

CHAPTER 9. CHIPPING POTATO VARIETY TRIAL, 2003

General Comments

A goal of the Chipping Potato Variety trial is to identify a short-season processing potato variety with better production and quality characteristics than Atlantic, the current standard. Chip quality was determined by personnel at Wise Foods, Inc.

Planting Information

Planting Site	PSREU, Yelvington Farm, Hastings, FL
Planting Date	January 28, 2003
Harvest Date	May 12, 2003
Season Length	104 days
Fertilizer Program	preplant, 100-43-86 lb/A; sidedress, 50-0-42 lb/A; 80-0-69 lb/A
Irrigation Program	seepage

Experimental Design

Number of Varieties	8 (Standard: Atlantic)
Number of Clones	8
Within Row Spacing	8 in (20 cm)
Between Row Spacing	40 in (102 cm)
Replications	4
Plot Size	16 ft (4.9 m)

Production Statistics

Early Vigor Ratings	36 days after planting
Highest Total Yield	Snowden and B1884-9 (492 cwt/acre or 55.1 MT/ha)
Highest Marketable Yield	B1884-9 (448 cwt/acre or 50.2 MT/ha)
Highest Gravity	AF2291-10 and MSF099-3 (1.082)

Specific Comments

Atlantic (USDA). Atlantic total and marketable tuber yields were 471 and 417 cwt/acre, respectively. Potato tuber skin color was tan with a netted texture. Tuber flesh color was white to cream. Tuber shape was rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of intermediate to shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 6 to 8 inches. Vine type at full flower was rated as upright with a good canopy. Plant maturity at harvest was rated as yellow and dying. Average specific gravity for Atlantic tubers was 1.079. Internal heat necrosis and hollow heart were each present in 7% of tubers at harvest.

Atlantic (MFX). Atlantic total and marketable tuber yields were 469 and 414 cwt/acre, respectively. Potato tuber skin color was brown to tan with a netted texture. Tuber flesh color was cream. Tuber shape was rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of intermediate to shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 6 to 8 inches. Vine type at full flower was rated as upright with a good canopy. Plant maturity at harvest was rated as moderately senescing to yellow and dying. Average specific gravity for Atlantic tubers was 1.079. Hollow heart was noted in 7% of tubers at harvest.

Coastal Chip (USDA). Coastal Chip total and marketable tuber yields were 390 and 318 cwt/acre, respectively. Potato tuber skin color was brown to tan with a netted texture. Tuber flesh color was white to cream. Tuber shape was rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of intermediate to shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 8 to 10 inches. Vine type at full flower was rated as spreading to upright with a good canopy. Plant maturity at harvest was rated as yellow and dying to completely dead. Average specific gravity for Coastal Chip tubers was 1.071.

Harley Blackwell (B0564-8) (USDA). Harley Blackwell total and marketable tuber yields were 429 and 372 cwt/acre, respectively. Potato tuber skin color was tan to buff with a netted texture. Tuber flesh color was white to cream. Tuber shape was rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of intermediate to shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 6 to 8 inches. Vine type at full flower was rated as spreading to upright with a good canopy. Plant maturity at harvest was rated as moderately senescing to yellow and dying. Average specific gravity for Harley Blackwell tubers was 1.074. Hollow heart was noted in 8% of tubers at harvest.

Liberator (MSU). Liberator total and marketable tuber yields were 331 and 265 cwt/acre, respectively. Potato tuber skin color was buff with a slightly netted texture. Tuber flesh color was white to cream. Tuber shape was rated as ‘round to oblong’ with an eye depth of shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 8 to 10 inches. Vine type at full flower was rated as spreading to upright with a good canopy. Plant maturity at harvest was rated as yellow and dying to completely dead. Average specific gravity for Liberator tubers was 1.081.

Sebago (MFX). Sebago total and marketable tuber yields were 390 and 289 cwt/acre, respectively. Potato tuber skin color was buff to white with a slightly netted texture. Tuber flesh color was white. Tuber shape was rated as ‘round to oblong’ with an eye depth of intermediate to shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 6 to 8 inches. Vine type at full flower was rated as spreading to upright with a good canopy. Plant maturity at harvest was rated as moderately senescing to yellow and dying. Average specific gravity for Sebago tubers was 1.065. Internal heat necrosis was noted in 5% of tubers at harvest.

Snowden (MFX). Snowden total and marketable tuber yields were 492 and 446 cwt/acre, respectively. Potato tuber skin color was brown to tan with a slightly netted to netted texture. Tuber flesh color was white. Tuber shape was rated as ‘mostly round’ with an eye depth of intermediate to shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 4 to 6 inches. Vine type at full flower was rated as spreading to upright with a good canopy. Plant maturity at harvest was rated as yellow and

dying. Average specific gravity for Snowden tubers was 1.080. Hollow heart was noted in 8% of tubers at harvest.

Suncrip (USDA). Suncrip total and marketable tuber yields were 463 and 395 cwt/acre, respectively. Potato tuber skin color was tan to buff with a slightly netted to netted texture. Tuber flesh color was white. Tuber shape was rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 8 to 10 inches. Vine type at full flower was rated as spreading to upright with a good canopy. Plant maturity at harvest was rated as yellow and dying. Average specific gravity for Suncrip tubers was 1.079.

AF1424-7 (UM). AF1424-7 total and marketable tuber yields were 423 and 304 cwt/acre, respectively. Potato tuber skin color was tan to buff with a slightly netted texture. Eye color for AF1424-7 was purple. Tuber flesh color was white to cream. Tuber shape was rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of intermediate to shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 4 to 6 inches. Vine type at full flower was rated as spreading to upright with a good canopy. Plant maturity at harvest was rated as yellow and dying. Average specific gravity for AF1424-7 tubers was 1.073.

AF2242-10 (UM). AF2242-10 total and marketable tuber yields were 425 and 336 cwt/acre, respectively. Potato tuber skin color was buff to white with a slightly netted to netted texture. Tuber flesh color was white to cream. Tuber shape was rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 6 to 8 inches. Vine type at full flower was rated as spreading with a good canopy. Plant maturity at harvest was rated as yellow and dying to completely dead. Average specific gravity for AF2242-10 tubers was 1.080.

AF2291-10 (UM). AF2291-10 total and marketable tuber yields were 451 and 413 cwt/acre, respectively. Potato tuber skin color was buff with a slightly netted to netted texture. Tuber flesh color was white to cream. Tuber shape was rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of intermediate to shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 2 to 4 inches. Vine type at full flower was rated as upright with a good canopy. Plant maturity at harvest was rated as moderately senescing to yellow and dying. Average specific gravity for AF2291-10 tubers was 1.082. Hollow heart was noted in 8% of tubers at harvest.

B0766-3 (USDA). B0766-3 total and marketable tuber yields were 442 and 349 cwt/acre, respectively. Potato tuber skin color was tan to buff with a netted texture. Tuber flesh color was white. Tuber shape was rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of intermediate to shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 6 to 8 inches. Vine type at full flower was rated as spreading to upright with a good canopy. Plant maturity at harvest was rated as yellow and dying. Average specific gravity for B0766-3 tubers was 1.074. Hollow heart was noted in 10% of tubers at harvest. Tubers at harvest were also noted for “dark lenticels”.

B1884-9 (USDA). B1884-9 total and marketable tuber yields were 492 and 448 cwt/acre, respectively. Potato tuber skin color was tan to buff with a slightly netted to netted texture. Tuber flesh color was white to cream. Tuber shape was rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 2 to 4 inches. Vine type at full flower was rated as spreading to upright with a fair canopy. Plant maturity at harvest was rated as moderately senescing to yellow and dying. Average specific gravity for B1884-9 tubers was 1.076.

B2135-163 (USDA). B2135-163 total and marketable tuber yields were 436 and 406 cwt/acre, respectively. Potato tuber skin color was tan with a netted texture. Tuber flesh color was white. Tuber shape was rated as ‘mostly round’ to ‘round to oblong’ with an eye depth of intermediate to shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 2 to 4 inches. Vine type at full flower was rated as spreading to upright with a fair canopy. Plant maturity at harvest was rated as yellow and dying. Average specific gravity for B2135-163 tubers was 1.074.

MSF099-3 (MSU). MSF099-3 total and marketable tuber yields were 315 and 258 cwt/acre, respectively. Potato tuber skin color was brown to tan with a slightly netted to netted texture. Tuber flesh color was white.

Tuber shape was rated as 'round to oblong' to 'mostly oblong' with an eye depth of shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 6 to 8 inches. Vine type at full flower was rated as upright with a good canopy. Plant maturity at harvest was rated as yellow and dying. Average specific gravity for MSF099-3 tubers was 1.082.

NY126 (Cornell). NY126 total and marketable tuber yields were 417 and 362 cwt/acre, respectively. Potato tuber skin color was brown to tan with a netted to slightly netted texture. Tuber flesh color was light yellow. Tuber shape was rated as 'round to oblong' to 'mostly oblong' with an eye depth of intermediate to shallow. Overall external tuber appearance was noted as fair to good. Early plant vigor (size) was rated as 6 to 8 inches. Vine type at full flower was rated as spreading to upright with a good canopy. Plant maturity at harvest was rated as yellow and dying. Average specific gravity for NY126 tubers was 1.075.

Table 29. Production statistics for Chipping potato selections.

Clone	Total	Marketable Yield ¹		Size						Size Class		Specific Gravity
	Yield (cwt/A)	(cwt/A)	% of standard	Distribution by Class (%) ²						Range (%)		
				C	B	A1	A2	A3	A4	A1 to A3	A2 to A3	
Atlantic (USDA)	471	417	100	5	4	36	32	23	0	91	55	1.079
Atlantic (MFX)	469	414	99	5	4	38	33	20	0	91	53	1.079
Coastal Chip ⁴	390	318	76	8	8	45	28	11	0	84	39	1.071
Harley Blackwell	429	372	89	7	5	38	33	18	0	88	50	1.074
Liberator	331	265	64	9	9	66	14	3	0	82	17	1.081
Sebago	390	289	69	13	10	49	17	10	0	77	28	1.065
Snowden	492	446	107	3	4	55	31	7	0	93	38	1.080
Suncrisp	463	395	95	6	7	49	29	9	0	87	38	1.079
AF1424-7	423	304	73	15	11	56	13	5	0	74	18	1.073
AF2242-10	425	336	81	11	8	62	15	4	0	82	19	1.080
AF2291-10	451	413	99	4	3	39	38	16	0	93	54	1.082
B0766-3	442	349	84	11	7	44	30	8	0	83	39	1.074
B1884-9	492	448	108	2	2	31	38	26	1	95	64	1.076
B2135-163	436	406	97	3	2	39	42	14	0	95	56	1.074
MSF099-3 ⁴	315	258	62	6	8	74	11	1	0	86	12	1.082
NY126	417	362	87	6	6	53	23	11	0	88	34	1.075
MSD ³	55	66		4	3	10	9	9	ns	6	14	0.004
<i>P Value</i>	0.0002	0.0001		0.0001	0.0001	0.0001	0.0001	0.0002	0.2556	0.0001	0.0001	0.0001

¹Marketable Yield: size classes A1 to A3.

²Size classes: C = .5 to 1.5" , B = 1.5 to 1 7/8", A1 = 1 7/8 to 2.5", A2 = 2.5 to 3.25", A3 = 3.25 to 4", A4 = >4"

³Means separated within columns by Waller-Duncan's k-ratio t test. Analysis based on 3 replications only.

⁴Entries not included in statistical analysis.

Table 30. Plant growth and tuber characteristics of Chipping potato selections.

Clone	Plant Growth Characteristics				Tuber Characteristics ¹							Chip Rating ²
	% Stand	Early Vigor	Vine Type	Vine Maturity	IFC	SC	ST	TS	ED	APP		
Atlantic (USDA)	98	5.8	9	3.0	1.7	6.0	5.0	2.7	6.7	5.3	3	
Atlantic (MFX)	98	6.3	9	3.3	2.0	5.7	5.0	2.7	6.7	5.3	3	
Coastal Chip	100	6.8	9-6	2.3	1.7	5.7	5.0	2.3	6.0	5.7	3	
Harley Blackwell	98	5.5	9-6	3.3	1.3	6.3	5.0	2.3	6.3	6.7	3	
Liberator	100	6.8	6-9	2.8	1.3	7.0	6.0	3.0	7.0	6.3	3	
Sebago	100	5.8	6-9	3.3	1.0	7.3	6.0	3.0	6.7	5.3	4	
Snowden	100	5.0	9-6	3.0	1.0	5.7	5.3	2.0	6.0	6.0	3	
Suncrisp	96	7.0	9-6	3.0	1.0	6.3	5.7	2.7	7.0	5.3	2	
AF1424-7	96	4.8	9-6	3.0	1.3	6.3	6.0	2.3	6.3	5.7	2	
AF2242-10	100	6.3	6	2.8	1.7	7.3	5.7	2.7	7.0	5.3	5	
AF2291-10	96	3.5	9	3.5	1.7	7.0	5.7	2.7	6.3	5.7	3	
B0766-3	97	6.0	9-6	3.0	1.0	6.3	5.0	2.3	6.0	5.3	3	
B1884-9	97	3.8	8-5	3.5	1.3	6.3	5.3	2.3	6.3	5.7	3	
B2135-163	94	5.8	9-6	3.0	1.0	6.0	5.0	2.7	6.7	6.0	2	
MSF099-3	98	5.5	9	2.5	1.0	5.7	5.3	3.7	7.0	6.7	2	
NY126	97	6.3	9-6	3.0	3.0	5.7	5.3	3.7	6.7	6.0	2	

¹ - See rating system outlined in Tables 1 and 2 (pages 8 and 9).

² - For descriptions, see general potato variety production information.

Table 31. External and internal tuber defects of Chipping potato selections.

Clone	% External Tuber Defects					% Internal Defects ²			
	Growth Cracks	Mis-shapen	Sun-burned	Rotten & misc.	Total Culls ¹	HH	BR	CRS	IHN
Atlantic (USDA)	0	1	2	0	3	7	0	0	7
Atlantic (MFX)	0	1	1	0	2	7	0	0	0
Coastal Chip ⁴	0	1	1	0	3	3	0	0	3
Harley Blackwell	0	0	1	1	2	8	0	0	0
Liberator	0	2	0	0	3	0	0	0	2
Sebago	0	1	2	1	4	2	0	0	5
Snowden	0	0	1	0	2	2	0	0	2
Suncrisp	0	1	1	0	2	8	0	0	0
AF1424-7	0	1	1	0	3	2	0	0	0
AF2242-10	1	2	0	0	3	0	0	0	0
AF2291-10	0	0	1	0	1	8	0	0	0
B0766-3	0	3	1	1	5	10	0	0	0
B1884-9	0	1	3	0	4	3	0	0	3
B2135-163	0	0	2	0	2	3	0	0	0
MSF099-3 ⁴	0	3	1	1	5	0	0	0	0
NY126	0	1	0	0	1	0	0	0	0
MSD ³	ns	ns	2	ns	3	ns	ns	ns	2
<i>P Value</i>	0.9517	0.1130	0.0238	0.2698	0.0257	0.4288	-	-	0.0001

¹Percent of Total Yield. Total culls include the sum of growth cracks, mishapen, sunburned and rotten/misc.

²Percent tubers; HH, hollow heart; BR, brown rot; CRS, corky ring spot; IHN, internal heat necrosis.

³Means separated within columns by Waller-Duncan's k-ratio t test.

⁴Entries not included in statistical analysis.

