Research Progress Report for 2001

Potato Breeding and Selection

Submitted to the

San Luis Valley Research Center Committee

and the

Colorado Potato Administrative Committee (Area II)

by

David G. Holm

San Luis Valley Research Center

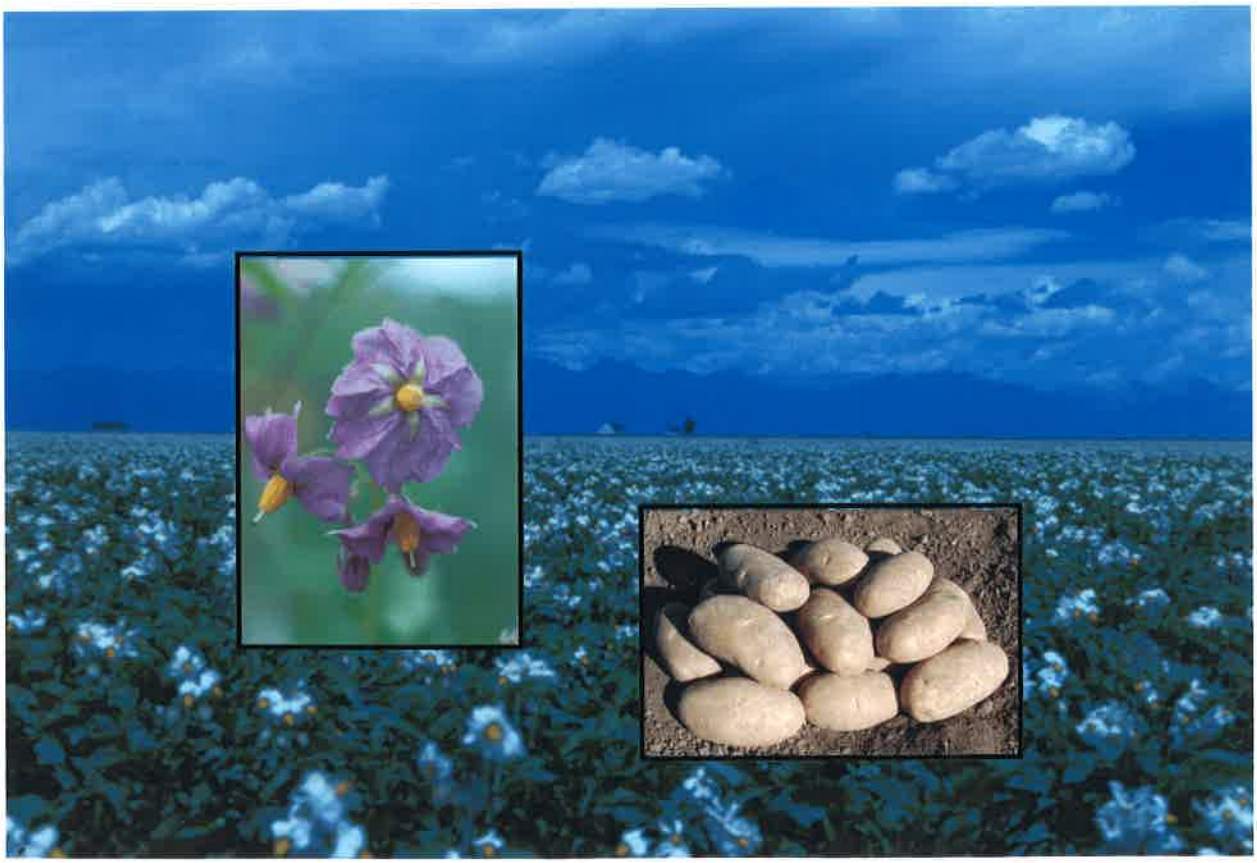


Table of Contents

Figures

Appendices

Brochure

Preface

The Colorado Potato Breeding and Selection Program is pleased to provide this copy of the "Potato Breeding and Selection Research Progress Report for 2001."

This report includes research funded by the Colorado Potato Industry (Area II and III), Colorado State University (Agricultural Experiment Station and the Department of Horticulture and Landscape Architecture), and the Cooperative State Research, Education, and Extension Service. These sources of funding, coupled with royalties collected from protected potato cultivars, have allowed us to significantly expand and strengthen our Program and other related CSU potato research efforts.

Royalties have allowed us to increase our breeding efforts for PVY immunity, resistance to late blight, and tuber resistance to dry rot and soft rot. New emphasis has been placed on identifying and incorporating breeding material demonstrating resistance to powdery scab. All pieces of the funding pie are significant in enhancing our research efforts in developing new potato cultivars for Colorado.

The Colorado Potato Breeding and Selection Program relies on the cooperation of several growers, shippers, processors, and research personnel to assess the adaptability, marketability, and other characteristics of advanced selections. Cooperative efforts with CSU personnel in conducting cultural management trials and disease evaluations are important in the ongoing assessment of advanced selections. Other collaborative research efforts with CSU faculty and graduate students in the Department of Horticulture and Landscape Architecture are allowing us to explore molecular aspects of breeding for late blight resistance. These efforts are also aimed at improving the nutritional quality and other important "consumer" characteristics of new cultivars.

We continue to expand our collaborations with the Southwest Regional Potato Group which involves Colorado, Texas, and California. The overall objective of this Group is to develop and evaluate improved potato cultivars to meet the production, marketing, and producer/consumer needs of the Southwest U.S. Other "partners" throughout the United States are supportive in providing breeding material and opportunities to screen our germplasm under various growing conditions and disease pressures not usually available in Colorado.

Best wishes for the 2002 production season.

Sincerely,

Phone: 719-754-3594, x14
Fax: 719-754-2619
Email: spudmkr@lamar.ext.colostate.edu

Acknowledgments

I would like to express appreciation to the following individuals, groups, and organizations for their efforts on behalf of the Colorado Potato Breeding and Selection Program in 2001.

✔ Financial Support from the following is gratefully acknowledged:
Colorado Potato Industry - Area II and III
Colorado State University - Colorado Agricultural Experiment Station
Department of Horticulture and Landscape Architecture
Cooperative State Research, Education, and Extension Service

These funds, coupled with royalties collected from Plant Variety Protection, have allowed us to significantly expand and strengthen our Program and other related CSU potato research efforts.

✔ San Luis Valley Research Center Committee

Jon Brownell	Greg Colbert	Terry Hillin	Art Holland
Mike Mitchell	Mark Peterson	Fran Strnad	

✔ Colorado State University Faculty, Staff, and Graduate Students

Jerry Alldredge	Rob Davidson	Hope Gruszewski	Ann McSay
Fernanda Powers	Eva Price	Ron Price	Stan Price
Tom Sanderson	Kent Sather	Cecil Stushnoff	Susie Thompson
Jorge Vivanco	David Yust	Sharon Yust	Christina Zinn

✔ Potato Certification Service

✔ Technical Support (temporary support personnel)

Felipe Aguilar	Mark Brimhall	Delphine Frank	Ansley Holm
Megan Hurley	Annette Kurys	Heather Messick	Tiffanie Morgan
Irena Popiel	Timothy Rafael	Freddie Rodriquez	Ted Sanchez
Yolanda Sandoval	Tim Snyder	Kyler Willet	

The Colorado Potato Breeding and Selection Program relies on the cooperation of several growers, shippers, processors, and research personnel to assess the adaptability, marketability, and other characteristics of advanced selections from our program. We sincerely appreciate their support and the valuable feedback they provide. We thank many cooperating breeding and selection programs throughout the United States and Canada who have provided breeding material and opportunities to screen our germplasm under various growing conditions and disease pressures not available in Colorado.

Research Progress Report for 2001

Potato Breeding and Selection

Submitted by

David G. Holm

San Luis Valley Research Center

Introduction

The primary objectives of the Colorado Potato Breeding and Selection Program are to develop new potato cultivars with increased yield, improved quality, resistance to diseases and pests, and tolerance to environmental stresses for Colorado. Other objectives are to provide a basic seed source to growers for seed increase and commercial testing; and to evaluate promising selections for potential seed export.

The Colorado Potato Breeding and Selection Program emphasizes the development of dual purpose fresh and processing russets. The balance of the breeding effort in order of priority is devoted to developing reds, chippers, and specialty cultivars. This broad approach is important for two primary reasons. First, it recognizes the diverse markets accessed by potato growers throughout Colorado. Second it allows us to utilize diverse germplasm resources in the improvement of russet cultivars, particularly for disease resistance and other internal quality characteristics. The development of "low input" cultivars, primarily for reduced nitrogen and fungicide input has always been emphasized.

Over the last few years, a major emphasis has been placed on developing Colorado cultivars that are resistant to late blight (foliar and tuber). Areas with recent increased emphasis or new emphasis are: 1) developing cultivars immune to PVY; 2) developing cultivars with tuber resistance to dry rot (Fusarium and early blight) and bacterial soft rot; 3) identifying and

incorporating breeding material demonstrating resistance to powder scab; and 4) developing protocols to screen and evaluate advanced selections for reduced tuber greening potential and red skin color retention in storage. Continued emphasis will be placed on breeding for improved postharvest and processing qualities such as lengthened dormancy and ability to process after cold storage. Cultivars with these characteristics will help assure that the potato industry in Colorado will remain productive and in a competitive position.

It takes 14+ years to develop a new potato cultivar (Table 1). Years 1 and 2 are the potato breeding phase of the development process. Parents are selected and crossed to produce true potato seed. Seedling tubers are then produced from the true seed in year 2. Subsequent years (3+) represent the selection phase of the development process. Each year represents another cycle of field selection. As each cycle is completed, fewer and fewer clones remain and the amount of seed per selection is increased. Clones surviving after eight cycles of field selection are released to growers for evaluations prior to official release as a named cultivar. Table 1 presents a detailed description of the steps involved in developing new potato cultivars.

Based on this time line, advanced selections from crosses made in 2001 will be available for grower evaluation in 2011. This illustrates the long term nature of potato breeding programs. It also underscores the impact that current research management decisions have on the characteristics future cultivars will possess as we strive to meet the needs of the Colorado potato industry.

Cultivar Trends/Statistics

Tables 2A-B and Figure 1 present statistics on the primary cultivars grown in the San Luis Valley during 1983-2001. This information shows trends in the production of the various cultivars over the years. Figure 2 presents a comparison of the production levels of the primary potato cultivars from 1997-2001. Russet Nugget, released by Colorado in 1988, was the primary cultivar grown on fall planted acreage in Colorado in 1997. Russet Nugget acreage has declined since the occurrence of late blight in 1998.

The top five cultivars grown in the San Luis Valley in 2001, based on acreage planted, were Russet Norkotah, Russet Nugget, Centennial Russet, Yukon Gold, and Sangre. They were followed, in order, by Silverton Russet and DT6063-1R (Cherry Red) .

Cultivars released by Colorado State University accounted for 59% of the 2001 fall potato acreage planted in Colorado. Russet Nugget accounted for 21% of the acreage making it second in area planted in the San Luis Valley and the fifth most popular russet cultivar in the United States. Of the fall planted Russet Norkotah acreage in Colorado, 55% was planted to Colorado Russet Norkotah Selections 3 and 8 (Figure 3).

Approximately 57% of the Colorado certified seed acreage accepted for certification, was represented by cultivars and line selections developed by CSU or in cooperation with other agencies. Advanced selections accounted for another 6% of the seed acreage.

Conservative estimates indicate that new potato cultivars and clonal selections increased the value of the Colorado fall potato crop by $11-$12 million annually due to improved yield and quality.

Potato Breeding

Germplasm Accession and Introgression. Six years ago, clones derived from somatic hybrids of the *Solanum tuberosum* (the commercially cultivated potato) and *Solanum bulbocastanum* were obtained from the USDA-ARS in Madison, WI. *Solanum bulbocastanum* is a species which exhibits high levels of resistance too late blight and early blight. In 1999, additional germplasm with resistance to late blight was identified and acquired from breeding programs around the United States.

Other germplasm has been acquired with multiple virus resistance to PVX, PVY, and leafroll from the USDA-ARS in Idaho. Several additional field selections exhibiting field immunity to PVY were obtained from Oregon State University in 2000. In 2001, additional sources of PVY immunity were obtained from the USDA-ARS in Idaho and Washington.

All of these materials and other accessions with improved quality and disease characteristics are being incorporated into the breeding program.

Crossing and Seedling Production. Eighty-nine parental clones were intercrossed in 2001 in two separate crossing blocks. The emphasis of the first crossing block was disease resistance (late blight and PVY) and the second emphasized cultivar development and virus resistance (PVX, PVY, and PLRV). Seed from 605 combinations was obtained. Approximately 45,000 seedling tubers representing 166 families were produced from 2000 crosses, for initial field selection in 2002. Second thru fourth size seedling tubers from these crosses will be distributed to Idaho, Minnesota, Oregon, Texas, and Alberta, Canada.

Additional seedling tubers for planting in 2002 will be obtained from Dr. Richard G. Novy, USDA-ARS, Aberdeen, Idaho; Dr. Dermot Lynch, Agriculture Canada, Lethbridge, Alberta; and Dr. J. Creighton Miller, Texas A&M University, College Station, Texas.

Seedling Selection and Clonal Development

A total of 77,993 first year seedlings were grown, with 930 being retained for subsequent planting, evaluation, and increase in 2002. Another 1,074 clones were in 12-hill, preliminary, and intermediate stages of selection. Of these, 293 were saved for further observation. Thirty-nine advanced selections were saved at harvest and will be increased in 2002 pending final evaluations. Another 188 selections were maintained for germplasm development, breeding, other experimental purposed, or seed increases for other programs.

Field trials conducted in 2001 included: Preliminary Trial, Intermediate Yield Trial, Advanced Yield Trial, Southwestern Regional Trial, Western Regional Main Trial, Western Regional Red Trial, Western Regional Specialty Trial, San Luis Valley Chipping Study, and Western Regional Chipping Trial. Appendix 1 summarizes the cultural information for the trials conducted by the Potato Breeding and Selection Program at the San Luis Valley Research Center in 2001.

A total of 203 samples were evaluated for two or more of the following postharvest characteristics: blackspot susceptibility, storage weight loss, dormancy, enzymatic browning, specific gravity, french fry color, french fry texture, and chip color. Appendix 2 lists the procedures used for the postharvest evaluations for the trials. Appendices 3-10 present additional information regarding the frequency distribution for the results of the postharvest evaluations for all selections and named cultivars included in the trials. Appendices 3-10 are useful in understanding how a given selection compares with the population of clones being evaluated.

Colorado advanced selections evaluated in the Southwest Regional Trials, Western Regional Trials, or by producers, included 11 russets (AC87079-3RU, AC87138-4RU, AC87084-3RU, AC89536-5RU, AC91014-2RU, AC92009-4RU, CO85026-4RU, CO92027-2RU, CO92077-2RU, NDC5372-1RU, and TC1675-1RU), 5 reds (CO86218-2R, CO89097-2R, CO93037-6R, DT6063-1R, and NDC5281-2R), and 3 chippers (AC87340-2W, AC89653-3W, and BC0894-2W). Comparative data for the remaining selections and standard cultivars is presented in Table 12.

Figure 4 includes photographs of advanced selections and recently named cultivars produced by growers in 2000. Included are five selections (AC92009-2RU, CO92077-2RU, NDC5372-1RU, TC1675-1RU, and NDC5281-2R) scheduled for initial grower evaluations in 2002.

Advanced selections that were discarded from further evaluation are AC87079-3RU, AC87138-4RU, AC91014-2RU, CO92027-2RU, and AC89653-3W. The status of AC87084-3RU and AC87340-2W are pending further evaluations over the next year.

Upcoming releases include *Cherry Red* (DT6063-1R), *Fremont Russet* (CO85026-4RU), and *Durango Red* (CO86218-2R) and *BC0894-2W*. Plant Variety Protection was granted for Russet Norkotah Selections 3 and 8. Plant Variety Protection for Keystone Russet and Silverton Russet was applied for.

Table 1. Generalized potato breeding and selection scheme used at the SLV Research Center.

Year	Comments
1	Select parents for crossing and true seed production in the greenhouse.
2	Produce seedling tubers from true seed in the greenhouse.
3	70,000-80,000 seedling tubers planted in the field as single hills. Several thousand tubers are obtained from other breeding programs. Initial selection of this material takes place at harvest. First cycle of field selection.
4	Twelve-hills of each single-hill selection are planted. Second cycle of field selection.
5	Preliminary Selections 1 (P1). Third cycle of field selection (48 plant tuber-unit seed increase). Initial evaluations for chipping qualities (chip color after various storage regimes and specific gravity) are conducted this year and subsequently.
6	Preliminary Selections 2 (P2). Fourth cycle of field selection (96 plant tuber-unit seed increase). Initial evaluations to characterize selections for blackspot bruise potential, storage weight loss, dormancy, and enzymatic browning. Initial evaluations for french fry potential (french fry color and specific gravity) are conducted this year and subsequently. Evaluations for chipping qualities are continued.
7	Intermediate Selections. Fifth cycle of field selection. Initial data collected on yield, grade, and growth characteristics. Plant a 144 plant tuber-unit seed increase and a 2 rep x 25 plants intermediate yield trial (IYT).
8-9, 14+	Advanced Selections: Includes selections that have advanced from the IYT. Additionally selections are included that have graduated from the Southwest Regional and Western Regional Trials. The advanced yield trials for reds, specialty types, and chippers are planted with entries in the Western Regional Red, Specialty and Chipping Trials. Selections are in the 6th-7th and 12+ cycles of field selection. All advanced yield trials (AYT) have 4 reps x 25 plants. Sixth- and seventh- year field selections respectively have a 400/1,600 plant tuber-unit seed increase. Selections in the sixth cycle of selection are indexed for viruses and cleanup/micropropagation is initiated. Testing for ring rot and PLRV reaction is also initiated at this stage and continues as needed. Selections in the 7th cycle of field selection are entered into cultural management trials and postharvest disease reaction (dry rot and soft rot) evaluations.
10	All 8th year selections have a 1/2 acre tuber-unit seed increase planted. These selections are entered in the Southwestern Regional Trials (4 locations - CO, TX, CA). Cultural management trials and postharvest disease reaction evaluations continue as needed.
11-13	All 9th year or older selections generally have a 1 acre or greater seed increase. These selections are entered in the Western Regional Trials (4 trials): main (russets and long whites), red, specialty , and chipping. The Western Coordinating Committee (WCC-27) directs these trials at 10+ locations in the Western United States each year. Cultural management trials and postharvest disease reaction evaluations continue as needed.
11+	Grower/industry evaluations. The Colorado Potato Breeding and Selection Project relies on the cooperation of several growers, shippers, and processors to evaluate advanced selections for adaptability and marketability.
14+	Release as a named cultivar.

Table 2A. Colorado fall potatoes: Production of primary potato cultivars, 1983-1990[1].

Cultivar	%/Acreage	Year							
		1983	1984	1985	1986	1987	1988	1989	1990
Russet Burbank	%	23.9	22.9	24.3	23.7	21.7	16.0	13.2	7.1
	Acreage	11,233	12,252	13,730	13,509	13,237	9,600	8,184	4,651
Centennial Russet	%	62.7	68.0	66.9	66.0	67.3	68.8	55.3	61.2
	Acreage	29,469	36,380	37,799	37,620	41,053	41,280	34,286	40,086
Russet Norkotah	%	---	---	---	---	---	2.2	9.9	14.0
	Acreage	---	---	---	---	---	1,320	6,138	9,170
Russet Nugget	%	---	---	---	---	---	---	---	---
	Acreage	---	---	---	---	---	---	---	---
Ranger Russet	%	---	---	---	---	---	---	---	---
	Acreage	---	---	---	---	---	---	---	---
Red McClure	%	3.7	1.6	1.9	1.0	1.0	---	---	---
	Acreage	1,739	856	1,074	570	610	---	---	---
Sangre	%	5.7	3.1	5.1	7.2	6.3	6.3	7.9	7.6
	Acreage	2,679	1,659	2,882	4,104	3,843	3,780	4,898	4,978
Cherry Red	%	---	---	---	---	---	---	---	---
	Acreage	---	---	---	---	---	---	---	---
Yukon Gold	%	---	---	---	---	---	---	---	---
	Acreage	---	---	---	---	---	---	---	---
Total Fall Acreage Planted		47,000	53,500	56,500	57,000	61,000	60,000	62,000	65,000

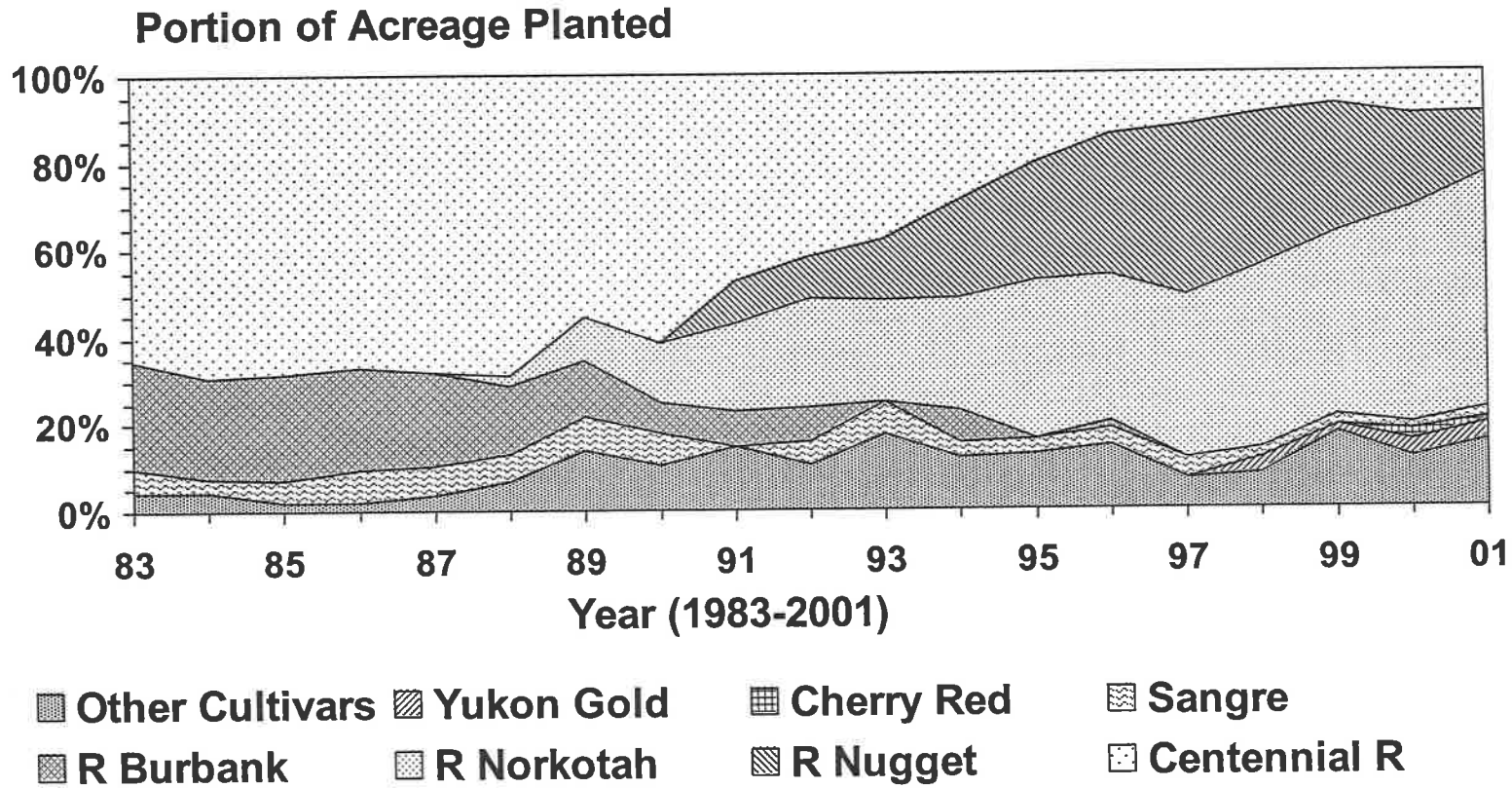
[1]Data provided by the Colorado Agricultural Statistics Service.

Table 2B. Colorado fall potatoes: Production of primary potato cultivars, 1991-2001[1].

Cultivar	%/Acreage	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Russet Burbank	%	8.3	8.7	—	7.6	—	1.6	---	---	---	---	---
	Acreage	5,644	5,742	---	5,624	---	1,248	---	---	---	---	---
Centennial Russet	%	47.5	44.4	38.3	30.3	20.5	15.0	12.3	9.3	7.6	9.9	9.6
	Acreage	32,300	29,304	27,768	22,422	15,785	11,700	9,471	7,049	5,687	7,484	6,538
Russet Norkotah	%	20.1	26.1	23.5	26.6	36.2	35.6	37.6	41.6	42.0	49.3	53.8
	Acreage	13,668	17,226	17,038	19,684	27,874	27,768	28,952	31,533	32,424	37,271	36,638
Russet Nugget	%	9.6	10.1	13.7	23.1	27.0	34.0	38.8	35.1	29.0	21.4	13.8
	Acreage	6,528	6,666	9,933	17,094	20,790	26,520	29,876	26,606	22,388	16,178	9,398
Ranger Russet	%	---	---	---	2.8	2.8	0.7	---	---	1.2	---	---
	Acreage	---	---	---	2,072	2,156	546	---	---	926	---	---
Red McClure	%	---	---	---	---	---	---	---	---	---	---	---
	Acreage	---	---	---	---	---	---	---	---	---	---	---
Sangre	%	---	5.9	7.5	3.8	3.8	4.4	4.4	2.7	2.5	1.8	2.1
	Acreage	---	3,894	5,438	2,812	2,926	3,432	3,388	2,047	1,930	1,361	1,430
Cherry Red	%	---	---	---	---	---	---	---	---	---	2.3	1.4
	Acreage	---	---	---	---	---	---	---	---	---	1,739	953
Yukon Gold	%	---	---	---	---	---	---	---	3.4	1.4	3.7	4.0
	Acreage	---	---	---	---	---	---	---	2,577	1,081	2,797	2,724
Total Fall Acreage Planted		68,000	66,000	72,500	74,000	77,000	78,000	77,000	75,800	77,200	75,600	68,100

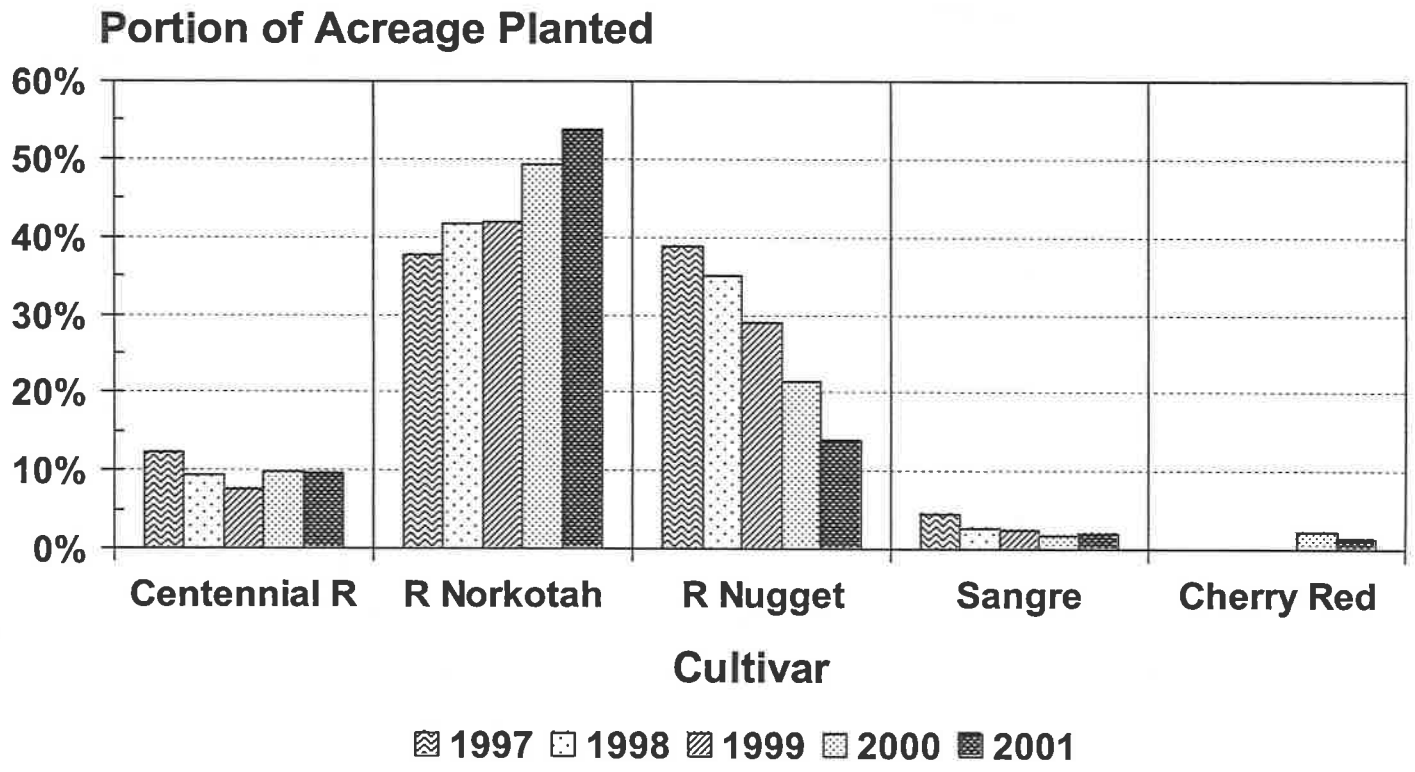
[1]Data provided by the Colorado Agricultural Statistics Service.

Figure 1. Primary SLV Potato Cultivars Planted 1983–2001



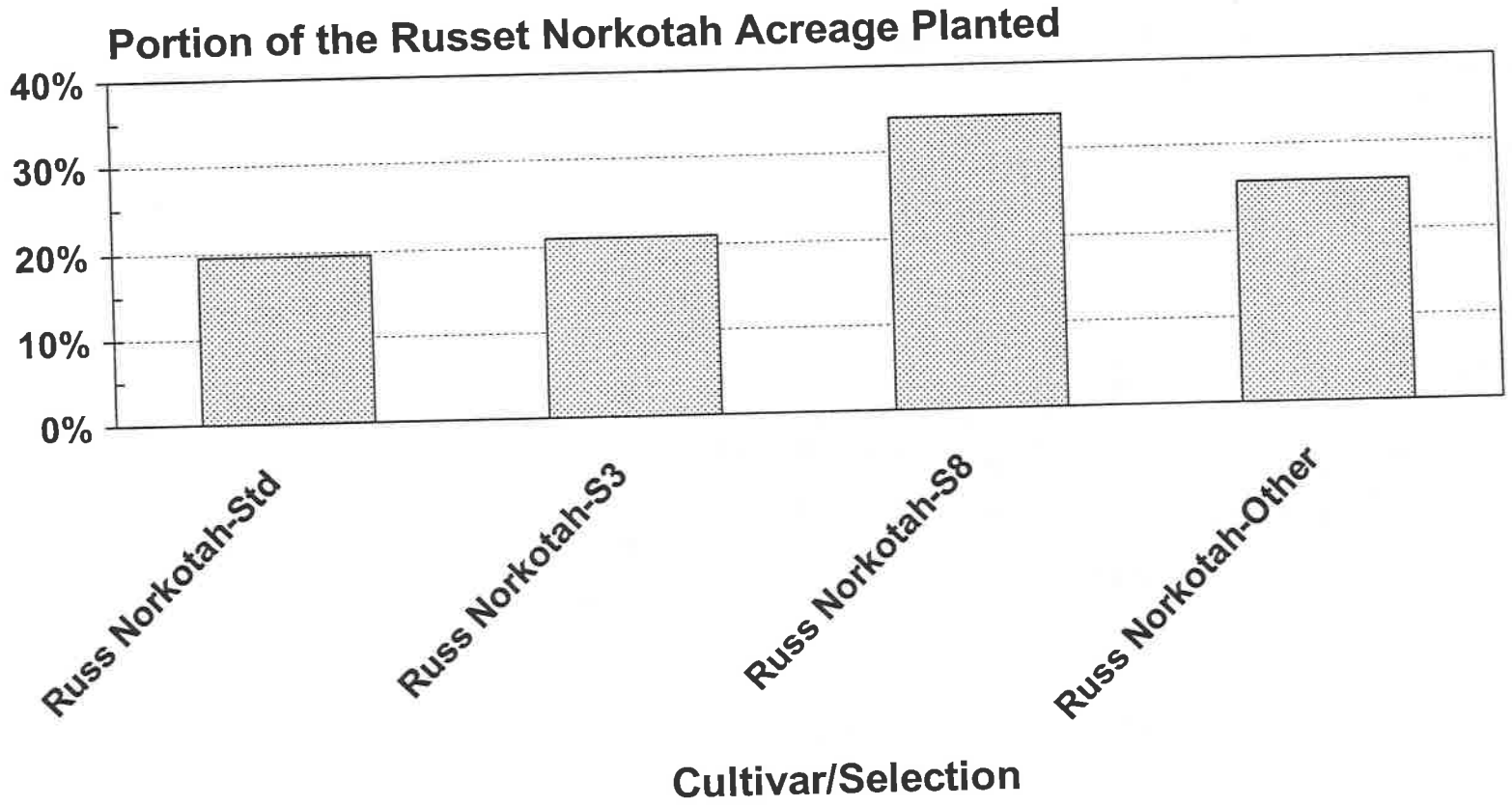
Data Source: Colorado Agricultural Statistics Service

Figure 2. Primary SLV Potato Cultivars 1997-2001 Comparison



Data Source: Colorado Agricultural Statistics Service

Figure 3. Colorado Russet Norkotah Acreage Breakdown



Data Source: Colorado Agricultural Statistics Service

Table 3A. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Preliminary Trial entries - 2001.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
AC96002-11RU	4.6	3.9	4.3	4.5	105	4.0
AC96010-3RU	4.8	4.2	4.5	5.7	105	4.4
AC96052-1RU	3.5	2.9	3.2	3.5	84	4.2
AC96815-2RU	3.9	4.2	4.1	5.8	84	4.2
CO94157-2W/Y	4.1	4.4	4.3	3.8	147	4.0
CO94157-3RU/Y	4.6	4.2	4.4	3.9	105	4.4
CO96004-9RU	4.7	4.4	4.6	4.6	112	3.4
CO96023-6RU	1.9	2.4	2.2	3.6	105	3.8
CO96043-5RU	4.0	3.5	3.8	3.9	98	4.8
CO96045-1RU	4.4	4.4	4.4	3.7	98	4.0
CO96047-7RU	3.8	4.9	4.4	3.4	98	3.8
CO96055-2RU	1.9	2.9	2.4	4.0	119	4.6
CO96055-5RU	3.0	2.9	3.0	3.5	105	4.8
CO96109-7RU	4.6	4.6	4.6	5.7	84	5.0
CO96133-11RU	4.4	3.9	4.2	3.9	105	4.4
CO96158-5RU	2.8	2.1	2.4	3.4	112	3.4
CO96440-3RU	2.5	2.7	2.6	4.2	84	3.4
VC1106-1W/Y	3.1	3.2	3.2	3.5	112	4.4
VC1123-2W/Y	3.8	4.7	4.3	3.6	91	4.8
Centennial Russet	5.0	4.8	4.9	6.2	89	4.8
Ranger Russet	4.7	3.1	3.9	3.3	89	4.0
Russet Burbank	4.4	3.7	4.1	3.6	145	4.2
Russet Norkotah-S3	5.0	4.9	5.0	3.9	111	3.0
Russet Nugget	4.0	3.5	3.8	3.7	93	4.6
Sangre-S10	4.3	4.4	4.4	3.6	103	3.6
Shepody	5.0	4.6	4.8	4.2	103	4.6
Yukon Gold	3.5	3.5	3.5	2.7	105	5.0

[1]Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

[2]Tubers were stored at 45F for 115 days.

[3]Days from harvest to first visible growth. Tubers were stored at 45F.

[4]Degree of darkening rated at 60 minutes after slicing fresh lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 3B. Specific gravity, french fry color, and texture for Preliminary Trial entries - 2001.

Clone	Specific Gravity	Fry Color[1]		Fry Texture[2]	
		At Harvest	6 wks 50F+ 9 wks 45F	At Harvest	6 wks 50F+ 9 wks 45F
AC96002-11RU	1.081	2	3	3	4
AC96010-3RU	1.083	3	4	3	4
AC96052-1RU	1.080	1	2	2	3
AC96815-2RU	1.095	2	2	3	2
CO94157-2W/Y	1.086	1	3	3	3
CO94157-3RU/Y	1.087	2	2	3	2
CO96004-9RU	1.090	2	1	4	3
CO96023-6RU	1.089	3	2	3	3
CO96043-5RU	1.075	1	3	2	2
CO96045-1RU	1.084	1	1	3	3
CO96047-7RU	1.081	3	4	3	3
CO96055-2RU	1.083	2	2	4	3
CO96055-5RU	1.084	3	3	3	2
CO96109-7RU	1.086	1	1	2	3
CO96133-11RU	1.078	3	3	1	1
CO96158-5RU	1.084	2	1	4	2
CO96440-3RU	1.083	2	3	2	2
VC1106-1W/Y	1.069	1	1	1	2
VC1123-2W/Y	1.076	1	1	2	2
Centennial Russet	1.076	4	5	2	2
Ranger Russet	1.085	2	2	3	4
Russet Burbank	1.078	2	2	3	3
Russet Norkotah-S3	1.079	3	3	3	3
Russet Nugget	1.087	2	2	4	3
Sangre-S10	1.062	4	4	2	2
Shepody	1.077	1	3	3	3
Yukon Gold	1.082	2	4	3	2

[1]Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

[2]Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 4A. Yield, grade, tuber shape, and skin type for Intermediate Yield Trial entries - 2001.

Clone	Yield (Cwt/A)					Tuber Shape[1]
	Total	US #1				
		Total	%	>10 oz	<4 oz	
AC95405-2RU	462	298	64.6	19	152	Ob
CO95007-1RU	427	265	62.2	21	161	Ob
CO95007-8RU	344	246	71.3	30	85	Ob
CO95086-8RU	385	291	75.6	30	90	Ob
CO95172-3RU	415	328	78.8	62	87	Ob
Russet Norkotah	418	341	81.4	108	72	L
Russet Nugget	485	348	72.1	64	131	Ob
Mean	419	302	72.2	48	111	----
LSD[2] (0.05)	NS	NS	NS	NS	NS	----

[1]Tuber shape: Ob=oblong; L=long.

[2]LSD=least significant difference; NS=not significant.

Table 4B. Grade defects for Intermediate Yield Trial entries - 2001.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
AC95405-2RU	2.6	MS*,GR	0.0
CO95007-1RU	0.3	MS*	0.0
CO95007-8RU	3.9	GC*,GR	1.3
CO95086-8RU	0.9	MS*,GC	0.0
CO95172-3RU	0.2	MS*	0.0
Russet Norkotah	1.3	MS*	0.0
Russet Nugget	1.1	MS,SG*	0.0

[1]Percent external defects based on the proportion of the total sample weight with significant defects.

[2]MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

[3]Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 4C. Growth characteristics of Intermediate Yield Trial entries - 2001.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
AC95405-2RU	94	2.5	3.0	3.7	3.5	3.0	3.5
CO95007-1RU	98	3.0	3.0	3.6	3.5	3.0	3.0
CO95007-8RU	96	3.5	2.5	5.0	2.0	2.0	2.0
CO95086-8RU	98	3.0	3.5	3.6	3.0	3.0	2.5
CO95172-3RU	96	3.5	2.5	3.1	3.5	3.0	3.0
Russet Norkotah	100	3.5	3.0	3.9	2.0	2.5	2.0
Russet Nugget	98	3.0	3.5	4.5	4.5	3.5	3.5
Mean	97	3.1	3.0	3.9	3.1	2.9	2.8
LSD[6] (0.05)	NS	NS	NS	NS	1.0	0.7	0.9

[1]Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

[2]Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

[3]Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

[4]Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

[5]Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

[6]LSD=least significant difference; NS=not significant.

Table 4D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Intermediate Yield Trial entries - 2001.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
AC95405-2RU	2.6	2.3	2.5	4.0	85	4.2
CO95007-1RU	3.5	3.8	3.7	4.8	71	2.4
CO95007-8RU	2.1	3.1	2.6	4.9	78	2.2
CO95086-8RU	3.6	4.0	3.8	4.8	78	4.2
CO95172-3RU	4.6	4.3	4.5	5.4	85	2.4
Russet Norkotah	4.8	4.2	4.5	5.5	85	2.6
Russet Nugget	4.0	2.1	3.1	3.6	92	3.8

[1]Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

[2]Tubers were stored at 45F for 115 days.

[3]Days from harvest to first visible growth. Tubers were stored at 45F.

[4]Degree of darkening rated at 60 minutes after slicing fresh lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 4E. Specific gravity, french fry color, and texture for Intermediate Yield Trial entries - 2001.

Clone	Specific Gravity	Fry Color[1] At Harvest	Fry Color[1] 3 wks 50F+ 9 wks 45F	Fry Texture[2] At Harvest	Fry Texture[2] 3 wks 50F+ 9 wks 45F
AC95405-2RU	1.091	2	2	4	3
CO95007-1RU	1.086	0	1	3	3
CO95007-8RU	1.086	1	2	4	3
CO95086-8RU	1.082	1	1	3	3
CO95172-3RU	1.091	2	2	3	2
Russet Norkotah	1.078	1	3	2	1
Russet Nugget	1.098	1	2	3	3

[1]Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

[2]Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 5A. Yield, grade, tuber shape, and skin type for Advanced Yield Trial entries - 2001.

Clone	Yield (Cwt/A)					Tuber Shape[1]
		US #1				
	Total	Total	%	>10 oz	<4 oz	
AC90636-3RU	332	266	80.2	38	63	Ob
AC93026-9RU	464	344	74.1	78	113	Ob
AC93047-1RU	313	218	69.5	13	87	Ob
CO93001-11RU	410	325	79.3	71	69	Ob
CO93016-3RU	405	298	73.8	43	102	Ob
CO93024-2RU	390	294	75.3	66	42	Ob
CO94024-16RU	342	187	54.8	16	152	Ob
CO94035-15RU	431	363	84.1	98	59	L
CO94055-8RU	325	284	87.4	112	30	Ob
CO94084-12RU	367	306	83.1	87	46	Ob
Keystone Russet	444	394	88.7	145	44	L
Russet Norkotah	420	347	82.6	123	62	L
Russet Nugget	424	289	68.1	27	133	Ob
Silverton Russet	386	267	69.0	24	116	L
Umatilla Russet	486	361	74.0	71	116	L
Mean	396	303	76.3	67	82	----
LSD[2] (0.05)	54	53	6.2	42	24	----

[1]Tuber shape: Ob=oblong; L=long.

[2]LSD=least significant difference.

Table 5B. Grade defects for Advanced Yield Trial entries - 2001.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
AC90636-3RU	1.1	MS*,GC	0.0
AC93026-9RU	1.3	MS,SG,GC,GR*	0.0
AC93047-1RU	2.7	MS*,GC,GR	0.4
CO93001-11RU	4.0	MS*,SG,GC,GR	0.7
CO93016-3RU	1.0	MS*,GC	1.5
CO93024-2RU	13.9	MS,GC*,GR	0.0
CO94024-16RU	0.6	MS*,GC	0.3
CO94035-15RU	2.0	MS*,GC,GR	5.4
CO94055-8RU	3.5	MS,SG,GR*	0.0
CO94084-12RU	4.1	MS*,GC*,GR	0.4
Keystone Russet	1.5	MS*,GC,GR	0.3
Russet Norkotah	2.8	MS*,SG,GR	2.4
Russet Nugget	0.5	MS*	0.0
Silverton Russet	0.9	MS,GC*,GR*	0.7
Umatilla Russet	2.0	MS*,SG,GC,GR	0.0

[1]Percent external defects based on the proportion of the total sample weight with significant defects.

[2]MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

[3]Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 5C. Growth characteristics of Advanced Yield Trial entries - 2001.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
AC90636-3RU	98	3.3	1.5	2.1	2.3	3.0	3.0
AC93026-9RU	99	3.3	2.5	3.2	3.3	3.0	3.0
AC93047-1RU	98	2.8	3.0	3.2	2.0	2.0	1.0
CO93001-11RU	100	3.8	3.5	3.6	2.8	2.5	2.0
CO93016-3RU	98	3.5	4.0	3.8	3.0	2.3	2.3
CO93024-2RU	98	3.5	3.8	4.1	2.8	2.5	1.8
CO94024-16RU	99	3.3	3.0	3.6	2.5	2.0	1.0
CO94035-15RU	98	3.5	3.8	3.0	3.3	3.0	3.0
CO94055-8RU	98	3.5	1.3	2.4	2.5	3.0	2.0
CO94084-12RU	98	3.0	3.0	2.9	2.5	2.5	1.5
Keystone Russet	100	3.3	2.8	3.7	3.0	3.0	3.0
Russet Norkotah	99	3.8	3.0	3.7	2.5	2.0	1.8
Russet Nugget	100	3.3	3.3	3.9	3.8	3.5	3.0
Silverton Russet	98	3.8	3.8	3.7	3.3	3.0	2.0
Umatilla Russet	98	3.0	3.3	3.8	3.8	3.0	3.0
Mean	99	3.4	3.0	3.4	2.9	2.7	2.2
LSD[6] (0.05)	NS	NS	0.6	0.8	0.6	0.4	0.4

[1]Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

[2]Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

[3]Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

[4]Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

[5]Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

[6]LSD=least significant difference; NS=not significant.

Table 5D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced Yield Trial entries - 2001.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
AC90636-3RU	3.9	2.6	3.3	4.7	99	4.2
AC93026-9RU	4.5	2.5	3.5	7.4	134	4.2
AC93047-1RU	4.5	3.8	4.2	5.3	85	3.0
CO93001-11RU	4.9	3.8	4.4	7.8	64	1.6
CO93016-3RU	3.2	3.0	3.1	5.9	71	2.4
CO93024-2RU	1.9	2.5	2.2	5.3	78	1.6
CO94024-16RU	3.5	2.6	3.1	4.7	57	2.4
CO94035-15RU	4.2	2.9	3.6	4.8	85	5.0
CO94055-8RU	3.9	3.2	3.6	2.8	85	4.6
CO94084-12RU	3.1	2.5	2.8	3.5	85	4.2
Keystone Russet	5.0	5.0	5.0	4.2	57	4.8
Russet Norkotah	4.8	4.8	4.8	4.6	78	2.6
Russet Nugget	4.8	2.2	3.5	3.0	85	4.2
Silverton Russet	3.9	4.2	4.1	8.1	57	4.0
Umatilla Russet	4.6	3.2	3.9	5.3	99	1.8

[1]Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

[2]Tubers were stored at 45F for 115 days.

[3]Days from harvest to first visible growth. Tubers were stored at 45F.

[4]Degree of darkening rated at 60 minutes after slicing fresh lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 5E. Specific gravity, french fry color, and texture for Advanced Yield Trial entries - 2001.

Clone	Specific Gravity	Fry Color[1]		Fry Texture[2]	
		At Harvest	3 wks 50F+ 9 wks 45F	At Harvest	3 wks 50F+ 9 wks 45F
AC90636-3RU	1.087	1	2	3	4
AC93026-9RU	1.090	2	3	3	3
AC93047-1RU	1.078	1	2	4	2
CO93001-11RU	1.075	1	1	2	3
CO93016-3RU	1.086	1	3	4	3
CO93024-2RU	1.086	2	2	4	2
CO94024-16RU	1.074	1	3	5	4
CO94035-15RU	1.086	1	1	3	3
CO94055-8RU	1.070	1	2	2	2
CO94084-12RU	1.078	0	3	4	2
Keystone Russet	1.082	2	3	4	3
Russet Norkotah	1.078	1	3	3	2
Russet Nugget	1.098	1	1	4	3
Silverton Russet	1.080	1	3	3	2
Umatilla Russet	1.097	2	2	2	3

[1]Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

[2]Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 6A. Yield, grade, tuber shape, and skin type for Southwest Regional Trial entries - 2001.

Clone	Yield (Cwt/A)					Tuber Shape[1]
	Total	US #1				
		Total	%	>10 oz	<4 oz	
AC92009-4RU	345	321	93.3	63	2	Ob
ATX9202-1RU	353	254	71.3	52	65	Ob
BTX1544-2W/Y	443	369	83.0	74	53	R
CO92027-2RU	349	226	63.7	24	122	Ob
CO92077-2RU	350	252	72.2	43	96	Ob
CO93037-6R	516	366	71.1	52	145	R
NDC5372-1RU	409	307	75.2	57	98	Ob
NDTX4304-1R	519	428	82.4	118	81	R
TC1675-1RU	417	321	76.3	62	81	Ob
Atlantic	431	345	80.0	113	73	Ov
Chipeta	464	376	81.0	127	41	R
Red LaSoda	482	393	81.6	138	52	Ov
Russet Norkotah	406	338	83.2	113	56	L
Russet Nugget	406	289	70.7	55	114	Ob
Sangre-S10	520	445	85.5	101	64	Ov
Yukon Gold	385	328	85.1	103	50	Ov
Mean	425	335	78.5	81	76	----
LSD[2] (0.05)	65	66	7.1	33	26	----

[1]Tuber shape: R=round; Ov=oval; Ob=oblong; L=long.

[2]LSD=least significant difference.

Table 6B. Grade defects for Southwest Regional Trial entries - 2001.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
AC92009-4RU	0.0		0.0
ATX9202-1RU	9.8	MS,SG,GC*,GR	1.3
BTX1544-2W/Y	4.8	MS,GC*	0.7
CO92027-2RU	0.4	MS*,GC*,GR	0.4
CO92077-2RU	0.3	GR*	0.0
CO93037-6R	1.1	MS,GC*	0.0
NDC5372-1RU	1.1	MS*,GR*	0.3
NDTX4304-1R	2.0	MS,GC*	0.4
TC1675-1RU	3.6	MS,GC*	0.0
Atlantic	2.8	MS,GC,GR*	5.1
Chipeta	10.1	MS,SG,GC*,GR	0.0
Red LaSoda	7.7	MS,GC*,GR	9.8
Russet Norkotah	2.9	MS*,SG,GC	1.0
Russet Nugget	0.9	MS*,GC	0.0
Sangre-S10	2.1	GC*,GR*	1.6
Yukon Gold	2.2	MS*,GC,GR	0.4

[1]Percent external defects based on the proportion of the total sample weight with significant defects.

[2]MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

[3]Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 6C. Growth characteristics of Southwest Regional Trial entries - 2001.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
AC92009-4RU	99	3.5	2.3	1.7	3.3	3.0	3.0
ATX9202-1RU	98	3.0	1.8	1.6	3.3	3.5	3.0
BTX1544-2W/Y	98	3.8	4.3	2.4	3.0	2.5	1.8
CO92027-2RU	98	3.5	3.0	3.2	2.3	2.8	2.8
CO92077-2RU	94	2.5	2.0	2.5	2.8	2.3	2.8
CO93037-6R	93	3.3	3.3	4.1	4.0	3.5	3.0
NDC5372-1RU	97	2.8	2.5	3.1	3.0	2.8	3.0
NDTX4304-1R	99	3.5	3.0	3.0	2.3	2.3	2.0
TC1675-1RU	99	2.8	2.8	3.2	3.0	2.8	3.0
Atlantic	97	4.0	3.3	2.7	3.0	3.0	3.0
Chipeta	98	3.5	3.5	3.2	4.0	3.0	3.0
Red LaSoda	99	3.8	3.5	2.7	3.0	3.0	2.3
Russet Norkotah	99	3.3	3.0	3.4	3.0	2.5	1.5
Russet Nugget	99	3.3	3.3	3.2	4.0	3.3	3.5
Sangre-S10	98	3.0	2.8	2.9	3.8	3.8	3.3
Yukon Gold	100	3.5	4.0	2.3	3.0	2.8	1.0
Mean	98	3.3	3.0	2.8	3.2	2.9	2.6
LSD[6] (0.05)	NS	0.7	0.6	0.8	0.4	0.6	0.5

[1]Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

[2]Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

[3]Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

[4]Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

[5]Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

[6]LSD=least significant difference; NS=not significant.

Table 6D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Southwest Regional Trial entries - 2001.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
AC92009-4RU	3.7	2.5	3.1	5.2	134	4.0
ATX9202-1RU	4.0	2.5	3.3	4.4	127	4.0
BTX1544-2W/Y	2.4	2.6	2.5	3.5	78	3.8
CO92027-2RU	4.4	2.7	3.6	5.5	78	3.4
CO92077-2RU	4.6	3.3	4.0	4.4	71	2.8
CO93037-6R	1.8	1.3	1.6	5.9	113	2.8
NDC5372-1RU	3.8	1.4	2.6	4.1	92	2.2
NDTX4304-1R	2.2	3.7	3.0	5.1	78	2.6
TC1675-1RU	4.9	2.4	3.7	2.8	113	3.2
Atlantic	2.7	1.4	2.1	4.7	78	5.0
Chipeta	3.1	1.4	2.3	3.8	92	3.6
Red LaSoda	2.3	3.9	3.1	5.5	92	1.2
Russet Norkotah	5.0	4.2	4.6	4.5	78	2.4
Russet Nugget	4.4	3.5	4.0	3.0	85	4.6
Sangre-S10	2.5	2.5	2.5	3.7	92	2.6
Yukon Gold	3.5	3.1	3.3	2.7	85	4.6

[1]Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

[2]Tubers were stored at 45F for 115 days.

[3]Days from harvest to first visible growth. Tubers were stored at 45F.

[4]Degree of darkening rated at 60 minutes after slicing fresh lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 6E. Specific gravity, french fry color, and texture for Southwest Regional Trial entries - 2001.

Clone	Specific Gravity	Fry Color[1]		Fry Texture[2]	
		At Harvest	3 wks 50F+ 9 wks 45F	At Harvest	3 wks 50F+ 9 wks 45F
AC92009-4RU	1.102	1	2	5	3
ATX9202-1RU	1.102	1	3	4	4
BTX1544-2W/Y	1.087	1	2	4	3
CO92027-2RU	1.086	1	2	4	2
CO92077-2RU	1.077	2	3	3	3
CO93037-6R	1.087	2	3	1	2
NDC5372-1RU	1.090	1	1	2	1
NDTX4304-1R	1.068	2	3	2	1
TC1675-1RU	1.101	1	1	4	4
Red LaSoda	1.078	2	2	2	2
Russet Norkotah	1.080	2	3	3	2
Russet Nugget	1.104	1	2	4	2
Sangre-S10	1.085	2	4	3	3
Yukon Gold	1.085	1	4	2	1

[1]Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

[2]Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 6F. Chip color[1] after various storage regimes and specific gravity of Southwest Regional Trial entries - 2001.

Clone	Specific Gravity	7 wks 40F	7 wks/40F +3 wks/60F	7 wks 50F	7 wks/50F +3 wks/60F
Atlantic	1.107	4.5	3.5	2.5	2.5
Chipeta	1.098	4.0	3.0	1.5	3.0

[1]Chip color was rated using the Snack Food Association 1-5 scale. Ratings of $\leq$2.0 are acceptable.

Table 7A. Yield, grade, tuber shape, and skin type for Western Regional Main Trial entries - 2000.

Clone	Yield (Cwt/A)					Tuber Shape[1]
	Total	US #1				
		Total	%	>10 oz	<4 oz	
A88093-1RU	466	393	84.4	73	71	Ob
A90014-2RU	439	392	89.1	131	41	Ob
A90045-7RU	507	449	88.5	181	47	L
A90586-11W	532	419	78.2	167	67	L
AC87079-3RU	422	344	81.4	69	71	Ob
AC87138-4RU	562	403	71.4	68	157	Ob
AC89536-5RU	453	358	78.8	66	87	Ob
AC91014-2RU	362	227	62.2	15	132	Ob
AO92017-6RU	397	296	74.1	48	93	Ob
ATX9202-3RU	460	387	83.9	120	40	Ob
TXNS296	429	359	83.6	107	60	L
Ranger Russet	462	385	83.2	116	56	L
Russet Burbank	462	302	65.2	47	151	L
Russet Norkotah	389	307	78.9	89	70	L
Russet Nugget	435	303	69.3	28	124	Ob
Shepody	507	422	83.5	171	48	Ob
Mean	455	359	78.5	93	82	----
LSD[2] (0.05)	59	61	5.6	50	20	----

[1]Tuber shape: Ob=oblong; L=long.

[2]LSD=least significant difference.

Table 7B. Grade defects for Western Regional Main Trial entries - 2001.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
A88093-1RU	0.3	MS*	0.6
A90014-2RU	1.6	MS*	0.0
A90045-7RU	2.3	GC*,GR	0.0
A90586-11W	8.7	MS,SG,GR*	0.0
AC87079-3RU	1.8	MS*,SG,GC	3.2
AC87138-4RU	0.4	MS*	3.0
AC89536-5RU	1.8	MS*,SG,GR	0.8
AC91014-2RU	0.7	MS*,GR	0.3
AO92017-6RU	2.2	MS*,SG,GC,GR	0.0
ATX9202-3RU	7.4	GC*,GR	0.0
TXNS296	2.3	MS*,SG*,GR	1.2
Ranger Russet	4.5	MS,SG*,GC,GR	0.0
Russet Burbank	1.9	MS,SG*,GC,GR*	0.2
Russet Norkotah	3.1	MS*	0.6
Russet Nugget	1.8	MS*,GC	0.0
Shepody	7.1	MS,SG,GR*	0.0

[1]Percent external defects based on the proportion of the total sample weight with significant defects.

[2]MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

[3]Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 7C. Growth characteristics of Western Regional Main Trial entries - 2001.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
A88093-1RU	98	3.5	3.8	4.0	2.5	2.5	2.3
A90014-2RU	98	2.8	2.8	3.2	3.0	2.8	3.0
A90045-7RU	98	4.0	3.3	3.2	3.8	3.0	3.5
A90586-11W	98	3.0	3.5	3.5	4.0	3.0	3.5
AC87079-3RU	98	2.8	4.3	3.8	4.0	3.0	2.8
AC87138-4RU	100	3.5	3.3	5.2	4.0	3.0	3.0
AC89536-5RU	99	3.3	3.0	2.9	3.5	3.3	3.0
AC91014-2RU	98	3.8	3.3	5.4	2.5	2.8	2.8
AO92017-6RU	99	3.3	3.3	3.4	3.8	2.8	3.3
ATX9202-3RU	99	3.3	2.5	2.0	3.8	4.0	3.5
TXNS296	99	3.0	3.0	4.4	2.8	2.5	2.0
Ranger Russet	100	3.0	3.0	3.1	3.0	3.0	3.0
Russet Burbank	99	3.3	4.0	3.5	3.0	2.5	3.0
Russet Norkotah	100	3.5	3.0	3.8	2.0	2.5	2.0
Russet Nugget	99	3.0	3.0	3.8	4.0	3.5	3.3
Shepody	99	3.5	3.8	3.3	3.5	3.0	3.0
Mean	99	3.3	3.3	3.6	3.3	2.9	2.9
LSD[6] (0.05)	NS	0.6	0.6	0.9	0.5	0.6	0.5

[1]Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

[2]Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

[3]Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

[4]Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

[5]Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

[6]LSD=least significant difference; NS=not significant.

Table 7D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Western Regional Main Trial entries - 2001.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
A88093-1RU	3.5	3.6	3.6	4.5	78	4.0
A90014-2RU	4.0	2.8	3.4	4.9	92	4.6
A90045-7RU	4.6	2.1	3.4	4.3	78	3.2
A90586-11W	4.7	2.6	3.7	6.4	85	2.6
AC87079-3RU	3.3	2.5	2.9	5.4	78	4.0
AC87138-4RU	3.5	2.5	3.0	5.2	85	3.0
AC89536-5RU	4.9	3.9	4.4	4.7	85	3.8
AC91014-2RU	4.6	3.4	4.0	6.6	99	4.2
AO92017-6RU	4.4	1.6	3.0	5.4	113	4.4
ATX9202-3RU	4.3	1.7	3.0	4.5	85	3.4
TXNS296	4.6	4.2	4.4	4.3	85	3.0
Ranger Russet	4.2	2.7	3.5	4.3	71	3.4
Russet Burbank	3.1	2.2	2.7	3.9	127	3.0
Russet Norkotah	4.2	4.3	4.3	4.8	78	2.6
Russet Nugget	4.2	3.5	3.9	3.5	92	4.0
Shepody	4.1	3.7	3.9	4.5	78	4.6

[1]Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

[2]Tubers were stored at 45F for 115 days.

[3]Days from harvest to first visible growth. Tubers were stored at 45F.

[4]Degree of darkening rated at 60 minutes after slicing fresh lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 7E. Specific gravity, french fry color, and texture for Western Regional Main Trial entries - 2001.

Clone	Specific Gravity	Fry Color[1]		Fry Texture[2]	
		At Harvest	3 wks 50F+ 9 wks 45F	At Harvest	3 wks 50F+ 9 wks 45F
A88093-1RU	1.087	1	1	4	2
A90014-2RU	1.093	1	1	3	4
A90045-7RU	1.096	2	3	3	3
A90586-11W	1.102	2	2	3	3
AC87079-3RU	1.093	1	2	3	3
AC87138-4RU	1.095	1	1	4	2
AC89536-5RU	1.094	1	3	4	3
AC91014-2RU	1.101	1	1	5	4
AO92017-6RU	1.095	2	2	3	3
ATX9202-3RU	1.097	2	2	5	4
TXNS296	1.084	2	3	3	2
Ranger Russet	1.090	2	1	3	3
Russet Burbank	1.088	2	1	4	4
Russet Norkotah	1.077	2	3	2	1
Russet Nugget	1.096	2	2	3	3
Shepody	1.087	1	3	3	2

[1]Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

[2]Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 8A. Yield, grade, tuber shape, and skin type for Advanced and Western Regional Red Trial entries - 2001.

Clone	Yield (Cwt/A)					Tuber Shape[1]
	Total	US #1				
		Total	%	>10 oz	<4 oz	
A92657-1R	340	291	85.8	93	35	R
CO86218-2R	490	375	76.9	93	107	R
CO89097-2R	525	441	83.6	172	60	Ov
CO94019-1R	420	310	73.6	57	105	R
CO94065-2R	499	253	50.9	26	241	R
CO95077-3R	291	38	13.2	0	253	R
DT6063-1R	452	354	78.0	79	89	Ov
NDC5281-2R	363	132	36.2	0	229	Ov
NDC6184-3R	307	92	29.8	0	211	R
NDO4323-2R	465	305	65.6	28	134	R
NDTX4271-5R	477	360	75.5	68	111	Ov
VC1075-1R	497	255	50.8	16	242	R
W84-75R	369	15	4.2	0	353	R
Norland-DR	436	340	78.1	42	93	Ov
Red LaSoda	543	459	84.2	165	70	Ov
Sangre-S10	540	472	87.6	161	63	Ov
Mean	438	281	60.9	63	150	----
LSD[2] (0.05)	59	61	7.7	37	37	----

[1]Tuber shape: R=round; Ov=oval.

[2]LSD=least significant difference.

Table 8B. Grade defects for Advanced and Western Regional Red Trial entries - 2001.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
A92657-1R	3.9	MS,GC*,GR	0.5
CO86218-2R	1.5	MS,GC*,GR	0.0
CO89097-2R	4.5	MS*,GC,GR	0.4
CO94019-1R	1.2	GC,GR*	0.4
CO94065-2R	0.9	MS*,GC,GR	0.0
CO95077-3R	0.0		0.0
DT6063-1R	2.0	MS*,GC*,GR	0.4
NDC5281-2R	0.5	MS*,GR*	0.0
NDC6184-3R	1.3	MS,GC*,GR	0.0
NDO4323-2R	5.6	MS,GC*	0.0
NDTX4271-5R	1.2	MS,GC*,GR	0.6
VC1075-1R	0.1	GC*	0.0
W84-75R	0.0		0.0
Norland-DR	0.6	MS*,GC	0.0
Red LaSoda	2.4	MS,GC*,GR	20.0
Sangre-S10	0.8	MS*,GC*,GR*	1.3

[1]Percent external defects based on the proportion of the total sample weight with significant defects.

[2]MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

[3]Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 8C. Growth characteristics of Advanced and Western Regional Red Trial entries - 2001.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
A92657-1R	73	2.5	1.5	2.8	3.0	3.3	3.0
CO86218-2R	97	3.0	2.3	3.4	3.0	3.0	3.0
CO89097-2R	98	2.5	2.8	3.9	3.3	3.0	2.8
CO94019-1R	97	3.0	1.3	3.8	3.8	3.3	3.0
CO94065-2R	98	3.0	3.3	4.7	3.8	3.3	2.0
CO95077-3R	96	3.0	2.0	6.6	2.0	2.3	2.0
DT6063-1R	97	3.8	3.5	3.4	3.5	3.0	2.3
NDC5281-2R	98	3.3	3.0	4.5	2.8	3.3	1.3
NDC6184-3R	94	2.5	2.0	5.7	2.8	2.8	2.0
NDO4323-2R	97	3.0	3.0	3.4	2.8	3.0	2.5
NDTX4271-5R	98	4.3	3.3	3.6	3.0	3.3	1.8
VC1075-1R	98	3.0	3.3	4.9	3.3	3.0	3.0
W84-75R	98	3.3	3.0	5.9	2.0	2.0	1.0
Norland-DR	97	3.3	3.8	4.5	1.8	2.0	1.0
Red LaSoda	97	3.5	3.8	3.2	3.8	3.0	2.5
Sangre-S10	99	3.0	2.3	3.1	4.0	3.0	3.3
Mean	96	3.1	2.7	4.2	3.0	2.9	2.3
LSD[6] (0.05)	8	0.6	0.6	1.4	0.6	0.5	0.5

[1]Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

[2]Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

[3]Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

[4]Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

[5]Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

[6]LSD=least significant difference.

Table 8D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced and Western Regional Red Trial entries - 2001.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
A92657-1R	3.3	2.2	2.8	9.1	78	2.2
CO86218-2R	4.3	2.9	3.6	5.1	92	1.4
CO89097-2R	3.3	3.6	3.5	6.8	71	4.2
CO94019-1R	1.9	1.2	1.6	5.5	99	1.0
CO94065-2R	3.6	3.6	3.6	6.4	113	4.0
CO95077-3R	3.7	3.2	3.5	8.1	85	1.8
DT6063-1R	4.5	4.4	4.5	5.3	78	4.6
NDC5281-2R	2.8	1.8	2.3	8.7	71	1.0
NDC6184-3R	2.9	1.9	2.4	8.2	50	2.0
NDO4323-2R	1.9	1.8	1.9	5.6	92	2.2
NDTX4271-5R	2.5	1.9	2.2	7.2	85	1.8
VC1075-1R	2.5	3.2	2.9	6.6	85	4.2
W84-75R	2.0	2.0	2.0	7.6	78	2.8
Norland-DR	2.4	3.5	3.0	6.2	57	3.4
Red LaSoda	3.2	3.6	3.4	4.3	92	1.2
Sangre-S10	3.7	3.9	3.8	3.5	78	2.8

[1]Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

[2]Tubers were stored at 45F for 115 days.

[3]Days from harvest to first visible growth. Tubers were stored at 45F.

[4]Degree of darkening rated at 60 minutes after slicing fresh lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 8E. Specific gravity, french fry color, and texture for Advanced and Western Regional Red Trial entries - 2001.

Clone	Specific Gravity	Fry Color[1]		Fry Texture[2]	
		At Harvest	3 wks 50F+ 9 wks 45F	At Harvest	3 wks 50F+ 9 wks 45F
A92657-1R	1.085	3	3	2	1
CO86218-2R	1.076	2	3	2	2
CO89097-2R	1.084	1	2	3	2
CO94019-1R	1.079	1	3	1	2
CO94065-2R	1.080	1	4	2	2
CO95077-3R	1.084	1	3	3	2
DT6063-1R	1.079	2	3	3	2
NDC5281-2R	1.080	1	1	3	1
NDC6184-3R	1.091	2	1	2	2
NDO4323-2R	1.086	1	4	3	3
NDTX4271-5R	1.069	1	3	2	2
VC1075-1R	1.078	2	3	1	1
W84-75R	1.068	1	3	2	2
Norland-DR	1.065	2	2	1	2
Red LaSoda	1.081	3	2	2	2
Sangre-S10	1.082	4	4	1	2

[1]Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

[2]Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 9A. Yield, grade, tuber shape, and skin type for Advanced and Western Regional Specialty Trial entries - 2001.

Clone	Yield (Cwt/A)					Tuber Shape[1]
	Total	US #1				
		Total	%	>10 oz	<4 oz	
CO94165-3P/P	451	203	43.6	15	244	Ob
CO94183-1R/R	387	261	67.2	9	116	Ov
CO94222-6RU/Y	346	164	47.2	8	177	Ob
TX1523-1RU/Y	417	322	77.1	31	88	Ov
TX1674-1W/Y	381	267	69.6	46	92	Ob
VC0967-2R/Y	448	320	71.1	22	119	Ov
VC0967-5R/Y	435	352	80.8	76	71	Ov
VC1002-3W/Y	416	163	39.0	21	252	R
VC1009-1W/Y	558	421	75.3	96	129	Ob
VC1015-1R/Y	537	415	76.9	78	114	Ob
VC1015-7R/Y	432	342	79.0	40	89	Ov
All Blue	463	296	63.6	50	159	Ob
Yukon Gold	389	319	81.6	103	66	Ov
Mean	435	296	67.1	46	132	----
LSD[2] (0.05)	61	68	8.1	28	24	----

[1]Tuber shape: R=round; Ov=oval; Ob=oblong.

[2]LSD=least significant difference.

Table 9B. Grade defects for Advanced and Western Regional Specialty Trial entries - 2001.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
CO94165-3P/P	0.9	MS*	0.5
CO94183-1R/R	2.4	MS,GC*	0.0
CO94222-6RU/Y	1.6	MS*,GC,GR*	1.5
TX1523-1RU/Y	1.8	MS,GC,GR*	0.0
TX1674-1W/Y	5.8	MS,GR*	0.0
VC0967-2R/Y	2.0	MS*,GC,GR	0.0
VC0967-5R/Y	2.8	MS,GR*	0.0
VC1002-3W/Y	0.3	GR*	0.0
VC1009-1W/Y	1.5	MS*,GC,GR*	2.6
VC1015-1R/Y	1.5	MS,GC,GR*	0.3
VC1015-7R/Y	0.3	GR*	0.0
All Blue	1.7	MS*,SG,GC	0.0
Yukon Gold	1.1	MS*	0.0

[1]Percent external defects based on the proportion of the total sample weight with significant defects.

[2]MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

[3]Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 9C. Growth characteristics of Advanced and Western Regional Specialty Trial entries - 2001.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
CO94165-3P/P	98	3.5	3.8	4.7	2.3	3.0	1.5
CO94183-1R/R	100	4.3	2.5	4.2	2.5	2.5	1.5
CO94222-6RU/Y	97	3.8	3.3	4.1	3.0	2.8	2.5
TX1523-1RU/Y	98	4.0	4.0	5.2	2.5	3.0	1.3
TX1674-1W/Y	97	3.5	3.0	3.5	2.8	2.0	3.0
VC0967-2R/Y	99	3.3	3.8	3.8	2.8	2.5	2.3
VC0967-5R/Y	96	2.8	3.0	3.7	4.0	3.0	3.0
VC1002-3W/Y	98	3.3	3.5	4.6	4.0	3.3	2.5
VC1009-1W/Y	98	3.0	3.8	4.4	4.0	3.5	3.5
VC1015-1R/Y	98	3.0	3.5	3.7	4.0	3.8	3.0
VC1015-7R/Y	95	3.5	3.3	3.7	3.0	3.0	2.0
All Blue	97	2.8	3.3	3.0	3.3	3.0	3.0
Yukon Gold	97	3.0	3.5	2.3	2.8	2.5	1.3
Mean	98	3.3	3.4	3.9	3.1	2.9	2.3
LSD[6] (0.05)	NS	0.6	0.6	1.1	0.5	0.6	0.5

[1]Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

[2]Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

[3]Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

[4]Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

[5]Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

[6]LSD=least significant difference; NS=not significant.

Table 9D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced and Western Regional Specialty Trial entries - 2001.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
CO94165-3P/P	---	---	---	4.5	78	---
CO94183-1R/R	3.1	2.6	2.9	4.9	85	---
CO94222-6RU/Y	4.2	3.0	3.6	5.1	57	3.8
TX1523-1RU/Y	4.0	1.4	2.7	4.3	78	4.4
TX1674-1W/Y	4.2	3.3	3.8	4.1	78	4.0
VC0967-2R/Y	2.4	2.4	2.4	5.0	78	4.0
VC0967-5R/Y	3.7	2.5	3.1	3.5	127	3.6
VC1002-3W/Y	4.3	4.4	4.4	3.7	99	4.6
VC1009-1W/Y	3.0	2.6	2.8	3.6	92	4.0
VC1015-1R/Y	1.3	2.1	1.7	3.2	92	4.0
VC1015-7R/Y	3.6	3.6	3.6	4.9	85	4.6
All Blue	3.6	2.5	3.1	3.3	99	---
Yukon Gold	4.1	3.3	3.7	2.8	99	3.8

[1]Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

[2]Tubers were stored at 45F for 115 days.

[3]Days from harvest to first visible growth. Tubers were stored at 45F.

[4]Degree of darkening rated at 60 minutes after slicing fresh lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 9E. Specific gravity, french fry color, and texture for Advanced and Western Regional Speciality Trial entries - 2001.

Clone	Specific Gravity	Fry Color[1]		Fry Texture[2]	
		At Harvest	3 wks 50F+ 9 wks 45F	At Harvest	3 wks 50F+ 9 wks 45F
CO94222-6RU/Y	1.098	2	2	3	3
TX1523-1RU/Y	1.083	1	1	3	1
TX1674-1W/Y	1.092	2	2	4	3
VC0967-2R/Y	1.076	1	1	2	2
VC0967-5R/Y	1.082	1	1	2	3
VC1002-3W/Y	1.098	1	1	3	3
VC1009-1W/Y	1.092	1	1	3	2
VC1015-1R/Y	1.084	2	3	1	2
VC1015-7R/Y	1.076	2	3	1	2
All Blue	1.084	-	-	3	3
Yukon Gold	1.079	1	4	3	3

[1]Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of ≤ 2 are acceptable.

[2]Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

Table 10A. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for San Luis Valley chipping study entries - 2001.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
AC87340-2W	3.8	4.2	4.0	4.0	79	3.8
AC89653-3W	4.2	4.1	4.2	5.1	65	4.4
AC94296-5W	4.5	4.3	4.4	4.0	119	4.8
AC94324-1W	3.7	3.4	3.6	3.4	112	4.8
B0766-3W	2.7	2.9	2.8	3.7	97	3.4
BC0894-2W	4.7	3.8	4.3	4.1	83	4.0
CO94027-6W	2.9	2.3	2.6	6.4	96	3.8
CO94032-3W	2.2	2.4	2.3	5.7	89	4.6
CO94165-3P/P	-	-	-	4.6	75	-
CO94183-1R/R	1.9	1.5	1.7	5.0	103	-
CO95031-2W	1.2	1.3	1.3	4.2	91	4.8
CO95051-7W	3.8	4.0	3.9	5.8	84	4.2
CO95070-7W	3.9	3.8	3.9	4.4	105	4.0
CO95117-8W	3.1	2.6	2.9	3.5	147	4.8
CO96076-7W	3.2	2.9	3.1	4.1	84	4.8
CO96083-1W	2.0	2.0	2.0	3.6	91	4.4
CO96083-7RU	2.4	2.2	2.3	4.3	70	5.0
CO96122-6W	1.9	1.0	1.5	4.7	84	4.4
CO96124-6W	2.9	2.4	2.7	4.2	105	4.6
CO96124-19W	2.2	1.6	1.9	3.8	112	4.4
CO96124-25W	1.0	1.1	1.1	3.1	91	2.0
CO96141-4W	4.5	3.6	4.1	4.3	105	4.8
CO96142-4W	5.0	4.1	4.6	4.9	105	3.6
CO96231-4W	4.6	3.1	3.8	3.1	105	4.4
CO96293-4W	3.9	1.7	2.8	4.8	98	4.6
NDC6084C-2W	2.3	2.2	2.3	6.0	82	3.2
NDTX4930-5W	3.1	2.6	2.9	3.3	110	4.6
NY112W	3.2	2.9	3.1	4.0	111	4.6
NY115W	4.8	4.4	4.6	4.7	104	4.6
VC1002-3W/Y	4.6	4.5	4.6	3.0	89	5.0

Table 10A continued on the next page.

Table 10A (cont'd). Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for San Luis Valley chipping study entries - 2001.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
W1313W	3.8	3.7	3.8	4.0	104	4.2
W1355-1W	2.2	2.0	2.1	3.8	97	2.4
Atlantic	3.2	2.3	2.8	4.2	103	4.8
Chipeta	3.5	2.2	2.9	3.1	97	4.4
Snowden	3.2	2.8	3.0	3.3	110	4.2

[1]Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

[2]Tubers were stored at 45F for 115 days.

[3]Days from harvest to first visible growth. Tubers were stored at 45F.

[4]Degree of darkening rated at 60 minutes after slicing fresh lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 10B. Chip color[1] after various storage regimes and specific gravity of San Luis Valley chipping study entries - 2001.

Clone	Specific Gravity	7 wks 40F	7 wks/40F +3 wks/60F	7 wks 50F	7 wks/50F +3 wks/60F
AC87340-2W	1.082	3.5	3.5	2.0	3.0
AC89653-3W	1.090	4.0	5.0	3.0	3.0
AC94296-5W	1.087	4.5	4.0	2.0	2.0
AC94324-1W	1.086	4.0	4.0	3.0	1.5
AC97029-2W/Y	1.086	5.0	4.5	3.0	3.5
AC97080-3W	1.079	5.0	5.0	3.5	3.5
AC97097-3W	1.086	4.5	4.0	2.5	2.5
AC97097-6W	1.086	3.5	3.0	2.0	3.0
AC97097-10W	1.086	4.5	4.5	1.5	2.0
AC97097-12W	1.082	5.0	5.0	3.0	3.0
AC97097-14W	1.092	3.5	4.0	2.0	2.0
AC97097-15W	1.089	4.0	3.5	2.5	2.5
AC97097-19W	1.085	5.0	4.0	2.0	2.0
AC97097-21W	1.087	4.0	3.5	2.0	2.5
AC97443-3W	1.084	3.5	3.0	2.5	2.5
AC97456-1W	1.075	5.0	4.5	3.0	2.5
AC97456-2W	1.075	4.0	3.5	3.0	2.0
B0766-3W	1.083	4.5	4.5	2.5	2.0
BC0894-2W	1.078	4.0	2.5	2.0	2.5
CO94027-6W	1.085	3.5	2.0	1.5	2.5
CO94032-3W	1.085	2.5	2.0	1.5	1.5
CO95031-2W	1.091	4.0	3.5	2.0	2.5
CO95051-7W	1.089	2.5	2.0	1.0	1.5
CO95070-7W	1.089	3.5	3.5	1.5	1.5
CO95117-8W	1.088	5.0	4.5	1.5	3.0
CO96076-7W	1.077	4.0	3.5	1.5	2.5
CO96083-1W	1.075	4.5	4.0	3.0	3.0
CO96083-7RU	1.083	4.5	4.0	2.0	1.5
CO96122-6W	1.089	5.0	4.5	1.5	2.5
CO96124-6W	1.082	5.0	4.0	2.5	2.5
CO96124-19W	1.086	4.5	4.0	2.0	2.0
CO96124-25W	1.089	4.0	4.0	2.5	2.5
CO96141-4W	1.083	3.5	4.0	2.0	2.0
CO96142-4W	1.080	4.0	4.5	2.0	2.0
CO96231-4W	1.077	4.0	4.5	2.0	2.5
CO96293-4W	1.095	3.5	3.0	1.5	2.0
CO97020-5RU	1.076	5.0	5.0	3.5	3.0
CO97020-6RU	1.074	5.0	4.5	3.5	3.0

Table 10B continued on the next page.

Table 10B (cont'd). Chip color[1] after various storage regimes and specific gravity of San Luis Valley chipping study entries - 2001.

Clone	Specific Gravity	7 wks 40F	7 wks/40F +3 wks/60F	7 wks 50F	7 wks/50F +3 wks/60F
CO97043-4W	1.086	2.0	2.0	1.0	2.5
CO97043-14W	1.086	3.5	3.5	1.5	1.5
CO97043-15W	1.079	3.5	4.0	1.5	2.0
CO97065-1W	1.076	4.0	4.0	2.5	2.5
CO97065-2W	1.078	5.0	5.0	2.5	3.5
CO97065-4W	1.081	5.0	4.0	2.5	2.5
CO97065-6W	1.087	3.5	4.0	1.5	1.5
CO97065-7W	1.093	4.0	4.0	1.0	1.5
CO97065-12W	1.086	4.5	4.5	2.5	2.5
CO97068-1W	1.084	4.5	4.5	2.5	2.5
CO97068-2W	1.082	3.5	4.0	2.5	2.5
CO97068-4W	1.089	3.0	2.0	1.0	2.0
CO97068-8W	1.093	4.0	4.0	2.0	3.0
CO97069-3W	1.090	4.0	3.5	1.5	2.5
CO97071-1W	1.092	4.0	3.5	1.5	2.5
CO97110-2W	1.080	3.0	4.0	3.0	3.0
CO97113-7W	1.080	4.0	4.5	2.5	3.0
NDC6084C-2W	1.088	3.0	2.0	2.0	2.0
NDTX4930-5W	1.086	3.5	2.5	1.0	2.0
NY112W	1.079	3.5	5.0	3.0	2.0
NY115W	1.085	2.0	3.5	1.5	2.0
VC1002-3W/Y	1.080	5.0	3.0	2.5	3.0
W1313W	1.095	2.5	3.5	1.5	2.5
W1355-1W	1.094	2.0	2.0	1.5	1.5
Atlantic	1.091	3.5	4.0	2.0	3.0
Chipeta	1.081	5.0	5.0	3.0	3.0
Snowden	1.090	3.5	2.5	1.5	2.0

[1] Chip color was rated using the Snack Food Association 1-5 scale. Ratings of $\leq$2.0 are acceptable.

Table 11A. Yield, grade, tuber shape, and skin type for Advanced and Western Regional Chipping Trial entries - 2001.

Clone	Yield (Cwt/A)					Tuber Shape[1]
		US #1				
	Total	Total	%	>10 oz	<4 oz	
A90490-1W	560	452	80.4	142	77	R
A91790-13W	515	308	58.9	57	199	R
AC87340-2W	486	360	74.0	60	124	R
AC89653-3W	450	277	61.1	31	170	R
AC94296-5W	449	259	57.9	15	179	R
AC94324-1W	413	289	70.2	49	104	Ov
CO94027-6W	320	122	37.9	5	197	R
CO94032-3W	315	149	46.9	5	162	R
CO95031-2W	467	322	69.1	33	139	Ov
CO95051-7W	372	295	79.1	28	75	R
CO95070-7W	350	176	50.3	10	173	R
CO95117-8W	307	177	57.7	2	127	R
NDC6084C-2W	377	233	61.3	31	141	R
NDTX4930-5W	432	355	81.9	82	68	Ov
NY112W	506	428	84.1	124	71	R
W1313W	424	260	61.3	14	159	R
W1355-1W	385	91	23.6	0	294	R
Atlantic	475	382	80.4	100	57	Ov
Chipeta	551	466	84.6	160	44	R
Mean	429	284	64.2	50	135	----
LSD[2] (0.05)	62	67	9.2	35	37	----

[1]Tuber shape: R=round; Ov=oval.

[2]LSD=least significant difference.

Table 11B. Grade defects for Advanced and Western Regional Chipping Trial entries - 2001.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
A90490-1W	5.7	MS,SG,GC,GR*	1.6
A91790-13W	1.4	GC,GR*	0.0
AC87340-2W	0.4	MS*,GR	0.2
AC89653-3W	0.6	MS*,SG	0.4
AC94296-5W	2.5	MS,GC,GR*	0.0
AC94324-1W	4.9	MS,GR*	0.0
CO94027-6W	0.2	GR*	0.0
CO94032-3W	1.0	MS,GC*	0.0
CO95031-2W	1.2	MS,GC,GR*	3.1
CO95051-7W	0.8	GC,GR*	0.0
CO95070-7W	0.4	MS*,GR*	0.6
CO95117-8W	0.9	MS,GR*	0.0
NDC6084C-2W	0.8	GR*	1.0
NDTX4930-5W	2.1	MS,GC,GR*	0.0
NY112W	1.4	MS,GR*	5.7
W1313W	1.0	MS*,GC,GR*	0.0
W1355-1W	0.2	MS*,GR*	0.0
Atlantic	7.7	MS,GC,GR*	2.6
Chipeta	7.4	MS,GC*,GR	0.0

[1]Percent external defects based on the proportion of the total sample weight with significant defects.

[2]MS=misshapen; SG=second growth; GC=growth crack; GR=green. Most prevalent defects for each clone are asterisked.

[3]Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

Table 11C. Growth characteristics of Advanced and Western Regional Chipping Trial entries - 2001.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
A90490-1W	97	3.5	3.8	4.3	4.0	3.0	3.0
A91790-13W	98	3.3	3.8	6.0	3.0	2.5	3.0
AC87340-2W	98	3.8	3.3	3.9	2.8	2.5	3.0
AC89653-3W	96	3.3	3.3	3.8	3.0	3.0	3.0
AC94296-5W	99	3.5	3.5	4.4	3.0	3.0	3.0
AC94324-1W	98	3.8	4.3	4.1	3.0	3.0	2.8
CO94027-6W	96	3.3	3.5	5.0	2.3	2.3	1.3
CO94032-3W	98	3.0	2.8	4.0	2.5	3.0	2.5
CO95031-2W	97	3.5	3.3	4.4	4.0	3.3	3.8
CO95051-7W	96	3.3	3.0	3.0	3.3	3.0	3.3
CO95070-7W	95	3.5	4.3	5.7	2.5	2.0	1.0
CO95117-8W	89	2.8	2.3	3.0	2.8	2.3	2.5
NDC6084C-2W	99	3.3	4.0	4.8	2.5	2.0	1.8
NDTX4930-5W	99	3.5	3.3	3.8	3.0	3.0	2.3
NY112W	97	3.3	3.5	3.0	3.8	3.0	3.3
W1313W	97	3.5	4.3	3.2	3.8	3.0	3.0
W1355-1W	98	3.8	3.0	4.1	3.0	3.0	1.8
Atlantic	98	3.5	4.0	3.5	3.0	3.0	3.0
Chipeta	97	3.3	4.5	4.9	4.0	3.0	3.0
Mean	97	3.4	3.5	4.1	3.1	2.8	2.6
LSD[6] (0.05)	3	NS	0.6	1.3	0.5	0.4	0.5

[1]Emergence uniformity is rated on a 1 to 5 scale, with 5 indicating very uniform emergence.

[2]Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

[3]Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

[4]Vine type is rated on a 1 to 5 scale, with 5 indicating very upright vines.

[5]Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

[6]LSD=least significant difference; NS=not significant.

Table 11D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Advanced and Western Regional Chipping Trial entries - 2001.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
A90490-1W	3.2	3.6	3.4	4.0	85	4.0
A91790-13W	4.1	3.3	3.7	4.8	92	3.0
AC87340-2W	3.0	2.7	2.9	5.0	71	3.4
AC89653-3W	4.3	3.4	3.9	4.9	64	4.0
AC94296-5W	4.6	3.8	4.2	4.9	99	4.4
AC94324-1W	4.0	3.1	3.6	4.3	85	4.6
CO94027-6W	2.2	1.7	2.0	8.9	85	4.0
CO94032-3W	2.4	2.7	2.6	6.9	78	4.4
CO95031-2W	1.9	1.1	1.5	4.8	71	2.6
CO95051-7W	3.1	1.7	2.4	7.4	71	2.4
CO95070-7W	3.7	1.4	2.6	5.8	71	3.2
CO95117-8W	3.1	1.8	2.5	4.2	113	4.0
NDC6084C-2W	1.8	1.4	1.6	10.5	71	2.0
NDTX4930-5W	2.8	1.7	2.3	3.5	78	4.0
NY112W	2.4	2.0	2.2	5.4	85	2.6
W1313W	3.8	3.9	3.9	6.7	85	4.6
W1355-1W	1.5	1.4	1.5	6.0	71	1.8
Atlantic	2.7	2.0	2.3	5.8	78	4.4
Chipeta	2.2	1.5	1.9	3.5	92	4.4

[1]Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

[2]Tubers were stored at 45F for 115 days.

[3]Days from harvest to first visible growth. Tubers were stored at 45F.

[4]Degree of darkening rated at 60 minutes after slicing fresh lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Table 11E. Chip color[1] after various storage regimes and specific gravity of Advanced and Western Regional Chipping Trial entries - 2001.

Clone	Specific Gravity	7 wks 40F	7 wks/40F +3 wks/60F	7 wks 50F	7 wks/50F +3 wks/60F
A90490-1W	1.087	5.0	3.5	2.0	2.5
A91790-13W	1.093	3.5	1.5	1.0	1.5
AC87340-2W	1.093	4.0	2.0	1.0	1.5
AC89653-3W	1.098	4.0	3.5	1.5	2.5
AC94296-5W	1.101	3.0	3.0	1.5	2.0
AC94324-1W	1.095	4.0	3.0	1.0	3.0
CO94027-6W	1.084	2.5	2.0	2.0	2.5
CO94032-3W	1.097	2.5	1.5	1.0	2.5
CO95031-2W	1.108	3.5	2.0	1.5	2.5
CO95051-7W	1.107	3.0	1.5	1.5	1.5
CO95070-7W	1.088	3.5	2.5	2.0	1.5
CO95117-8W	1.098	4.5	3.5	2.0	1.0
NDC6084C-2W	1.091	2.5	2.5	1.5	1.0
NDTX4930-5W	1.092	2.5	2.5	1.0	1.5
NY112W	1.097	3.0	2.0	1.0	2.0
W1313W	1.103	2.5	2.5	2.5	3.0
W1355-1W	1.093	2.5	1.5	2.0	2.5
Atlantic	1.101	4.0	3.0	1.0	2.0
Chipeta	1.097	5.0	3.0	1.5	2.0

[1] Chip color was rated using the Snack Food Association 1-5 scale. Ratings of $\leq$2.0 are acceptable.

Table 12. Summary comparison of advanced selections and named cultivars for yield, grade, maturity, specific gravity, and grade defects - 2001. Advanced selections to be released for grower evaluation in 2002 are bolded.

Clone	Usage[1]	# Trials	Total Yield (Cwt/A)	% US #1	Vine Maturity[2]	Specific Gravity	% External Defects[3]	% Hollow Heart[4]
Russets								
CO85026-4RU	FM	12	376	88.5	3.5	1.086	3.3	0.0
AC87084-3RU	Dual	8	509	89.2	3.4	1.093	2.8	0.3
AC89536-5RU	FM	6	496	82.1	3.2	1.083	2.9	0.3
AC92009-4RU	FM	4	345	89.5	3.1	1.092	1.1	0.0
CO92077-2RU	FM	4	387	75.1	2.8	1.076	0.9	0.1
NDC5372-1RU	Dual	4	421	74.8	3.1	1.083	2.8	0.1
TC1675-1RU	Dual	4	418	73.0	3.2	1.089	3.8	0.2
Centennial Russet	FM	35	294	77.4	3.0	1.080	0.8	0.3
Russet Norkotah	FM	39	355	83.8	1.8	1.077	2.1	0.4
Russet Nugget	Dual	40	410	79.2	3.8	1.091	1.6	0.2
Reds								
CO86218-2R	FM	12	423	81.2	3.0	1.076	1.6	0.2
DT6063-1R	FM	8	459	85.7	2.8	1.081	2.9	0.4
CO89097-2R	FM	7	497	83.0	2.9	1.081	2.9	0.3
NDC5281-2R	FM	4	386	46.5	2.1	1.085	0.8	0.0
Sangre	FM	21	460	85.6	3.0	1.072	1.6	1.0
Chippers								
BC0894-2W	Chip	11	389	83.1	2.3	1.080	1.3	0.0
AC87340-2W	Chip	7	477	78.5	3.3	1.083	0.9	0.3
Atlantic	Chip	19	435	86.5	3.2	1.096	2.5	4.2
Chipeta	Chip	19	497	82.6	3.3	1.088	5.8	0.4

[1]FM=fresh market; Dual= indicates a clone with both fresh market and processing potential.

[2]Vine maturity: 1=very early; 2=early; 3=medium; 4=late; 5=very late.

[3]Includes defects such as second growth, growth crack, misshapen, and green.

[4]Based on tubers greater than 10 ounces.

Figure 4. Photographs of advanced selections - 2001.

Russets

CO85026-4RU (Fremont Russet)

AC87084-3RU

AC89536-5RU

AC92009-2RU

CO92077-2RU

NDC5372-1RU

Figure 4 (Cont'd). Photographs of advanced selections - 2001.

Russets (continued)

TC1675-1RU

Reds

CO86218-2R (Durango Red)

DT6063-1R (Cherry Red)

CO89097-2R

NDC5281-2R

Figure 4 (Cont'd). Photographs of advanced selections - 2001.

Chippers

BC0894-2W

AC87340-2W

Table 13A. Detailed data summary for CO85026-4RU (Fremont Russet).

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		12	376	295-422
Yield US #1 (Cwt/A)		12	333	254-384
% US #1		12	88.5	82-93
Yield >10 oz (Cwt/A)		12	108	37-157
Yield <4 oz (Cwt/A)		12	31	9-64
% External Defects[1]		12	3.3	0.4-10.0
% Hollow Heart[2]		12	0.0	0.0-0.0
% Stand		12	98	96-100
Emergence Uniformity		10	3.4	3.0-3.8
Vine Vigor[3]		10	2.3	2.0-3.0
Stems/Plant		12	2.5	1.8-2.9
Vine Size[4]		10	3.0	1.8-4.0
Vine Maturity5		12	3.5	3.2-4.0
Blackspot[6]	Bud End	12	3.5	1.9-5.0
	Stem End	12	3.2	1.6-4.8
	Average	12	3.4	
Weight Loss[7]		12	3.4	2.3-5.0
Dormancy[8]		12	82	64-95
Enzymatic Browning[9]		12	4.0	3.0-4.8
Specific Gravity		12	1.086	1.075-1.100
Fry Color[10]	Harvest	12	2.3	1.0-4.0
	Storage	12	3.1	2.0-4.0
Fry Texture[11]	Harvest	12	2.7	1.0-4.0
	Storage	12	2.7	1.0-4.0

Refer to footnotes on page 77.

Table 13B. Detailed data summary for AC87084-3RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		8	509	440-577
Yield US #1 (Cwt/A)		8	455	335-530
% US #1		8	89.2	76.2-94.3
Yield >10 oz (Cwt/A)		8	189	63-271
Yield <4 oz (Cwt/A)		8	40	18-70
% External Defects[1]		8	2.8	0.5-7.9
% Hollow Heart[2]		8	0.3	0.0-1.9
% Stand		8	97	93-98
Emergence Uniformity		8	3.4	3.0-4.2
Vine Vigor[3]		8	3.8	3.3-4.2
Stems/Plant		8	4.3	2.7-5.2
Vine Size[4]		8	4.4	4.0-5.0
Vine Maturity5		8	3.4	3.0-4.0
Blackspot[6]	Bud End	8	3.0	1.8-4.6
	Stem End	8	3.3	1.9-4.9
	Average	8	3.2	
Weight Loss[7]		8	5.3	4.1-7.6
Dormancy[8]		8	75	68-83
Enzymatic Browning[9]		8	1.9	1.2-3.4
Specific Gravity		8	1.093	1.086-1.101
Fry Color[10]	Harvest	8	1.9	1.0-2.0
	Storage	8	2.4	2.0-3.0
Fry Texture[11]	Harvest	8	3.8	3.0-4.0
	Storage	8	3.8	3.0-4.0

Refer to footnotes on page 77.

Table 13C. Detailed data summary for AC89536-5RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		6	496	367-683
Yield US #1 (Cwt/A)		6	413	255-603
% US #1		6	82.1	69.2-89.5
Yield >10 oz (Cwt/A)		6	117	14-246
Yield <4 oz (Cwt/A)		6	71	50-87
% External Defects[1]		6	2.9	0.7-8.7
% Hollow Heart[2]		6	0.3	0.0-0.8
% Stand		6	99	97-100
Emergence Uniformity		6	3.6	3.0-4.0
Vine Vigor[3]		6	3.1	2.0-3.8
Stems/Plant		6	3.0	2.0-3.6
Vine Size[4]		6	3.9	3.5-4.5
Vine Maturity5		6	3.2	3.0-3.5
Blackspot[6]	Bud End	7	4.7	4.2-5.0
	Stem End	7	4.6	3.0-5.0
	Average	7	5.0	
Weight Loss[7]		7	5.5	4.0-6.9
Dormancy[8]		7	87	77-106
Enzymatic Browning[9]		7	3.8	3.2-4.2
Specific Gravity		7	1.083	1.079-1.089
Fry Color[10]	Harvest	7	2.7	2.0-4.0
	Storage	7	3.3	3.0-4.0
Fry Texture[11]	Harvest	7	2.7	2.0-4.0
	Storage	7	2.8	2.0-3.0

Refer to footnotes on page 77.

Table 13D. Detailed data summary for AC92009-4RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	345	332-365
Yield US #1 (Cwt/A)		4	309	290-330
% US #1		4	89.5	86.4-93.3
Yield >10 oz (Cwt/A)		4	84	63-111
Yield <4 oz (Cwt/A)		4	67	44-79
% External Defects[1]		4	1.1	0.0-2.4
% Hollow Heart[2]		4	0.0	
% Stand		4	98	97-99
Emergence Uniformity		4	3.1	2.5-3.5
Vine Vigor[3]		4	2.2	2.0-2.5
Stems/Plant		4	1.9	1.4-2.4
Vine Size[4]		4	3.6	3.0-4.0
Vine Maturity5		4	3.1	3.0-3.5
Blackspot[6]	Bud End	5	4.5	3.7-5.0
	Stem End		4.0	2.5-5.0
	Average		4.3	
Weight Loss[7]		5	4.9	4.0-5.4
Dormancy[8]		5	135	113-171
Enzymatic Browning[9]		5	4.1	3.4-4.8
Specific Gravity		5	1.092	1.081-1.102
Fry Color[10]	Harvest	5	1.8	1.0-3.0
	Storage	5	2.4	2.0-3.0
Fry Texture[11]	Harvest	5	3.6	3.0-5.0
	Storage	5	3.2	3.0-4.0

Refer to footnotes on page 77.

Table 13E. Detailed data summary for CO92077-2RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	387	350-468
Yield US #1 (Cwt/A)		4	290	252-348
% US #1		4	75.1	72-77
Yield >10 oz (Cwt/A)		4	48	26-63
Yield <4 oz (Cwt/A)		4	93	75-117
% External Defects[1]		4	0.9	0.1-2.3
% Hollow Heart[2]		4	0.1	0.0-0.3
% Stand		4	95	90-99
Emergence Uniformity		4	2.8	2.5-3.0
Vine Vigor[3]		4	2.3	2.0-2.8
Stems/Plant		4	2.4	1.7-3.1
Vine Size[4]		4	2.8	2.5-3.0
Vine Maturity5		4	2.8	2.5-3.0
Blackspot[6]	Bud End	5	4.6	4.1-5.0
	Stem End	5	4.3	3.3-5.0
	Average	5	4.5	
Weight Loss[7]		5	4.3	3.4-4.9
Dormancy[8]		5	79	70-101
Enzymatic Browning[9]		5	3.0	1.4-4.2
Specific Gravity		5	1.076	1.069-1.086
Fry Color[10]	Harvest	5	2.0	1.0-3.0
	Storage	5	2.8	2.0-4.0
Fry Texture[11]	Harvest	5	3.0	3.0-3.0
	Storage	5	2.4	2.0-3.0

Refer to footnotes on page 77.

Table 13F. Detailed data summary for NDC5372-1RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	421	388-462
Yield US #1 (Cwt/A)		4	315	292-334
% US #1		4	74.8	70-79
Yield >10 oz (Cwt/A)		4	73	57-100
Yield <4 oz (Cwt/A)		4	95	77-125
% External Defects[1]		4	2.8	1.1-4.6
% Hollow Heart[2]		4	0.1	0.0-0.3
% Stand		4	98	96-100
Emergence Uniformity		4	3.1	2.8-3.5
Vine Vigor[3]		4	2.8	2.5-3.0
Stems/Plant		4	3.6	2.4-4.6
Vine Size[4]		4	3.0	3.0-3.0
Vine Maturity5		4	3.1	3.0-3.5
Blackspot[6]	Bud End	5	4.6	3.8-5.0
	Stem End	5	2.7	1.4-4.8
	Average	5	3.7	
Weight Loss[7]		5	5.5	4.0-6.6
Dormancy[8]		5	100	91-115
Enzymatic Browning[9]		5	2.9	2.0-4.0
Specific Gravity		5	1.083	1.075-1.092
Fry Color[10]	Harvest	5	1.2	1.0-2.0
	Storage	5	1.6	1.0 3.0
Fry Texture[11]	Harvest	5	2.2	2.0-3.0
	Storage	5	2.0	1.0-3.0

Refer to footnotes on page 77.

Table 13G. Detailed data summary for TC1675-1RU.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	418	409-425
Yield US #1 (Cwt/A)		4	306	275-330
% US #1		4	73.0	64.5-80.4
Yield >10 oz (Cwt/A)		4	61	35-99
Yield <4 oz (Cwt/A)		4	96	68-136
% External Defects[1]		4	3.8	2.7-5.3
% Hollow Heart[2]		4	0.2	0.0-0.7
% Stand		4	98	95-100
Emergence Uniformity		4	3.1	2.8-3.5
Vine Vigor[3]		4	3.0	2.8-3.3
Stems/Plant		4	3.6	2.5-4.9
Vine Size[4]		4	3.2	3.0-3.8
Vine Maturity5		4	3.2	3.0-3.5
Blackspot[6]	Bud End	5	4.6	4.2-4.9
	Stem End	5	3.5	2.4-4.9
	Average	5	4.1	
Weight Loss[7]		5	2.9	2.4-3.6
Dormancy[8]		5	110	105-115
Enzymatic Browning[9]		5	3.3	2.8-3.6
Specific Gravity		5	1.089	1.080-1.101
Fry Color[10]	Harvest	5	1.0	1.0-1.0
	Storage	5	1.6	1.0-2.0
Fry Texture[11]	Harvest	5	3.8	3.0-4.0
	Storage	5	3.8	3.0-4.0

Refer to footnotes on page 77.

Table 13H. Detailed data summary for Centennial Russet.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		35	294	177-392
Yield US #1 (Cwt/A)		35	229	129-320
% US #1		35	77.4	61.9-89.0
Yield >10 oz (Cwt/A)		35	26	4-72
Yield <4 oz (Cwt/A)		35	62	32-102
% External Defects[1]		35	0.8	0.0-3.3
% Hollow Heart[2]		35	0.3	0.0-3.3
% Stand		35	97	90-99
Emergence Uniformity		15	3.2	3.0-3.5
Vine Vigor[3]		15	2.2	1.0-3.0
Stems/Plant		27	3.0	2.2-3.6
Vine Size[4]		15	2.6	2.0-3.0
Vine Maturity5		15	3.0	2.5-3.5
Blackspot[6]	Bud End	34	4.8	3.7-5.0
	Stem End	34	4.8	4.2-5.0
	Average	37	4.8	
Weight Loss[7]		37	6.7	3.7-9.0
Dormancy[8]		30	88	57-123
Enzymatic Browning[9]		32	4.0	3.2-5.0
Specific Gravity		44	1.080	1.069-1.090
Fry Color[10]	Harvest	36	3.7	3.0-5.0
	Storage	36	4.0	3.0-4.0
Fry Texture[11]	Harvest	36	2.4	1.0-4.0
	Storage	36	2.2	1.0-3.0

Refer to footnotes on page 77.

Table 13I. Detailed data summary for Russet Norkotah.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		39	355	174-451
Yield US #1 (Cwt/A)		39	298	144-391
% US #1		39	83.8	77.8-92.2
Yield >10 oz (Cwt/A)		39	96	23-212
Yield <4 oz (Cwt/A)		39	49	22-83
% External Defects[1]		39	2.1	0.4-5.3
% Hollow Heart[2]		39	0.4	0.0-2.8
% Stand		39	98	88-100
Emergence Uniformity		30	3.1	1.0-4.0
Vine Vigor[3]		30	3.0	1.5-4.0
Stems/Plant		35	3.6	2.5-4.8
Vine Size[4]		32	2.3	1.0-3.3
Vine Maturity5		39	1.8	1.0-3.0
Blackspot[6]	Bud End	38	4.8	2.9-5.0
	Stem End	38	4.5	3.4-5.0
	Average	39	4.7	
Weight Loss		39	4.5	1.0-7.1
Dormancy[8]		38	96	78-116
Enzymatic Browning[9]		38	3.1	2.2-4.8
Specific Gravity		42	1.077	1.066-1.091
Fry Color[10]	Harvest	39	2.2	1.0-4.0
	Storage	39	2.5	1.0-4.0
Fry Texture[11]	Harvest	39	2.6	2.0-4.0
	Storage	39	2.6	1.0-4.0

Refer to footnotes on page 77.

Table 13J. Detailed data summary for Russet Nugget.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		40	410	284-557
Yield US #1 (Cwt/A)		40	327	225-518
% US #1		40	79.2	68.0-93.0
Yield >10 oz (Cwt/A)		40	78	11-258
Yield <4 oz (Cwt/A)		40	77	30-133
% External Defects[1]		40	1.6	0.1-4.3
% Hollow Heart[2]		40	0.2	0.0-1.2
% Stand		40	98	96-100
Emergence Uniformity		30	3.3	3.0-4.0
Vine Vigor[3]		30	3.2	3.0-4.0
Stems/Plant		36	3.3	2.1-5.1
Vine Size[4]		30	4.2	3.8-5.0
Vine Maturity5		40	3.8	3.0-4.3
Blackspot[6]	Bud End	44	4.7	3.6-5.0
	Stem End	44	4.5	2.1-5.0
	Average	47	4.6	
Weight Loss[7]		47	3.7	1.7-5.5
Dormancy[8]		42	94	57-116
Enzymatic Browning[9]		43	4.0	3.2-4.6
Specific Gravity		49	1.091	1.072-1.110
Fry Color[10]	Harvest	47	1.7	0.5-3.0
	Storage	47	2.1	1.0-3.0
Fry Texture[11]	Harvest	47	3.9	2.0-5.0
	Storage	47	3.7	2.0-5.0

Refer to footnotes on page 77.

Table 13K. Detailed data summary for CO86218-2R.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		12	423	290-501
Yield US #1 (Cwt/A)		12	344	226-437
% US #1		12	81.2	73.1-90.3
Yield >10 oz (Cwt/A)		12	99	45-189
Yield <4 oz (Cwt/A)		12	72	32-119
% External Defects[1]		12	1.6	0.3-4.4
% Hollow Heart[2]		12	0.2	0.0-1.9
% Stand		12	95	88-99
Emergence Uniformity		11	3.2	2.8-3.8
Vine Vigor[3]		11	2.3	2.0-3.0
Stems/Plant		12	2.9	2.0-3.4
Vine Size[4]		11	3.0	2.0-4.0
Vine Maturity5		12	3.0	2.5-3.8
Blackspot[6]	Bud End	12	4.2	2.9-5.0
	Stem End	12	4.1	2.9-4.9
	Average	12	4.1	
Weight Loss[7]		12	4.6	3.8-5.4
Dormancy[8]		12	82	68-92
Enzymatic Browning[9]		12	2.4	1.2-4.0
Specific Gravity		12	1.076	1.071-1.082
Fry Color[10]	Harvest	12	2.6	2.0-3.0
	Storage	12	3.3	2.0-4.0
Fry Texture[11]	Harvest	12	2.7	2.0-4.0
	Storage	12	2.6	2.0-3.0

Refer to footnotes on page 77.

Table 13L. Detailed data summary for DT6063-1R.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		8	459	363-538
Yield US #1 (Cwt/A)		8	394	307-462
% US #1		8	85.7	78.0-90.7
Yield >10 oz (Cwt/A)		8	137	79-192
Yield <4 oz (Cwt/A)		8	51	30-89
% External Defects[1]		8	2.9	2.0-5.5
% Hollow Heart[2]		8	0.4	0.0-1.1
% Stand		8	98	96-100
Emergence Uniformity		8	3.3	2.8-3.8
Vine Vigor[3]		8	3.3	2.8-3.8
Stems/Plant		8	3.2	2.1-3.9
Vine Size[4]		8	3.4	3.0-4.0
Vine Maturity5		8	2.8	2.3-3.3
Blackspot[6]	Bud End	9	4.9	4.5-5.0
	Stem End	9	4.7	4.4-5.0
	Average	9	4.8	
Weight Loss[7]		9	5.2	3.5-6.1
Dormancy[8]		9	77	64-88
Enzymatic Browning[9]		9	4.2	3.4-4.6
Specific Gravity		9	1.081	1.077-1.088
Fry Color[10]	Harvest	9	2.7	2.0-3.0
	Storage	9	3.1	2.0-4.0
Fry Texture[11]	Harvest	9	2.7	2.0-3.0
	Storage	9	2.8	2.0-3.0

Refer to footnotes on page 77.

Table 13M. Detailed data summary for CO89097-2R.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		7	497	390-581
Yield US #1 (Cwt/A)		7	414	310-527
% US #1		7	83.0	75.6-90.7
Yield >10 oz (Cwt/A)		7	139	69-249
Yield <4 oz (Cwt/A)		7	67	46-98
% External Defects[1]		7	2.9	0.2-6.5
% Hollow Heart[2]		7	0.3	0.0-0.8
% Stand		7	97	95-100
Emergence Uniformity		7	3.0	2.5-3.5
Vine Vigor[3]		7	2.9	2.2-3.0
Stems/Plant		7	3.4	2.3-4.5
Vine Size[4]		7	3.5	3.0-4.0
Vine Maturity5		7	2.9	2.2-3.8
Blackspot[6]	Bud End	8	3.9	2.1-4.8
	Stem End	8	4.0	2.4-5.0
	Average	8	4.0	
Weight Loss[7]		8	6.7	4.7-8.2
Dormancy[8]		8	66	54-78
Enzymatic Browning[9]		8	4.2	3.4-4.8
Specific Gravity		8	1.081	1.071-1.086
Fry Color[10]	Harvest	8	2.4	1.0-3.0
	Storage	7	2.7	2.0-3.0
Fry Texture[11]	Harvest	8	2.9	2.0-4.0
	Storage	7	2.7	2.0-3.0

Refer to footnotes on page 77.

Table 13N. Detailed data summary for NDC5281-2R.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		4	386	321-452
Yield US #1 (Cwt/A)		4	179	115-272
% US #1		4	46.5	28.4-61.2
Yield >10 oz (Cwt/A)		4	2	0-7
Yield <4 oz (Cwt/A)		4	203	123-289
% External Defects[1]		4	0.8	0.3-1.8
% Hollow Heart[2]		4	0.0	0.0-0.0
% Stand		4	97	96-99
Emergence Uniformity		4	3.4	3.3-3.8
Vine Vigor[3]		4	3.1	3.0-3.3
Stems/Plant		4	4.8	2.9-6.4
Vine Size[4]		4	3.3	2.8-3.8
Vine Maturity5		4	2.1	1.3-3.0
Blackspot[6]	Bud End	5	3.5	2.7-4.7
	Stem End	5	3.1	1.8-4.2
	Average	5	3.3	
Weight Loss[7]		5	8.5	6.1-10.0
Dormancy[8]		5	83	71-101
Enzymatic Browning[9]		5	1.4	1.0-2.4
Specific Gravity		5	1.085	1.080-1.096
Fry Color[10]	Harvest	5	2.0	1.0-3.0
	Storage	5	2.4	1.0-4.0
Fry Texture[11]	Harvest	5	3.0	2.0-4.0
	Storage	5	2.4	1.0-3.0

Refer to footnotes on page 77.

Table 13O. Detailed data summary for Sangre.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		21	460	364-571
Yield US #1 (Cwt/A)		21	395	305-497
% US #1		21	85.6	72.2-92.8
Yield >10 oz (Cwt/A)		21	129	35-319
Yield <4 oz (Cwt/A)		21	58	30-117
% External Defects[1]		21	1.6	0.0-5.7
% Hollow Heart[2]		21	1.0	0.0-8.2
% Stand		21	97	92-100
Emergence Uniformity		11	3.1	2.5-3.5
Vine Vigor[3]		11	2.5	1.8-3.0
Stems/Plant		21	3.0	1.9-3.9
Vine Size[4]		11	3.8	3.0-4.0
Vine Maturity5		21	3.0	1.5-4.0
Blackspot[6]	Bud End	29	4.1	2.4-5.0
	Stem End	29	4.4	2.5-5.0
	Average	30	4.3	
Weight Loss[7]		30	3.7	2.2-5.1
Dormancy[8]		26	92	71-109
Enzymatic Browning[9]		27	3.3	1.8-4.8
Specific Gravity		30	1.072	1.059-1.085
Fry Color[10]	Harvest	29	3.2	1.0-4.0
	Storage	29	3.2	1.0-4.0
Fry Texture[11]	Harvest	29	2.5	1.0-4.0
	Storage	29	2.4	1.0-3.0

Refer to footnotes on page 77.

Table 13P. Detailed data summary for BC0894-2W.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		11	389	330 - 471
Yield US #1 (Cwt/A)		11	323	272 - 403
% US #1		11	83.1	75.7 - 91.5
Yield >10 oz (Cwt/A)		11	73	24 - 135
Yield <4 oz (Cwt/A)		11	60	26 - 103
% External Defects[1]		11	1.3	0.1 - 3.6
% Hollow Heart[2]		11	0.0	
% Stand		11	96	90 - 99
Emergence Uniformity		10	3.0	2.2 - 3.8
Vine Vigor[3]		10	3.1	3.0 - 3.8
Stems/Plant		11	2.9	2.3 - 3.8
Vine Size[4]		10	2.9	2.2 - 3.5
Vine Maturity5		11	2.3	1.2 - 2.8
Blackspot[6]	Bud End	19	4.6	3.0 - 5.0
	Stem End	19	4.0	1.9 - 5.0
	Average	19	4.3	
Weight Loss[7]		19	5.1	3.4 - 12.9
Dormancy[8]		19	86	77 - 105
Enzymatic Browning[9]		19	3.4	1.4 - 4.4
Specific Gravity		20	1.079	1.075 - 1.087
Chip Color[10]	40	20	3.2	2.0 - 4.5
	40R	20	2.5	1.0 - 4.0
	50	20	1.6	1.0 - 2.5
	50R	20	1.6	1.0 - 3.0

Refer to footnotes on page 77.

Table 13Q. Detailed data summary for AC87340-2W.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		7	477	429-544
Yield US #1 (Cwt/A)		7	375	305-464
% US #1		7	78.5	66.4-86.1
Yield >10 oz (Cwt/A)		7	77	26-120
Yield <4 oz (Cwt/A)		7	97	55-149
% External Defects[1]		7	.9	0.1-1.6
% Hollow Heart[2]		7	0.3	0.0-1.1
% Stand		7	98	97-99
Emergence Uniformity		7	3.6	3.0-4.0
Vine Vigor[3]		7	3.0	2.5-3.5
Stems/Plant		7	3.6	2.6-4.8
Vine Size[4]		7	3.1	2.8-3.5
Vine Maturity5		7	3.3	3.0 -3.8
Blackspot[6]	Bud End	15	3.7	2.7-4.8
	Stem End	15	4.0	2.7-5.0
	Average	15	3.8	
Weight Loss[7]		15	5.0	3.3-6.9
Dormancy[8]		15	74	49-93
Enzymatic Browning[9]		15	3.6	1.8-4.4
Specific Gravity		16	1.083	1.075-1.094
Chip Color[10]	40	16	3.5	2.0-5.0
	40R	16	2.8	1.0-5.0
	50	16	1.5	1.0-2.5
	50R	16	1.6	1.0-3.0

Refer to footnotes on page 77.

Table 13R. Detailed data summary for Atlantic.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		19	435	307-566
Yield US #1 (Cwt/A)		19	376	265-491
% US #1		19	86.5	79.0-93.2
Yield >10 oz (Cwt/A)		19	134	58-290
Yield <4 oz (Cwt/A)		19	47	22-96
% External Defects[1]		19	2.5	0.1-8.3
% Hollow Heart[2]		19	4.2	0.3-16.4
% Stand		19	97	93-99
Emergence Uniformity		13	3.6	3.0-4.3
Vine Vigor[3]		13	3.6	3.0-4.0
Stems/Plant		19	3.0	2.2-4.2
Vine Size[4]		13	3.1	2.2-4.0
Vine Maturity5		19	3.2	2.8-3.8
Blackspot[6]	Bud End	27	3.1	1.8-5.0
	Stem End	27	2.7	1.4-4.3
	Average	28	2.9	
Weight Loss[7]		28	5.4	3.0-7.9
Dormancy[8]		25	89	64-116
Enzymatic Browning[9]		26	4.5	3.8-5.0
Specific Gravity		29	1.096	1.083-1.120
Chip Color[10]	40	29	3.7	2.0-5.0
	40R	29	3.2	1.5-4.5
	50	29	2.4	1.0-3.5
	50R	29	2.2	1.0-3.5

Refer to footnotes on page 77.

Table 13S. Detailed data summary for Chipeta.

Variable		# Trials	Mean	Range
Total Yield (Cwt/A)		19	497	399-626
Yield US #1 (Cwt/A)		19	412	306-566
% US #1		19	82.6	70.6-90.4
Yield >10 oz (Cwt/A)		19	149	52-388
Yield <4 oz (Cwt/A)		19	55	22-119
% External Defects[1]		19	5.8	1.2-12.5
% Hollow Heart[2]		19	0.4	0.0-3.5
% Stand		19	98	95-100
Emergence Uniformity		12	3.3	3.0-3.8
Vine Vigor[3]		12	3.8	3.2-4.5
Stems/Plant		18	3.6	2.5-4.9
Vine Size[4]		12	4.1	4.0-4.5
Vine Maturity5		19	3.3	3.0-4.0
Blackspot[6]	Bud End	26	3.9	2.2-5.0
	Stem End	26	3.6	1.4-4.9
	Average	28	3.8	
Weight Loss[7]		28	4.0	2.2-8.0
Dormancy[8]		24	99	78-118
Enzymatic Browning[9]		25	3.8	2.8-5.0
Specific Gravity		28	1.088	1.076-1.100
Chip Color[10]	40	28	4.3	3.0-5.0
	40R	28	3.5	1.5-5.0
	50	28	2.4	1.0-4.0
	50R	28	2.0	1.0-3.0

Refer to footnotes on page 77.

Footnotes for Tables 13A-S:

[1]Percent external defects based on the proportion of the total sample weight with significant defects.

[2]Percent hollow heart calculated as follows: (Weight of tubers >10 ounces with defects/total sample weight) x 100.

[3]Vine vigor is rated on a 1 to 5 scale, with 5 indicating very vigorous vines.

[4]Vine size is rated on a 1 to 5 scale, with 5 indicating very large vines.

[5]Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

[6]Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

[7]Tubers were stored at 45F for approximately 3 months.

[8]Days from harvest to first visible growth. Tubers were stored at 45F.

[9]Degree of darkening rated at 60 minutes after slicing fresh lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

[10]Chip color was rated using the Snack Food Association 1-5 scale. Ratings of <2.0 are acceptable. Reconditioned samples were stored at 60F for three weeks. Fry color was rated on a 0 to 4 scale, with 0 being the lightest or best color. Color ratings of <2.0 are acceptable.

[11]Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry and mealy and 1 representing a soggy, wet texture.

APPENDIX 1. Cultural management information for the Potato Breeding and Selection Program's trials at the San Luis Valley Research Center - 2001.

LOCATION: San Luis Valley Research Center

SOIL TYPE: Sandy Loam (Dunul cobbly sandy loam)

DATE:
Planted - 5/16/01
Hilled - 5/31/01
Vines Killed - 8/31/01 (sulfuric acid - 28 gal/A)
Harvested - 9/25/01

PLOT INFORMATION:
Size of Plots - 1 row x 25'
Spacing Between Hills - 12"
Spacing Between Rows - 34"
Hills Per Plot - 25
Number of Reps - 4

METHOD OF HARVEST:
Machine (Grimme 1-row)

FERTILIZER:
5/09/01 - 80 lbs N + 60 lbs P_2O_5 + 40 lbs K_20/A (liquid applied in-row)
7/04/01 - 6 lbs N + 13 lbs S (fertigated)
7/09/01 - 6 lbs N + 15 lbs S (fertigated)
7/10/01 - 6 lbs N + 15 lbs S (fertigated)
7/15/01 - 4 lbs N + 8 lbs S (fertigated)
7/19/01 - 9 lbs N + 20 lbs S (fertigated)
7/24/01 - 7 lbs N + 16 lbs S (fertigated)

IRRIGATION:
Center Pivot -16.0" gross application (application frequency and amount based on ET)
Rainfall - 4.6"

INSECTICIDES APPLIED:
7/12/01 - Leverage 2.7 (0.08 oz a.i./A)
7/26/01 - Leverage 2.7 (0.08 oz a.i./A)
8/11/01 - Leverage 2.7 (0.08 oz a.i./A)

FUNGICIDES APPLIED:
7/18/01 - Quadris (0.1 lb a.i./A)
8/03/01 - Agri Tin 80WP (0.2 lb a.i./A)
7/28/01 - Super Tin 80WP (0.2 lb a.i./A)
8/11/01 - Bravo Weather Stik (0.9 lb a.i./A)

HERBICIDES APPLIED:
6/01/01 - Sencor 4 (0.1 lb a.i./A) + Eptam 7-E (3.9 lb a.i./A)

APPENDIX 2. General procedures used for postharvest evaluations.

Blackspot. Ten randomly selected tubers for each clone tested are bruised on the stem and bud ends with a 150 g weight dropped from a height of 60 cm. Tubers are stored at 40F prior to bruising. After bruising, tubers are stored at room temperature for two or three days prior to evaluation. Blackspot susceptibility is evaluated by cutting the tubers in half longitudinally and rating the extent of damage. Blackspot is rated on a 1 to 5 scale, with 5 indicating no discoloration.

Storage Weight Loss and Dormancy. Ten randomly selected tubers are weighed and stored at 45F for approximately a three month period under low relative humidity conditions to evaluate storage weight loss potential. These tubers are also observed weekly for sprout growth. Dormancy is reported as days after harvest to first visible sprout growth.

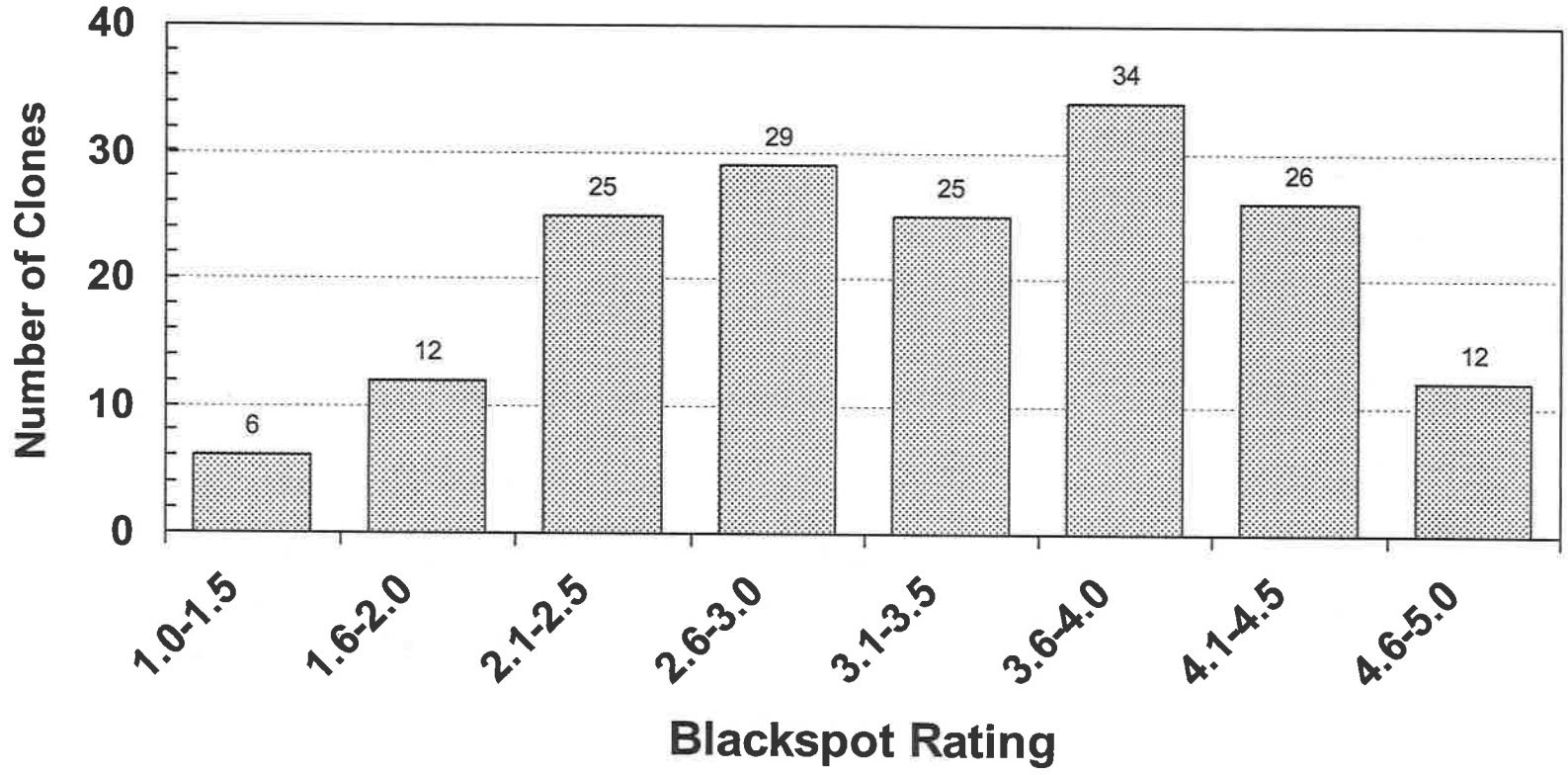
Enzymatic Browning. Five tubers of each clone are cut in half lengthwise and rated for degree of darkening 60 minutes later. Degree of darkening is rated on a 1 to 5 scale, with 5 indicating no discoloration.

Specific Gravity. Specific gravity is determined using the air/water method.

Fry Color and Texture. Fry color and texture is determined at or shortly after harvest and after a minimum of eight weeks of storage at 45F. Fries are cooked for 3 ½ minutes at 375F. Fry color is rated on a 0-4 scale using the USDA color standards. Color ratings $\leq$2 are acceptable. Fry texture is rated on a 1 to 5 scale, with 5 indicating that the cooked flesh was dry and mealy, with 1 representing a soggy, wet texture.

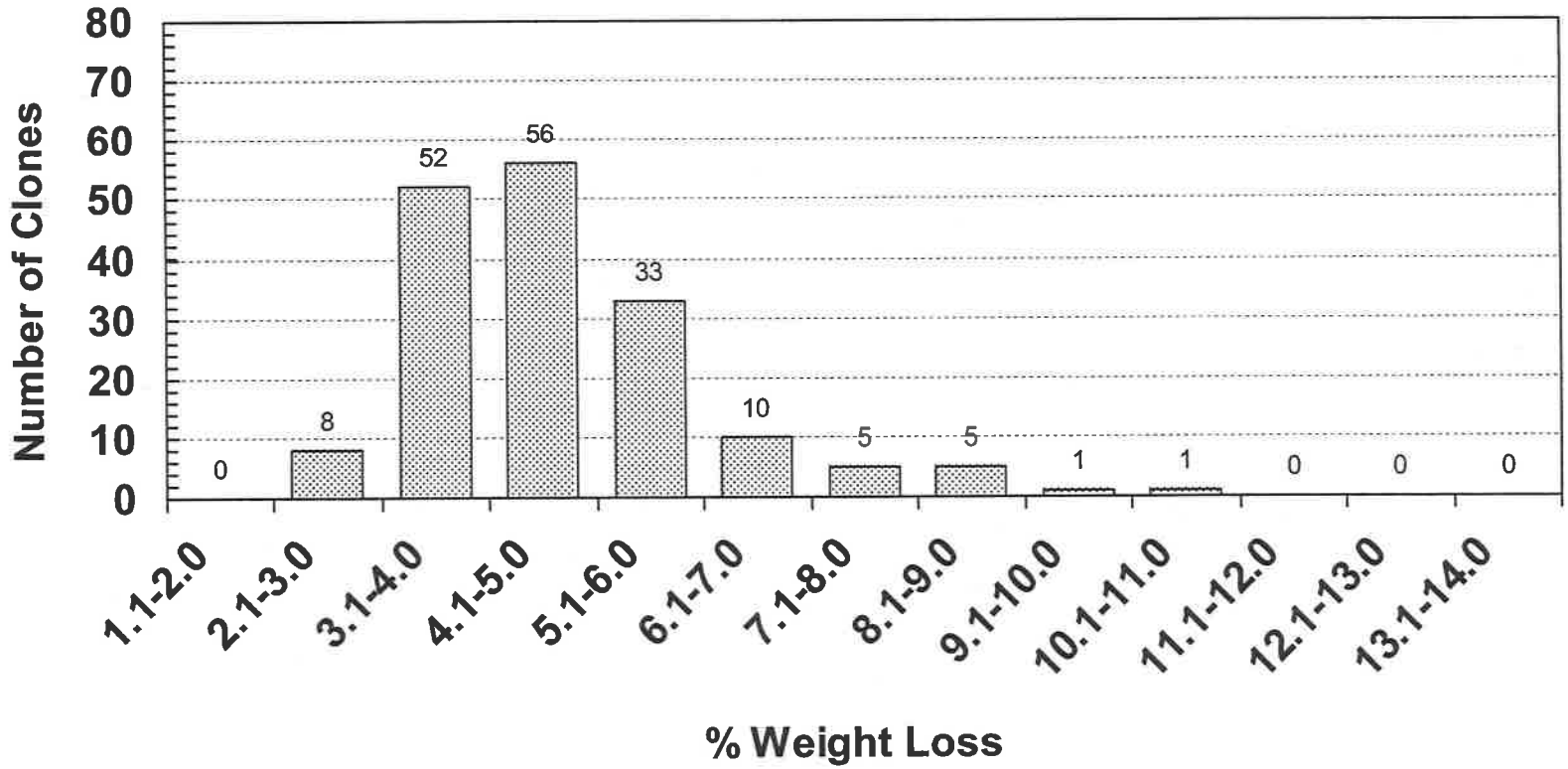
Chip Color. Chip color is determined after an interval of storage at 40 and 50F and after reconditioning for three weeks at 60F. Chips are cooked at 365F until bubbling slows. Chip color is rated using the Snack Food Association 1-5 scale. Ratings $\leq$2.0 are acceptable.

Appendix 3. Blackspot Distribution (169 Samples) - 2001

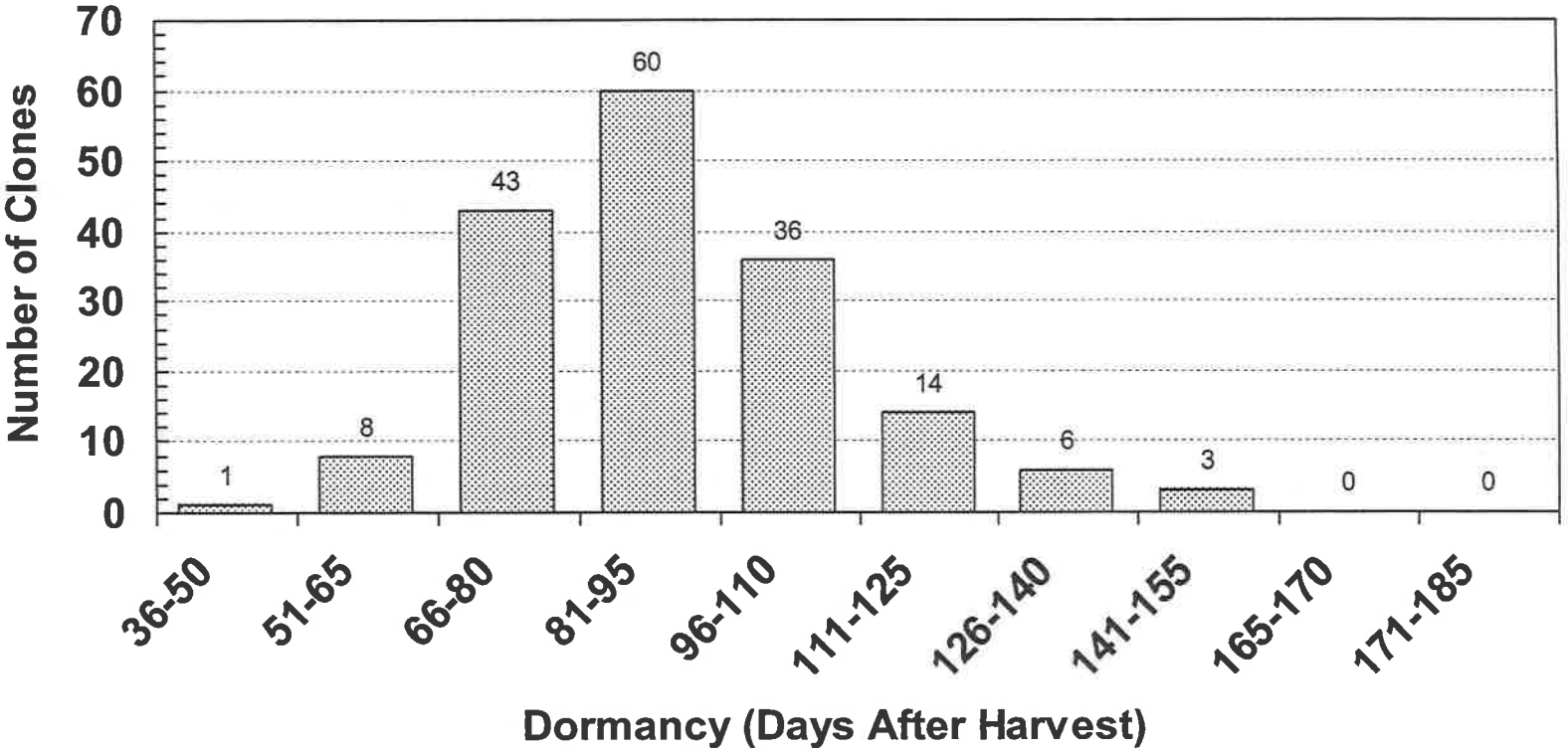


5=No Discoloration

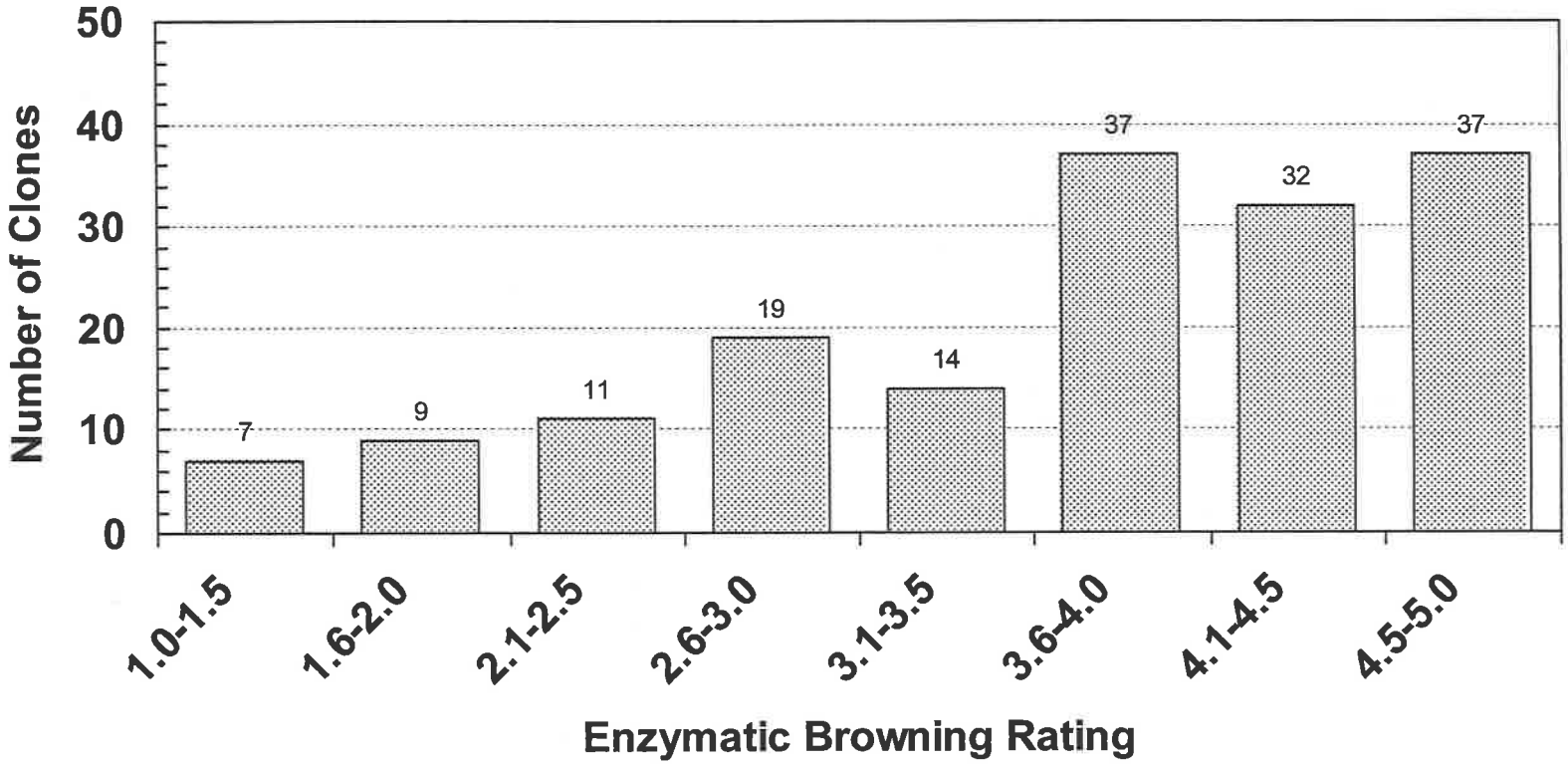
Appendix 4. % Weight Loss Distribution (171 Clones) - 2001



Appendix 5. Dormancy Distribution (171 Clones) - 2001

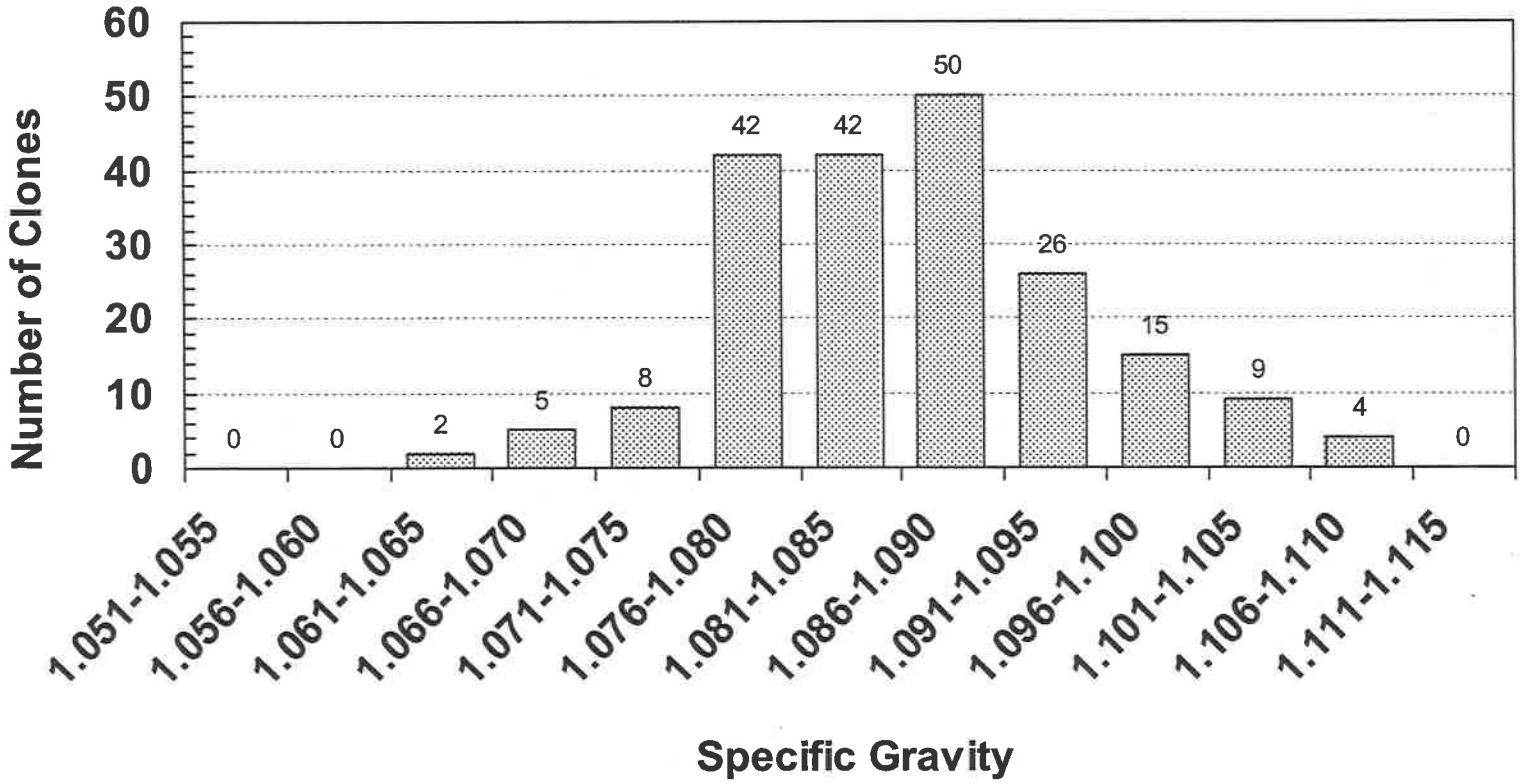


Appendix 6. Enzymatic Browning Distribution (166 Clones) - 2001

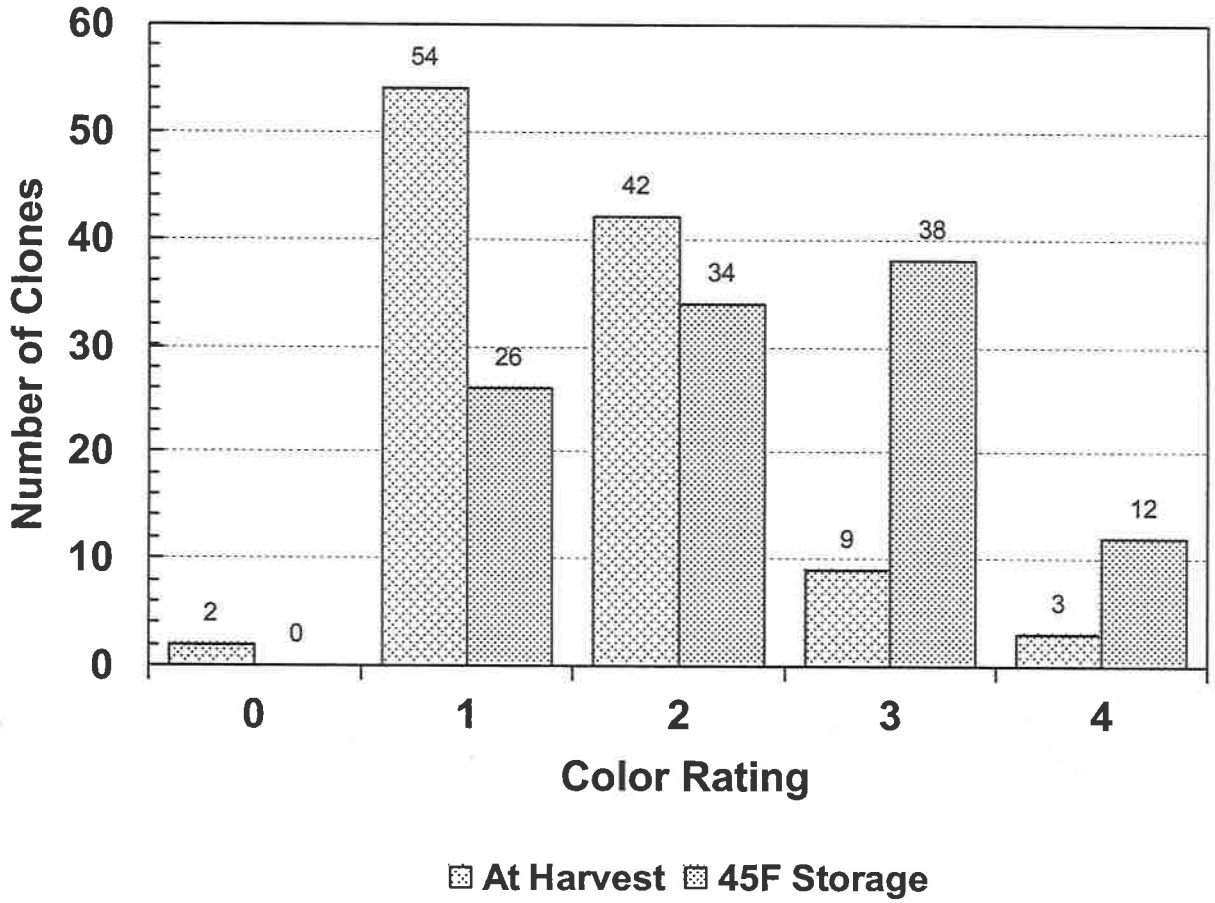


5=No Discoloration

Appendix 7. Specific Gravity Distribution (203 Clones) - 2001

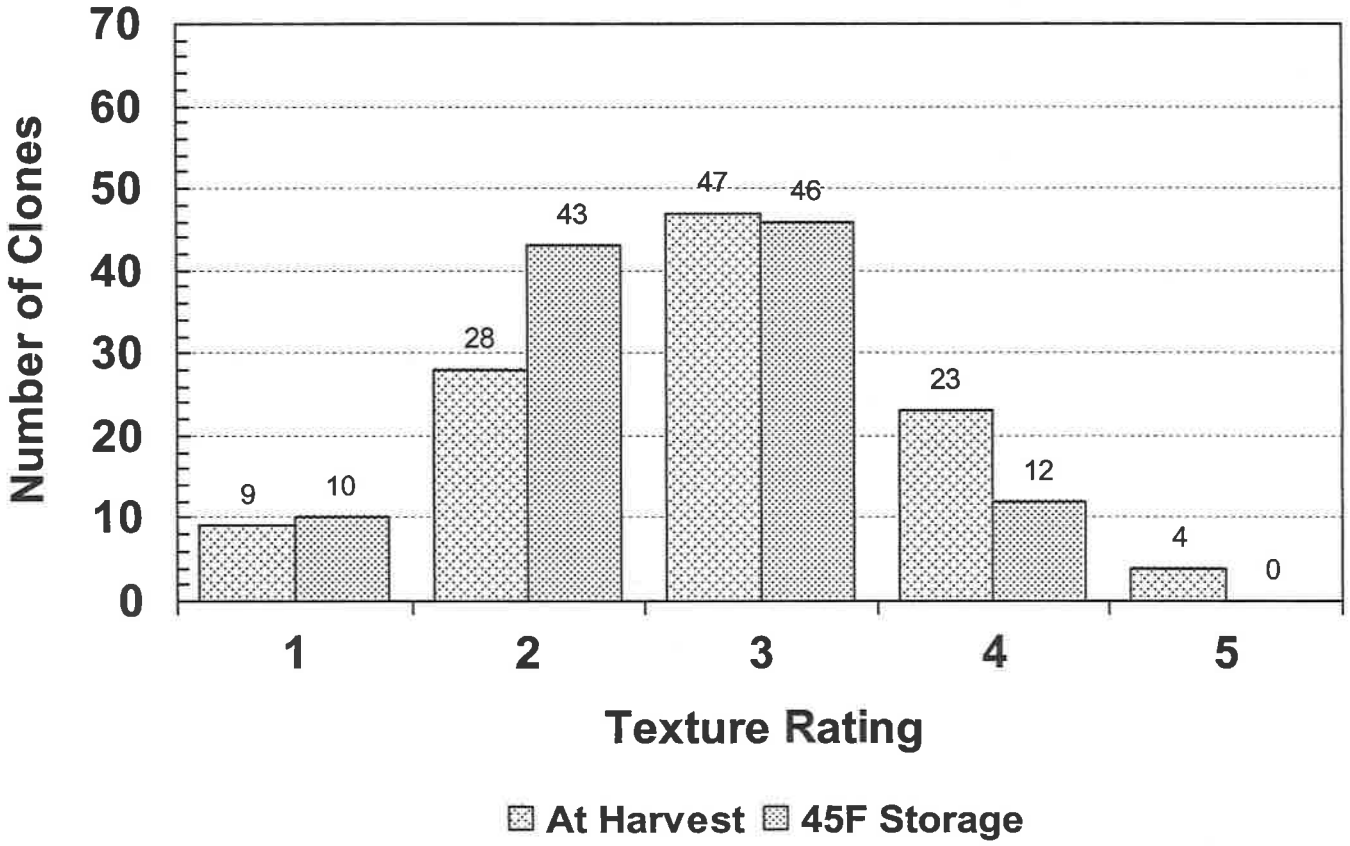


Appendix 8. Fry Color Distribution (110 Clones) - 2001



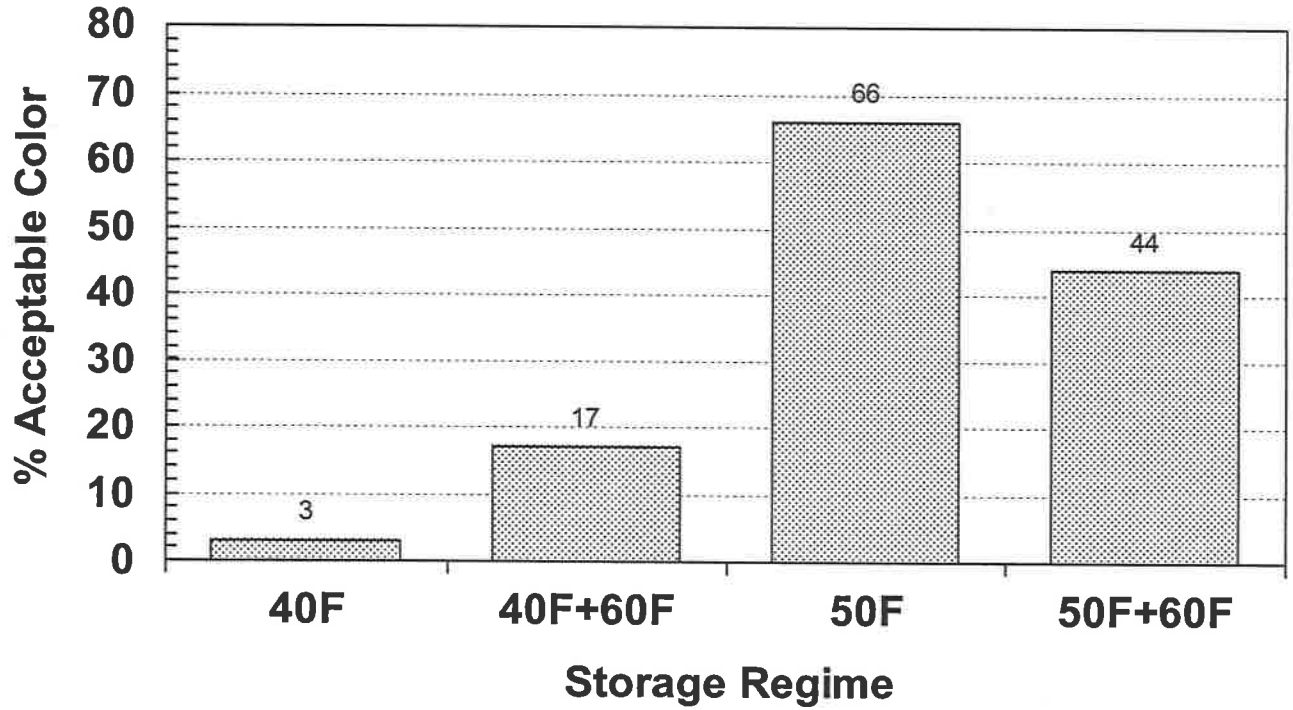
0=Lightest (values ≤2 acceptable)

Appendix 9. Fry Texture Distribution (111 Clones) - 2001



5=Dry Texture

Appendix 10. % Acceptable Chip Color (88 Clones) - 2001



Values ≤2 acceptable (SFA 1-5 Scale)

DRY GOODS

A total of 203 samples were evaluated for two or more of the following postharvest characteristics: blackspot susceptibility, storage weight loss, dormancy, enzymatic browning, specific gravity, french fry color, french fry texture, and chip color.

Colorado advanced selections evaluated in the Southwest Regional Trials, Western Regional Trials, or by producers, included 11 russets (AC87079-3RU, AC87138-4RU, AC87084-3RU, AC89536-5RU, AC91014-2RU, AC92009-2RU, CO85026-4RU, CO92027-2RU, CO92077-2RU, NDC5372-1RU, and TC1675-1RU), 5 reds (CO86218-2R, CO89097-2R, CO93037-6R, DT6063-1R, and NDC5281-2R), and 3 chippers (AC87340-2W, AC89653-3W, and BC0894-2W).. Upcoming releases include Cherry Red (DT6063-1R), Fremont Russet (CO85026-4RU), and Durango Red (CO86218-2R) and BC0894-2W. Plant Variety Protection was granted for Russet Norkotah Selections 3 and 8.. Plant Variety Protection for Keystone Russet and Silverton Russet was applied for.

Research Impact

Since 1975, there have been seven potato cultivars released by Colorado State University (CSU). They are Centennial Russet (1976), Sangre(1982), Ute Russet (1986), Russet Nugget (1988), Chipeta (1993), Keystone Russet (2000), and Silverton Russet (2000). CSU also cooperated with other agencies in the naming of Gemchip (1989), Frontier Russet (1990), Ranger Russet (1991), Century Russet (1995), and Russet Legend (1999). Russet Legend was selected from a cross of Century Russet and WNC672-2 made by the Colorado Potato Breeding and Selection Program in 1983. Clonal selections released by CSU include Sangre-Selection 10, 11, and 14 and Russet Norkotah-Selection 3 and Selection 8.

Cultivars released by Colorado State University accounted for 59% of the 2001 fall potato acreage planted in Colorado. Of the Colorado certified seed acreage accepted, 57% was represented by cultivars and line selections developed by CSU or in cooperation with other agencies. Advanced selections accounted for another 6% of the seed acreage.

Russet Nugget, named in 1988, accounted for 21% of the acreage making it second in area planted in the San Luis Valley and the fifth most popular russet cultivar in the United States.

Of the Russet Norkotah fall potato acreage in Colorado, 55% was planted to Colorado Russet Norkotah Selections 3 and 8.

Conservative estimates indicate that new potato cultivars and clonal selections increased the value of the Colorado fall potato crop by $11-$12 million annually due to improved yield and quality.

Acknowledgments

Financial support from the *Colorado potato industry* (Area II and III), the *Colorado Agricultural Experiment Station*, and the *Cooperative State Research, Education, and Extension Service*, for the Potato Breeding and Selection Program is gratefully acknowledged. These funds, coupled with royalties collected from Plant Variety Protection, have allowed us to significantly expand and strengthen our Program and other related CSU potato research efforts.

San Luis Valley Research Center
Agricultural Experiment Station
Colorado State University

The Colorado Potato Breeding and Selection Program - *2001 Update*

Dr. David G. Holm, Professor
Department of Horticulture & Landscape Architecture

0249 East Road 9 North
Center, CO 81125

Phone: 719-754-3594, x14
Fax: 719-754-2619
Email: spudmkr@lamar.colostate.edu

02.0306

Objectives

The primary objective of the Colorado Potato Breeding and Selection Program is to develop new potato cultivars with increased yield, improved quality, resistance to diseases and pests, and tolerance to environmental stresses for Colorado. Other objectives are to provide a basic seed source to growers for seed increase and commercial testing, and to evaluate promising selections for potential seed export.

The Colorado Potato Breeding and Selection Program emphasizes the development of dual purpose(fresh and processing) russet cultivars. The balance of the breeding effort, in order of priority, is devoted to developing reds, chippers, and specialty cultivars. This broad approach is important because it recognizes the diverse markets accessed by potato growers throughout Colorado. The development of "low input" cultivars, primarily for reduced nitrogen and fungicide input has always been emphasized.

A major effort is being placed on developing Colorado cultivars that are resistant to late blight (foliar and tuber). Other areas of increased emphasis are 1) developing cultivars immune to PVY; 2) developing cultivars with tuber resistance to dry rot (*Fusarium* and early blight) and bacterial soft rot; 3) identifying and incorporating breeding material demonstrating resistance to powdery scab; and 4) developing protocols to screen and evaluate advanced selections for reduced tuber greening potential and red skin color retention in storage.

Continued emphasis will be placed on breeding for improved postharvest and processing qualities such as lengthened dormancy and ability to process after cold storage. Cultivars with these characteristics will help assure that the potato industry in Colorado will remain productive and in a competitive position.

Cooperative efforts with other CSU personnel in conducting cultural management trials and disease evaluations are ongoing. These collaborative efforts are important as we evaluated advanced selections.

Other collaborative research efforts with CSU faculty and graduate students in the Department of Horticulture and Landscape Architecture are allowing us to explore molecular aspects of breeding for late blight resistance. These efforts are also aimed at improving the nutritional quality and other important "consumer" characteristics of new cultivars.

We continue to expand our collaborations with the Southwest Regional Potato Group which involves Colorado, Texas, and California. The overall objective of this Group is to develop and evaluate improved potato cultivars to meet the production, marketing, and producer/consumer needs of the Southwest U.S. Other "partners" throughout the United States are supportive in providing breeding material and opportunities to screen our germplasm under various growing conditions and disease pressures not usually available in Colorado.

Significant Accomplishments for the Year 2001

Breeding Program. Six years ago, clones derived from somatic hybrids of the *Solanum tuberosum* (the commercially cultivated potato) and *Solanum bulbocastanum* were obtained from the USDA-ARS in Madison, WI. *Solanum bulbocastanum* is a species which exhibits high levels of resistance too late blight and early blight. In 1999, additional germplasm with resistance to late blight was identified and acquired from breeding programs around the United States. Other germplasm has been acquired with multiple virus resistance to PVX, PVY, and leafroll from the USDA-ARS in Idaho. Several additional field selections exhibiting field immunity to PVY were obtained from Oregon State University in 2000. These materials and other accessions are being incorporated into the breeding program.

Eighty-nine parental clones were intercrossed in 2001 in two separate crossing blocks. The emphasis of the first crossing block was disease resistance (late blight and PVY) and the second emphasized cultivar development and virus resistance (PVX, PVY, and PLRV). Seed from 605 combinations was obtained.

Approximately 45,000 seedling tubers representing 166 families were produced from 2000 crosses, for initial field selection in 2002. Second thru fourth size seedling tubers from these crosses will be distributed to Idaho, Minnesota, Oregon, Texas, and Alberta, Canada. Additional seedling tubers for planting in 2002 will be obtained from Dr. Richard G. Novy, USDA-ARS, Aberdeen, Idaho; Dr. Dermot Lynch, Agriculture Canada, Lethbridge, Alberta; and Dr. J. Creighton Miller, Texas A&M University, College Station, Texas.

Selection Program. A total of 77,993 first year seedlings were grown, with 930 being retained for subsequent planting, evaluation, and increase in future years. Another 1,074 clones were in 12-hill, preliminary, and intermediate stages of selection. Of these, 293 were saved for further observation. Thirty-nine advanced selections were saved at harvest and will be increased in 2002 pending final evaluations.