

1992

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

Alexander D. Pavlista

*University of Nebraska-Lincoln*, [apavlista@unl.edu](mailto:apavlista@unl.edu)

Larry E. Williams

Carl S. Gall

Follow this and additional works at: <https://digitalcommons.unl.edu/extensionhist>

---

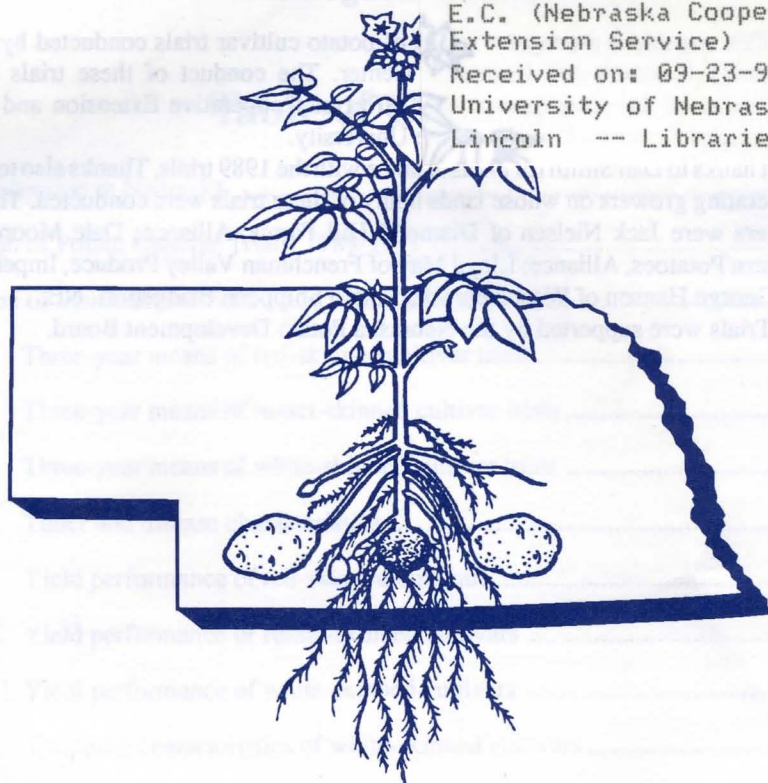
Pavlista, Alexander D.; Williams, Larry E.; and Gall, Carl S., "EC92-1247-D Nebraska Potato Cultivar Tests 1989-91" (1992).  
*Historical Materials from University of Nebraska-Lincoln Extension*. 4701.  
<https://digitalcommons.unl.edu/extensionhist/4701>

This Article is brought to you for free and open access by the Extension at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Historical Materials from University of Nebraska-Lincoln Extension by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

CYT  
S  
85  
E7  
no. 1247  
Copy 2

# Nebraska Potato Cultivar Tests 1989-91

Nebraska Cooperative  
Extension Service  
E.C. (Nebraska Cooperative  
Extension Service)  
Received on: 09-23-92  
University of Nebraska,  
Lincoln -- Libraries



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



Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Kenneth R. Bolen, Director of Cooperative Extension, University of Nebraska, Institute of Agriculture and Natural Resources.



The University of Nebraska-Lincoln Institute of Agriculture and Natural Resources does not discriminate in its academic, admissions and services to the public on the basis of sex, age, race, color, religion, disability, national origin, marital status, sexual orientation, or political affiliation.

Institute of Agriculture and Natural Resources  
 University of Nebraska-Lincoln  
**Nebraska**  
**Potato Cultivar Tests**  
 College of Agricultural and Natural Resources  
 1989-91  
 College of Home Economics

### 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.

Trials were supported by the Nebraska Potato Development Board.



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

# 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

### Table of Contents

Potato Production in Nebraska .....	4
Description of Potato Cultivar Trials, 1989-1991 .....	5
Description of Standard Cultivars .....	5
Table II. Three-year means of red-skinned cultivar trials .....	5
Table III. Three-year means of russet-skinned cultivar trials .....	6
Table IV. Three-year means of white-skinned cultivar trials .....	6
Table V. Tuber and disease characteristics .....	6
Table VI. Yield performance of red-skinned cultivars .....	7
Table VII. Yield performance of russet-skinned cultivars .....	7
Table VIII. Yield performance of white-skinned cultivars .....	8
Table IX. Chipping characteristics of white-skinned cultivars .....	9
Table X. Summary of 1989 North Central Regional Trial in Nebraska .....	10
Table XI. Summary of 1990 North Central Regional Trial in Nebraska .....	10
Table XII. Summary of 1991 North Central Regional Trial in Nebraska .....	11

---

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 cwt (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).

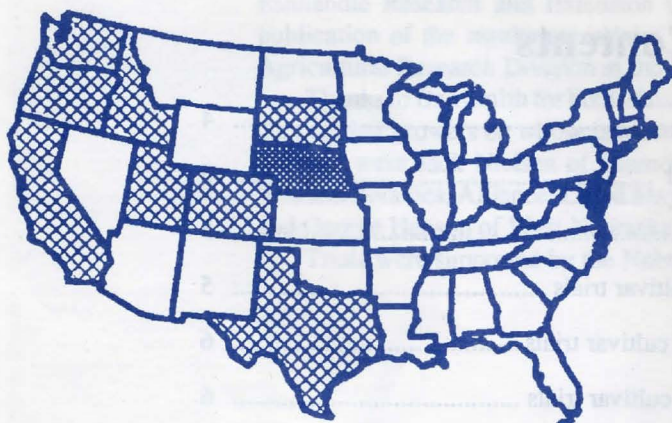


Figure 1. Nebraska's "processing potato" markets are shown here. They include the seven major buyers of Nebraska's chipping potatoes, and South Dakota, where all of Nebraska's french fry potatoes go for processing.

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).

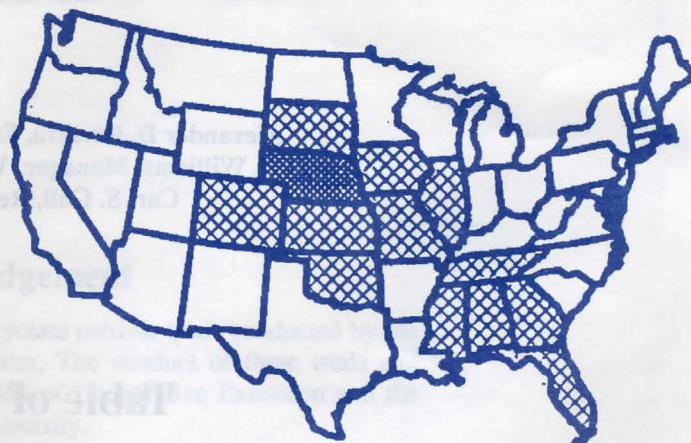


Figure 2. The state's "table potato" markets for the most part lie to the east and southeast of Nebraska.

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
<i>R. LaSoda</i>	428	96	1.071
<i>D.R. Norland</i>	289	91	1.069
<i>Red Cloud</i>	327	95	1.075
<i>Sangre</i>	357	94	1.070
<i>LA 12-59</i>	335	94	1.081
<i>NE 8206</i>	342	93	1.081
<b>MEAN:</b>	346	94	1.075
<b>LSD 0.10:</b>	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
<i>R. Burbank</i>	280	90	1.074
<i>Century</i>	319	91	1.082
<i>Frontier</i>	323	91	1.082
<i>Norgold</i>	328	91	1.077
<i>Norkotah</i>	306	90	1.074
<i>Ranger</i>	462	93	1.071
<i>Shepody</i>	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 Agron FF10
<i>Atlantic</i>	391	95	1.093	57
<i>LaBelle</i>	377	96	1.083	58
<i>Monona</i>	360	95	1.071	58
<i>Norchip</i>	333	92	1.081	59
<i>Snowden</i>	332	94	1.089	64
<i>MS 700-70</i>	339	94	1.088	51
<i>NE 84106</i>	355	94	1.079	58
<i>W 842</i>	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 Agron FF10, higher numbers indicate lighter chips.

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

Red cultivar:	Comments:
<i>R. LaSoda</i>	over browns
<i>D.R. Norland</i>	over browns
<i>Red Cloud</i>	off type
<i>Sangre</i>	surface scab
<i>LA 12-59</i>	over browns
<i>NE 8206</i>	surface scab, oblong tubers, pink skin
Russet Cultivar:	Comments:
<i>Burbank</i>	jelly end, off-type
<i>Century</i>	surface scab, thin skin
<i>Frontier</i>	
<i>Norgold</i>	early die, hollow heart
<i>Norkotah</i>	early die, jelly end
<i>Ranger</i>	
<i>Shepody</i>	
White cultivar:	Comments:
<i>Atlantic</i>	surface scab, hollow heart
<i>LaBelle</i>	surface scab
<i>Monona</i>	black scurf
<i>Norchip</i>	off-type, vascular discolor, black scurf
<i>Snowden</i>	surface scab
<i>MS 700-70</i>	
<i>NE 84106</i>	early blight
<i>W 842</i>	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
<b>I. Yield in cwt/a of tubers greater than 1 7/8 in:</b>					
<i>R. LaSoda</i>	316	386	485	493	458
<i>D.R. Norland</i>	231	259	387	260	310
<i>Red Cloud</i>	308	243	450	310	323
<i>Sangre</i>	404	284	454	343	298
<i>Viking</i>	212	—	—	—	—
<i>LA 12-59</i>	296	293	460	312	314
<i>MN 13420</i>	—	279	427	—	—
<i>ND 1196-2R</i>	—	—	—	185	323
<i>ND 2224-5R</i>	—	235	364	—	—
<i>NDT9-1068-11R</i>	364	187	321	—	—
<i>NE 8206</i>	343	320	414	264	370
<b>MEAN:</b>	309	276	418	310	342
<b>LSD 0.10:</b>	52	21	84	64	55
<b>II. Percent of total yield due to tubers greater than 1 7/8 in:</b>					
<i>R. LaSoda</i>	95	96	no data	96	95
<i>D.R. Norland</i>	91	90	—	91	92
<i>Red Cloud</i>	97	94	—	94	95
<i>Sangre</i>	98	91	—	93	92
<i>Viking</i>	94	—	—	—	—
<i>LA 12-59</i>	96	94	—	94	92
<i>MN 13420</i>	—	92	—	—	—
<i>ND 1196-2R</i>	—	—	—	84	88
<i>ND 2224-5R</i>	—	88	—	—	—
<i>NDT9-1068-11R</i>	99	90	—	—	—
<i>NE 8206</i>	95	91	—	93	94
<b>MEAN:</b>	96	92	—	92	93
<b>LSD 0.10:</b>	2	3	—	4	3
<b>III. Specific gravity of tubers greater than 1 7/8 in:</b>					
<i>R. LaSoda</i>	1.083	1.073	1.067	1.068	1.066
<i>D.R. Norland</i>	1.081	1.070	1.061	1.076	1.058
<i>Red Cloud</i>	1.082	1.085	1.071	1.060	1.076
<i>Sangre</i>	1.081	1.074	1.063	1.072	1.060
<i>Viking</i>	1.073	—	—	—	—
<i>LA 12-59</i>	1.091	1.090	1.090	1.073	1.076
<i>MN 13420</i>	—	1.079	1.067	—	—
<i>ND 1196-2R</i>	—	—	—	1.075	1.065
<i>ND 2224-5R</i>	—	1.072	1.064	—	—
<i>NDT9-1068-11R</i>	1.075	1.073	1.067	—	—
<i>NE 8206</i>	1.095	1.087	1.076	1.069	1.080
<b>MEAN:</b>	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
<b>I. Yield in cwt/a of tubers greater than 1 7/8 in:</b>					
<i>Burbank</i>	291	281	273	264	289
<i>Century</i>	227	330	372	339	327
<i>Frontier</i>	229	308	397	279	373
<i>Hilite</i>	216	—	—	—	—
<i>Krantz</i>	162	—	—	—	—
<i>Norgold</i>	321	274	385	246	416
<i>Norkotah</i>	345	235	385	246	318
<i>Ranger</i>	—	330	585	462	472
<i>Shepody</i>	306	306	314	325	241
<i>MN 10874</i>	216	—	—	—	—
<i>ND 1538-IRUS</i>	—	—	—	320	320
<i>ND 671-4RUS</i>	—	—	—	214	273
<b>MEAN:</b>	257	295	387	299	337
<b>LSD 0.10:</b>	67	32	57	57	62
<b>II. Percent of total yield due to tubers greater than 1 7/8 in:</b>					
<i>Burbank</i>	88	93	no data	88	89
<i>Century</i>	91	92	—	93	87
<i>Frontier</i>	89	91	—	90	92
<i>Hilite</i>	87	—	—	—	—
<i>Krantz</i>	94	—	—	—	—
<i>Norgold</i>	94	87	—	90	94
<i>Norkotah</i>	94	87	—	89	88
<i>Ranger</i>	—	94	—	96	90
<i>Shepody</i>	94	94	—	95	92
<i>MN 10874</i>	90	—	—	—	—
<i>ND 1538-IRUS</i>	—	—	—	92	85
<i>ND 671-4RUS</i>	—	—	—	88	89
<b>MEAN:</b>	91	91	—	91	90
<b>LSD 0.10:</b>	4	3	—	3	6
<b>III. Specific gravity of tubers greater than 1 7/8 in:</b>					
<i>Burbank</i>	1.077	1.070	1.070	1.084	1.071
<i>Century</i>	1.096	1.081	1.082	1.071	1.081
<i>Frontier</i>	1.094	1.087	1.077	1.075	1.079
<i>Hilite</i>	1.083	—	—	—	—
<i>Krantz</i>	1.084	—	—	—	—
<i>Norgold</i>	1.084	1.075	1.070	1.083	1.071
<i>Norkotah</i>	1.083	1.074	1.070	1.070	1.071
<i>Ranger</i>	—	1.069	1.075	1.069	1.072
<i>Shepody</i>	1.090	1.078	1.078	1.068	1.070
<i>MN 10874</i>	1.084	—	—	—	—
<i>ND 1538-IRUS</i>	—	—	—	1.070	1.071
<i>ND 671-4RUS</i>	—	—	—	1.073	1.070
<b>MEAN:</b>	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
<b>I. Yield in cwt/a of tubers greater than 1 7/8 in:</b>						
<i>Atlantic</i>	491	466	269	524	258	335
<i>Conestoga</i>	341	389	221	417	—	—
<i>Denali</i>	408	434	196	441	—	—
<i>Gemchip</i>	333	421	235	456	—	—
<i>LaBelle</i>	464	491	255	420	219	410
<i>Mainchip</i>	—	—	—	—	268	246
<i>Monona</i>	246	472	243	441	323	433
<i>Norchip</i>	352	385	235	429	268	327
<i>Shepody</i>	—	—	—	356	192	325
<i>Snowden</i>	400	420	250	335	241	343
<i>Wischip</i>	310	385	264	577	—	—
<i>A80559-2</i>	—	—	218	378	—	—
<i>AC80545-1</i>	306	462	223	359	—	—
<i>BN9845-1</i>	333	385	216	320	—	—
<i>BN9859-3</i>	368	350	—	—	—	—
<i>MN12171-103</i>	—	—	—	—	231	221
<i>MN13740</i>	—	—	—	—	199	214
<i>MS401-1Y</i>	—	—	—	—	248	256
<i>MS700-70</i>	—	—	264	393	273	425
<i>MS716-15</i>	—	—	—	—	296	379
<i>NE8245</i>	387	411	—	—	—	—
<i>NE84106</i>	460	472	306	429	217	248
<i>NE219,70-3</i>	372	390	—	—	—	—
<i>NE22.75-1</i>	427	464	279	429	—	—
<i>NY81</i>	345	352	—	—	—	—
<i>NY85</i>	—	—	160	269	—	—
<i>W842</i>	289	318	262	424	228	254
<i>W856</i>	—	—	—	—	204	275
<i>W870</i>	—	—	—	—	236	321
<i>W877</i>	—	—	—	—	173	229
<i>W887</i>	—	—	—	—	169	277
<b>MEAN:</b>	368	415	235	411	235	302
<b>LSD 0.10:</b>	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
<b>II. Percent of total yield due to tubers greater than 1 7/8 in:</b>						
<i>Atlantic</i>	98	93	94	96	no data	no data
<i>Conestoga</i>	96	96	94	95		
<i>Denali</i>	97	93	94	93		
<i>Gemchip</i>	97	94	96	96		
<i>LaBelle</i>	98	96	95	97		
<i>Mainchip</i>	—	—	—	—		
<i>Monona</i>	98	93	95	95		
<i>Norchip</i>	96	94	83	95		
<i>Shepody</i>	—	—	—	—		
<i>Snowden</i>	98	93	92	92		
<i>Wischip</i>	94	92	95	95		
<i>A80559-2</i>	—	—	93	96		
<i>AC80545-1</i>	98	98	94	94		
<i>BN9845-1</i>	96	90	94	94		
<i>BN9859-3</i>	96	89	—	—		
<i>MN12171-103</i>	—	—	—	—		
<i>MN13740</i>	—	—	—	—		
<i>MS401-1Y</i>	—	—	—	—		
<i>MS700-70</i>	—	—	94	95		
<i>MS716-15</i>	—	—	—	—		
<i>NE8245</i>	95	93	—	—		
<i>NE84106</i>	95	93	92	95		
<i>NE219,70-3</i>	96	98	—	—		
<i>NE22.75-1</i>	98	96	95	95		
<i>NY81</i>	94	90	—	—		
<i>NY85</i>	—	—	84	95		
<i>W842</i>	94	87	92	93		
<i>W856</i>	—	—	—	—		
<i>W870</i>	—	—	—	—		
<i>W877</i>	—	—	—	—		
<i>W887</i>	—	—	—	—		
<b>MEAN:</b>	96	93	91	95		
<b>LSD 0.10:</b>	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
<b>I. Specific gravity of tubers greater than 1 7/8 in:</b>						
<i>Atlantic</i>	1.099	1.093	1.091	1.090	1.093	1.090
<i>Conestoga</i>	1.095	1.086	1.077	1.076	—	—
<i>Denali</i>	1.100	1.087	1.087	1.088	—	—
<i>Gemchip</i>	1.089	1.073	1.075	1.074	—	—
<i>LaBelle</i>	1.088	1.083	1.075	1.075	1.090	1.087
<i>Mainchip</i>	—	—	—	—	1.088	1.085
<i>Monona</i>	1.079	1.070	1.070	1.070	1.070	1.069
<i>Norchip</i>	1.090	1.084	1.076	1.076	1.071	1.088
<i>Shepody</i>	—	—	—	1.079	1.078	1.079
<i>Snowden</i>	1.095	1.093	1.085	1.085	1.083	1.090
<i>Wischip</i>	1.088	1.088	1.077	1.076	—	—
<i>A80559-2</i>	—	—	1.078	1.080	—	—
<i>AC80545-1</i>	1.088	1.087	1.072	1.071	—	—
<i>BN9845-1</i>	1.093	1.084	1.079	1.080	—	—
<i>BN9859-3</i>	1.088	1.077	—	—	—	—
<i>MN12171-103</i>	—	—	—	—	1.084	1.093
<i>MN13740</i>	—	—	—	—	1.074	1.088
<i>MS401-1Y</i>	—	—	—	—	1.096	1.096
<i>MS700-70</i>	—	—	1.083	1.083	1.091	1.093
<i>MS716-15</i>	—	—	—	—	1.089	1.100
<i>NE8245</i>	1.083	1.078	—	—	—	—
<i>NE84106</i>	1.089	1.083	1.075	1.074	1.069	1.081
<i>NE219,70-3</i>	1.085	1.080	—	—	—	—
<i>NE22.75-1</i>	1.083	1.074	1.078	1.080	—	—
<i>NY81</i>	1.086	1.073	—	—	—	—
<i>NY85</i>	—	—	1.084	1.083	—	—
<i>W842</i>	1.102	1.095	1.091	1.087	1.084	1.095
<i>W856</i>	—	—	—	—	1.084	1.098
<i>W870</i>	—	—	—	—	1.093	1.093
<i>W877</i>	—	—	—	—	1.091	1.106
<i>W887</i>	—	—	—	—	1.081	1.095
<b>MEAN:</b>	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
<b>II. Chip color (Agtron FF10 - higher #s = lighter the chip) of tubers greater than 1 7/8 inch:</b>						
<i>Atlantic</i>	no data	no data	60	52	no data	60
<i>Conestoga</i>			58	46		
<i>Denali</i>			59	56		
<i>Gemchip</i>			71	40		
<i>LaBelle</i>			65	46		62
<i>Mainchip</i>						63
<i>Monona</i>			63	51		59
<i>Norchip</i>			57	63		56
<i>Shepody</i>				57		56
<i>Snowden</i>			63	64		65
<i>Wischip</i>			62	57		
<i>A80559-2</i>			61	51		
<i>AC80545-1</i>			53	65		
<i>BN9845-1</i>			63	61		
<i>BN9859-3</i>						59
<i>MN12171-103</i>						57
<i>MN13740</i>						60
<i>MS401-1Y</i>						63
<i>MS700-70</i>			43	48		63
<i>MS716-15</i>						63
<i>NE8245</i>						
<i>NE84106</i>			60	57		58
<i>NE219,70-3</i>						
<i>NE22.75-1</i>			42	62		
<i>NY81</i>						
<i>NY85</i>			50	23		
<i>W842</i>			60	51		58
<i>W856</i>						63
<i>W870</i>						60
<i>W877</i>						57
<i>W887</i>						58
<b>MEAN:</b>			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
<i>Norchip</i>	T-5	275	92	22.2	35	8	74	100	pointy ends
<i>Norgold Rus.</i>	0	359	92	19.7	43	0	93	87	necrosis in large tubers
<i>Norland</i>	T-1	222	93	19.4		2	93	100	over brown
<i>Red Pontiac</i>	T-4	336	98	20.1		17	80	99	over brown
<i>Rus. Burbank</i>	0	275	86	19.2	38	0	67	100	off-types, jelly end
<i>BN 9826-1</i>	T-1	176	87	21.8	40	9	80	97	
<i>MN 13420</i>	T-1	374	92	21.2		1	92	100	purple skin, good shape
<i>MN 13545</i>	0	153	80	23.1	51	0	95	99	oval
<i>MS 700-70</i>	T-3	367	96	22.9	38	3	90	100	
<i>ND 1196-2R</i>	T-2	191	80	18.4		4	91	100	small round tubers
<i>NE 219,70-3</i>	1-3	290	95	20.7	48	13	55	94	non-uniform, oily chips
<i>NE 22,75-1</i>	0	229	93	20.3	30	0	99	93	uniform round
<i>W 855</i>	T-1	283	89	22.9	49	4	89	99	uniform round
<i>W 1005</i>	0	260	88	20.7	53	0	80	100	pointy end, long & skinny
<b>MEAN:</b>		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
<i>Norchip</i>	T-1	320	93	19.9	59	99	0	94	pointy ends
<i>Norgold Rus.</i>	T-1	187	80	19.4	22	21	71	93	
<i>Norland</i>	T-1	218	93	17.1	33	77	13	90	
<i>Red Pontiac</i>	T-1	398	97	17.3	26	92	7	85	good size
<i>Rus. Burbank</i>	T-1	177	83	19.0	42	44	50	75	off-types, jelly end
<i>LA 12-59</i>	T-1	272	89	21.2	49	83	15	99	
<i>MN 12966</i>	T-1	196	91	20.1	50	86	9	74	jelly end, slow emerge
<i>MN 13540</i>	T-1	255	86	18.8	52	98	0	97	
<i>MN 13740</i>	T-1	303	92	19.7	56	96	1	91	
<i>MS 41-1</i>	T-2	325	91	20.9	51	98	0	72	
<i>MS 402-8</i>	T-1	160	91	20.5	48	42	53	94	
<i>ND 1196-2R</i>	T-1	293	89	18.4	31	77	11	100	
<i>ND 1538-1Rus</i>	T-1	293	85	20.5	34	31	62	93	small tubers
<i>ND 2008-2</i>	T-1	226	90	18.4	48	90	0	97	off-type, small tubers
<i>Wisc. 856</i>	T-1	308	93	18.8	57	91	4	96	
<i>Wisc. 870</i>	T-1	361	95	22.2	49	90	0	91	pointy end
<i>Wisc. 877</i>	1-5	279	92	20.7	53	97	0	91	small tubers, bad scab
<b>MEAN:</b>		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
<i>Norchip</i>	T-1	316	88	19.7	61	5	23	67	96	
<i>Norgold Rus.</i>	0	214	95	16.2	44	3	0	61	95	
<i>Norland</i>	0	295	96	17.1	46	1	0	97	93	
<i>Red Pontiac</i>	T-1	396	95	15.2	26	5	13	84	92	good size
<i>Rus. Burbank</i>	0	250	87	14.1	54	5	0	79	97	many off-types
<i>LA 12-59</i>	T-1	336	95	17.7	54	5	3	93	96	best test red
<i>MN 12567</i>	T-1	258	93	21.6	54	2	26	66	92	
<i>MN 12966</i>	T-1	271	98	18.2	43	2	6	81	95	light red skin
<i>MN 13035</i>	T-1	327	93	17.7	30	5	45	65	91	
<i>MS 401-1Y</i>	T-2	259	91	20.9	54	3	92	8	94	
<i>MS 402-8</i>	T-1	96	100	22.9	48	1	9	78	92	
<i>ND 1871-3R</i>	T-1	231	93	13.9	30	5	51	47	97	short plants
<i>ND 1538-1Rus</i>	0	315	93	16.9	51	2	0	81	97	best russet
<i>Wisc. 856</i>	T-1	272	94	18.4	60	5	41	50	97	tall plants
<i>Wisc. 870</i>	T-2	295	94	19.7	60	4	43	48	96	best test chipper
<i>Wisc. 877</i>	1-2	223	89	20.7	53	4	36	51	96	
<b>MEAN:</b>		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.



University of Nebraska-Lincoln

Agricultural Research Division

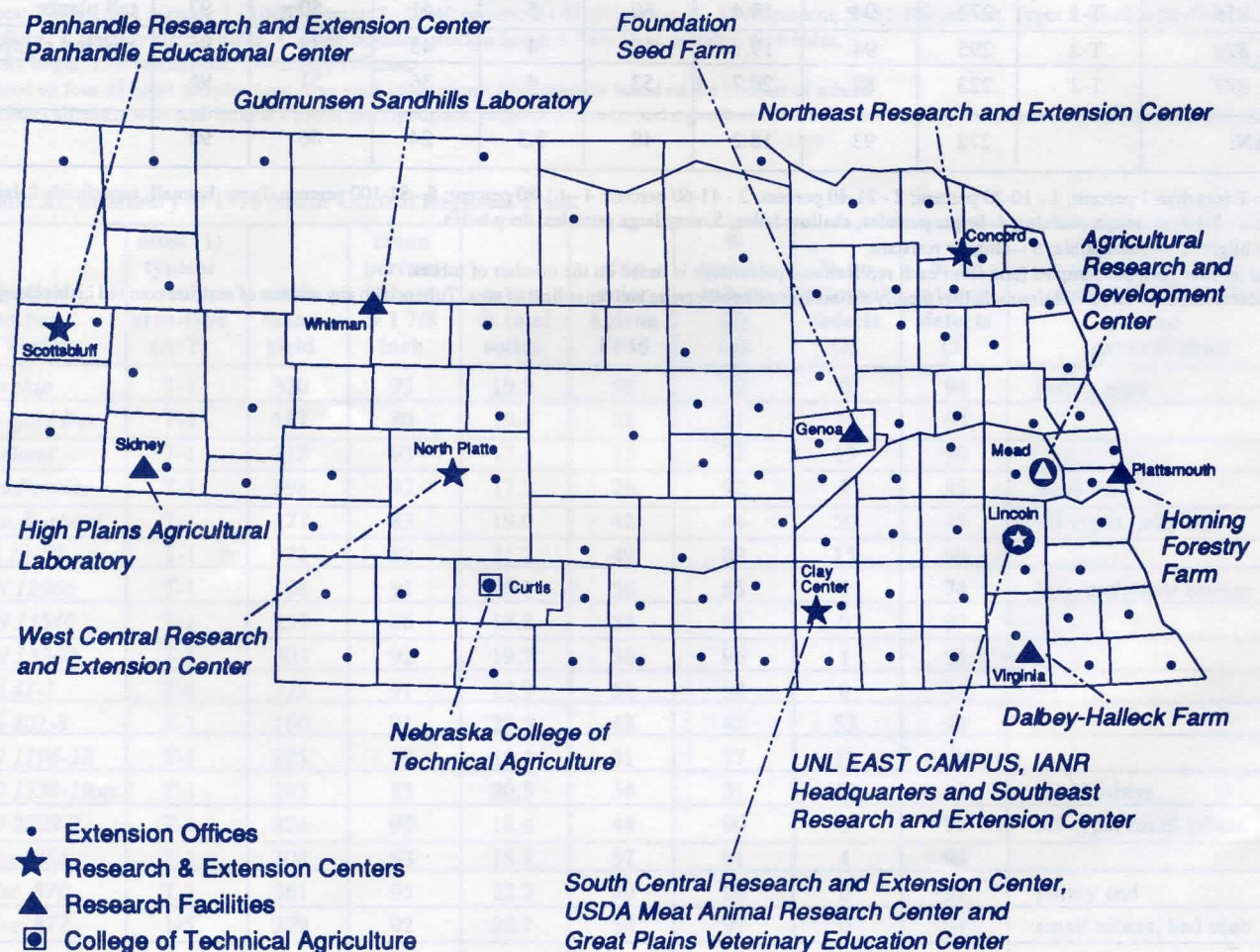
College of Agricultural Sciences and Natural Resources

College of Home Economics

Conservation and Survey Division

Cooperative Extension Division

International Programs



1) Area 1 has the 1 person, 1-10 cows; area 2-21-40 persons; 3-41-60 persons; 4-61-80 persons; 5-81-100 persons; 6-101-150 persons; 7-151-200 persons; 8-201-250 persons; 9-251-300 persons; 10-301-350 persons; 11-351-400 persons; 12-401-450 persons; 13-451-500 persons; 14-501-550 persons; 15-551-600 persons; 16-601-650 persons; 17-651-700 persons; 18-701-750 persons; 19-751-800 persons; 20-801-850 persons; 21-851-900 persons; 22-901-950 persons; 23-951-1000 persons; 24-1001-1050 persons; 25-1051-1100 persons; 26-1101-1150 persons; 27-1151-1200 persons; 28-1201-1250 persons; 29-1251-1300 persons; 30-1301-1350 persons; 31-1351-1400 persons; 32-1401-1450 persons; 33-1451-1500 persons; 34-1501-1550 persons; 35-1551-1600 persons; 36-1601-1650 persons; 37-1651-1700 persons; 38-1701-1750 persons; 39-1751-1800 persons; 40-1801-1850 persons; 41-1851-1900 persons; 42-1901-1950 persons; 43-1951-2000 persons; 44-2001-2050 persons; 45-2051-2100 persons; 46-2101-2150 persons; 47-2151-2200 persons; 48-2201-2250 persons; 49-2251-2300 persons; 50-2301-2350 persons; 51-2351-2400 persons; 52-2401-2450 persons; 53-2451-2500 persons; 54-2501-2550 persons; 55-2551-2600 persons; 56-2601-2650 persons; 57-2651-2700 persons; 58-2701-2750 persons; 59-2751-2800 persons; 60-2801-2850 persons; 61-2851-2900 persons; 62-2901-2950 persons; 63-2951-3000 persons; 64-3001-3050 persons; 65-3051-3100 persons; 66-3101-3150 persons; 67-3151-3200 persons; 68-3201-3250 persons; 69-3251-3300 persons; 70-3301-3350 persons; 71-3351-3400 persons; 72-3401-3450 persons; 73-3451-3500 persons; 74-3501-3550 persons; 75-3551-3600 persons; 76-3601-3650 persons; 77-3651-3700 persons; 78-3701-3750 persons; 79-3751-3800 persons; 80-3801-3850 persons; 81-3851-3900 persons; 82-3901-3950 persons; 83-3951-4000 persons; 84-4001-4050 persons; 85-4051-4100 persons; 86-4101-4150 persons; 87-4151-4200 persons; 88-4201-4250 persons; 89-4251-4300 persons; 90-4301-4350 persons; 91-4351-4400 persons; 92-4401-4450 persons; 93-4451-4500 persons; 94-4501-4550 persons; 95-4551-4600 persons; 96-4601-4650 persons; 97-4651-4700 persons; 98-4701-4750 persons; 99-4751-4800 persons; 100-4801-4850 persons; 101-4851-4900 persons; 102-4901-4950 persons; 103-4951-5000 persons; 104-5001-5050 persons; 105-5051-5100 persons; 106-5101-5150 persons; 107-5151-5200 persons; 108-5201-5250 persons; 109-5251-5300 persons; 110-5301-5350 persons; 111-5351-5400 persons; 112-5401-5450 persons; 113-5451-5500 persons; 114-5501-5550 persons; 115-5551-5600 persons; 116-5601-5650 persons; 117-5651-5700 persons; 118-5701-5750 persons; 119-5751-5800 persons; 120-5801-5850 persons; 121-5851-5900 persons; 122-5901-5950 persons; 123-5951-6000 persons; 124-6001-6050 persons; 125-6051-6100 persons; 126-6101-6150 persons; 127-6151-6200 persons; 128-6201-6250 persons; 129-6251-6300 persons; 130-6301-6350 persons; 131-6351-6400 persons; 132-6401-6450 persons; 133-6451-6500 persons; 134-6501-6550 persons; 135-6551-6600 persons; 136-6601-6650 persons; 137-6651-6700 persons; 138-6701-6750 persons; 139-6751-6800 persons; 140-6801-6850 persons; 141-6851-6900 persons; 142-6901-6950 persons; 143-6951-7000 persons; 144-7001-7050 persons; 145-7051-7100 persons; 146-7101-7150 persons; 147-7151-7200 persons; 148-7201-7250 persons; 149-7251-7300 persons; 150-7301-7350 persons; 151-7351-7400 persons; 152-7401-7450 persons; 153-7451-7500 persons; 154-7501-7550 persons; 155-7551-7600 persons; 156-7601-7650 persons; 157-7651-7700 persons; 158-7701-7750 persons; 159-7751-7800 persons; 160-7801-7850 persons; 161-7851-7900 persons; 162-7901-7950 persons; 163-7951-8000 persons; 164-8001-8050 persons; 165-8051-8100 persons; 166-8101-8150 persons; 167-8151-8200 persons; 168-8201-8250 persons; 169-8251-8300 persons; 170-8301-8350 persons; 171-8351-8400 persons; 172-8401-8450 persons; 173-8451-8500 persons; 174-8501-8550 persons; 175-8551-8600 persons; 176-8601-8650 persons; 177-8651-8700 persons; 178-8701-8750 persons; 179-8751-8800 persons; 180-8801-8850 persons; 181-8851-8900 persons; 182-8901-8950 persons; 183-8951-9000 persons; 184-9001-9050 persons; 185-9051-9100 persons; 186-9101-9150 persons; 187-9151-9200 persons; 188-9201-9250 persons; 189-9251-9300 persons; 190-9301-9350 persons; 191-9351-9400 persons; 192-9401-9450 persons; 193-9451-9500 persons; 194-9501-9550 persons; 195-9551-9600 persons; 196-9601-9650 persons; 197-9651-9700 persons; 198-9701-9750 persons; 199-9751-9800 persons; 200-9801-9850 persons; 201-9851-9900 persons; 202-9901-9950 persons; 203-9951-10000 persons; 204-10001-10050 persons; 205-10051-10100 persons; 206-10101-10150 persons; 207-10151-10200 persons; 208-10201-10250 persons; 209-10251-10300 persons; 210-10301-10350 persons; 211-10351-10400 persons; 212-10401-10450 persons; 213-10451-10500 persons; 214-10501-10550 persons; 215-10551-10600 persons; 216-10601-10650 persons; 217-10651-10700 persons; 218-10701-10750 persons; 219-10751-10800 persons; 220-10801-10850 persons; 221-10851-10900 persons; 222-10901-10950 persons; 223-10951-11000 persons; 224-11001-11050 persons; 225-11051-11100 persons; 226-11101-11150 persons; 227-11151-11200 persons; 228-11201-11250 persons; 229-11251-11300 persons; 230-11301-11350 persons; 231-11351-11400 persons; 232-11401-11450 persons; 233-11451-11500 persons; 234-11501-11550 persons; 235-11551-11600 persons; 236-11601-11650 persons; 237-11651-11700 persons; 238-11701-11750 persons; 239-11751-11800 persons; 240-11801-11850 persons; 241-11851-11900 persons; 242-11901-11950 persons; 243-11951-12000 persons; 244-12001-12050 persons; 245-12051-12100 persons; 246-12101-12150 persons; 247-12151-12200 persons; 248-12201-12250 persons; 249-12251-12300 persons; 250-12301-12350 persons; 251-12351-12400 persons; 252-12401-12450 persons; 253-12451-12500 persons; 254-12501-12550 persons; 255-12551-12600 persons; 256-12601-12650 persons; 257-12651-12700 persons; 258-12701-12750 persons; 259-12751-12800 persons; 260-12801-12850 persons; 261-12851-12900 persons; 262-12901-12950 persons; 263-12951-13000 persons; 264-13001-13050 persons; 265-13051-13100 persons; 266-13101-13150 persons; 267-13151-13200 persons; 268-13201-13250 persons; 269-13251-13300 persons; 270-13301-13350 persons; 271-13351-13400 persons; 272-13401-13450 persons; 273-13451-13500 persons; 274-13501-13550 persons; 275-13551-13600 persons; 276-13601-13650 persons; 277-13651-13700 persons; 278-13701-13750 persons; 279-13751-13800 persons; 280-13801-13850 persons; 281-13851-13900 persons; 282-13901-13950 persons; 283-13951-14000 persons; 284-14001-14050 persons; 285-14051-14100 persons; 286-14101-14150 persons; 287-14151-14200 persons; 288-14201-14250 persons; 289-14251-14300 persons; 290-14301-14350 persons; 291-14351-14400 persons; 292-14401-14450 persons; 293-14451-14500 persons; 294-14501-14550 persons; 295-14551-14600 persons; 296-14601-14650 persons; 297-14651-14700 persons; 298-14701-14750 persons; 299-14751-14800 persons; 300-14801-14850 persons; 301-14851-14900 persons; 302-14901-14950 persons; 303-14951-15000 persons; 304-15001-15050 persons; 305-15051-15100 persons; 306-15101-15150 persons; 307-15151-15200 persons; 308-15201-15250 persons; 309-15251-15300 persons; 310-15301-15350 persons; 311-15351-15400 persons; 312-15401-15450 persons; 313-15451-15500 persons; 314-15501-15550 persons; 315-15551-15600 persons; 316-15601-15650 persons; 317-15651-15700 persons; 318-15701-15750 persons; 319-15751-15800 persons; 320-15801-15850 persons; 321-15851-15900 persons; 322-15901-15950 persons; 323-15951-16000 persons; 324-16001-16050 persons; 325-16051-16100 persons; 326-16101-16150 persons; 327-16151-16200 persons; 328-16201-16250 persons; 329-16251-16300 persons; 330-16301-16350 persons; 331-16351-16400 persons; 332-16401-16450 persons; 333-16451-16500 persons; 334-16501-16550 persons; 335-16551-16600 persons; 336-16601-16650 persons; 337-16651-16700 persons; 338-16701-16750 persons; 339-16751-16800 persons; 340-16801-16850 persons; 341-16851-16900 persons; 342-16901-16950 persons; 343-16951-17000 persons; 344-17001-17050 persons; 345-17051-17100 persons; 346-17101-17150 persons; 347-17151-17200 persons; 348-17201-17250 persons; 349-17251-17300 persons; 350-17301-17350 persons; 351-17351-17400 persons; 352-17401-17450 persons; 353-17451-17500 persons; 354-17501-17550 persons; 355-17551-17600 persons; 356-17601-17650 persons; 357-17651-17700 persons; 358-17701-17750 persons; 359-17751-17800 persons; 360-17801-17850 persons; 361-17851-17900 persons; 362-17901-17950 persons; 363-17951-18000 persons; 364-18001-18050 persons; 365-18051-18100 persons; 366-18101-18150 persons; 367-18151-18200 persons; 368-18201-18250 persons; 369-18251-18300 persons; 370-18301-18350 persons; 371-18351-18400 persons; 372-18401-18450 persons; 373-18451-18500 persons; 374-18501-18550 persons; 375-18551-18600 persons; 376-18601-18650 persons; 377-18651-18700 persons; 378-18701-18750 persons; 379-18751-18800 persons; 380-18801-18850 persons; 381-18851-18900 persons; 382-18901-18950 persons; 383-18951-19000 persons; 384-19001-19050 persons; 385-19051-19100 persons; 386-19101-19150 persons; 387-19151-19200 persons; 388-19201-19250 persons; 389-19251-19300 persons; 390-19301-19350 persons; 391-19351-19400 persons; 392-19401-19450 persons; 393-19451-19500 persons; 394-19501-19550 persons; 395-19551-19600 persons; 396-19601-19650 persons; 397-19651-19700 persons; 398-19701-19750 persons; 399-19751-19800 persons; 400-19801-19850 persons; 401-19851-19900 persons; 402-19901-19950 persons; 403-19951-20000 persons; 404-20001-20050 persons; 405-20051-20100 persons; 406-20101-20150 persons; 407-20151-20200 persons; 408-20201-20250 persons; 409-20251-20300 persons; 410-20301-20350 persons; 411-20351-20400 persons; 412-20401-20450 persons; 413-20451-20500 persons; 414-20501-20550 persons; 415-20551-20600 persons; 416-20601-20650 persons; 417-20651-20700 persons; 418-20701-20750 persons; 419-20751-20800 persons; 420-20801-20850 persons; 421-20851-20900 persons; 422-20901-20950 persons; 423-20951-21000 persons; 424-21001-21050 persons; 425-21051-21100 persons; 426-21101-21150 persons; 427-21151-21200 persons; 428-21201-21250 persons; 429-21251-21300 persons; 430-21301-21350 persons; 431-21351-21400 persons; 432-21401-21450 persons; 433-21451-21500 persons; 434-21501-21550 persons; 435-21551-21600 persons; 436-21601-21650 persons; 437-21651-21700 persons; 438-21701-21750 persons; 439-21751-21800 persons; 440-21801-21850 persons; 441-21851-21900 persons; 442-21901-21950 persons; 443-21951-22000 persons; 444-22001-22050 persons; 445-22051-22100 persons; 446-22101-22150 persons; 447-22151-22200 persons; 448-22201-22250 persons; 449-22251-22300 persons; 450-22301-22350 persons; 451-22351-22400 persons; 452-22401-22450 persons; 453-22451-22500 persons; 454-22501-22550 persons; 455-22551-22600 persons; 456-22601-22650 persons; 457-22651-22700 persons; 458-22701-22750 persons; 459-22751-22800 persons; 460-22801-22850 persons; 461-22851-22900 persons; 462-22901-22950 persons; 463-22951-23000 persons; 464-23001-23050 persons; 465-23051-23100 persons; 466-23101-23150 persons; 467-23151-23200 persons; 468-23201-23250 persons; 469-23251-23300 persons; 470-23301-23350 persons; 471-23351-23400 persons; 472-23401-23450 persons; 473-23451-23500 persons; 474-23501-23550 persons; 475-23551-23600 persons; 476-23601-23650 persons; 477-23651-23700 persons; 478-23701-23750 persons; 479-23751-23800 persons; 480-23801-23850 persons; 481-23851-23900 persons; 482-23901-23950 persons; 483-23951-24000 persons; 484-24001-24050 persons; 485-24051-24100 persons; 486-24101-24150 persons; 487-24151-24200 persons; 488-24201-24250 persons; 489-24251-24300 persons; 490-24301-24350 persons; 491-24351-24400 persons; 492-24401-24450 persons; 493-24451-24500 persons; 494-24501-24550 persons; 495-24551-24600 persons; 496-24601-24650 persons; 497-24651-24700 persons; 498-24701-24750 persons; 499-24751-24800 persons; 500-24801-24850 persons; 501-24851-24900 persons; 502-24901-24950 persons; 503-24951-25000 persons; 504-25001-25050 persons; 505-25051-25100 persons; 506-25101-25150 persons; 507-25151-25200 persons; 508-25201-25250 persons; 509-25251-25300 persons; 510-25301-25350 persons; 511-25351-25400 persons; 512-25401-25450 persons; 513-25451-25500 persons; 514-25501-25550 persons; 515-25551-25600 persons; 516-25601-25650 persons; 517-25651-25700 persons; 518-25701-25750 persons; 519-25751-25800 persons; 520-25801-25850 persons; 521-25851-25900 persons; 522-25901-25950 persons; 523-25951-26000 persons; 524-26001-26050 persons; 525-26051-26100 persons; 526-26101-26150 persons; 527-26151-26200 persons; 528-26201-26250 persons; 529-26251-26300 persons; 530-26301-26350 persons; 531-26351-26400 persons; 532-26401-26450 persons; 533-26451-26500 persons; 534-26501-26550 persons; 535-26551-26600 persons; 536-26601-26650 persons; 537-26651-26700 persons; 538-26701-26750 persons; 539-26751-26800 persons; 540-26801-26850 persons; 541-26851-26900 persons; 542-26901-26950 persons; 543-26951-27000 persons; 544-27001-27050 persons; 545-27051-27100 persons; 546-27101-27150 persons; 547-27151-27200 persons; 548-27201-27250 persons; 549-27251-27300 persons; 550-27301-27350 persons; 551-27351-27400 persons; 552-27401-27450 persons; 553-27451-27500 persons; 554-27501-27550 persons; 555-27551-27600 persons; 556-27601-27650 persons; 557-27651-27700 persons; 558-27701-27750 persons; 559-27751-27800 persons; 560-27801-27850 persons; 561-27851-27900 persons; 562-27901-27950 persons; 563-27951-28000 persons; 564-28001-28050 persons; 565-28051-28100 persons; 566-28101-28150 persons; 567-28151-28200 persons; 568-28201-28250 persons; 569-28251-28300 persons; 570-28301-28350 persons; 571-28351-28400 persons; 572-28401-28450 persons; 573-28451-28500 persons; 574-28501-28550 persons; 575-28551-28600 persons; 576-28601-28650 persons; 577-28651-28700 persons; 578-28701-28750 persons; 579-28751-28800 persons; 580-28801-28850 persons; 581-28851-28900 persons; 582-28901-28950 persons; 583-28951-29000 persons; 584-29001-29050 persons; 585-29051-29100 persons; 586-29101-29150 persons; 587-29151-29200 persons; 588-29201-29250 persons; 589-29251-29300 persons; 590-29301-29350 persons; 591-29351-29400 persons; 592-29401-29450 persons; 593-29451-29500 persons; 594-29501-29550 persons; 595-29551-29600 persons; 596-29601-29650 persons; 597-29651-29700 persons; 598-29701-29750 persons; 599-29751-29800 persons; 600-29801-29850 persons; 601-29851-29900 persons; 602-29901-29950 persons; 603-29951-30000 persons; 604-30001-30050 persons; 605-30051-30100 persons; 606-30101-30150 persons; 607-30151-30200 persons; 608-30201-30250 persons; 609-30251-30300 persons; 610-30301-30350 persons; 611-30351-30400 persons; 612-30401-30450 persons; 613-30451-30500 persons; 614-30501-30550 persons; 615-30551-30600 persons; 616-30601-30650 persons; 617-30651-30700 persons; 618-30701-30750 persons; 619-30751-30800 persons; 620-30801-30850 persons; 621-30851-30900 persons; 622-30901-30950 persons; 623-30951-31000 persons; 624-31001-31050 persons; 625-31051-31100 persons; 626-31101-31150 persons; 627-31151-31200 persons; 628-31201-31250 persons; 629-31251-31300 persons; 630-31301-31350 persons; 631-31351-31400 persons; 632-31401-31450 persons; 633-31451-31500 persons; 634-31501-31550 persons; 635-31551-31600 persons; 636-31601-31650 persons; 637-31651-31700 persons; 638-31701-31750 persons; 639-31751-31800 persons; 640-31801-31850 persons; 641-31851-31900 persons; 642-31901-31950 persons; 643-31951-32000 persons; 644-32001-32050 persons; 645-32051-32100 persons; 646-32101-32150 persons; 647-32151-32200 persons; 648-32201-32250 persons; 649-32251-32300 persons; 650-32301-32350 persons; 651-32351-32400 persons; 652-32401-32450 persons; 653-32451-32500 persons; 654-32501-32550 persons; 655-32551-32600 persons; 656-32601-32650 persons; 657-32651-32700 persons; 658-32701-32750 persons; 659-32751-32800 persons; 660-32801-32850 persons; 661-32851-32900 persons; 662-32901-32950 persons; 663-32951-33000 persons; 664-33001-33050 persons; 665-33051-33100 persons; 666-33101-33150 persons; 667-33151-33200 persons; 668-33201-33250 persons; 669-33251-33300 persons; 670-33301-33350 persons; 671-33351