seasons scab is not a severe problem. The two trials with the highest incidence of scab were our Round White Trial 1 and the Unreplicated Trial.

Round White Trial 1. (Tables 5a and 5b)

Of the twenty-eight clones in this trial, six had marketable yields greater than Atlantic (264 cwt/A). However only two clones: CAPC10 (305 cwt/A) and Snowden (305 cwt/A) had significantly greater yield compared to Atlantic. Only three clones in this trial had overall appearance scores of good. These were: B1591-1; CAPC25; and T28-1. Clones with slightly higher specific gravity than Atlantic were: AF1424-7; B1591-1; CAPC20; MSH095-4; and Snowden. Internal defects in this trial were only slight to moderate. Heat necrosis was found in eight of the clones. None of these had an average rating greater than eight. In most cases within this group only one or two tubers out of forty sampled had any evidence which translates to between 2.5 to 5% incidence, however Atlantic had 25% incidence. Five clones with 10% or greater incidence of hollow heart were: Atlantic (28%); AF1565-12 (10%); and B1709-6 (10%). Vascular ring discoloration was found in eight clones, though in all but one case (AF1470-6, 20%) only one out of forty was recorded as having incidence. Brown center was found in almost half of the clones within this trial but only three: Atlantic (15%); B1709-6 (13%); and SC8801-2 (10%) had 10% or greater incidence. All samples were chipped at the TRS and nine clones received a rating of excellent or better.

Round White Trial 2. (Tables 6a and 6b)

In this trial, Atlantic had a marketable yield of 240 cwt/A. Four clones produced slightly higher yields: Snowden (286 cwt/A); T2-2 (251 cwt/A); B0178-34 (245 cwt/A); and NY112 (243 cwt/A). Three clones with appearance ratings of good (7) or better were: B1870-1 (8); NY112 (8); and T2-2 (7). Heat necrosis was observed in seven clones, with two having greater than 10% incidence: B1884-9 (15%); and NY112 (13%). Hollow heart was found in six clones with two: Atlantic (18%), and AF1856-1 (10%) having equal to or more than 10%. Brown center was found in nine clones. All clones in this trial were chipped of these only two had scores of excellent or better: B0178-34 (1.5), T2-2 (2).

NE-184 White Trial. (Tables 7a and 7b)

Five out of fifteen clones in the trial had marketable yields greater than Atlantic (262 cwt/A): Keuka Gold (319 cwt/A), Snowden (305 cwt/A), NY112 (298 cwt/A), AF1469-2 (279 cwt/A), and Aquilon (264 cwt/A). Clones with appearance scores of good (7) or better were: Keuka Gold (8); NY112 (8); AF1469-2 (7); Eva (7); and Yukon Gold (7). Though some clones were free of internal defects, overall incidence was moderate. Eleven clones had heat necrosis and seven had 10% or greater expression of symptoms: Aquilon (55%); AF1758-7 (45%); Yukon Gold (25%); Atlantic (23%); Shepody (13%); Kennebec (10%); and Snowden (10%). Severity ratings were very slight for all clones, with the exception of Aquilon. Two [Atlantic (23%), and W1313 (20%)] had a high incidence of hollow heart. Brown center was found in seventeen of the clones and eight of these had 10% or greater occurrence: W1313 (28%); AF1758-7 (20%); Atlantic (20%); AF1668-60 (18%); Keuka Gold (15%); AF1938-3 (13%); Envol (10%); and Yukon Gold (10%). The clones with specific gravity readings equal to or better than Atlantic were: B0766-3; B1240-1; B1425-9; Keuka Gold; Snowden; and W1313. Out of the ten clones chipped in this trial, five (AF1455-20, AF1469-2, AF1763-2, AF1938-3, and B1240-1) were rated excellent.

NE-184 Red Trial. (Tables 8a and 8b)

In this trial our check variety, Dark Red Norland, had a marketable yield of 165 cwt/A. Of the nine other clones in this trial, six produced greater marketable yields: ND3196-1R (237 cwt/A); Chieftan (231 cwt/A); Dakota Rose (213 cwt/A); CO86218-2 (183 cwt/A); Ida Rose (176 cwt/A); and Nordonna (172 cwt/A). Two clones were given appearance ratings of good (Dakota Rose and Nordonna). Only one clone had evidence of heat necrosis, Ida Rose (10%), with a severity rating of slight. Hollow heart was found in three clones, but only one of these had greater than 10% [ND3196-1R (15%)]. Brown center was found in five clones and two of these had greater than 10% [ND3196-1R (85%); and Dakota Rose (18%)].

Unreplicated Trial (Tables 9a and 9b)

This trial provides a first look at a large number of clones produced by our cooperators. Clones with promising attributes such as high yield, exceptional appearance or high disease resistance are then evaluated in following years in replicated trials. Because the data is very preliminary and we screen so many clones, we will not comment on any of them but the data is provided so that our cooperators can identify and comment on clones that appear promising.

Overall Yield Trial Summary

The USDA clones with the most potential as chippers were: B0178-34, B0766-3, B1240-1, and B1591-1. In all cases yields were good and chip scores were typically around 2. The table stock clones from the USDA with the most potential were B1752-5 a round yellow-flesh potato, B1758-4 a red, and B1816-5 a purple-skinned yellow-flesh. All three had low incidence of internal defects. B1816-5 may, however be highly susceptible to silver scurf, an external tuber defect of increasing importance. B0564-8 is also still very promising as a potential dual purpose clone. Since 1995 it has been evaluated in 22 trials and its marketable yield has beeen 111% of Atlantic. It also has very low incidence of internal heat necrosis compared to Atlantic and its specific gravity is only three or four points lower.

Clones from the University of Maine showing the most promise were: AF1424-7; AF1455-20; AF1469-2; and AF1763-2. Their overall yields were less than Atlantic and gravities were lower, but these clones had no heat necrosis. Also they typically chipped as well as or slightly better than Atlantic.

From Cornell University: Eva; T2-2; Keuka Gold; and NY112, performed well. However, Keuka Gold and NY112 suffer from heat necrosis so they may not be suitable for North Carolina. Gravities for all four were lower than Atlantic, but yields were higher with the exception of Eva.

From North Dakota the best red was Nordonna. However, we have seen a fair amount of vascular ring problems in this clone and growers should pay attention to vine killing.

Two clones from Michigan that chipped well were: MSH031-5 and MSH095-4. These were seen on a limited basis but had comparable gravity and yield to Atlantic. They also chipped better and had low incidence of any internal defects.

The private industry clones that preformed the best were CAPC20 (a chipper), and CAPC25 (a yellow-flesh table stocker) from CanAgrico. Vivaldi, a medium to large yellow-flesh oblong potato from HZPC, was also very attractive (in fact it was one of the most attractive clones we saw all season) but it was only evaluated in one trial during the 2001 season.

B. Breeding Efforts

1. NCSU/USDA-ARS Early Generation Project. (10a and 10b)

This project, conducted in cooperation with Dr. Kathleen Haynes, USDA-ARS, is an on-going effort focused on developing improved varieties more suitable to the range of climates and

photoperiods found in the Mid-Atlantic and Southeastern U.S. In 2001, we conducted the first replicated trial of 17 clones which have been selected based on yield and appearance in Maine and, or North Carolina during the last three years. This year they were evaluated in Virginia, Maine and North Carolina. The results obtained in these trials are preliminary but are provided for those interested in seeing how some of our early generation materials are performing at this point.

USDA EG Single-Hills

This trial represents the first year in a series of three observational trials to screen clones for qualities we have determined as desirable. The 2001 season was the fourth season where this project has taken place. During the last 3 years we have screened between 5000 and 7000 single-hill plots. This year we planted 5770 single-hills. To generate the minitubers we planted out true seed in greenhouses both at the VGJREC/TRS and in Beltsville MD. Two tubers were harvested from each clone with the A tuber being sent to the USDA's Chapman Farm in Aroostook county ME and the B tuber to North Carolina. The tubers were then planted in duplicate plots with a stake for every four clones and three feet between each hill. Selections were made in early July in NC and in September in ME. At the TRS 113 selections were made, while in ME we made 83 selections. Out of those selections there were 9 overlaps for a total of 187 selections made in 2001.

USDA EG 6-Hills

Our second year selections were made on six-hill plots. This year 133 clones were planted and 11 were selected in NC, while in ME 19 were selected. Three selections overlapped for a total of 27. Of the 11 selections made in North Carolina, four were selected in NC during the Single-Hill harvest the previous year, and one of those was selected in both ME and NC. Of those selected in Maine, 16 were selected in ME the previous year and only one of these was selected in both ME and NC during the 2000 growing season.

USDA EG 20-Hills

Our third year selections were made on 20-hill plots. After this stage, the clones are placed in multi-state yield trials. This year we planted 59 clones and selected eight in NC, and 7 in ME. In this cycle there was one overlap for a total of 14 clones. Of the eight selected in NC all but two were selected in NC in 2000 and of those six only two were selected in NC during the 1999 Single-Hill harvest. Of those selected in Maine 6 were selected in ME last year and of those six, five were selected in Maine from the 1999 Single Hills.

2. NCSU/Univ. of Maine Early Generation Project

UM EG 4-Hills

This project is very similar to the Early Generation project with the USDA in that it is a collaborative effort with the University of Maine in an attempt to develop more adapted clones for the mid-Atlantic and Southeastern regions of the US. It differs, in that the first year we select materials is during the second round of the selection cycle, as our collaborator (the late Dr. Al Reeves) sends us a single large tuber of each of his single-hill selectionswhich we cut into four pieces and plant. This year in the 4 hill plots we planted 189 clones, of these we selected fourteen. These selections will be reviewed next year in 12 hill plots.

UM EG 12-Hills

Out seven 12-Hill plots planted we selected one to be carried through to the following year.

V. 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. Wise Foods, Berwick, PA is also gratefully acknowledged for conducting chip tests. HZPC Americas Corp., and CanAgrico provided unrestricted gifts for variety evaluation which benefited the project. Seed for the trials were provided by: Dr. Dave Douches, Michigan State University; Dr. Kathleen Haynes, USDA/ARS, Beltsville, MD; Mr. Bryce Farnsworth, North Dakota State University; Dr. Robert Plaisted, Cornell University; Dr. Greg Porter, University of Maine; Dr. Al Reeves, University of Maine; and from HZPC Americas Corp., and CanAgrico. Also a special thanks goes to Agway Seed Potato Department for their efforts to procure small amounts of seed for shipment to NC. This project is funded in part by The North Carolina Potato Growers Association and the USDA CSREES. Their continuing support is much appreciated.

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Appendix 1: LAND MANAGEMENT CONDITIONS

Location: Durwood Cooper Farms, Gum Neck, Tyrrell Co., NC

Trial Design: Randomzied complete block, four replications
Plot Dimensions: Sixteen 21' rows at 38' row spacing, 28 hills per row
Seedpiece Treatment: None
Weed Control: Sencor 1 1/2 pts./A
Fertilizer: 850 lbs, 23-10-19 broadcast
Insect Control: N/A
Disease Control: None
Irrigation: None
Vine Kill: None

Location: James Brother's Farms, Weeksville, Pasquotank Co., NC

Trial Design: Randomized complete block, four replications
Plot Dimensions: Twenty 21' rows at 40' row spacing, 28 hills per row
Seedpiece Treatment: None
Weed Control: Sencor 1/2 to 3/4 lbs/A, Poast 6-8" 1 1/2 pts/A
Select 1 lb/A
Halosulfuron-methyl 0.024 lbs/A
Fertilizer: 200 lbs N 75-75 broadcast
Insect Control: Provado
Disease Control: N/A
Irrigation: None
Vine Kill: Paraquat

Location: McCotter Farms, Bayboro, Pamlico Co.
Trial Design: Randomized complete block, four replications
Plot Dimensions: Sixteen 21' rows at 38' row spacing, 28 hills per row
Seedpiece Treatment: None
Weed Control: Lexone 1/2 lb/A
Fertilizer: 190lbs/A N, 40 lbs/A P, 120lbs/A K
Insect Control: Provado 3 1/2 oz/A
Disease Control: Manex 1 1/2 pts/A
Irrigation: None
Vine Kill: None

Location: Tull Hill Farms, Kinston, Lenior Co., NC

Trial Design: Randomized complete block, four replications
Plot Dimensions: Twelve 21' rows at 38' row spacing, 28 hills per row
Seedpiece Treatment: None
Weed Control: 1/3 lb metribuzin, Dual 1.5pt/A pre-emergence
Fertilizer: 1400lbs, 14-4-14 broadcast
Insect Control: N/A
Disease Control: N/A
Irrigation: None
Vine Kill: Paraquat

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-eight 21' rows at 38' row spacing, 28 hills per row
Seedpiece Treatment: None
Weed Control: Sencor 1/2lbs/A Dual 1pt/A
Fertilizer: 650 lbs, 17-17-17 broadcast;
200 lbs, 34-0-0 broadcast
Insect Control: Admire 2F 17 oz/A
Disease Control: None
Irrigation: 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: Fifteen 21' rows at 38' row spacing, 28 hills per row
Seedpiece Treatment: None
Weed Control: Sencor 1/2lbs/A Dual 1pt/A
Fertilizer: 650 lbs, 17-17-17 broadcast;
200 lbs, 34-0-0 broadcast
Insect Control: Admire 2F 17 oz/A
Disease Control: None
Irrigation: None
Vine Kill: None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: NE-184 White Variety Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Twenty five 21' rows at 38' row spacing, 28 hills per row
Seedpiece Treatment: None
Weed Control: Sencor 1/2lbs/A Dual 1pt/A
Fertilizer: 650 lbs, 17-17-17 broadcast;
200 lbs, 34-0-0 broadcast
Insect Control: Admire 2F 17 oz/A
Disease Control: None
Irrigation: None
Vine Kill: None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: NE-184 Red Variety Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Ten 21' rows at 38' row spacing, 28 hills per row
Seedpiece Treatment: None
Weed Control: Sencor 1/2lbs/A Dual 1pt/A
Fertilizer: 650 lbs, 17-17-17 broadcast;
200 lbs, 34-0-0 broadcast
Insect Control: Admire 2F 17 oz/A
Disease Control: None
Irrigation: None
Vine Kill: None

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

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: Early Generation Yield Trial
Trial Design: Randomized complete block, four replications
Plot Dimensions: Eighteen 18.75' rows at 38" row spacing, 25 hills per row

Seedpiece Treatment:	None
Weed Control:	Sencor 1/2lbs/A Dual 1pt/A
Fertilizer:	650 lbs, 17-17-17 broadcast;
	200 lbs, 34-0-0 broadcast
Insect Control:	Admire 2F 17 oz/A
Disease Control:	None
Irrigation:	None
Vine Kill:	None

Location: Tidewater Research Station, Plymouth, Washington Co., NC
Trial Title: Unreplicated Variety Trial
Trial Design: Randomized complete block
Plot Dimensions: Twenty Three 21' rows at 38" row spacing, 28 hills per row

Seedpiece Treatment:	None
Weed Control:	Sencor 1/2lbs/A Dual 1pt/A
Fertilizer:	650 lbs, 17-17-17 broadcast;
	200 lbs, 34-0-0 broadcast
Insect Control:	Admire 2F 17 oz/A
Disease Control:	None
Irrigation:	None
Vine Kill:	None

Appendix 2: STANDARDIZED NE184 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: REGIONAL WEATHER DATA

Pamlico Co.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Mean Temp	44.58	52.09	51.76	61.72	68.98	77.36	N/A	--	--	--	--	--	59.42
Min Temp	32.23	39.11	39.9	48.97	57.1	68.29	N/A	--	--	--	--	--	47.60
Max Temp	56.94	65.07	63.61	74.47	80.87	86.43	N/A	--	--	--	--	--	71.23
Precip	1.27	3.28	3.26	2.86	3.16	6.8	N/A	--	--	--	--	--	20.63
30yr precip	4.30	4.24	3.91	3.21	4.62	5.38	7.02	6.56	5.13	3.02	3.15	3.68	54.22
Precip Dev	-3.03	-0.96	-0.65	-0.35	-1.46	1.42	N/A						

Tyrrell Co.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Mean Temp	40.35	46.06	47.25	56.13	64.67	75.73	76.93	--	--	--	--	--	55.03
Min Temp	29.88	35.17	37	45.74	53.78	66.69	68.21	--	--	--	--	--	44.71
Max Temp	50.82	56.94	57.5	66.53	75.57	84.77	85.64	--	--	--	--	--	65.36
Precip	1.11	2.28	0.96	1.4	1.25	1.26	2.35	--	--	--	--	--	8.26
30yr precip	3.95	3.64	4.08	3.43	4.41	4.67	6.39	5.82	4.39	3.31	3.00	3.21	50.30
Precip Dev	-1.84	-1.36	-3.82	-1.97	-3.16	-3.41	-4.04						

Pasquotank Co.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Mean Temp	41.42	48.32	48.5	60.34	66.96	76.25	76.6	--	--	--	--	--	57.00
Min Temp	31.81	39.93	39.48	50.03	56.85	68.29	67.97	--	--	--	--	--	47.73
Max Temp	51.03	56.71	57.52	70.65	77.07	84.2	85.23	--	--	--	--	--	66.20
Precip	1.89	1.91	3.28	1.45	1.41	5.88	3.79	--	--	--	--	--	15.82
30yr precip	4.18	3.68	4.05	3.04	4.23	4.29	5.67	5.45	4.5	3.38	2.91	3.1	48.48
Precip Dev	-2.29	-1.77	-0.77	-1.59	-2.82	1.61	-1.88						

Washington Co.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Mean Temp	42.95	49.64	50.53	62.48	68.9	77.17	N/A	--	--	--	--	--	58.61
Min Temp	31	38	39	48.53	56.1	67.57	N/A	--	--	--	--	--	46.70
Max Temp	54.9	61.29	62.06	75.97	81.7	86.77	N/A	--	--	--	--	--	70.45
Precip	1.40	3.31	2.92	1.28	5.14	6.35	N/A	--	--	--	--	--	20.40
30yr precip	4.22	3.80	4.32	3.37	4.72	4.74	6.08	4.44	4.58	3.36	3.12	3.31	51.06
Precip Dev	-2.82	-0.49	-1.40	-2.09	0.42	1.61	N/A						

Lenior Co.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Mean Temp	41.74	47.39	49.76	61.25	68.68	77.2	76.62	--	--	--	--	--	57.67
Min Temp	30.35	34.71	38.74	48.08	56.26	68.47	67.54	--	--	--	--	--	46.10
Max Temp	53.13	60.07	60.77	74.42	81.1	85.93	85.56	--	--	--	--	--	69.24
Precip	1.14	2.91	4.30	1.36	2.61	9.09	6.04	--	--	--	--	--	21.41
30yr precip	4.24	3.75	3.97	3.49	4.55	5.12	6.09	5.97	4.86	3.05	2.79	3.50	51.20
Precip Dev	-3.10	-0.84	0.33	-2.13	-1.49	3.97	-0.05						

SOURCE: NCDA via National Climate Center, National Oceanic and Atmospheric Administration.

Appendix 4: COMMENT CODES FOR TABLE B

AC=air cracks
BR=bruise
CPB=colorado potato beetle
CS=common scab
DAE=deep apical eyes
DSA=deep stolen end
EB=early blight
ECB= European corn borer
EL= enlarged lenticels
FS=fusarium wilt
GC=growth cracks
HI= herbicide injury
HS=heat sprouts;
IL=infected lenticels
LB=late blight
LHD=leaf hopper damage
MS=mishaped tubers
PE=pink eye
PR=pink rot
PLRV=potato leaf roll virus
PTS=very pointed tubers
PS=powdery scab
PVA, PVX, PVY=potato viruses A, X, Y
RZ=Rhizoctonia
SEB=stem end browning
SG=secondary growth
SIS=silver scurf
SKN=skins
SS=sun scald
SR=soft rot
STST=sticky stolens
VW=Verticillium wilt
WSTD=weak stand
WW=wire worm
YF=yellow flesh (YF scale: 1=light yellow to 3=dark yellow)

Note: ^ before code indicates high levels