

Progress Report Regarding University of Manitoba
Field Research for 1989

Assessing the Chloride Fertilizer Requirements of Barley and Wheat
Grown on Manitoba Soils

R.M. Mohr, D.N. Flaten, C.C. Bernier and G.J. Racz
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Summary of Progress to Date

Field research is currently underway in order to assess the chloride fertilizer requirements of wheat and barley grown on Manitoba soils. Field studies are progressing well at this point. Five sites have been established on a variety of soil types and textures across southern Manitoba. All sites have shown good germination, emergence and growth to date and, as a result of recent rains, have adequate moisture reserves. Plant counts and a chemical weed control program are being undertaken at present.

Changes Since April/89 Annual Report

In order to collect more complete information, several changes have been made to the planned field studies outlined in the Annual Report of April 1989. The number of off-campus field locations has been increased from two to four. Recommended varieties of two different crops, Katepwa wheat and Bedford barley, have been included as test crops in these off-campus field studies rather than only barley as originally planned. As well, rather than using two barley varieties for the intensive study at "the Point" on the U of M campus only one barley variety, Bedford, has been used as a test crop. Treatments are as described in the Annual Report aside from the addition of a seed row treatment of 25 kg/ha Cl as KCl. To date, data collection remains as set out in the Annual Report of April 1989.

Study #1 - Field Studies Conducted Off-Campus

Four off-campus field locations have been established on soils rated very low to low in chloride according to the North and South Dakota guidelines of <30 lbs/ac to 60 cm and <60 lbs/ac to 60 cm respectively. Of these four sites, two sites have been treated with disease inoculum to allow a study of the effect of chloride on common root rot. The remaining two sites have not been treated with disease inoculum, but will be used to gather additional information about the effect of chloride fertilization on grain yield.

a. Off-Campus Sites Without Root Rot Inoculum

Two sites, one near Anola (Fig. 1, east of Winnipeg) and one near Darlingford (Fig. 1, southwest of Winnipeg) were sown to Katepwa wheat on May 23. These trials consist of five replicates of seven fertilizer treatments (Fig. 2). These treatments are as follows:

1. 0 kg/ha Cl as KCl
2. 25 kg/ha Cl as KCl (broadcast)
3. 50 kg/ha Cl as KCl (broadcast)
4. 0 kg/ha Cl as NaCl
5. 25 kg/ha Cl as NaCl (broadcast)
6. 50 kg/ha Cl as NaCl (broadcast)
7. 25 kg/ha Cl as KCl (seed row placement)

b. Off-Campus Sites Inoculated With Root Rot

Two sites (one near Carman seeded May 25 and 26 and one near Portage seeded May 29) have been established in order to determine the effect of chloride fertilizer on common root rot of wheat and barley. A split plot design was used with Katepwa wheat and Bedford barley as main plots. Each site consists of six replicates of fourteen treatments for both wheat and barley (Fig. 3). Treatments are comprised of three fertilizer rates (0, 25, 50 kg/ha Cl) x two sources of broadcast fertilizer (KCl or NaCl) x two inoculation treatments (inoculum and no inoculum). Two additional treatments of 25 kg/ha Cl as KCl (seed row placement) x two inoculation treatments (inoculum and no inoculum) have also been included. These treatments are as follows:

1. no inoculum x 0 kg/ha Cl as KCl
2. no inoculum x 25 kg/ha Cl as KCl (broadcast)
3. no inoculum x 50 kg/ha Cl as KCl (broadcast)
4. no inoculum x 0 kg/ha Cl as NaCl
5. no inoculum x 25 kg/ha Cl as NaCl (broadcast)
6. no inoculum x 50 kg/ha Cl as NaCl (broadcast)
7. inoculum x 0 kg/ha Cl as KCl
8. inoculum x 25 kg/ha Cl as KCl (broadcast)
9. inoculum x 50 kg/ha Cl as KCl (broadcast)
10. inoculum x 0 kg/ha Cl as NaCl
11. inoculum x 25 kg/ha Cl as NaCl (broadcast)
12. inoculum x 50 kg/ha Cl as NaCl (broadcast)
13. no inoculum x 25 kg/ha Cl as KCl (seed row placement)
14. inoculum x 25 kg/ha Cl as KCl (seed row placement)

Study #2 - Intensive Study at "the Point" on U of M Campus

Two plots of Bedford barley were seeded at "the Point" on May 31. Treatments applied at this site correspond to those listed the Off-Campus Sites Inoculated With Root Rot (Fig. 4). One plot in which common root rot inoculum was applied consists of six replicates of treatments 1 through 14. The second plot in which spot blotch inoculum will be applied consists of six replicates of treatments 1 through 12. Unlike the common root rot inoculum which was applied through the drill into the seed row, spot blotch inoculum will be applied to the soil surface during the growing season approximately one month after emergence.

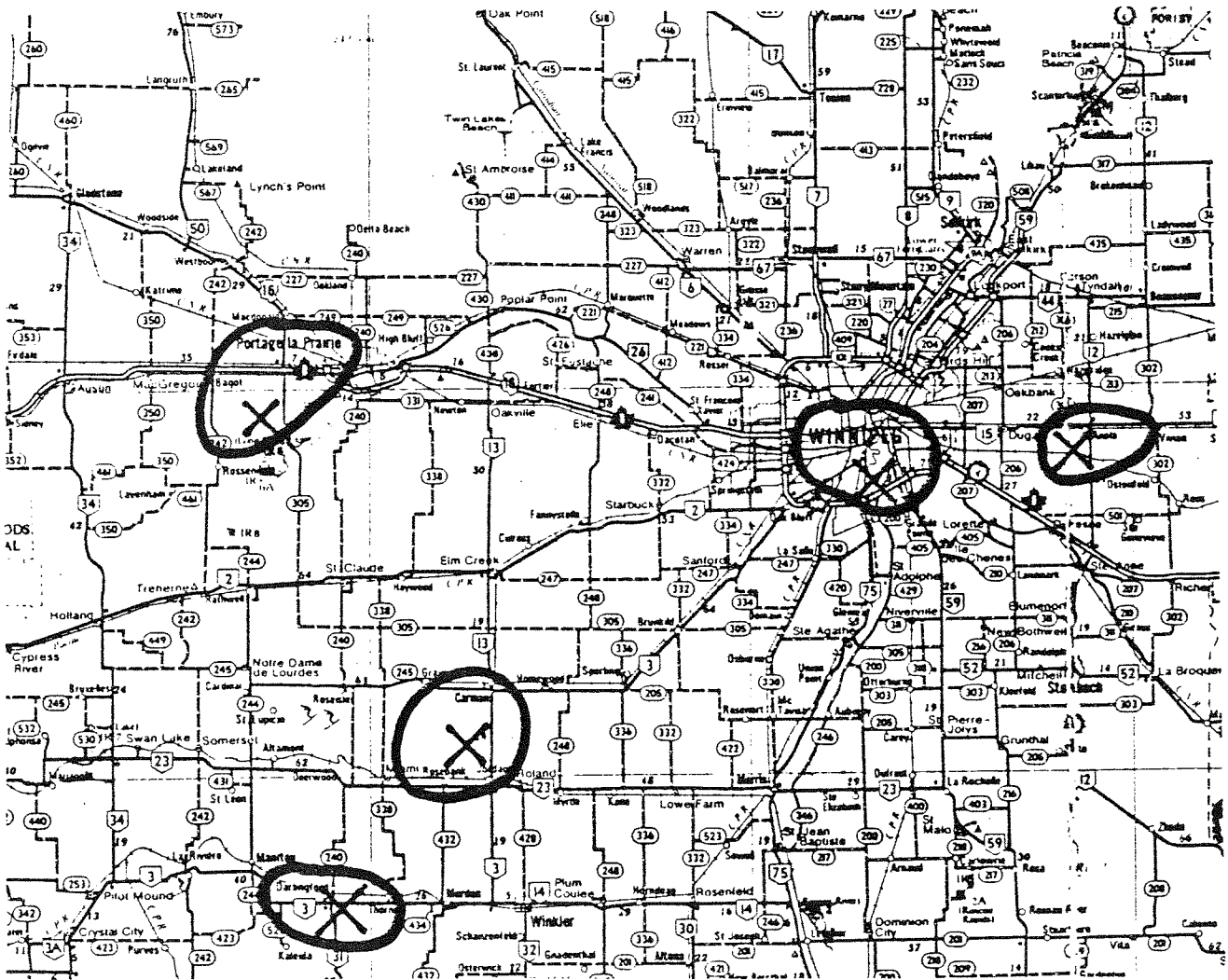


Figure 1. Location of field plots for chloride experiments.

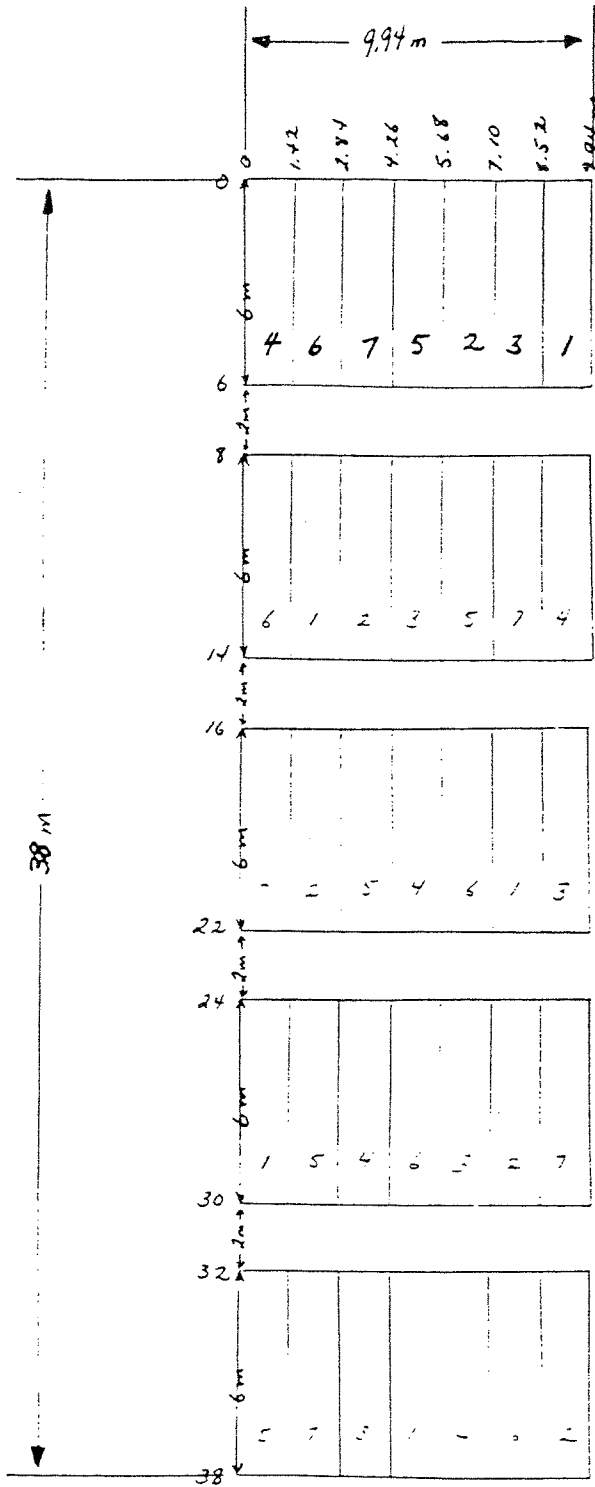


Figure 2. Plot diagram for Study #1a, Off-Campus Sites Without Root Rot Inoculum

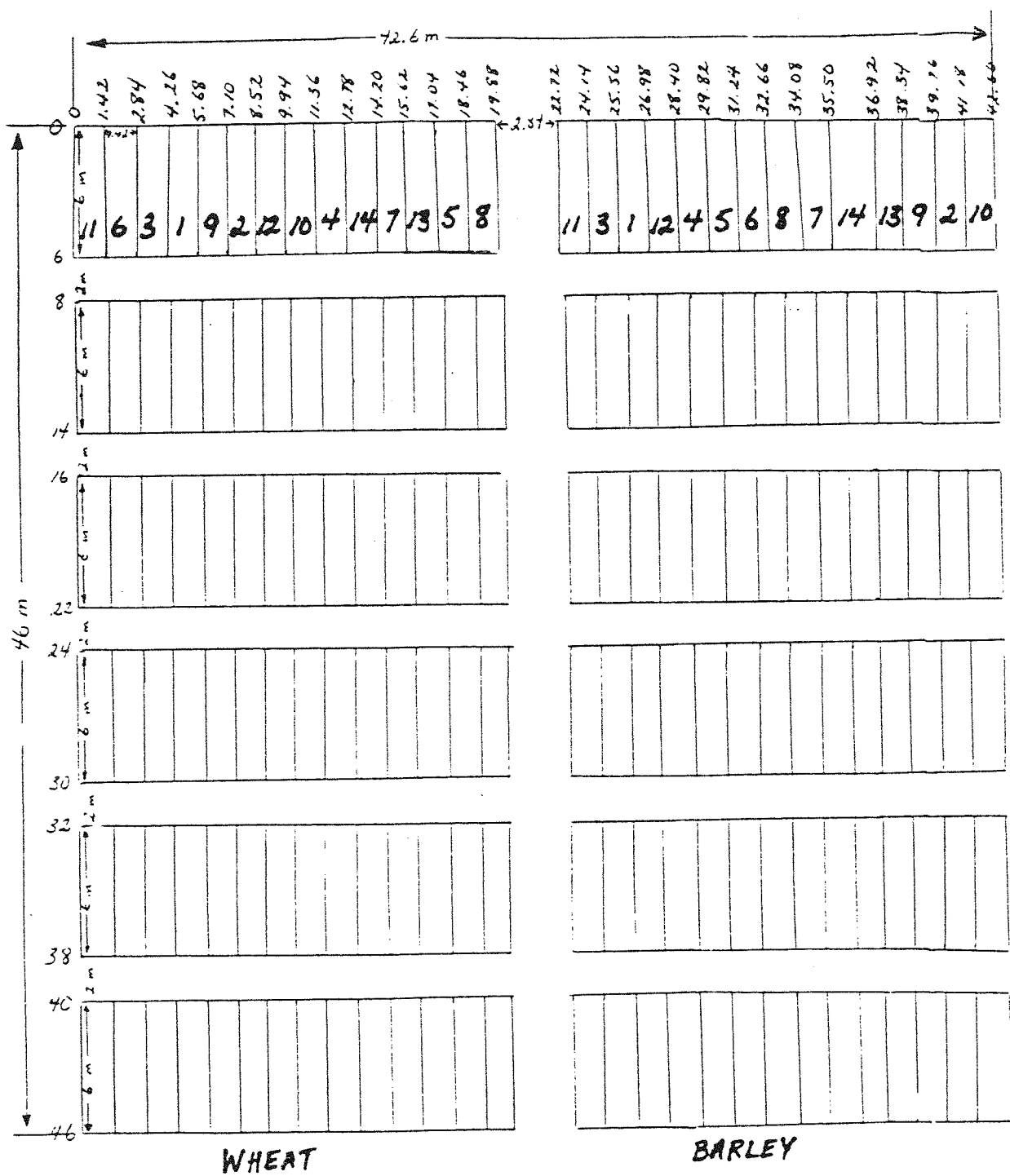


Figure 3. Plot diagram for Study #1b, Off-Campus Sites Inoculated With Root Rot

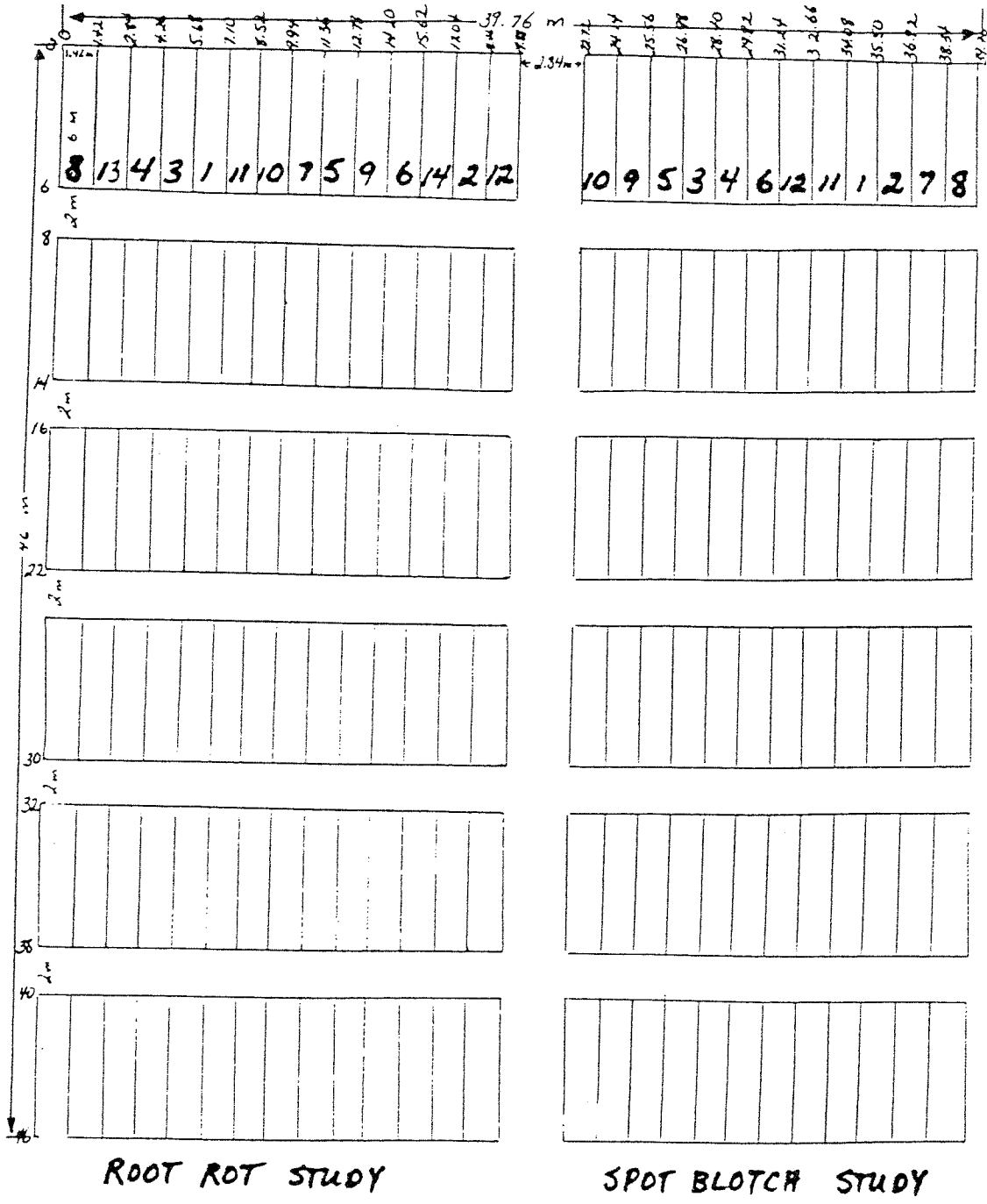


Figure 4. Plot diagram for Study #2, Intensive Study at "the Point" on U of M Campus

Annual Report for the
University of Manitoba Research Project

Assessing the Chloride Fertilizer Requirements of Barley
Grown on Manitoba Soils

D.N. Flaten, C.C. Bernier, and G.J. Racz
April 1989

Phase 1 - Assessment of Chloride Fertility Status of Manitoba Soils

In 1988, typical Manitoba soils were sampled according to toposequence and depth and have been analysed for chloride (see attachment for preliminary values). Of the 160 soils which were sampled, the majority would be classified as low in chloride according to the guidelines used in North and South Dakota.

Further analysis of the soil sample information will be conducted to investigate relationships between chloride and soil type, texture, drainage, toposequence and depth. A study of differences between methods of analysis for Cl may also be conducted.

There may however, be little relationship between yield response to chloride and levels of extractable chloride in soil under Manitoba conditions. In a preliminary trial in 1988 Dr. Bernier of the Dept. of Plant Science found a response to chloride fertilization where wheat had been inoculated with take-all fungus at the plot at "the Point" on the campus (approx. 177 kg of Cl/ha in top 60 cm) but not at Portage (approx. 78 kg of Cl/ha). No response to Cl was observed without inoculation at either site.

Phase 2 - Determination of the Effects of Chloride Fertilization on the Growth and Yield of Barley *in Bedford*

The field studies which were originally planned for the project have been scaled back slightly because of a lack of resources and a shortfall in the budget (the level of sponsorship originally requested was \$40,000 per year; the total commitment of sponsors now stands at \$26,000).

*see wheat activity
soil levels
• 30 lb/ac Pl
• 11 lb/ac C*

All field studies will be confined to barley as a test crop. Two levels of investigation are planned:

Study 1 - Field Studies Conducted Off-Campus

A recommended variety of barley (probably Bedford) will be grown at two field locations off the university campus. These sites will be low or very low in Cl, according to the North and South Dakota guidelines of <60 and <30 lb/ac, respectively, in the top 60 cm. Fertilizer treatments will include 0, 25 and 50 kg of Cl/ha in forms of broadcast KCl or NaCl. For all fertilizer rates and types there will be treatments with and without the addition of disease inoculum at time of seeding. Inoculum will be placed in the seed row, through the drill,

*25 kg/ha
in the seed
- inoculum*

in the center 4 rows of the 8 row drill-width. Six replicates of each treatment will be established in small plots, each measuring approximately 1.42 m x 6 m. Plants at heading stage will be monitored for K, Cl, NO₃, Na, Cu, Mn, and Zn. Disease severity, including measurements of common root rot and spot blotch will be determined. Soil samples will be taken at time of seeding and analysed for NO₃, Cl, Cu, Mn and Zn. Final grain yield will be measured as well as bulk density of grain.

Study #2 - Intensive Study at "the Point" on U of M Campus

*Barley cc
Bedford*

The Point was selected for the intensive study because it is near the Pathology lab and because it produced a response to Cl for inoculated wheat during preliminary trials in 1988. Two varieties of barley will be grown, Bedford and Heartland. Treatments and data collection will be similar to the plots in Study #1, except for the addition of a foliar inoculation, for spot blotch, during the growing season.

Financial Report for April 1/88 to March 31/89

*2 sup. inoc trials
(1) G₀ field exp't
14 tet.
NaCl, KCl
0.25, 50 cl⁻
inoc exp. 47.5 not 47?
r 2 KCl seed inc.
(2) neighboring field
Brier inocul
not inocul y film
arises
no seed in tet.
spot blotch.*

Income

Central Canada Potash	\$1000
Cominco Fertilizers	1500
Kalium Chemicals	2000
Potash and Phosphate Inst. of Canada	5000
Potash Corp. of Saskatchewan	2500
Western Canadian Fertilizer Assn.	1000
<u>Western Coop Fertilizers Ltd.</u>	<u>5000 + loss</u>

July analysis

Total income \$18000

Expenses

Casual technical staff*	\$700
Supplies	400
<u>Chloride analysis at NDSU</u>	<u>1950</u>
Total expenses	\$3050

NET CARRYOVER TO 1989/90 \$14950

Additional Commitments

Repayment to Dept. of Soil Science for staff and field expenses for gathering soil samples in July/88*	\$6000
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*- Dept. of Soil Science
- for chem to project.*

ADJUSTED NET CARRYOVER TO 1989/90 \$8950

* Funding for the project did not arrive until August/88. Due to cash flow problems, most of the expenses for gathering and processing the 800 soil samples in July/88 were paid by the Dept. of Soil Science.

Financial Plans for 1989/90 and 1990/91

ADJUSTED NET CARRYOVER TO 1989/90 \$8950

1989/90 Income

Central Canada Potash	\$1000
Cominco Fertilizers	2500
Kalium Chemicals	2000
Potash and Phosphate Inst. of Canada	5000
Potash Corp. of Saskatchewan	5000
Sherritt-Gordon Mines Ltd.	5000
Western Canadian Fertilizer Assn.	1000
<u>Western Coop Fertilizers Ltd.</u>	<u>5000</u>

Total income \$26500

1989/90 Expenses

Salaries	
Graduate Student	\$12000
Summer Ass't. (.5 soils/.5 plant)	7000

Lab Supplies 5000

Field Supplies and Travel 6000

Total expenses \$30000

NET CARRYOVER TO 1990/91 \$5450

1990/91 Income

Central Canada Potash	\$1000
Cominco Fertilizers	2500
Kalium Chemicals	2000
Potash and Phosphate Inst. of Canada	5000
Potash Corp. of Saskatchewan	5000
Sherritt-Gordon Mines Ltd.	5000
Western Canadian Fertilizer Assn.	1000
<u>Western Coop Fertilizers Ltd.</u>	<u>5000</u>

Total income \$26500

1990/91 Expenses

Salaries	
Graduate Student	\$12500
Summer Ass't. (.5 soils/.5 plant)	7500

Lab Supplies 5500

Field Supplies and Travel 6450

Total expenses \$31950

NET CARRYOVER TO 1991/92 \$0

Preliminary Assessment of Chloride Status in Manitoba Soils
(April 10/89 - estimates for kg/ha estimated as ppm x 2 for each 15 cm)

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm)	Chloride (kg/ha, top 60cm)
1	Red River HC	3 5 3E	1-1	0 15	2.63	1.24	37.69717	190.3099
2				15 30	2.06	0.67	20.36863	
3				30 60	2	0.61	18.54458	
4				60 90	5.62	4.23	128.596	
5				90 120	12.42	11.03	335.3225	
6	Red River HC		2	0 15	2.45	1.06	32.225	317.3859
7				15 30	2.13	0.74	22.4967	
8				30 60	3.1	1.71	51.98562	
9				60 90	7.16	5.77	175.4135	
10				90 120	18.82	17.43	529.8885	
11	Red River HC		3	0 15	4.08	2.69	81.77855	388.5241
12				15 30	3.63	2.24	68.09812	
13				30 60	2.12	0.73	22.19269	
14				60 90	5.44	4.05	123.1238	
15				90 120	11.96	10.57	321.338	
16	Osborne HC	5 5 3E	2-1	0 15	1.7	0.31	9.424294	48.0335
17				15 30	1.55	0.16	4.864152	
18				30 60	1.55	0.16	4.864152	
19				60 90	1.45	0.06	1.824057	
20				90 120	1.49	0.1	3.040095	
21	Osborne HC		2	0 15	1.58	0.19	5.77618	24.92878
22				15 30	1.51	0.12	3.648114	
23				30 60	1.44	0.05	1.520047	
24				60 90	1.5	0.11	3.344104	
25				90 120	1.47	0.08	2.432076	
26	Osborne HC		3	0 15	3.2	1.81	55.02571	126.4679
27				15 30	1.56	0.17	5.168161	
28				30 60	1.44	0.05	1.520047	
29				60 90	1.46	0.07	2.128066	
30				90 120	1.47	0.08	2.432076	
31	Red River HC	6 5 1E	3-1	0 15	1.9	0.47	14.28845	98.49907
32				15 30	1.84	0.41	12.46439	
33				30 60	1.8	0.37	11.24835	
34				60 90	1.66	0.23	6.992218	
35				90 120	1.87	0.44	13.37642	
36	Red River HC		2	0 15	1.85	0.42	12.7684	86.33869
37				15 30	1.81	0.38	11.55236	
38				30 60	1.74	0.31	9.424294	
39				60 90	2.18	0.75	22.80071	
40				90 120	1.7	0.27	8.208256	
41	Red River HC		3	0 15	2.1	0.67	20.36863	130.7241
42				15 30	2.01	0.58	17.63255	
43				30 60	1.88	0.45	13.68043	
44				60 90	1.96	0.53	16.1125	
45				90 120	2.93	1.5	45.60142	
46	Osborne HC	7 6 1W	4-1	0 15	1.92	0.49	14.89646	71.13822
47				15 30	1.69	0.26	7.904246	
48				30 60	1.64	0.21	6.384199	
49				60 90	1.57	0.14	4.256133	
50				90 120	1.66	0.23	6.992218	
51	Osborne HC		2	0 15	1.65	0.22	6.688208	46.20944
52				15 30	1.63	0.2	6.080189	
53				30 60	1.6	0.17	5.168161	
54				60 90	1.54	0.11	3.344104	
55				90 120	1.57	0.14	4.256133	
56	Osborne HC		3	0 15	1.81	0.38	11.55236	60.19388
57				15 30	1.66	0.23	6.992218	
58				30 60	1.62	0.19	5.77618	
59				60 90	1.8	0.37	11.24835	
60				90 120	1.69	0.26	7.904246	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm)	(kg/ha, top 60cm)
61	Hochfeld FSL	33 1 4W	5-1	0 15	3.73	2.3	69.92218	204.2944
62				15 30	2.15	0.72	21.88868	
63				30 60	1.6	0.17	5.168161	
64				60 90	1.56	0.13	3.952123	
65				90 120	1.52	0.09	2.736085	
66	Hochfeld FSL		2	0 15	1.8	0.37	11.24835	48.64152
67				15 30	1.5	0.07	2.128066	
68				30 60	1.61	0.18	5.472171	
69				60 90	1.51	0.08	2.432076	
70				90 120	1.54	0.11	3.344104	
71	Hochfeld VFSL		3	0 15	1.8	0.37	11.24835	140.4524
72				15 30	1.61	0.18	5.472171	
73				30 60	2.31	0.88	26.75283	
74				60 90	1.63	0.2	6.080189	
75				90 120	1.62	0.19	5.77618	
76	Hochfeld VFSL	33 2 4W	6-1	0 15	1.56	0.13	3.952123	127.076
77				15 30	2.29	0.86	26.14481	
78				30 60	1.98	0.55	16.72052	
79				60 90	1.6	0.17	5.168161	
80				90 120	1.48	0.05	1.520047	
81	Hochfeld FSL		2	0 15	1.6	0.17	5.168161	69.31416
82				15 30	1.9	0.47	14.28845	
83				30 60	1.68	0.25	7.600237	
84				60 90	1.63	0.2	6.080189	
85				90 120	1.71	0.28	8.512265	
86	Hochfeld VFSL		3	0 15	1.62	0.19	5.77618	55.32972
87				15 30	1.49	0.06	1.824057	
88				30 60	1.76	0.33	10.03231	
89				60 90	1.73	0.3	9.120284	
90				90 120	1.55	0.12	3.648114	
91	Rheinland FSL	21 1 4W	7-1	0 15	1.49	0.06	1.824057	17.63255
92				15 30	1.5	0.07	2.128066	
93				30 60	1.51	0.08	2.432076	
94				60 90	1.5	0.07	2.128066	
95				90 120	1.48	0.05	1.520047	
96	Rheinland FSL		2	0 15	1.55	0.12	3.648114	16.41651
97				15 30	1.54	0.11	3.344104	
98				30 60	1.45	0.02	0.608019	
99				60 90	1.5	0.07	2.128066	
100				90 120	1.52	0.09	2.736085	
101	Rheinland FSL		3	0 15	1.49	0.06	1.824057	13.37642
102				15 30	1.47	0.04	1.216038	
103				30 60	1.49	0.06	1.824057	
104				60 90	1.48	0.05	1.520047	
105				90 120	1.5	0.07	2.128066	
106	Rheinland FSL	17 3 5W	8-1	0 15	4.31	2.88	87.55473	537.4888
107				15 30	4.79	3.36	102.1472	
108				30 60	2.73	1.3	39.52123	
109				60 90	1.83	0.4	12.16038	
110				90 120	1.62	0.19	5.77618	
111	Rheinland LFS		2	0 15	1.66	0.23	6.992218	71.13822
112				15 30	1.93	0.5	15.20047	
113				30 60	1.65	0.22	6.688208	
114				60 90	1.61	0.18	5.472171	
115				90 120	1.91	0.48	14.59245	
116	Rheinland LFS		3	0 15	2.02	0.59	17.93656	179.3656
117				15 30	1.97	0.54	16.41651	
118				30 60	2.34	0.91	27.66486	
119				60 90	2.16	0.73	22.19269	
120				90 120	2.03	0.6	18.24057	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm)	(kg/ha, top 60cm)
121	Almasippi FSL	28 8 6W	9-1	0 15	1.49	0.04	1.216038	15.80849
122				15 30	1.53	0.08	2.432076	
123				30 60	1.52	0.07	2.128066	
124				60 90	1.49	0.04	1.216038	
125				90 120	1.45	0	0	
126	Almasippi FSL		2	0 15	1.57	0.12	3.648114	17.02453
127				15 30	1.51	0.06	1.824057	
128				30 60	1.5	0.05	1.520047	
129				60 90	1.48	0.03	0.912028	
130				90 120	1.47	0.02	0.608019	
131	St. Claude FSL		3	0 15	1.53	0.08	2.432076	13.98444
132				15 30	1.5	0.05	1.520047	
133				30 60	1.5	0.05	1.520047	
134				60 90	1.48	0.03	0.912028	
135				90 120	1.55	0.1	3.040095	
136	Willowcrest FSL		4	0 15	1.52	0.07	2.128066	11.55236
137				15 30	1.51	0.06	1.824057	
138				30 60	1.48	0.03	0.912028	
139				60 90	1.47	0.02	0.608019	
140				90 120	1.45	0	0	
141	Lelant FSL	33 10 7W	10-1	0 15	1.62	0.17	5.168161	20.67264
142				15 30	1.54	0.09	2.736085	
143				30 60	1.49	0.04	1.216038	
144				60 90	1.47	0.02	0.608019	
145				90 120	1.46	0.01	0.304009	
146	St. Claude FSL		2	0 15	1.78	0.33	10.03231	31.61699
147				15 30	1.58	0.13	3.952123	
148				30 60	1.48	0.03	0.912028	
149				60 90	1.48	0.03	0.912028	
150				90 120	1.46	0.01	0.304009	
151	Almasippi FSL		3	0 15	1.58	0.14	4.256133	18.84859
152				15 30	1.55	0.11	3.344104	
153				30 60	1.47	0.03	0.912028	
154				60 90	1.48	0.04	1.216038	
155				90 120	1.49	0.05	1.520047	
156	Lelant LFS		4	0 15	1.54	0.1	3.040095	9.728303
157				15 30	1.46	0.02	0.608019	
158				30 60	1.46	0.02	0.608019	
159				60 90	1.47	0.03	0.912028	
160				90 120	1.46	0.02	0.608019	
161	Long Plain LFS	17 9 7W	11-1	0 15	1.46	0.02	0.608019	4.864152
162				15 30	1.46	0.02	0.608019	
163				30 60	1.46	0.02	0.608019	
164				60 90	1.46	0.02	0.608019	
165				90 120	1.46	0.02	0.608019	
166	Willowcrest FSL		2	0 15	1.48	0.04	1.216038	9.728303
167				15 30	1.5	0.06	1.824057	
168				30 60	1.47	0.03	0.912028	
169				60 90	1.45	0.01	0.304009	
170				90 120	1.47	0.03	0.912028	
171	Willowcrest LFS		3	0 15	1.47	0.03	0.912028	7.296227
172				15 30	1.47	0.03	0.912028	
173				30 60	1.47	0.03	0.912028	
174				60 90	1.45	0.01	0.304009	
175				90 120	1.46	0.02	0.608019	
176	Almasippi FSL		4	0 15	1.53	0.09	2.736085	12.7684
177				15 30	1.52	0.08	2.432076	
178				30 60	1.46	0.02	0.608019	
179				60 90	1.47	0.03	0.912028	
180				90 120	1.46	0.02	0.608019	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration---- (ppm)	(kg/ha, top 60cm)
181	Willowcrest	FSL 19 8 5W	12-1	0 15	1.54	0.11	3.344104	12.7684
182				15 30	1.49	0.06	1.824057	
183				30 60	1.45	0.02	0.608019	
184				60 90	1.45	0.02	0.608019	
185				90 120	1.44	0.01	0.304009	
186	Almasippi	LFS	2	0 15	1.65	0.22	6.688208	28.57689
187				15 30	1.56	0.13	3.952123	
188				30 60	1.49	0.06	1.824057	
189				60 90	1.5	0.07	2.128066	
190				90 120	1.51	0.08	2.432076	
191	Long Plain	LFS	3	0 15	1.44	0.01	0.304009	10.94434
192				15 30	1.5	0.07	2.128066	
193				30 60	1.48	0.05	1.520047	
194				60 90	1.45	0.02	0.608019	
195				90 120	1.46	0.03	0.912028	
196	Almasippi	FSL	4	0 15	1.58	0.15	4.560142	17.02453
197				15 30	1.5	0.07	2.128066	
198				30 60	1.46	0.03	0.912028	
199				60 90	1.48	0.05	1.520047	
200				90 120	1.45	0.02	0.608019	
201	St. Claude	FSL 28 14 12W	13-1	0 15	3.89	2.46	74.78633	1262.247
202				15 30	9.21	7.78	236.5194	
203				30 60	6.69	5.26	159.909	
204				60 90	3.58	2.15	65.36204	
205				90 120	2.87	1.44	43.77736	
206	St. Claude	FSL	2	0 15	2.61	1.18	35.87312	316.7779
207				15 30	3.44	2.01	61.1059	
208				30 60	2.44	1.01	30.70496	
209				60 90	1.96	0.53	16.1125	
210				90 120	3.1	1.67	50.76958	
211	Willowcrest	FSL	3	0 15	1.5	0.08	2.432076	21.88868
212				15 30	1.5	0.08	2.432076	
213				30 60	1.52	0.1	3.040095	
214				60 90	1.49	0.07	2.128066	
215				90 120	1.49	0.07	2.128066	
216	Willowcrest	FSL	4	0 15	1.5	0.08	2.432076	15.80849
217				15 30	1.48	0.06	1.824057	
218				30 60	1.48	0.06	1.824057	
219				60 90	1.54	0.12	3.648114	
220				90 120	1.51	0.09	2.736085	
221	Lelant	LFS 13 13 13W	14-1	0 15	1.67	0.25	7.600237	65.05803
222				15 30	1.6	0.18	5.472171	
223				30 60	1.74	0.32	9.728303	
224				60 90	1.83	0.41	12.46439	
225				90 120	1.61	0.19	5.77618	
226	Almasippi	LFS	2	0 15	1.54	0.12	3.648114	117.9557
227				15 30	1.68	0.26	7.904246	
228				30 60	2.2	0.78	23.71274	
229				60 90	3.33	1.91	58.06581	
230				90 120	1.99	0.57	17.32854	
231	Almasippi	LFS	3	0 15	1.48	0.06	1.824057	13.98444
232				15 30	1.47	0.05	1.520047	
233				30 60	1.48	0.06	1.824057	
234				60 90	2.67	1.25	38.00118	
235				90 120	2.54	1.12	34.04906	
236	Almasippi	LFS	4	0 15	1.56	0.14	4.256133	18.24057
237				15 30	1.52	0.1	3.040095	
238				30 60	1.45	0.03	0.912028	
239				60 90	1.59	0.17	5.168161	
240				90 120	2.32	0.9	27.36085	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm)	Chloride (kg/ha, top 60cm)
241	Lelant LFS	24 11 10W	15-1	0 15	1.5	1.5	45.60142	364.8114
242				15 30	1.58	1.58	48.0335	
243				30 60	1.46	1.46	44.38538	
244				60 90	1.47	1.47	44.68939	
245				90 120	1.47	1.47	44.68939	
246	Rosebank FSL		2	0 15	1.51	1.51	45.90543	358.7312
247				15 30	1.47	1.47	44.68939	
248				30 60	1.46	1.46	44.38538	
249				60 90	1.47	1.47	44.68939	
250				90 120	1.46	1.46	44.38538	
251	Rosebank LFS		3	0 15	1.76	1.76	53.50567	375.7557
252				15 30	1.48	1.48	44.9934	
253				30 60	1.47	1.47	44.68939	
254				60 90	1.46	1.46	44.38538	
255				90 120	1.48	1.48	44.9934	
256	Aronet SCL		4	0 15	1.57	1.57	47.72949	367.8515
257				15 30	1.54	1.54	46.81746	
258				30 60	1.47	1.47	44.68939	
259				60 90	1.48	1.48	44.9934	
260				90 120	1.45	1.45	44.08137	
261	Long Plain LFS	27 11 9W	16-1	0 15	2.06	2.06	62.62595	579.4421
262				15 30	2.73	2.73	82.99459	
263				30 60	2.37	2.37	72.05025	
264				60 90	2.12	2.12	64.45001	
265				90 120	2.23	2.23	67.79411	
266	Willowcrest FSL		2	0 15	1.49	1.49	45.29741	361.7713
267				15 30	1.54	1.54	46.81746	
268				30 60	1.46	1.46	44.38538	
269				60 90	1.46	1.46	44.38538	
270				90 120	1.45	1.45	44.08137	
271	St. Claude FSL		3	0 15	1.98	0.55	16.72052	51.68161
272				15 30	1.61	0.18	5.472171	
273				30 60	1.49	0.06	1.824057	
274				60 90	1.46	0.03	0.912028	
275				90 120	1.44	0.01	0.304009	
276	Almasippi ? SCL		4	0 15	1.57	0.14	4.256133	64.45001
277				15 30	1.53	0.1	3.040095	
278				30 60	1.84	0.41	12.46439	
279				60 90	1.51	0.08	2.432076	
280				90 120	1.57	0.14	4.256133	
281	Stockton FSL	14 11 9W	17-1	0 15	1.46	0.03	0.912028	6.08019
282				15 30	1.44	0.01	0.304009	
283				30 60	1.46	0.03	0.912028	
284				60 90	1.47	0.04	1.216038	
285				90 120	1.48	0.05	1.520047	
286	Stockton FSL		2	0 15	1.45	0.02	0.608019	4.256133
287				15 30	1.46	0.03	0.912028	
288				30 60	1.44	0.01	0.304009	
289				60 90	1.44	0.01	0.304009	
290				90 120	1.45	0.02	0.608019	
291	Stockton LFS		3	0 15	1.45	0.02	0.608019	3.648114
292				15 30	1.45	0.02	0.608019	
293				30 60	1.44	0.01	0.304009	
294				60 90	1.45	0.02	0.608019	
295				90 120	1.45	0.02	0.608019	
296	Stockton LFS		4	0 15	1.44	0.01	0.304009	2.432076
297				15 30	1.44	0.01	0.304009	
298				30 60	1.44	0.01	0.304009	
299				60 90	1.44	0.01	0.304009	
300				90 120	1.45	0.02	0.608019	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm)	(kg/ha, top 60cm)
301	Wellwood CL	14 6 11W	18-1	0 15	1.52	0.08	2.432076	16.41651
302				15 30	1.49	0.05	1.520047	
303				30 60	1.51	0.07	2.128066	
304				60 90	1.46	0.02	0.608019	
305				90 120	1.47	0.03	0.912028	
306	Wellwood CL		2	0 15	1.48	0.04	1.216038	19.45661
307				15 30	1.54	0.1	3.040095	
308				30 60	1.53	0.09	2.736085	
309				60 90	1.5	0.06	1.824057	
310				90 120	1.5	0.06	1.824057	
311	Wellwood CL		3	0 15	1.58	0.14	4.256133	56.54576
312				15 30	1.57	0.13	3.952123	
313				30 60	1.77	0.33	10.03231	
314				60 90	1.62	0.18	5.472171	
315				90 120	1.6	0.16	4.864152	
316	Wellwood CL		4	0 15	1.54	0.1	3.040095	49.85755
317				15 30	1.54	0.1	3.040095	
318				30 60	1.75	0.31	9.424294	
319				60 90	1.67	0.23	6.992218	
320				90 120	1.6	0.16	4.864152	
321	Stockton FSL	27 10 15W	19-1	0 15	1.54	0.1	3.040095	21.28066
322				15 30	1.57	0.13	3.952123	
323				30 60	1.5	0.06	1.824057	
324				60 90	1.48	0.04	1.216038	
325				90 120	1.48	0.04	1.216038	
326	Stockton FSL		2	0 15	1.5	0.06	1.824057	12.16038
327				15 30	1.5	0.06	1.824057	
328				30 60	1.48	0.04	1.216038	
329				60 90	1.5	0.06	1.824057	
330				90 120	1.45	0.01	0.304009	
331	Stockton LFS		3	0 15	1.53	0.09	2.736085	20.67264
332				15 30	1.51	0.07	2.128066	
333				30 60	1.53	0.09	2.736085	
334				60 90	1.5	0.06	1.824057	
335				90 120	1.47	0.03	0.912028	
336	Stockton LFS		4	0 15	1.47	0.03	0.912028	6.688208
337				15 30	1.46	0.02	0.608019	
338				30 60	1.47	0.03	0.912028	
339				60 90	1.47	0.03	0.912028	
340				90 120	1.45	0.01	0.304009	
341	Wellwood L	5 12 14W	20-1	0 15	1.58	0.14	4.256133	31.00897
342				15 30	1.53	0.09	2.736085	
343				30 60	1.58	0.14	4.256133	
344				60 90	1.54	0.1	3.040095	
345				90 120	1.56	0.12	3.648114	
346	Wellwood L		2	0 15	1.49	0.05	1.520047	12.7684
347				15 30	1.48	0.04	1.216038	
348				30 60	1.5	0.06	1.824057	
349				60 90	1.47	0.03	0.912028	
350				90 120	1.5	0.06	1.824057	
351	Wellwood L		3	0 15	1.51	0.07	2.128066	15.20047
352				15 30	1.48	0.04	1.216038	
353				30 60	1.51	0.07	2.128066	
354				60 90	1.52	0.08	2.432076	
355				90 120	1.56	0.12	3.648114	
356	Wellwood L		4	0 15	1.5	0.06	1.824057	18.24057
357				15 30	1.48	0.04	1.216038	
358				30 60	1.54	0.1	3.040095	
359				60 90	1.52	0.08	2.432076	
360				90 120	1.57	0.13	3.952123	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm)	(kg/ha, top 60cm)
361	Wellwood C	35 12 16W	21-1	0 15	1.58	0.14	4.256133	24.32076
362				15 30	1.56	0.12	3.648114	
363				30 60	1.51	0.07	2.128066	
364				60 90	1.48	0.04	1.216038	
365				90 120	1.48	0.04	1.216038	
366	Wellwood CL		2	0 15	1.49	0.05	1.520047	12.7684
367				15 30	1.5	0.06	1.824057	
368				30 60	1.49	0.05	1.520047	
369				60 90	1.49	0.05	1.520047	
370				90 120	1.48	0.04	1.216038	
371	Wellwood L		3	0 15	1.47	0.03	0.912028	6.08019
372				15 30	1.45	0.01	0.304009	
373				30 60	1.47	0.03	0.912028	
374				60 90	1.47	0.03	0.912028	
375				90 120	1.46	0.02	0.608019	
376	Wellwood CL		4	0 15	1.46	0.02	0.608019	6.688208
377				15 30	1.47	0.03	0.912028	
378				30 60	1.47	0.03	0.912028	
379				60 90	1.48	0.04	1.216038	
380				90 120	1.46	0.02	0.608019	
381	Stockton LFS	19 14 13W	22-1	0 15	1.45	0.01	0.304009	1.216038
382				15 30	1.45	0.01	0.304009	
383				30 60	1.44	0	0	
384				60 90	1.44	0	0	
385				90 120	1.44	0	0	
386	Stockton LS		2	0 15	1.5	0.06	1.824057	4.864152
387				15 30	1.46	0.02	0.608019	
388				30 60	1.44	0	0	
389				60 90	1.48	0.04	1.216038	
390				90 120	1.48	0.04	1.216038	
391	Stockton SL		3	0 15	1.67	0.22	6.688208	24.32076
392				15 30	1.55	0.1	3.040095	
393				30 60	1.49	0.04	1.216038	
394				60 90	1.48	0.03	0.912028	
395				90 120	1.49	0.04	1.216038	
396	Stockton SL		4	0 15	1.58	0.13	3.952123	18.24057
397				15 30	1.52	0.07	2.128066	
398				30 60	1.5	0.05	1.520047	
399				60 90	1.5	0.05	1.520047	
400				90 120	1.5	0.05	1.520047	
401	Newdale CL	26 14 18W	23-1	0 15	1.78	0.33	10.03231	44.38538
402				15 30	1.63	0.18	5.472171	
403				30 60	1.56	0.11	3.344104	
404				60 90	1.54	0.09	2.736085	
405				90 120	1.54	0.09	2.736085	
406	Newdale CL		2	0 15	1.63	0.18	5.472171	37.69717
407				15 30	1.61	0.16	4.864152	
408				30 60	1.59	0.14	4.256133	
409				60 90	1.63	0.18	5.472171	
410				90 120	1.73	0.28	8.512265	
411	Newdale CL		3	0 15	1.61	0.16	4.864152	24.92878
412				15 30	1.54	0.09	2.736085	
413				30 60	1.53	0.08	2.432076	
414				60 90	1.49	0.04	1.216038	
415				90 120	missing	0	0	
416	Newdale L		4	0 15	1.69	0.24	7.296227	54.11369
417				15 30	1.74	0.29	8.816275	
418				30 60	1.63	0.18	5.472171	
419				60 90	1.62	0.17	5.168161	
420				90 120	1.6	0.15	4.560142	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm) (kg/ha, top 60cm)	
421	Newdale CL	8 16 20W	24-1	0 15	1.53	0.08	2.432076	18.84859
422				15 30	1.52	0.07	2.128066	
423				30 60	1.53	0.08	2.432076	
424				60 90	1.57	0.12	3.648114	
425				90 120	1.53	0.08	2.432076	
426	Newdale CL		2	0 15	1.52	0.07	2.128066	13.98444
427				15 30	1.51	0.06	1.824057	
428				30 60	1.5	0.05	1.520047	
429				60 90	1.5	0.05	1.520047	
430				90 120	1.51	0.06	1.824057	
431	Newdale CL		3	0 15	1.5	0.05	1.520047	9.728303
432				15 30	1.5	0.05	1.520047	
433				30 60	1.48	0.03	0.912028	
434				60 90	1.47	0.02	0.608019	
435				90 120	1.48	0.03	0.912028	
436	Newdale CL		4	0 15	1.5	0.05	1.520047	6.688208
437				15 30	1.47	0.02	0.608019	
438				30 60	1.47	0.02	0.608019	
439				60 90	1.48	0.03	0.912028	
440				90 120	1.52	0.07	2.128066	
441	Newdale L	32 12 23W	25-1	0 15	1.83	0.38	11.55236	110.0514
442				15 30	2.1	0.65	19.76062	
443				30 60	1.84	0.39	11.85637	
444				60 90	1.65	0.2	6.080189	
445				90 120	1.69	0.24	7.296227	
446	Newdale L		2	0 15	1.5	0.05	1.520047	16.41651
447				15 30	1.53	0.08	2.432076	
448				30 60	1.52	0.07	2.128066	
449				60 90	1.55	0.1	3.040095	
450				90 120	1.54	0.09	2.736085	
451	Newdale CL		3	0 15	1.52	0.07	2.128066	15.80849
452				15 30	1.52	0.07	2.128066	
453				30 60	1.51	0.06	1.824057	
454				60 90	1.58	0.13	3.952123	
455				90 120	1.57	0.12	3.648114	
456	Newdale CL		4	0 15	1.51	0.06	1.824057	20.67264
457				15 30	1.51	0.06	1.824057	
458				30 60	1.56	0.11	3.344104	
459				60 90	1.6	0.15	4.560142	
460				90 120	1.54	0.09	2.736085	
461	Erickson CL	24 20 25W	26-1	0 15	1.51	0.06	1.824057	17.63255
462				15 30	1.54	0.09	2.736085	
463				30 60	1.52	0.07	2.128066	
464				60 90	1.54	0.09	2.736085	
465				90 120	1.55	0.1	3.040095	
466	Erickson CL		2	0 15	1.48	0.03	0.912028	15.80849
467				15 30	1.56	0.11	3.344104	
468				30 60	1.51	0.06	1.824057	
469				60 90	1.5	0.05	1.520047	
470				90 120	1.55	0.1	3.040095	
471	Erickson CL		3	0 15	1.49	0.04	1.216038	18.24057
472				15 30	1.49	0.04	1.216038	
473				30 60	1.56	0.11	3.344104	
474				60 90	1.64	0.19	5.77618	
475				90 120	1.55	0.1	3.040095	
476	Erickson CL		4	0 15	1.49	0.04	1.216038	25.5368
477				15 30	1.55	0.1	3.040095	
478				30 60	1.59	0.14	4.256133	
479				60 90	1.49	0.04	1.216038	
480				90 120	1.56	0.11	3.344104	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm)	(kg/ha, top 60cm)
481	Erickson CL	26 19 24W	27-1	0 15	1.5	0.05	1.520047	10.33632
482				15 30	1.49	0.04	1.216038	
483				30 60	1.49	0.04	1.216038	
484				60 90	1.52	0.07	2.128066	
485				90 120	1.52	0.07	2.128066	
486	Erickson CL		2	0 15	1.63	0.18	5.472171	28.57689
487				15 30	1.54	0.09	2.736085	
488				30 60	1.55	0.1	3.040095	
489				60 90	1.58	0.13	3.952123	
490				90 120	1.67	0.22	6.688208	
491	Erickson L		3	0 15	1.51	0.06	1.824057	15.80849
492				15 30	1.49	0.04	1.216038	
493				30 60	1.53	0.08	2.432076	
494				60 90	1.54	0.09	2.736085	
495				90 120	1.62	0.17	5.168161	
496	Erickson L		4	0 15	1.52	0.07	2.128066	25.5368
497				15 30	1.54	0.09	2.736085	
498				30 60	1.58	0.13	3.952123	
499				60 90	1.57	0.12	3.648114	
500				90 120	1.51	0.06	1.824057	
501	Erickson CL	31 19 22W	28-1	0 15	1.5	0.05	1.520047	12.16038
502	(near Waitville border)			15 30	1.5	0.05	1.520047	
503				30 60	1.5	0.05	1.520047	
504				60 90	1.47	0.02	0.608019	
505				90 120	1.5	0.05	1.520047	
506	Erickson CL		2	0 15	1.49	0.04	1.216038	10.94434
507				15 30	1.49	0.04	1.216038	
508				30 60	1.5	0.05	1.520047	
509				60 90	1.5	0.05	1.520047	
510				90 120	1.5	0.05	1.520047	
511	Erickson L		3	0 15	1.57	0.06	1.824057	21.88868
512				15 30	1.59	0.08	2.432076	
513				30 60	1.62	0.11	3.344104	
514				60 90	1.6	0.09	2.736085	
515				90 120	1.6	0.09	2.736085	
516	Erickson L		4	0 15	1.57	0.06	1.824057	13.98444
517				15 30	1.56	0.05	1.520047	
518				30 60	1.57	0.06	1.824057	
519				60 90	1.56	0.05	1.520047	
520				90 120	1.58	0.07	2.128066	
521	Pembina L	29 7 9W	29-1	0 15	1.56	0.05	1.520047	13.98444
522				15 30	1.57	0.06	1.824057	
523				30 60	1.57	0.06	1.824057	
524				60 90	1.56	0.05	1.520047	
525				90 120	1.57	0.06	1.824057	
526	Pembina L		2	0 15	1.58	0.07	2.128066	15.80849
527				15 30	1.58	0.07	2.128066	
528				30 60	1.57	0.06	1.824057	
529				60 90	1.62	0.11	3.344104	
530				90 120	1.57	0.06	1.824057	
531	Pembina L		3	0 15	1.58	0.07	2.128066	24.92878
532				15 30	1.59	0.08	2.432076	
533				30 60	1.64	0.13	3.952123	
534				60 90	1.74	0.23	6.992218	
535				90 120	1.63	0.12	3.648114	
536	Pembina L		4	0 15	1.64	0.13	3.952123	35.2651
537				15 30	1.66	0.15	4.560142	
538				30 60	1.66	0.15	4.560142	
539				60 90	1.73	0.22	6.688208	
540				90 120	missing	0	0	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration---- (kg/ha, top 60cm)
541	Pembina CL	28 6 8W	30-1	0 15	1.68	0.13	3.952123
542				15 30	1.76	0.21	6.384199
543				30 60	1.78	0.23	6.992218
544				60 90	1.65	0.1	3.040095
545				90 120	1.72	0.17	5.168161
546	Pembina L		2	0 15	1.61	0.06	1.824057
547				15 30	1.6	0.05	1.520047
548				30 60	1.61	0.06	1.824057
549				60 90	1.6	0.05	1.520047
550				90 120	1.61	0.06	1.824057
551	Pembina CL		3	0 15	2.24	0.69	20.97665
552				15 30	2.3	0.75	22.80071
553				30 60	1.85	0.3	9.120284
554				60 90	1.7	0.15	4.560142
555				90 120	1.63	0.08	2.432076
556	Pembina CL		4	0 15	1.87	0.32	9.728303
557				15 30	1.79	0.24	7.296227
558				30 60	1.66	0.11	3.344104
559				60 90	1.66	0.11	3.344104
560				90 120	1.65	0.1	3.040095
561	Pembina L	30 6 10W	31-1	0 15	1.72	0.17	5.168161
562				15 30	1.75	0.2	6.080189
563				30 60	1.68	0.13	3.952123
564				60 90	1.69	0.14	4.256133
565				90 120	1.76	0.21	6.384199
566	Pembina L		2	0 15	1.6	0.05	1.520047
567				15 30	1.62	0.07	2.128066
568				30 60	1.58	0.03	0.912028
569				60 90	1.59	0.04	1.216038
570				90 120	1.59	0.04	1.216038
571	Pembina L		3	0 15	1.7	0.15	4.560142
572				15 30	1.74	0.19	5.77618
573				30 60	1.72	0.17	5.168161
574				60 90	1.83	0.28	8.512265
575				90 120	missing	0	0
576	Pembina L		4	0 15	1.6	0.05	1.520047
577				15 30	1.61	0.06	1.824057
578				30 60	1.7	0.15	4.560142
579				60 90	1.8	0.25	7.600237
580				90 120	1.71	0.16	4.864152
581	Cameron CL	17 7 21W	32-1	0 15	1.68	0.13	3.952123
582				15 30	1.67	0.12	3.648114
583				30 60	1.6	0.05	1.520047
584				60 90	1.64	0.09	2.736085
585				90 120	1.72	0.17	5.168161
586	Cameron CL		2	0 15	1.61	0.06	1.824057
587				15 30	1.59	0.04	1.216038
588				30 60	1.58	0.03	0.912028
589				60 90	1.59	0.04	1.216038
590				90 120	1.56	0.01	0.304009
591	Cameron CL		3	0 15	1.6	0.05	1.520047
592				15 30	1.57	0.02	0.608019
593				30 60	1.58	0.03	0.912028
594				60 90	1.57	0.02	0.608019
595				90 120	1.58	0.03	0.912028
596	Cameron L		4	0 15	1.58	0.03	0.912028
597				15 30	1.56	0.01	0.304009
598				30 60	1.58	0.03	0.912028
599				60 90	1.57	0.02	0.608019
600				90 120	1.58	0.03	0.912028

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm)	(kg/ha, top 60cm)
601	Waskada CL	2 2 26W	33-1	0 15	1.73	0.17	5.168161	47.42548
602				15 30	1.71	0.15	4.560142	
603				30 60	1.79	0.23	6.992218	
604				60 90	1.64	0.08	2.432076	
605				90 120	1.66	0.1	3.040095	
606	Waskada CL		2	0 15	1.61	0.05	1.520047	24.32076
607				15 30	1.63	0.07	2.128066	
608				30 60	1.7	0.14	4.256133	
609				60 90	1.69	0.13	3.952123	
610				90 120	1.71	0.15	4.560142	
611	Waskada CL		3	0 15	1.64	0.08	2.432076	29.18491
612				15 30	1.68	0.12	3.648114	
613				30 60	1.7	0.14	4.256133	
614				60 90	1.83	0.27	8.208256	
615				90 120	3.01	1.45	44.08137	
616	Waskada CL		4	0 15	1.79	0.23	6.992218	69.92218
617				15 30	1.94	0.38	11.55236	
618				30 60	1.83	0.27	8.208256	
619				60 90	1.76	0.2	6.080189	
620				90 120	1.7	0.14	4.256133	
621	Waskada CL	6 2 24W	34-1	0 15	2.16	0.6	18.24057	153.2208
622				15 30	2.2	0.64	19.45661	
623				30 60	2.2	0.64	19.45661	
624				60 90	1.81	0.25	7.600237	
625				90 120	1.72	0.16	4.864152	
626	Waskada L		2	0 15	1.97	0.41	12.46439	103.9712
627				15 30	1.88	0.32	9.728303	
628				30 60	2.05	0.49	14.89646	
629				60 90	3.35	1.79	54.4177	
630				90 120	3.09	1.53	46.51345	
631	Waskada L		3	0 15	1.76	0.2	6.080189	65.66605
632				15 30	1.88	0.32	9.728303	
633				30 60	1.84	0.28	8.512265	
634				60 90	1.69	0.13	3.952123	
635				90 120	1.7	0.14	4.256133	
636	Waskada L		4	0 15	2.33	0.77	23.40873	195.7821
637				15 30	2.27	0.71	21.58467	
638				30 60	2.43	0.87	26.44882	
639				60 90	2.34	0.78	23.71274	
640				90 120	2.22	0.66	20.06463	
641	Waskada L	36 2 20W	35-1	0 15	1.72	0.16	4.864152	26.75283
642				15 30	1.7	0.14	4.256133	
643				30 60	1.63	0.07	2.128066	
644				60 90	1.65	0.09	2.736085	
645				90 120	1.66	0.1	3.040095	
646	Waskada CL		2	0 15	1.78	0.22	6.688208	28.57689
647				15 30	1.65	0.09	2.736085	
648				30 60	1.64	0.08	2.432076	
649				60 90	1.6	0.04	1.216038	
650				90 120	1.62	0.06	1.824057	
651	Waskada L		3	0 15	1.68	0.12	3.648114	28.57689
652				15 30	1.65	0.09	2.736085	
653				30 60	1.69	0.13	3.952123	
654				60 90	1.64	0.08	2.432076	
655				90 120	1.64	0.08	2.432076	
656	Waskada CL		4	0 15	1.59	0.03	0.912028	10.94434
657				15 30	1.61	0.05	1.520047	
658				30 60	1.61	0.05	1.520047	
659				60 90	1.63	0.07	2.128066	
660				90 120	1.64	0.08	2.432076	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm)	(kg/ha, top 60cm)
661	Cameron L	22 6 22W	36-1	0 15	1.59	0.06	1.824057	17.63255
662				15 30	1.62	0.09	2.736085	
663				30 60	1.6	0.07	2.128066	
664				60 90	1.62	0.09	2.736085	
665				90 120	1.78	0.25	7.600237	
666	Cameron L		2	0 15	1.57	0.04	1.216038	11.55236
667				15 30	1.58	0.05	1.520047	
668				30 60	1.58	0.05	1.520047	
669				60 90	1.56	0.03	0.912028	
670				90 120	1.6	0.07	2.128066	
671	Cameron CL		3	0 15	1.6	0.07	2.128066	20.06463
672				15 30	1.63	0.1	3.040095	
673				30 60	1.61	0.08	2.432076	
674				60 90	1.96	0.43	13.07241	
675				90 120	2.02	0.49	14.89646	
676	Cameron CL		4	0 15	1.69	0.16	4.864152	42.56133
677				15 30	1.67	0.14	4.256133	
678				30 60	1.73	0.2	6.080189	
679				60 90	1.69	0.16	4.864152	
680				90 120	1.74	0.21	6.384199	
681	Cameron CL	15 6 22W	37-1	0 15	1.59	0.06	1.824057	22.4967
682				15 30	1.68	0.15	4.560142	
683				30 60	1.61	0.08	2.432076	
684				60 90	1.63	0.1	3.040095	
685				90 120	1.65	0.12	3.648114	
686	Cameron L		2	0 15	1.59	0.06	1.824057	17.63255
687				15 30	1.62	0.09	2.736085	
688				30 60	1.6	0.07	2.128066	
689				60 90	1.56	0.03	0.912028	
690				90 120	1.58	0.05	1.520047	
691	Cameron L		3	0 15	1.57	0.03	0.912028	15.20047
692				15 30	1.6	0.06	1.824057	
693				30 60	1.62	0.08	2.432076	
694				60 90	1.59	0.05	1.520047	
695				90 120	1.61	0.07	2.128066	
696	Cameron L		4	0 15	1.7	0.16	4.864152	41.34529
697				15 30	1.7	0.16	4.864152	
698				30 60	1.72	0.18	5.472171	
699				60 90	1.9	0.36	10.94434	
700				90 120	2.04	0.5	15.20047	
701	Souris LFS	6 9 24W	38-1	0 15	1.6	0.06	1.824057	9.728303
702				15 30	1.58	0.04	1.216038	
703				30 60	1.57	0.03	0.912028	
704				60 90	1.57	0.03	0.912028	
705				90 120	1.56	0.02	0.608019	
706	Souris LFS		2	0 15	1.58	0.04	1.216038	4.864152
707				15 30	1.56	0.02	0.608019	
708				30 60	1.55	0.01	0.304009	
709				60 90	1.54	0	0	
710				90 120	1.54	0	0	
711	Souris LFS		3	0 15	1.59	0.05	1.520047	12.7684
712				15 30	1.6	0.06	1.824057	
713				30 60	1.59	0.05	1.520047	
714				60 90	1.75	0.21	6.384199	
715				90 120	1.87	0.33	10.03231	
716	Souris FSL		4	0 15	1.56	0.02	0.608019	2.432076
717				15 30	1.56	0.02	0.608019	
718				30 60	1.54	0	0	
719				60 90	1.55	0.01	0.304009	
720				90 120	1.54	0	0	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm)	(kg/ha, top 60cm)
721	Souris LFS	7 8 23W	39-1	0 15	1.55	0.02	0.608019	9.120284
722				15 30	1.58	0.05	1.520047	
723				30 60	1.57	0.04	1.216038	
724				60 90	1.6	0.07	2.128066	
725				90 120	1.55	0.02	0.608019	
726	Souris LFS		2	0 15	1.57	0.04	1.216038	22.4967
727				15 30	1.66	0.13	3.952123	
728				30 60	1.63	0.1	3.040095	
729				60 90	1.54	0.01	0.304009	
730				90 120	1.55	0.02	0.608019	
731	Souris LFS		3	0 15	1.53	0	0	1.216038
732				15 30	1.53	0	0	
733				30 60	1.54	0.01	0.304009	
734				60 90	1.54	0.01	0.304009	
735				90 120	1.54	0.01	0.304009	
736			4	0 15	1.58	0.05	1.520047	21.88868
737	Souris LFS			15 30	1.58	0.05	1.520047	
738				30 60	1.66	0.13	3.952123	
739				60 90	1.58	0.05	1.520047	
740				90 120	1.55	0.02	0.608019	
741	Souris LFS	23 7 24W	40-1	0 15	1.56	0.03	0.912028	9.120284
742				15 30	1.57	0.04	1.216038	
743				30 60	1.57	0.04	1.216038	
744				60 90	1.59	0.06	1.824057	
745				90 120	1.56	0.03	0.912028	
746	Souris LFS		2	0 15	1.56	0.03	0.912028	5.472171
747				15 30	1.55	0.02	0.608019	
748				30 60	1.55	0.02	0.608019	
749				60 90	1.57	0.04	1.216038	
750				90 120	1.56	0.03	0.912028	
751	Souris LFS		3	0 15	1.57	0.03	0.912028	6.688208
752				15 30	1.56	0.02	0.608019	
753				30 60	1.57	0.03	0.912028	
754				60 90	1.57	0.03	0.912028	
755				90 120	1.55	0.01	0.304009	
756	Souris LFS		4	0 15	1.56	0.02	0.608019	4.256133
757				15 30	1.57	0.03	0.912028	
758				30 60	1.55	0.01	0.304009	
759				60 90	1.55	0.01	0.304009	
760				90 120	1.55	0.01	0.304009	
761	?? Point, U of M, Rep 1		41-1	0 15	3.12	1.58	48.0335	214.0227
762				15 30	2.98	1.44	43.77736	
763				30 60	1.79	0.25	7.600237	
764				60 90	1.65	0.11	3.344104	
765				90 120	1.66	0.12	3.648114	
766	?? Point, U of M, Rep 3		2	0 15	2.39	0.85	25.84081	108.2274
767				15 30	1.97	0.43	13.07241	
768				30 60	1.79	0.25	7.600237	
769				60 90	1.7	0.16	4.864152	
770				90 120	1.65	0.11	3.344104	
771	?? Point, U of M, Rep 5		3	0 15	2.89	1.35	41.04128	184.8378
772				15 30	2.35	0.81	24.62477	
773				30 60	1.98	0.44	13.37642	
774				60 90	1.68	0.14	4.256133	
775				90 120	1.64	0.1	3.040095	
776	?? Point, U of M, Rep 6		4	0 15	2.69	1.15	34.96109	203.0783
777				15 30	2.63	1.09	33.13703	
778				30 60	2.09	0.55	16.72052	
779				60 90	1.64	0.1	3.040095	
780				90 120	1.66	0.12	3.648114	

Sample #	Site Assoc.	Sample Location (Sec Tp R)	Site #	Depth (cm)	AgNO ₃ Titrated (mL)	Adj. for Blank (mL)	Chloride ---Concentration--- (ppm)	(kg/ha, top 60cm)
781	??	Portage Station, Rep 1	42-1	0 15	1.9	0.37	11.24835	65.05803
782				15 30	1.83	0.3	9.120284	
783				30 60	1.73	0.2	6.080189	
784				60 90	1.7	0.17	5.168161	
785				90 120	1.74	0.21	6.384199	
786	??	Portage Station, Rep 3	2	0 15	1.77	0.24	7.296227	62.01793
787				15 30	1.81	0.28	8.512265	
788				30 60	1.78	0.25	7.600237	
789				60 90	1.6	0.07	2.128066	
790				90 120	1.7	0.17	5.168161	
791	??	Portage Station, Rep 4	3	0 15	1.87	0.34	10.33632	113.0915
792				15 30	2.07	0.54	16.41651	
793				30 60	2.02	0.49	14.89646	
794				60 90	1.72	0.19	5.77618	
795				90 120	1.77	0.24	7.296227	
796	??	Portage Station, Rep 6	4	0 15	2.03	0.5	15.20047	70.5302
797				15 30	1.75	0.22	6.688208	
798				30 60	1.75	0.22	6.688208	
799				60 90	1.64	0.11	3.344104	
800				90 120	1.74	0.21	6.384199	