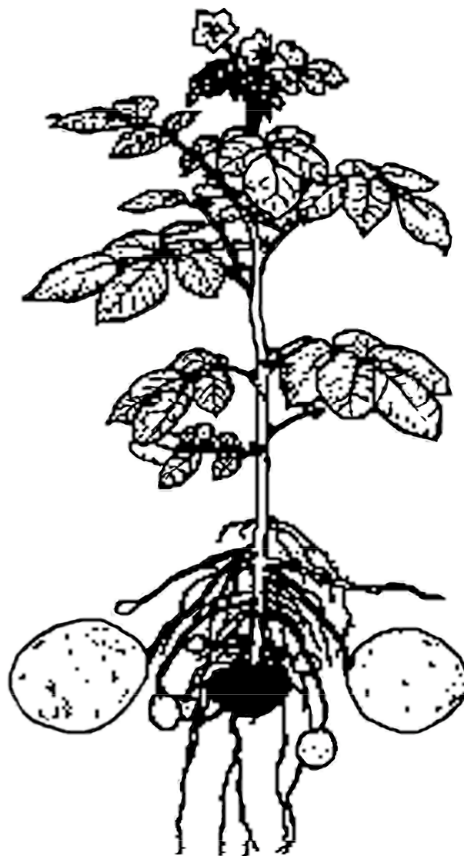


NORTH CAROLINA POTATO VARIETY TRIAL AND BREEDING REPORT

2002



G. C. Yencho and M. E. Clough
Department of Horticultural Science
North Carolina State University
Vernon G. James Research and Extension Center
207 Research Station Road
Plymouth, NC 27962
Tel: 252-793-4428 ext. 147
Fax 252-793-5142
Email: Craig_Yencho@ncsu.edu
Web Address: <http://plymouth.ces.state.nc.us/hort/potato/>

I. OBJECTIVES:

Our research is conducted in collaboration with the USDA Cooperative States Research Extension and Education Service (CSREES) NE-184 Multi-state Potato Variety Development and Evaluation Project. The overall objective of the NE-184 Project is to develop high yielding, disease and insect resistant, table- and chip-stock potato varieties for potato growers in the eastern US. The objective of the NC State University variety development and breeding program is to evaluate germplasm, and select and develop better adapted potato varieties that are suitable for use by the North Carolina growers, and the southeastern US potato industry in general.

II. PROJECT SUMMARY

Our program focuses on two areas: the development of new potato germplasm and varieties through 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. In 2002, we planted 7411 single-hill plots, 828 four hill plots, 183 six hill plots, 12 12-hill plots and 28 20-hill plots for the breeding program. While, a total of 164 preliminary and advanced clones were evaluated in replicated yield trials either on-farm, or at the Tidewater Research Station (NCDA&CS)/Vernon G. James Research and Extension Center, (NCSU) in Plymouth, NC. The results of the yield trials are summarized later this report, and in Tables 1-10. Each table has two parts, the first (a) being devoted to yield information, specific gravity measurements, and chip color scores, and the second (b) providing potato plant and tuber quality characteristics. This report can also be viewed and downloaded at our website <http://plymouth.ces.state.nc.us/hort/potato/index.html>.

In 2002, the USDA clones with the most potential as chippers were: B0564-8, B0766-3, and B1240-1. In all cases, yields were good and chip scores were 2 or 3. The clone B0564-8 is scheduled for release by the USDA-ARS in 2003 as the variety Harley Blackwell. It is an attractive, round-white potato with a medium net skin and an average specific gravity in NC of 1.073 compared to 1.076 for Atlantic. B0564-8 is primarily intended for chipping, but its attractive appearance and lower gravity compared to Atlantic may also make it suitable for table-stock purposes. In NC, it has produced marketable yields 108% of Atlantic, but it does not suffer from internal heat necrosis (IHN), a common problem of Atlantic in the mid-Atlantic regions.

The table-stock clones from the USDA with the most potential were: B1752-5 a round, yellow-fleshed potato; B1758-4 a red-skinned, white-fleshed clone; and B1816-5 a purple-skinned, yellow-fleshed clone. All three had minimal incidence of internal defects. The reds need further testing. We believe B1816-5 has good potential as a specialty-type potato, and we will be testing it with the NCSU Specialty Crops Program and on-farm in 2003.

Clones from the University of Maine showing the most promise were: AF1424-7 and AF1569-2. In most trials the marketable yields for these were good, there were few internal defects, and chip scores for were either 2 or 3.

From Cornell University NY112, NY126, and NY129 performed well. NY112 is an especially attractive, netted, chip-stock potato with good yields, however, it has suffered from susceptibility to IHN making it unsuitable for North Carolina. NY126 and NY129 have promise

as table-stock varieties and we will continue intensive evaluations of these clones. NY126 is an attractive, round to oblong, pale yellow-fleshed potato with yields close to Atlantic. NY129 is a round, red-skinned, white-fleshed potato with few internal defects and yields close to Chieftain.

Nordonna is an attractive round, red-skinned, white-fleshed potato from North Dakota that has performed well in many of our yield trials with an average marketable yield of 207 cwt/A. However, we have seen a fair amount of secondary growth in this clone over the last two years and this may limit its overall acceptance in NC.

Two clones from Michigan that yielded and chipped well were: MSH031-5 and MSH095-4, each having comparable gravity and yield to Atlantic and low incidence of any internal defects.

Vivaldi, a medium to large yellow-fleshed oblong table-stock potato from HZPC, was very attractive, and had low incidence of internal defects and yields comparable to Atlantic. This clone is very attractive in NC and will be tested further.

III. 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.

IV. 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 8	Jun 19	110
James Bros.'	Weeksville silt loam	Mar 12	Jul 1	113(104 vine kill)
McCotter's	Yonges loamy fine sand	Mar 7	Jun 20	104
Tull Hill	Rains loamy sand	Feb. 28	Jun 17	106(102 vine kill)
TRS/VGJREC	Portsmouth fine sandy loam	Mar 11, 19, 20	Jun 25 Jul 1, 3, 8	103, 104, 105, 111, 112

EXPERIMENTAL DESIGN: All yield trials were planted in a randomized complete block design with 4 replications except the preliminary evaluation trial, which had only one replication per clone. Sixteen clones were evaluated at Cooper's and McCotter's, while 12 and 22 clones, respectively, were evaluated at the Tull Hill and James Brother's on-farm trials. Plots consisted of one 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 a 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 two-row harvester modified 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 $\geq 1\frac{7}{8}$ "; and C's $< 1\frac{7}{8}$ ". The TRS/VGJREC trials were graded to five classes: 1's $< 1\frac{7}{8}$ "; 2's $> 1\frac{7}{8}$ to $2\frac{1}{2}$ "; 3's $> 2\frac{1}{2}$ to $3\frac{1}{4}$ "; 4's $> 3\frac{1}{4}$ to 4"; 5's > 4 ". Culls were removed and weighed separately in all trials. Each clone was evaluated for tuber quality and appearance during grading using standardized NE-184 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. The tubers were cut and scored for the presence of hollow heart, heat necrosis and any other internal defects. A second sub-sample of marketable tubers from each replication was taken and bulked by entry for specific gravity readings and chipping tests. Specific gravity was determined using the weight-in-air/weight-in-water method. Chip evaluations were conducted at the TRS/VGJREC and Wise Foods, Berwick, PA.

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.

V. RESULTS:

Environmental Summary (Appendix 3)

Eastern NC's potato season was highly variable this year. Our season started wet putting us behind at planting, especially on the research station. Thereafter, temperatures fluctuated between hot and cool, while remaining extremely dry at most sites, until the very last week of the season when several heavy rains occurred resulting in much lower yields than normal. Yields at the research station were considerably lower compared to previous years due to the late planting and subsequent drought.

The hot dry weather during the first 1.5 months of the season is thought to have contributed to an outbreak of Tomato Spotted Wilt Virus (TSWV). To the best of our knowledge this is the first time that TSWV has occurred so widely on potatoes in NC. The virus has a very wide host range including weedy and cultivated species and is vectored by thrips. Table 11 summarizes % TSWV incidence recorded per clone in our replicated yield trials while Table 12 summarizes mean % TSWV incidence by variety trial. Table (b) for each trial also provides data on % incidence of TSWV by clone. Clearly, Atlantic is one of the more susceptible varieties.

A. Yield Trials

1. On-Farm Trials

Cooper Variety Trial (Tables 1a and 1b)

Atlantic, our standard, had a marketable yield of 201 cwt/A and though no other clone had a significantly greater marketable yield, NY112 bested the standard at 247 cwt/A. Eight clones had a chip score rating of 2 at both the TRS and Wise. These were: AF1938-3; Atlantic; B0564-9; B0564-8; B0766-3; MSH031-5; MSH095-4; and Snowden. Two clones, B0564-8 and B0564-9, received overall appearance scores of 8. Others that scored high were: AF1938-3; Atlantic; B1752-5; and NY112. All clones with IHN had a rating of 8, which is not severe. Atlantic had 10% incidence of IHN and B1752-5 had 7%. Brown center was observed in several clones. The two with the highest incidence were: Suncrisp (32%) and Superior (17%). The primary defects in the trial were misshapes, and sunscalds.

James Brother's Variety Trial (Tables 2a and 2b)

Atlantic had a marketable yield of 236 cwt/A. Snowden had a significantly greater marketable yield of 325 cwt/A. None of the clones chipped better than good (<3). In terms of appearance the only clone to receive an 8 was NY127. Others with a 7 were: AF1569-2; B1758-4; NY126; Vivaldi; and Yukon Gold. Four clones having an IHN incidence greater than 10% were: AF1470-6 (12%); AF1565-12 (17%); AF1569-2 (22%); and Atlantic (17%). But, none had an average IHN rating greater than 8. Hollow heart was observed in AF1569-12 at 10%, while vascular ring defects were observed in AF1569-12 (15%), B1240-1 (15%), Fabula (20%), and MSH095-4 (22%). Culls were primarily due to chain tubers, secondary growth and sunscald.

McCotter Variety Trial (Tables 3a and 3b)

This trial was severely impacted by TSWV and the site was very dry most of the season. The marketable yield of Atlantic in this trial was 195 cwt/A. Snowden had the highest marketable yield at 232 cwt/A. Gravities in this trial were generally higher than most of our other trials due to the drought. Atlantic had a gravity of 1.082, NY125 had a gravity of 1.083 and Yukon Gold had the highest gravity at 1.084. Only one clone, B0564-8, chipped better than a 3 at both the TRS and Wise. B0766-3 was rated the most attractive with an appearance score of 7. Overall, IHN incidence was low and no clones were rated less than 8. Defects were primarily misshapes, secondary growth and sunscald.

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

Chieftain, our red standard, had a marketable yield of 246 cwt/A. None of the other clones in the trial exceeded the standard. There were however, three clones with statistically similar yields: B1816-5 (230 cwt/A); Cherry Red (200 cwt/A); and NY129 (228 cwt/A). Clones with overall appearance scores of 7 or greater were: B1816-5, a purple-skinned, yellow-fleshed clone, and NY129. Clones with percent IHN levels greater than 10% were: Chieftain (35%); Ida Rose (15%); and Symfonia (22%). Clones with 10% incidence of brown center or greater were: B1758-3 (10%); B1758-4 (12%); ND3196-1R (27%); and Symfonia (22%). The most common defects were soft rot, misshapes and silver scurf.

2. Research Station Yield Trials

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

Of the twenty-two clones in this trial, ten had marketable yields greater than Atlantic, which yielded only 145 cwt/A. However, only two clones: B0564-9 (179 cwt/A) and Snowden (219

cwt/A) had significantly higher marketable yields. The clones with the highest gravities in this trial were: AF1424-7 (1.081) and AF2217-3 (1.083). In terms of chipping, ten clones had scores of 2 and one clone, Snowden, had a score of 1. Four clones, B0564-8, B0766-3, NY126, and Yukon Gold, received an overall appearance rating score of 7. Clones with 10% or more incidence of IHN were: AF2215-3 (15%); Atlantic (40%); and Yukon Gold (10%). The most severe IHN rating was a 7 for Atlantic. Atlantic also had 17% brown center. Soft rot was noted internally in all but three clones and seven clones had incidence of 10% or more. These were: AF1565-12 (12%); AF1569-2 (27%); AF1763-2 (10%); B0564-8 (12%); B0766-3 (10%); B1752-5 (12%); and Fabula (10%). Common defects were misshapes, soft rot, sunscald, and Rhizoctonia.

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

Atlantic had a marketable yield of 116 cwt/A in this trial. Five clones, AF222-3 (168 cwt/A), AF2269-8 (168 cwt/A), B2024-10 (153 cwt/A), NY112 (180 cwt/A), and Snowden (202 cwt/A), had significantly higher yields. Five clones (AF2207-4, AF2222-2, AF2269-8, B2001-197, and NY125) had a chip rating of 2. Four clones (AF2269-8, B2024-10, NY112, and NYU47-21) were rated as a 7 for overall appearance. Two clones, Atlantic (27%) and B2024-10 (12.5%), had greater than 10% IHN incidence. The heat necrosis severity ratings for these two clones were 6 and 5 respectively while all other IHN ratings were 8 or 9. Two clones with a 10% or greater incidence of brown center were: Atlantic (10%) and NYU47-21 (17%). Culls were mostly for misshapes, sunscald, and soft rot.

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

Of the twenty-four clones in this trial none had marketable yields greater than Atlantic. However, five equaled that of Atlantic (ATX84706-2Ru (170 cwt/), B1240-1 (176 cwt/A), Kennebec (177 cwt/A), Superior (174 cwt/A), and W1313 (170 cwt/A). One clone, Snowden, received a chip rating of 1 and eight other clones had a rating of 2 (AF1455-20, AF1470-6, ARS-W96-40006-1, ARS-W96-4654-1, B1240-1, B1425-9, W1242, and W1313). Two clones (AF1470-6 and Yukon Gold) were rated a 7 for overall appearance. Three clones had 10% or greater incidence of IHN. These were: ARS-W96-4654-1 (40% at a rating of 7); Katahdin (10% at a rating of 8); and Russet Burbank (73% at a rating of 6). Two clones Gem Russet (20%) and Superior (15%) had 10% or greater incidence of brown center. Ten percent or greater incidence of soft rot was noted in AF1569-2 and ARS-W96-40022-5. Culls were commonly misshapes, sunscald, soft rot, and Rhizoctonia.

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

The standard, Chieftain, had a marketable yield of 229 cwt/A. Only one clone, Roselys, had a higher marketable yield than Chieftain but it was not statistically different and it was not particularly attractive. NorDonna and NY129 had on overall appearance ratings of 7. Five clones (B1758-3, Brise du Nord, Chieftain, Ida Rose, and Symfonia) had greater than 10% incidence of IHN. Culls were due mostly to misshapes, growth cracks, and Rhizoctonia.

Unreplicated Trial (Tables 9a and 9b)

Fifty-four clones were evaluated in this trial along with the standards Atlantic, Snowden and Superior. Each 28-hill plot was unreplicated. Clones with promising attributes such as high

yield, high specific gravity, exceptional appearance and/or high disease resistance will be evaluated in following years in replicated trials.

B. Breeding and Early Generation Selection 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 2002, 15 clones remaining from three years of selection for yield and appearance in Maine and North Carolina during the last three years were evaluated for the first time in replicated trials in Virginia and North Carolina. The results obtained in these trials are preliminary and all of the clones are scheduled for reevaluation in 2003

USDA EG 6-Hills

In 2002, 187 6-hill plots were planted with 17 being selected in NC, and 20 selected in ME. Three selections overlapped in both sites for a total of 34 selections. Of the 17 selections made in North Carolina, 11 were selected in NC during the 2001 single-hill harvest, and one of those was selected in both ME and NC. Of the 20 selected in Maine, 13 were selected in ME the previous year with only one being selected in both sites during the 2001 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 as described above. This year, 27 clones were planted and we selected eight in NC, and three in ME. During this cycle of selection there was no overlap so a total of eleven clones remain. Of the eight selected in NC only four were selected in NC in 2001 and of those only one was selected in NC during the 2000 single-Hill harvest. Of those selected in Maine one was selected in ME last year and it was also selected in Maine from the 2000 single hills.

2. NCSU/Univ. of Maine Early Generation Project

UM EG 4-Hills

Our collaboration with the University of Maine (UM) is similar to the USDA-ARS Early Generation project in that it is an attempt to develop more adapted clones for the mid-Atlantic and Southeastern regions of the US. It differs in that the UM sends us a single large tuber of each of their first-year, single-hill selections that we cut into four pieces and plant as four-hill. UM retains then retains all of the selections that we make assuming that they are not too ugly. For 2002, we planted 287 four-hill plots and selected twenty-four. These selections will be reviewed next year in 12 hill plots.

UM EG 12-Hills and 20-Hills

Two out of twelve 12-Hill plots were selected, and no 20-hill plots were advanced this year.

3. NCSU/Cornell Univ. Early Generation Project

Cornell EG 4 Hills

This project follows the same format as the UM EG project. This year we screened 541 clones in 4 Hill plots and selected 68. These will be evaluated in 2003 as 12-hill plots.

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 provided an unrestricted gift 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; Dr. Susie Thompson, North Dakota State University; Dr. Walter De Jong Cornell University; Dr. Greg Porter, University of Maine; Ms. Nena Huston and Mr. Garland Grounds, University of Maine; and from HZPC Americas Corp. 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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Table 1a. Copper's Farm Variety Trial. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 103 DAP¹ at Copper's Farm, Gum Neck, Tyrrell Co., NC - 2002.

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ² (% of total yield)			Specific Gravity ³	Chip Color ⁴	
				A's + B's	C's	Culls		TRS	Wise
AF1424-7	235	206	116	88	9	4	1.072	3	2
AF1565-12	202	166	86	82	12	6	1.066	2	3
AF1938-3	179	128	72	71	8	21	1.060	2	2
Atlantic	247	201	100	81	12	7	1.072	2	2
B0564-8	223	172	94	76	22	3	1.066	2	2
B0564-9	222	187	96	83	10	7	1.068	2	2
B0766-3	240	206	109	86	11	4	1.073	2	2
B1240-1	230	198	102	86	9	5	1.058	2	3
B1752-5	154	121	61	77	14	9	1.066	3	-
Coastal Chip	218	189	104	86	12	2	1.063	3	4
MSH031-5	213	174	95	81	15	4	1.070	2	2
MSH095-4	174	147	77	83	10	7	1.071	2	2
NY112	283	247	129	88	11	2	1.064	2	3
Snowden	206	122	66	59	40	2	1.068	2	2
Suncrisp	157	131	70	83	13	4	1.069	3	4
Superior	216	191	104	88	6	5	1.068	3	4
Grand Mean	212	174							
CV (%)	20	24							
LSD (K=100)	70	67							

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

² Size classes: A's + B's > 1 7/8"; C's ≤ 1 7/8" ; Culls = all defective potatoes.

³ Determined by weight in air/water method.

⁴ Chip Color Ratings conducted by Wise Foods Inc. and the NCSU potato breeding Program at the TRS/VGJREC:

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

Table 1b. Cooper's Farm Variety Trial. Plant vine type, disease and, air pollution scores, maturity at ca. 3 weeks prior to harvest, external and internal tuber attributes, of potato clones harvested 103 DAP¹ at Cooper's Farm, Gum Neck, Tyrrell Co., NC-2002

Clone	Plant Data ²				Tuber Data ²										Internal Defects ³ (no./40 tubers)										%	Comments ⁵
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	□	HN	HNR	HH	VR	BC	SR	TSWV ⁴					
AF1424-7	7	8	8	5	□ 9	8	5	4	3	6	7	8	5	□ 0	9	0	0	0	0	0	4.4	MS, SS				
AF1565-12	6	8	8	4	6	7	5	7	3	7	5	8	6	0	9	0	3	1	0	0.9	MS, RZ, SR, SS					
AF1938-3	6	9	8	5	□ 6	8	7	5	4	8	6	8	7	□ 0	9	1	0	0	0	0.0	MS, SS					
Atlantic	7	6	8	6	6	5	7	6	2	6	5	8	7	4	8	0	0	1	0	21.4	GC, SS, RZ					
B0564-8	5	7	8	5	□ 6	5	6	8	2	7	4	8	8	□ 0	9	0	1	0	1	14.4	RZ, SR, MS					
B0564-9	6	6	8	4	6	6	6	7	2	7	6	7	8	0	9	0	0	0	0	63.4	RZ, SR, SS, FS					
B0766-3	6	8	8	4	□ 6	7	7	7	2	7	6	8	7	□ 0	9	0	0	0	0	1.8	SR, MS					
B1240-1	6	7	6	6	6	7	5	4	3	7	7	8	5	0	9	0	0	0	0	17.8	SS, MS					
B1752-5	8	8	5	4	□ 7	8	5	7	2	8	5	8	7	□ 3	8	1	0	0	0	1.3	SS, HS, SG, SR					
Coastal Chip	6	8	8	5	6	7	5	6	2	5	5	8	5	2	9	0	0	1	0	0.0	SG, DAE, DSE, CS, SR, MS, GC					
MSH031-5	7	8	6	5	□ 9	8	4	6	4	8	5	8	6	□ 0	9	0	0	1	0	3.0	MS, SS					
MSH095-4	6	7	7	5	6	7	5	4	2	5	8	8	5	0	9	0	0	0	0	3.0	MS, SS, DSE, DAE, lumpy					
NY112	8	8	8	6	□ 7	5	6	6	2	7	5	7	7	□ 0	9	0	0	0	0	3.9	SS, RZ					
Snowden	9	8	6	6	7	5	7	7	2	6	3	8	6	0	9	0	0	0	0	12.5	SS, DAE, DSE					
Suncrisp	6	8	8	5	□ 6	5	7	7	3	7	5	8	6	□ 0	9	0	1	13	0	0.0	SS, DAE, SR					
Superior	6	8	8	4	6	7	7	7	3	6	6	8	6	0	9	0	4	7	1	0.9	SS, MS, DAE, DSE, RZ					
□	□	□	□	□	□ □	□	□	□	□	□	□	□	□	□ □	□	□	□	□	□	□	□	□				

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

² See NE184 Standard Potato Rating System for key to scores in Appendix 2.

³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

⁵ See Appendix 4 for Comment Codes

Table 2a. James Brother's Farm Variety Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity of potato clones harvested 113 DAP¹ (104 DVK¹) at James Brother's Farm, Weeksville, Pasquotank Co., NC - 2002.

Clone	Total Yield cwt/A	Marketable Yield cwt/A	% Atl.	Size Distribution by Class ² (% of total yield)			Specific Gravity ³	Chip Color ⁴	
				A's + B's	C's	Culls		TRS	Wise
Adora	230	186	84	81	15	5	1.058	-	-
AF1470-6	214	181	78	84	9	8	1.056	4	4
AF1565-12	265	208	89	78	10	12	1.066	2	4
AF1569-2	281	238	107	85	6	9	1.065	3	2
Atlantic	280	236	100	83	6	11	1.071	3	4
B0564-8	253	199	87	78	14	8	1.069	3	3
B0564-9	279	241	107	86	6	7	1.068	3	4
B0766-3	283	210	92	74	5	21	1.067	3	2
B1240-1	264	219	98	83	9	8	1.062	3	3
B1752-5	241	161	73	67	10	22	1.070	-	-
B1758-4	163	120	54	73	19	7	1.062	-	-
Fabula	230	190	80	82	5	13	1.053	-	-
La Rouge	275	238	104	87	8	6	1.061	-	-
MSE149-5Y	272	216	98	79	5	15	1.061	-	-
MSH095-4	251	205	91	81	8	10	1.067	2	3
NY126	263	224	100	85	7	8	1.067	3	2
NY127	332	271	121	82	8	11	1.068	3	2
Platina	202	148	64	73	9	18	1.049	-	-
Snowden	366	325	145	89	8	3	1.069	3	3
Superior	231	195	85	84	5	11	1.066	3	4
Vivaldi	260	203	88	78	12	9	1.064	-	-
Yukon Gold	241	198	88	82	6	12	1.070	-	-
Grand Mean	258	210							
CV (%)	12	16							
LSD (K=100)	41	45							

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

² Size classes: A's + B's > 1 7/8"; C's ≤ 1 7/8" ; Culls = all defective potatoes.

³ Determined by weight in air/water method.

⁴ Chip Color Ratings conducted by Wise Foods Inc. and the NCSU potato breeding Program at the TRS/VGJREC:

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

Table 2b. James Brother's Farm Variety Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, external and internal tuber attributes, of potato clones harvested 113 DAP¹ (104 DVK¹) at James Bros. Farm, Weeksville, Pasquotank Co., NC-2002

Clone	Plant Data ²				Tuber Data ²										Internal Defects ³ (no./40 tubers)										% TSWV ⁴	Comments ⁵
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP													
														□	HN	HNR	HH	VR	BC	SR						
Adora	5	9	8	4	□	7	7	5	7	5	4	7	8	6	□	1	9	0	0	1	2	2.8	MS, SR, SS, SG, YF1			
AF1470-6	5	9	8	5		6	7	5	7	3	7	6	6	6		5	8	0	3	0	0	0.9	SR, GC, SS, MS			
AF1565-12	5	9	8	4	□	6	7	5	7	4	6	7	7	5	□	7	9	4	6	3	0	0.0	SG, SS, MS			
AF1569-2	6	9	8	6		6	5	5	6	2	7	7	8	7		9	9	0	0	0	0	0.0	SS			
Atlantic	7	9	8	6	□	7	5	5	6	2	6	7	6	6	□	7	8	0	0	5	0	13.9	SS, MS, TSWV			
B0564-8	5	8	8	5		6	5	5	7	2	6	6	7	6		0	9	0	3	0	0	12.8	FS, SS			
B0564-9	7	9	7	6	□	6	5	6	7	2	6	8	7	6	□	0	9	0	0	0	0	24.7	SG, MS, SS			
B0766-3	6	9	8	6		6	6	5	6	3	7	7	6	5		2	9	0	2	1	0	7.3	SG, CT, SS			
B1240-1	6	9	8	6	□	6	5	5	6	3	6	7	7	5	□	0	9	0	6	2	0	10.5	SG, MS, SS, GC			
B1752-5	6	9	8	5		7	8	7	7	2	8	5	8	6		3	8	0	0	1	0	0.9	SG, CT, SS, YF2			
B1758-4	7	4	8	6	□	2	8	5	7	2	6	5	8	7	□	0	9	0	2	0	0	3.7	SR, MS, GC			
Fabula	8	9	8	7		6	7	6	6	5	5	7	8	4		0	9	0	8	0	0	10.4	MS, SG, CT, YF1			
La Rouge	6	9	8	6	□	3	8	5	7	3	3	8	8	4	□	0	9	0	1	0	0	2.7	MS, CT, SS			
MSE149-5Y	6	9	7	6		6	7	5	4	4	8	8	8	4		0	9	0	0	0	0	8.3	MS, SS, CS, YF1			
MSH095-4	7	9	9	6	□	6	7	3	5	4	3	7	8	3	□	0	9	0	9	0	0	7.3	MS, CT, SG			
NY126	6	9	8	5		6	6	5	7	3	8	7	8	7		0	9	0	0	0	0	3.64	SS, SG, YF1			
NY127	6	9	8	5	□	6	9	7	7	2	8	7	7	8	□	0	9	0	2	0	0	2.9	SS, MS, CS, DAE			
Platina	6	8	8	6		6	8	5	5	3	7	6	8	3		0	9	0	3	0	0	3.8	SG, EL, MS, SS, CT			
Snowden	9	9	8	7	□	7	5	5	7	2	5	5	8	6	□	0	9	0	2	3	0	3.7	MS, SS			
Superior	7	9	8	6		6	6	5	7	3	6	6	8	6		0	9	0	3	0	0	0.9	SS, MS			
Vivaldi	7	9	8	6	□	7	8	5	7	5	7	6	7	7	□	1	9	0	0	0	0	8.1	SS, SG, CS, MS, SG, YF1			
Yukon Gold	8	9	8	5		7	8	5	7	3	8	7	7	7		1	9	0	0	0	0	12.3	SS, SR, SG, YF2			
□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□			

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

² See NE184 Standard Potato Rating System for key to scores in Appendix 2.

³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

⁵ See Appendix 4 for Comment Codes

Table 3a. McCotter's Farm Variety Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity of potato clones harvested 105 DAP¹ at McCotter's Farm, Vandemere, Pamlico Co., NC - 2002. □ □ □ □

Clone	Total Yield cwt/A	□	Marketable Yield cwt/A % Atl.		Size Distribution by Class ² (% of total yield)					Specific Gravity ³	Chip Color ⁴	
					□	A's + B's	C's	Culls	□		TRS	Wise
Atlantic	215	□	195	100	□	90	6	4	□	1.082	3	3
B0564-8	172		140	72		82	14	4		1.078	2	2
B0564-9	185	□	164	84	□	89	8	4	□	1.081	2	3
B0766-3	165		152	81		92	5	3		1.079	2	3
B1752-5	198	□	132	70	□	67	8	25	□	1.078	-	-
Caesar	216		160	85		74	8	18		1.064	-	-
Ida Rose	178	□	151	78	□	85	11	4	□	1.067	-	-
La Rouge	230		203	105		88	6	6		1.072	-	-
MSE149-5Y	173	□	146	77	□	85	6	9	□	1.069	-	-
ND3196-1R	114		87	45		76	13	11		1.071	-	-
NY121	149	□	85	44	□	57	33	10	□	1.080	2	3
NY125	173		144	76		82	13	4		1.083	3	2
NYU47-21	196	□	181	95	□	92	5	3	□	1.082	3	2
Snowden	261		232	148		89	6	5		1.082	2	3
Superior	161	□	137	72	□	85	6	9	□	1.079	4	4
Yukon Gold	162		139	73		86	7	7		1.084	-	-
Grand Mean	184		153									
CV (%)	16		19									
LSD (K=100)	42	□	40	□	□	□	□	□	□	□	□	□

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

² Size classes: A's + B's > 1 7/8"; C's ≤ 1 7/8" ; Culls = all defective potatoes.

³ Determined by weight in air/water method.

⁴ Chip Color Ratings conducted by Wise Foods Inc. and the NCSU potato breeding Program at the TRS/VGJREC:

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

Table 3b. McCotter's Farm Variety Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3 weeks prior to harvest, external and internal tuber attributes of potato clones harvested 105 DAP¹ at McCotter's Farm, Vandemere, Pamlico Co., NC-2002 □

Clone	Plant Data ²				Tuber Data ²										Internal Defects ³ (no./40 tubers)										% TSWV ⁴	Comments ⁵
	TYPE	DIS	POLL	MAT	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	□	HN	HNR	HH	VR	BC	SR						
Atlantic	9	6	7	6	□ 6	5	7	7	2	7	7	8	6	□ 1	9	0	0	3	0	12.2	SS, MS, GC					
B0564-8	9	4	7	4	6	5	7	7	2	8	3	7	6	0	9	0	1	0	0	24.4	SR, FS, MS					
B0564-9	8	6	7	5	□ 6	5	7	7	2	7	6	6	6	□ 0	9	0	0	0	0	58.0	FS, SR					
B0766-3	7	8	8	5	6	7	7	7	2	8	6	8	7	1	9	0	0	0	2	3.6	GC, MS					
B1752-5	8	8	8	5	□ 7	8	5	7	2	7	5	7	4	□ 0	9	0	1	2	0	5.6	SG, YF2, GC, FS, SR					
Caesar	9	7	7	7	9	9	5	7	5	8	6	8	4	0	9	0	0	0	0	9.8	SG, MS, SS, YF1					
Ida Rose	9	9	7	7	□ 2	6	7	5	2	7	5	6	4	□ 3	8	0	1	0	0	4.1	SG, RZ, GC, EL, SG					
La Rouge	7	8	8	5	3	7	7	6	3	4	7	7	5	0	9	0	0	0	1	10.8	MS, SR, FS					
MSE149-5Y	8	7	8	6	□ 7	7	7	6	2	8	6	7	4	□ 3	9	0	0	0	4	5.3	MS, SR, FS, YF1, SS					
ND3196-1R	8	6	7	5	2	8	7	6	2	6	5	6	4	3	8	0	0	0	0	45.7	SR, FS					
NY121	9	7	7	4	□ 8	7	7	7	2	7	3	7	3	□ 0	9	0	0	0	2	10.7	MS, SR, FS					
NY125	7	8	8	5	6	7	5	7	3	6	5	7	5	0	9	0	2	0	0	9.8	SR, MS, YF1					
NYU47-21	7	7	7	5	□ 6	6	7	6	2	7	7	7	6	□ 0	9	0	0	0	0	8.2	GC, SR					
Snowden	9	8	7	6	6	5	7	7	2	6	7	7	6	0	9	0	0	0	0	3.6	MS, DAE, SR, FS, DSE					
Superior	8	8	8	4	□ 6	5	7	7	2	6	6	7	5	□ 0	9	0	0	0	0	12.6	MS, DAE, DSE, SR, FS					
Yukon Gold	8	8	7	5	7	8	7	7	2	7	6	7	6	0	9	0	0	0	0	18.1	SG, SR, MS, FS					
□	□	□	□	□	□ □	□	□	□	□	□	□	□	□	□ □	□	□	□	□	□	□	□					

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

² See NE184 Standard Potato Rating System for key to scores in Appendix 2.

³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

⁵ See Appendix 4 for Comment Codes

Table 4a. Tull Hill Farms Red Variety Trial. Total and Marketable yield, percentage of total yield by size class, and specific gravity of potato clones harvested 106 DAP¹ (102 DVK¹) at Tull Hill Farms, Kinston, Lenoir Co., NC - 2002

Clone	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ² (% of total yield)			Specific ³ Gravity
		cwt/A	% Chieftain	A's + B's	C's	Culls	
B1758-3	234	165	71	70	19	11	1.058
B1758-4	231	155	65	65	20	15	1.057
B1816-5	291	230	95	78	16	5	1.067
Cherry Red	246	200	84	82	13	5	1.070
Chieftain	283	246	100	87	8	5	1.060
Ida Rose	245	182	76	74	22	4	1.049
ND3196-1R	191	134	54	71	7	22	1.064
Nordonna	214	170	70	79	10	11	1.055
NY129	259	228	93	88	7	5	1.056
NYT17-2	236	157	65	66	26	8	1.065
Super Rd. Norl.	199	164	68	81	9	9	1.053
Symfonia	157	87	36	56	13	31	1.069
Grand Mean	232	177					
CV (%)	18	21					
LSD (K=100)	69	54					

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

² Size classes: A's + B's > 1 7/8"; C's ≤ 1 7/8" ; Culls = all defective potatoes.

³ Determined by weight in air/water method.

Table 4b. Tull Hill Farms Red Variety Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3weeks prior to harvest, external and internal tuber attributes of potato clones harvested 106 DAP¹ (102 DVK¹) at Tull Hill Farms, Kinston, Lenior Co., NC-2002 □

Clone	Plant Data ²				Tuber Data ²								Internal Defects ³ (no./40 tubers)								%	Comments ⁵
	TYPE	DIS	POLL	MAT	CLRTXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP					SR	TSWV ⁴				
													HN	HNR	HH	VRBC						
B1758-3	9	4	8	6	□ 2	6	6	7	2	7	5	6	6	□ 1	9	0	0	4	3	4.1	SR, SS	
B1758-4	8	4	8	4	2	6	7	7	3	8	6	7	5	3	8	0	0	5	0	4.5	SIS, PTS, SR, MS	
B1816-5	6	7	8	4	□ 1	6	5	7	4	7	4	7	7	□ 0	9	0	0	0	0	2.7	MS, SIS, SR, PTS, YF2	
Cherry Red	9	8	8	5	2	5	5	8	3	7	5	7	5	0	9	3	0	0	1	0.9	SIS, MS, SR	
Chieftain	8	8	7	5	□ 3	7	5	8	2	6	6	7	6	□ 14	8	0	3	0	0	0.0	SR	
Ida Rose	8	8	8	7	2	6	7	6	2	7	3	8	5	6	9	0	1	2	0	3.0	SS, EL, SG	
ND3196-1R	9	7	8	4	□ 2	7	7	8	3	5	5	5	3	□ 0	9	1	0	11	1	14.3	SR, EL, MS	
Nordonna	8	8	7	5	2	7	7	8	2	6	4	8	6	0	9	0	3	0	0	1.4	SG, MS	
NY129	9	8	8	5	□ 2	6	7	7	2	8	6	6	7	□ 0	9	0	1	2	0	0.0	SIS, EL, SR	
NYT17-2	6	7	8	3	3	7	5	8	5	8	3	6	6	1	9	0	0	3	1	5.5	SIS, MS, SR, MS	
Super Rd. Norl.	7	7	8	3	□ 2	7	7	7	2	6	5	7	6	□ 1	9	0	0	3	0	5.6	GC, SR	
Symfonia	8	8	7	6	3	7	7	8	5	8	5	7	3	9	8	3	0	9	0	0.0	SG	
□	□	□	□	□	□ □	□	□	□	□	□	□	□	□	□ □	□	□	□	□	□	□	□	

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

² See NE184 Standard Potato Rating System for key to scores in Appendix 2.

³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

⁵ See Appendix 4 for Comment Codes

Table 5a. Round White Trial One. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 104 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002.

CLONE	Total Yield cwt/A	□	Marketable Yield		Size Distribution by Class ² (% of total yield)							1 7/8 to 4"	2 1/2 to 4"	□	Specific Gravity ³	Chip Color ⁴	
			□ cwt/A	% Atl.	□	1's	2's	3's	4's	5's	Culls						
Adora	149	□	108	78	□	27	66	6	0	0	2	□	72	6	□	1.064	-
AF1424-7	163		132	105		12	49	32	0	0	7		81	32		1.081	3
AF1470-6	143	□	118	85	□	9	45	36	1	0	9	□	82	37	□	1.058	3
AF1565-12	128		96	73		16	43	30	1	0	9		75	31		1.068	3
AF1569-2	195	□	167	123	□	11	48	36	1	0	4	□	85	37	□	1.063	2
AF1763-2	185		153	116		12	58	24	0	0	6		82	24		1.064	3
AF1938-3	129	□	107	80	□	3	29	52	2	0	14	□	83	54	□	1.070	2
AF2215-3	172		144	105		13	51	31	0	0	4		82	31		1.072	2
AF2217-3	140	□	99	75	□	11	38	32	1	0	18	□	71	33	□	1.083	-
AF2220-7	170		141	107		8	48	35	1	0	9		83	36		1.074	2
Atlantic	181	□	145	100	□	9	30	46	3	0	13	□	78	49	□	1.079	2
B0564-8	192		151	114		16	54	24	0	0	6		78	24		1.074	2
B0564-9	205	□	179	137	□	8	37	50	0	0	5	□	87	50	□	1.076	2
B0766-3	147		123	96		8	45	39	0	0	8		84	39		1.069	2
B1752-5	181	□	150	113	□	12	49	33	1	0	6	□	83	34	□	1.071	-
B1880-6	161		103	80		36	53	10	0	0	1		62	10		1.070	2
B2024-33	192	□	154	113	□	19	57	23	0	0	1	□	80	23	□	1.070	3
Fabula	192		167	128		7	31	53	2	1	5		87	55		1.058	-
NY126	177	□	155	117	□	8	32	51	4	1	4	□	87	55	□	1.055	2
Snowden	257		219	170		11	54	31	0	0	4		85	31		1.073	1
Superior	170	□	153	114	□	5	32	57	1	0	4	□	90	58	□	1.075	3
Yukon Gold	157		130	100		8	38	41	3	0	10		83	44		1.072	-
Grand Mean	172		141														
CV (%)	13		16														
LSD (K=100)	30	□	30	□	□	□	□	□	□	□	□	□	□	□	□	□	□

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

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

³ Determined by weight in air/water method.

⁴ Chip Color Ratings conducted by Wise Foods Inc. and the NCSU potato breeding Program at the TRS/VGJREC:

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

Table 5b. Round White Trial One. Plant vine type, disease and air pollution scores, maturity at ca. 3weeks prior to harvest, tuber external and internal attributes of potato clones harvested 104 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002. □

CLONE	Plant Data ²				Tuber Data ² □										Internal Defects ³ (no./40 tubers)							%	Comments ⁵
	TYPE	DIS	POLL	MAT	□	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	□	HN	HNR	HH	VR	BC	SR	TSWV ⁴	
Adora	6	8	8	4	□	6	8	7	7	4	8	4	8	6	□	0	9	0	2	0	3	0.0	IL, MS, SS
AF1424-7	7	8	8	5		8	8	6	5	3	8	5	7	5		0	9	0	0	0	0	1.3	MS, SR
AF1470-6	5	8	8	3	□	6	8	7	7	3	7	5	8	6	□	2	8	0	0	1	1	0.0	GC, IL, MS, SR, SS, RZ
AF1565-12	6	8	7	4		8	8	5	7	4	8	5	7	6		0	9	0	0	0	5	2.6	GC, MS, SG, SS, RZ
AF1569-2	6	8	8	5	□	7	6	5	7	7	8	6	8	6	□	0	9	0	0	0	11	0.0	MS, SR, SS, RZ
AF1763-2	6	8	8	4		8	7	5	7	7	7	5	6	5		0	9	0	0	0	4	0.0	GC, MS, SG, SR, SS, RZ
AF1938-3	8	8	8	6	□	6	8	6	6	5	8	7	8	6	□	0	9	0	0	0	0	0.0	GC, MS, SR, RZ, TSWV
AF2215-3	7	8	8	5		6	7	5	7	3	8	5	8	6		6	8	0	0	0	1	2.8	IL, MS, SR, SS
AF2217-3	8	8	8	6	□	6	7	6	5	2	8	5	8	5	□	0	9	1	0	0	0	0.0	GC, MS, SR, SS, RZ
AF2220-7	6	8	8	5		6	7	5	6	3	7	6	7	4		0	9	0	0	1	2	0.0	DAE, GC, MS, SR, SS
Atlantic	8	6	8	5	□	6	5	7	5	2	7	7	7	6	□	16	7	0	0	7	1	17.5	GC, SR, RZ, MS
B0564-8	7	6	8	5		6	6	7	7	2	7	5	8	7		0	9	0	0	0	5	10.0	SS, RZ, MS, SR, FS
B0564-9	9	8	7	5	□	6	6	6	6	2	7	6	8	6	□	0	9	0	0	0	1	4.5	SR, SS, FS, RZ, MS
B0766-3	5	8	8	4		6	7	6	6	3	8	5	8	7		1	9	1	0	1	4	1.8	GC, IL, MS, SR, STST
B1752-5	6	8	8	5	□	7	8	7	7	2	8	6	6	6	□	2	9	1	0	2	5	0.0	SR, RZ, SS, MS, SG, IL
B1880-6	6	8	8	4		7	6	7	7	2	7	3	7	6		0	9	0	0	0	3	0.0	SS, RZ
B2024-33	6	8	8	5	□	7	6	7	7	2	8	3	7	6	□	0	9	0	0	1	2	0.0	MS, SR, SS, YF1
Fabula	8	8	8	7		8	7	5	7	4	7	6	7	6		0	9	0	0	0	4	3.0	MS, SR, RZ
NY126	8	8	8	5	□	7	7	7	7	2	8	7	7	7	□	0	9	0	0	0	1	3.5	MS, SR, YF1
Snowden	9	8	8	7		7	5	7	7	2	5	5	7	6		0	9	0	0	2	1	4.6	DAE, DSE, MS, SR, SS, RZ
Superior	7	8	8	5	□	6	7	5	7	3	7	5	7	6	□	2	8	0	0	1	3	0.0	MS, SS
Yukon Gold	9	8	8	5		7	8	7	7	2	7	5	6	7		4	9	0	0	0	1	1.8	SR, RZ, YF1
□	□	□	□	□		□	□	□	□	□	□	□	□	□		□	□	□	□	□	□	□	□

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

² See NE184 Standard Potato Rating System for key to scores in Appendix 2.

³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

⁵ See Appendix 4 for Comment Codes

Table 6a. Round White Trial Two. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 111 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002.

CLONE	Total Yield cwt/A	█	Marketable Yield █ cwt/A	% Atl.	Size Distribution by Class ² (% of total yield)										1 7/8 to 4"	2 1/2 to 4"	█ Specific Gravity ³	Chip Color ⁴
					█	1's	2's	3's	4's	5's	Culls							
AF2207-4	170	█	123	107	█	13	42	28	1	0	17	█	70	29	█	1.082	2	
AF2214-1	165		113	101		8	36	32	1	0	23		69	33		1.075	3	
AF2222-2	171	█	114	100	█	24	58	8	0	0	10	█	66	8	█	1.069	2	
AF2222-3	186		150	132		8	43	37	0	0	11		81	37		1.072	3	
AF2242-10	156	█	106	93	█	19	51	17	0	0	14	█	68	17	█	1.073	3	
AF2269-8	209		168	151		4	39	41	0	0	16		80	41		1.059	2	
ARSW97-4287-2	174	█	144	125	█	12	54	29	0	0	5	█	83	29	█	1.073	3	
Atlantic	155		116	100		6	31	39	4	0	19		74	43		1.075	3	
B1971-11	143	█	105	94	█	12	45	28	0	0	15	█	73	28	█	1.066	3	
B2001-197	100		82	69		7	51	30	0	0	12		81	30		1.062	2	
B2024-10	199	█	153	132	█	4	37	39	1	0	20	█	76	39	█	1.071	3	
Caesar	182		122	103		11	51	14	0	0	24		65	14		1.063	-	
Kennebec	182	█	138	124	█	3	26	44	6	0	20	█	76	51	█	1.069	-	
MSF313-3	110		58	52		14	37	16	0	0	33		53	16		1.073	3	
MSH031-5	127	█	95	84	█	13	60	13	0	0	13	█	74	13	█	1.075	3	
NY112	219		180	157		7	38	44	0	0	11		82	44		1.069	3	
NY121	133	█	61	52	█	50	43	1	0	0	6	█	44	1	█	1.076	3	
NY125	176		135	120		17	51	25	0	0	7		76	25		1.068	2	
NY127	166	█	115	100	█	14	51	18	0	0	17	█	69	18	█	1.070	3	
NYU47-21	165		132	116		5	42	36	1	0	16		79	37		1.070	3	
Platina	170	█	124	115	█	8	40	32	1	0	20	█	72	32	█	1.056	-	
Snowden	237		202	178		9	50	34	2	0	6		85	35		1.076	3	
Superior	105	█	91	81	█	4	34	52	1	0	8	█	87	53	█	1.068	4	
Vivaldi	190		118	106		31	57	5	0	0	7		62	5		1.063	-	
Grand Mean	166		123															
CV (%)	17		21															
LSD (K=100)	38	█	36		█	█	█	█	█	█	█	█	█	█	█		█	

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

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

³ Determined by weight in air/water method.

⁴ Chip Color Ratings conducted by Wise Foods Inc. and the NCSU potato breeding Program at the TRS/VGJREC:

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

Table 6b. Round White Trial Two. Plant vine type, disease and air pollution scores, maturity at ca. 3weeks prior to harvest, tuber external and internal attributes of potato clones harvested 111 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002. □ □ □

CLONE	Plant Data ²				Tuber Data ²										Internal Defects ³ (no./40 tubers)										% TSWV ⁴	Comments ⁵
	TYPE	DIS	POLL	MAT	□	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	□	HN	HNR	HH	VR	BC	SR					
AF2207-4	7	8	8	6	□	6	6	7	5	2	8	5	5	3	□	0	9	0	0	2	1	0.9	MS, RZ, SS, SR, GC			
AF2214-1	6	8	8	5		6	6	5	7	2	8	6	6	5		1	9	1	1	1	0	3.7	^SR, SS, MS, RZ			
AF2222-2	8	8	8	5	□	8	7	7	7	2	8	4	6	6	□	0	9	0	0	0	0	0.0	MS, SR, SS, IL, RZ			
AF2222-3	7	8	8	7		8	7	7	7	2	7	5	5	5		0	9	0	0	0	2	0.0	MS, SR, SS, DAE, DSE			
AF2242-10	5	7	8	4	□	6	6	5	7	3	8	5	7	6	□	1	8	0	0	0	0	3.6	SR, MS, IL, SS			
AF2269-8	7	8	8	5		8	8	5	7	5	7	6	5	7		0	9	0	0	0	1	1.9	^SR, SS, RZ, PTS, SG			
ARS-4287-2	9	8	8	7	□	6	5	5	7	3	6	6	7	6		3	8	0	0	0	1	0.0	IL, SS, MS, SIS, SR			
Atlantic	6	7	8	5		6	5	7	7	2	6	6	4	6		11	6	0	0	4	2	9.1	^SR, SS, MS			
B1971-11	6	7	8	5	□	6	6	5	7	3	8	6	5	5	□	0	9	0	0	0	0	6.7	^SR, MS, SS, RZ			
B2001-197	5	8	8	4		8	8	7	7	2	8	5	4	6		0	9	0	3	0	1	3.7	SR, SS, RZ			
B2024-10	8	8	8	6	□	7	7	5	7	3	8	6	4	7	□	5	5	0	0	0	2	0.9	^SR, RZ, YF1			
Caesar	8	8	8	7		9	7	4	7	5	8	5	4	6		1	9	0	1	3	0	0.0	SR, CS, RZ, MS, YF1			
Kennebec	8	8	8	6	□	8	7	5	5	4	6	7	5	4	□	0	9	0	0	0	0	0.0	MS, SR			
MSF313-3	6	8	7	5		8	6	7	7	2	8	5	4	4		1	9	0	0	0	0	0.0	^RZ, CS, SR, SS			
MSH031-5	7	8	8	5	□	8	8	4	7	3	8	5	6	6	□	0	9	0	0	2	1	0.0	RZ, MS, CS			
NY112	8	8	8	6		5	5	7	6	3	7	6	7	7		0	9	0	0	0	3	0.9	SR			
NY121	6	8	8	4	□	8	8	7	7	2	7	3	7	3	□	0	9	0	1	0	0	0.9	SR, SS, MS, DSE, RZ			
NY125	6	8	8	5		8	8	7	7	2	6	5	4	4		0	9	0	0	0	3	0.0	MS, SR			
NY127	6	8	8	5	□	8	8	7	7	2	6	5	4	4	□	0	9	0	0	0	3	6.2	SR, RZ, CS, MS			
NYU47-21	6	8	8	6		9	7	7	7	2	8	6	5	7		3	9	0	0	7	2	1.0	SR, FS			
Platina	6	8	8	6	□	9	7	7	7	5	7	6	5	5	□	0	9	0	0	0	2	1.0	SR, MS, RZ,IL			
Snowden	8	8	8	6		5	5	7	7	2	5	6	7	5		0	9	0	0	1	1	1.9	SR, MS, DSE, DAE, SS			
Superior	6	8	8	6	□	6	6	5	7	3	6	6	6	6	□	1	9	0	0	3	0	0.0	SR, MS, FS			
Vivaldi	8	8	8	5		9	8	5	7	5	8	5	7	6		0	9	0	2	0	0	1.8	SR, MS, CS, SS			
□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□			

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

² See NE184 Standard Potato Rating System for key to scores in Appendix 2.

³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

⁵ See Appendix 4 for Comment Codes

Table 7a. NE-184 Trial. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 103 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002. □ □ □

CLONE	Total Yield cwt/A	Marketable Yield		Size Distribution by Class ² (% of total yield)								1 7/8 to 4"	2 1/2 to 4"	Specific Gravity ³	Chip Color ⁴
		□ cwt/A	% Atl.	□ 1's	2's	3's	4's	5's	Culls	□					
A9014-2	147	□ 118	59	□ 9	67	13	0	0	11	□ 80		13	□	1.070	-
AF1455-20	169	138	70	11	46	36	0	0	8	81		36		1.081	2
AF1470-6	146	□ 125	62	□ 9	44	41	0	0	6	□ 85		41	□	1.058	2
AF1569-2	196	154	74	17	50	27	0	0	6	77		27		1.069	3
ARS-W96-40006-1	187	□ 141	68	□ 19	56	19	0	0	7	□ 75		19	□	1.078	3
ARS-W96-40022-5	181	117	57	31	48	15	0	0	7	62		15		1.077	2
ARS-W96-4654-1	159	□ 95	48	□ 38	56	3	0	0	3	□ 59		3	□	1.078	3
Atlantic	232	206	100	8	35	52	1	0	4	88		53		1.080	2
ATX84706-2Ru	197	□ 170	82	□ 5	41	43	1	0	10	□ 85		44	□	1.074	-
B1240-1	192	176	89	6	34	54	4	0	3	92		57		1.077	2
B1425-9	193	□ 146	74	□ 17	52	23	0	0	8	□ 75		23	□	1.083	2
Envol	144	118	61	10	49	31	2	0	8	82		33		1.072	3
Gem Russ	114	□ 68	34	□ 34	56	3	0	0	7	□ 59		3	□	1.067	-
Katahdin	158	137	68	9	43	43	0	0	4	86		43		1.067	-
Kennebec	195	□ 177	87	□ 3	25	62	4	0	7	□ 90		66	□	1.069	-
NY102	162	137	69	11	62	23	0	0	4	85		23		1.081	3
Russ Bur	131	□ 50	26	□ 28	37	1	0	0	35	□ 38		1	□	1.072	-
Russ Nor 3117	161	128	66	17	69	11	0	0	3	79		11		1.065	-
Shepody	156	□ 115	59	□ 7	52	20	1	0	19	□ 74		21	□	1.081	-
Snowden	191	159	80	11	46	36	1	0	6	83		37		1.082	1
Superior	195	□ 174	88	□ 7	43	46	1	0	4	□ 89		46	□	1.073	3
W1242	159	126	64	7	26	49	4	0	13	79		53		1.077	2
W1313	198	□ 170	85	□ 13	47	38	0	0	2	□ 85		38	□	1.086	2
Yukon Gold	147	117	59	13	41	39	0	0	8	80		39		1.075	-
Grand Mean	171	136													
CV (%)	16	20													
LSD (K=100)	41	□ 38	□	□	□	□	□	□	□	□		□	□	□	□

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

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

³ Determined by weight in air/water method.

⁴ Chip Color Ratings conducted by Wise Foods Inc. and the NCSU potato breeding Program at the TRS/VGJREC:

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

Table 7b. NE-184 Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3weeks prior to harvest, tuber external and internal attributes of potato clones harvested 103 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002.

CLONE	Plant Data ²				Tuber Data ²												Internal Defects ³ (no./40 tubers)										% TSWV ⁴	Comments ⁵
	TYPE	DIS	POLL	MAT	□	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	□	HN	HNR	HH	VR	BC	SR							
A9014-2	6	8	8	6	□	5	3	5	6	6	6	5	7	5	□	0	9	0	0	0	0	3.9	MS, SS, RZ					
AF1455-20	8	8	8	5		8	7	7	7	2	7	5	7	4		0	9	0	0	0	2	1.9	MS, SR, RZ, SS					
AF1470-6	5	8	8	3	□	8	8	7	7	2	8	5	7	7	□	0	9	0	3	0	2	0.0	MS, SR, RZ					
AF1569-2	6	8	8	5		6	6	7	7	2	8	5	6	6		0	9	0	0	0	5	0.0	SS, SR, RZ					
ARS-W96-40006-1	7	8	8	5	□	6	6	7	7	3	8	5	7	5	□	0	9	0	0	0	2	7.3	MS, SR, RZ, SS					
ARS-W96-40022-5	6	8	8	4		6	6	5	7	2	6	3	6	4		0	9	0	3	0	14	0.0	MS, GC, SS, SR					
ARS-W96-4654-1	6	8	7	5	□	6	6	5	7	2	6	2	7	4	□	16	7	0	0	0	0	0.9	MS, SS					
Atlantic	6	7	8	5		7	5	7	6	2	7	7	7	6		3	8	0	0	0	3	14.5	MS, SR, RZ, SS					
ATX84706-2Ru	6	8	8	6	□	6	6	5	6	6	8	7	7	4	□	0	9	0	0	0	2	1.0						
B1240-1	6	7	7	6		6	5	7	3	2	7	7	7	6		1	9	0	0	2	3	12.9	MS, SS					
B1425-9	9	7	8	6	□	6	6	7	7	2	6	5	6	4	□	0	9	0	0	2	3	14.4	MS, SR, SS					
Envol	5	8	8	4		8	7	5	7	3	7	5	7	5		0	9	0	0	0	10	1.3	MS, SR, RZ					
Gem Russ	8	8	8	7	□	4	3	5	5	6	8	1	7	3	□	0	9	0	0	8	0	6.2	□					
Katahdin	6	8	7	6		8	7	5	5	4	7	7	8	5		4	8	0	0	3	2	0.0	MS, SS					
Kennebec	9	8	7	7	□	8	7	5	5	5	6	9	7	5	□	1	9	0	0	0	0	0.0	□					
NY102	6	8	8	5		8	7	7	6	2	7	5	7	5		0	9	0	0	1	1	0.0	MS, SS, RZ, DAE, DSE					
Russ Bur	8	8	8	7	□	6	4	5	6	6	7	1	7	1	□	29	6	0	0	0	3	5.4	^MS, PTS, SG					
Russ Nor 3117	6	8	8	5		4	3	7	7	6	8	0	7	6		0	9	0	0	0	0	0.0	MS, SR					
Shepody	8	8	8	6	□	8	7	7	5	6	7	7	7	4	□	2	8	0	0	3	1	1.9	MS, SR, SG					
Snowden	8	8	7	5		7	5	7	6	2	5	6	7	6		1	8	0	0	0	0	2.9	MS, SS, RZ, DSE, DAE					
Superior	6	8	8	5	□	7	7	5	7	3	7	6	7	6	□	0	9	0	0	6	3	0.9	MS, SR					
W1242	7	7	8	7		8	8	7	5	3	7	6	7	5		0	9	0	0	3	0	13.8	MS, SR, DSE, RZ					
W1313	9	8	8	7	□	6	5	5	5	2	7	6	7	6	□	1	9	0	0	0	1	0.0	MS, DSE					
Yukon Gold	8	8	8	5		7	8	7	7	2	8	6	7	7		3	8	1	0	3	1	1.0	MS, SR					
□		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□					

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

² See NE184 Standard Potato Rating System for key to scores in Appendix 2.

³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

⁵ See Appendix 4 for Comment Codes

Table 8a. NE-184 Red-Skinned Potato Variety Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity of potato clones harvested 105 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002. □ □

CLONE	Size Dist. by Class (%) ²												Specific Gravity ³
	Total Yield cwt/A	Marketable Yield		(% of total yield)							1 7/8 to 4"	2 1/2 to 4"	
		□ cwt/A	% Chieftain	□ 1's	2's	3's	4's	5's	Cull's	□			
B1523-4	206	□ 173	75	□ 15	51	31	1	0	3	□ 83	32	□ 1.072	
B1758-3	108	89	39	15	29	45	7	0	3	81	52	1.065	
B1758-4	177	□ 149	65	□ 13	41	43	0	0	3	□ 84	43	□ 1.070	
B1952-2	196	174	76	5	35	53	1	0	7	89	54	1.075	
Brise du Nord	251	□ 210	92	□ 5	47	37	0	0	11	□ 84	37	□ 1.072	
Chieftain	263	229	100	7	40	46	0	0	6	87	46	1.065	
Dk Rd Nor	212	□ 161	69	□ 13	54	20	0	0	12	□ 75	20	□ 1.062	
Ida Rose	253	216	95	8	30	51	4	0	7	85	55	1.062	
La Rouge	255	□ 229	99	□ 5	30	56	3	0	5	□ 89	59	□ 1.065	
MI Purple	235	214	92	5	23	62	4	0	8	89	66	1.069	
ND3196-1R	231	□ 200	87	□ 6	36	51	0	0	8	□ 86	51	□ 1.066	
Nordonna	217	150	64	16	45	23	0	0	17	68	23	1.062	
NY129	230	□ 188	82	□ 9	41	41	0	0	9	□ 82	41	□ 1.061	
NYT17-2	196	104	44	34	50	1	0	0	15	51	1	1.065	
Roselys	280	□ 252	110	□ 4	25	63	2	0	6	□ 90	65	□ 1.068	
Symfonia	102	68	29	7	33	25	0	0	35	58	25	1.070	
Grand Mean	213	175											
CV (%)	16	21											
LSD (K=100)	47	□ 50	□	□ □	□	□	□	□	□	□ □	□	□ □	

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

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

³ Determined by weight in air/water method.

Table 8b. NE-184 Red-Skinned Potato 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 potatoes harvested 105 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002.

CLONE	Plant Data ²				Tuber Data ²											Internal Defects ³ (no./40 tubers)										% TSWV ⁴	Comments ⁵
	TYPE	DIS	POLL	MAT																							
					CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR								
B1523-4	7	7	7	5	2	6	5	6	2	7	6	8	6	0	9	0	0	0	2	5.1	MS, SR, SG, RZ						
B1758-3	6	4	8	5	2	7	7	6	2	7	6	8	6	5	9	0	0	0	0	0.0	MS, SR, SS						
B1758-4	8	4	8	5	2	7	7	6	2	7	5	8	6	1	9	0	0	0	0	15.2	GC, MS, SR, RZ						
B1952-2	6	7	7	5	1	7	5	4	2	6	5	6	5	1	9	0	0	0	0	6.4	GC, SIS, RZ						
Brise du Nord	9	8	8	7	3	6	5	4	3	7	6	6	3	5	9	0	0	0	0	0.0	GC, MS, RZ						
Chieftain	7	8	8	5	3	7	5	5	2	6	6	7	5	14	8	0	0	0	0	1.9	GC, MS, RZ						
Dk Rd Nor	5	8	8	4	2	8	7	7	3	6	3	7	5	1	9	0	0	0	0	0.0	GC, MS, SR, RZ						
Ida Rose	9	8	7	7	2	6	7	5	2	7	7	6	4	17	6	0	0	0	0	2.2	IL, RZ						
La Rouge	6	8	8	5	3	8	5	6	3	6	7	7	5	0	9	0	0	0	0	0.0	DAE, DSE, MS, SS						
MI Purple	5	8	8	5	1	7	5	4	3	6	7	6	6	2	9	0	0	0	0	0.0	GC, MS, SIS, SG, SS, RZ						
ND3196-1R	6	8	7	5	2	8	7	6	3	6	5	7	6	2	9	0	0	0	0	3.0	GC, MS, SS, RZ						
Nordonna	7	8	7	5	2	7	7	7	2	7	3	7	7	0	9	0	0	0	0	2.1	MS, SG, SS, RZ						
NY129	8	8	8	6	2	7	7	6	2	8	5	6	7	0	9	0	0	0	0	1.9	MS, ^RZ						
NYT17-2	6	8	8	4	2	8	5	7	5	8	2	6	4	0	9	0	0	0	0	0.0	SIS, SG, SR, RZ, RF2						
Roselys	6	7	8	5	3	8	5	6	4	8	7	8	5	0	9	0	0	0	0	3.6	MS, SS						
Symfonia	8	8	8	7	3	7	5	6	4	8	6	6	3	7	7	0	0	0	0	0.0	GC, MS, SG, SS, RZ						

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

² See NE184 Standard Potato Rating System for key to scores in Appendix 2.

³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

⁵ See Appendix 4 for Comment Codes

Table 9a. UNR Trial. Total and marketable yield, percentage of total yield by size class, and specific gravity of potato clones harvested 112 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002. □ □ □ □

CLONE	Total Yield cwt/A		Marketable Yield cwt/A % Atlantic		Size Dist. by Class (%) ² (% of total yield)							1 7/8 to 4"		2 1/2 to 4"		Specific Gravity ³
					1's	2's	3's	4's	5's	Cull's						
AF2209-16	98	□	73	109	10	70	5	0	0	16	□	74	5	□		1.060
AF2276-8	117		53	80	34	42	4	0	0	20		46	4			1.067
AF2278-1	104	□	47	70	40	38	6	0	0	15	□	45	6	□		1.070
AF2280-6	148		90	135	12	45	15	0	0	28		61	15			1.068
AF2291-10	150	□	101	151	9	40	24	3	0	24	□	67	27	□		1.078
AF2293-2	88		47	71	35	54	0	0	0	11		54	0			1.076
AF2314-2	118	□	92	138	3	57	22	0	0	18	□	78	22	□		1.064
AF2321-5	178		142	96	2	27	53	0	0	18		80	53			1.064
AF2322-4	145	□	91	62	30	63	0	0	0	7	□	63	0	□		1.065
AF2323-4	192		122	82	16	52	11	0	0	21		64	11			1.061
AF2326-1	148	□	115	78	4	53	25	0	0	18	□	77	25	□		1.078
AF2329-1	200		173	117	3	24	62	0	0	10		87	62			1.054
AF2341-3	165	□	114	77	3	29	40	0	0	28	□	69	40	□		1.067
AF2349-3	100		42	28	33	42	0	0	0	25		42	0			1.066
AF2351-2	131	□	61	41	12	46	0	0	0	41	□	46	0	□		1.074
AF2351-3	182		104	71	9	38	19	0	0	33		57	19			1.077
AF2351-4	201	□	127	86	13	51	12	0	0	24	□	63	12	□		1.076
AF2351-6	182		148	100	2	27	47	7	0	17		81	54			1.070
AF2351-7	262	□	212	144	4	13	58	10	0	15	□	81	69	□		1.066
AF2353-1	145		79	53	9	41	14	0	0	37		54	14			1.069
AF2360-2	192	□	141	96	1	11	49	13	0	26	□	74	62	□		1.064
AF2363-11	108		54	42	1	20	30	0	0	49		50	30			1.085
□	□	□ □	□	□ □	□	□	□	□	□	□ □	□	□	□ □			

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

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

³ Determined by weight in air/water method.

Table 9b. UNR Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3weeks prior to harvest, tuber external and internal attributes of potato clones harvested 112 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002.

CLONE	Plant Data ²				Tuber Data ²											Internal Defects ³ (no./40 tubers)								% TSWV ⁴	Comments ⁵
	TYPE	DIS	POLL	MAT	□											□									
					CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR						
AF2209-16	5	8	5	4	□	6	7	5	7	4	7	5	7	6	□	3	7	0	1	0	0	0.0	SR, MS		
AF2276-8	9	8	8	6		6	6	5	7	3	8	2	7	4		3	6	0	1	0	0	3.6	SR, TSWV		
AF2278-1	6	8	8	4	□	6	6	5	7	4	7	3	8	5	□	0	9	0	1	0	0	0.0	SR, MS, RZ, SS		
AF2280-6	6	8	8	5		6	7	5	7	3	8	5	6	6		1	8	0	1	0	0	3.6	SR, IL, MS		
AF2291-10	8	8	6	7	□	8	7	7	7	2	7	5	6	6	□	0	9	0	1	0	0	0.0	SR, SS, MS		
AF2293-2	5	8	8	3		6	7	7	7	2	8	3	8	5		0	9	0	1	0	0	0.0	SR, MS, RZ		
AF2314-2	5	7	8	5	□	7	5	5	7	5	8	5	7	7	□	0	9	0	1	0	0	7.7	SR, MS		
AF2321-5	9	9	8	6		8	7	5	5	3	8	5	7	6		0	9	0	1	0	0	0.0	MS, SR		
AF2322-4	5	8	8	4	□	8	7	5	7	4	8	3	8	5	□	0	9	0	1	0	0	0.0	MS, SR		
AF2323-4	6	8	8	4		6	7	5	7	2	6	3	7	5		0	9	0	1	0	0	0.0	SR, MS, SC, TSWV		
AF2326-1	6	8	8	5	□	6	6	5	7	3	7	3	7	6	□	0	9	0	1	0	0	0.0	SR		
AF2329-1	6	8	8	5		6	7	7	7	2	7	7	8	7		0	9	0	1	0	0	0.0	SR, SS		
AF2341-3	8	8	6	7	□	6	6	7	6	2	8	5	6	6	□	2	7	0	1	0	0	0.0	SR, ^RZ		
AF2349-3	6	8	8	6		6	6	5	7	2	8	2	6	5		0	9	0	1	0	0	0.0			
AF2351-2	6	8	8	5	□	8	8	7	7	2	6	3	5	6	□	0	9	0	1	0	0	3.6	SR, MS		
AF2351-3	9	8	7	6		8	6	7	7	2	7	5	6	4		0	9	0	1	0	0	0.0	SR, MS, RZ, GC		
AF2351-4	9	8	9	5	□	6	7	7	7	2	7	3	6	5	□	0	9	0	1	0	0	0.0	SR, RZ, MS		
AF2351-6	9	9	7	7		8	7	7	6	2	7	7	7	7		2	6	0	1	0	0	0.0	SR, RZ, MS, CS		
AF2351-7	9	9	8	8	□	6	5	7	6	2	7	8	7	8	□	10	2	0	1	0	0	0.0	SR, FS, RZ		
AF2353-1	9	9	9	8		6	6	6	6	2	8	3	8	6		0	9	0	1	0	0	0.0	YF1		
AF2360-2	9	9	8	6	□	8	7	7	6	2	7	8	6	6	□	0	9	0	1	0	0	0.0	SR, MS, GC		
AF2363-11	8	7	9	6		6	7	7	5	2	6	7	5	5		0	9	0	1	0	0	9.5	SR, GC, MS, RZ		
□	□	□	□	□	□ □	□	□	□	□	□	□	□	□	□ □	□	□	□	□	□	□	□	□			

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

² See NE184 Standard Potato Rating System for key to scores in Appendix 2.

³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

⁵ See Appendix 4 for Comment Codes

Table 9a. Continued.

CLONE	Total Yield cwt/A		Marketable Yield cwt/A % Atlantic		Size Dist. by Class (%) ² (% of total yield)							1 7/8 to 4"		2 1/2 to 4"	Specific Gravity ³
					1's	2's	3's	4's	5's	Cull's					
AF2363-9	149		110	86	5	44	30	0	0	21		74	30		1.077
AF2366-1	145		99	77	8	51	17	0	0	23		68	17		1.079
Atlantic	150		113	100	8	35	36	3	0	18		74	40		1.080
B1806-8	157		113	115	13	53	19	0	0	15		72	19		1.079
B1958-53	156		125	128	10	65	15	0	0	10		80	15		1.077
B1970-1	139		63	64	21	39	7	0	0	34		45	7		1.075
B1992-177	123		98	100	10	50	29	0	0	11		79	29		1.075
B2018-6	125		89	91	6	43	27	0	0	23		71	27		1.063
B2024-26	139		105	108	15	54	22	0	0	9		76	22		1.075
B2033-3	157		122	124	17	66	12	0	0	5		78	12		1.071
B2066-3	77		35	32	39	46	0	0	0	15		46	0		1.081
B2078-13	115		59	54	38	51	0	0	0	11		51	0		1.075
B2078-5	144		100	90	21	59	10	0	0	10		69	10		1.072
B2079-7	108		39	35	61	36	0	0	0	3		36	0		1.079
B2095-1	132		58	53	34	44	0	0	0	22		44	0		1.070
B2098-11	120		81	74	22	51	16	0	0	11		67	16		1.065
B2098-8	97		78	71	13	69	12	0	0	6		81	12		1.066
B2100-2	168		114	104	8	49	19	0	0	24		68	19		1.071
B2100-8	175		117	106	22	54	13	0	0	11		67	13		1.067
B2133-123	197		135	122	19	56	12	0	0	13		69	12		1.073
B2133-124	215		144	131	17	47	20	0	0	16		67	20		1.084
B2133-127	198		144	131	3	25	42	5	0	25		72	47		1.075
B2135-163	218		197	179	1	23	67	0	0	9		90	67		1.071

¹ DAP = Days After Planting; DVK = Days to Vine Kill² Size classes: 1's < 1 7/8"; 2's 1 7/8 to 2 1/2"; 3's 2 1/2 to 3 1/4" ; 4's 3 1/4 to 4"; 5's ≥ 4"; Culls = all defective potatoes.³ Determined by weight in air/water method.

Table 9b. Continued.

CLONE	Plant Data ²				Tuber Data ²											Internal Defects ³ (no./40 tubers)										% TSWV ⁴	Comments ⁵
	TYPE	DIS	POLL	MAT	□											□											
					CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	□	HN	HNR	HH	VR	BC	SR							
AF2363-9	6	8	8	6	□	6	7	5	5	2	7	6	7	4	□	0	9	0	1	0	0	3.9	^GC, SR, MS				
AF2366-1	5	6	8	5		6	7	5	7	2	7	3	7	6		4	4	0	1	0	0	14.3	SR,				
Atlantic	6	7	8	5	□	6	5	7	6	2	6	6	7	6	□	27	8	0	2	2	3	15.4	SR, RZ, GC, MS, SS				
B1806-8	6	8	8	5		7	6	5	7	3	8	3	7	6		0	9	0	0	0	2	0.0	SR, YF1				
B1958-53	6	5	8	5	□	6	7	5	6	4	8	4	8	4	□	0	9	0	0	0	0	0.0	SR, MS				
B1970-1	6	8	8	4		6	5	7	6	2	8	5	6	7		1	7	0	0	0	0	3.9	SR, IL, RZ, FS, YF1				
B1992-177	6	8	8	5	□	7	6	7	7	1	8	3	8	6	□	0	9	0	0	0	1	0.0	SR, FS, YF1				
B2018-6	6	7	8	6		7	6	7	7	1	8	5	7	7		0	9	0	0	0	0	7.7	SR, RZ, YF1				
B2024-26	9	8	8	5	□	6	5	7	7	2	8	4	8	6	□	0	9	0	0	0	0	0.0	SR, IL, YF1				
B2033-3	9	8	7	7		3	6	5	7	3	8	4	8	5		1	8	0	0	0	1	3.6					
B2066-3	5	8	8	5	□	2	8	7	7	2	7	2	7	5	□	0	9	0	0	0	0	0.0	SR, YF2				
B2078-13	5	7	8	4		2	7	7	7	2	7	2	8	5		0	9	0	0	0	1	0.0	SR, SIS				
B2078-5	5	8	8	4	□	3	8	7	7	2	6	2	8	4	□	0	9	0	1	0	0	0.0	MS, SR, SS				
B2079-7	8	8	7	3		2	7	7	7	2	7	2	8	5		0	9	0	3	0	0	0.0	SR, MS				
B2095-1	6	8	8	4	□	7	8	7	7	2	7	2	7	5	□	0	9	0	1	0	0	0.0	MS, SR, GC, IL, YF2				
B2098-11	5	8	8	4		2	7	7	7	2	8	3	8	6		0	9	0	0	0	1	0.0	SR, MS				
B2098-8	8	8	8	4	□	3	8	7	7	5	7	3	8	6	□	0	9	0	0	0	0	0.0	SR, MS, YF1				
B2100-2	9	6	8	5		2	7	5	7	4	8	5	7	6		0	9	0	0	0	0	0.0	SR, MS				
B2100-8	9	8	7	5	□	2	7	6	7	2	7	4	8	6	□	0	9	0	0	0	0	0.0	SR, MS, YF1				
B2133-123	6	8	8	5		6	6	7	7	2	8	5	7	6		0	9	0	0	0	0	3.7	SR, RZ,				
B2133-124	6	7	7	5	□	6	6	5	6	2	9	7	7	7	□	0	9	0	0	0	0	11.1	SR				
B2133-127	6	7	8	6		6	6	7	7	1	9	7	7	7		2	8	0	0	1	0	15.4	SR, RZ				
B2135-163	6	8	8	5	□	8	7	7	7	1	9	7	8	8	□	1	7	0	0	0	0	3.6	SR, RZ				
□	□	□	□	□	□ □	□	□	□	□	□	□	□	□	□ □	□	□	□	□	□	□	□	□					

¹ DAP = Days After Planting; DVK = Days to Vine Kill² See NE184 Standard Potato Rating System for key to scores in Appendix 2.³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants⁵ See Appendix 4 for Comment Codes

Table 9a. Continued.

CLONE	Total Yield		Marketable Yield		Size Dist. by Class (%) ²							1 7/8	2 1/2	Specific		
					(% of total yield)											
	cwt/A	□	cwt/A	% Atlantic	□	1's	2's	3's	4's	5's	Cull's	□	to 4"	to 4"	□	Gravity ³
B2136-170	141	□	87	79	□	3	19	35	8	0	35	□	62	43	□	1.070
NYV101-1	191		111	87		14	52	6	0	0	27		58	6		1.068
NYV101-9	138	□	100	78	□	5	39	33	0	0	22	□	72	33	□	1.073
NYV135-1	108		95	74		5	42	41	5	0	7		88	46		1.071
NYV15-71	100	□	24	19	□	56	24	0	0	0	20	□	24	0	□	1.074
NYV15-72	160		118	92		10	53	20	0	0	17		73	20		1.070
NYV75-9	124	□	89	70	□	6	55	16	0	0	23	□	72	16	□	1.057
NYV76-13	169		148	116		3	35	49	4	0	10		88	52		1.070
NYV78-25	137	□	114	89	□	4	44	39	0	0	13	□	83	39	□	1.076
NYV78-28	139		96	75		11	54	15	0	0	20		69	15		1.075
Snowden	188	□	154	142	□	9	56	25	0	0	10	□	82	25	□	1.078
Superior	158		138	128		4	34	49	4	0	9		87	53		1.069
Grand Mean	152		107													
□	□	□ □	□	□ □	□	□	□	□	□	□	□ □	□	□ □	□ □		

¹ DAP = Days After Planting; DVK = Days to Vine Kill² Size classes: 1's < 1 7/8"; 2's 1 7/8 to 2 1/2"; 3's 2 1/2 to 3 1/4"; 4's 3 1/4 to 4"; 5's ≥ 4"; Culls = all defective potatoes.³ Determined by weight in air/water method.

Table 9b. Continued.

CLONE	Plant Data ²				Tuber Data ²										Internal Defects ³ (no./40 tubers)								%	Comments ⁵
	TYPE	DIS	POLL	MAT	□	CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	□	HN	HNR	HH	VR	BC	SR	TSWV ⁴		
B2136-170	6	6	8	5	□	6	5	7	7	2	5	6	6	5	□	1	8	0	0	0	1	16.0	SR, IL	
NYV101-1	6	7	7	5		6	6	5	7	2	7	3	6	5		0	9	0	0	0	0	14.3	SR, MS, IL	
NYV101-9	8	7	8	5	□	8	7	7	7	2	8	5	7	6	□	0	9	0	0	0	0	9.5	SR, IL, MS	
NYV135-1	8	8	8	5		6	6	6	7	2	7	5	8	5		0	9	0	0	0	0	6.7	SR, RZ	
NYV15-71	5	8	8	4	□	6	8	7	7	2	7	1	7	3	□	0	9	0	1	0	0	0.0	SR, IL	
NYV15-72	6	8	8	5		6	7	7	7	2	7	3	7	5		0	9	0	0	0	0	0.0	SR, IL, MS	
NYV75-9	6	8	7	6	□	8	7	6	6	2	7	3	7	4	□	0	9	0	0	0	2	4.4	SR, IL	
NYV76-13	9	8	8	6		6	6	6	7	2	6	6	8	7		0	9	0	0	0	0	0.0	SR	
NYV78-25	8	8	8	5	□	6	6	7	7	2	8	5	7	6	□	0	9	0	0	0	1	4.6	SR, IL, RZ	
NYV78-28	5	8	8	5		8	6	5	6	3	7	5	7	5		0	9	0	0	0	0	4.4	SR, IL, RZ	
Snowden	8	8	8	5	□	5	5	7	7	2	5	5	8	6	□	1	9	0	0	0	2	0.0	SR, MS	
Superior	6	8	8	5		6	6	6	7	3	6	6	8	6		1	9	0	0	1	3	1.9	SR, MS, IL	
□	□	□	□	□	□ □	□	□	□	□	□	□	□	□	□ □	□	□	□	□	□	□	□	□	□	

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

² See NE184 Standard Potato Rating System for key to scores in Appendix 2.

³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

⁵ See Appendix 4 for Comment Codes

Table 10a. Early Generation Yield Trial. Total and marketable yield, percentage of total yield by size class, specific gravity, and chip scores of potato clones harvested 105 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002.

CLONE	Selection Location & Year ²			Total Yield □ cwt/A	Marketable Yield		Size Distribution by Class ³ (% of total yield)							Specific Gravity ⁴	Chip Color ⁵
	1999	2000	2001		□ cwt/A	% Atl.	□ 1's	2's	3's	4's	5's	Culls			
Atlantic	N/A	N/A	N/A	□ 234	□ 205	100	□ 5	36	51	2	0	7	□ 1.082	3	
B2111-80	NC	N/M	NC	172	154	76	8	44	45	0	0	3	1.084	2	
B2117-218	ME	ME	ME	□ 181	□ 156	78	□ 8	38	47	1	0	7	□ 1.068	2	
B2122-55	ME	NC	NC	190	162	80	8	34	51	1	0	7	1.079	3	
B2122-72	ME	NC	NC	□ 171	□ 127	59	□ 25	56	15	0	0	3	□ 1.081	2	
B2128-13	ME	ME	ME	215	184	91	5	33	48	5	0	9	1.079	3	
B2128-133	ME	ME	ME	□ 167	□ 149	76	□ 9	48	41	0	0	2	□ 1.065	3	
B2128-85	ME	NC	NC	185	152	76	15	56	25	0	0	4	1.079	2	
B2130-136	NC	N/M	ME	□ 164	□ 133	68	□ 12	47	35	0	0	7	□ 1.070	3	
B2131-112	ME	ME	NC	220	196	100	8	41	48	0	0	4	1.073	2	
B2133-18	ME	ME	ME	□ 162	□ 123	61	□ 19	54	22	0	0	6	□ 1.079	3	
B2133-46	NC	ME	NC	185	152	76	17	52	29	0	0	1	1.083	2	
B2133-70	ME	N/M	ME	□ 164	□ 147	74	□ 5	31	53	6	0	5	□ 1.079	2	
B2133-75	N/M	NC	N/M	165	151	77	8	42	49	0	0	1	1.078	3	
B2133-81	ME	N/M	NC	□ 189	□ 153	79	□ 17	59	22	0	0	3	□ 1.077	2	
		Grand Mean		189	153										
		CV (%)		14	17										
□	□	LSD (K=100)		43	□ 43	□	□ □	□	□	□	□	□	□ □	□	

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

² NC = North Carolina; ME = Maine; N/M = Selected at both locations

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 Wise Foods Inc. and the NCSU potato breeding Program at the TRS/VGJREC:

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

Table 10b. Early Generation Yield Trial. Plant vine type, disease and air pollution scores, maturity at ca. 3weeks prior to harvest, tuber external and internal attributes of potato clones harvested 105 DAP¹ at the NCSU VGJREC/NCDA TRS, Plymouth, Washington Co., NC - 2002.

CLONE	Plant Data ²				Tuber Data ²											Internal Defects ³ (no./40 tubers)										% TSWV ⁴	Comments ⁵
	TYPE	DIS	POLL	MAT																							
					CLR	TXT	TCX	TSS	SHP	EYE	SIZE	DIS	APP	HN	HNR	HH	VR	BC	SR								
Atlantic	6	6	8	5		6	5	7	6	2	6	6	7	7		9	8	0	0	0	1	19	RZ,GC,SR				
B2111-80	5	8	8	4		6	7	7	7	2	7	3	8	7		0	9	0	0	0	1	1	MS				
B2117-218	8	8	8	7		8	7	7	7	2	8	5	6	6		0	9	0	0	0	2	1	RZ,SR,MS,IL				
B2122-55	9	8	8	6		6	6	7	5	2	7	7	6	5		0	9	0	0	0	1	0	^RZ,SR,MS,SS				
B2122-72	5	8	7	4		7	6	5	7	4	8	3	7	6		0	9	0	0	0	0	0	RZ,GC,MS				
B2128-13	6	8	8	6		6	5	7	5	3	7	7	7	7		13	7	0	0	1	0	1	RZ,GC,MS,^SS				
B2128-133	6	8	8	4		8	7	5	6	4	8	5	7	6		0	9	0	0	0	0	0	MS,SS,SG				
B2128-85	6	7	8	4		6	7	7	6	4	8	5	7	6		0	9	0	0	2	3	9	RZ,SS				
B2130-136	8	7	7	5		6	6	7	6	2	7	3	6	5		6	8	0	0	0	2	7	SR,SS,TSWV				
B2131-112	6	7	8	6		6	5	7	6	2	7	6	7	7		9	7	0	1	0	0	6	RZ,SS,MS,SR				
B2133-18	6	7	8	4		7	7	7	7	2	8	5	7	5		0	9	0	0	0	1	3	MS, RZ, SS				
B2133-46	6	7	8	5		6	5	7	6	2	8	5	7	7		0	9	0	0	1	0	9	RZ,SR				
B2133-70	8	8	8	6		6	6	7	6	3	8	7	7	7		1	9	0	0	1	0	4	GC,RZ,SS				
B2133-75	7	8	6	6		7	6	7	7	2	8	7	8	9		0	9	0	0	0	0	0	RZ,MS				
B2133-81	6	7	8	5		6	5	7	6	3	8	5	7	4		0	9	0	0	0	0	7	RZ,SS				

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

² See NE184 Standard Potato Rating System for key to scores in Appendix 2.

³ 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 %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

⁵ See Appendix 4 for Comment Codes

Table 11. Mean percent Tomato Spotted Wilt Virus (TSWV) incidence and total and marketable yield observed by clone in potato variety trials, 2002.

Clone	# Trials	% TSWV Incidence ¹			Total Yld cwt/A	Marketable Yld cwt/A
		Min	Max	Mean		
A9014-2	1	3.9	3.9	3.9	147	118
Adora	2	0.0	2.8	1.4	190	147
AF1424-7	2	1.3	4.4	2.8	199	169
AF1455-20	1	1.9	1.9	1.9	169	138
AF1470-6	3	0.0	0.9	0.3	168	141
AF1565-12	3	0.0	2.6	1.2	198	157
AF1569-2	3	0.0	0.0	0.0	224	187
AF1763-2	1	0.0	0.0	0.0	185	153
AF1938-3	2	0.0	0.0	0.0	154	117
AF2207-4	1	0.9	0.9	0.9	170	123
AF2214-1	1	3.7	3.7	3.7	165	113
AF2215-3	1	2.8	2.8	2.8	172	144
AF2217-3	1	0.0	0.0	0.0	140	99
AF2220-7	1	0.0	0.0	0.0	170	141
AF2222-2	1	0.0	0.0	0.0	171	114
AF2222-3	1	0.0	0.0	0.0	186	150
AF2242-10	1	3.6	3.6	3.6	156	106
AF2269-8	1	1.9	1.9	1.9	209	168
ARS-W96-40006-1	1	7.3	7.3	7.3	187	141
ARS-W96-40022-5	1	0.0	0.0	0.0	181	117
ARS-W96-4654-1	1	0.9	0.9	0.9	159	95
ARSW97-4287-2	1	0.0	0.0	0.0	174	144
Atlantic	7	9.1	21.4	14.8	209	173
ATX84706-2Ru	1	1.0	1.0	1.0	197	170
B0564-8	4	10.0	24.4	15.4	210	165
B0564-9	4	4.5	58.0	37.7	223	193
B0766-3	4	1.8	7.3	3.6	209	173
B1240-1	3	10.5	17.8	13.7	229	198
B1425-9	1	14.4	14.4	14.4	193	146
B1523-4	1	5.1	5.1	5.0	206	173
B1752-5	4	0.0	5.6	2.0	193	141
B1758-3	2	0.0	4.1	2.0	171	127
B1758-4	3	3.7	15.2	7.8	190	141
B1816-5	1	2.7	2.7	2.7	291	230
B1880-6	1	0.0	0.0	0.0	161	103
B1952-2	1	6.4	6.4	6.4	196	174
B1971-11	1	6.7	6.7	6.7	143	105
B2001-197	1	3.7	3.7	3.7	100	82
B2024-10	1	0.9	0.9	0.9	199	153
B2024-33	1	0.0	0.0	0.0	192	154
Brise du Nord	1	0.0	0.0	0.0	251	210
Caesar	2	0.0	9.8	4.9	199	141

¹ %TSWV = Percent Tomato Spotted Wilt Virus observed in plants

Table 11. continued.

Clone	# Trials	% TSWV Incidence ¹			Total Yld cwt/A	Marketable Yld cwt/A
		Min	Max	Mean		
Cherry Red	1	0.9	0.9	0.9	246	200
Chieftain	2	0.0	1.9	0.9	273	237
Coastal Chip	1	0.0	0.0	0.0	218	189
Dk Rd Nor	1	0.0	0.0	0.0	212	161
Envol	1	1.3	1.3	1.3	144	118
Fabula	2	3.0	10.4	6.7	211	178
Gem Russ	1	6.2	6.2	6.2	114	68
Ida Rose	3	3.0	4.1	3.1	225	183
Katahdin	1	0.0	0.0	0.0	158	137
Kennebec	2	0.0	0.0	0.0	189	158
La Rouge	3	0.0	10.8	4.5	253	223
MI Purple	1	0.0	0.0	0.0	235	214
MSE149-5Y	2	5.3	8.3	6.8	222	181
MSF313-3	1	0.0	0.0	0.0	110	58
MSH031-5	2	0.0	3.0	1.5	170	134
MSH095-4	2	3.0	7.3	5.1	213	176
ND3196-1R	3	3.0	45.7	21.0	179	140
Nordonna	2	1.4	2.1	1.7	215	160
NY102	1	0.0	0.0	0.0	162	137
NY112	2	0.9	3.9	2.4	251	213
NY121	2	0.9	10.7	5.8	141	73
NY125	2	0.0	9.8	4.9	175	139
NY126	2	3.5	3.6	3.6	220	190
NY127	2	2.9	6.2	4.5	249	193
NY129	2	0.0	1.9	1.0	244	208
NYT17-2	2	0.0	5.5	2.8	216	130
NYU47-21	2	1.0	8.2	4.6	180	156
Platina	2	1.0	3.8	2.4	186	136
Roselys	1	3.6	3.6	3.6	280	252
Russ Bur	1	5.4	5.4	5.4	131	50
Russ Nor 3117	1	0.0	0.0	0.0	161	128
Shepody	1	1.9	1.9	1.9	156	115
Snowden	7	0.0	12.5	4.2	244	202
Suncrisp	1	0.0	0.0	0.0	157	131
Super Rd. Norl.	1	5.6	5.6	5.6	199	164
Superior	7	0.0	12.6	2.5	177	154
Symfonia	2	0.0	0.0	0.0	129	77
Vivaldi	2	1.8	8.1	5.0	225	160
W1242	1	13.8	13.8	13.8	159	126
W1313	1	0.0	0.0	0.0	198	170
Yukon Gold	4	1.0	18.0	8.3	177	146

¹%TSWV = Percent Tomato Spotted Wilt Virus observed in plants

Table 12. Mean % Tomato Spotted Wilt Virus incidence observed in variety trial plots by trial.

Trial	Planting Date	TSWV		
		Min	Max	Mean
Cooper's Farm	3/8/02	0	79.2	9.3
James Brother's Farm	3/12/02	0	48.1	6.4
McCotter's Farm	3/17/02	0	82.4	15.2
Tull-Hill Farms	2/28/02	0	22.2	3.5
NE-184 White	3/20/02	0	32.1	3.8
NE-184 Red	3/11/02	0	53.6	2.6
Round White1	3/19/02	0	47.6	2.4
Round White2	3/20/02	0	19.0	1.8

Appendix 1: LAND MANAGEMENT CONDITIONS

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

Trial Design: Randomized complete block, four replications

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

Seed piece 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-two 21' rows at 40' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Sencor 1/2 to 3/4 lbs/A, Poast 6-8" 1 1/2 pts/A
Select 1 lb/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

Seed piece 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:

Irrigation: None

Vine Kill: None

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

Trial Design: Randomized complete block, four replications

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

Seed piece 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-two 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Sencor 1/2lbs/A Dual 1pt/A
Matrix 1.5 oz/A

Fertilizer: 850 lbs, 17-17-17 broadcast;
250 lbs, 34-0-0 broadcast

Insect Control: Admire 2F 17 oz/A
Thiodan 1qt/A

Disease Control: Bravo 1.5 pt/A

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: Twenty-four 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Sencor 1/2lbs/A Dual 1pt/A
Matrix 1.5 oz/A

Fertilizer: 850 lbs, 17-17-17 broadcast;
250 lbs, 34-0-0 broadcast

Insect Control: Admire 2F 17 oz/A
Thiodan 1qt/A

Disease Control: Bravo 1.5 pt/A

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-four 21' rows at 38' row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Sencor 1/2lbs/A Dual 1pt/A
Matrix 1.5 oz/A

Fertilizer: 850 lbs, 17-17-17 broadcast;
250 lbs, 34-0-0 broadcast

Insect Control: Admire 2F 17 oz/A
Thiodan 1qt/A

Disease Control: Bravo 1.5 pt/A

Irrigation: None

Vine Kill: None

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

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

Trial Title: NE-184 Red Variety Trial

Trial Design: Randomized complete block, four replications

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

Seed piece Treatment: None

Weed Control: Sencor 1/2lbs/A Dual 1pt/A

Matrix 1.5 oz/A

Fertilizer: 850 lbs, 17-17-17 broadcast;

250 lbs, 34-0-0 broadcast

Insect Control: Admire 2F 17 oz/A

Thiodan 1qt/A

Disease Control: Bravo 1.5 pt/A

Irrigation: None

Vine Kill: None

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

Trial Title: Early Generation Yield Trial

Trial Design: Randomized complete block, four replications

Plot Dimensions: Fifteen 18.75' rows at 38" row spacing, 25 hills per row

Seed piece Treatment: None

Weed Control: Sencor 1/2lbs/A Dual 1pt/A

Matrix 1.5 oz/A

Fertilizer: 850 lbs, 17-17-17 broadcast;

250 lbs, 34-0-0 broadcast

Insect Control: Admire 2F 17 oz/A

Thiodan 1qt/A

Disease Control: Bravo 1.5 pt/A

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: Seventeen 21' rows at 38" row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Sencor 1/2lbs/A Dual 1pt/A

Matrix 1.5 oz/A

Fertilizer: 850 lbs, 17-17-17 broadcast;

250 lbs, 34-0-0 broadcast

Insect Control: Admire 2F 17 oz/A

Thiodan 1qt/A

Disease Control: Bravo 1.5 pt/A

Irrigation: None

Vine Kill: None

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

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

Trial Title: EDEN Bioscience Messenger Trial

Trial Design: Split block randomized complete block

Plot Dimensions: Four Clones 21' rows at 38" row spacing, 28 hills per row

Seed piece Treatment: None

Weed Control: Sencor 1/2lbs/A Dual 1pt/A

Matrix 1.5 oz/A

Fertilizer: 850 lbs, 17-17-17 broadcast;

250 lbs, 34-0-0 broadcast

Insect Control: Admire 2F 17 oz/A

Thiodan 1qt/A

Disease Control: Bravo 1.5 pt/A

Irrigation: None

Vine Kill: None

Other: Messenger 2.25 oz/A

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: WEEKLY WEATHER DATA

Week	<u>Pamlico Co.</u>						<u>Tyrrell Co.</u>					
	Max Temp	Min Temp	Mean Temp	Precip (In)	30yr Precip	Precip DEV	Max Temp	Min Temp	Mean Temp	Precip (In)	30yr Precip	Precip DEV
01/01-01/05	41	28	35	0.42	0.70	-0.28	42	27	34	0.47	0.68	-0.21
01/06-01/12	60	32	46	0.54	1.03	-0.49	52	28	40	2.67	1.02	1.65
01/13-01/19	62	36	49	0.3	1.02	-0.72	55	30	43	0.38	0.98	-0.60
01/20-01/26	61	38	50	1.76	0.96	0.80	53	32	43	1.21	0.91	0.30
01/27-02/02	77	49	63	0.03	0.88	-0.85	72	37	54	0.03	0.82	-0.79
02/03-02/09	55	32	43	1.63	0.85	0.78	48	26	37	0.78	0.80	-0.02
02/10-02/16	66	36	51	0.42	0.80	-0.38	55	30	43	0	0.79	-0.79
02/17-02/23	66	38	52	0.55	0.82	-0.27	65	35	50	0.19	0.81	-0.62
02/24-03/02	60	32	46	0.13	0.82	-0.69	53	28	40	0.24	0.97	-0.73
03/03-03/09	65	36	51	1.56	0.82	0.74	56	32	44	2.53	0.85	1.68
03/10-03/16	72	50	61	2.5	0.88	1.62	N/A	N/A	N/A	N/A	0.87	N/A
03/17-03/23	68	44	56	1.12	0.85	0.27	58	45	51	1.12	0.86	0.26
03/24-03/30	75	46	61	0.44	0.84	-0.40	67	48	57	0.79	0.83	-0.04
03/31-04/06	74	50	62	1.32	0.79	0.53	66	46	56	1.07	0.77	0.30
04/07-04/13	73	49	61	0.05	0.75	-0.70	67	41	54	0.21	0.72	-0.51
04/14-04/20	87	64	76	1.01	0.76	0.25	82	58	70	1.33	0.75	0.58
04/21-04/27	78	55	66	0.18	0.80	-0.62	72	47	59	0.6	0.71	-0.11
04/28-05/04	81	61	71	0.85	0.83	0.02	78	59	68	0.28	0.73	-0.45
05/05-05/11	81	63	72	0.1	0.95	-0.85	76	56	66	0.01	0.80	-0.79
05/12-05/18	83	57	70	0.41	1.04	-0.63	79	51	65	0.32	0.80	-0.48
05/19-05/25	73	51	62	0.88	1.13	-0.25	64	44	54	0	0.95	-0.95
05/26-06/01	84	62	73	0.42	1.15	-0.73	81	58	70	0.27	0.98	-0.71
06/02-06/08	86	66	76	0.09	1.15	-1.06	81	55	68	0	1.04	-1.04
06/09-06/15	90	62	76	1.7	1.14	0.56	84	53	69	0	1.13	-1.13
06/16-06/22	82	66	74	2.61	1.14	1.47	84	66	75	0	1.09	-1.09
06/23-06/29	88	70	79	3.08	1.23	1.85	87	72	79	0.71	1.16	-0.45
06/30-07/06	88	69	79	0.48	1.40	-0.92	89	67	78	0	1.24	-1.24
07/07-07/13	85	66	76	1.43	1.40	0.03	87	63	75	0.29	1.23	-0.94
07/14-07/20	90	72	81	2.21	1.49	0.72	90	72	81	0.24	1.39	-1.15
07/21-07/27	87	72	79	4.31	1.59	2.72	87	74	80	0.32	1.43	-1.11
07/28-07/31	95	76	85	0.03	0.84	-0.81	95	75	85	0	0.82	-0.82
			Totals	32.56	30.83	1.73				Totals	16.06	28.92 -12.00

Appendix 3: WEEKLY WEATHER DATA (Cont'd.)

	Pasquotank Co.						Lenior Co.					
Week	Max Temp	Min Temp	Mean Temp	Precip (In)	30yr Precip	Precip DEV	Max Temp	Min Temp	Mean Temp	Precip (In)	30yr Precip	Precip DEV
01/01-01/05	40	29	35	0.29	0.73	-0.44	38	23	30	0.77	0.66	0.11
01/06-01/12	54	34	44	0.9	1.05	-0.15	54	29	41	1.16	0.97	0.19
01/13-01/19	55	36	46	2.11	0.99	1.12	56	31	44	1.1	0.98	0.12
01/20-01/26	57	38	47	2.55	0.91	1.64	59	39	49	2.14	0.94	1.20
01/27-02/02	73	49	61	0	0.77	-0.77	74	46	60	0	0.90	-0.90
02/03-02/09	53	33	43	1.05	0.77	0.28	52	31	42	1.35	0.93	0.42
02/10-02/16	60	40	50	0.49	0.80	-0.31	61	32	47	0.13	0.86	-0.73
02/17-02/23	61	39	50	0.66	0.84	-0.18	62	36	49	0.47	0.88	-0.41
02/24-03/02	55	34	45	0.08	0.85	-0.77	56	30	43	0	0.88	-0.88
03/03-03/09	61	39	50	1.81	0.88	0.93	62	34	48	3.62	0.88	2.75
03/10-03/16	65	51	58	1.16	0.94	0.22	68	47	58	1.07	0.91	0.16
03/17-03/23	61	45	53	1.66	0.94	0.72	64	45	55	0.89	0.91	-0.02
03/24-03/30	65	45	55	1.23	0.94	0.29	69	45	57	0.42	0.86	-0.44
03/31-04/06	66	49	58	3.09	0.85	2.24	69	47	58	2.99	0.84	2.15
04/07-04/13	65	49	57	0.89	0.72	0.17	70	46	58	0.84	0.83	0.01
04/14-04/20	85	65	75	0.35	0.72	-0.37	85	62	74	0.89	0.81	0.08
04/21-04/27	72	51	61	0.94	0.78	0.16	77	54	66	0.06	0.85	-0.79
04/28-05/04	77	59	68	1.12	0.88	0.24	79	58	69	0.06	0.82	-0.76
05/05-05/11	77	61	69	0.06	1.04	-0.98	79	58	69	1.03	0.85	0.18
05/12-05/18	79	60	69	0	1.13	-1.13	80	56	68	0.43	0.90	-0.47
05/19-05/25	70	49	60	0.04	1.13	-1.09	73	46	60	0.58	1.01	-0.43
05/26-06/01	85	63	74	0	1.06	-1.06	87	62	74	0.09	1.12	-1.03
06/02-06/08	87	67	77	1.43	0.98	0.45	90	67	78	0.39	1.15	-0.76
06/09-06/15	87	64	76	2.32	0.91	1.42	90	62	76	1.13	1.13	0.00
06/16-06/22	83	68	75	0	0.89	-0.89	85	65	75	0	1.06	-1.06
06/23-06/29	89	72	80	4.1	0.93	3.17	87	70	79	2.17	1.02	1.15
06/30-07/06	89	69	79	0.04	1.05	-1.01	91	69	80	1.82	1.16	0.66
07/07-07/13	86	67	76	3.4	0.96	2.44	86	65	76	0.22	1.22	-1.00
07/14-07/20	90	73	82	1.95	1.02	0.93	90	71	81	1.08	1.34	-0.26
07/21-07/27	86	73	80	5.49	1.06	4.43	88	71	80	2.73	1.40	1.33
07/28-07/31	94	77	85	0.17	0.59	-0.42	94	76	85	0.74	0.78	-0.04
			Totals	39.38	28.1	11.28			Totals	30.37	29.82	0.55

Appendix 3: WEEKLY WEATHER DATA (Cont'd.)

Week	<u>Washington Co.</u>					
	Max Temp	Min Temp	Mean Temp	Precip (In)	30yr Precip	Precip DEV
01/01-01/05	40	27	33	1.01	0.68	0.33
01/06-01/12	55	32	44	0.92	1.02	-0.10
01/13-01/19	56	35	45	2.03	1.02	1.01
01/20-01/26	58	38	48	2.23	0.96	1.27
01/27-02/02	76	48	62	0.04	0.88	-0.84
02/03-02/09	53	32	42	1.21	0.88	0.33
02/10-02/16	62	37	49	0.52	0.85	-0.33
02/17-02/23	63	39	51	0.4	0.91	-0.51
02/24-03/02	60	31	45	0.12	0.93	-0.81
03/03-03/09	65	38	52	2.17	0.95	1.22
03/10-03/16	69	50	59	1.36	1.00	0.36
03/17-03/23	67	42	54	1.08	0.98	0.10
03/24-03/30	72	46	59	1.48	0.94	0.54
03/31-04/06	69	47	58	2.18	0.90	1.28
04/07-04/13	69	47	58	0.64	0.83	-0.19
04/14-04/20	88	63	75	0.43	0.82	-0.39
04/21-04/27	75	51	63	0.4	0.90	-0.50
04/28-05/04	80	60	70	0.77	0.88	-0.11
05/05-05/11	83	60	72	0.21	0.92	-0.71
05/12-05/18	84	57	70	1.24	0.99	0.25
05/19-05/25	72	49	61	0.06	1.06	-1.00
05/26-06/01	87	62	75	0.19	1.16	-0.97
06/02-06/08	89	66	78	1.25	1.23	0.02
06/09-06/15	90	63	77	0.26	1.22	-0.96
06/16-06/22	85	66	75	0.49	1.14	-0.65
06/23-06/29	90	70	80	0.88	1.06	-0.18
06/30-07/06	91	66	79	0.09	1.16	-1.07
07/07-07/13	88	64	76	0.45	1.17	-0.72
07/14-07/20	92	73	83	1.76	1.24	0.52
07/21-07/27	87	71	79	4.44	1.33	3.11
07/28-07/31	96	75	85	0.28	0.75	-0.47
Totals				30.59	30.76	-0.17

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
CT=chain tubers
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=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
RF=red flesh (RF scale: 1=light red to 3=dark red)
RZ=Rhizoctonia
SEB=stem end browning
SG=secondary growth
SIS=silver scurf
SKN=skins
SS=sun scald
SR=soft rot
STST=sticky stolens
TSWV=Tomato Spotted Wilt Virus
VW=Verticillium wilt
WSTD=weak stand
WW=wire worm
YF=yellow flesh (YF scale: 1=light yellow to 3=dark yellow)

Note: ^ before code indicates high levels