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EC92-1247-D Nebraska Potato Cultivar Tests 1989-91

Alexander D. Pavlista
University of Nebraska-Lincoln, apavlista@unl.edu

Larry E. Williams

Carl S. Gall

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University of Nebraska
Institute of Agriculture and Natural Resources
Agricultural Research Division
Cooperative Extension

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Acknowledgement

This circular is a progress report of potato cultivar trials conducted by the Panhandle Research and Extension Center. The conduct of these trials and publication of the results are a joint effort of Cooperative Extension and the Agricultural Research Division at the University.

Thanks to Dan Smith for his assistance with the 1989 trials. Thanks also to the cooperating growers on whose lands many of these trials were conducted. These growers were Jack Nielsen of Diamond Hill Farms, Alliance; Dale Moore of Western Potatoes, Alliance; Lloyd May of Frenchman Valley Produce, Imperial; and George Hanson of West Nebraska Potato Shippers, Bridgeport, NE.

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Nebraska Potato Cultivar Tests
1989-91

Alexander D. Pavlista, Extension Potato Specialist
Larry E. Williams, Manager, Vegetable Processing Pilot Plant
Carl S. Gall, Research Assistant

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Key metric conversions: 1 lb/a = 1.12 kg/ha
1 cwt/a = 100 lb/a = 0.112 mT/ha
1 mT = 1000 kg = 2,205 lb = 22 cwt

Potato Production in Nebraska

The potato industry has been active in Nebraska throughout this century. Potatoes are commercially grown in over 20 counties. Total acreage is over 12,000; almost all of the acres are irrigated with center pivot. Production is over 4 million cwts (100 lb bags). Nebraska potatoes are used in chips, fries, tablestock, and seed — all facets of the industry.

There has been a 30 percent increase in potato acreage since 1988, at which time Nebraska ranked 17 in potato production in the country. In 1990, the state ranked 13 in potato production. Two-thirds of Nebraska's potato acreage is in the Panhandle.

Nebraska's potato industry grossed $28 - $29 million in sales in 1989. It is primarily an exporting industry; $25 million comes from sales to 31 other states. Seven of these are major buyers of Nebraska's chipping potatoes *(Figure 1)*.

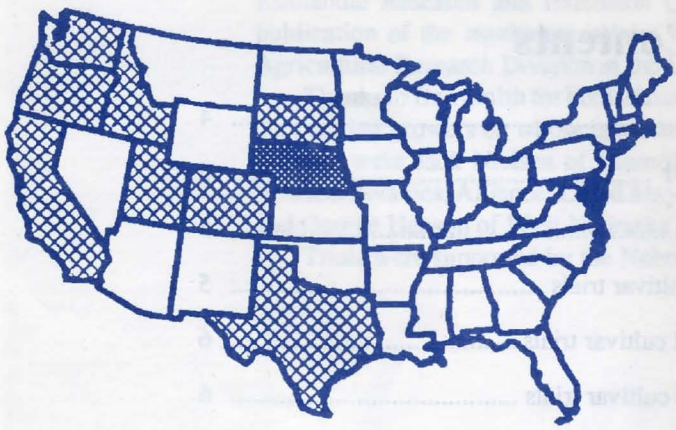

Figure 1. Nebraska's "processing potato" markets are shown here. They include the seven major buyers of Nebraska's chipping potatoes, and South Dakota, where all of Nebraska's french fry potatoes go for processing.

Currently, all french fry potatoes go to South Dakota for processing. Most of the tablestock potatoes are sold east of Nebraska and in the southeastern part of the country *(Figure 2)*.

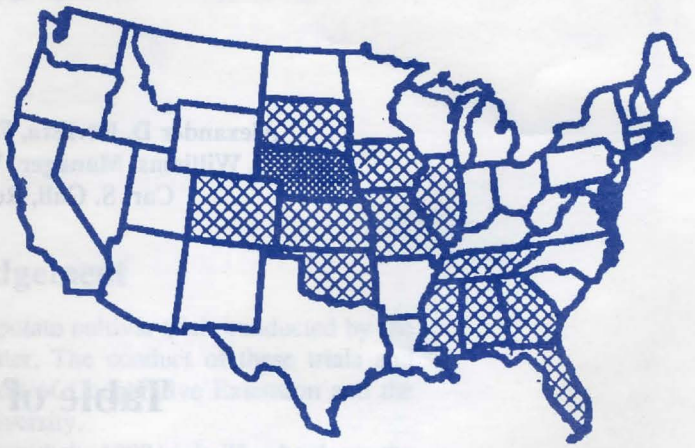

Figure 2. The state's "table potato" markets for the most part lie to the east and southeast of Nebraska.

Two thirds of gross sales, or $17 million, are directed into local communities such as Alliance, Basset, Bridgeport, Gering, Hemingford, Hershey, Imperial, Scottsbluff and Wood River. The approximate distribution of this income is: payroll, 25 percent; vehicle costs (maintenance, etc.), 14 percent; farm chemicals (fertilizers, pesticides, etc.), 13 percent; land costs (rental, etc.), 13 percent; capital equipment (storage sheds, conveyors, etc.), 10 percent; and miscellaneous (utilities, packing, taxes, etc.) 25 percent *(Figure 3)*. Using the input-output multiplier of 3 for the state, over $50 million is funneled into the state's economy by the potato industry.

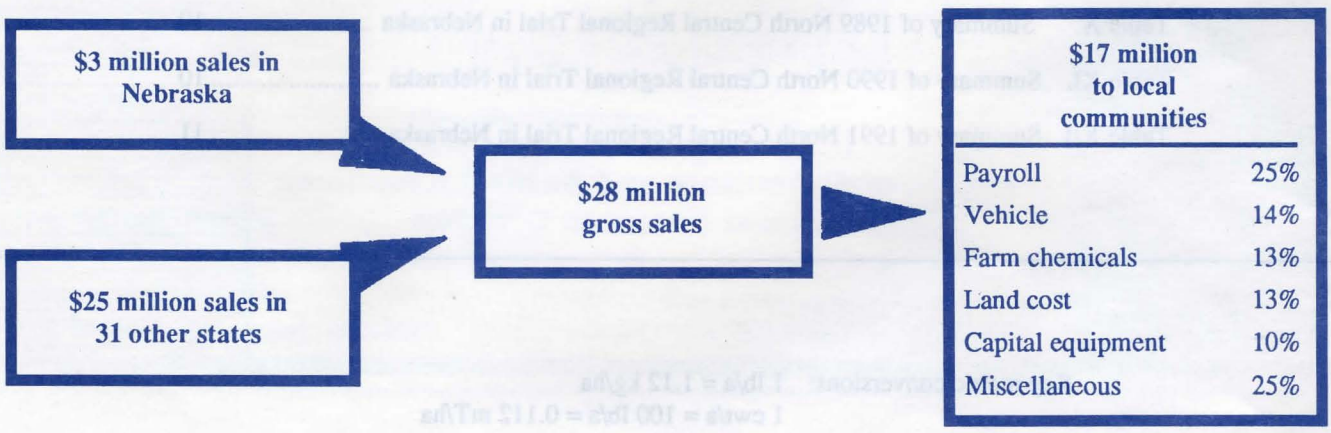

Figure 3. Local impact of Nebraska's potato industry in millions of dollars.

Description of Potato Cultivar Trials, 1989-1991

The Nebraska potato cultivar trials are divided into four groups: red-skinned, russet-skinned, white-skinned, and the North Central Regional (NCR) Trial. The red and russet cultivar trials contained seven to nine cultivars each, while the white/chip cultivar trials contained 16 to 18 cultivars. The NCR trials are a mix of red, russet and white cultivars totaling 16 to 18 which are tested in 13 to 16 locations in the North Central United States and Canada.

Cultural practices were reasonably consistent between locations and years. Fertilization ranged from 120 to 140 lb/a nitrogen and 60 to 90 lb/a phosphorous. Potassium was added at Frenchman Valley Produce (FVP) near Imperial and Diamond Hill Farms (DHF) near Alliance. Sulfur was added at FVP and West Nebraska Potato Shippers (WNPS) near Bridgeport.

All seed pieces were cut and treated with mancozeb, and Thimet was applied at planting. Other insecticides used as needed were Pydrin/Asana and Monitor. Bravo was used for early blight as needed. The herbicides used were Sencor/Lexone, Dual, Eptam/Genep, and Poast. Vine desiccation was performed using mechanical means, at times with a Diquat pretreatment. Trials at the Panhandle Research and Extension Center (PREC) were furrow irrigated in 1989 and irrigated with a rolling-line sprinkler system in 1990 and 1991; all other trials were under center-pivot irrigation.

Table I. Key dates of each trial by site and year .

Red, Russet, White, and NCR	PREC 1989	PREC 1990	PREC 1991
planting (P)	5/22	4/24	5/10
emergence (E)	6/16	5/23	5/30
desiccation (D)	9/6	9/4	8/26
harvest (H)	9/23	9/20	9/16
days from P to H	124	149	129
days from E to D	82	104	88
Red and Russet	**FVP 1990**	**FVP 1991**	**WNPS 1991**
planting (P)	3/29	4/16	4/23
emergence (E)	(4/27)	(5/17)	5/20
desiccation (D)	8/1	8/5	8/20
harvest (H)	8/13	8/8	8/28
days from P to H	137	114	127
days from E to D	(95)	(80)	92
White/Chip	**DHF 1989**	**WP 1990**	**DHF 1991**
planting (P)	5/18	5/15	5/22
emergence (E)	6/9	6/5	6/8
desiccation (D)	(9/5)	9/6	9/24
harvest (H)	9/25	9/26	9/25
days from P to H	130	134	126
days from E to D	(88)	93	108

(#) = estimated

All trials were conducted using a random complete block design with four replicates for each cultivar. Plots were one row, 3 ft, with 25 seed pieces, 20 ft.

Yields and, for the chipping trials, specific gravities were taken from each replicate. Other data such as chip color and tuber disease were taken on pools consisting of 25 tuber samples from each replicate.

The red and russet trials were conducted side-by-side at the Panhandle Research and Extension Center, Mitchell, in 1989 and 1990; at Frenchman Valley Produce, Imperial, in 1990 and 1991, and at West Nebraska Potato Shippers, Bridgeport, in 1991. The white/chip trials were conducted at the PREC, Mitchell and Scottsbluff, in 1989, 1990 and 1991; at Diamond Hill Farms, Alliance, in 1989 and 1991; and at Western Potatoes (WP), Alliance, in 1990. The NCR trials were conducted at the PREC in all years.

Description of Standard Cultivars

Red-Skinned Cultivars:

Red LaSoda, released in 1953 as a mutant of LaSoda, is a main season cultivar used in fresh markets, well-suited for boiling. It is grown primarily in the southeastern United States. The skin color is deep red, which tends to fade in storage. Tubers tend to skin easily. It has a high-yield potential and tubers size early; off-types are common and it has deep eyes. It is susceptible to scab and early blight.

Norland, released in 1957, has several darker red strains; these are called *Red (R.) Norland* and *Dark Red (D.R.) Norland*. The red skin color fades after tuber maturity. These are early maturing cultivars with low to medium yields. Tubers are used for boiling and frying. There are few off-types or internal defects. They are tolerant to scab but susceptible to early blight and common viruses.

Sangre, released in 1982, is a medium-maturing cultivar for the fresh market used for boiling and baking. It has medium yields. It emerges slowly and grows rapidly. It is tolerant to leaf roll and rarely exhibits hollow heart, but it is susceptible to blights and early dying, and moderately susceptible to dry rot. Tubers tend to net under dry soil conditions, giving a brownish appearance.

Table II. Three-year means of RED-skinned potato cultivar trials, 1989-91.

Cultivar	yield, cwt/a: tubers > 1 7/8 in	% total, tubers > 1 7/8 in	specific gravity
R. LaSoda	428	96	1.071
D.R. Norland	289	91	1.069
Red Cloud	327	95	1.075
Sangre	357	94	1.070
LA 12-59	335	94	1.081
NE 8206	342	93	1.081
MEAN:	346	94	1.075
LSD 0.10:	46	2	0.005

Russet-Skinned Cultivars:

Norgold Russet, released in 1964, matures early and is used as an early russet in the fresh markets for baking and boiling. It has poor frying quality and too-low specific gravity for processing. It is resistant to scab but susceptible to wilts, blights and common viruses, and very susceptible to black leg. Large tubers tend to hollow heart.

Russet Burbank (Netted Gem, Idaho Russet), reported in 1914, is a late maturing cultivar that dominates the United States' potato industry today. It stores well and is the standard for baking and french fry processing. It is tolerant to scab but susceptible to wilts, leaf roll and, under stress, develops jelly-end (sugar-end) and off-types.

Russet Norkotah, released in 1987, is an early to medium maturing cultivar for the fresh market. Its specific gravity is low and yield is medium. It is susceptible to early dying, blights and most viruses. Its popularity is due to its very attractive tubers for the count-carton market.

White-Skinned Cultivars:

Atlantic, released in 1978, is a mid-season chipping cultivar with high-yield potential and high specific gravity. It is a standard cultivar for chipping from field or short-term storage. It is tolerant to scab and early dying, but susceptible to heat necrosis and hollow heart in large tubers.

Monona, released in 1984, is a mid-season chipping cultivar with medium yields and low specific gravity. It reconditions rapidly after storage and gives an excellent chip color, often used for processing after extended storage. It is tolerant to scab and early dying, but susceptible to blackleg. Its shape tends to be irregular.

Norchip, released in 1968, is a medium-early maturing cultivar with low to medium yields and medium to high specific gravity. Good to excellent chip color remains after long storage. It is moderately tolerant to scab but susceptible to early dying and leaf roll, and is highly susceptible to early blight. Under stress, tubers tend to be off-type and cracked.

Shepody, released in 1980, is a medium-late maturing cultivar grown primarily for the french fry market. (It is included in the russet trials.) It is tolerant of heat stress, but susceptible to scab, blights, early dying, pink eye, and PVX and PVY.

Most of the other named cultivars in the trials have been released since 1989.

Table III. Three-year means of RUSSET-skinned potato cultivar trials, 1989-91.

Cultivar	yield, cwt/a: tubers > 1 7/8 in	% total tubers > 1 7/8 in	specific gravity
R. Burbank	280	90	1.074
Century	319	91	1.082
Frontier	323	91	1.082
Norgold	328	91	1.077
Norkotah	306	90	1.074
Ranger	462	93	1.071
Shepody	298	94	1.077
MEAN:	327	91	1.077
LSD 0.10:	55	3	0.005

Table IV. Three-year means of WHITE-skinned cultivar trials, 1989-1991.

Cultivar	yield, cwt/a: tubers > 1 7/8 in	% total tubers > 1 7/8 in	specific gravity	chip color Agtron FF10
Atlantic	391	95	1.093	57
LaBelle	377	96	1.083	58
Monona	360	95	1.071	58
Norchip	333	92	1.081	59
Snowden	332	94	1.089	64
MS 700-70	339	94	1.088	51
NE 84106	355	94	1.079	58
W 842	296	92	1.092	56
MEAN:	348	94	1.084	58
LSD 0.10:	56	3	0.003	8

Note: Chip colors were taken 2 to 3 months after storage at 45-50 degrees F.
With the Agtron FF10, higher numbers indicate lighter chips.

Table V. Tuber and disease problems observed over the three years of trials.

Red cultivar:	**Comments:**
R. LaSoda	over browns
D.R. Norland	over browns
Red Cloud	off type
Sangre	surface scab
LA 12-59	over browns
NE 8206	surface scab, oblong tubers, pink skin
Russet Cultivar:	**Comments:**
Burbank	jelly end, off-type
Century	surface scab, thin skin
Frontier	
Norgold	early die, hollow heart
Norkotah	early die, jelly end
Ranger	
Shepody	
White cultivar:	**Comments:**
Atlantic	surface scab, hollow heart
LaBelle	surface scab
Monona	black scurf
Norchip	off-type, vascular discolor, black scurf
Snowden	surface scab
MS 700-70	
NE 84106	early blight
W 842	surface scab, black scurf

Table VI. Yield performance of RED-skinned cultivars in Nebraska.

Cultivar	PREC 1989	PREC 1990	FVP 1990	WNPS 1991	FVP 1991
I. Yield in cwt/a of tubers greater than 1 7/8 in:					
R. LaSoda	316	386	485	493	458
D.R. Norland	231	259	387	260	310
Red Cloud	308	243	450	310	323
Sangre	404	284	454	343	298
Viking	212	—	—	—	—
LA 12-59	296	293	460	312	314
MN 13420	—	279	427	—	—
ND 1196-2R	—	—	—	185	323
ND 2224-5R	--	235	364	—	—
NDT9-1068-11R	364	187	321	—	—
NE 8206	343	320	414	264	370
MEAN:	309	276	418	310	342
LSD 0.10:	52	21	84	64	55
II. Percent of total yield due to tubers greater than 1 7/8 in:					
R. LaSoda	95	96	no data	96	95
D.R. Norland	91	90		91	92
Red Cloud	97	94		94	95
Sangre	98	91		93	92
Viking	94	—		—	—
LA 12-59	96	94		94	92
MN 13420	—	92		—	—
ND 1196-2R	—	—		84	88
ND 2224-5R	—	88		—	—
NDT9-1068-11R	99	90		—	—
NE 8206	95	91		93	94
MEAN:	96	92		92	93
LSD 0.10:	2	3		4	3
III. Specific gravity of tubers greater than 1 7/8 in:					
R. LaSoda	1.083	1.073	1.067	1.068	1.066
D.R. Norland	1.081	1.070	1.061	1.076	1.058
Red Cloud	1.082	1.085	1.071	1.060	1.076
Sangre	1.081	1.074	1.063	1.072	1.060
Viking	1.073	—	—	—	—
LA 12-59	1.091	1.090	1.090	1.073	1.076
MN 13420	—	1.079	1.067	—	—
ND 1196-2R	—	—	—	1.075	1.065
ND 2224-5R	—	1.072	1.064	—	—
NDT9-1068-11R	1.075	1.073	1.067	—	—
NE 8206	1.095	1.087	1.076	1.069	1.080
MEAN:	1.083	1.078	1.070	1.070	1.069

Table VII. Yield performance of RUSSET-skinned cultivars in Nebraska.

Cultivar	PREC 1989	PREC 1990	FVP 1990	WNPS 1991	FVP 1991
I. Yield in cwt/a of tubers greater than 1 7/8 in:					
Burbank	291	281	273	264	289
Century	227	330	372	339	327
Frontier	229	308	397	279	373
Hilite	216	—	—	—	—
Krantz	162	—	—	—	—
Norgold	321	274	385	246	416
Norkotah	345	235	385	246	318
Ranger	—	330	585	462	472
Shepody	306	306	314	325	241
MN 10874	216	—	—	—	—
ND 1538-1RUS	—	—	—	320	320
ND 671-4RUS	—	—	—	214	273
MEAN:	257	295	387	299	337
LSD 0.10:	67	32	57	57	62
II. Percent of total yield due to tubers greater than 1 7/8 in:					
Burbank	88	93	no data	88	89
Century	91	92		93	87
Frontier	89	91		90	92
Hilite	87	—		—	—
Krantz	94	—		—	—
Norgold	94	87		90	94
Norkotah	94	87		89	88
Ranger	—	94		96	90
Shepody	94	94		95	92
MN 10874	90	—		—	—
ND 1538-1RUS	—	—		92	85
ND 671-4RUS	—	—		88	89
MEAN:	91	91		91	90
LSD 0.10:	4	3		3	6
III. Specific gravity of tubers greater than 1 7/8 in:					
Burbank	1.077	1.070	1.070	1.084	1.071
Century	1.096	1.081	1.082	1.071	1.081
Frontier	1.094	1.087	1.077	1.075	1.079
Hilite	1.083	—	—	—	—
Krantz	1.084	—	—	—	—
Norgold	1.084	1.075	1.070	1.083	1.071
Norkotah	1.083	1.074	1.070	1.070	1.071
Ranger	—	1.069	1.075	1.069	1.072
Shepody	1.090	1.078	1.078	1.068	1.070
MN 10874	1.084	—	—	—	—
ND 1538-1RUS	—	—	—	1.070	1.071
ND 671-4RUS	—	—	—	1.073	1.070
MEAN:	1.086	1.076	1.075	1.074	1.073

Note: Shepody, a white-skinned potato, is included since it is used in french fry processing.

Table VIIIa. Yield performance of WHITE-skinned cultivars in Nebraska.

Cultivar	PREC 1989	DHF 1989	PREC 1990	WP 1990	PREC 1991	DHF 1991
I. Yield in cwt/a of tubers greater than 1 7/8 in:						
Atlantic	491	466	269	524	258	335
Conestoga	341	389	221	417	—	—
Denali	408	434	196	441	—	—
Gemchip	333	421	235	456	—	—
LaBelle	464	491	255	420	219	410
Mainchip	—	—	—	—	268	246
Monona	246	472	243	441	323	433
Norchip	352	385	235	429	268	327
Shepody	—	—	—	356	192	325
Snowden	400	420	250	335	241	343
Wischip	310	385	264	577	—	—
A80559-2	—	—	218	378	—	—
AC80545-1	306	462	223	359	—	—
BN9845-1	333	385	216	320	—	—
BN9859-3	368	350	—	—	—	—
MN12171-103	—	—	—	—	231	221
MN13740	—	—	—	—	199	214
MS401-1Y	—	—	—	—	248	256
MS700-70	—	—	264	393	273	425
MS716-15	—	—	—	—	296	379
NE8245	387	411	—	—	—	—
NE84106	460	472	306	429	217	248
NE219,70-3	372	390	—	—	—	—
NE22.75-1	427	464	279	429	—	—
NY81	345	352	—	—	—	—
NY85	—	—	160	269	—	—
W842	289	318	262	424	228	254
W856	—	—	—	—	204	275
W870	—	—	—	—	236	321
W877	—	—	—	—	173	229
W887	—	—	—	—	169	277
MEAN:	368	415	235	411	235	302
LSD 0.10:	67	52	30	34	46	90

Table VIIIb. Yield performance of WHITE-skinned cultivars in Nebraska.

Cultivar	PREC 1989	DHF 1989	PREC 1990	WP 1990	PREC 1991	DHF 1991
II. Percent of total yield due to tubers greater than 1 7/8 in:						
Atlantic	98	93	94	96	no data	no data
Conestoga	96	96	94	95		
Denali	97	93	94	93		
Gemchip	97	94	96	96		
LaBelle	98	96	95	97		
Mainchip	—	—	—	—		
Monona	98	93	95	95		
Norchip	96	94	83	95		
Shepody	—	—	—	—		
Snowden	98	93	92	92		
Wischip	94	92	95	95		
A80559-2	—	—	93	96		
AC80545-1	98	98	94	94		
BN9845-1	96	90	94	94		
BN9859-3	96	89	—	—		
MN12171-103	—	—	—	—		
MN13740	—	—	—	—		
MS401-1Y	—	—	—	—		
MS700-70	—	—	94	95		
MS716-15	—	—	—	—		
NE8245	95	93	—	—		
NE84106	95	93	92	95		
NE219,70-3	96	98	—	—		
NE22.75-1	98	96	95	95		
NY81	94	90	—	—		
NY85	—	—	84	95		
W842	94	87	92	93		
W856	—	—	—	—		
W870	—	—	—	—		
W877	—	—	—	—		
W887	—	—	—	—		
MEAN:	96	93	91	95		
LSD 0.10:	2	3	3	2		

Table IXa. Chipping characteristics of WHITE-skinned cultivars in Nebraska.

Cultivar	PREC 1989	DHF 1989	PREC 1990	WP 1990	PREC 1991	DHF 1991
I. Specific gravity of tubers greater than 1 7/8 in:						
Atlantic	1.099	1.093	1.091	1.090	1.093	1.090
Conestoga	1.095	1.086	1.077	1.076	—	—
Denali	1.100	1.087	1.087	1.088	—	—
Gemchip	1.089	1.073	1.075	1.074	—	—
LaBelle	1.088	1.083	1.075	1.075	1.090	1.087
Mainchip	—	—	—	—	1.088	1.085
Monona	1.079	1.070	1.070	1.070	1.070	1.069
Norchip	1.090	1.084	1.076	1.076	1.071	1.088
Shepody	—	—	—	1.079	1.078	1.079
Snowden	1.095	1.093	1.085	1.085	1.083	1.090
Wischip	1.088	1.088	1.077	1.076	—	—
A80559-2	—	—	1.078	1.080	—	—
AC80545-1	1.088	1.087	1.072	1.071	—	—
BN9845-1	1.093	1.084	1.079	1.080	—	—
BN9859-3	1.088	1.077	—	—	—	—
MN12171-103	—	—	—	—	1.084	1.093
MN13740	—	—	—	—	1.074	1.088
MS401-1Y	—	—	—	—	1.096	1.096
MS700-70	—	—	1.083	1.083	1.091	1.093
MS716-15	—	—	—	—	1.089	1.100
NE8245	1.083	1.078	—	—	—	—
NE84106	1.089	1.083	1.075	1.074	1.069	1.081
NE219,70-3	1.085	1.080	—	—	—	—
NE22.75-1	1.083	1.074	1.078	1.080	—	—
NY81	1.086	1.073	—	—	—	—
NY85	—	—	1.084	1.083	—	—
W842	1.102	1.095	1.091	1.087	1.084	1.095
W856	—	—	—	—	1.084	1.098
W870	—	—	—	—	1.093	1.093
W877	—	—	—	—	1.091	1.106
W887	—	—	—	—	1.081	1.095
MEAN:	1.090	1.083	1.080	1.079	1.085	1.090

Table IXb. Chipping characteristics of WHITE-skinned cultivars in Nebraska.

Cultivar	PREC 1989	DHF 1989	PREC 1990	WP 1990	PREC 1991	DHF 1991
II. Chip color (Agtron FF10 - higher #s = lighter the chip) of tubers greater than 1 7/8 inch:						
Atlantic	no data	no data	60	52	no data	60
Conestoga			58	46		
Denali			59	56		
Gemchip			71	40		
LaBelle			65	46		62
Mainchip						63
Monona			63	51		59
Norchip			57	63		56
Shepody				57		56
Snowden			63	64		65
Wischip			62	57		
A80559-2			61	51		
AC80545-1			53	65		
BN9845-1			63	61		
BN9859-3						
MN12171-103						59
MN13740						57
MS401-1Y						60
MS700-70			43	48		63
MS716-15						63
NE8245						
NE84106			60	57		58
NE219,70-3						
NE22.75-1			42	62		
NY81						
NY85			50	23		
W842			60	51		58
W856						63
W870						60
W877						57
W887						58
MEAN:			58	53		60

Note: Chip color readings were taken 2 to 3 months after storage at 45-50 degrees F.

Table X. Summary of 1989 North Central Regional Trial.

Selection Number or Variety	most (1) typical scab area-type (A-T)	cwt/a mean yield	mean percent tubers > 1 7/8 inch	mean % total solids	chip color Agtron FF10	% scabby tubers (3) (4)	% no external defects (3)	% no internal defects (3)	comments on defects and general notes
Norchip	T-5	275	92	22.2	35	8	74	100	pointy ends
Norgold Rus.	0	359	92	19.7	43	0	93	87	necrosis in large tubers
Norland	T-1	222	93	19.4		2	93	100	over brown
Red Pontiac	T-4	336	98	20.1		17	80	99	over brown
Rus. Burbank	0	275	86	19.2	38	0	67	100	off-types, jelly end
BN 9826-1	T-1	176	87	21.8	40	9	80	97	
MN 13420	T-1	374	92	21.2		1	92	100	purple skin, good shape
MN 13545	0	153	80	23.1	51	0	95	99	oval
MS 700-70	T-3	367	96	22.9	38	3	90	100	
ND 1196-2R	T-2	191	80	18.4		4	91	100	small round tubers
NE 219,70-3	1-3	290	95	20.7	48	13	55	94	non-uniform, oily chips
NE 22,75-1	0	229	93	20.3	30	0	99	93	uniform round
W 855	T-1	283	89	22.9	49	4	89	99	uniform round
W 1005	0	260	88	20.7	53	0	80	100	pointy end, long & skinny
MEAN:		275	95	19.2	40	4	84	98	

1) Area: T-less than 1 percent; 1 - 10-20 percent; 2 - 21-40 percent; 3 - 41-60 percent; 4 - 61-80 percent; 5 - 81-100 percent. Type: 1. small, superficial; 2. larger, superficial; 3. larger, rough pustules; 4. larger pustules, shallow holes; 5. very large pustules, deep holes.
2) Early blight: 1 — susceptible; 5 — highly resistant.
3) Based on four 25 tuber samples (one from each replication); percentage is based on the number of tubers.
4) Includes all tubers with scab lesions whether merely surface, pitted or otherwise and regardless of area. Tubers with any amount of scab are counted in this category.

Table XI. Summary of 1990 North Central Regional Trial.

Selection Number or Variety	most (1) typical scab area-type (A-T)	cwt/a mean yield	mean percent tubers > 1 7/8 inch	mean % total solids	chip color Agtron FF10	% scabby tubers (3) (4)	% no external defects (3)	% no internal defects (3)	comments on defects and general notes
Norchip	T-1	320	93	19.9	59	99	0	94	pointy ends
Norgold Rus.	T-1	187	80	19.4	22	21	71	93	
Norland	T-1	218	93	17.1	33	77	13	90	
Red Pontiac	T-1	398	97	17.3	26	92	7	85	good size
Rus. Burbank	T-1	177	83	19.0	42	44	50	75	off-types, jelly end
LA 12-59	T-1	272	89	21.2	49	83	15	99	
MN 12966	T-1	196	91	20.1	50	86	9	74	jelly end, slow emerge
MN 13540	T-1	255	86	18.8	52	98	0	97	
MN 13740	T-1	303	92	19.7	56	96	1	91	
MS 41-1	T-2	325	91	20.9	51	98	0	72	
MS 402-8	T-1	160	91	20.5	48	42	53	94	
ND 1196-2R	T-1	293	89	18.4	31	77	11	100	
ND 1538-1Rus	T-1	293	85	20.5	34	31	62	93	small tubers
ND 2008-2	T-1	226	90	18.4	48	90	0	97	off-type, small tubers
Wisc. 856	T-1	308	93	18.8	57	91	4	96	
Wisc. 870	T-1	361	95	22.2	49	90	0	91	pointy end
Wisc. 877	1-5	279	92	20.7	53	97	0	91	small tubers, bad scab
MEAN:		277	90	19.6	46	78	16	90	

1) Area: T-less than 1 percent; 1 - 10-20 percent; 2 - 21-40 percent; 3 - 41-60 percent; 4 - 61-80 percent; 5 - 81-100 percent. Type: 1. small, superficial; 2. larger, superficial; 3. larger, rough pustules; 4. larger pustules, shallow holes; 5. very large pustules, deep holes.
2) Early blight: 1 — susceptible; 5 — highly resistant.
3) Based on four 25 tuber samples (one from each replication); percentage is based on the number of tubers.
4) Includes all tubers with scab lesions whether merely surface, pitted or otherwise and regardless of area. Tubers with any amount of scab are counted in this category.

Table XII. Summary of 1991 North Central Regional Trial.

Selection Number or Variety	most (1) typical scab area-type (A-T)	cwt/a mean yield	mean percent tubers > 1 7/8 inch	mean % total solids	chip color Agtron FF10	early blight reading (2)	% scabby tubers (3) (4)	% no external defects (3)	% no internal defects (3)	comments on defects and general notes
Norchip	T-1	316	88	19.7	61	5	23	67	96	
Norgold Rus.	0	214	95	16.2	44	3	0	61	95	
Norland	0	295	96	17.1	46	1	0	97	93	
Red Pontiac	T-1	396	95	15.2	26	5	13	84	92	good size
Rus. Burbank	0	250	87	14.1	54	5	0	79	97	many off-types
LA 12-59	T-1	336	95	17.7	54	5	3	93	96	best test red
MN 12567	T-1	258	93	21.6	54	2	26	66	92	
MN 12966	T-1	271	98	18.2	43	2	6	81	95	light red skin
MN 13035	T-1	327	93	17.7	30	5	45	65	91	
MS 401-1Y	T-2	259	91	20.9	54	3	92	8	94	
MS 402-8	T-1	96	100	22.9	48	1	9	78	92	
ND 1871-3R	T-1	231	93	13.9	30	5	51	47	97	short plants
ND 1538-1Rus	0	315	93	16.9	51	2	0	81	97	best russet
Wisc. 856	T-1	272	94	18.4	60	5	41	50	97	tall plants
Wisc. 870	T-2	295	94	19.7	60	4	43	48	96	best test chipper
Wisc. 877	1-2	223	89	20.7	53	4	36	51	96	
MEAN:		272	93	18.2	48	3.3	24	66	95	

1) Area: T-less than 1 percent; 1 - 10-20 percent; 2 - 21-40 percent; 3 - 41-60 percent; 4 - 61-80 percent; 5 - 81-100 percent. Type: 1. small, superficial; 2. larger, superficial; 3. larger, rough pustules; 4. larger pustules, shallow holes; 5. very large pustules, deep holes.
2) Early blight: 1 — susceptible; 5 — highly resistant.
3) Based on four 25 tuber samples (one from each replication); percentage is based on the number of tubers.
4) Includes all tubers with scab lesions whether merely surface, pitted or otherwise and regardless of area. Tubers with any amount of scab are counted in this category.

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