Research Progress Report for 1994

Potato Breeding and Selection

Submitted to the

San Luis Valley Research Center Committee

and the

Colorado Potato Administrative
Committee (Area II)

by

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San Luis Valley Research Center

RESEARCH PROGRESS REPORT FOR 1994

Potato Breeding and Selection

and

Physiological and Cultural Studies on Potatoes

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Research was conducted in the following areas in 1994:

A) Potato Breeding
B) Seedling Selection and Clonal Development (includes data collected on field growth characteristics and postharvest evaluations if appropriate)
   - Preliminary Trial
   - Intermediate Trial
   - Advanced Yield Trial
   - Western Regional Main Trial
   - Chipping Study
   - Western Regional Chip Trial
   - Western Regional Red Trial
   - Out-of-State Trials
   - Grower Evaluations
C) Russet Norkotah Selection Study
D) Simulated Hail Study
E) Sugar Profiles for Processing Cultivars

Figure 1 is a simplified flow chart depicting the steps involved in developing a new potato cultivar. The reader may desire to refer to this figure while reviewing the "Potato Breeding" and "Seedling Selection and Clonal Development" sections of this report.

Figure 2 presents statistics on the primary cultivars grown in the San Luis Valley in 1994. Cultivars released by CSU or in cooperation in other agencies accounted for 62.5% of the potato acreage planted in the San Luis Valley.

POTATO BREEDING

Fifty-four parental clones were intercrossed in 1994. Seeds from 156 combinations were obtained. Eighty seedling families were grown in the

greenhouse producing 26,007 tubers for initial field selection in 1995. Surplus tubers will be distributed to Idaho, Minnesota, Oregon, Texas, and Alberta, Canada.

Seedling tubers were obtained from Dr. J. J. Pavek, USDA-ARS, Aberdeen, Idaho; Dr. J. Creighton Miller, Texas A&M, Lubbock, Texas; Dr. Dermot Lynch, Agriculture Canada, Lethbridge, Alberta; Dr. Gary Secor, North Dakota State University, Fargo, North Dakota; Dr. Kathleen Haynes, USDA-ARS, Beltsville, Maryland; and Dr. Robert E. Hanneman, USDA-ARS, Madison, Wisconsin. Materials received from Wisconsin are part of the USDA Potato Germplasm Enhancement Project lead by Dr. Hanneman.

SEEDLING SELECTION AND CLONAL DEVELOPMENT

A total of 71,212 first-year seedlings were planted with 592 being selected at harvest for further observation. Another 647 clones were in 12-hill, preliminary, and intermediate stages of selection. One hundred eighty nine of these clones were saved at harvest for further evaluation. Thirty-two advanced selections were saved and continent on additional evaluations will be increased in 1995. Another 210 selections were maintained for germplasm development, breeding, or other experimental purposes.

Appendix 1 lists the procedures used for the postharvest evaluations for the trials summarized in this section of the report. Appendices 2-9 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 2-9 are useful in understanding how a given selection compares with the population of clones being evaluated. Remarks regarding the results of the postharvest evaluations will generally be limited except to highlight particular clones with certain strengths or weaknesses.

Preliminary Trial. The preliminary trials (P1 and P2) are composed of selections undergoing the third and fourth cycles (years) of selection in the field. Fourth year materials (P2) selected at harvest are evaluated for several postharvest characteristics prior to being advanced to the intermediate yield trial (IYT) the following year. This allows us to start to characterize each clone for tuber quality and flag those with serious quality defects.

Nineteen selections and seven cultivars were evaluated in the preliminary trial. Results of the postharvest evaluations are presented in Tables 1A-B.

Selection AC87234-2 was susceptible to blackspot bruising and enzymatic browning. Lemhi Russet was also very susceptible to blackspot bruising and is often included as a susceptible check cultivar in blackspot evaluations.

Selections with acceptable fry color after storage were AC87138-4, AC89002-5, NDC4339-5, TX1229-2RU, TX1385-2RU, TXAV657-27, and W1005.

Intermediate Trial. The intermediate yield trial (IYT) is composed of selections undergoing the fifth cycle of selection in the field. IYT selections which are saved are entered in the advanced yield trial (AYT) the following year.

Twelve clones, 9 selections and 3 cultivars, were evaluated in the intermediate yield trial. Results on yield, grade, growth characteristics, and postharvest evaluations are summarized in Tables 2A-E.

All entries had significantly greater total and US #1 yields than Russet Norkotah. The highest yielding selection was AC88015-1.

Selection AC88289-2 was particularly susceptible to blackspot bruising again this year and will be discarded. This selection has Lemhi Russet as a parent.

Advanced Yield Trial. The advanced yield trial (AYT) is composed of selections saved from the IYT the previous year in addition to those saved from previous AYT trials prior to and after graduation for the Western Regional Trials. This would generally include selections in the 6th-8th and 12+ cycles of selection in the field.

Twenty-eight clones, 24 advanced selections and 4 cultivars, were evaluated in the advanced yield trial. Results on yield, grade, growth characteristics, and postharvest evaluations are summarized in Tables 3A-E.

Advanced russet selections in this trial that have been released to growers for evaluation or that show promise for release in 1995 are AC78069-17, AC83068-1, CO80011-5 (Crestone Russet), CO81082-1, CO82142-4, and CO85026-4. Selection CO85026-4 will be evaluated in the Western Regional Main Trial in 1995. AC78069-17 has processing potential.

Western Regional Main Trial. Twenty-two selections and six cultivars were grown in the Western Regional Trial. Selections entered by Colorado were AC83064-1, AC83064-6, AC84487-1, and CO84074-2. This cooperative trial is conducted at several locations in the Western United States. Tables 4A-E present the data collected on these selections in the Colorado trial.

Several selections had excellent yield and grade. The average total yield for the trial was 379 cwt with 81.4% US #1 tubers. Many of the selections produced acceptable french fries also.

All of the Colorado entries are currently released to growers for evaluation and will be tested again in this trial in 1995. AC83064-6 and AC84487-1 has shown some processing potential, but low specific gravities may present a problem for both selections.

Chipping Studies. Forty-five clones, 40 selections and 5 cultivars, were tested for chipping potential after various storage regimes. Additional information on postharvest characteristics was collected on eighteen of these selections. Data from this study are summarized in Tables 5A-B. Appendix 9 shows the percent of the samples producing acceptable chip

after the various storage regimes. This figure also includes information for the Western Regional Chip Trial.

Of the selections and cultivars evaluated, 38% could be classified as "cold" chippers (produced acceptable chips after 7 weeks of 40F storage and/or with reconditioning after storage at 40F). More advanced selections with excellent chip ratings were AC87313-3, CO87017-5, and BC0894-2.

The only selection very susceptible to blackspot bruising was AC88456-6. This selection also had the highest specific gravity (1.105).

Western Regional Chip Trial. The Colorado Western Regional Chip Trial also included intermediate and advanced chipping selections from our program that were not formally entered into the regional trial. Trial results are presented in Tables 6A-E.

Advanced selections and recently named cultivars that have shown considerable potential in this trial in the current or past years are AC83306-1 and Chipeta. Selection AC83306-1 will be discarded however because commercial trials showed potential for blackspot bruise problems.

BC0894-2 was formally entered into the 1994 Western Regional Chip Trial. BC0894-2 is early maturing and shows potential as a "cold" chipper. Several other selections also show potential as "cold" chippers.

AC88456-6 and Atlantic were very susceptible to blackspot bruising in this trial. AC88456-6 will be discarded from further increase.

Western Regional Red Trial. This was the second year for a formalized Western Regional Red Trial. The Colorado Western Regional Red Trial also included red selections from our program that were not formally entered into the regional trial. Trial results are summarized in Tables 7A-E.

Three red selections [CO86142-3 (NDTX302-1 x Redsen), CO86218-2 (Sangre x NDTX9-1069-11R), COTX86146-2 (NDTX9-1068-11R x Chieftain)] originating in Colorado were entered in the 1994 Western Regional Red Trial and will be reevaluated in 1995. The parents for each selection are listed in the parenthesis.

Few of the selections had yields greater (total and US #1) than Sangre-14. Stand problems were observed for all of the NDO entries from Oregon. This affected overall yield and grade of these selections.

None of the reds had any significant levels of blackspot bruising. Several reds had significant levels of enzymatic browning.

Out-of-State Trials. Testing of advanced clones in other states is an ongoing part of the breeding and selection project. California is the primary out-of-state testing area. Considerable testing is also conducted in Texas and Arizona. Currently a limited amount of testing is conducted in Utah.

Generally selections are evaluated in both observational and yield trials in these areas. Our cooperators are: California - Dr. Ron Voss, University of California and Johnston Farms; Texas - Dr. J. Creighton Miller, Jr. and Doug Smallwood, Texas A&M; and Arizona - Pinto Creek Management, Mr. Buzz Shahan; and Utah - Mr. Loren Nelson.

Thirty-seven selections (29 russets, 2 reds, and 6 chippers) were tested at Johnston Farms in California in 1994. Many of these selections showed promise will be retested in 1995. Fifty-six selections were sent to Dr. Ron Voss for selection.

Nine advanced selections were tested in Arizona. The most promising will be reevaluated in 1995. Two more advanced selections that show considerable potential for both California and Arizona are AC83064-1 and AC83064-6.

Grower Tests. Grower evaluations were conducted on nine russets (AC78069-17, AC83064-1, AC83064-6, AC83068-1, AC84487-1, CO80011-5, CO84074-2, CO81082-1, and CO82142-4) and one chipper (AC83306-1). Selection AC83306-1 was discarded from further evaluation. CO80011-5 (Crestone Russet) will be named in 1995. The rest of the selections will be evaluated by growers again in 1995.

CO85026-4 will be released for initial grower evaluations in 1995. Data on this selection and other advanced selections are summarized in Table 8.

Cultivar Releases. Growers recommended naming CO80011-5 (Crestone Russet). Some concern arose in 1993 and again in 1994 regarding release because of production problems. Growers at the end of the growing season however recommend release. CO80011-5 will be released by the Colorado Agricultural Experiment Station in mid 1995 as a high yielding, medium-early maturing, fresh market potato.

Century Russet (A74212-1E), a high yielding, medium-late maturing, fresh market cultivar, will be named and released in 1995 jointly by the Oregon, Idaho, Washington, Colorado, California, and Texas Agricultural Experiment Stations and the USDA-ARS.

RUSSET NORKOTAH SELECTION STUDIES

The objective of this study is to determine if improvement in Russet Norkotah could be made through clonal selection for larger vines and later maturity.

Forty clonal selections of Russet Norkotah were selected from two tuber-united certified seed lots in 1990. These selections were increased and evaluated for vine vigor in 1991 and 1992. Additionally another 10 selections were made from a seed lot at the SLV Research Center in 1991 and increased and evaluated for vine vigor in 1992.

Eleven of the original 50 clonal selections were retained for further evaluation in yield trials in 1993 and 1994. Nitrogen was applied at a

rate of 140 lbs/acre both years. Significant differences were again observed among the selections for yield, grade, maturity and other growth characteristics in 1994 (Tables 9A-B).

Selections 2, 3, 4 and 8 had significantly greater total yields than clone 14, the standard Russet Norkotah from the SLV Research Center. Selections 3 and 8 had significantly greater US #1 yields than clone 14. Selections 3 and 8 have consistently performed better than the standard over the two years. Selection 2 tends to have a high yield of <4 oz tubers. Additional cultural management studies may be useful in maximizing the yield and grade of this selection.

Plantlets of selections 2, 3, and 8 have been cleaned-up of virus are currently being micropropagated by several Colorado seed growers.

INFLUENCE OF SIMULATED HAIL DAMAGE ON YIELD AND GRADE

The influence of simulated hail on yield and grade of Ranger Russet and Russet Nugget was studied. Hail damage was simulated using a weed eater to remove foliage amounts of 30, 60, or 30% + 30%. The treatments were applied on July 21. The combined defoliation was additionally treated on August 5. The purpose of this additional treatment was to determine the effect of successive hails on potato plants. Results of this study are summarized in Table 10.

There was a significant cultivar x hail damage interaction for all variables. This indicates that the two cultivars, Ranger Russet and Russet Nugget, reacted differently to the simulated hail treatments. Ranger Russet sustained 22 and 26% loss respectively for total and US #1 yields with 60% simulated damage. Comparable values for Russet Nugget were 33 and 32%. The combined defoliation treatment loss was very similar to the loss observed for the 60% defoliation for Ranger Russet. However for Russet Nugget, the combined defoliation treatment resulted in a greater yield loss than for the 60% defoliation treatments. These results suggest that Russet Nugget was more susceptible to simulated hail than Ranger Russet. This may be partially explained by the fact that Ranger Russet bulks tubers earlier so that a late season hail should have less influence on yield.

Results of the last two years suggests that loss from successive hails will be equal to or greater than the sum of each individual hail depending on the year, timing of treatments, and the cultivar.

SUGAR PROFILES FOR PROCESSING CULTIVARS

Sugar profiles for various processing cultivars are presented in Figures 3-6. Generally sucrose values of $\leq$2.0 mg/g tuber are acceptable. A comparable value for glucose would be $\leq$0.35 mg/g tuber.

These results would suggest that the russets (Figures 3-4) were chemically immature (sucrose values >2.0 mg/g tuber) at harvest. This resulted in a significant increase in glucose during storage that would result in dark

french fries. For the chippers, acceptable levels of sucrose were reached by harvest (they were chemically mature). This resulted in acceptable levels of glucose during storage which should result in acceptable chip color during storage.

FIGURE 1. POTATO BREEDING AND SELECTION FLOW CHART

SLV Research Center - David G. Holm

Colorado State University - Agricultural Experiment Station

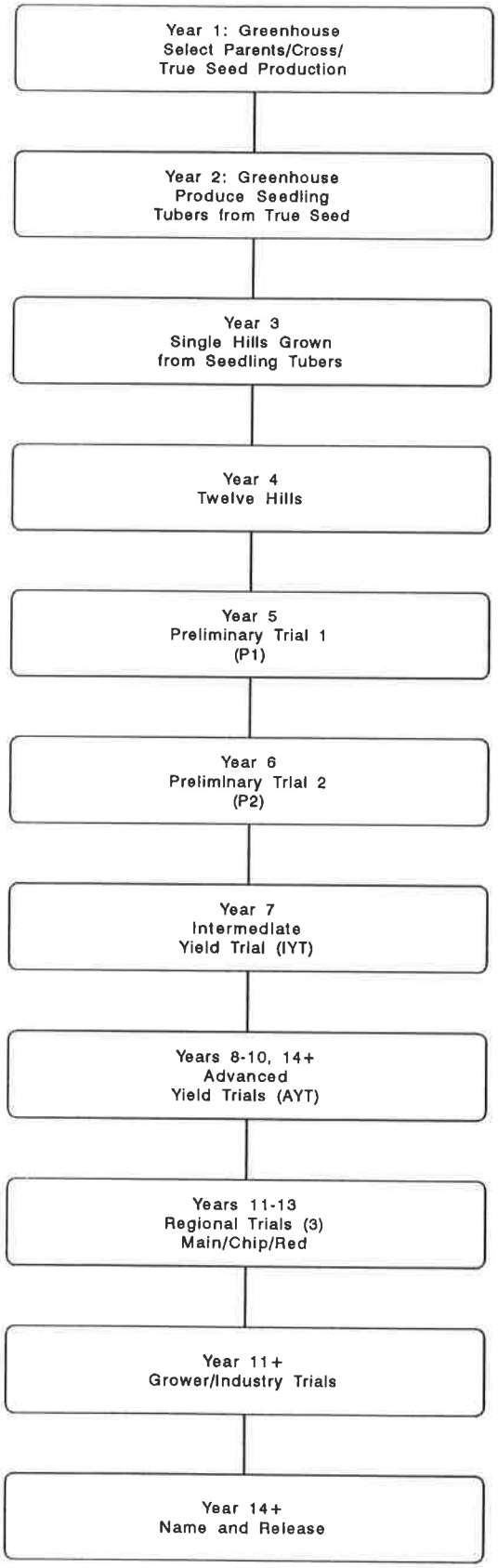


FIGURE 2. PRIMARY SLV POTATO CULTIVARS - 1994

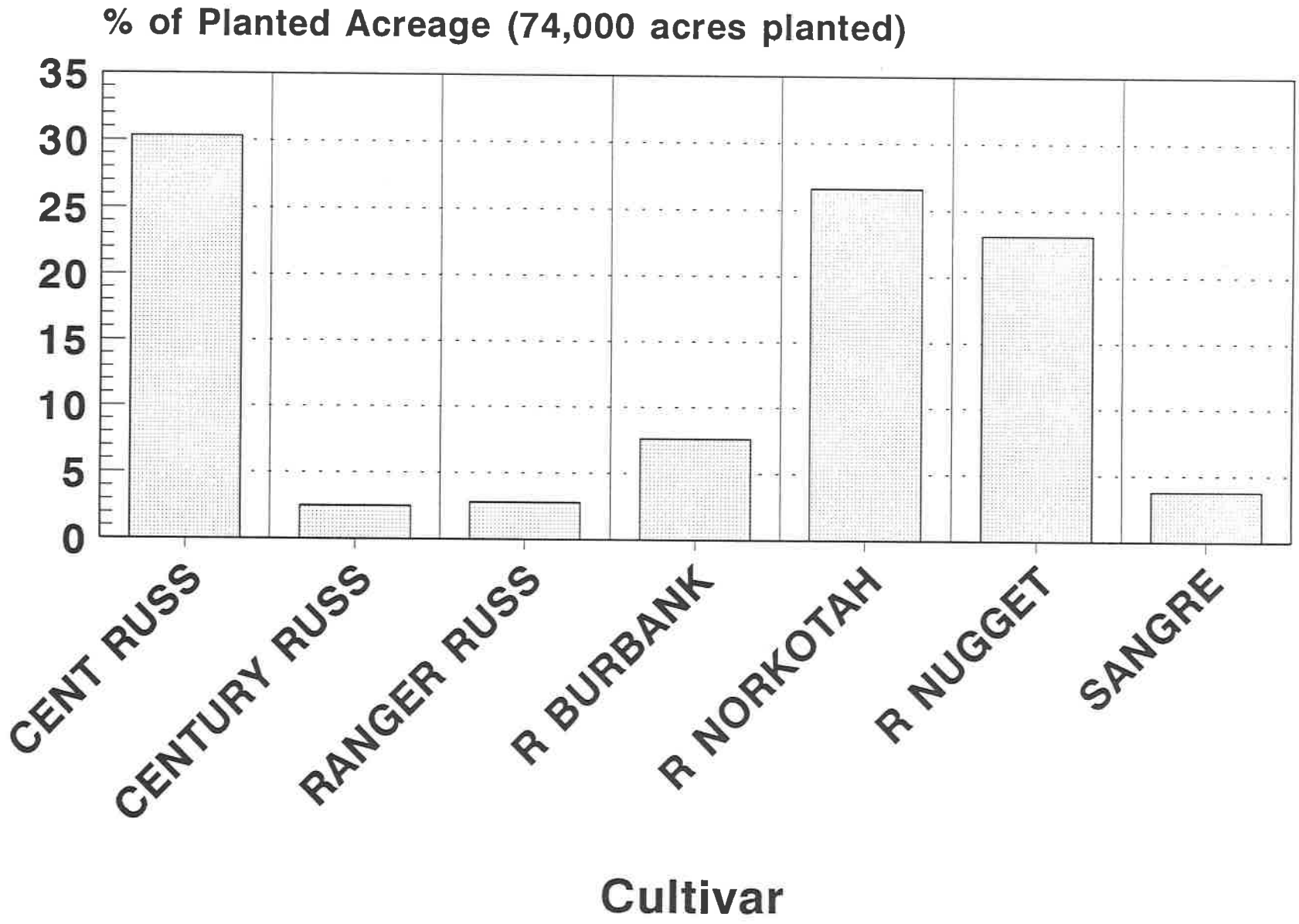


Table 1A. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for preliminary yield trial clones - 1994.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
AC87079-3	5.0	4.7	4.9	4.9	114	4.4
AC87138-4	4.9	4.7	4.8	4.8	121	3.6
AC87210-2	5.0	5.0	5.0	5.6	121	4.2
AC87234-2	2.9	5.0	4.0	3.9	121	1.6
AC89002-5	4.9	4.6	4.8	4.4	114	4.0
AC89021-2	5.0	5.0	5.0	5.0	114	4.2
AC89047-1	5.0	5.0	5.0	5.2	114	4.8
CO89036-10	5.0	5.0	5.0	5.3	128	4.6
CO89037-7	4.1	4.6	4.4	5.3	114	4.8
CO89042-4	4.9	5.0	5.0	4.0	92	3.6
CO89045-5	5.0	4.8	4.9	3.6	92	4.0
CO89097-2	4.6	4.6	4.6	7.3	78	4.6
NDC4339-5	4.1	3.5	3.8	11.2	78	3.4
NDTX3773-1RU	5.0	5.0	5.0	6.1	113	4.2
TX1229-2RU	5.0	3.5	4.3	5.0	127	4.8
TX1385-12RU	4.0	4.5	4.3	4.1	71	4.4
TXAV657-27	4.6	5.0	4.8	4.0	106	4.6
W1005	4.5	5.0	4.8	5.0	92	4.4
W1099	5.0	5.0	5.0	5.6	92	4.6
Centennial Russet	4.9	4.9	4.9	7.2	119	3.8
Lemhi Russet	1.9	3.8	2.9	3.8	113	2.2
Ranger Russet	4.7	4.6	4.7	4.5	73	3.6
Russet Burbank	5.0	5.0	5.0	3.5	126	4.0
Russet Nugget	5.0	5.0	5.0	4.5	102	3.8
Shepody	5.0	5.0	5.0	3.3	106	4.6
Sangre-14	5.0	5.0	5.0	4.7	106	3.8

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

[2]Tubers were stored at 45F for a three month period.

[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 1B. Specific gravity, french fry color, and texture for preliminary trial clones - 1994.

Clone	Specific Gravity	Fry Color[1]		Fry Texture[2]	
		At Harvest	7 wks 50F+ 8 wks 45F	At Harvest	7 wks 50F+ 8 wks 45F
AC87079-3	1.083	2	3	4	4
AC87138-4	1.081	2	2	2	3
AC87210-2	1.069	3	3	3	3
AC87234-2	1.072	4	4	4	3
AC89002-5	1.082	2	2	4	4
AC89021-2	1.082	2	3	3	4
AC89047-1	1.088	3	3	3	4
CO89036-10	1.074	4	4	2	2
CO89037-7	1.076	2	3	3	3
CO89042-4	1.094	3	4	3	3
CO89045-5	1.077	4	3	3	2
CO89097-2	1.071	3	3	4	3
NDC4339-5	1.072	2	2	2	2
NDTX3773-1RU	1.076	4	4	2	2
TX1229-2RU	1.081	2	1	3	3
TX1385-12RU	1.077	1	1	3	3
TXAV657-27	1.078	2	2	3	3
W1005	1.079	1	1	3	3
W1099	1.068	2	3	3	4
Centennial Russet	1.075	4	4	2	3
Lemhi Russet	1.078	3	3	3	3
Ranger Russet	1.079	2	3	3	3
Russet Burbank	1.077	2	2	4	3
Russet Nugget	1.079	2	3	5	4
Shepody	1.071	2	3	3	3
Sangre-14	1.072	3	3	2	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, with 1 representing a soggy, wet texture.

Table 2A. Yield, grade, tuber shape, and skin type for intermediate yield trial clones - 1994.

Clone	Yield (Cwt/A) Total	US #1 Total	US #1 %	US #1 >10 oz	US #1 <4 oz	Tuber Shape & Skin Type[1]
AC88015-1	466	350	76.4	133	103	L,Ru
AC88042-1	360	299	83.4	42	58	L,Ru
AC88070-3	346	305	88.2	89	32	L,Ru
AC88092-1	277	244	87.8	82	34	L,Ru
AC88162-4	370	306	82.6	86	58	L,Ru
AC88165-3	369	310	84.1	88	56	L,Ru
AC88289-2	351	324	92.3	184	18	L,Ru
CO88043-3	332	273	82.2	77	53	L,Ru
NDC4092-3	292	183	63.0	26	109	Ob,Ru
Centennial Russet	301	268	89.0	37	32	Ob,Ru
Russet Norkotah	174	144	82.0	52	27	L,Ru
Russet Nugget	424	344	81.1	71	74	Ob,Ru
Mean	338	279	82.7	81	54	-----
LSD[2] (0.05)	71	40	12.2	41	NS	-----

[1]Tuber shape & skin type: Ob=oblong; L=long; Ru=russet.

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

Table 2B. Grade defects for intermediate yield trial clones - 1994.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
AC88015-1	1.1	GC*,MS*	0.0
AC88042-1	0.7	MS*	0.0
AC88070-3	2.8	GC*	0.0
AC88092-1	0.0		0.0
AC88162-4	1.6	GC,MS*	0.0
AC88165-3	0.8	GC,MS*	0.0
AC88289-2	2.7	SG,GC,MS*	0.0
CO88043-3	2.0	MS*	0.0
NDC4092-3	0.0		0.0
Centennial Russet	0.4	GC*	0.0
Russet Norkotah	1.9	MS*	0.0
Russet Nugget	1.2	SG,GC*,MS	0.0

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

[2]SG=second growth; GC=growth crack; MS=misshapen; 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 2C. Growth characteristics of intermediate yield trial clones - 1994.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
AC88015-1	98	2.5	3.0	3.2	3.5	2.0	2.5
AC88042-1	100	3.0	3.0	3.0	4.0	3.0	3.0
AC88070-3	96	3.0	3.0	3.6	3.5	2.5	4.0
AC88092-1	96	3.0	2.0	3.7	2.0	2.5	1.0
AC88162-4	98	3.0	3.0	3.8	5.0	3.0	4.0
AC88165-3	98	3.5	3.0	3.6	4.0	2.0	2.5
AC88289-2	96	4.0	3.0	2.4	3.0	4.0	2.0
CO88043-3	98	3.0	3.0	4.4	3.0	1.5	2.5
NDC4092-3	100	3.0	3.0	4.3	2.5	3.0	1.0
Centennial Russet	98	3.5	3.0	3.3	3.0	3.0	3.0
Russet Norkotah	94	1.0	1.5	2.6	1.0	3.0	1.0
Russet Nugget	96	3.0	3.0	3.9	5.0	3.0	3.0
Mean	97	3.0	2.8	3.5	3.3	2.7	2.5
LSD[6] (0.05)	NS	0.8	0.5	0.8	0.8	0.7	0.8

[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 2D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for intermediate yield trial clones - 1994.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
AC88015-1	4.8	5.0	4.9	4.8	50	3.6
AC88042-1	5.0	5.0	5.0	9.2	99	3.4
AC88070-3	3.8	2.7	3.3	3.9	113	2.8
AC88092-1	4.8	3.6	4.2	3.7	78	3.4
AC88162-4	4.9	4.2	4.6	3.6	106	3.2
AC88165-3	4.8	5.0	4.9	3.8	64	3.6
AC88289-2	2.5	4.0	3.3	4.4	113	4.8
CO88043-3	5.0	5.0	5.0	5.9	50	3.6
NDC4092-3	5.0	5.0	5.0	3.2	85	2.8
Centennial Russet	5.0	5.0	5.0	6.7	71	4.0
Russet Norkotah	5.0	4.9	5.0	1.0	99	3.6
Russet Nugget	5.0	5.0	5.0	3.4	99	4.2

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

[2]Tubers were stored at 45F for a three month period.

[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 2E. Specific gravity, french fry color, and texture for intermediate yield trial clones - 1994.

Clone	Specific Gravity	Fry Color[1]		Fry Texture[2]	
		At Harvest	4 wks 50F+ 8 wks 45F	At Harvest	4 wks 50F+ 8 wks 45F
AC88015-1	1.067	3	3	3	3
AC88042-1	1.075	2	2	4	3
AC88070-3	1.080	3	3	2	3
AC88092-1	1.073	3	2	3	2
AC88162-4	1.092	4	4	3	4
AC88165-3	1.076	3	3	3	4
AC88289-2	1.084	2	2	2	3
CO88043-3	1.073	4	4	3	3
NDC4092-3	1.080	1	2	4	4
Centennial Russet	1.077	4	4	2	2
Russet Norkotah	1.073	3	3	3	2
Russet Nugget	1.085	1	2	4	4

[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, with 1 representing a soggy, wet texture.

Table 3A. Yield, grade, tuber shape, and skin type for advanced yield trial clones - 1994.

Clone	Yield (Cwt/A)					Tuber Shape & Skin Type[1]
	Total	US #1				
		Total	%	>10 oz	<4 oz	
AC78069-17	426	368	86.4	205	36	Ob,Ru
AC82359-1	338	296	87.0	113	36	L,Ru
AC82363-3	470	425	90.4	171	38	Ob,Ru
AC83068-1	480	427	89.0	138	43	Ob,Ru
AC84437-2	456	409	89.7	164	24	Ob,Ru
AC87084-3	457	430	94.3	221	18	Ob,Ru
AC87123-1	343	289	84.1	106	44	Ob,Ru
AC87123-4	325	281	86.4	71	35	Ob,Ru
CO80011-5	388	323	82.7	112	44	L,Ru
CO81082-1	317	277	87.5	103	36	L,Ru
CO82142-4	347	322	92.8	171	16	L,Ru
CO85026-4	383	357	93.4	143	9	L,Ru
CO86030-1	476	443	93.1	248	27	L,Ru
CO86051-3	381	314	82.4	157	31	L,Ru
CO86153-2	398	320	80.2	114	45	Ob,Ru
CO87009-4	370	299	80.8	50	66	Ob,Ru
CO87062-5	343	301	87.4	167	16	L,Ru
CO87062-6	348	296	85.3	156	18	L,Ru
CO87090-5	401	365	90.8	207	26	Ob,Ru
CO87140-3	351	288	81.9	56	54	Ob,Ru
TC1406-1	397	332	83.6	85	64	L,Ru
TC1412-5	404	346	85.4	131	38	L,Ru
TX1216-1RU	311	235	75.4	52	73	Ob,Ru
TXAV657-27	397	321	80.9	103	68	L,Ru
Centennial Russet	287	236	82.2	47	43	Ob,Ru
Ranger Russet	411	369	89.2	209	24	L,Ru
Russet Norkotah	235	196	82.2	86	33	L,Ru
Russet Nugget	397	316	79.6	75	72	Ob,Ru
Mean	380	328	85.9	131	39	-----
LSD[2] (0.05)	53	56	5.5	50	11	-----

[1]Tuber shape & skin type: Ob=oblong; L=long; Ru=russet.

[2]LSD=least significant difference.

Table 3B. Grade defects for advanced yield trial clones - 1994.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
AC78069-17	5.2	GC,MS*	0.0
AC82359-1	2.0	GC,MS*,GR	0.0
AC82363-3	1.5	GC,MS*,GR	0.0
AC83068-1	1.9	GC*	0.0
AC84437-2	5.1	GC*,MS*	0.0
AC87084-3	1.9	GC*,MS	0.0
AC87123-1	3.0	GC*,MS	0.0
AC87123-4	2.7	GC,MS*	0.0
CO80011-5	5.3	GC*,MS	0.0
CO81082-1	1.2	MS*	0.0
CO82142-4	2.4	GC*,MS*	0.0
CO85026-4	4.3	SG,GC*	0.0
CO86030-1	1.3	GC*,MS*,GR	0.0
CO86051-3	9.3	GC*,MS,GR	0.0
CO86153-2	8.3	GC*,MS	0.0
CO87009-4	1.2	GC,MS*	0.0
CO87062-5	7.7	GC,MS*	0.0
CO87062-6	9.6	GC,MS*	0.3
CO87090-5	2.4	GC,MS*,GR	0.0
CO87140-3	2.5	GC*	0.7
TC1406-1	0.3	GC*,MS*	0.0
TC1412-5	5.2	GC*,MS	0.0
TX1216-1RU	0.7	SG*,MS,GR	0.3
TXAV657-27	1.8	GC*,MS*,GR	0.0
Centennial Russet	2.6	GC*,MS	0.0
Ranger Russet	4.5	SG*,MS,GR	0.0
Russet Norkotah	2.7	MS*	0.0
Russet Nugget	2.5	GC,MS*,GR	0.0

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

[2]SG=second growth; GC=growth crack; MS=misshapen; 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 3C. Growth characteristics of advanced yield trial clones - 1994.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
AC78069-17	98	2.8	3.0	4.1	4.2	2.8	3.0
AC82359-1	99	3.0	2.0	2.8	4.0	2.5	3.2
AC82363-3	99	2.5	3.0	3.2	4.5	3.2	3.8
AC83068-1	98	3.2	2.8	3.8	4.0	2.5	3.0
AC84437-2	98	2.8	3.2	3.5	4.0	3.2	3.0
AC87084-3	98	3.0	4.0	4.6	5.0	3.5	3.2
AC87123-1	98	2.5	3.0	3.4	3.0	2.2	2.0
AC87123-4	95	2.8	2.5	3.0	3.0	2.5	1.5
CO80011-5	97	2.2	2.8	4.2	3.0	2.0	2.2
CO81082-1	95	2.2	2.2	3.5	2.8	2.8	2.0
CO82142-4	98	3.0	2.0	3.7	3.8	2.8	3.0
CO85026-4	100	3.8	2.2	2.8	3.0	2.8	3.5
CO86030-1	98	3.0	3.0	3.8	3.5	2.0	4.0
CO86051-3	97	3.0	1.2	4.1	3.0	2.0	3.0
CO86153-2	98	2.5	2.8	5.1	4.0	2.8	3.8
CO87009-4	97	2.2	2.5	3.5	4.0	3.2	3.0
CO87062-5	100	3.2	2.8	3.0	2.8	2.0	1.5
CO87062-6	99	3.2	2.8	3.0	3.0	2.8	1.0
CO87090-5	99	3.5	3.5	4.1	4.0	3.8	3.0
CO87140-3	99	3.2	2.5	3.8	3.2	2.5	2.8
TC1406-1	99	3.0	3.5	5.4	4.2	3.2	2.8
TC1412-5	98	3.0	3.0	3.2	4.2	3.8	3.0
TX1216-1RU	98	3.0	3.2	5.0	2.5	2.5	1.0
TXAV657-27	100	3.2	3.8	5.8	3.8	2.8	2.0
Centennial Russet	97	3.2	2.0	3.0	3.0	3.8	2.8
Ranger Russet	97	3.0	2.8	2.8	4.0	2.8	3.0
Russet Norkotah	97	1.5	2.5	2.9	1.8	3.0	1.0
Russet Nugget	99	3.0	3.2	3.7	5.0	2.2	3.8
Mean	98	2.9	2.8	3.8	3.6	2.8	2.7
LSD[6] (0.05)	NS	0.9	0.7	0.9	0.5	0.7	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 3D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for advanced yield trial clones - 1994.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
AC78069-17	5.0	5.0	5.0	3.7	99	4.2
AC82359-1	4.2	4.4	4.3	4.1	85	3.6
AC82363-3	5.0	4.4	4.7	4.6	99	4.0
AC83068-1	4.1	4.1	4.1	3.6	106	3.4
AC84437-2	5.0	4.3	4.7	3.7	106	4.0
AC87084-3	4.6	4.1	4.4	4.8	78	2.2
AC87123-1	4.8	3.9	4.4	4.2	57	2.8
AC87123-4	5.0	5.0	5.0	4.1	71	2.6
CO80011-5	4.7	5.0	4.9	4.4	78	3.8
CO81082-1	5.0	4.8	4.9	4.6	64	3.6
CO82142-4	5.0	5.0	5.0	4.1	64	3.8
CO85026-4	5.0	4.8	4.9	3.7	85	3.8
CO86030-1	5.0	5.0	5.0	3.7	85	3.6
CO86051-3	4.8	4.9	4.9	3.9	85	4.2
CO86153-2	4.8	5.0	4.9	4.4	106	3.2
CO87009-4	5.0	5.0	5.0	3.7	99	4.0
CO87062-5	5.0	4.6	4.8	4.1	113	4.2
CO87062-6	4.8	5.0	4.9	4.4	92	3.6
CO87090-5	3.9	4.8	4.4	5.1	92	3.0
CO87140-3	5.0	4.3	4.7	3.3	99	2.6
TC1406-1	5.0	4.0	4.5	3.9	71	2.8
TC1412-5	4.5	4.4	4.5	3.6	106	2.6
TX1216-1RU	5.0	4.8	4.9	4.1	64	3.0
TXAV657-27	4.7	3.9	4.3	5.3	85	2.6
Centennial Russet	5.0	5.0	5.0	7.3	85	4.4
Ranger Russet	5.0	4.9	5.0	3.5	64	3.4
Russet Norkotah	5.0	5.0	5.0	4.2	106	3.8
Russet Nugget	4.8	5.0	4.9	3.5	99	4.2

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

[2]Tubers were stored at 45F for a three month period.

[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 3E. Specific gravity, french fry color, and texture for advanced yield trial clones - 1994.

Clone	Specific Gravity	Fry Color[1]		Fry Texture[2]	
		At Harvest	4 wks 50F+ 8 wks 45F	At Harvest	4 wks 50F+ 8 wks 45F
AC78069-17	1.080	1	2	3	3
AC82359-1	1.083	2	2	2	3
AC82363-3	1.092	2	2	3	3
AC83068-1	1.076	3	3	3	2
AC84437-2	1.085	2	3	4	4
AC87084-3	1.091	1	2	3	4
AC87123-1	1.080	2	3	3	3
AC87123-4	1.074	2	3	3	3
CO80011-5	1.068	3	3	3	3
CO81082-1	1.072	4	4	3	3
CO82142-4	1.080	3	4	3	3
CO85026-4	1.079	2	3	1	1
CO86030-1	1.075	2	1	4	4
CO86051-3	1.074	2	1	4	4
CO86153-2	1.075	1	3	3	3
CO87009-4	1.091	1	2	4	3
CO87062-5	1.073	1	1	3	3
CO87062-6	1.066	2	2	3	2
CO87090-5	1.068	2	2	4	3
CO87140-3	1.085	1	1	4	4
TC1406-1	1.084	1	2	4	4
TC1412-5	1.093	2	2	4	4
TX1216-1RU	1.071	4	3	3	3
TXAV657-27	1.081	2	2	3	3
Centennial Russet	1.075	4	4	2	2
Ranger Russet	1.078	2	2	2	2
Russet Norkotah	1.072	2	2	3	3
Russet Nugget	1.085	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, with 1 representing a soggy, wet texture.

Table 4A. Yield, grade, tuber shape, and skin type for Western Regional Main Trial clones - 1994.

Clone	Yield (Cwt/A) Total	US #1 Total	US #1 %	US #1 >10 oz	US #1 <4 oz	Tuber Shape & Skin Type[1]
A81286-1	435	379	86.8	115	49	Ob,Ru
A81386-1	396	314	79.1	109	73	Ob,Ru
A8333-5	423	355	83.5	141	61	Ob,Ru
A8390-3	354	321	90.6	112	29	L,Ru
A83115-12	405	357	88.0	111	41	Ob,Ru
A8495-1	352	227	64.3	39	122	L,Ru
A84118-3	398	332	83.2	90	53	L,Ru
A84180-8	393	318	81.0	122	61	L,Ru
AC83064-1	443	400	90.2	223	28	L,Ru
AC83064-6	388	355	91.4	149	27	L,Ru
AC84487-1	275	227	82.3	80	41	L,Ru
AO80432-1	292	236	80.8	62	49	L,Ru
AO8478-1	381	299	78.4	123	51	Ob,Ru
AO84275-3	425	349	81.2	105	69	Ob,Ru
AO85165-1	436	382	87.4	201	48	L,Ru
ATX84706-2RU	341	303	88.6	154	25	Ob,Ru
CO84074-2	330	271	82.1	77	56	Ob,Ru
COO8390-1	438	320	72.8	75	113	Ob,Ru
M-12	402	260	65.0	68	121	L,Ru
M-15	437	302	68.9	102	113	L,Ru
NDO2904-7	325	273	83.5	179	45	L,Ru
TX1229-2RU	378	320	84.6	171	32	L,W
Centennial Russet	298	243	81.6	62	50	Ob,Ru
Ranger Russet	424	371	87.4	210	37	L,Ru
Russet Burbank	456	333	73.0	75	101	L,Ru
Russet Norkotah	185	150	81.0	66	34	L,Ru
Russet Nugget	388	306	78.8	75	79	Ob,Ru
Shepody	425	351	82.6	181	53	L,W
Mean	379	309	81.4	117	59	-----
LSD[2] (0.05)	54	58	6.5	46	20	-----

[1]Tuber shape & skin type: Ob=oblong; L=long; Ru=russet; W=white.

[2]LSD=least significant difference.

Table 4B. Grade defects for Western Regional Main Trial clones - 1994.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
A81286-1	1.5	GC,MS*,GR	0.0
A81386-1	2.3	SG*,MS	0.0
A8333-5	1.6	GC*,MS,GR	0.0
A8390-3	1.0	GC*,MS	0.0
A83115-12	1.9	GC,MS*	0.0
A8495-1	0.6	MS*,GR	0.0
A84118-3	3.4	GC*,MS	0.0
A84180-8	3.4	GC*,MS*	0.0
AC83064-1	3.4	GC,MS*,GR	0.0
AC83064-6	1.6	GC*,MS	0.0
AC84487-1	2.7	GC*,MS*	0.0
AO80432-1	2.3	SG,GC,MS*	0.0
AO8478-1	8.3	GC*,MS,GR	0.0
AO84275-3	1.7	GC,MS*	0.0
AO85165-1	1.4	SG,MS*	0.0
ATX84706-2RU	4.1	GC*,MS	0.0
CO84074-2	1.1	MS*	0.0
COO8390-1	1.2	GC,MS*	0.0
M-12	5.3	SG*,MS,GR	1.2
M-15	5.0	SG*,MS	0.4
NDO2904-7	2.4	SG*,MS	0.0
TX1229-2RU	6.9	GC*,MS	0.0
Centennial Russet	1.5	GC*,MS	0.0
Ranger Russet	3.9	SG*,GC	0.0
Russet Burbank	4.9	SG*,GC,MS	2.2
Russet Norkotah	0.6	SG*	0.0
Russet Nugget	0.9	MS*	0.0
Shepody	5.0	SG,MS*,GR	0.7

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

[2]SG=second growth; GC=growth crack; MS=misshapen; 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 Western Regional Main Trial clones - 1994.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
A81286-1	99	2.8	3.0	3.5	4.0	2.0	4.0
A81386-1	98	3.0	2.8	4.0	4.0	2.0	3.0
A8333-5	98	3.5	3.0	3.9	3.8	2.2	3.5
A8390-3	92	3.0	3.0	3.2	3.2	3.0	2.0
A83115-12	98	2.8	3.5	3.7	4.5	2.8	3.5
A8495-1	97	2.5	3.0	2.7	3.5	3.0	3.0
A84118-3	100	3.0	3.0	2.7	4.8	3.0	4.0
A84180-8	99	3.2	2.8	3.1	4.2	2.8	2.8
AC83064-1	98	3.0	3.0	3.8	4.0	3.0	3.0
AC83064-6	99	3.2	3.0	3.1	4.0	3.2	3.0
AC84487-1	98	3.0	2.2	3.9	2.2	3.0	2.0
AO80432-1	90	2.2	3.0	3.8	3.2	2.2	3.0
AO8478-1	100	2.8	3.0	3.7	3.5	2.0	3.2
AO84275-3	97	3.0	3.0	3.6	4.0	2.8	3.2
AO85165-1	97	2.0	2.5	2.4	4.0	3.2	3.2
ATX84706-2RU	98	2.8	3.2	3.0	3.0	2.2	1.5
CO84074-2	95	2.8	2.0	3.1	3.5	3.0	2.0
COO8390-1	97	3.0	3.0	4.6	4.0	2.8	3.0
M-12	97	3.2	4.0	3.3	5.0	3.2	4.0
M-15	99	3.2	3.8	3.6	4.0	3.0	2.8
NDO2904-7	97	2.8	3.0	2.8	3.0	2.8	2.0
TX1229-2RU	98	3.0	3.2	3.1	3.2	2.8	2.0
Centennial Russet	98	3.0	2.8	3.0	3.0	3.8	3.0
Ranger Russet	96	2.8	3.0	3.3	3.8	2.5	2.8
Russet Burbank	98	3.2	3.8	3.3	4.2	3.2	2.8
Russet Norkotah	93	1.5	2.0	3.5	1.2	3.0	1.5
Russet Nugget	99	3.0	3.2	3.8	5.0	2.5	3.5
Shepody	97	3.2	3.8	4.0	4.0	3.0	2.5
Mean	97	2.9	3.0	3.4	3.7	2.8	2.8
LSD[6] (0.05)	4	0.7	0.5	0.8	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.

Table 4D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Western Regional Main Trial clones - 1994.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
A81286-1	4.9	4.7	4.8	4.2	99	3.0
A81386-1	5.0	5.0	5.0	3.7	99	2.4
A8333-5	5.0	4.6	4.8	3.1	92	2.2
A8390-3	4.4	4.5	4.5	5.4	71	4.2
A83115-12	5.0	5.0	5.0	5.4	64	3.4
A8495-1	4.6	4.1	4.4	4.2	113	3.4
A84118-3	5.0	5.0	5.0	3.0	99	4.6
A84180-8	5.0	5.0	5.0	4.2	113	3.6
AC83064-1	5.0	5.0	5.0	3.6	71	4.8
AC83064-6	4.9	4.9	4.9	4.3	71	4.6
AC84487-1	5.0	4.2	4.6	6.9	99	4.0
AO80432-1	4.7	4.4	4.6	3.2	85	3.8
AO8478-1	4.6	3.5	4.1	5.0	78	2.6
AO84275-3	5.0	4.8	4.9	3.6	99	3.2
AO85165-1	5.0	5.0	5.0	4.2	99	3.0
ATX84706-2RU	5.0	2.4	3.7	4.8	78	3.4
CO84074-2	5.0	5.0	5.0	3.3	106	4.4
COO8390-1	5.0	5.0	5.0	4.1	99	4.4
M-12	5.0	4.4	4.7	3.5	141	2.2
M-15	4.7	4.1	4.4	3.3	99	2.6
NDO2904-7	4.9	5.0	5.0	4.4	78	3.2
TX1229-2RU	4.9	2.9	3.9	4.3	106	3.2
Centennial Russet	5.0	5.0	5.0	6.9	85	4.2
Ranger Russet	5.0	4.9	5.0	3.3	50	3.2
Russet Burbank	4.6	4.8	4.7	2.6	134	3.0
Russet Norkotah	5.0	5.0	5.0	3.6	99	4.0
Russet Nugget	5.0	5.0	5.0	4.1	99	4.2
Shepody	5.0	5.0	5.0	3.1	92	4.6

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

[2]Tubers were stored at 45F for a three month period.

[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 Western Regional Main Trial clones - 1994.

Clone	Specific Gravity	Fry Color[1]		Fry Texture[2]	
		At Harvest	4 wks 50F+ 8 wks 45F	At Harvest	4 wks 50F+ 8 wks 45F
A81286-1	1.078	1	2	3	3
A81386-1	1.073	1	1	4	4
A8333-5	1.075	2	3	2	2
A8390-3	1.081	2	3	2	3
A83115-12	1.070	3	3	2	3
A8495-1	1.088	1	1	4	4
A84118-3	1.088	1	2	4	4
A84180-8	1.078	2	2	4	4
AC83064-1	1.066	4	4	2	3
AC83064-6	1.072	2	2	3	3
AC84487-1	1.068	1	2	3	3
AO80432-1	1.083	2	2	3	3
AO8478-1	1.081	3	2	3	4
AO84275-3	1.082	2	2	4	3
AO85165-1	1.075	3	3	3	3
ATX84706-2RU	1.077	2	2	4	4
CO84074-2	1.069	4	4	2	3
COO8390-1	1.081	2	3	4	4
M-12	1.080	2	2	4	4
M-15	1.076	2	2	4	4
NDO2904-7	1.070	2	2	3	3
TX1229-2RU	1.077	2	2	4	3
Centennial Russet	1.074	4	4	2	2
Ranger Russet	1.075	2	3	3	3
Russet Burbank	1.078	2	2	3	3
Russet Norkotah	1.071	2	3	3	3
Russet Nugget	1.087	1	2	4	4
Shepody	1.076	2	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, with 1 representing a soggy, wet texture.

Table 5A. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for San Luis Valley chipping study entries - 1994.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
AC83306-1	5.0	5.0	5.0	4.3	106	3.2
AC87313-3	5.0	4.1	4.6	5.4	84	4.0
AC87340-2	4.8	4.7	4.8	5.0	93	4.0
AC88356-1	4.4	4.1	4.3	4.4	99	4.8
AC88357-3	5.0	4.8	4.9	6.2	106	4.8
AC88456-6	3.5	2.5	3.0	4.7	120	5.0
AC88459-4	4.9	3.8	4.4	6.3	92	4.8
AC88637-2	3.5	3.7	3.6	5.2	92	4.8
ATX85404-8	4.8	4.4	4.6	7.1	95	3.8
B0245-15	4.8	5.0	4.9	6.5	134	4.2
BC0894-2	5.0	5.0	5.0	5.2	105	3.8
C087017-5	4.8	4.4	4.6	4.9	119	4.0
C087106-5	5.0	5.0	5.0	6.3	77	4.6
NDC4327-2	5.0	4.1	4.6	3.7	71	4.0
ND01496-1	4.9	5.0	5.0	6.1	106	4.4
W870	4.9	4.3	4.6	6.5	99	4.6
W877	3.6	4.0	3.8	6.8	85	4.6
W887	4.1	4.2	4.2	4.8	99	3.2
Atlantic	4.5	3.8	4.2	5.9	106	4.8
Chipeta	5.0	4.9	5.0	5.0	114	3.2
Mainechip	5.0	4.6	4.8	7.5	99	4.0
Norchip	4.9	4.8	4.9	8.3	106	3.8
Snowden	4.6	5.0	4.8	4.2	113	4.4

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

[2]Tubers were stored at 45F for a three month period.

[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 5B. Chip color[1] and specific gravity of San Luis Valley chipping study entries - 1994.

Clone	7 wks 40F	7 wks/40F +3 wks/60F	7 wks 50F	7 wks/50F +3 wks/60F	Specific Gravity
AC83306-1	3.5	3.0	3.0	1.5	1.075
AC87313-3	2.5	1.5	2.0	1.5	1.084
AC87340-2	2.5	1.5	1.0	2.0	1.075
AC88356-1	3.5	2.5	2.0	1.5	1.090
AC88357-3	2.0	2.5	2.0	1.0	1.087
AC88456-6	2.5	2.0	2.0	2.5	1.105
AC88459-4	2.5	3.0	1.5	2.5	1.089
AC88637-2	2.5	2.0	1.5	1.5	1.089
AC89653-3	2.5	3.0	2.5	1.5	1.088
AC90450-3	2.0	1.5	1.5	1.0	1.088
AC90450-6	2.0	3.0	1.0	2.0	1.089
AC90460-2	3.5	3.0	3.0	2.5	1.073
AC90467-1	4.0	3.5	3.0	2.0	1.086
AC90467-3	3.5	3.0	2.0	2.0	1.083
ATX85404-8	2.5	2.5	2.5	1.0	1.086
B0245-15	2.5	3.0	1.5	2.0	1.087
B0717-1	4.0	3.5	2.5	3.0	1.082
B9792-8B	3.5	1.5	2.0	1.0	1.089
BC0894-2	2.5	1.5	1.0	1.5	1.077
C087017-5	3.5	2.0	2.5	1.0	1.088
C087106-5	4.0	3.0	2.0	1.0	1.088
C090029-2	4.0	3.5	2.0	3.0	1.081
C090029-3	4.0	3.0	1.0	2.0	1.088
C090215-2	2.5	1.5	1.0	1.0	1.086
C090215-7	2.5	1.0	2.0	2.0	1.087
C090218-1	2.5	2.0	2.5	2.0	1.079
ND2417-6	3.0	3.0	2.0	1.5	1.078
ND2471-8	2.5	3.0	2.0	3.0	1.082
NDC4327-2	3.0	2.5	2.5	1.5	1.082
NDC4601-3	4.0	3.5	2.5	3.0	1.081
NDC4637-2	2.5	1.5	1.0	1.0	1.095
NDC4645-1	3.0	2.5	1.0	1.0	1.074
NDC4661-2	3.0	2.0	1.5	1.0	1.092
NDC4765-2	2.5	2.0	1.5	1.0	1.079
ND01496-1	2.5	1.5	1.5	2.0	1.085
RC92003-2	---	---	---	---	1.086
RC92003-3	---	---	---	---	1.080
W870	2.5	3.0	2.0	2.5	1.091
W877	1.5	2.5	1.5	1.5	1.095
W887	3.5	2.5	2.5	1.5	1.089
Atlantic	3.5	3.5	3.5	3.0	1.092
Chipeta	4.0	3.5	2.0	2.0	1.082
Mainechip	3.0	1.5	1.5	2.0	1.086
Norchip	2.5	3.5	1.5	2.5	1.079
Snowden	3.0	2.0	1.5	1.0	1.090

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

Table 6A. Yield, grade, tuber shape, and skin type for Western Regional Chip Trial clones - 1994.

Clone	Yield (Cwt/A) Total	US #1 Total	US #1 %	US #1 >10 oz	US #1 <4 oz	Tuber Shape & Skin Type[1]
AC83306-1	476	395	82.9	128	43	R,W
AC87313-3	471	382	81.2	55	87	R,W
AC88356-1	450	377	83.9	181	36	R,W
AC88357-3	333	291	87.5	78	38	R,W
AC88431-3	336	268	79.8	105	44	R,W
AC88456-6	333	308	92.2	107	23	R,W
AC88459-4	335	256	76.4	87	78	R,W
AC88637-2	348	313	90.1	103	34	R,W
ATX85404-8	430	347	80.5	85	77	R,W
BC0894-2	363	332	91.5	135	26	R,W
C087017-5	365	327	89.5	99	33	R,W
C087106-5	409	330	80.7	89	72	R,W
ND01496-1	326	236	71.7	70	82	R,W
Atlantic	456	414	90.7	252	29	R,W
Chipeta	495	422	85.3	208	55	R,W
Norchip	361	297	82.3	127	33	R,W
Mean	393	331	84.1	119	50	----
LSD[2] (0.05)	51	46	5.7	40	18	----

[1]Tuber shape & skin type: R=round; W=white.

[2]LSD=least significant difference.

Table 6B. Grade defects for Western Regional Chip Trial clones - 1994.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
AC83306-1	8.1	GC*,MS,GR	0.0
AC87313-3	0.5	GC*,MS*,GR*	1.1
AC88356-1	8.3	GC*,MS,GR	0.6
AC88357-3	1.2	GC*,MS	0.3
AC88431-3	7.0	GC*,MS	0.8
AC88456-6	0.7	GC*,MS	1.2
AC88459-4	0.5	GC*,GR*	0.0
AC88637-2	0.4	MS*	0.0
ATX85404-8	1.4	GC*,MS	0.0
BC0894-2	1.2	MS*	0.0
C087017-5	1.4	GC*	0.0
C087106-5	1.8	GC,MS*,GR	0.4
ND01496-1	2.3	GC*,MS	0.0
Atlantic	2.8	GC*,MS	1.3
Chipeta	3.6	SG,GC*,MS	0.0
Norchip	8.2	GC*,MS	0.0

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

[2]SG=second growth; GC=growth crack; MS=misshapen; 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 Western Regional Chip Trial clones - 1994.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
AC83306-1	99	3.0	3.8	3.9	5.0	3.0	3.2
AC87313-3	99	3.8	3.0	5.6	4.0	3.0	3.0
AC88356-1	99	3.2	3.2	4.3	4.5	3.0	3.0
AC88357-3	99	3.2	2.5	4.8	3.2	2.8	2.8
AC88431-3	99	3.2	2.8	2.4	3.0	2.0	2.0
AC88456-6	99	3.5	2.8	3.6	4.0	2.2	3.2
AC88459-4	98	3.0	3.0	3.3	3.0	3.2	2.0
AC88637-2	98	3.5	2.8	3.5	2.8	3.0	2.2
ATX85404-8	98	2.8	3.2	4.1	4.0	3.0	3.0
BC0894-2	99	3.0	3.0	2.8	2.8	2.8	1.8
C087017-5	98	3.0	3.0	3.5	4.8	3.0	4.0
C087106-5	98	3.0	3.0	3.6	4.0	3.0	3.5
ND01496-1	97	2.5	3.0	4.7	3.0	3.0	2.2
Atlantic	98	3.0	3.8	3.0	3.5	2.8	3.0
Chipeta	99	3.0	3.2	3.4	4.5	2.8	3.0
Norchip	99	3.0	2.8	3.2	2.8	3.0	2.0
Mean	98	3.1	3.0	3.7	3.7	2.8	2.8
LSD[6] (0.05)	NS	0.6	0.6	0.9	0.5	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 6D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Western Regional Chip Trial clones - 1994.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
AC83306-1	5.0	4.5	4.8	4.2	92	3.2
AC87313-3	4.2	3.2	3.7	4.6	50	3.8
AC88356-1	4.7	4.6	4.7	3.6	78	4.8
AC88357-3	5.0	4.5	4.8	6.9	78	4.4
AC88431-3	5.0	4.7	4.9	7.3	113	4.4
AC88456-6	3.2	2.2	2.7	5.1	64	3.2
AC88459-4	5.0	4.1	4.6	7.4	71	4.8
AC88637-2	4.1	3.3	3.7	5.4	71	4.6
ATX85404-8	4.7	4.3	4.5	5.3	78	4.4
BC0894-2	4.6	5.0	4.8	3.5	85	3.6
C087017-5	4.6	3.5	4.1	4.3	92	3.2
C087106-5	4.3	4.5	4.4	5.2	50	4.8
ND01496-1	5.0	4.2	4.6	4.5	92	3.4
Atlantic	2.8	4.3	3.6	4.1	85	4.8
Chipeta	4.1	4.4	4.3	3.5	99	4.0
Norchip	4.4	4.7	4.6	5.5	78	4.2

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

[2]Tubers were stored at 45F for a three month period.

[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. Chip color[1] and specific gravity of Western Regional Chip Trial clones - 1994.

Clone	7 wks 40F	7 wks/40F +3 wks/60F	7 wks 50F	7 wks/50F +3 wks/60F	Specific Gravity
AC83306-1	3.5	1.5	2.5	1.5	1.092
AC87313-3	2.5	1.5	1.0	1.0	1.089
AC88356-1	3.0	2.5	1.0	1.5	1.088
AC88357-3	3.0	2.0	1.5	1.0	1.087
AC88431-3	3.5	2.0	2.0	2.5	1.078
AC88456-6	2.5	2.0	1.5	1.5	1.101
AC88459-4	3.5	2.5	2.0	2.0	1.087
AC88637-2	2.5	2.5	1.5	2.5	1.084
ATX85404-8	3.5	1.5	1.5	1.5	1.087
BC0894-2	2.5	2.0	2.0	2.0	1.075
CO87017-5	3.0	2.5	2.0	2.0	1.094
CO87106-5	3.0	2.0	2.5	1.0	1.093
ND01496-1	2.5	1.5	1.0	1.0	1.088
Atlantic	3.5	3.0	2.0	1.5	1.087
Chipeta	4.5	3.0	2.0	2.0	1.086
Norchip	4.0	3.5	2.0	2.5	1.077

[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 Red Trial clones - 1994.

Clone	Yield (Cwt/A) Total	US #1 Total	US #1 %	>10 oz	<4 oz	Tuber Shape & Skin Type[1]
A82705-1R	474	426	89.8	178	44	R,R
A83359-5	549	514	93.6	222	28	R,R
AD82745-1	481	432	89.8	139	40	R,R
BC1145-1	328	237	72.0	55	78	R,R
CO86142-3	310	271	87.2	87	28	R,R
CO86218-2	364	329	90.3	148	32	R,R
COTX86146-2	434	353	81.9	156	33	R,R
ND1871-3R	430	370	85.8	94	53	R,R
NDC4069-4	336	291	86.5	119	30	R,R
NDO2438-7R	379	241	63.1	41	137	R,R
NDO2469-1R	321	254	79.4	106	39	R,R
NDO2686-6R	258	200	77.7	41	58	Ov,R
NDTX8-731-1R	263	229	86.6	121	28	R,R
Norland	307	266	86.6	90	32	R,R
Red LaSoda	427	391	91.7	215	23	Ov,R
Sangre-14	430	396	92.1	233	32	Ov,R
Mean	381	325	84.6	128	45	----
LSD[2] (0.05)	51	52	6.9	35	18	----

[1]Tuber shape & skin type: R=round; Ov=oval; R=red.

[2]LSD=least significant difference.

Table 7B. Grade defects for Western Regional Red Trial clones - 1994.

Clone	% External Defects[1]	External Defects Observed[2]	% Hollow Heart[3]
A82705-1R	1.0	GC*,MS	0.0
A83359-5	1.2	GC*,GR	2.3
AD82745-1	2.0	GC*,MS	0.0
BC1145-1	3.8	GC*	0.0
CO86142-3	3.7	GC*	0.0
CO86218-2	1.0	MS*	0.0
COTX86146-2	10.9	GC*,MS,GR	1.0
ND1871-3R	1.7	MS*	0.0
NDC4069-4	4.6	GC*,MS	0.0
NDO2438-7R	0.5	GC*	0.0
NDO2469-1R	8.6	GC*,GR	0.0
NDO2686-6R	0.0		0.0
NDTX8-731-1R	2.5	GC*,MS,GR	3.1
Norland	3.1	SG,GC*,MS	0.0
Red LaSoda	3.0	SG,GC*,MS,GR	6.5
Sangre-14	0.5	GC*,GR*	1.1

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

[2]SG=second growth; GC=growth crack; MS=misshapen; 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 Red Trial clones - 1994.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2]	Stems/ Plant	Vine Size[3]	Vine Type[4]	Vine Maturity[5]
A82705-1R	100	3.5	2.0	3.2	4.0	3.0	2.2
A83359-5	97	2.8	3.0	2.5	5.0	3.0	4.0
AD82745-1	98	3.5	2.0	2.1	4.2	3.0	3.0
BC1145-1	98	2.5	2.0	3.2	2.5	1.8	2.2
CO86142-3	95	3.0	3.0	3.0	2.2	3.0	1.0
CO86218-2	93	3.2	2.0	3.0	3.0	3.0	2.8
COTX86146-2	97	2.8	2.0	2.9	3.8	3.0	2.5
ND1871-3R	99	2.8	2.8	3.2	3.8	3.0	3.0
NDC4069-4	94	1.8	2.2	4.3	4.2	3.0	3.0
NDO2438-7R	72	2.5	3.0	4.6	2.5	3.0	1.0
NDO2469-1R	63	2.0	2.2	4.4	3.2	3.0	3.0
NDO2686-6R	67	2.2	2.8	5.0	1.5	2.8	1.0
NDTX8-731-1R	86	2.8	3.0	2.7	2.8	3.0	1.8
Norland	96	3.5	3.0	4.3	2.0	2.0	1.0
Red LaSoda	98	2.8	3.0	3.2	3.0	3.0	1.2
Sangre-14	93	3.0	2.0	2.9	3.8	3.0	3.2
Mean	90	2.8	2.5	3.4	3.2	2.8	2.2
LSD[6] (0.05)	8	0.8	0.5	0.9	0.6	0.3	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 7D. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for Western Regional Red Trial clones - 1994.

Clone	Blackspot Index[1]			% Weight Loss[2]	Dormancy (Days)[3]	Enzymatic Browning[4]
	Bud End	Stem End	Average			
A82705-1R	3.8	4.1	4.0	5.4	106	4.4
A83359-5	4.4	4.7	4.6	4.0	99	4.4
AD82745-1	3.4	4.8	4.1	4.6	99	4.6
BC1145-1	4.9	4.8	4.9	3.4	99	4.4
CO86142-3	5.0	4.6	4.8	5.1	99	3.8
CO86218-2	4.9	4.9	4.9	4.2	85	3.2
COTX86146-2	4.2	3.6	3.9	6.5	85	2.6
ND1871-3R	4.5	4.1	4.3	7.1	62	1.6
NDC4069-4	3.9	3.4	3.7	11.9	85	---
NDO2438-7R	4.5	5.0	4.8	6.0	99	2.8
NDO2469-1R	5.0	5.0	5.0	5.8	71	3.6
NDO2686-6R	5.0	4.0	4.5	10.7	99	2.8
NDTX8-731-1R	4.9	4.7	4.8	6.5	99	3.8
Norland	3.5	4.5	4.0	6.4	50	3.6
Red LaSoda	4.5	5.0	4.8	4.7	85	2.2
Sangre-14	4.2	5.0	4.6	3.4	71	3.6

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

[2]Tubers were stored at 45F for a three month period.

[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 Red Trial clones - 1994.

Clone	Specific Gravity	Fry Color[1]		Fry Texture[2]	
		At Harvest	4 wks 50F+ 8 wks 45F	At Harvest	4 wks 50F+ 8 wks 45F
A82705-1R	1.069	4	4	2	2
A83359-5	1.071	3	4	2	2
AD82745-1	1.070	4	4	2	2
BC1145-1	1.069	2	2	4	3
CO86142-3	1.076	3	3	3	2
CO86218-2	1.074	3	3	2	2
COTX86146-2	1.071	2	2	3	2
ND1871-3R	1.073	4	4	3	2
NDC4069-4	1.087	-	-	3	3
NDO2438-7R	1.065	2	3	2	2
NDO2469-1R	1.072	2	3	3	3
NDO2686-6R	1.071	2	2	3	3
NDTX8-731-1R	1.067	3	4	3	3
Norland	1.063	2	4	2	3
Red LaSoda	1.072	3	3	3	3
Sangre-14	1.071	3	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, with 1 representing a soggy, wet texture.

Table 8. Summary comparison of advanced selections and named cultivars for yield, grade, maturity, specific gravity, and grade defects - 1994.

Clone	Usage[1]	Loc x Years	Total Yield (Cwt/A)	% US #1	Vine Maturity[2]	Specific Gravity	% External Defects[3]	% Hollow Heart[4]
Russets								
CO80011-5	FM	9	380	83.1	2.3	1.072	3.1	0.0
AC78069-17	FM/FRY	8	407	88.1	3.3	1.084	4.7	0.3
CO81082-1	FM	8	339	85.5	2.1	1.075	0.7	0.5
CO82142-4	FM	7	383	91.8	3.5	1.086	1.0	0.3
AC83064-1	FM	6	472	88.1	3.2	1.078	1.4	0.0
AC83064-6	FM/FRY	6	392	85.7	3.1	1.080	0.9	0.2
AC83068-1	FM	6	502	83.4	3.1	1.084	1.7	0.3
AC84487-1	FM/FRY	5	357	84.2	1.9	1.071	1.9	0.2
CO84074-2	FM	5	401	81.6	2.8	1.073	1.5	0.1
CO85026-4	FM	4	381	90.6	3.6	1.083	2.0	0.0
Centennial Russet	FM	26	302	78.5	3.0	1.082	1.0	0.4
Ranger Russet	FM/FRY	5	390	86.9	3.2	1.088	3.0	0.0
Russet Burbank	FM/FRY	21	379	65.2	2.8	1.086	9.0	1.4
Russet Norkotah	FM	15	280	82.6	1.3	1.075	1.8	0.1
Russet Nugget	FM/FRY	16	397	81.5	3.8	1.096	1.6	0.2
Chippers								
AC83306-1	CHIP	6	469	76.1	3.2	1.095	6.2	0.1
Atlantic	CHIP	8	407	86.5	3.3	1.098	1.4	2.2
Chipeta	CHIP	9	468	84.6	3.4	1.092	3.1	0.0
Norchip	CHIP	14	336	74.2	1.9	1.083	5.8	0.5
Snowden	CHIP	3	420	67.2	2.9	1.095	0.1	0.0

[1]FM=fresh market, FRY=french fry.

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

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

[4]Based on tubers greater than 10 ounces.

Table 9A. Yield and grade for Russet Norkotah clones - 1994.

Clone	Yield (Cwt/A)				
		US #1			
	Total	Total	%	>10 oz	<4 oz
1	330	218	66.2	78	110
2	378	270	71.5	65	101
3	385	341	88.6	178	32
4	390	298	76.0	53	85
5	348	262	75.2	28	75
6	263	231	87.6	98	24
7	326	295	90.1	121	28
8	369	345	93.5	183	20
9	263	233	88.6	88	25
10	277	243	87.8	120	26
11	296	268	90.5	125	21
12[1]	305	276	90.2	143	24
13[1]	263	230	87.8	77	26
14[1]	323	279	86.5	133	27
Mean	323	271	84.3	106	45
LSD[2] (0.05)	44	48	5.3	46	16

[1]Standard clones selected from grower lots. Clone 14 is from the SLV Research Center.

[2]LSD=least significant difference.

Table 9B. Growth characteristics for Russet Norkotah clones - 1994.

Clone	% Stand	Emergence Uniformity[1]	Vine Vigor[2] 7/16	Vine Vigor[2] 8/10	Plant Height (in)	Avg. Tuber Weight (oz)	Tubers/ Plant	Stems/ Plant	Tubers/ Stem	Vine Maturity[3]
1	98	2.5	2.8	3.2	23.1	4.3	8.1	4.8	1.7	2.5
2	98	2.8	3.0	3.0	19.4	4.9	8.2	4.5	1.9	2.5
3	95	1.8	2.8	3.0	20.5	8.1	5.2	3.1	1.8	3.0
4	99	2.5	2.5	3.5	22.5	4.9	8.4	4.1	2.1	3.0
5	97	3.0	2.2	3.2	21.8	4.4	8.6	4.0	2.2	2.5
6	98	2.0	2.5	1.2	12.2	6.6	4.2	3.0	1.4	1.2
7	97	2.5	3.0	2.2	13.0	6.6	5.4	3.3	1.6	1.2
8	97	2.2	3.0	3.0	17.1	7.8	5.1	3.6	1.4	2.5
9	95	2.2	2.2	1.8	12.5	6.2	4.7	3.2	1.5	1.2
10	99	2.2	2.5	1.5	13.2	6.8	4.3	3.0	1.4	1.2
11	98	2.5	2.2	2.0	13.1	7.2	4.4	3.0	1.5	1.5
12[4]	99	2.8	2.8	2.0	13.3	8.0	4.0	2.9	1.4	1.8
13[4]	96	1.8	2.2	2.0	13.1	6.2	4.6	3.2	1.4	1.5
14[4]	96	2.2	2.8	2.0	13.1	6.9	5.1	2.9	1.8	2.0
Mean	97	2.4	2.6	2.4	16.3	6.3	5.7	3.5	1.7	2.0
LSD[4] (0.05)	NS	0.7	NS	0.5	2.0	1.0	0.8	0.7	0.4	0.8

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

[4]Standard clones selected from grower lots. Clone 14 is from the SLV Research Center.

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

Table 10. Influence of simulated hail damage on yield, grade, stand, and vine maturity of Ranger Russet and Russet Nugget - 1994.

Treatment[1]	Yield (Cwt/A) Total	US #1 Total	US #1 %	US #1 >10 oz	US #1 <4 oz	% Stand	Vine Maturity[2]
Ranger Russet							
0%	392	349	89.3	184	25	98	3.0
30%	347	303	87.4	125	24	100	2.8
60%	304	260	85.2	102	29	96	3.0
30% + 30%	305	268	87.5	115	25	97	3.0
Russet Nugget							
0%	436	350	80.1	98	83	96	3.0
30%	358	280	78.3	86	69	98	3.5
60%	291	238	81.9	86	48	98	4.0
30% + 30%	239	171	71.6	31	64	99	3.5
Interaction Cultivar x Hail Damage LSD[3]	45*	44*	5.8*	36+	15*	2+	0.4+
Main Effects							
Cultivar							
Ranger Russet	337	295	87.3	132	26	98	2.9
Russet Nugget	331	260	78.0	75	66	98	3.5
Significance[3]	NS	*	*	*	*	NS	*
Hail Damage							
0%	414	350	84.7	141	54	97	3.0
30%	353	292	82.8	106	47	99	3.1
60%	298	249	83.6	94	39	97	3.5
30% + 30%	272	219	79.6	73	44	98	3.2
LSD[3]	32*	31*	3.4+	31*	11*	NS	0.3+

[1]The 30% and 60% treatments were applied July 21. The combined 30% + 30% treatment was applied on July 21 and August 5.

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

[3]LSD=least significant difference. NS=not significant; *P=0.05; +P=0.10.

FIGURE 3. PROCESSING STUDY - 1994
SUGAR ANALYSIS - SUCROSE - FRENCH FRY CULTIVARS

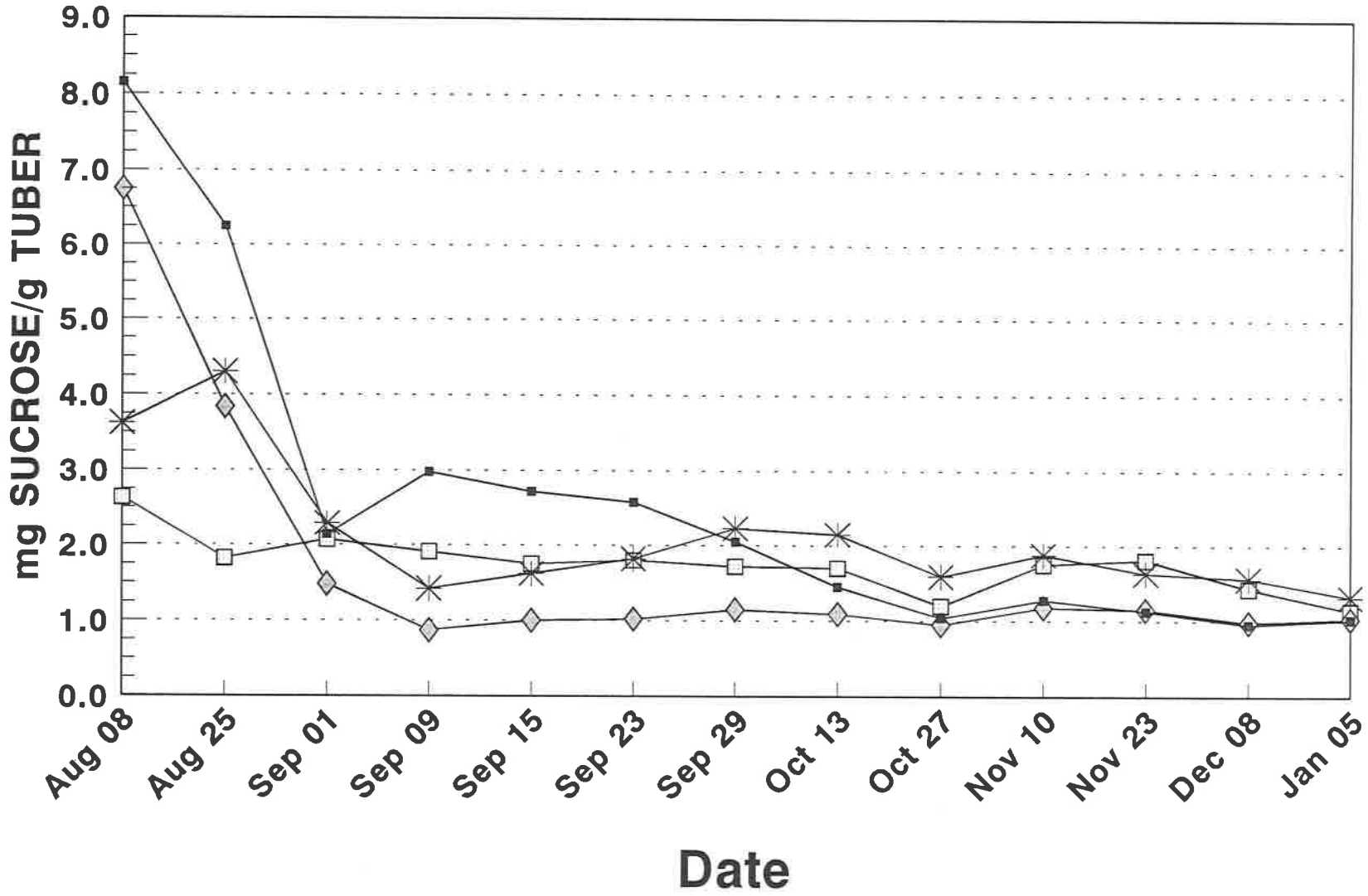


FIGURE 4. PROCESSING STUDY - 1994
SUGAR ANALYSIS - GLUCOSE - FRENCH FRY CULTIVARS

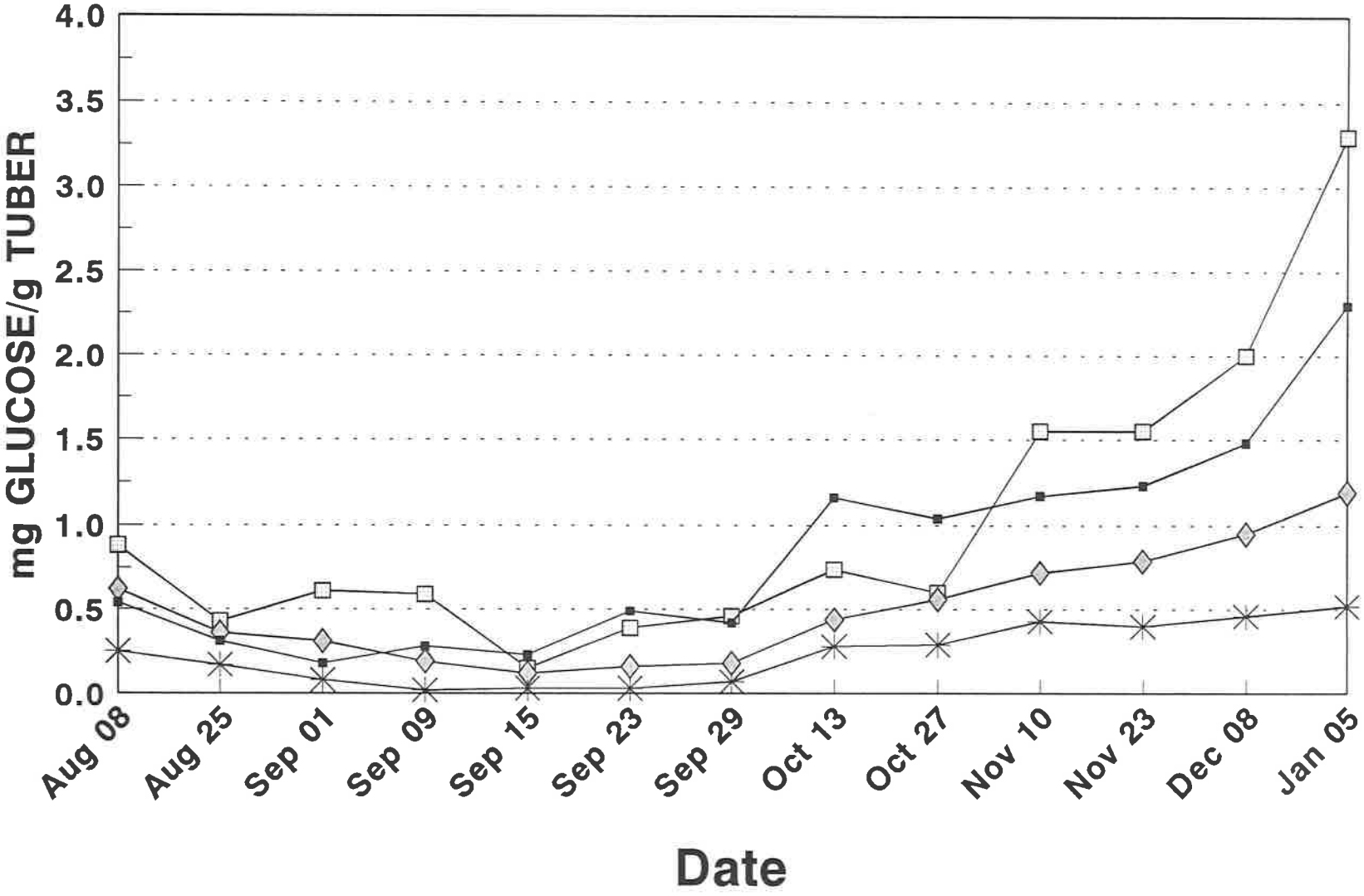


FIGURE 5. PROCESSING STUDY - 1994
SUGAR ANALYSIS - SUCROSE - CHIP CULTIVARS

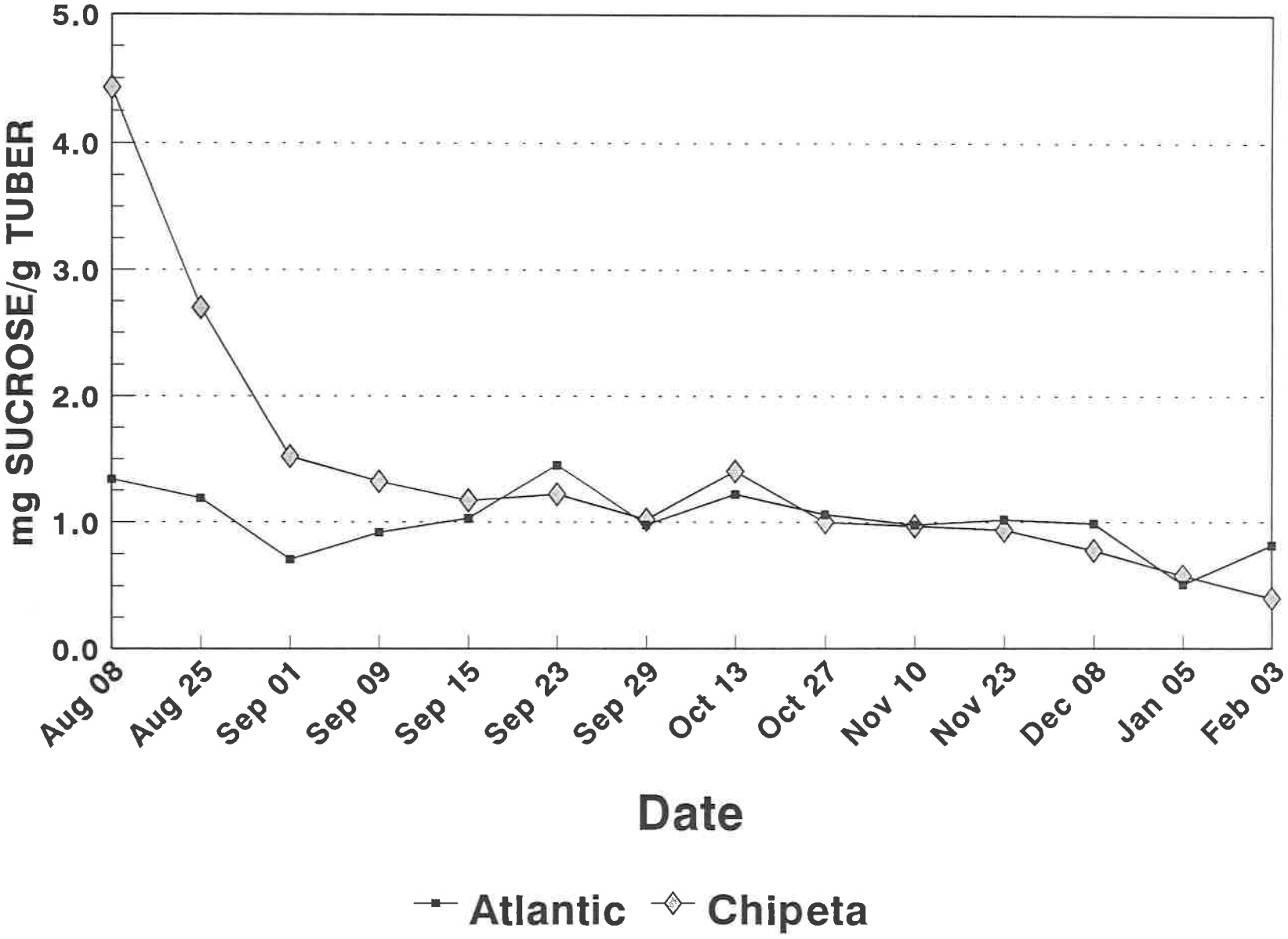
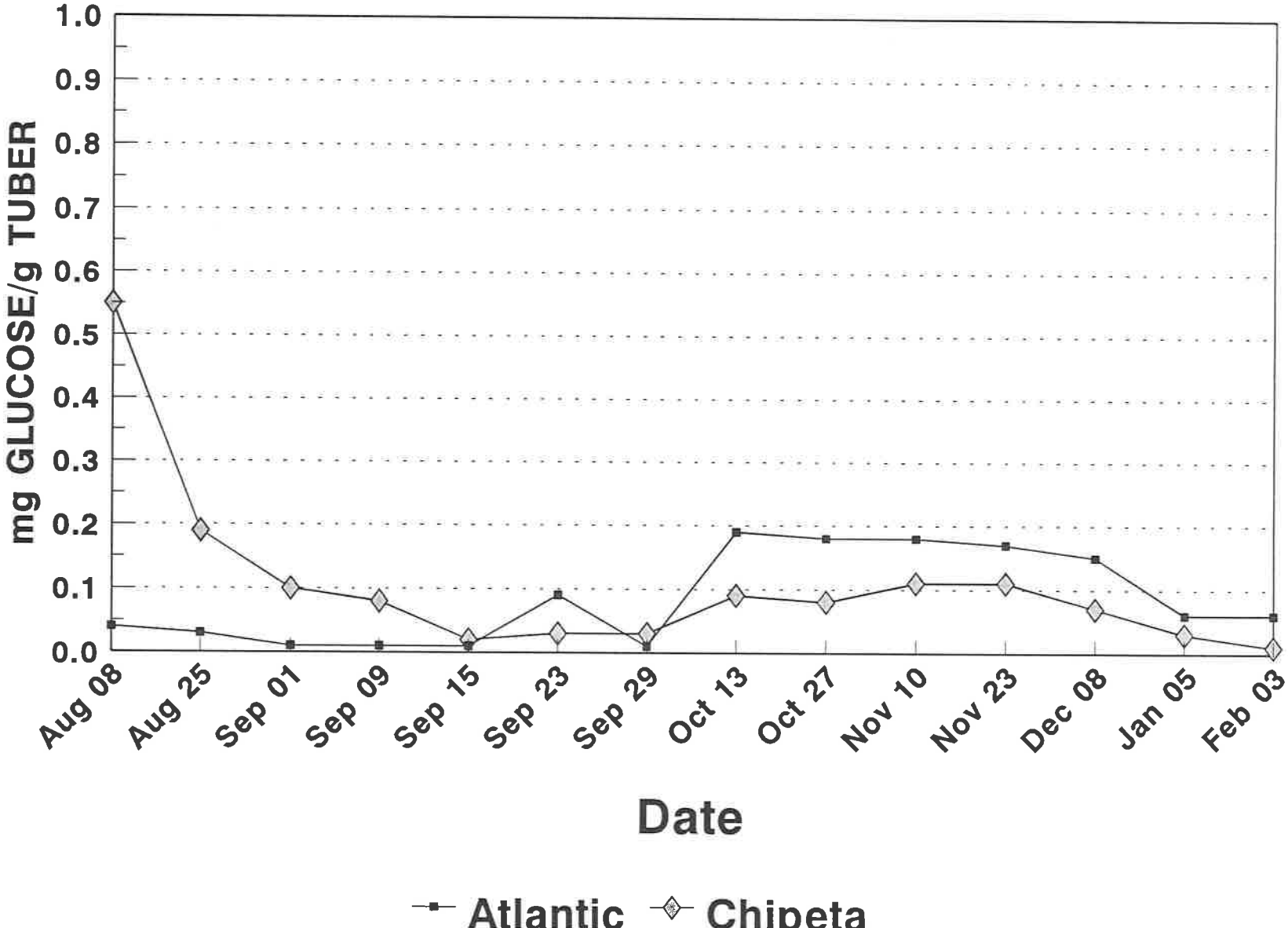


FIGURE 6. PROCESSING STUDY - 1994
SUGAR ANALYSIS - GLUCOSE - CHIP CULTIVARS



APPENDIX 1. 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-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 into storage and held at 45F for 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.

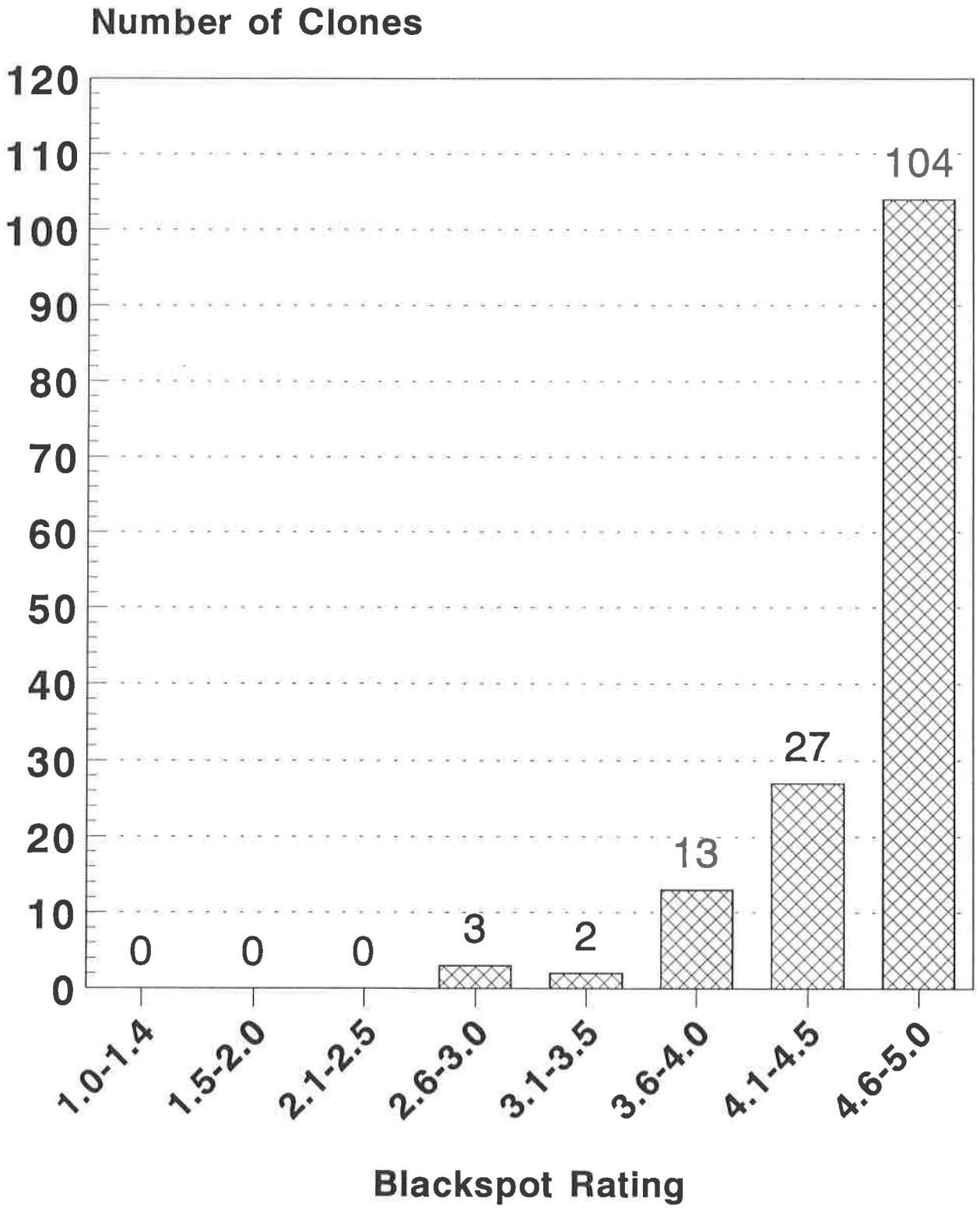
Enzymatic Browning. Five tubers of each clone are cut in half lengthwise and rated for degree of darkening at 60 minutes after cutting. Degree of darkening is rated on a 1 to 5 scale, with 5 indicating no discoloration.

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 1/2 minutes at 375F. Fry color is rated on a 0-4 scale using the USDA color standards. Color ratings ≤ 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.

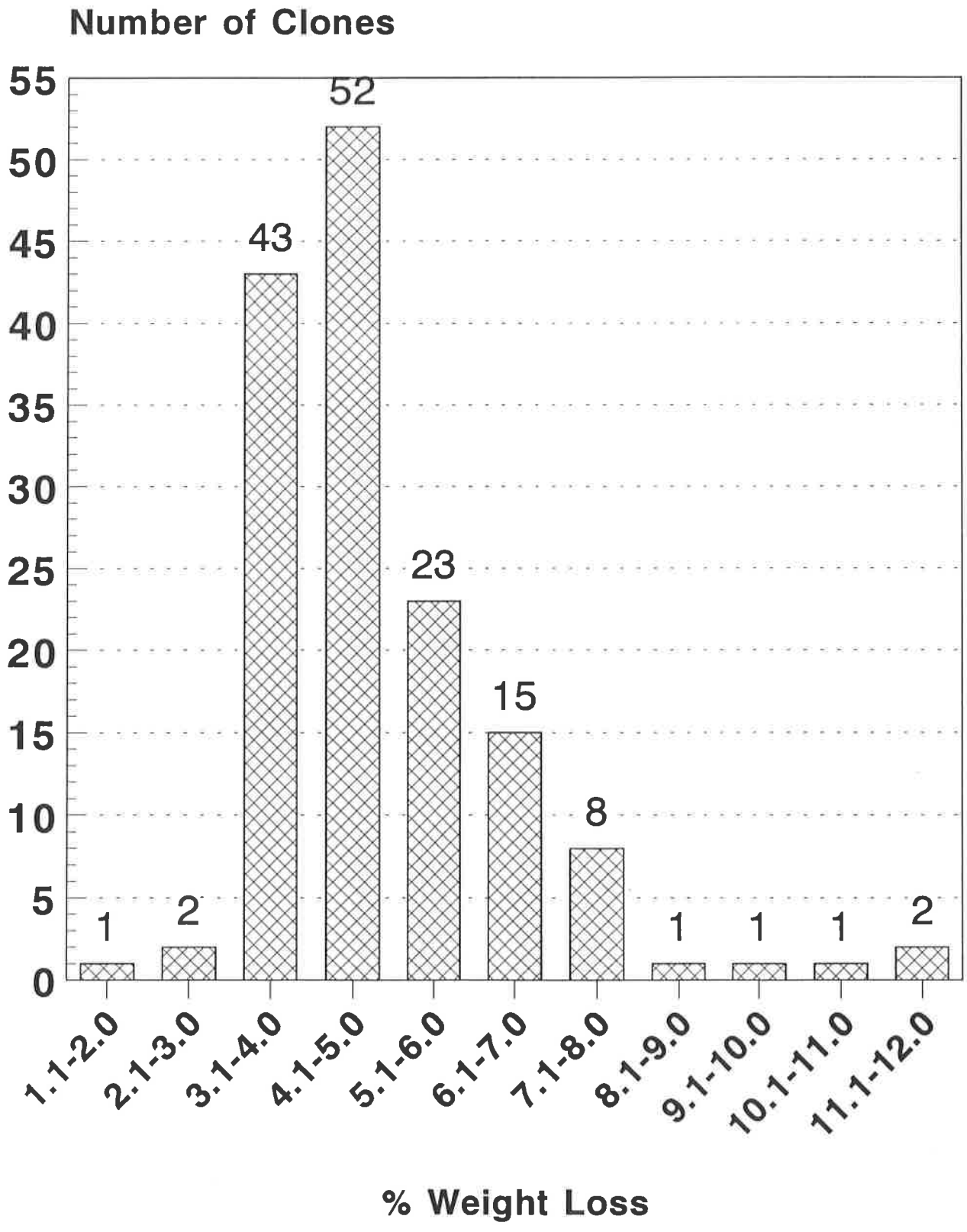
Chip Color. Chip color is determined after an interval of storage at 40 and 50F and after reconditioning from these temperatures at 60F. Chips are cooked at 365F until bubbling slows. Chip color is rating using the Snack Food Association 1-5 scale. Ratings ≤ 2.0 are acceptable.

Appendix 2. Blackspot Distribution (149 Clones) - 1994

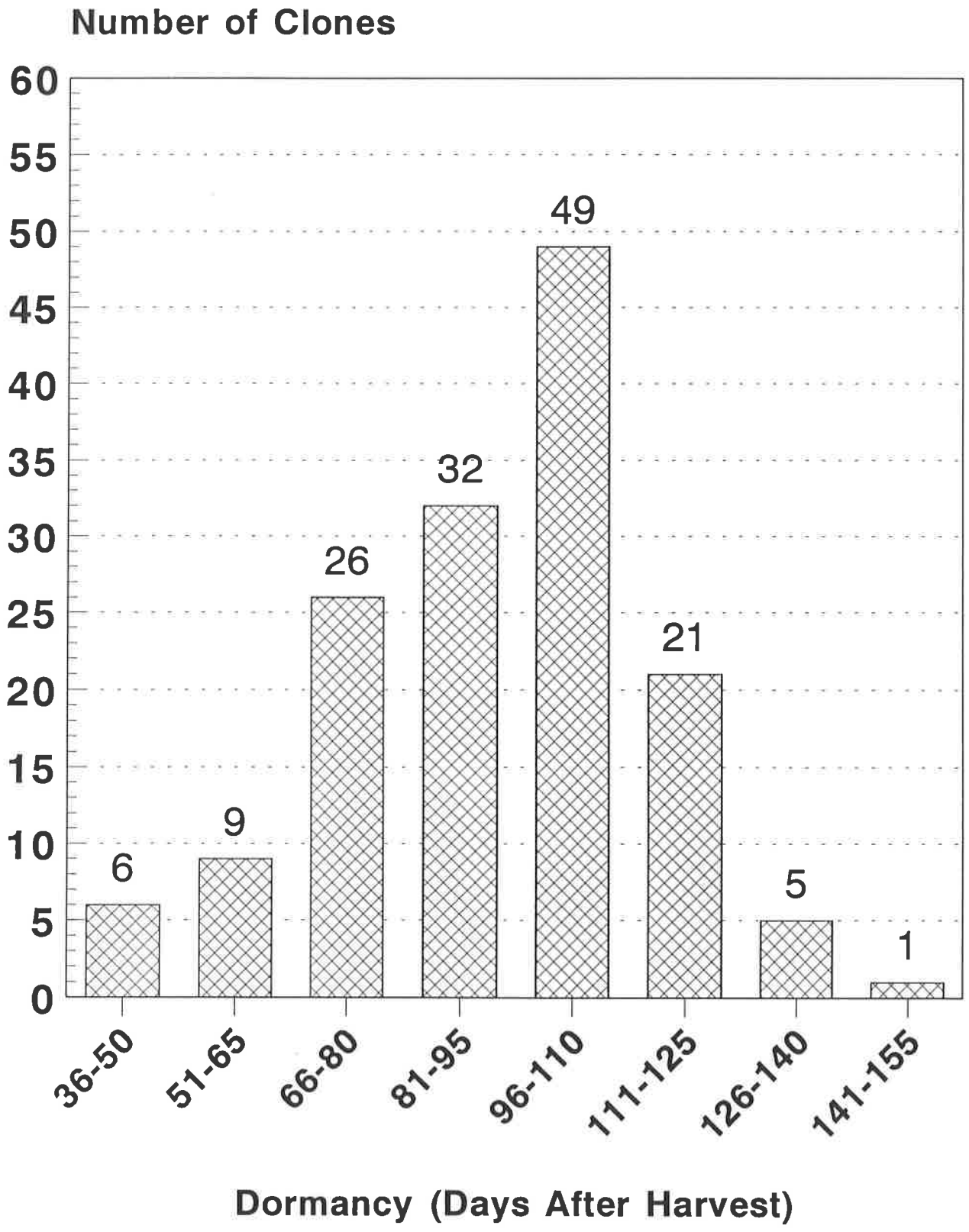


5=No Discoloration

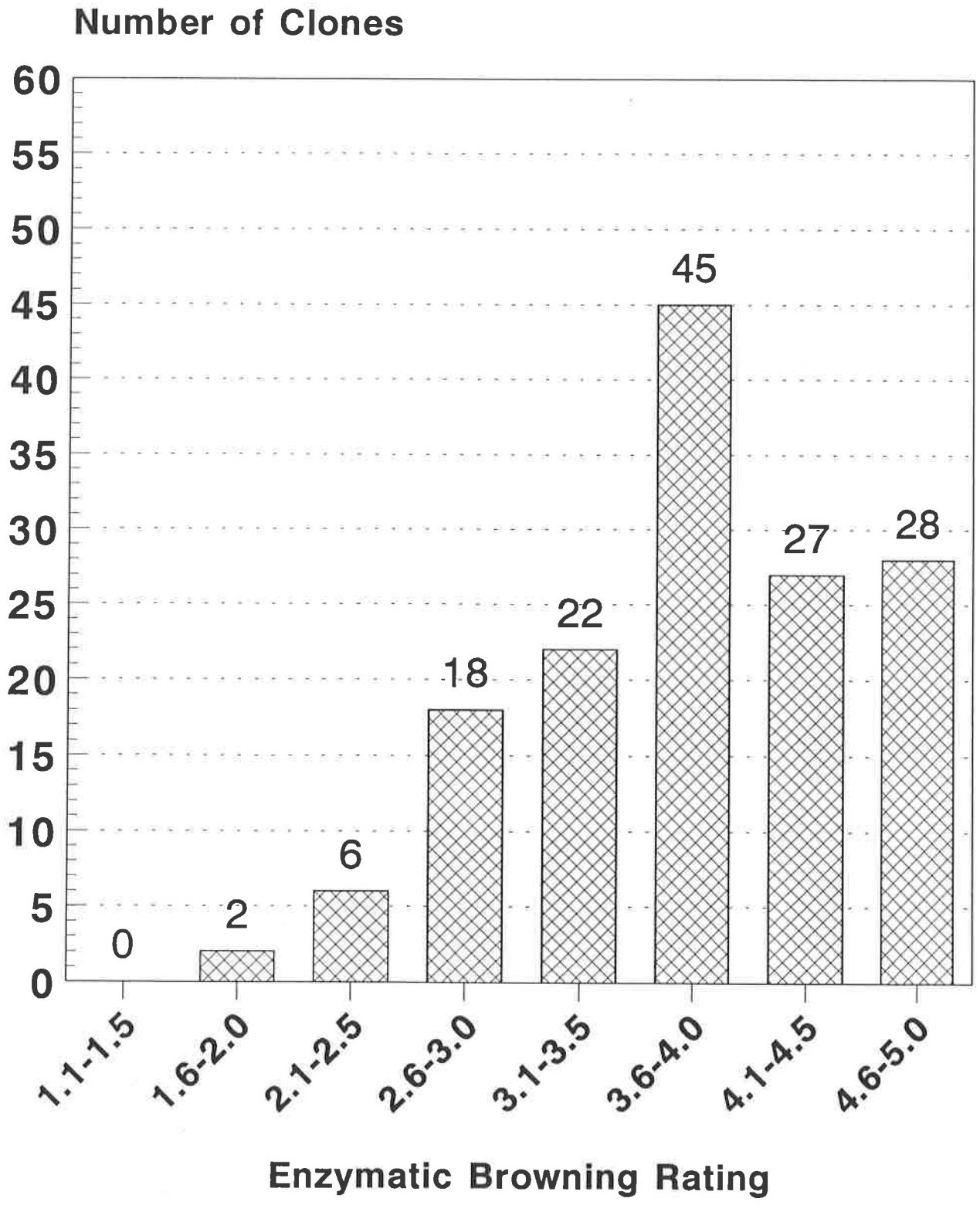
Appendix 3. % Weight Loss Distribution (149 Clones) - 1994



Appendix 4. Dormancy Distribution (149 Clones) - 1994

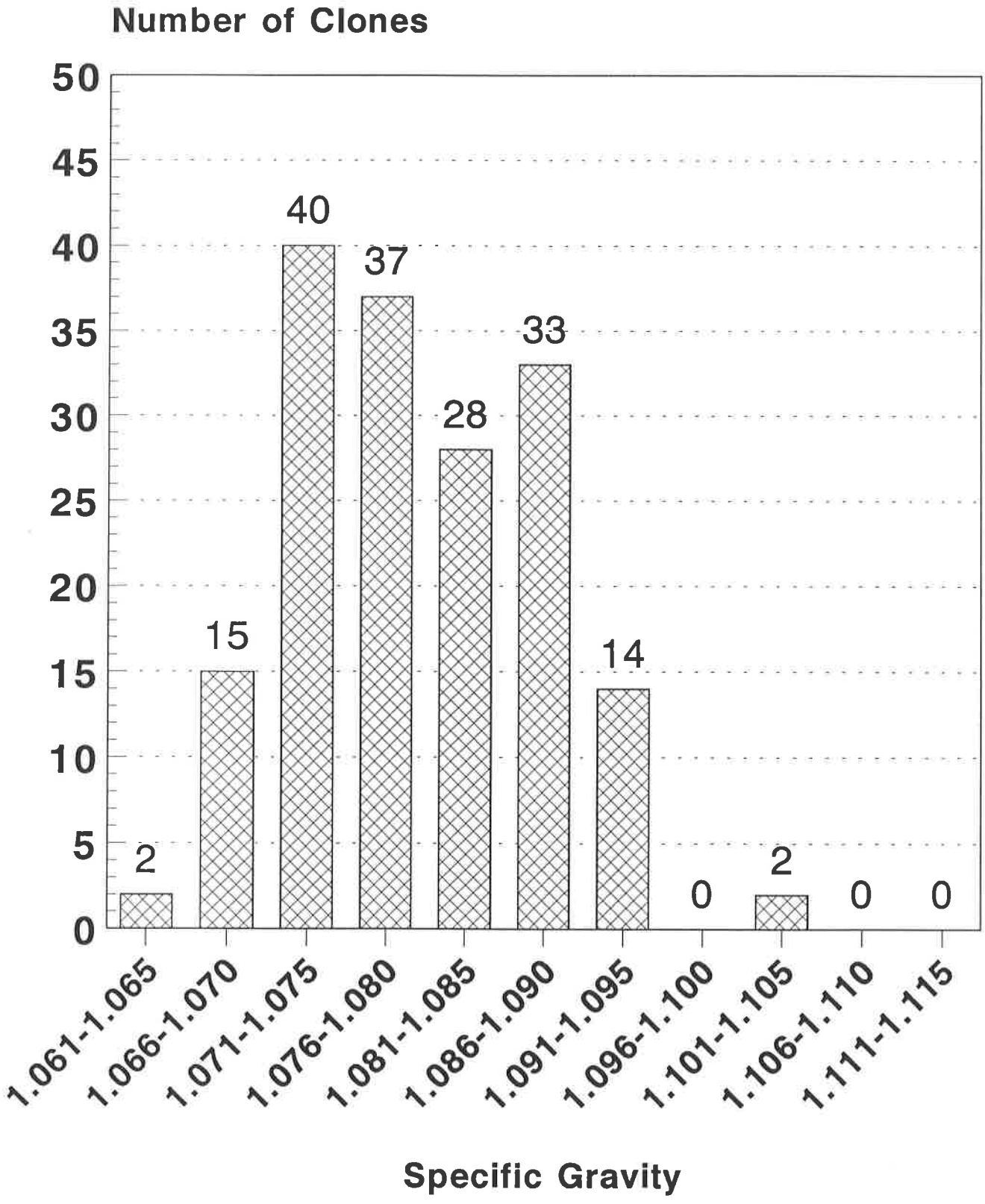


Appendix 5. Enzymatic Browning (60 Min) Distribution (148 Clones) - 1994

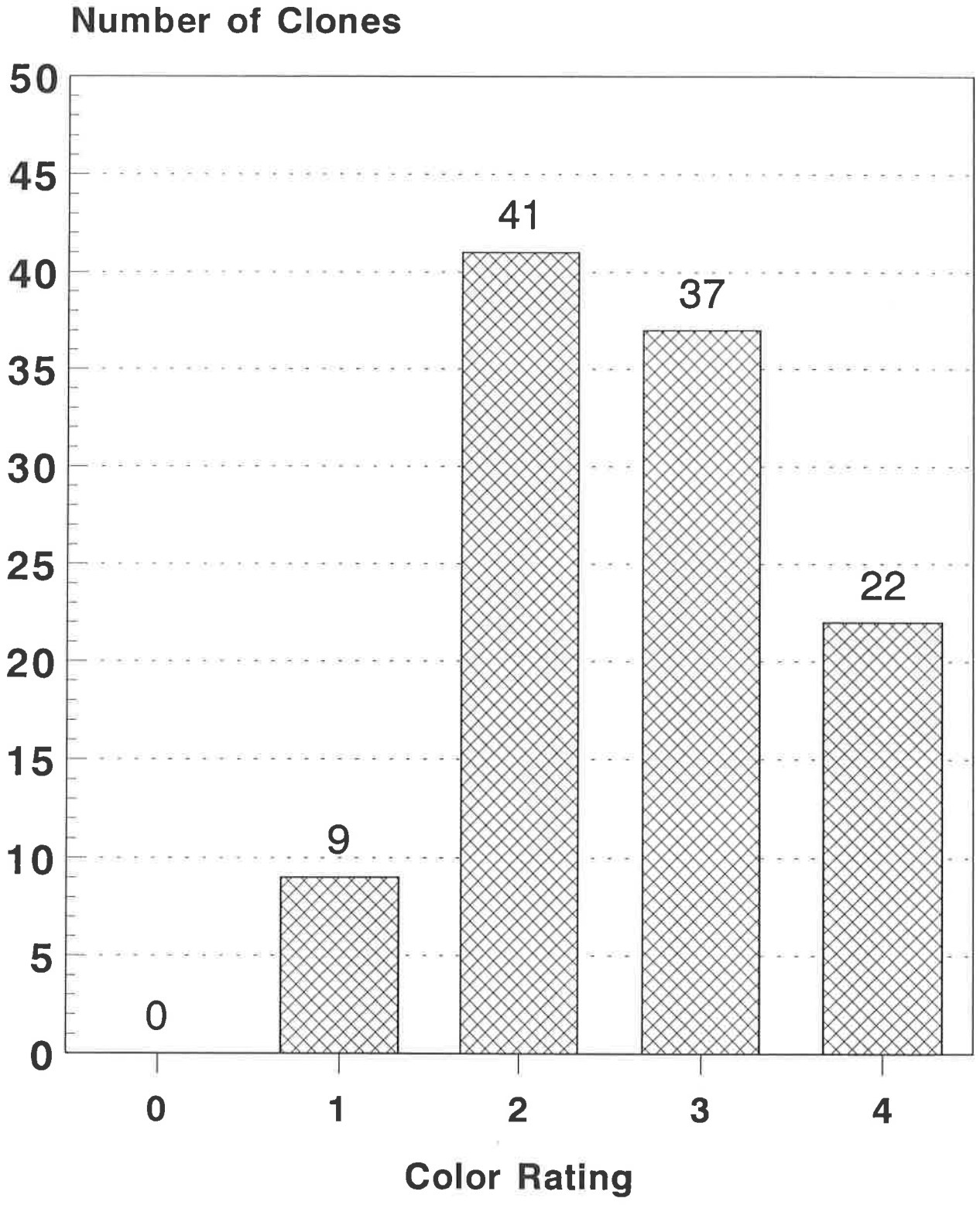


5=No Discoloration

Appendix 6. Specific Gravity Distribution (171 Clones) - 1994

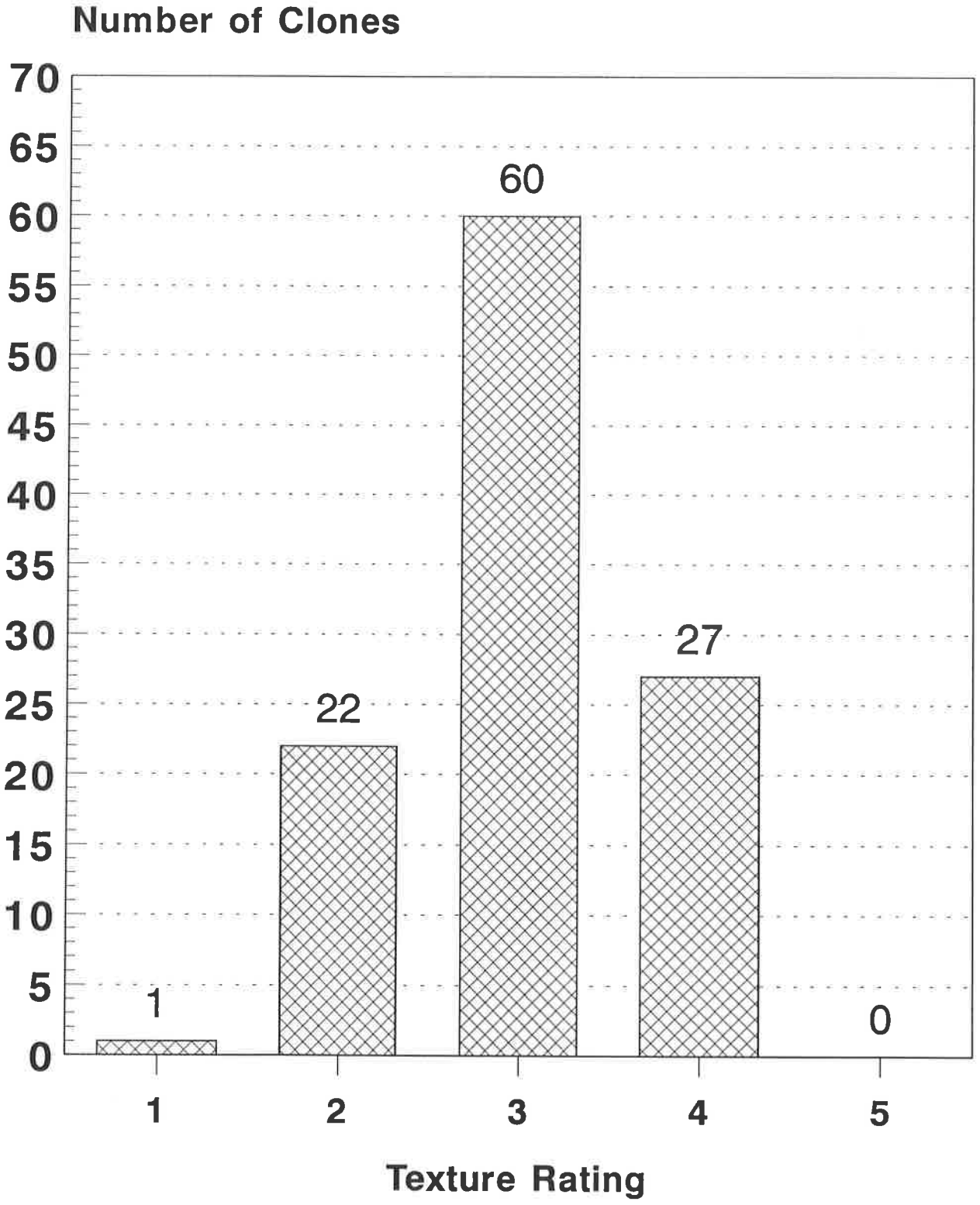


Appendix 7. Fry Color (45F Storage) Distribution (109 Clones) - 1994



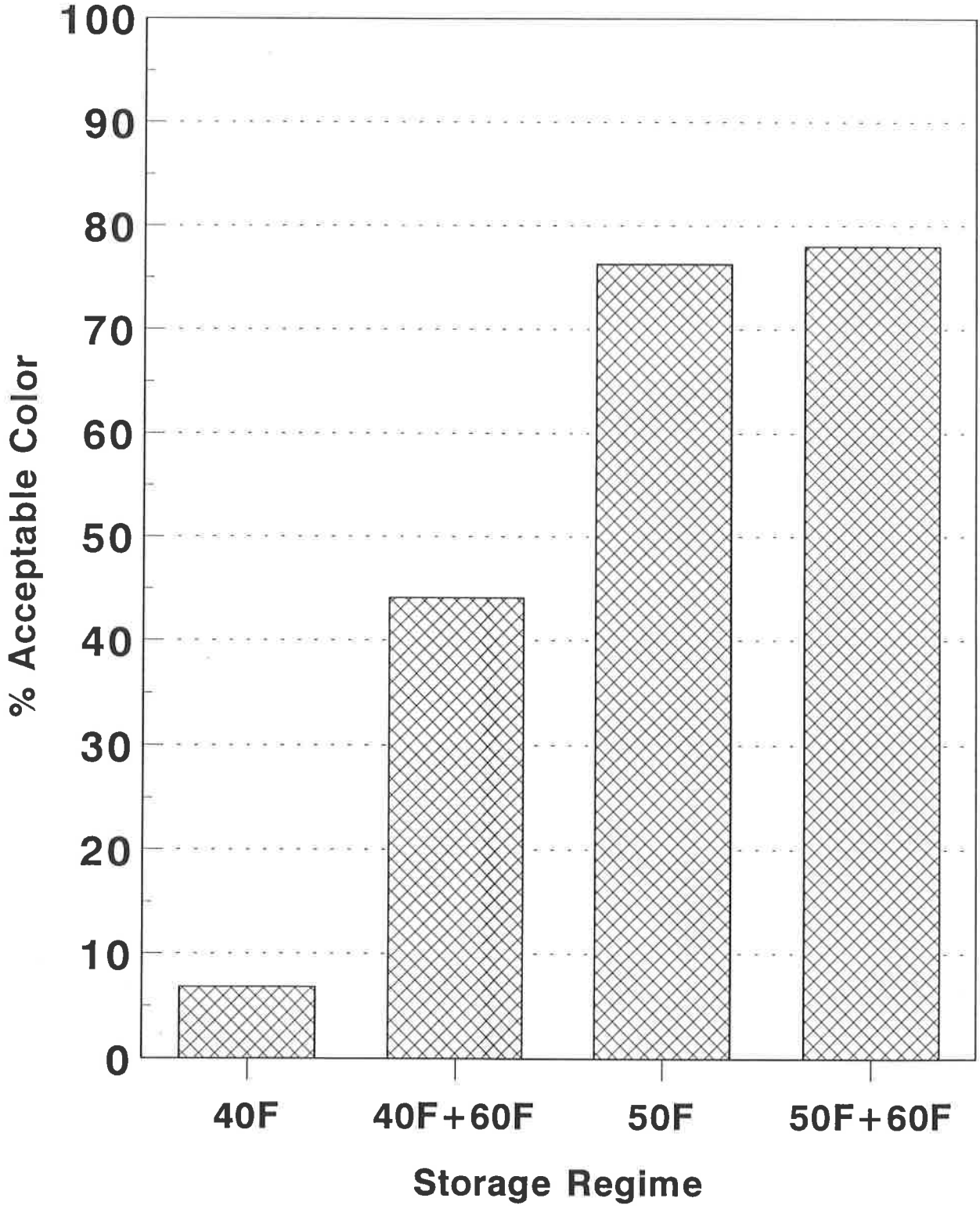
0=Lightest (values of 2 or less acceptable)

Appendix 8. Fry Texture (45F Storage) Distribution (110 Clones) - 1994



5=Dry Texture

Appendix 9. Chip Color - 1994 (59 Clones)



Values of 2 or less acceptable based on SFA 1-5 scale