

1998 NORTH DAKOTA POTATO VARIETY TRIALS AND BREEDING REPORT

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Technical assistance of the following people is gratefully acknowledged:

Dean Peterson, Basilio Salas, Roger Ruthenberg, Ann Erickson, and Louise Heinz. Thanks also to the personnel at the Casselton Agronomy Seed Farm, the Langdon Research Center, and the Northwest Experiment Station at Crookston, MN.

Special thanks to Carl Hoverson for the use of his land and the maintenance of the McCanna irrigated trial during the 1998 growing season.

Financial support of the breeding program by the Red River Valley Potato Growers Association is gratefully acknowledged.

Crossing and Seedling Production

In 1998, 2,840 crosses were made in the greenhouse producing 538 seedling families. Twenty-six percent of the families had one or more parents that were identified as having late blight resistance. During the summer of 1998, 118,752 seedlings were grown for minituber production. Twenty-three percent of the seedlings planted for tuber production in 1998 had one or more parents that were identified as having late blight resistance. Selected clones with late blight resistance in their background will be evaluated in the winter of 1998-99 for resistance.

1st Year Selections

Approximately 115,400 red, white, and russet-skinned seedlings were grown at the Langdon Agricultural Experiment Station. Seedlings were planted on May 13th and the 19th and 20th at Langdon. Evaluation and harvesting was conducted during the second week of October at Langdon.

Advanced Selections

Replicated plantings of 1,215 second year selections from the 1997 seedling crop were planted at McLeod and Absaraka. A total of two hundred second-year selections were saved at harvest from both sites. Of the advanced material (>2 year material), 450 selections were planted and 253 were saved at harvest. Third year and older selections were planted at the Casselton Agronomy Seed Farm for clean seed stock production and at McLeod and Crookston for evaluation and selection.

Cultivar and Advanced Selection Yield Trials

Trials were conducted under dryland conditions at the Northwest Experiment Station at Crookston, MN and at Park River, ND. In addition, two irrigated trials were established in growers' fields near McCanna and McLeod, ND. Spacing, fertility, planting and harvest dates are listed in **Table 1**. The four trials, with a few entry differences, were replicates of one another. They consisted of standard and newly released varieties, and advanced NDSU and Idaho selections. The replication across sites allowed for the assessment of the potato selections and cultivars under both dryland and irrigated conditions.

The McLeod site also consisted of two additional trials -- a secondary trial consisting of additional promising ND selections, and an out-of-state trial consisting primarily of entries from Texas and Europe. Rainfall during May and June of 1998 was excessive at McLeod, with 11.5" rainfall during May and June. In the previous 4 years, an average rainfall amount during that time period was 4.2". Three of four replications of the secondary trial were lost to flooding, the results of which are not presented in this report. The remaining two trials at the McLeod site, the primary and out-of-state trials, had flooding in 10% of their plots. Fourteen percent of the plots in the primary trial at the Crookston site also had flooding. The abnormally low yields in these flooded plots are not indicative of the true merit of the entries under normal growing conditions, and data from these flooded plots were not included in the final statistical analysis.

Entries in each of the four sites consisted of 20 hills, replicated four times in a randomized complete block design.

Irrigated Sites

McCanna: The average total yield of the 25 entries at the McCanna site was 347 cwt/A. Average U.S. No. 1 yield was 303 cwt/A. **Red Pontiac** and **ND5822C-7** were the highest yielding entries with U.S. No. 1 yields (cwt/Acre) of 468 (**Table 2 and Fig. 1**). **ND5822C-7** is a white chipper with uniform, attractive tubers and resistance to the Colorado potato beetle. Entered for the first time in the primary state trials, **ND5822C-7** significantly outyielded all chipping cultivars by 100 cwt/A or more. Two other ND chipping selections, **ND2676-10** and **ND5775-3** also yielded well with 371 cwt/A and 393 cwt/A, respectively.

After **Red Pontiac**, **ND5084-3R** was the next highest-yielding red at 376; this selection was the highest yielding red entry at McCanna in 1997. While similar to **Red Pontiac** in yield, **ND5084-3R** generally has a smaller percentage of tubers in the >3.5" range.

In the russet / long white category, **Shepody** and **Russet Norkotah** were the highest yielding at 353 and 330 cwt/A, respectively. **A79180-10**, an Idaho selection followed closely at 328 cwt/A. **A79180-10** had been the highest yielding russet entry in the McCanna trials in the previous two years. **A79180-10** which was rated quite highly for french fry production in 1995, received lower but acceptable ratings in 1996 and 1997 (**Table 8**).

McLeod:

Primary Trial: The average total yield of the 26 entries at this site was 295 cwt/A. Average U.S. No. 1 yield was 247 cwt/A. **ND5084-3R**, a red selection, was the highest yielding entry with a U.S. No. 1 yield of 374 cwt/A (**Table 3 and Fig. 2**). The next highest-yielding, red-skinned entries were **Red Pontiac** at 295 cwt/A and **ND5002-3R** at 274 cwt/A. Duplicating its performance in the McCanna trial, **ND5822C-7** was again the highest -yielding chipping selection at 339 cwt/A, followed closely by **Atlantic** at 333. Chipping selection **ND5775-3** also yielded well at 320 cwt/A.

Russet Norkotah was the highest yielding russet entry for U.S. No. 1's at 320, significantly out-yielding the next highest yielding russet entry, **A79180-10**, by 89 cwt/A.

Out-Of-State Trial: This trial is designed for the evaluation of new cultivars and advanced selections from other breeding programs. Promising selections are moved to the secondary and primary state trials in subsequent years. The average total yield of the twenty entries was 281 cwt/A. Average U.S. No. 1 yield was 212 cwt/A. **Norchip** and the European cultivar **Morning Gold**, a cultivar of the De Z.P.C seed company, were the top yielders with U.S. No. 1 yields of 342 and 341 cwt/A respectively, followed closely by **Latona** at 328 (**Table 4**). **Morning Gold** is a yellow-skinned, light yellow-fleshed, tablestock cultivar with good storage characteristics. **Latona**, another De Z.P.C. entry, is a tablestock variety having oval tubers with a light-yellow flesh.

Non-Irrigated Sites

Crookston: Utilized for the first time as a dryland trial site, the average total yield for the 27 entries in the primary state trial at Crookston was 237 cwt/A. Average U.S. No. 1 yield was 206 cwt/A. **Russet Norkotah** and **Norchip** tied for first place with U.S. No. 1

yields of 316 cwt/A (**Table 5 and Fig. 3**) . **ND2676-10**, a cold-sweetening resistant, chipping selection was the second-highest yielding entry at 286 cwt/A.

Among red-skinned entries, **ND3574-5R** and **ND5084-3R** led with U.S. No. 1 yields of 257 and 254 cwt/A. The tuber size distribution between the two entries was almost identical, with a substantially smaller percentage of > 3 ½" tubers as compared to **Red Pontiac**.

Park River: Last used as a test site in 1994, a trial was again established at Park River in collaboration with Brad Brummond, Walsh County Extension Agent in 1997. Initial progress of the primary trial in 1998 was very good. However, a lack of timely insecticide applications in Mid-June resulted in some severe Colorado potato beetle feeding damage. The extent of the damage was such that any yield data obtained following the control of the beetle population would be confounded by beetle defoliation. The trial was allowed to progress as a screening of potato clones for resistance to Colorado potato beetle, with no further application of insecticides.

Differences among clones was striking when defoliation readings were taken on July 9th (**Table 6**) especially with respect to **ND5822C-7**, a white chipping selection with acceptable tuber type and yield that had been bred for resistance to the Colorado potato beetle. Whereas, several cultivars and selections had >70% defoliation, **ND5822C-7** displayed less than 10% defoliation. Statistical analysis of the defoliation data showed no significant differences among replications, indicating beetle populations were effectively dispersed throughout the trial. Under the intense beetle populations at Park River, all clones were defoliated by the last week of July. The trial was rotobeat on August 6th, 108 days after planting, and harvested on August 12th to assess yield potential and how it correlated with beetle resistance.

NorValley, known to have non-preference resistance to Colorado potato beetle, and **ND5822C-7** were the two top yielding entries with total yield of 166 and 160 cwt/A, respectively. **Red Pontiac** was third at 154 cwt/A (**Table 6**). The relatively high yields of **ND5822C-7**, a later-maturing selection than **NorValley** or **Red Pontiac**, would indicate that its resistance to Colorado potato beetle was instrumental in its achievement of higher yields. A highly significant negative correlation ($r = -0.58$) was found between yield and defoliation (prob > r was 0.0001) in the Park River trial. Further studies of **ND5822C-7** are planned in 1999 to ascertain the mechanism(s) that confer resistance to Colorado potato beetle.

Summary: The overall performance of the entries at the McCanna, McLeod and Crookston sites have been summarized in **Table 7 and Fig. 4**.

Processing Trials

French Fries: Samples were tested for french fry qualities by the Food and Nutrition Department using two taste-panels comprised of 6 panelists. Sensory characteristics evaluated were fry color, flavor and texture (**Table 8**). All sensory scores for these three characteristics were based on 6 separate panel evaluations of each cultivar from the McCanna and Oakes sites, and 3 panel evaluations at the Grand Forks site. With six panelists at each evaluation, sensory scores are therefore an average of 36 and 18

individual evaluations. Exceptions were the Grand Fork entries, *Dali*, *Rikea*, SW91102, *Russet Burbank*, and *Fianna* which were represented by 36 evaluations (rather than 18), and the control / reference samples of *Russet Burbank* (included at each panel evaluation) for which sensory scores are an average of 228 individual evaluations.

Averaging the scores obtained for color, texture, and flavor, allowed a relative ranking of entries (**Table 8**). The Idaho-Texas clone, **ATX9201-1Russ** had the highest ranking among all entries, followed closely by **ND5343-1Russ**, **ND4027-4Russ**, **Agria**, **Russet Burbank**, **COO83008-1 (Legend)**, and **Fianna**. All remaining entries had acceptable scores with the exception of **TXNS278** (A genetic variant of Russet Norkotah selected by the Texas breeding program), and the two Idaho-Texas selections **ATX9204-2Russ** and **ATX87262-2Russ**.

Baking, Boiling and Microwaving: Tubers of 29 potato clones from the Park River (dryland) trial, 35 clones from the irrigated trial at McCanna, and an additional 5 clones from the Oakes irrigated trial in 1997 were evaluated for the following sensory characteristics in each of three cooking categories by a taste panel of seven:

Boiling: Characteristics examined were color immediately and four hours after cooking, mealiness, and flavor.

Baking: Mealiness, color, and flavor were evaluated.

Microwaving: Mealiness, color, and flavor were evaluated.

Two replications of sensory data were taken for each entry. The summation of scores at the Park River (dryland) site across all three cooking categories identified the following top 10 cultivars and advanced selections: **ND3196-1R**, **A79180-10**, **Atlantic**, **ND860-2**, **Shepody**, **A82119-3**, **N8-14**, **Red Pontiac**, **Red Norland**, and **Goldrush**.

A similar summation of sensory scores of the 39 clones from the McCanna and Oakes irrigated trials identified the following top 10 cultivars and advanced selections: **N8-14**, **Agria**, **Sante**, **ND4027-4Russ**, **Shepody**, **Lili**, **A79180-10**, **Russet Burbank**, **Fianna**, and **Atlantic**.

Top sensory-rated clones in 1997 that also were rated in the top ten in 1996 were: **Shepody**, **A79180-10**, **ND4027-4Russ**, **Atlantic**, **Russet Burbank**, and **N8-14**.

Chipping: In collaboration with the East Grand Forks Potato Worksite, selections and cultivars are assessed for their resistance to the accumulation of reducing sugars following storage at 43F (**Table 9**). Of the 38 entries analyzed, only **NorValley**, **ND2676-10**, **N8-14**, and **ND3828-15** chipped acceptably (Agtron value ≥ 55) directly from 43F. Surprisingly, ND860-2, a clone well known for its cold-sweetening resistance did not meet the acceptable criteria with its reading of 52. Other selections and cultivars worthy of mention in that they direct chipped within a range of 50 - 55 and reconditioned acceptably were: **Snowden**, **NDO1496-1**, **ND860-2**, **ND2470-27**, **ND3636-1**, **ND3647-6**, **ND4778-2**, **ND2676-12** (a full-sib of **ND2676-10**), **ND5775-3**, and **SW91102**. ND3636-1, ND3647-6, and ND3828-15 are no longer being

considered for release as cultivars.

Promising Selections--Summary for 1998

White Chippers

●**ND5822C-7**: Entered for the first time in the primary state trials in 1998, this selection was the highest yielding chipping entry in both the McCanna and McLeod irrigated trials with an average U.S. No. 1 yield across the two sites of 404 cwt/A; an average of 89 - 121 cwt /A greater yield than the chipping cultivars entered in the same two trials. Under dryland conditions at Crookston, it yielded 225 cwt/A, placing it fifth among the 10 chipping entries. This medium-late maturing selection produces round tubers, very uniform in size, with specific gravities typically in the mid 80's to low 90's. In preliminary trials it does appear to have some cold-sweetening resistance, and was shown at the Park River site in 1998 to have resistance to Colorado potato beetle.

●**ND5775-3**: Also entered for the first time in the primary state trials in 1998, this selection averaged 357 cwt/A across the two irrigated trials, and 223 cwt/A at the dryland trial at Crookston. While high-yielding, its tuber size tended to be in the smaller size categories, with the majority of its tubers being less than <2.5" in size.

●**ND2676-10**: This medium maturing selection produces uniform, attractive tubers, and has cold-sweetening resistance. Specific gravity is generally in the low - mid 80's. It was entered in the North Central Regional Potato Variety Trial (NCRPVT) for the third year in 1998. In the 1996-1997 NCRPVT trials (comprising a total of 11 sites) its average U.S. No. 1 yield was 249 cwt/A compared to *Snowden* at 281 cwt/A, *Norchip* at 234 cwt/A, and *Atlantic* at 288 cwt/A. Its average U.S. No. 1 yield under irrigation in ND trials in 1998 was 314 cwt/A, placing it 4th among the ten chipping entries. At Crookston it was the second-highest chipping entry at 286 cwt/A. In the past it had been noted for erratic yields that were thought to be due to poor quality seed. Higher quality seed has since been used with an associated improved performance.

●**ND2470-27**: One of the highest yielding chippers in the irrigated trials in 1996, and the highest-yielding white chipper at both Oakes and McCanna in 1997, ND2470-27 did not perform as well in the 1998 trials. Average U.S. No. 1 yield across the two irrigated sites in 1998 was 257 cwt/A. At Crookston, it ranked 4th among the 10 chipping entries at 226 cwt/A. ND2470-27 has cold chipping properties and could be used as tablestock with high sensory ratings for boiling, baking, and microwaving in 1995 - 1997. It was entered for the first time in the 1998 North Central Regional Potato Variety Trial.

Red Selections

●**ND5084-3R**: As in 1997, ND5084-3R was among the highest yielding red selections in 1998. Its U.S. No. 1 yield averaged over the ND irrigated sites was 375 cwt/A, as compared to *Red Pontiac* at 382. Under dryland conditions, it yielded 254 cwt/A, 13 cwt/A higher than *Red Pontiac*. While yielding similarly to *Red Pontiac*, its tuber type and color are smoother and deeper red. It also tends to have a lower percentage of tubers in the >3.5" diameter size than *Red Pontiac*. While it has many positive

attributes, it apparently does have a weakness with respect to stolon adhesion or “clinging” stolons, which may limit its potential as a cultivar.

●**ND5002-3R**: Entered for the first time in the primary state trials in 1998. This selection has tubers with typically a deep red skin color and round shape. This year, skin color seemed to be affected by silver scurf. Yields in its first year were good with U.S. No. 1 yields of 299 cwt/A for the irrigated sites making it the third-highest yielding red entry. Under dryland conditions at Crookston it yielded 205 cwt/A—slightly higher than *Dark Red Norland*.

●**ND3574-5R**: A higher-yielding, red selection with round-oblong, deep red tubers and an early maturity similar to *Red Norland*. Average U.S. No. 1 yield under irrigated conditions in 1998 was 232 cwt/A— much lower than *Red Pontiac*, but considerably higher than the yields of *Red Norland*, *Dark Red Norland*, or *NorDonna*. Under dryland growing conditions at Crookston, it was the highest yielding red-skinned entry at 257 cwt/A. Growers have commented that it seems to retain its skin pigmentation in storage without fading.

●**ND3196-1R**: With a yield and maturity similar to *Red Norland*, ND3196-1R has a very nice round shape and a darker skin color than *Red Norland*. Under irrigation in 1998, it averaged 230 cwt/A, very similar to yields observed for *NorDonna*, *Red Norland*, and *Dark Red Norland*. At the Crookston site, it again yielded similarly to other earlier-maturing red cultivars with a U.S. No. 1 yield of 174 cwt/A.

●**ND2225-1R**: An early-maturing selection with good tuber type, deep red skin, and bright white flesh. Based upon a variety release meeting earlier this year, the decision was made not to release it as a cultivar. The primary reason for this decision was ND2225-1R’s propensity to develop russeted skin or “buckskin” under heavier, acidic soils, and its susceptibility to tuber early blight. In peat soils, irrigated sandy soils, and heavy acidic clay soils, the skin russetting is not pronounced, and ND2225-1R can be quite attractive. This selection has found a niche with certain growers in MN and ND, and done well in trials conducted by Pennsylvania State University. This selection will no longer be included in ND yield trials after this year.

Russets

●**A79180-10**: This Idaho selection was the highest yielding russet at McCanna in 1996 and at McCanna, Oakes, and Park River in 1997. In the 1998 trials, its U.S. No. 1 yield across all irrigated sites was 280 cwt/A, placing it third among the entries in the Russet / Long White category behind *Russet Norkotah* and *Shepody*. It placed fifth among entries at Crookston with a yield 167 cwt/A. In 1995 it had excellent french fry evaluation score--somewhat lower but acceptable in 1996 and 1997. It has consistently scored well for sensory qualities and could be a dual-purpose selection. However, its lightly-russeted skin, may limit its use for tablestock.

●**ND4093-4Russ**: While not as high yielding as A79180-10 or *Russet Norkotah*, its yield has compared favorably with *Russet Burbank* or *Goldrush*. In 1998, it averaged 230 cwt/A under irrigation and 233 cwt/A in the Crookston dryland trial. It is a medium

maturing selection with nice tuber type and excellent russeting. In french fry sensory evaluations it is usually ranked similarly or higher (in 1998) than *Russet Burbank* for fry color, taste, and texture. However, its lower specific gravity may limit its use for processing.

Germplasm Enhancement Update

A major objective of the NDSU program is the incorporation of resistance to the newer genotypes of *Phytophthora infestans*, such as the US-8 genotype that predominates in North Dakota. Crosses utilizing parents with genetic resistance to late blight continued this past winter and their progeny were grown in the greenhouse this past summer. Several new sources of late blight resistance were incorporated into the crossing program. Of special merit was the Scottish potato cultivar ***Stirling***, a round white cultivar having late blight resistance and tubers that size well under our North Dakota conditions. Further selections were made within late blight resistant families this Fall at Langdon, with several putative resistant selections displaying cultivar qualities. These and other more advanced clonal selections will be grown in the greenhouse this winter and evaluated for late blight resistance in collaboration with Drs. Gary Secor and Neil Gudmestad of the Plant Pathology Department at NDSU.

Field testing of material for late blight resistance also was conducted at Prosper, ND this past summer in collaboration with NDSU Plant Pathology. Plots at Prosper were planted July 15th with greenhouse - grown plants inoculated with the US-8 genotype, to act as a source of inoculum in the field. The entire field was then sprayed with water that same night to aid in the development of the disease. Following inoculation, the season was warm and dry, and late blight pressure was not as great as in past years. However, late blight did appear by late August, allowing differentiation among clones for resistance/susceptibility.

Eighty entries consisting of selected ND breeding clones with one or more resistant parents, new European cultivars, and potato clones with known resistance to late blight were evaluated as 5 hill, unreplicated plots. Readings were taken of percent necrotic tissue at the end of August, with many clones showing very good resistance. At the end of September the hills of resistant clones were dug and tuber qualities evaluated. Resistant clones with acceptable maturity and tuber characteristics were **ND6588B-13** (J101K27 x ND5433-2), **ND6590B-3** (J101K27 x S440), **ND6595B-22 and 42** (J138A12 x Norchip), **AND9552-4** (AWN86514-4 x AO84275-3), **AND9504-1** (J101K6 x A84118-3), **BO718-3**, and ***Robijn***.

Twenty-nine entries were also evaluated in a replicated trial, the results of which are presented in **Fig. 5**. As in the 5 hill, unreplicated plots, the entries in the replicated trial displayed a range of resistance / susceptibility. Most notably resistant were three clones from the family **AND9524** (J138A4 x A84118-3), as well as **AND9504-1** (J101K6 x A84118-3), **AND9517-2** (J103K7 x A84118-3), **BND1849-2** (J138A12 x B1419-6) , and ***Stirling***. These clones will be used as parents in the 1999 crossing program.

The breeding program is also incorporating genetic resistance to *Verticillium* wilt, early blight, silver scurf, PLRV, PVY, green peach aphid and Colorado potato beetle into commercially-acceptable clones. **ND5822C-7** is an example of our efforts in this area. Identified as resistant to Colorado potato beetle in screenings by Drs. Lorenzen and Balbyshev and in the 1998 Park River screening trial, **ND5822C-7** is also notable

for its yield and tuber-type in the 1998 yield trials.

In addition, the following report updating their efforts in germplasm enhancement was contributed by Jim Lorenzen, Nikolay Balbyshev, Abbas Lafta, Boris Sagredo, and Wayne Larson:

Field 1998: Eight trials were planted to screen for resistance to the Colorado potato beetle in Crookston, Fargo, and McLeod. In each trial, lines were selected that were nearly untouched by the beetles. One of the main resistance factors in many of these lines is the glycoalkaloid, leptine. Laboratory tests showed that new populations developed for this factor had nearly twice the percentage leptine as previous generations, with nearly 80% of the foliar glycoalkaloid content as this potent beetle deterrent. The screening site at McLeod also proved to be an excellent site for screening for scab resistance. Scab severity was scored for two tetraploid populations for which genetic maps are being developed. This will allow us to identify the location of the gene(s) that cause scab resistance. This mapping effort has identified a gene locus that is responsible for much of the variation in leptine content, and an additional locus that further amplifies beetle resistance. There was wide variation in yields in this mapping population, with about 20% of the clones having higher yields than the average of the three higher yielding check clones, *Red Pontiac*, *Russet Burbank*, and *Shepody*. The maximum individual plot yield of a beetle-resistant test line was 660 cwt/acre, more than double that of the check varieties in that trial.

Greenhouse : Crosses were made to combine beetle resistance with late blight resistance from two tetraploid sources. In addition, three diploid populations were scored for resistance to *Verticillium*. Two of these populations also segregated for a high degree of resistance to late blight (US-8), and were screened for late blight resistance. Chip quality from cold storage will be determined in the near future. DNA fingerprinting methods are being utilized to identify gene loci that determine resistance to *Verticillium*, late blight, and cold-sweetening.

Table 1. Spacing, Fertilizer, Soil Type, Planting and Harvest Dates of the 1998 North Dakota Potato Variety Trial Sites.

Location	Spacing		Fertilizer Applied	Soil Types	Planting Date	Rotobeat
	Row	Plant				
Crookston	38"	12"	120 lbs soil N, 60 lbs/A of P ₂ O ₅ , 40 lbs/A of K ₂ O	Wheatville prairie fine sandy loam	5-22	9-8
McCanna	38"	12"	150 lbs/A of P ₂ O ₅ , 60 lbs/A of K ₂ O, copper sulfate @ 3/4 pint/A, Sidedress of 28-0-0 @ 15 gal/A, fertigation of 28-0-0 6 times during season.	Sandy loam	4-21	9-9
McLeod	38"	12"	160 lbs/A of N (Total with soil nitrogen=166 lbs/A), 60 lbs/A of P ₂ O ₅ , 100 lbs/A of K ₂ O	Hecla fine sandy loam	5-7	9-3
Park River	38"	12"	Soil test indicated 231 lbs/A of N, and sufficient P and K	Glyndon silt loam	4-21	8-6

Note: The North Dakota advanced selections described in these trials can be distinguished as russet, red, or white-skinned by:

ND5555-5 = white

ND5555-5R = red

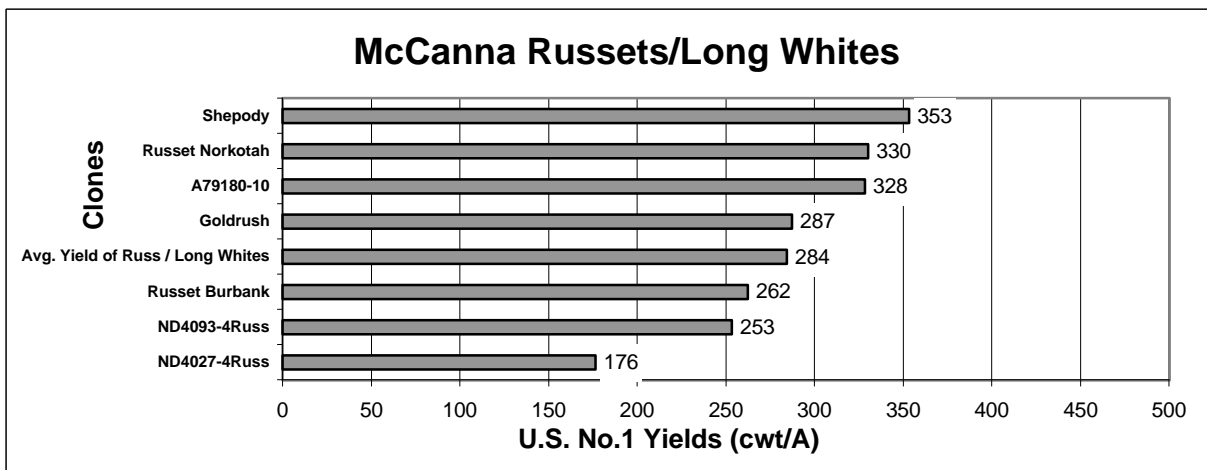
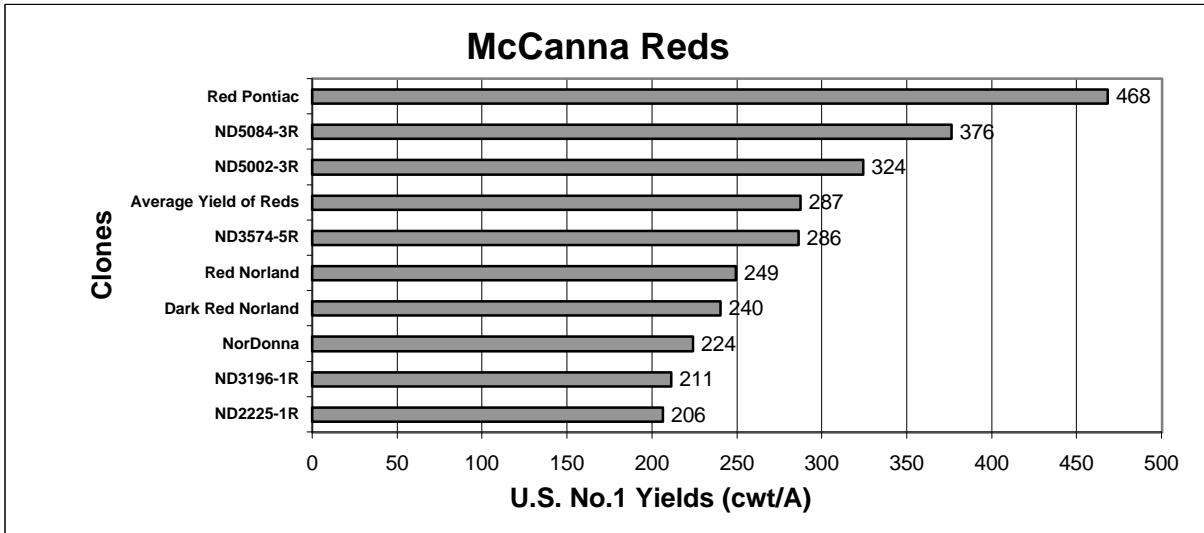
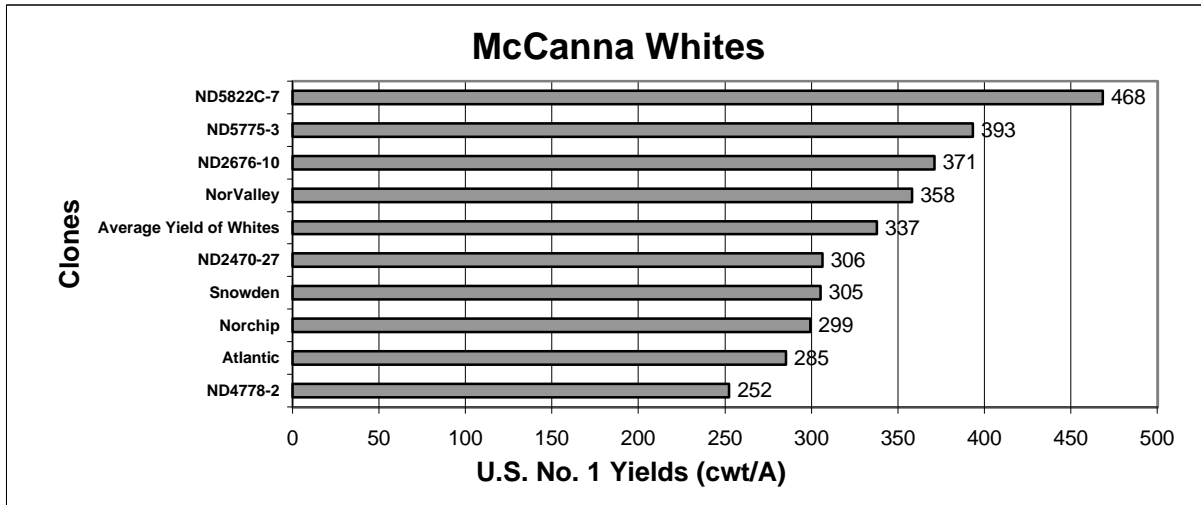


Fig. 1. U.S. No. 1 Yields of Entries at the Irrigated McLeod, ND site--1998.

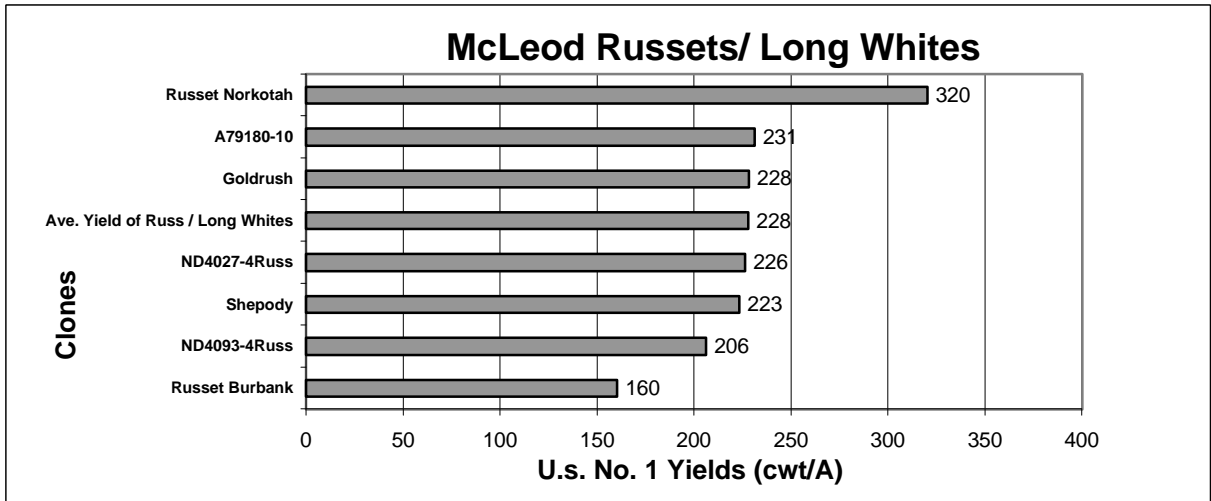
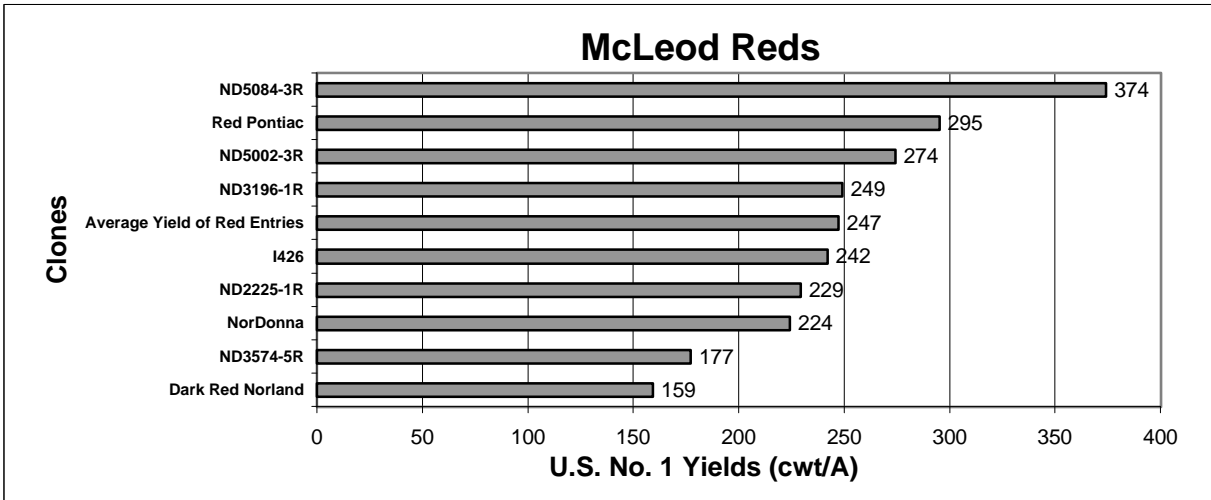
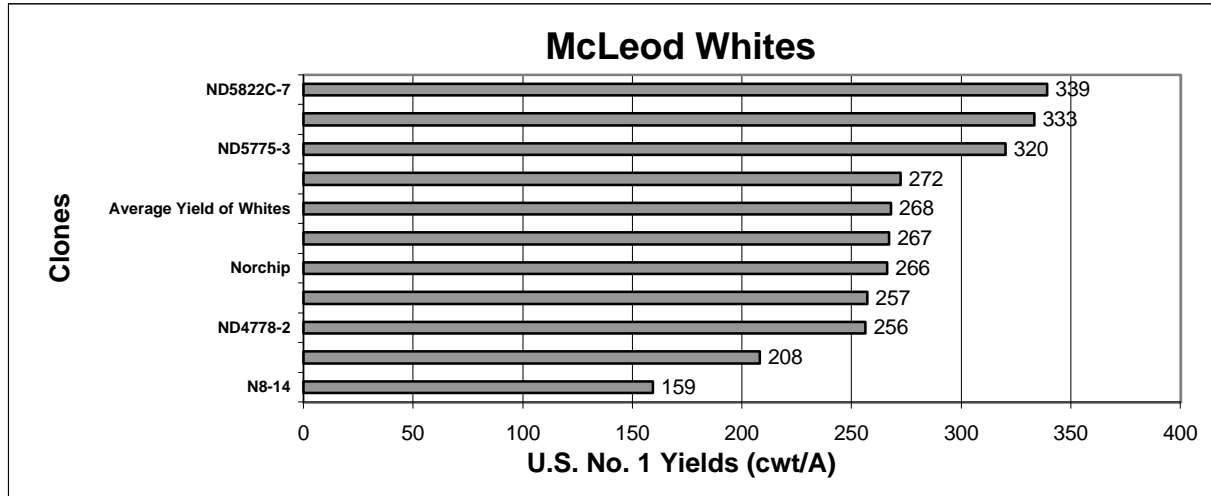


Fig. 2. U.S. No.1 Yields of Entries at McLeod, ND 1998.

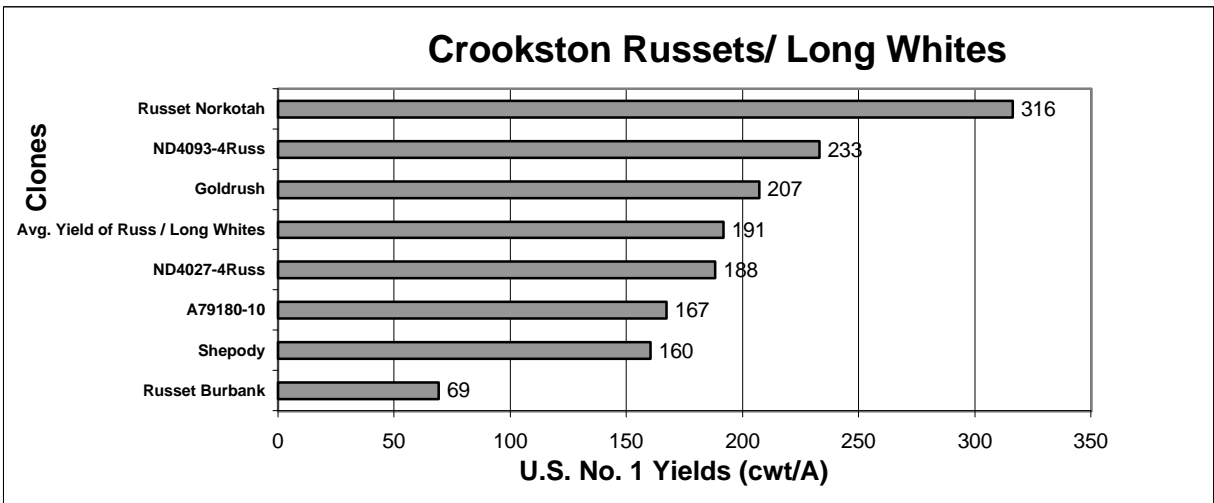
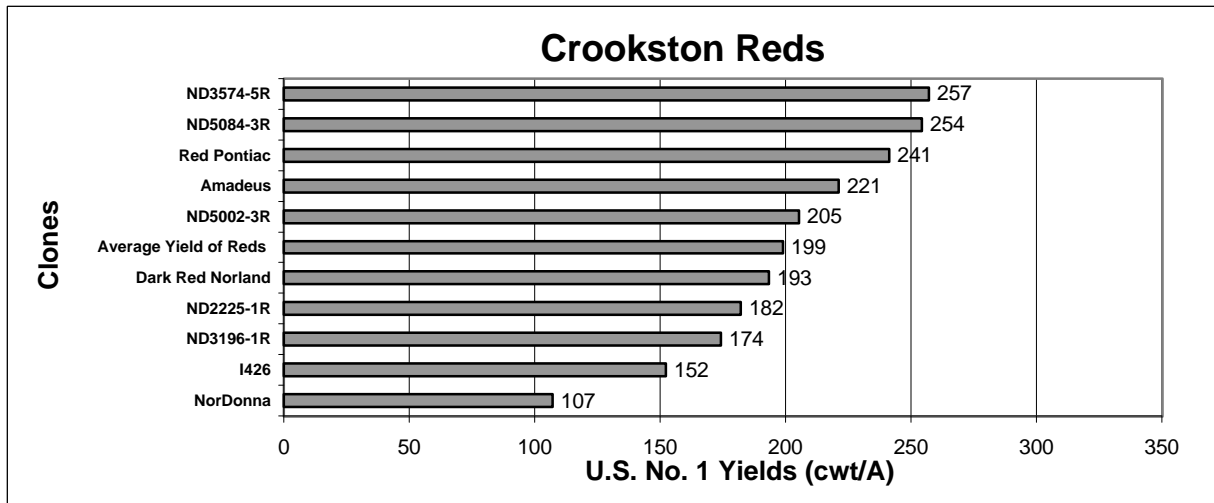
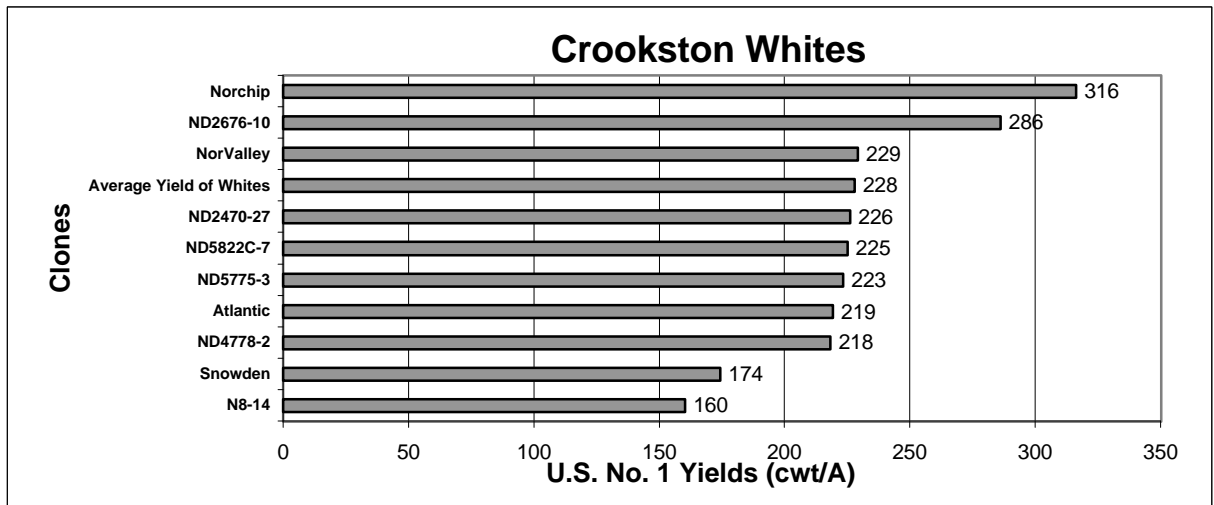


Fig. 3. U.S. No. 1 Yields of Entries Under Non-Irrigated Conditions at Crookston, MN 1998.

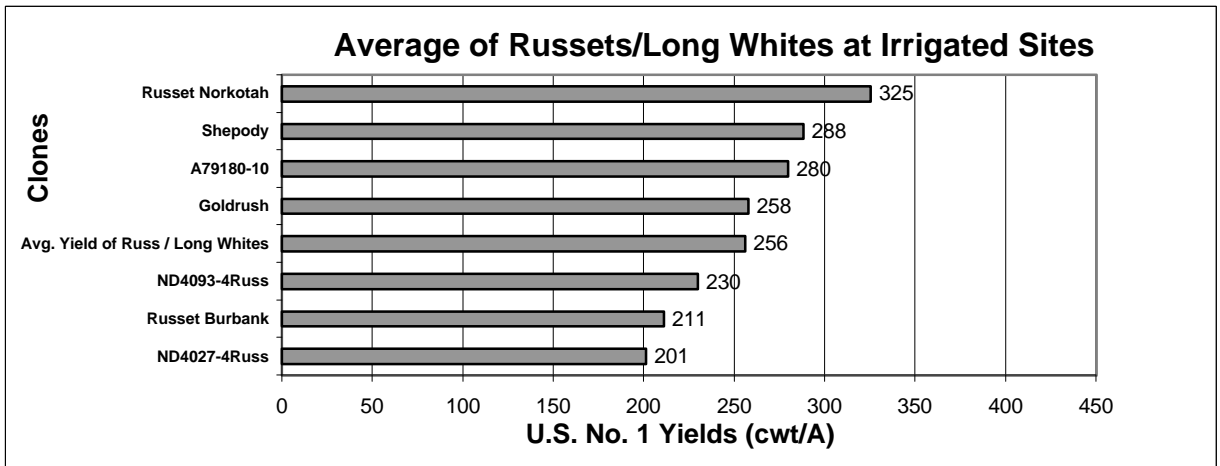
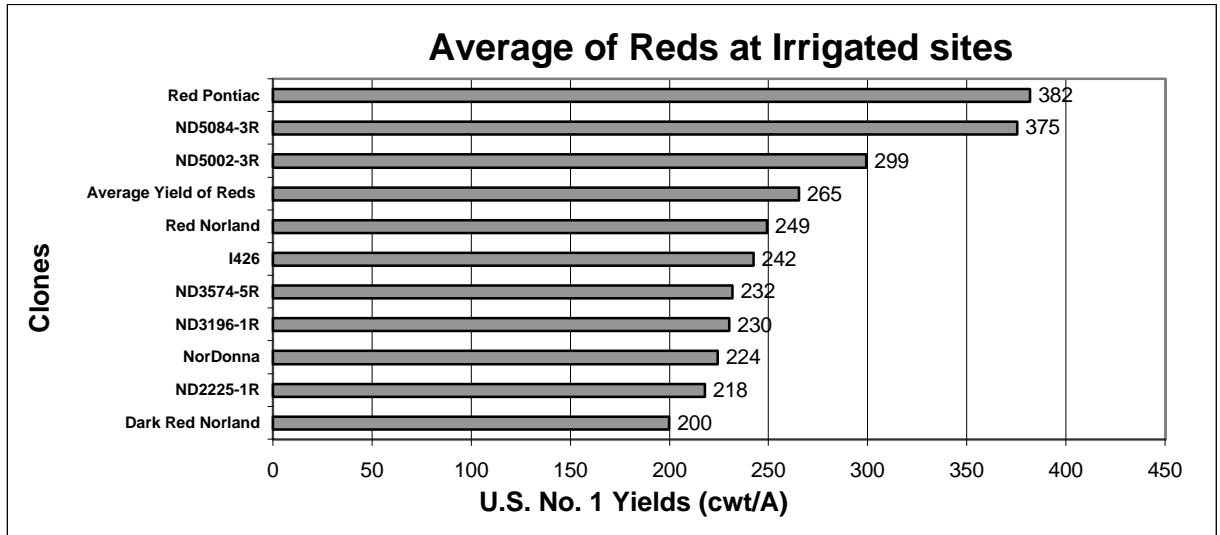
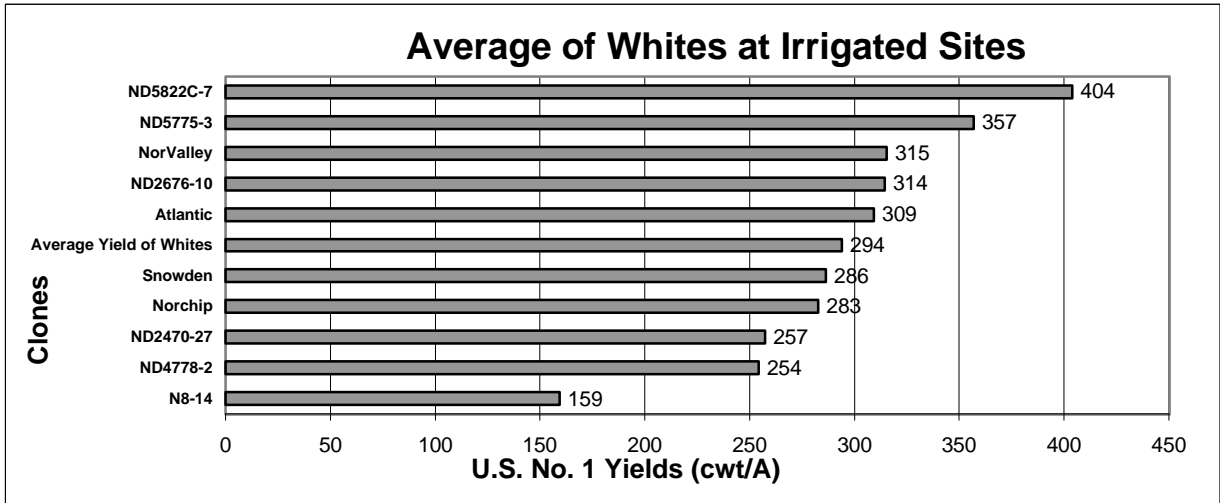


Fig. 4. U.S. No. 1 Yields of Entries Averaged Across Irrigated Sites --1998.

Table 8: Average French Fry Evaluation Scores for the 1997 Season

Cultivar or Selection	Color	Texture	Flavor	Combined Sensory Score ¹
Irrigated Sites				
*REFER TO RATING GUIDE BELOW				
ND4027-4Russ	6.9	6.8	6.8	6.8
Agria	6.6	6.5	6.6	6.6
Russet Burbank (Control)	6.5	6.6	6.6	6.6
NDL128-11	6.7	6.1	6.6	6.5
ND4093-4Russ	7.2	6.1	6.1	6.5
Romano	6.9	6.2	6	6.4
Sante	6.1	6.2	6.7	6.3
Fianna	6.3	5.9	6.4	6.2
Lili	6.7	5.8	5.9	6.1
A79180-10	6.2	6.2	5.7	6.0
Russet Burbank	6.3	5.9	5.6	5.9
A82119-3	6.3	5.8	5.6	5.9
SW88-109	6.5	5.1	6	5.9
Shepody	6.5	5.5	5.2	5.7
Russet Norkotah	6.1	5.4	5.5	5.7
ND5104-1Russ	5.9	4.8	5.5	5.4
ND5104-2Russ	6	4.9	4.8	5.2
Goldrush	4.7	5.3	5.3	5.1
Picasso	5	4.8	5.1	5.0
Grand Forks Site				
ATX9201-1Russ	7.3	7	6.7	7.0
ND5343-1Russ	6.6	6.8	6.9	6.8
COO83008-1	6.7	6.6	6.6	6.6
Fianna	6.8	6.5	6.4	6.6
ND4219-14Russ	6.6	6.5	5.8	6.3
SW91102	7.1	6.3	5.3	6.2
Shepody	6.5	6.2	6	6.2
ND4233-1Russ	6.4	5.8	6.2	6.1
NDO2904-7Russ	6.5	5.8	5.8	6.0
ATX9202-3Russ	6.3	6.3	5.3	6.0
Asterix	5.8	6.2	5.8	5.9
ND4240-9Russ	5.6	5.8	6.1	5.8
TXAV657-27Russ	6.2	5.7	5.6	5.8
Russet Burbank	5.7	6	5.7	5.8
Goldrush	5.9	5.4	6.1	5.8
TXNS223	4.9	6.2	6.1	5.7
TXNS112	5.7	5.5	5.4	5.5
Dali	5.3	5.4	5.4	5.4
Viking	5.4	5.1	5.6	5.4
Russet Norkotah	5	5.2	5.9	5.4
ND2667-9Russ	4.5	5.3	5.6	5.1
ATX9220-3Russ	4.5	5.2	5.7	5.1
Rikea	4.8	5	5.3	5.0
TXNS278	4.7	5.1	4.9	4.9
ATX9204-2Russ	4.2	4.4	5.2	4.6
ATX87262-2Russ	3.8	5.2	4.6	4.5

¹ Combined Sensory Score is the average of the three ratings for color, texture, and taste.

*Rating Guide

7-9	Good
5-6	Fair, and acceptable
1-4	Poor, not acceptable

**Table 9: Chipping Evaluation of Cultivars and Selections
Grown at Three North Dakota 1997 State Trial Sites
[McCanna(M), Grand Forks(GF) and Park River (PR)].**

Variety or Selection	First Chipping: Direct Chip from 43° ¹	Second Chipping: Two Weeks Reconditioning ²	Third Chipping: Four Weeks Reconditioning ³
Agtron Reading⁴			
Atlantic	43	48	50
Goldrush	37	40	41
Norchip(M,GF only)	47	52	55
NorValley	55	52	58
Russet Burbank	36	37	41
Russet Norkotah	34	42	45
Shepody	38	43	48
Snowden	51	52	55
A79180-10	40	45	48
A82119-3	35	41	43
N8-14	58	57	59
NDL128-11(GF,PR only)	34	41	46
NDO1496-1	53	55	56
ND860-2	52	56	56
ND2470-27	53	55	56
ND2676-10	56	59	58
ND3636-1	52	56	56
ND3647-6	53	54	56
ND3828-15	56	58	59
ND4027-4Russ	39	42	45
ND4093-4Russ	41	44	48
ND4778-2	52	53	55
ND5104-1Russ(M,GF only)	36	38	38
Fianna(GF,PR only)	46	51	54
Single Site Entries Grown in Trials at McCanna(M), Grand Forks(GF), Oakes, or Park River (PR) ND.			
Lili(M)	45	41	50
Picasso(M)	24	30	32
Pike(GF)	45	54	56
Romano(M)	43	55	53
SW88109(M)	40	42	45
ND2676-12(GF)	53	58	57
ND5104-2Russ(M)	44	45	49
ND5775-3(GF)	54	55	55
ND5822C-7(GF)	48	53	57
Agria(Oakes)	50	54	51
Dali(GF)	37	39	43
Rikea(GF)	34	32	37
Sante(Oakes)	39	57	54
SW91102(GF)	50	47	55

¹Stored for 4 weeks at 43°

²Stored for 4 weeks at 43°, Reconditioned for 2 weeks at 65°

³Stored for 4 weeks at 43°, Reconditioned for 4 weeks at 65°

⁴Agtron 0-90

0=Black; 90=white

55=minimum acceptable color

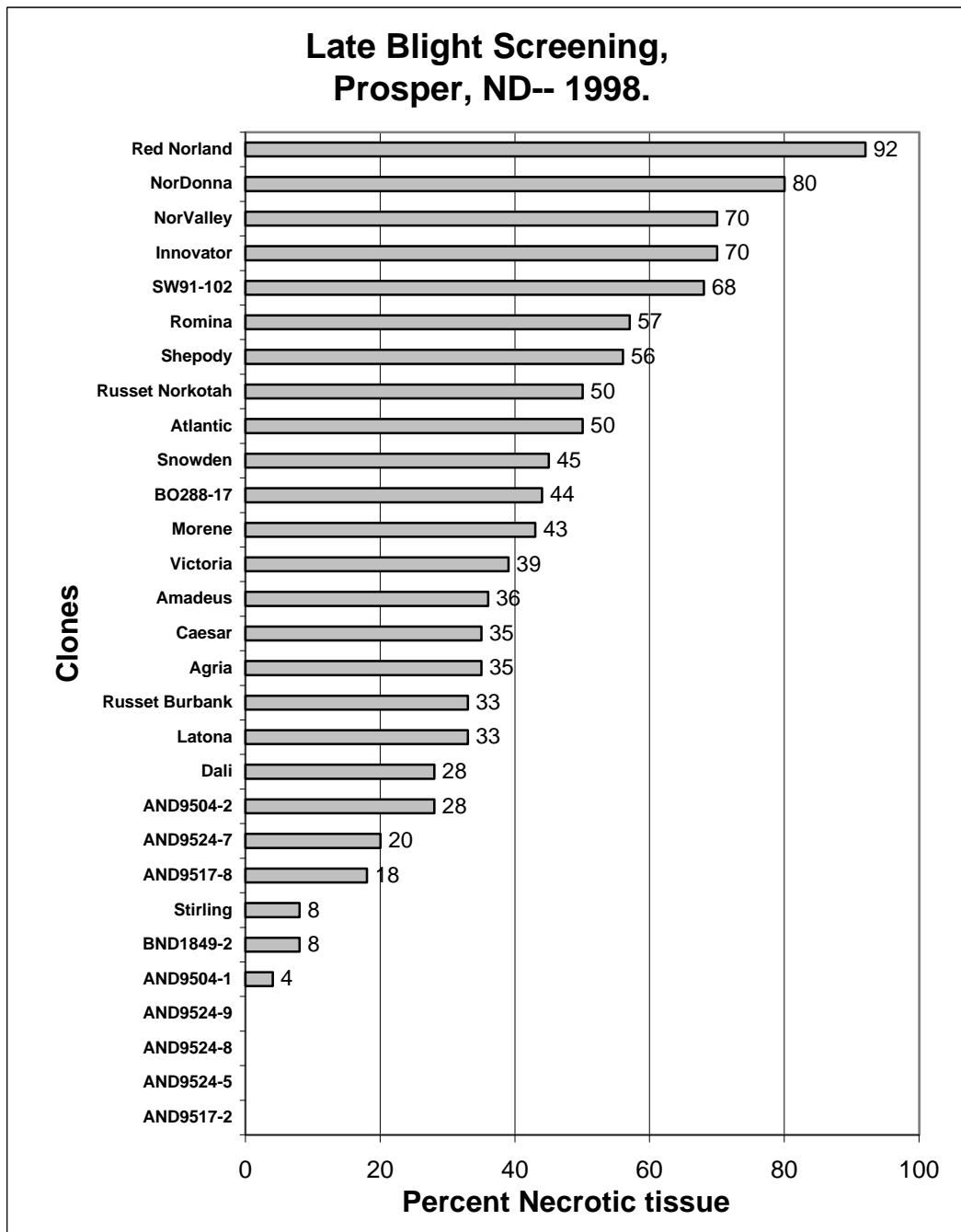


Fig 5. Resistance/susceptibility of potato clones at Prosper, ND--1998.