

jdb project engineering inc.

MAIL: 1-880L 15th STREET, WINKLER, MB R6W 0H5

OFFICE: ROBLIN PLAZA, 880 – 15th STREET, WINKLER, MB R6W 0H5

Phone: (204) 331-4440 Cell: (204) 332-2169 Email: jbotha@jdbprojects.ca



14 February 2017

jdb project #048

cc: Conrad Rempel, Birkland Farms

Conservation & Water Stewardship
Environmental Approvals Branch
160-123 Main Street
Winnipeg, MB
R3C 1A5

Re: Birkland Farms – Expansion of Confirmed Livestock Area (Feedlot)

Background

On behalf of Birkland Farms we hereby apply for a Permit to expand their existing feedlot from eleven (11) to seventeen (17) feeding pens, thus adding another six (6) feeding pens.

The location is in the RM of Thompson, NE 8-4-5W.

The existing feeding pens are rectangular in shape with feed bunks on the opposite sides and with the drainage channels in the center. All the existing feeding pens are draining into one common and sedimentation evaporation pond with about 50% covered with reeds.

Although the evaporation is less with the reeds, the existing sedimentation and evaporation pond is functioning effectively based on the historical records and can also accommodate the expansion. It was only necessary once during an abnormal rainfall event that a pump out was necessary during the past twenty (20) years.

The additional six (6) feeding pens will also be rectangular with the feed bunk on the side of the feed alley and the drainage channel inside the pens.

The existing operation accommodates 250 livestock per pen which amounts to a maximum head number of about 2,800.

The expansion of another six (6) pens will therefore adding another 1,700 livestock to a maximum head number of 4,500.

Water and waste movement in feeding pens is controlled by the water holding ability of the manure pack, the impermeable soil/manure layer sealing the feeding pen, and the slope and drainage patterns of the pen, drains, and catch basins.

Water enters the feedlot as part of the water supply system and as snow and rainfall. The annual precipitation, and accumulated winter snowfall, and the volume expected from summer storms are indicated below.

Feedlot Pen Surface

Proper construction and maintenance of the feeding pen surface is important for animal health, welfare, and productivity. A smooth, firm surface with a 2 to 4 percent slope will drain well. In densely populated pens (less than 230 to 300 square feet per head; Birkland will be 130 ft²/head) the trampling action of cattle and accumulation of manure and urine will cause four distinct layers to develop in a pen. From the bottom, these four layers are: the initial pen surface, a compacted soil/manure layer, a gleyed hard pan layer, and the manure pack on the surface. Proper management of these layers will control runoff, prevent seepage of nutrients down into the ground and provide a clean comfortable surface for cattle.

The action of the cattle hooves mixes manure and urine into the soil. Chemicals in the manure and urine change the soil's physical and chemical properties. High sodium levels cause soil particles to disperse and reduce water infiltration. Organic gels, or slimes, form under low oxygen (anaerobic) conditions, further reducing infiltration or seepage.

Initial Pen Surface

All topsoil will be removed, silty sand will be removed to accommodate a 300 mm layer of compacted shale to provide a smooth uniform sloped surface which will drain well. Refer to the subsoil tests results in **Appendix A**. Sand or gravelly soils do not seal well enough for development of a gleyed layer. A slope of 4% is recommended and used for the design. With higher slopes, up to 6%, the pen must be shorter to minimize erosion. Depth of pen depends on slope with that in **Table 1** recommended.

Table 1: Pen Slope

<i>Pen Slope %</i>	<i>Maximum Pen Depth</i>
2	230 ft (70 m)
3	215 ft (66 m)
4	200 ft (61 m)
5	180 ft (55 m)
6	160 ft (49 m)

Compacted Soil/Manure Layer

Cattle compact a layer of soil and manure to hock depth, 5 – 15 cm (2" to 6"). This layer of soil mixed with organic matter develops quickly in a new pen. At the first wet spell, the soil softens and manure is worked deeper into the soil. The characteristics of this layer are somewhat independent of the pen surface soil.

Gleyed Layer

In active feedlots, a gleyed layer develops between the soil/manure layer and the manure pack. The gleyed layer is 5 - 10 cm thick and has a high resistance to penetration. By limiting downward movement of moisture and air, the gleyed layer maintains constant soil moisture and anaerobic conditions in the layers below. Under these conditions nitrate turns into nitrogen gas, which is released into the atmosphere, thus limiting the leaching of nitrogen compounds deeper into the ground water.

The gleyed layer should not be damaged with equipment or aggressive pen cleaning and a pen must not be scraped until the gleyed layer develops. Exposing this layer during scraping will result in offensive odours. The cattle density will however be high with the sealing expected to be well developed.

Manure Pack

The manure pack is an accumulation of manure and bedding in the pen. It acts like a giant sponge, absorbing rain and snowmelt. It can hold up to 30 mm of rainfall.

When rain falls on a feedlot pen with a built up manure pack, the pack absorbs the water until it is saturated. The hardpan layer prevents percolation of water downwards. When the manure pack is saturated, runoff begins and the excess water runs off from the pen. Typically, there is anywhere from immediate runoff to a 24-hour delay after a storm before pen runoff begins. Additional storage is created in the pens by the depressions created by the cattle's hooves. The variables are pen slope and manure pack depth.

The manure layer provides a large storage reservoir for most storms. Once the manure layer is saturated after a sequence of storms or a long duration storm, the hardpan directs all the rain to runoff. With runoff there is a need to consider heavy loads of manure in the catch basins or provide sedimentation areas upstream of catch basins.

Pen and Feedlot Drainage

There are economic and production benefits from producing cattle on clean, well-drained pens. Feedlot runoff has a high organic matter content, therefore a high pollution potential.

The feedlot runoff will be directed to a sedimentation pond or catch basin where it is stored until it can be applied to crop land.

- *Diversion drains – Diversion banks prevent runoff from areas outside the feedlot from entering controlled drainage area of pens, cattle alleys, and feeding alleys. A new feeding alley is going to be built with a cross slope away from the new pens and therefore will act as a diversion bank.*
- *Pens – The new pens will allow drainage of runoff to exit the pen and enter the feedlot drains.*

Pen design will adhere to the following:

- *Feed troughs will be located at the top of the pen slope and will run parallel to the contour to minimize pen to pen drainage.*
 - *Water trough aprons are located and shaped to shed rainfall and divert runoff around the watering area.*
 - *Fence lines built so that manure accumulating under the fence can be easily removed.*
 - *A stable pen base with a smooth uniform surface will be constructed.*
 - *Pen slope designed to be 4%.*
- *Feedlot drains – The drain will be constructed inside the feeding pens to carry runoff to the sediment and catch basins. The feedlot drain will have a 0.3% slope.*

- *Catch and sediment basins – Feedlot runoff will be held until it can be utilized on crop land if adequate evaporation hasn't taken place. Sedimentation basins upstream from the catch basin, will minimize solids build up in the catch basin.*

The drain has been designed to work for large flows and also small flows and velocities and large enough to handle the maximum flow at the outfall end.

The drain has enough slope to prevent solids from settling. If the slope is too high for stable flow, erosion will occur. The pen drain has been designed for a 0.3% slope. If the slope is under 0.3%, manure will settle out and deposit. If the slope is over 1%, the flow will erode the gravel drain bed.

Runoff Management

The appropriate runoff management systems depend on the size of the feedlot and the relative risk to ground and surface water. When evaporation is not adequate, the system is designed to apply the runoff to crop land, where the nutrients are used by plants. When the plants are harvested as hay, cereal grains and straw, or silage the nutrients are removed, protecting surface and ground water.

This large feedlot will collect the runoff first in the existing sedimentation pond. If the runoff is hold for up to 30 minutes, the large manure particles will settle out. These nutrient rich solids can be spread on crop land. The water from the sedimentation basin will flows to the existing catch basin. The existing evaporation and catch basins were evaluated for a 24-hour rain storm expected only once every 30 years. After the catch basin, and when adequate evaporation hasn't taken place the runoff will be irrigated onto crop land where the nitrogen, phosphorus, potassium, and salt is harvested as grain and straw.

Runoff Calculations and Catch Basin Sizing

With the 1 in 30 years, 24-hour storm at 105 mm for this area and the runoff coefficient of 0.25 the Runoff Volume for all eleven (17) pens = $57,340 \text{ m}^2 \times 106 \text{ mm} \times 0.25 = 1,520 \text{ m}^3$. [The runoff coefficient of 0.25 is based on an initial pen moisture storage of 30 mm, SCS runoff curve of 0.65. The runoff coefficients were developed using the SWMHYMO Model and was calibrated against the actual runoff from a feedlot near Vegreville and using a measured storm.] Refer to **Table 2** for the monthly runoff volumes.

Feedlot runoff depends on the existing moisture content of the manure pack. Sometimes feedlot runoff starts immediately, under other conditions there may be no runoff until 25 – 30 m of rain falls. Runoff will also vary depending on the intensity of storm or on the speed of snow melt.

Based on the net volume calculations as per **Table 2**, the required maximum storage needed is 1,270 m³ with the existing catch basin already providing at least 2,000 m³, with no additional storage by the sedimentation basins brought into consideration. Refer also to **Figure 1** for a graphical representation of these calculations.

Sediment Settling Basin Design

Runoff from pens will carry solids in the form of soil and manure particles. It is easier to handle these solids by allowing them to separate or settle in a sediment basin (basically a long, flat ditch) where they can be removed by machinery rather than trying to agitate and pump them out of a large catch basin.

The design for the sediment basin volume is based on a 60 minute retention time, which is double than the recommended 30 minutes found in the literature.

The sediment basin design is based on a given cubic metre per second (m³/s) flow of runoff. The intensity for a 1 in 30 year, 24 hour storm of 106 mm was used to determine the dedicated sediment basin for the additional six (6) pens which amounts to 20 m³/hour and with a 60 minute retention time and 0.5 m deep basin, an area of only 40 m² is required for this sediment basin.

Manure Management

The following will be the Manure Management Plan for handling the manure coming from the feedlot by Kroeker Farms (second Party):

- *Stockpiling*
 - *Stockpiling of the manure will take place on NE 8-4-5, in the field beside the feedlot yard.*
 - *Cleanout will happen in late spring/early summer*
 - *The stockpile will be rows of manure that will be turned with a compost turner based on temperature and CO₂ levels.*
- *Spreading*

*Spreading will take place across 1,333 acres (refer to **Figure 2**) throughout successive years:*

 - *NE 2-4-5 – 47 acres Field ID: 558*
 - *SW 5-4-5 – 56 acres, Field ID: 530*
 - *SW 5-4-5 – 90 acres, Field ID: 531*
 - *NW 8-4-5 – 38 acres, Field ID: 561*
 - *SW 11-4-5 – 40 acres, Field ID: 583*
 - *SW 11-4-5 – 70 acres, Field ID: 584*
 - *NW 11-4-5 – 75 acres, Field ID: 587*
 - *SE 14-3-5 – 72 acres, Field ID: 470*
 - *NE 14-3-5 – 144 acres, Filed ID: KFL471*
 - *SE 15-4-5 – 55 acres, Field ID: 590*
 - *SW 17-4-5 – 143.4 acres, Field ID: 597*
 - *NW 17-4-5 – 54 acres, Field ID: 598*
 - *SE 18-4-5 – 73 acres, Field ID: 592*
 - *NE 18-4-5 – 76 acres, Field ID: 595*
 - *SE 24-4-6 – 168 acres, Field ID: 610*
 - *NE 24-4-6 – 35 acres, Field ID: 616*
 - *NE 24-4-6 – 24 acres, Field ID: 617*
 - *SE 26-3-5 – 60 acres, Field ID: SE 26-3-5*
 - *SW 27-3-5 – 40 acres, Field ID: 492*
 - *NW 27-3-5 – 38 acres, Field ID: 494*
 - *NW 27-3-5 – 38 acres, Field ID: 495*
 - *NW 27-3-5 – 40 acres, Field ID: 497*

Composted manure will be spread in late September/early October.

Please refer to the engineered stamped drawings in **Appendix A** as well as the Variation Order No. 2/16 by the RM of Thompson for Set-Back Variance (S.17.2) accompanying this letter under **Appendix B**. The soil tests for the abovementioned Fields are to be found under **Appendix C**.

We hope the above meets with your approval but should you have any questions or need additional clarification, don't hesitate to contact the undersigned.

Sincerely



Johan Botha, P.Eng.

Attached: **Table 2**
 Figure 1 – Runoff Calculations
 Figure 2 – Fields for Manure Spreading
 Appendix A – Stamped Engineering Drawings
 Appendix B – Variation Order No. 2/16
 Appendix C – Soil Tests

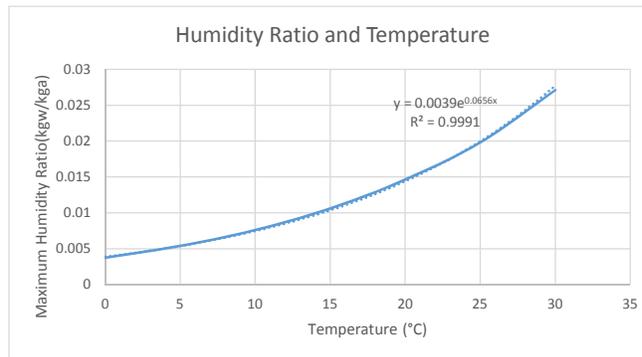
TABLE 2: Runoff Calculations

Total Pond Area (Sedimentation + Storage Basin)		5850	m ²
Total Pen Stock Area (Existing + Proposed)		57340	m ²
Runoff Coefficient "C":		0.25	

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precipitation [mm]	13	39	18	34	65	92	53	106	26	25	56	16
Precipitation [m3]	745	2236	1032	1950	3727	5275	3039	6078	1491	1434	3211	917
Effective Runoff [m3]	186	559	258	487	932	1319	760	1520	373	358	803	229
Evaporation [m3]	0	0	484	1070	1445	1194	1215	1841	1076	922	236	272
Year 1 Net Storage Required [m3]	186	745	520	0	0	125	0	0	0	0	567	524
Year 2 Net Storage Required [m3]	711	1270	1044	462	0	125	0	0	0	0	567	524
Year 3 Net Storage Required [m3]	711	1270	1044	462	0	125	0	0	0	0	567	524

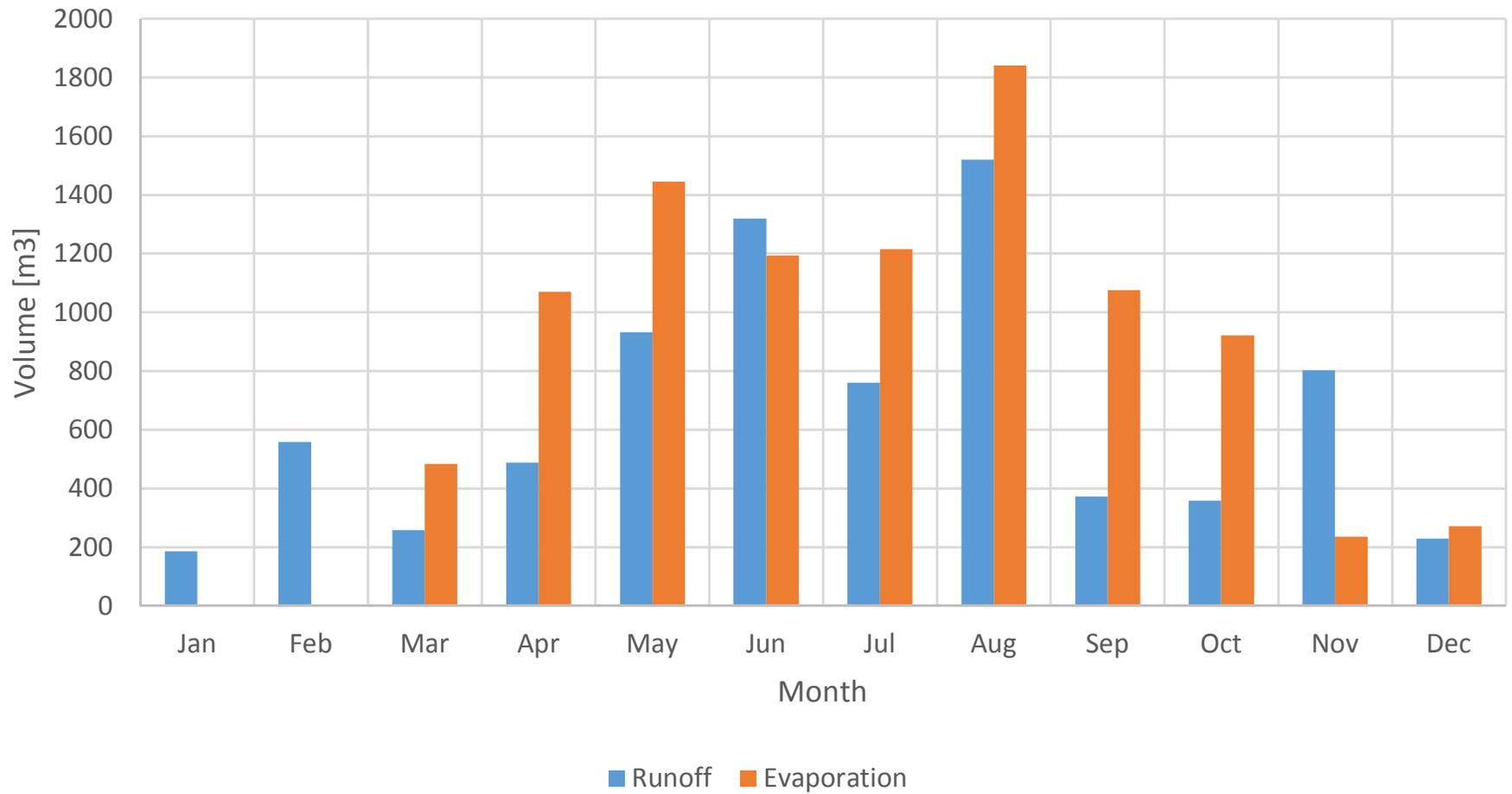
Example of Monthly Evaporation (April)

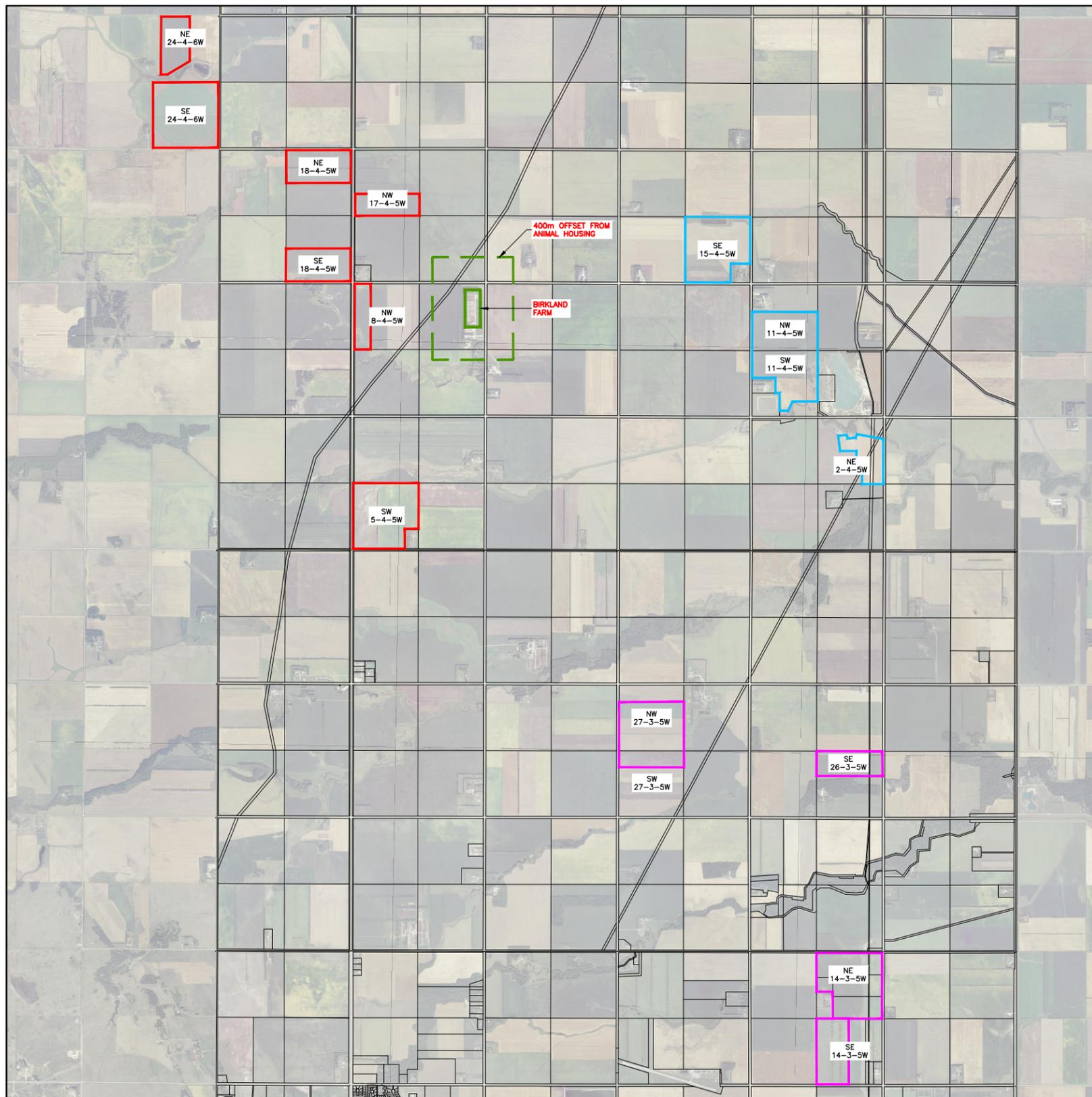
Statistical Data Obtained from Past 30 Years	
	Apr
Mean relative humidity, 6 am (%)	77
Mean relative humidity, 3 pm (%)	38
Average Temperature (°C)	5.2
Mean hourly wind speed (km/h)	14



1) Maximum Humidity Ratio	kg water/kg air = $.0039 e^{0.00656(5.2)} = 0.0055$
2) Humidity Ratio in air (Mollier Diagram) 6am	0.004 based on average monthly temperature and average relative humidity at 6am
3) Humidity Ratio in air (Mollier Diagram) 3pm	0.002 based on average monthly temperature and average relative humidity at 3pm
4) gh (gh = $\theta A(X_s - X)$ @ 6am	<p>where: $\theta = (25 + 19V)$ V = Velocity above water surface (m/s) A = Water Surface area (m²) X_s = Humidity ratio in saturated air at the same temperature as the water surface (kg/kg) X = Humidity ration in the air (kg/kg) from Mollier Diagram</p> <p>gh = $(25 + 19(14 \times 1000/3600))(5850)(0.0055 - 0.004) = 859.33$ kg/hr gh = 0.147 mm/hr</p>
5) gh @ 3pm	<p>calculated similarly as above gh = 2016.33 kg/hr gh = 0.345 mm/hr</p>
6) Total evaporation / day	<p>Assuming 12 hours/day follows the 6am evaporation rate with the other 12 hours/day following the 3pm evaporation rate</p> <p>Total Evaporation rate = $(12 \times 0.147) + (12 \times 0.345) = 5.90$ mm/day Total Evaporation/month = $(5.90/1000) \times 30 \times 5850 = 1070$ m³</p>

FIGURE 1: Runoff & Evaporation





- RM OF THOMPSON
- RM OF ROLAND
- RM OF STANLEY

jdb project engineering inc.
 ROBLIN PLAZA, BUILDING L 880 - 15TH STREET WINKLER, MB R6W 0H5
 PH: (204) 331-4440 EMAIL: jbotha@jdbprojects.ca



FIGURE 2

BIRKLAND FARMS
 BOX 879 WINKLER, MB R6W 4A9
 PHONE: (204) 362-3075

BIRKLAND FARMS
 MANURE APPLICATION



KEY PLAN
SCALE = 1:25,000

APPENDIX A

BIRKLAND FARMS

FEEDLOT EXPANSION

PLAN INDEX

PLAN AND PROFILE

SHEET 01 SITE PLAN

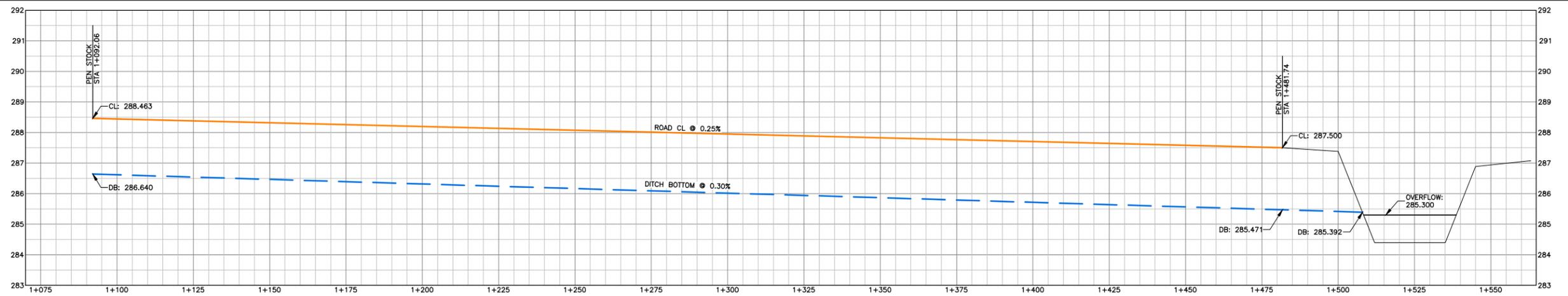
DETAILS

SHEET 02 MISCELLANEOUS DETAILS

jdb project engineering inc.

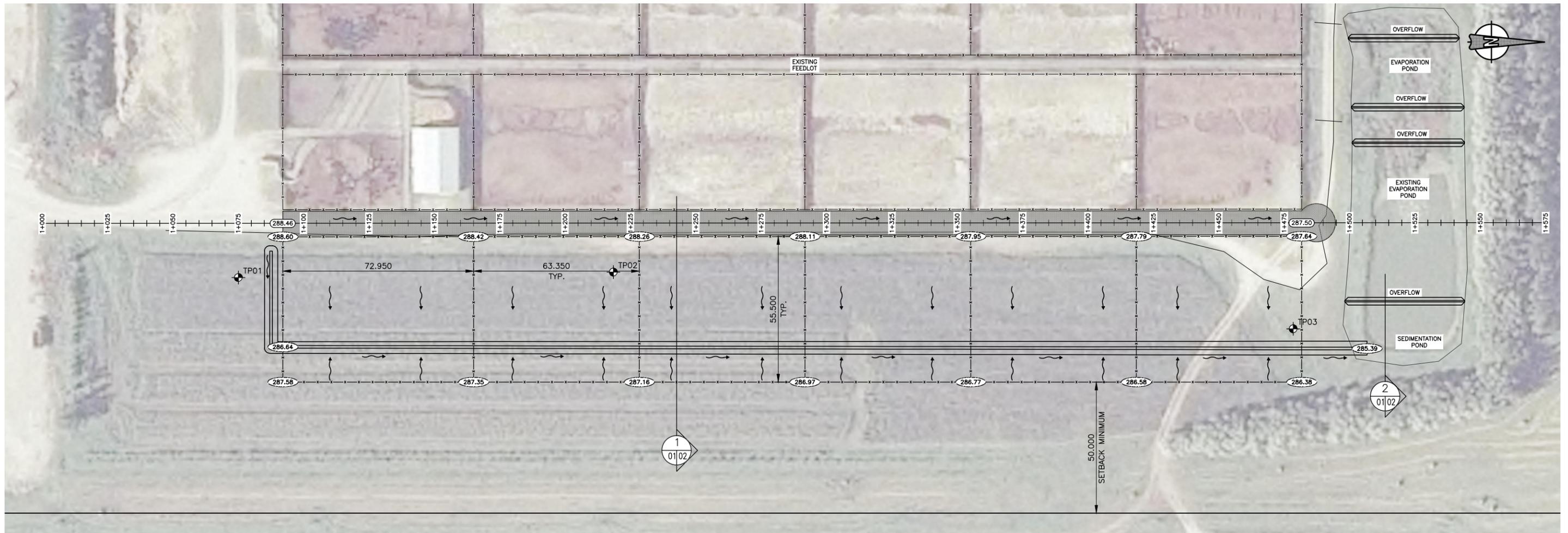
ROBLIN PLAZA, BUILDING L 880 - 15TH STREET WINKLER, MB R6W 0H5
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PROFILE VIEW

HORIZONTAL SCALE = 1:750
VERTICAL SCALE = 1:75



PLAN VIEW

SCALE = 1:750



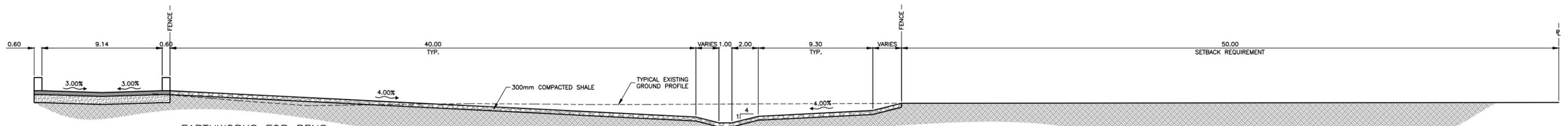
jdb project engineering inc.

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BIRKLAND FARMS
BOX 879 WINKLER, MB R6W 4A9
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1	REVISION	REVIEW ISSUED FOR	16/07/13
			DATE
PROJECT: BIRKLAND FEEDLOT EXPANSION			
TITLE: SITE PLAN			
DESIGNED BY: NG	REVIEWED BY: JB	FIELD BOOK: NONE	SHEET NO: 01
DRAWN BY: NG	DATE: 16/07/04	SCALE: 1:750	DRAWING NO: 048



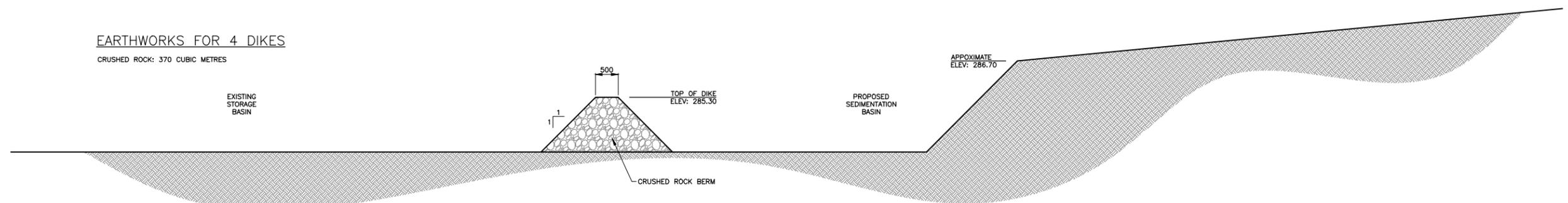
EARTHWORKS FOR PENS

TOPSOIL STRIPPING: 3,250 CUBIC METRES
 SUBGRADE CUT: 6,550 CUBIC METRES
 FILL: 2,450 CUBIC METRES
 NET: SUBGRADE CUT 4,100 CUBIC METRES
 SHALE FILL: 6,500 CUBIC METRES

1 SECTION VIEW
 02/01 SCALE = 1:750

EARTHWORKS FOR 4 DIKES

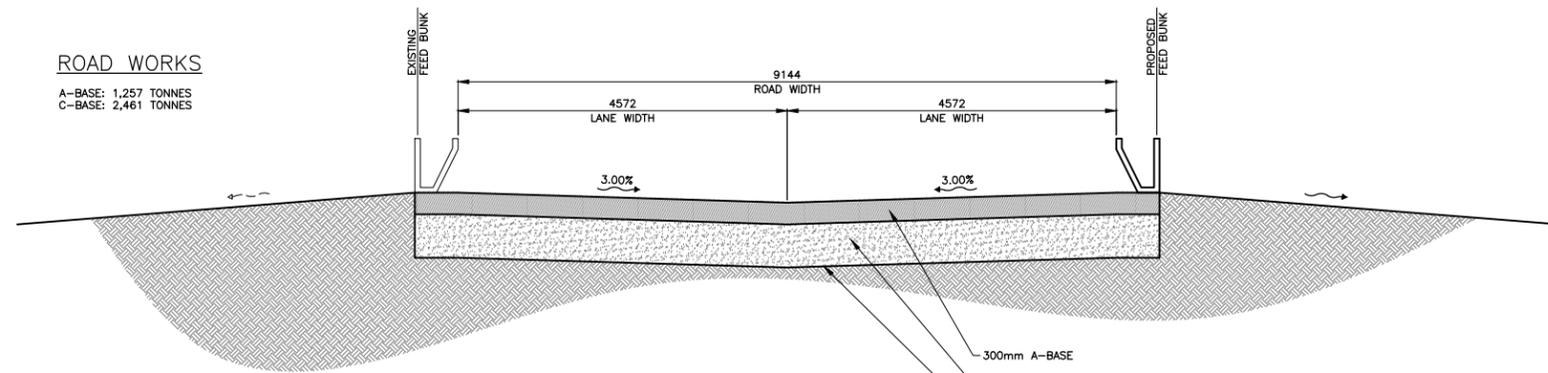
CRUSHED ROCK: 370 CUBIC METRES



2 TYPICAL DIKE SECTION VIEW
 02/01 SCALE = 1:50

ROAD WORKS

A-BASE: 1,257 TONNES
 C-BASE: 2,461 TONNES



ROAD DETAIL

SCALE = 1:50



jdb project engineering inc.

ROBLIN PLAZA, BUILDING L 880 - 15TH STREET WINKLER, MB R6W 0H5
 PH: (204) 331-4440 EMAIL: jbotha@jdbprojects.ca



1	REVIEW	16/07/13
REVISION	ISSUED FOR	DATE
PROJECT: BIRKLAND FEEDLOT EXPANSION		
TITLE: MISCELLANEOUS DETAILS		
DESIGNED BY: NG	REVIEWED BY: JB	FIELD BOOK: NONE
DRAWN BY: NG	DATE: 16/07/04	SCALE: AS SHOWN
SHEET NO: 02	DRAWING NO: 048	

BIRKLAND FARMS
 BOX 879 WINKLER, MB R6W 4A9
 PHONE: (204) 362-3075

APPENDIX B

THE RURAL MUNICIPALITY OF THOMPSON

UNDER THE PLANNING ACT

VARIATION ORDER

VARIATION ORDER NO. 2/16

WHEREAS Kroeker Farms Ltd., owners of the property legally described as the North East ¼ 8-4-5 WPM, Miami, Manitoba applied to the Council of the Rural Municipality of Thompson to vary the Rural Municipality of Thompson Zoning By-law No.3/08 provided under:

Part 6, Section 94 of *The Planning Act* as it applies to the property in order to vary the established requirements as follows:

From (zoning requirements): to establish and allow the property line distance to 50 meters from 100 meters AND to vary the zoning requirement from 80 acres to 50 acres
- for the purpose of subdividing

And after careful consideration of the application and any representations made for or against the variation sought by the applicant, the Council of the Rural Municipality of Thompson in meeting duly assembled this 24th day of March A.D. 2016

APPROVED the said Variation.

This order shall expire if not acted upon within 12 months of the date of making.

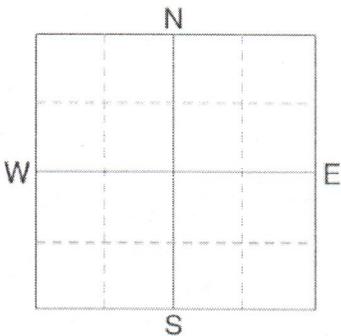


Jody Oakes
Chief Administrative Officer



Brian Callum
Reeve

APPENDIX C

 Soil Analysis by Agvise Laboratories (http://www.agvise.com) Northwood: (701) 587-6010 Benson: (320) 843-4109	SOIL TEST REPORT	
	FIELD ID 595 SAMPLE ID FIELD NAME COUNTY 05 TWP 04 RANGE SECTION 18 QTR NE ACRES 76 PREV. CROP Corn-Grain	
SUBMITTED FOR: PGF	SUBMITTED BY: KR0320 KROEKER FARMS-WINKLER 777 CIRCLE K DRIVE WINKLER, MB R6W 4B4	REF # 14046534 BOX # 0 LAB # NW26822
Date Sampled 04/29/2016	Date Received 05/01/2016	Date Reported 1/30/2017

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice	
		VLow	Low	Med	High	Potatoes-Irr.		Potatoes-Irr.		YIELD GOAL	
Nitrate	0-6"	15 lb/ac									
	6-12"	21 lb/ac									
	12-24"	40 lb/ac									
	0-24"	76 lb/ac									
Olsen Phosphorus	23 ppm	*****									
Potassium	292 ppm	*****									
Chloride	0-6"	10 lb/ac	****								
	6-12"	26 lb/ac									
Sulfur	0-6"	18 lb/ac	*****								
	6-12"	16 lb/ac	*****								
Boron	0.9 ppm	*****									
Zinc	1.51 ppm	*****									
Iron	20.2 ppm	*****									
Manganese	3.0 ppm	*****									
Copper	0.39 ppm	*****									
Magnesium	386 ppm	*****									
Calcium	3829 ppm	*****									
Sodium	39 ppm	*****									
Org. Matter	2.8 %	*****									
Carbonate(CCE)	1.3 %	*****									
Sol. Salts	0-6"	0.14 mmho/cm	***								
	6-12"	0.21 mmho/cm	*****								
						1st Crop Choice: Potatoes-Irr. YIELD GOAL 400 Cwt. SUGGESTED GUIDELINES Band. LB/ACRE APPLICATION: N 144, P ₂ O ₅ 50 Band (2x2) *, K ₂ O 50 Band (2x2) *, Cl Not Available, S 7 Band (Trial), B 0, Zn 2 Band (Trial), Fe 0, Mn 0, Cu 1 Band (Trial), Mg 0, Lime.					
						2nd Crop Choice: Potatoes-Irr. YIELD GOAL 400 Cwt. SUGGESTED GUIDELINES Broadcast. LB/ACRE APPLICATION: N 144, P ₂ O ₅ 52 Broadcast, K ₂ O 50 Band (2x2) *, Cl Not Available, S 15 Broadcast (Trial), B 0, Zn 2 Broadcast (Trial), Fe 0, Mn 0, Cu 2 Broadcast (Trial), Mg 0, Lime.					
						Soil pH: 0-6" 7.8, 6-24" 8.1. Buffer pH: 23.3 meq. Cation Exchange Capacity: 23.3 meq. % Base Saturation (Typical Range): % Ca (65-75) 82.2, % Mg (15-20) 13.8, % K (1-7) 3.2, % Na (0-5) 0.7, % H (0-5).					

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

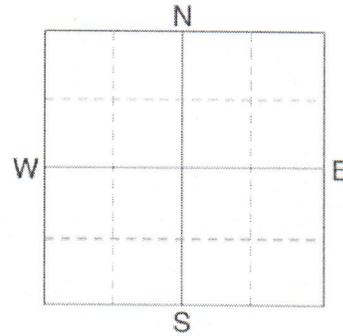
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **592**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **18** QTR **SE** ACRES **73**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
PGF

SUBMITTED BY: **KR0320**
KROEKER FARMS-WINKLER
777 CIRCLE K DRIVE
WINKLER, MB **R6W 4B4**

REF # **14046532** BOX # **0**
 LAB # **NW26818**

Date Sampled **04/29/2016**

Date Received **05/01/2016**

Date Reported **1/30/2017**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice	
		VLow	Low	Med	High	Potatoes-Irr.		Potatoes-Irr.		YIELD GOAL	
Nitrate	0-6"	15 lb/ac				YIELD GOAL		YIELD GOAL		YIELD GOAL	
	6-12"	32 lb/ac				400 Cwt		400 Cwt			
	12-24"	46 lb/ac				SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES	
	0-24"	93 lb/ac				Band		Broadcast			
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION
Phosphorus	Olsen	26 ppm	*****			N	127	N	127	N	
Potassium		384 ppm	*****			P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅	
Chloride	0-6"	7 lb/ac	***			K ₂ O	50 Band (2x2) *	K ₂ O	50 Band (2x2) *	K ₂ O	
	6-12"	44 lb/ac				Cl	Not Available	Cl	Not Available	Cl	
Sulfur	0-6"	14 lb/ac	*****			S	7 Band (Trial)	S	15 Broadcast	S	
	6-12"	16 lb/ac	*****			B	0	B	0	B	
Boron		0.8 ppm	*****			Zn	0	Zn	0	Zn	
Zinc		3.78 ppm	*****			Fe	0	Fe	0	Fe	
Iron		27.4 ppm	*****			Mn	0	Mn	0	Mn	
Manganese		3.0 ppm	*****			Cu	1 Band (Trial)	Cu	2 Broadcast (Trial)	Cu	
Copper		0.36 ppm	*****			Mg	0	Mg	0	Mg	
Magnesium		354 ppm	*****			Lime		Lime		Lime	
Calcium		2462 ppm	*****			Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)	
Sodium		33 ppm	*****			Buffer pH				% Ca	% Mg
Org.Matter		3.5 %	*****							% K	% Na
Carbonate(CCE)		0.4 %	**							% H	
Sol. Salts	0-6"	0.2 mmho/cm	*****			0-6"	7.2	16.4 meq	(65-75)	(15-20)	(1-7)
	6-12"	0.28 mmho/cm	*****			6-24"	8.0		75.1	18.0	6.0
										0.9	(0-5)

General Comments: Coarse Loams (CEC range = 11 to 20) (Medium)

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

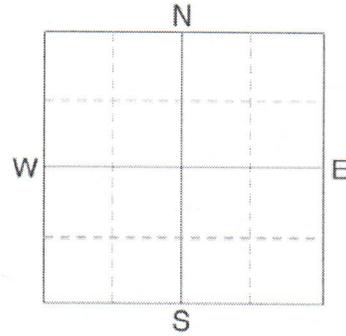
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
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 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **561**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **8** QTR **NW** ACRES **38**
 PREV. CROP



SUBMITTED FOR:
PGF

SUBMITTED BY: **KR0320**
KROEKER FARMS-WINKLER
777 CIRCLE K DRIVE
WINKLER, MB **R6W 4B4**

REF # **14046529** BOX # **0**
 LAB # **NW26821**

Date Sampled **04/29/2016** Date Received **05/01/2016** Date Reported **1/30/2017**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		VLow	Low	Med	High									
Nitrate	0-6"	6 lb/ac				Potatoes-Irr.		Potatoes-Irr.						
	6-12"	20 lb/ac				YIELD GOAL		YIELD GOAL		YIELD GOAL				
	12-24"	70 lb/ac				400 Cwt		400 Cwt						
	0-24"	96 lb/ac				SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES				
						Band		Broadcast						
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION			
Phosphorus	Olsen	52 ppm	*****			N	124	N	124	N				
Potassium		497 ppm	*****			P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅				
Chloride	0-6"	1 lb/ac				K ₂ O	50 Band (2x2) *	K ₂ O	50 Band (2x2) *	K ₂ O				
	6-12"	35 lb/ac				Cl	Not Available	Cl	Not Available	Cl				
Sulfur	0-6"	16 lb/ac	*****			S	7 Band (Trial)	S	15 Broadcast (Trial)	S				
	6-12"	42 lb/ac	*****			B	0	B	0	B				
Boron		1.1 ppm	*****			Zn	0	Zn	0	Zn				
Zinc		2.46 ppm	*****			Fe	0	Fe	0	Fe				
Iron		10.3 ppm	*****			Mn	0	Mn	0	Mn				
Manganese		1.6 ppm	*****			Cu	1 Band (Trial)	Cu	2 Broadcast (Trial)	Cu				
Copper		0.49 ppm	*****			Mg	0	Mg	0	Mg				
Magnesium		371 ppm	*****			Lime		Lime		Lime				
Calcium		4369 ppm	*****			Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)				
Sodium		43 ppm	*****			0-6"	8.2	Buffer pH		% Ca	% Mg	% K	% Na	% H
Org.Matter		2.5 %	*****			6-24"	8.3			(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
Carbonate(CCE)		3.0 %	*****						26.4 meq	82.8	11.7	4.8	0.7	
Sol. Salts	0-6"	0.26 mmho/cm	*****											
	6-12"	0.36 mmho/cm	*****											

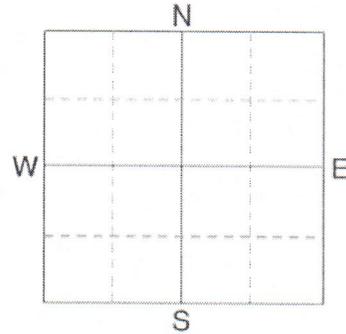
General Comments: Texture is not estimated on high pH soils.
Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
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 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **590**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **15** QTR **SE** ACRES **55**
 PREV. CROP



SUBMITTED FOR:
PGF

SUBMITTED BY: **KR0320**
KROEKER FARMS-WINKLER
777 CIRCLE K DRIVE
WINKLER, MB R6W 4B4

REF # **14046531** BOX # **0**
 LAB # **NW26819**

Date Sampled **04/29/2016**

Date Received **05/01/2016**

Date Reported **1/30/2017**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice			
		VLow	Low	Med	High								
Nitrate	0-6"	12 lb/ac				Potatoes-Irr.		Potatoes-Irr.					
	6-12"	13 lb/ac				YIELD GOAL		YIELD GOAL		YIELD GOAL			
	12-24"	14 lb/ac				400 Cwt		400 Cwt					
	0-24"	39 lb/ac				SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES			
						Band		Broadcast					
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION		
Phosphorus	Olsen	37 ppm	*****			N	181	N	181	N			
Potassium		276 ppm	*****			P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅			
Chloride	0-6"	38 lb/ac	*****			K ₂ O	50 Band (2x2) *	K ₂ O	50 Band (2x2) *	K ₂ O			
	6-12"	54 lb/ac	*****			Cl	Not Available	Cl	Not Available	Cl			
Sulfur	0-6"	30 lb/ac	*****			S	7 Band (Trial)	S	15 Broadcast (Trial)	S			
	6-12"	100 lb/ac	*****			B	0	B	0	B			
Boron		1.4 ppm	*****			Zn	0	Zn	0	Zn			
Zinc		2.11 ppm	*****			Fe	0	Fe	0	Fe			
Iron		10.0 ppm	*****			Mn	0	Mn	0	Mn			
Manganese		2.9 ppm	*****			Cu	0	Cu	0	Cu			
Copper		1.22 ppm	*****			Mg	0	Mg	0	Mg			
Magnesium		526 ppm	*****			Lime		Lime		Lime			
Calcium		4351 ppm	*****			Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)			
Sodium		45 ppm	*****			0-6"	8.2	27.0 meq	(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
Org.Matter		2.7 %	*****			6-24"	8.3		80.4	16.2	2.6	0.7	
Carbonate(CCE)		2.4 %	*****										
Sol. Salts	0-6"	0.37 mmho/cm	*****										
	6-12"	0.5 mmho/cm	*****										

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

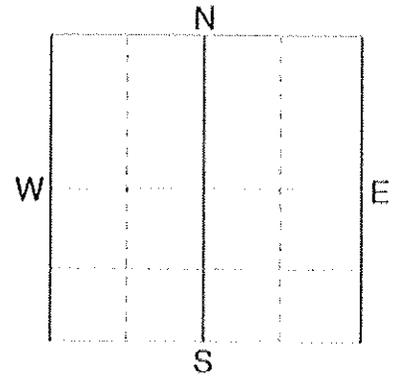
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



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SOIL TEST REPORT

FIELD ID 492
 SAMPLE ID
 FIELD NAME
 COUNTY 5
 TWP 3 RANGE
 SECTION 27 QTR SW ACRES 40
 PREV. CROP



SUBMITTED FOR:
 PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046571 BOX # 0
 LAB # NW66056

Date Sampled 09/08/2016

Date Received 09/09/2016

Date Reported 2/8/2017

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice			3rd Crop Choice							
		Low	Med	High															
Nitrate	0-6"	11 lb/ac			Potatoes-Irr.			Potatoes-Irr.			YIELD GOAL								
	6-12"	3 lb/ac			YIELD GOAL			YIELD GOAL			YIELD GOAL								
	12-24"	4 lb/ac			400 Cwt			400 Cwt			SUGGESTED GUIDELINES								
	0-24"	18 lb/ac			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES								
Phosphorus	Olsen	42 ppm			Band			Broadcast											
					LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		LB/ACRE	APPLICATION							
Potassium		292 ppm			N	202		N	202		N								
					P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅								
Chloride	0-6"	30 lb/ac			K ₂ O	50	Band (2x2) *	K ₂ O	50	Band (2x2) *	K ₂ O								
	6-12"	13 lb/ac			Cl		Not Available	Cl		Not Available	Cl								
Sulfur	0-6"	16 lb/ac			S	7	Band (Trial)	S	15	Broadcast (Trial)	S								
	6-12"	18 lb/ac			B	0		B	0		B								
Boron		0.9 ppm			Zn	0		Zn	0		Zn								
Zinc		2.45 ppm			Fe	0		Fe	0		Fe								
Iron		10.6 ppm			Mn	0		Mn	0		Mn								
Manganese		2.1 ppm			Cu	0		Cu	0		Cu								
Copper		0.86 ppm			Mg	0		Mg	0		Mg								
Magnesium		347 ppm			Lime			Lime			Lime								
Calcium		4074 ppm			Soil pH			Buffer pH			Cation Exchange Capacity			% Base Saturation (Typical Range)					
Sodium		21 ppm			0-6" 8.2			6-24" 8.5			24.1 meq			% Ca	% Mg	% K	% Na	% H	
Org.Matter		1.9 %			65-75			15-20			1-7			84.5	12.0	3.1	0.4	0.4	
Carbonate(CCE)		1.7 %			(0-5)			(0-5)			(0-5)								
Sol. Salts	0-6"	0.3 mmho/cm																	
	6-12"	0.29 mmho/cm																	

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

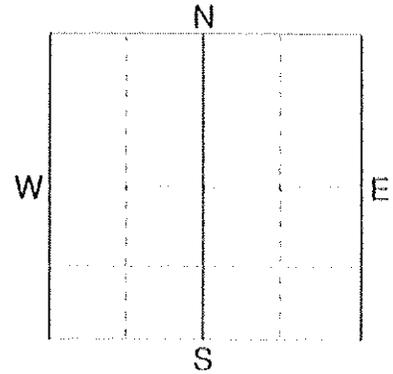
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



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 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 494
 SAMPLE ID
 FIELD NAME
 COUNTY 05
 TWP 03 RANGE
 SECTION 27 QTR NW ACRES 38
 PREV. CROP



SUBMITTED FOR:
 PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046584 BOX # 0
 LAB # NW25206

Date Sampled 04/25/2016

Date Received 04/26/2016

Date Reported 2/8/2017

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice			3rd Crop Choice			
		Low	Med	High	Potatoes-Irr.			Potatoes-Irr.			YIELD GOAL				
					YIELD GOAL			YIELD GOAL			YIELD GOAL				
					400 Cwt			400 Cwt			400 Cwt				
					SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES				
					Band			Broadcast			SUGGESTED GUIDELINES				
					LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION			
Nitrate	0-6"	12 lb/ac			N	143		N	143		N				
	6-12"	25 lb/ac			P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅				
	12-24"	40 lb/ac			K ₂ O	50	Band (2x2) *	K ₂ O	50	Band (2x2) *	K ₂ O				
	0-24"	77 lb/ac			Cl		Not Available	Cl		Not Available	Cl				
Phosphorus	Olsen	50 ppm			S	9	Band (Trial)	S	20	Broadcast	S				
Potassium		565 ppm			B	1	Broadcast	B	1	Broadcast	B				
Chloride	0-6"	7 lb/ac			Zn	0		Zn	0		Zn				
	6-12"	28 lb/ac			Fe	0		Fe	0		Fe				
Sulfur	0-6"	14 lb/ac			Mn	0		Mn	0		Mn				
	6-12"	16 lb/ac			Cu	1	Band (Trial)	Cu	1	Broadcast (Trial)	Cu				
Boron		0.6 ppm			Mg	0		Mg	0		Mg				
Zinc		4.45 ppm			Lime			Lime			Lime				
Iron		40.5 ppm			Soil pH			Buffer pH			Cation Exchange Capacity				
Manganese		3.2 ppm			0-6" 7.3			13.3 meq			% Base Saturation (Typical Range)				
Copper		0.57 ppm			6-24" 7.6						% Ca	% Mg	% K	% Na	% H
Magnesium		317 ppm									(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
Calcium		1811 ppm									68.0	19.8	10.9	1.3	
Sodium		41 ppm													
Org. Matter		2.4 %													
Carbonate(CCE)		0.2 %													
Sol. Salts	0-6"	0.2 mmho/cm													
	6-12"	0.29 mmho/cm													

General Comments: Coarse Loams (CEC range = 11 to 20) (Medium)

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

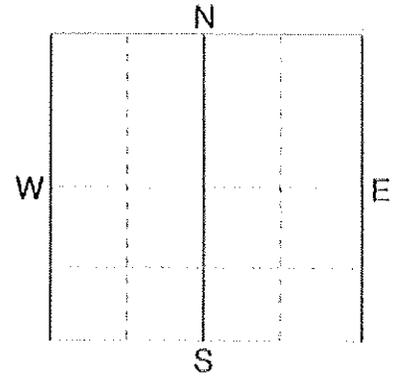
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



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 (http://www.agvise.com)
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 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 495
 SAMPLE ID
 FIELD NAME
 COUNTY 05
 TWP 03 RANGE
 SECTION 27 QTR NW ACRES 38
 PREV. CROP



SUBMITTED FOR:
 PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046527 BOX # 0
 LAB # NW26815

Date Sampled 04/28/2016

Date Received 05/01/2016

Date Reported 2/8/2017

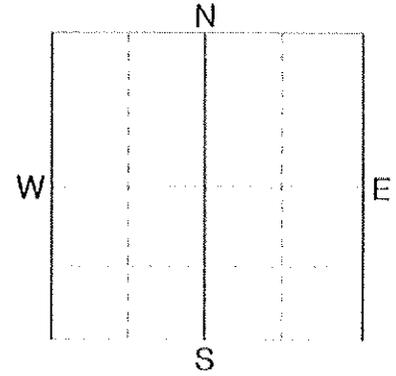
Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice	
		Low	Med	High							
Nitrate	0-6"	10 lb/ac				Potatoes-Irr.	Potatoes-Irr.				
	6-12"	20 lb/ac				YIELD GOAL	YIELD GOAL			YIELD GOAL	
	12-24"	22 lb/ac				400 Cwt	400 Cwt				
	0-24"	52 lb/ac				SUGGESTED GUIDELINES	SUGGESTED GUIDELINES			SUGGESTED GUIDELINES	
						Band	Broadcast				
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION
Phosphorus	Olsen 51 ppm				N	168		N	168	N	
Potassium	344 ppm				P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅	50	P ₂ O ₅	
Chloride	0-6" 1 lb/ac 6-12" 7 lb/ac				K ₂ O	50	Band (2x2) *	K ₂ O	50	K ₂ O	
Sulfur	0-6" 10 lb/ac 6-12" 12 lb/ac				Cl		Not Available	Cl		Cl	
Boron	0.7 ppm				S	9	Band (Trial)	S	20	S	
Zinc	3.57 ppm				B	1	Broadcast	B	1	B	
Iron	15.1 ppm				Zn	0		Zn	0	Zn	
Manganese	1.2 ppm				Fe	0		Fe	0	Fe	
Copper	0.6 ppm				Mn	0		Mn	0	Mn	
Magnesium	396 ppm				Cu	1	Band (Trial)	Cu	1	Cu	
Calcium	2583 ppm				Mg	0		Mg	0	Mg	
Sodium	21 ppm				Lime			Lime		Lime	
Org.Matter	2.3 %				Sulfur			Sulfur			
Carbonate(CCE)	0.5 %				Lime			Lime			
Sol. Salts	0-6"	0.21 mmho/cm			Sulfur			Sulfur			
	6-12"	0.29 mmho/cm			Lime			Lime			
						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulfur			
						Lime		Lime			
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						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulfur			
						Lime		Lime			
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						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulfur			
						Lime		Lime			
						Sulfur		Sulf			



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 584
 SAMPLE ID
 FIELD NAME
 COUNTY 5
 TWP 4 RANGE
 SECTION 11 QTRSW ACRES 70
 PREV. CROP



SUBMITTED FOR:
 PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046566 BOX # 0
 LAB # NW66052

Date Sampled 09/08/2016

Date Received 09/09/2016

Date Reported 2/8/2017

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice			3rd Crop Choice			
		Low	Med	High	Potatoes-Irr.			Potatoes-Irr.			YIELD GOAL				
					YIELD GOAL			YIELD GOAL			YIELD GOAL				
					400 Cwt			400 Cwt							
					SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES				
					Band			Broadcast							
					LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		LB/ACRE	APPLICATION			
Nitrate	0-6" 29 lb/ac 6-12" 20 lb/ac 12-24" 28 lb/ac 0-24" 77 lb/ac				N	143		N	143		N				
Phosphorus	Olsen 23 ppm				P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅	54	Broadcast	P ₂ O ₅				
Potassium	180 ppm				K ₂ O	122	Band *	K ₂ O	168	Broadcast	K ₂ O				
Chloride	0-6" 30 lb/ac 6-12" 23 lb/ac				Cl		Not Available	Cl		Not Available	Cl				
Sulfur	0-6" 14 lb/ac 6-12" 20 lb/ac				S	9	Band (Trial)	S	20	Broadcast	S				
Boron	0.8 ppm				B	0		B	0		B				
Zinc	2.00 ppm				Zn	3	Band (Trial)	Zn	4	Broadcast(Trial)	Zn				
Iron	11.0 ppm				Fe	0		Fe	0		Fe				
Manganese	1.8 ppm				Mn	0		Mn	0		Mn				
Copper	0.97 ppm				Cu	0		Cu	0		Cu				
Magnesium	348 ppm				Mg	0		Mg	0		Mg				
Calcium	4254 ppm				Lime			Lime			Lime				
Sodium	27 ppm				Soil pH			Cation Exchange Capacity			% Base Saturation (Typical Range)				
Org.Matter	2.0 %				Buffer pH						% Ca	% Mg	% K	% Na	% H
Carbonate(CCE)	1.5 %							24.7 meq			(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
Sol. Salts	0-6" 0.33 mmho/cm 6-12" 0.32 mmho/cm				0-6" 8.1 6-24" 8.3						85.9	11.7	1.9	0.5	

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

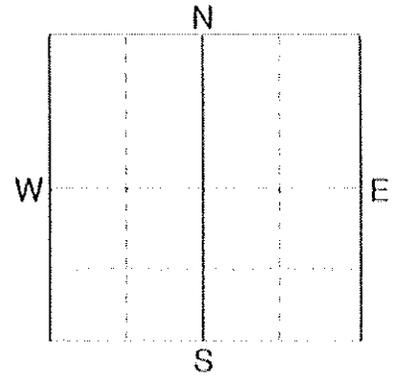
Crop 2: ** Chloride yield data is limited for this crop. Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
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 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 616
 SAMPLE ID
 FIELD NAME
 COUNTY 6
 TWP 4 RANGE
 SECTION 24 QTR NW ACRES 35
 PREV. CROP



SUBMITTED FOR:
 PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046564 BOX # 0
 LAB # NW66049

Date Sampled 09/08/2016

Date Received 09/09/2016

Date Reported 2/8/2017

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice			3rd Crop Choice		
		Low	Med	High										
					Potatoes-Irr.			Potatoes-Irr.			YIELD GOAL			
					YIELD GOAL			YIELD GOAL			YIELD GOAL			
					400 Cwt			400 Cwt			SUGGESTED GUIDELINES			
					SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			
					Band			Broadcast						
					LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		
Nitrate	0-6" 12 lb/ac 6-12" 6 lb/ac 12-24" 34 lb/ac 0-24" 52 lb/ac				N	168		N	168		N			
Phosphorus	Olsen 14 ppm				P ₂ O ₅	75	Band *	P ₂ O ₅	104	Broadcast	P ₂ O ₅			
Potassium	147 ppm				K ₂ O	173	Band *	K ₂ O	234	Broadcast	K ₂ O			
Chloride	0-6" 8 lb/ac 6-12" 17 lb/ac				Cl		Not Available	Cl		Not Available	Cl			
Sulfur	0-6" 16 lb/ac 6-12" 70 lb/ac				S	7	Band (Trial)	S	15	Broadcast (Trial)	S			
Boron	1.1 ppm				B	0		B	0		B			
Zinc	1.34 ppm				Zn	3	Band (Trial)	Zn	4	Broadcast(Trial)	Zn			
Iron	16.0 ppm				Fe	0		Fe	0		Fe			
Manganese	2.5 ppm				Mn	0		Mn	0		Mn			
Copper	0.59 ppm				Cu	1	Band (Trial)	Cu	1	Broadcast (Trial)	Cu			
Magnesium	469 ppm				Mg	0		Mg	0		Mg			
Calcium	3910 ppm				Lime			Lime			Lime			
Sodium	45 ppm													
Org.Matter	2.6 %				Soil pH			% Base Saturation (Typical Range)						
Carbonate(CCE)	1.0 %				Buffer pH		Cation Exchange Capacity	% Ca	% Mg	% K	% Na	% H		
Sol. Salts	0-6" 0.28 mmho/cm 6-12" 0.39 mmho/cm				0-6" 8.1 6-24" 8.4		24.0 meq	65-75 81.4	15-20 16.3	1-7 1.6	0-5 0.8	0-5		

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

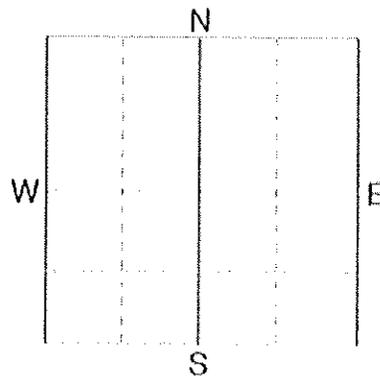
Crop 2: ** Chloride yield data is limited for this crop. Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
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 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 617
 SAMPLE ID
 FIELD NAME
 COUNTY 6
 TWP 4 RANGE
 SECTION 24 QTR NW ACRES 24
 PREV. CROP



SUBMITTED FOR:
 PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046565 BOX # 0
 LAB # NW66050

Date Sampled 09/08/2016

Date Received 09/09/2016

Date Reported 2/8/2017

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice			3rd Crop Choice			
		Very Low	Low	Med	High	Potatoes-Irr.			Potatoes-Irr.			YIELD GOAL			
Nitrate	0-6"	12 lb/ac				YIELD GOAL			YIELD GOAL			YIELD GOAL			
	6-12"	9 lb/ac				400 Cwt			400 Cwt						
	12-24"	34 lb/ac				SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			
	0-24"	55 lb/ac				Band			Broadcast						
Olsen Phosphorus	16 ppm				N	165		N	165		N				
Potassium	154 ppm				P ₂ O ₅	68	Band *	P ₂ O ₅	96	Broadcast	P ₂ O ₅				
Chloride	0-6"	7 lb/ac				K ₂ O	162	Band *	K ₂ O	220	Broadcast	K ₂ O			
	6-12"	35 lb/ac				Cl		Not Available	Cl		Not Available	Cl			
Sulfur	0-6"	14 lb/ac				S	9	Band (Trial)	S	20	Broadcast	S			
	6-12"	60 lb/ac				B	0		B	0		B			
Boron	1.2 ppm				Zn	3	Band (Trial)	Zn	4	Broadcast (Trial)	Zn				
Zinc	1.38 ppm				Fe	0		Fe	0		Fe				
Iron	10.6 ppm				Mn	0		Mn	0		Mn				
Manganese	2.2 ppm				Cu	1	Band (Trial)	Cu	2	Broadcast (Trial)	Cu				
Copper	0.41 ppm				Mg	0		Mg	0		Mg				
Magnesium	449 ppm				Lime			Lime			Lime				
Calcium	4526 ppm				Soil pH			Cation Exchange Capacity			% Base Saturation (Typical Range)				
Sodium	34 ppm				Buffer pH						% Ca	% Mg	% K	% Na	% H
Org.Matter	2.8 %				0-6" 8.3			26.9 meq			(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
Carbonate(CCE)	1.4 %				6-24" 8.5						84.1	13.9	1.5	0.5	
Sol. Salts	0-6"	0.19 mmho/cm													
	6-12"	0.27 mmho/cm													

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

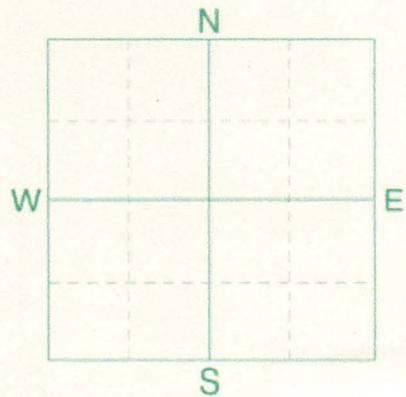
Crop 2: ** Chloride yield data is limited for this crop. Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **610**
 SAMPLE ID
 FIELD NAME
 COUNTY **06**
 TWP **04** RANGE
 SECTION **24** QTR **SE** ACRES **168**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB R6W 4A5

REF # **18791347** BOX # **0**
 LAB # **NW25205**

Date Sampled **04/25/2016**

Date Received **04/26/2016**

Date Reported **4/28/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice			
		VLow	Low	Med	High								
Nitrate	0-6" 14 lb/ac					Corn-Grain		Corn-Grain		Corn-Grain			
						YIELD GOAL		YIELD GOAL		YIELD GOAL			
	0-24" 88 lb/ac					120 BU		140 BU		140 BU			
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES			
Phosphorus	Olsen 25 ppm					Broadcast		Broadcast		Band			
	Potassium 322 ppm					LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION		
Chloride						N 56		N 80		N 80			
	0-6" 26 lb/ac					P ₂ O ₅ 0		P ₂ O ₅ 0		P ₂ O ₅ 15	Band (2x2) *		
Sulfur	0-24" 480 +lb/ac					K ₂ O 0		K ₂ O 0		K ₂ O 10	Band (2x2) *		
						Cl		Cl		Cl			
Boron						S 10	Broadcast (Trial)	S 10	Broadcast (Trial)	S 0			
Zinc	2.27 ppm					B		B		B			
Iron						Zn 0		Zn 0		Zn 0			
Manganese						Fe		Fe		Fe			
Copper	0.59 ppm					Mn		Mn		Mn			
Magnesium						Cu 0		Cu 0		Cu 0			
Calcium						Mg		Mg		Mg			
Sodium						Lime		Lime		Lime			
Org.Matter	2.8 %					Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)			
Carbonate(CCE)	1.4 %					Buffer pH			% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.29 mmho/cm					0-6" 8.1							
	0-24" 0.48 mmho/cm					6-24" 8.3							

Crop 1: Crop Removal: P205 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

Crop 2: Crop Removal: P205 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

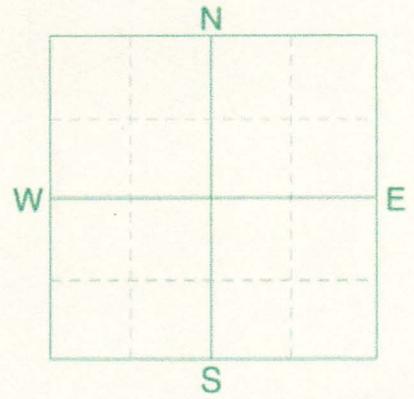
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P205 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **598**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **17** QTR **NW** ACRES **54**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **18791348** BOX # **0**
 LAB # **NW25204**

Date Sampled **04/25/2016**

Date Received **04/26/2016**

Date Reported **4/28/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice			
		VLow	Low	Med	High								
Nitrate	0-6" 9 lb/ac					Corn-Grain		Corn-Grain		Corn-Grain			
						YIELD GOAL		YIELD GOAL		YIELD GOAL			
	0-24" 64 lb/ac					120 BU		140 BU		140 BU			
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES			
Phosphorus	Olsen 20 ppm					Broadcast		Broadcast		Band			
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION		
Potassium	315 ppm					N 80		N 104		N 104			
Chloride						P ₂ O ₅ 28	Broadcast	P ₂ O ₅ 32	Broadcast	P ₂ O ₅ 15	Band (2x2) *		
	0-6" 14 lb/ac					K ₂ O 0		K ₂ O 0		K ₂ O 10	Band (2x2) *		
Sulfur	0-24" 112 lb/ac					Cl		Cl		Cl			
Boron						S 10	Broadcast	S 10	Broadcast	S 0			
Zinc	1.81 ppm					B		B		B			
Iron						Zn 0		Zn 0		Zn 0			
Manganese						Fe		Fe		Fe			
Copper	0.59 ppm					Mn		Mn		Mn			
Magnesium						Cu 0		Cu 0		Cu 0			
Calcium						Mg		Mg		Mg			
Sodium						Lime		Lime		Lime			
Org.Matter	3.6 %					Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)			
Carbonate(CCE)	1.4 %					Buffer pH			% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.26 mmho/cm					0-6" 8.0							
	0-24" 0.27 mmho/cm					6-24" 8.4							

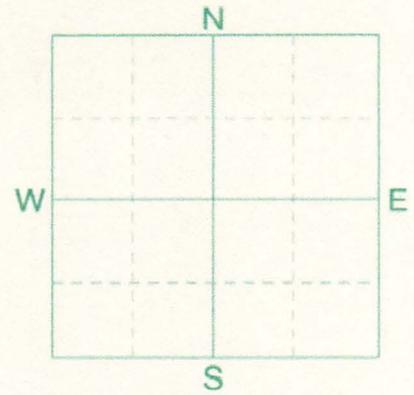
Crop 1: Crop Removal: P2O5 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
 Crop 2: Crop Removal: P2O5 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
 Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
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 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **530**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **5** QTR **SW** ACRES **56**
 PREV. CROP **Soybeans**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **18791350** BOX # **0**
 LAB # **NW25203**

Date Sampled **04/25/2016**

Date Received **04/26/2016**

Date Reported **4/28/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice		
		VLow	Low	Med	High	Corn-Grain		Corn-Grain		Corn-Grain		
Nitrate	0-6" 5 lb/ac					YIELD GOAL		YIELD GOAL		YIELD GOAL		
	0-24" 40 lb/ac	*****				120 BU		140 BU		140 BU		
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		
						Broadcast		Broadcast		Band		
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	
Olsen Phosphorus	14 ppm	*****				N 74		N 98		N 98		
Potassium	200 ppm	*****				P ₂ O ₅ 54	Broadcast	P ₂ O ₅ 62	Broadcast	P ₂ O ₅ 27	Band *	
Chloride						K ₂ O 0		K ₂ O 0		K ₂ O 10	Band (2x2) *	
						Cl		Cl		Cl		
Sulfur	0-6" 72 lb/ac	*****				S 0		S 0		S 0		
	0-24" 480 +lb/ac	*****				B		B		B		
Boron						Zn 2	Broadcast(Trial)	Zn 2	Broadcast(Trial)	Zn 2	Band (Trial)	
Zinc	1.82 ppm	*****				Fe		Fe		Fe		
Iron						Mn		Mn		Mn		
Manganese						Cu 0		Cu 0		Cu 0		
Copper	0.6 ppm	*****				Mg		Mg		Mg		
Magnesium						Lime		Lime		Lime		
Calcium						Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)		
Sodium						Buffer pH		% Ca	% Mg	% K	% Na	% H
Org.Matter	2.4 %	*****				0-6" 8.1						
Carbonate(CCE)	4.7 %	*****				6-24" 8.3						
Sol. Salts	0-6" 0.33 mmho/cm	*****										
	0-24" 0.63 mmho/cm	*****										

Crop 1: Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P205 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

Crop 2: Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P205 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

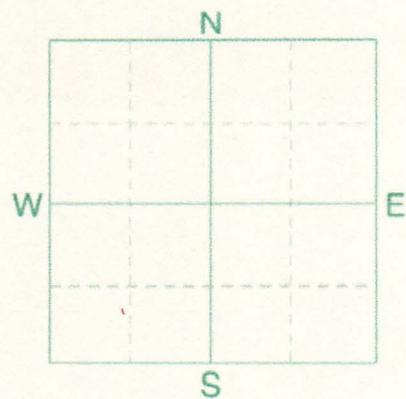
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P205 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **531**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **5** QTR **SW** ACRES **90**
 PREV. CROP **Potatoes**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **18791349** BOX # **0**
 LAB # **NW25202**

Date Sampled **04/25/2016**

Date Received **04/26/2016**

Date Reported **4/28/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		VLow	Low	Med	High									
Nitrate	0-6" 7 lb/ac					Corn-Grain		Corn-Grain		Corn-Grain				
						YIELD GOAL		YIELD GOAL		YIELD GOAL				
	0-24" 56 lb/ac					120 BU		140 BU		140 BU				
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES				
Phosphorus	Olsen 23 ppm					Broadcast		Broadcast		Band				
	Potassium 292 ppm					LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION			
Chloride						N	88	N	112	N	112			
	0-6" 10 lb/ac					P ₂ O ₅	0	P ₂ O ₅	0	P ₂ O ₅	15			
Sulfur	0-24" 64 lb/ac					K ₂ O	0	K ₂ O	0	K ₂ O	10			
						Cl		Cl		Cl				
Boron						S	15	S	15	S	4			
Zinc	2.45 ppm					B		B		B				
Iron						Zn	0	Zn	0	Zn	0			
Manganese						Fe		Fe		Fe				
Copper	0.55 ppm					Mn		Mn		Mn				
Magnesium						Cu	0	Cu	0	Cu	0			
Calcium						Mg		Mg		Mg				
Sodium						Lime		Lime		Lime				
Org.Matter	2.5 %					Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)				
Carbonate(CCE)	1.3 %					Buffer pH				% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.23 mmho/cm					0-6" 8.0								
	0-24" 0.34 mmho/cm					6-24" 8.2								

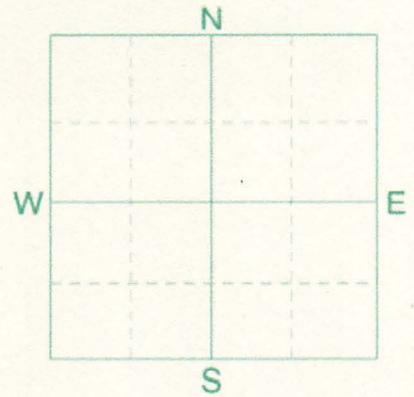
Crop 1: Crop Removal: P205 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
 Crop 2: Crop Removal: P205 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
 Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P205 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **583**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **11** QTR **SW** ACRES **40**
 PREV. CROP **Beans-Edible**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **18790993** BOX # **0**
 LAB # **NW26095**

Date Sampled **04/27/2016**

Date Received **04/28/2016**

Date Reported **5/2/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice		
		VLow	Low	Med	High	Corn-Grain		Corn-Grain		Corn-Grain		
Nitrate	0-6" 25 lb/ac					YIELD GOAL		YIELD GOAL		YIELD GOAL		
						120 BU		140 BU		140 BU		
	0-24" 104 lb/ac					SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		
						Broadcast		Broadcast		Band		
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	
Olsen Phosphorus	46 ppm						N 25	N 34	N 34			
Potassium	195 ppm						P ₂ O ₅ 0	P ₂ O ₅ 0	P ₂ O ₅ 15	Band (2x2) *		
Chloride							K ₂ O 0	K ₂ O 0	K ₂ O 10	Band (2x2) *		
Sulfur	0-6" 30 lb/ac											
	0-24" 128 lb/ac											
Boron							Cl	Cl	Cl			
Zinc	3.09 ppm						S 10 Broadcast (Trial)	S 10 Broadcast (Trial)	S 0			
Iron							B	B	B			
Manganese							Zn 0	Zn 0	Zn 0			
Copper	1.54 ppm						Fe	Fe	Fe			
Magnesium							Mn	Mn	Mn			
Calcium							Cu 0	Cu 0	Cu 0			
Sodium							Mg	Mg	Mg			
Org.Matter	2.5 %						Lime	Lime	Lime			
Carbonate(CCE)	0.3 %											
Sol. Salts	0-6" 0.37 mmho/cm					Soil pH	Buffer pH	Cation Exchange Capacity		% Base Saturation (Typical Range)		
	0-24" 0.4 mmho/cm					0-6" 7.8		% Ca	% Mg	% K	% Na	% H
						6-24" 8.2						

Crop 1: Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P2O5 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

Crop 2: Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P2O5 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

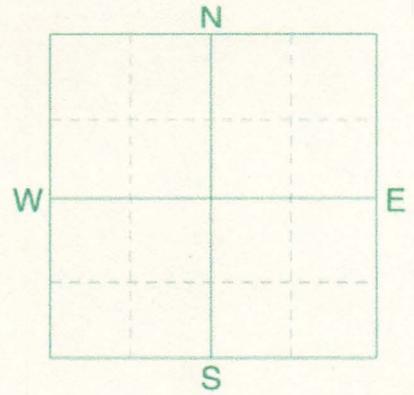
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P2O5 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

SOIL TEST REPORT



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

FIELD ID **558**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **2** QTR **NE** ACRES **47**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB R6W 4A5

REF # **18790994** BOX # **0**
 LAB # **NW26097**

Date Sampled **04/27/2016**

Date Received **04/28/2016**

Date Reported **5/2/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice			3rd Crop Choice							
		VLow	Low	Med	High	Corn-Grain			Corn-Grain			Corn-Grain							
Nitrate	0-6" 8 lb/ac	*****				YIELD GOAL			YIELD GOAL			YIELD GOAL							
	0-24" 44 lb/ac					120 BU			140 BU			140 BU							
						SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES							
						Broadcast			Broadcast			Band							
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION								
Olsen Phosphorus	15 ppm	*****				N	100		N	124		N	124						
Potassium	202 ppm	*****				P ₂ O ₅	49	Broadcast	P ₂ O ₅	57	Broadcast	P ₂ O ₅	24	Band *					
Chloride						K ₂ O	0		K ₂ O	0		K ₂ O	10	Band (2x2) *					
Sulfur	0-6" 6 lb/ac	*****				Cl			Cl			Cl							
	0-24" 32 lb/ac	*****				S	25	Broadcast	S	25	Broadcast	S	12	Band					
Boron						B			B			B							
Zinc	1.64 ppm	*****				Zn	0		Zn	0		Zn	0						
Iron						Fe			Fe			Fe							
Manganese						Mn			Mn			Mn							
Copper	1.03 ppm	*****				Cu	0		Cu	0		Cu	0						
Magnesium						Mg			Mg			Mg							
Calcium						Lime			Lime			Lime							
Sodium																			
Org.Matter	2.8 %	*****				Soil pH			Buffer pH			Cation Exchange Capacity			% Base Saturation (Typical Range)				
Carbonate(CCE)	0.0 %	*****															% Ca	% Mg	% K
Sol. Salts	0-6" 0.24 mmho/cm	*****				0-6"	7.0												
	0-24" 0.33 mmho/cm	*****				6-24"	8.0												

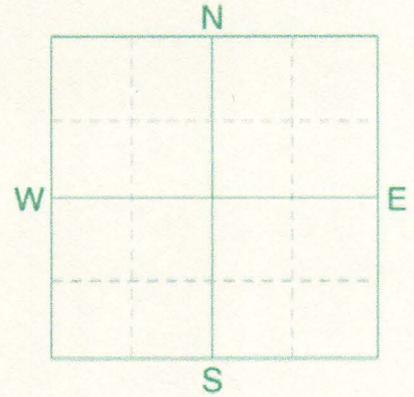
Crop 1: Crop Removal: P2O5 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
Crop 2: Crop Removal: P2O5 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
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 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **470**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **03** RANGE
 SECTION **14** QTR **SE** ACRES **72**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **18790997** BOX # **0**
 LAB # **NW26093**

Date Sampled **04/27/2016**

Date Received **04/28/2016**

Date Reported **5/2/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		VLow	Low	Med	High	Beans-Edible		Beans-Edible		Beans-Edible				
Nitrate	0-6" 7 lb/ac					YIELD GOAL		YIELD GOAL		YIELD GOAL				
	0-24" 96 lb/ac	*****				2000 LBS		2500 LBS		2500 LBS				
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES				
						Broadcast		Broadcast		Band				
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION			
Olsen Phosphorus	23 ppm	*****				N	28	N	29	N	29			
Potassium	194 ppm	*****				P ₂ O ₅	0	P ₂ O ₅	0	P ₂ O ₅	15 Band *			
Chloride						K ₂ O	0	K ₂ O	0	K ₂ O	0			
						Cl		Cl		Cl				
Sulfur	0-6" 10 lb/ac	*****				S	20 Broadcast	S	20 Broadcast	S	9 Band (Trial)			
	0-24" 176 lb/ac	*****				B		B		B				
Boron						Zn	2 Broadcast(Trial)	Zn	2 Broadcast(Trial)	Zn	2 Band (Trial)			
Zinc	1.71 ppm	*****				Fe		Fe		Fe				
Iron						Mn		Mn		Mn				
Manganese						Cu	0	Cu	0	Cu	0			
Copper	0.43 ppm	*****				Mg		Mg		Mg				
Magnesium						Lime		Lime		Lime				
Calcium														
Sodium														
Org.Matter	1.9 %	*****				Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)				
Carbonate(CCE)	0.5 %	***				Buffer pH				% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.19 mmho/cm	****				0-6" 8.0								
	0-24" 0.38 mmho/cm	*****				6-24" 8.3								

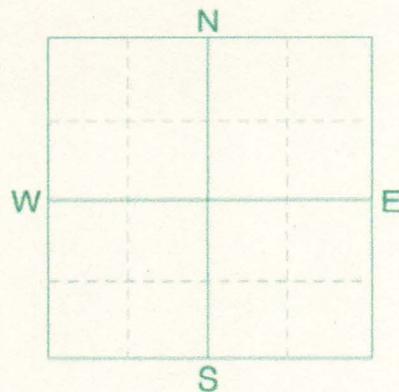
Crop 1: Crop Removal: P205 = 28 K2O = 28 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
Crop 2: Crop Removal: P205 = 35 K2O = 35 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P205 = 35 K2O = 35 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
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 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **KFL471**
 SAMPLE ID **ZION**
 FIELD NAME
 COUNTY **5**
 TWP **3** RANGE
 SECTION **14** QTR **NE** ACRES **144**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
GEORGE FROESE-BIRKLAND

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **17341651** BOX # **0**
 LAB # **NW181542**

Date Sampled **11/16/2016**

Date Received **11/17/2016**

Date Reported **11/29/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		VLow	Low	Med	High	Beans-Edible		Corn-Grain		Corn-Grain				
Nitrate	0-6" 13 lb/ac					YIELD GOAL		YIELD GOAL		YIELD GOAL				
	0-24" 64 lb/ac	*****				2500 LBS		140 BU		160 BU				
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES				
						Broadcast		Broadcast		Broadcast				
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION			
Phosphorus	Olsen 16 ppm	*****				N	61	N	104	N	128			
Potassium	163 ppm	*****				P ₂ O ₅	44 Broadcast	P ₂ O ₅	52 Broadcast	P ₂ O ₅	60 Broadcast			
Chloride						K ₂ O	27 Broadcast	K ₂ O	39 Broadcast	K ₂ O	44 Broadcast			
Sulfur	0-6" 120 +lb/ac 0-24" 480 +lb/ac	*****				Cl		Cl		Cl				
Boron						S	0	S	0	S	0			
Zinc	2.25 ppm	*****				B		B		B				
Iron						Zn	0	Zn	0	Zn	0			
Manganese						Fe		Fe		Fe				
Copper	0.6 ppm	*****				Mn		Mn		Mn				
Magnesium						Cu	0	Cu	0	Cu	0			
Calcium						Mg		Mg		Mg				
Sodium						Lime		Lime		Lime				
Org.Matter	3.0 %	*****				Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)				
Carbonate(CCE)	1.0 %	*****				Buffer pH				% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.81 mmho/cm 0-24" 1.2 mmho/cm	*****				0-6" 7.3								
		*****				6-24" 7.8								

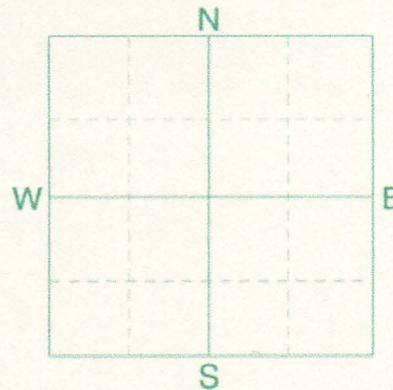
Crop 1: Crop Removal: P205 = 35 K20 = 35 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
 Crop 2: Crop Removal: P205 = 56 K20 = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
 Crop 3: Crop Removal: P205 = 64 K20 = 43 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **SE 26-3-5**
 SAMPLE ID **NORTH 60**
 FIELD NAME
 COUNTY **5**
 TWP **3** RANGE
 SECTION **26** QTR **SE** ACRES **60**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:

GEORGE FROESE
BIRKLAND FARMS

SUBMITTED BY: KR3239

KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB

R6W 4A5

REF # **17341652** BOX # **0**
 LAB # **NW181547**

Date Sampled **11/16/2016**

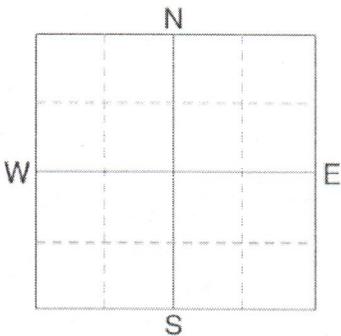
Date Received **11/17/2016**

Date Reported **11/29/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		VLow	Low	Med	High									
Nitrate	0-6" 21 lb/ac					Beans-Edible		Soybeans		Corn-Grain				
						YIELD GOAL		YIELD GOAL		YIELD GOAL				
	0-24" 32 lb/ac	*****				2500 LBS		50 BU		140 BU				
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES				
						Broadcast		Broadcast		Broadcast				
Olsen	14 ppm	*****				LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION			
Phosphorus						N	93	N	***	N	136			
Potassium	301 ppm	*****				P ₂ O ₅	52 Broadcast	P ₂ O ₅	44 Broadcast	P ₂ O ₅	62 Broadcast			
Chloride						K ₂ O	0	K ₂ O	0	K ₂ O	0			
Sulfur	0-6" 90 lb/ac 0-24" 480 +lb/ac	*****				Cl		Cl		Cl				
Boron						S	0	S	0	S	0			
Zinc	3.40 ppm	*****				B		B		B				
Iron						Zn	0	Zn	0	Zn	0			
Manganese						Fe		Fe		Fe				
Copper	2.25 ppm	*****				Mn		Mn		Mn				
Magnesium						Cu	0	Cu	0	Cu	0			
Calcium						Mg		Mg		Mg				
Sodium						Lime		Lime		Lime				
Org. Matter	5.7 %	*****				Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)				
Carbonate(CCE)	1.1 %	*****				Buffer pH				% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.55 mmho/cm 0-24" 1.35 mmho/cm	*****				0-6" 7.4								
		*****				6-24" 7.5								

Crop 1: Crop Removal: P2O5 = 35 K2O = 35 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
Crop 2: The risk of the development of iron chlorosis on soybeans on this field is moderate based on the salt and carbonate levels. Crop Removal: P2O5 = 44 K2O = 75 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years. Soybeans may respond to nitrogen on fields testing less than 60 lb/ac with a limited soybean history.
Crop 3: Crop Removal: P2O5 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

APPENDIX C

 Soil Analysis by Agvise Laboratories (http://www.agvise.com) Northwood: (701) 587-6010 Benson: (320) 843-4109	SOIL TEST REPORT	
	FIELD ID 595 SAMPLE ID FIELD NAME COUNTY 05 TWP 04 RANGE SECTION 18 QTR NE ACRES 76 PREV. CROP Corn-Grain	
SUBMITTED FOR: PGF	SUBMITTED BY: KR0320 KROEKER FARMS-WINKLER 777 CIRCLE K DRIVE WINKLER, MB R6W 4B4	REF # 14046534 BOX # 0 LAB # NW26822
Date Sampled 04/29/2016	Date Received 05/01/2016	Date Reported 1/30/2017

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		VLow	Low	Med	High									
Nitrate	0-6"	15 lb/ac					Potatoes-Irr.		YIELD GOAL					
	6-12"	21 lb/ac					Potatoes-Irr.		YIELD GOAL					
	12-24"	40 lb/ac					400 Cwt		YIELD GOAL					
	0-24"	76 lb/ac					SUGGESTED GUIDELINES		SUGGESTED GUIDELINES					
Phosphorus	Olsen	23 ppm	*****				Band		Broadcast					
	Potassium	292 ppm	*****				LB/ACRE	APPLICATION	LB/ACRE	APPLICATION				
Chloride	0-6"	10 lb/ac	****				N	144	N	144				
	6-12"	26 lb/ac					P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅	52 Broadcast				
Sulfur	0-6"	18 lb/ac	*****				K ₂ O	50 Band (2x2) *	K ₂ O	50 Band (2x2) *				
	6-12"	16 lb/ac	*****				Cl	Not Available	Cl	Not Available				
Boron	0.9 ppm	*****				S	7 Band (Trial)	S	15 Broadcast (Trial)	S				
Zinc	1.51 ppm	*****				B	0	B	0	B				
Iron	20.2 ppm	*****				Zn	2 Band (Trial)	Zn	2 Broadcast (Trial)	Zn				
Manganese	3.0 ppm	*****				Fe	0	Fe	0	Fe				
Copper	0.39 ppm	*****				Mn	0	Mn	0	Mn				
Magnesium	386 ppm	*****				Cu	1 Band (Trial)	Cu	2 Broadcast (Trial)	Cu				
Calcium	3829 ppm	*****				Mg	0	Mg	0	Mg				
Sodium	39 ppm	*****				Lime		Lime		Lime				
Org. Matter	2.8 %	*****				Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)				
Carbonate(CCE)	1.3 %	*****				0-6" 7.8	Buffer pH			% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.14 mmho/cm	***				6-24" 8.1		23.3 meq		(65-75) 82.2	(15-20) 13.8	(1-7) 3.2	(0-5) 0.7	(0-5)

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

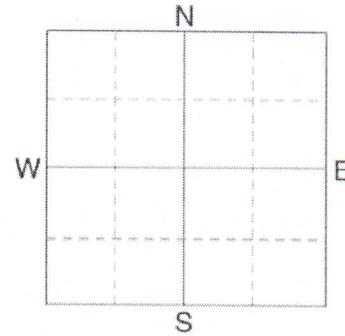
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **592**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **18** QTR **SE** ACRES **73**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
PGF

SUBMITTED BY: **KR0320**
KROEKER FARMS-WINKLER
777 CIRCLE K DRIVE
WINKLER, MB **R6W 4B4**

REF # **14046532** BOX # **0**
 LAB # **NW26818**

Date Sampled **04/29/2016**

Date Received **05/01/2016**

Date Reported **1/30/2017**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice	
		VLow	Low	Med	High	Potatoes-Irr.		Potatoes-Irr.		YIELD GOAL	
Nitrate	0-6"	15 lb/ac				YIELD GOAL		YIELD GOAL		YIELD GOAL	
	6-12"	32 lb/ac				400 Cwt		400 Cwt			
	12-24"	46 lb/ac				SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES	
	0-24"	93 lb/ac				Band		Broadcast			
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION
Phosphorus	Olsen	26 ppm	*****			N	127	N	127	N	
Potassium		384 ppm	*****			P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅	
Chloride	0-6"	7 lb/ac	***			K ₂ O	50 Band (2x2) *	K ₂ O	50 Band (2x2) *	K ₂ O	
	6-12"	44 lb/ac				Cl	Not Available	Cl	Not Available	Cl	
Sulfur	0-6"	14 lb/ac	*****			S	7 Band (Trial)	S	15 Broadcast	S	
	6-12"	16 lb/ac	*****			B	0	B	0	B	
Boron		0.8 ppm	*****			Zn	0	Zn	0	Zn	
Zinc		3.78 ppm	*****			Fe	0	Fe	0	Fe	
Iron		27.4 ppm	*****			Mn	0	Mn	0	Mn	
Manganese		3.0 ppm	*****			Cu	1 Band (Trial)	Cu	2 Broadcast (Trial)	Cu	
Copper		0.36 ppm	*****			Mg	0	Mg	0	Mg	
Magnesium		354 ppm	*****			Lime		Lime		Lime	
Calcium		2462 ppm	*****			Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)	
Sodium		33 ppm	*****			0-6"	7.2	16.4 meq	% Ca	% Mg	% K
Org.Matter		3.5 %	*****			6-24"	8.0		(65-75)	(15-20)	(1-7)
Carbonate(CCE)		0.4 %	**						(0-5)	(0-5)	(0-5)
Sol. Salts	0-6"	0.2 mmho/cm	*****						75.1	18.0	6.0
	6-12"	0.28 mmho/cm	*****								0.9

General Comments: Coarse Loams (CEC range = 11 to 20) (Medium)

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

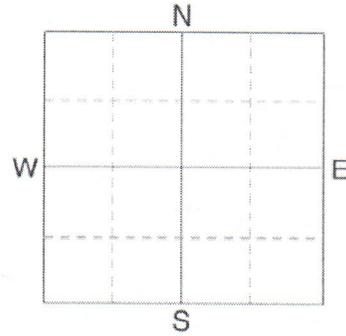
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
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 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **561**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **8** QTR **NW** ACRES **38**
 PREV. CROP



SUBMITTED FOR:
PGF

SUBMITTED BY: **KR0320**
KROEKER FARMS-WINKLER
777 CIRCLE K DRIVE
WINKLER, MB **R6W 4B4**

REF # **14046529** BOX # **0**
 LAB # **NW26821**

Date Sampled **04/29/2016** Date Received **05/01/2016** Date Reported **1/30/2017**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice			
		VLow	Low	Med	High								
Nitrate	0-6"	6 lb/ac				Potatoes-Irr.		Potatoes-Irr.		YIELD GOAL			
	6-12"	20 lb/ac				YIELD GOAL		YIELD GOAL		YIELD GOAL			
	12-24"	70 lb/ac				400 Cwt		400 Cwt					
	0-24"	96 lb/ac				SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES			
						Band		Broadcast					
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION		
Phosphorus	Olsen	52 ppm	*****			N	124	N	124	N			
Potassium		497 ppm	*****			P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅			
Chloride						K ₂ O	50 Band (2x2) *	K ₂ O	50 Band (2x2) *	K ₂ O			
						Cl	Not Available	Cl	Not Available	Cl			
Sulfur						S	7 Band (Trial)	S	15 Broadcast (Trial)	S			
Boron		1.1 ppm	*****			B	0	B	0	B			
Zinc		2.46 ppm	*****			Zn	0	Zn	0	Zn			
Iron		10.3 ppm	*****			Fe	0	Fe	0	Fe			
Manganese		1.6 ppm	*****			Mn	0	Mn	0	Mn			
Copper		0.49 ppm	*****			Cu	1 Band (Trial)	Cu	2 Broadcast (Trial)	Cu			
Magnesium		371 ppm	*****			Mg	0	Mg	0	Mg			
Calcium		4369 ppm	*****			Lime		Lime		Lime			
Sodium		43 ppm	*****										
Org. Matter		2.5 %	*****										
Carbonate(CCE)		3.0 %	*****										
Sol. Salts	0-6"	0.26 mmho/cm	*****			Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
	6-12"	0.36 mmho/cm	*****			0-6"	8.2	26.4 meq	% Ca	% Mg	% K	% Na	% H
						6-24"	8.3		(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
								82.8	11.7	4.8	0.7		

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

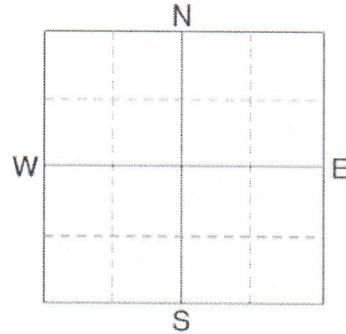
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
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 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **590**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **15** QTR **SE** ACRES **55**
 PREV. CROP



SUBMITTED FOR:
PGF

SUBMITTED BY: **KR0320**
KROEKER FARMS-WINKLER
777 CIRCLE K DRIVE
WINKLER, MB **R6W 4B4**

REF # **14046531** BOX # **0**
 LAB # **NW26819**

Date Sampled **04/29/2016** Date Received **05/01/2016** Date Reported **1/30/2017**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice			
		VLow	Low	Med	High								
Nitrate	0-6"	12 lb/ac				Potatoes-Irr.		Potatoes-Irr.					
	6-12"	13 lb/ac				YIELD GOAL		YIELD GOAL		YIELD GOAL			
	12-24"	14 lb/ac				400 Cwt		400 Cwt					
	0-24"	39 lb/ac				SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES			
						Band		Broadcast					
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION		
Phosphorus	Olsen	37 ppm	*****			N	181	N	181	N			
Potassium		276 ppm	*****			P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅	50 Band (2x2) *	P ₂ O ₅			
Chloride	0-6"	38 lb/ac	*****			K ₂ O	50 Band (2x2) *	K ₂ O	50 Band (2x2) *	K ₂ O			
	6-12"	54 lb/ac	*****			Cl	Not Available	Cl	Not Available	Cl			
Sulfur	0-6"	30 lb/ac	*****			S	7 Band (Trial)	S	15 Broadcast (Trial)	S			
	6-12"	100 lb/ac	*****			B	0	B	0	B			
Boron		1.4 ppm	*****			Zn	0	Zn	0	Zn			
Zinc		2.11 ppm	*****			Fe	0	Fe	0	Fe			
Iron		10.0 ppm	*****			Mn	0	Mn	0	Mn			
Manganese		2.9 ppm	*****			Cu	0	Cu	0	Cu			
Copper		1.22 ppm	*****			Mg	0	Mg	0	Mg			
Magnesium		526 ppm	*****			Lime		Lime		Lime			
Calcium		4351 ppm	*****										
Sodium		45 ppm	*****										
Org. Matter		2.7 %	*****										
Carbonate(CCE)		2.4 %	*****										
Sol. Salts	0-6"	0.37 mmho/cm	*****			Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
	6-12"	0.5 mmho/cm	*****			0-6" 8.2		27.0 meq	% Ca	% Mg	% K	% Na	% H
						6-24" 8.3			(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
									80.4	16.2	2.6	0.7	

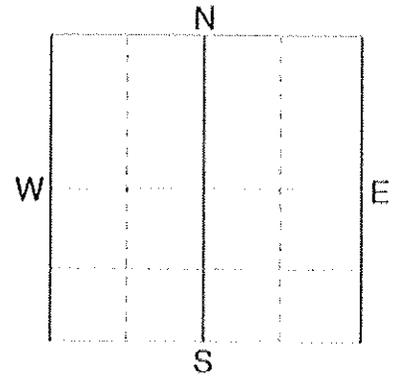
General Comments: Texture is not estimated on high pH soils.
Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



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SOIL TEST REPORT

FIELD ID 492
 SAMPLE ID
 FIELD NAME
 COUNTY 5
 TWP 3 RANGE
 SECTION 27 QTR SW ACRES 40
 PREV. CROP



SUBMITTED FOR:
 PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046571 BOX # 0
 LAB # NW66056

Date Sampled 09/08/2016

Date Received 09/09/2016

Date Reported 2/8/2017

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice			3rd Crop Choice		
		Low	Med	High	Potatoes-Irr.			Potatoes-Irr.						
					YIELD GOAL			YIELD GOAL			YIELD GOAL			
					400 Cwt			400 Cwt						
					SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			
					Band			Broadcast						
					LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		
Nitrate	0-6" 11 lb/ac 6-12" 3 lb/ac 12-24" 4 lb/ac 0-24" 18 lb/ac				N	202		N	202		N			
Phosphorus	Olsen 42 ppm				P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅			
Potassium	292 ppm				K ₂ O	50	Band (2x2) *	K ₂ O	50	Band (2x2) *	K ₂ O			
Chloride	0-6" 30 lb/ac 6-12" 13 lb/ac				Cl		Not Available	Cl		Not Available	Cl			
Sulfur	0-6" 16 lb/ac 6-12" 18 lb/ac				S	7	Band (Trial)	S	15	Broadcast (Trial)	S			
Boron	0.9 ppm				B	0		B	0		B			
Zinc	2.45 ppm				Zn	0		Zn	0		Zn			
Iron	10.6 ppm				Fe	0		Fe	0		Fe			
Manganese	2.1 ppm				Mn	0		Mn	0		Mn			
Copper	0.86 ppm				Cu	0		Cu	0		Cu			
Magnesium	347 ppm				Mg	0		Mg	0		Mg			
Calcium	4074 ppm				Lime			Lime			Lime			
Sodium	21 ppm													
Org.Matter	1.9 %													
Carbonate(CCE)	1.7 %				Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)						
								% Ca	% Mg	% K	% Na	% H		
					0-6" 8.2		24.1 meq	(65-75)	(15-20)	(1-7)	(0-5)	(0-5)		
					6-24" 8.5			84.5	12.0	3.1	0.4			
Soil Salts	0-6" 0.3 mmho/cm 6-12" 0.29 mmho/cm													

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

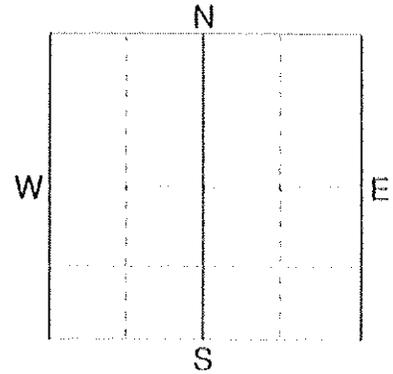
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



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 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 494
 SAMPLE ID
 FIELD NAME
 COUNTY 05
 TWP 03 RANGE
 SECTION 27 QTR NW ACRES 38
 PREV. CROP



SUBMITTED FOR:
 PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046584 BOX # 0
 LAB # NW25206

Date Sampled 04/25/2016

Date Received 04/26/2016

Date Reported 2/8/2017

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice			3rd Crop Choice		
		Low	Med	High	Potatoes-Irr.			Potatoes-Irr.			YIELD GOAL			
Nitrate	0-6"	12 lb/ac			YIELD GOAL			YIELD GOAL			YIELD GOAL			
	6-12"	25 lb/ac			400 Cwt			400 Cwt						
	12-24"	40 lb/ac			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			
	0-24"	77 lb/ac			Band			Broadcast						
					LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		
Phosphorus	Olsen	50 ppm			N	143		N	143		N			
Potassium		565 ppm			P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅			
Chloride					K ₂ O	50	Band (2x2) *	K ₂ O	50	Band (2x2) *	K ₂ O			
Sulfur					Cl		Not Available	Cl		Not Available	Cl			
Boron		0.6 ppm			S	9	Band (Trial)	S	20	Broadcast	S			
Zinc		4.45 ppm			B	1	Broadcast	B	1	Broadcast	B			
Iron		40.5 ppm			Zn	0		Zn	0		Zn			
Manganese		3.2 ppm			Fe	0		Fe	0		Fe			
Copper		0.57 ppm			Mn	0		Mn	0		Mn			
Magnesium		317 ppm			Cu	1	Band (Trial)	Cu	1	Broadcast (Trial)	Cu			
Calcium		1811 ppm			Mg	0		Mg	0		Mg			
Sodium		41 ppm			Lime			Lime			Lime			
Org. Matter		2.4 %			Sulfur			Sulfur			Sulfur			
Carbonate(CCE)		0.2 %			Lime			Lime			Lime			
Sol. Salts	0-6"	0.2 mmho/cm			Soil pH	Buffer pH		Cation Exchange Capacity		% Base Saturation (Typical Range)				
	6-12"	0.29 mmho/cm			0-6" 7.3			13.3 meq		% Ca	% Mg	% K	% Na	% H
					6-24" 7.6					(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
										68.0	19.8	10.9	1.3	

General Comments: Coarse Loams (CEC range = 11 to 20) (Medium)

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

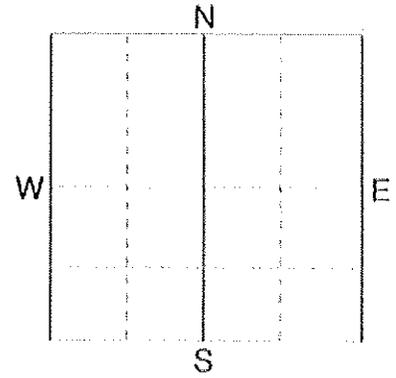
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



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 (http://www.agvise.com)
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 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 495
 SAMPLE ID
 FIELD NAME
 COUNTY 05
 TWP 03 RANGE
 SECTION 27 QTR NW ACRES 38
 PREV. CROP



SUBMITTED FOR:
 PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046527 BOX # 0
 LAB # NW26815

Date Sampled 04/28/2016

Date Received 05/01/2016

Date Reported 2/8/2017

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		Low	Med	High										
Nitrate	0-6"	10 lb/ac				Potatoes-Irr.	Potatoes-Irr.							
	6-12"	20 lb/ac				YIELD GOAL	YIELD GOAL			YIELD GOAL				
	12-24"	22 lb/ac				400 Cwt	400 Cwt							
	0-24"	52 lb/ac				SUGGESTED GUIDELINES	SUGGESTED GUIDELINES			SUGGESTED GUIDELINES				
						Band	Broadcast							
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION			
Phosphorus	Olsen 51 ppm				N	168		N	168	N				
Potassium	344 ppm				P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅	50	P ₂ O ₅				
Chloride	0-6" 1 lb/ac 6-12" 7 lb/ac				K ₂ O	50	Band (2x2) *	K ₂ O	50	K ₂ O				
Sulfur	0-6" 10 lb/ac 6-12" 12 lb/ac				Cl		Not Available	Cl		Cl				
Boron	0.7 ppm				S	9	Band (Trial)	S	20	S				
Zinc	3.57 ppm				B	1	Broadcast	B	1	B				
Iron	15.1 ppm				Zn	0		Zn	0	Zn				
Manganese	1.2 ppm				Fe	0		Fe	0	Fe				
Copper	0.6 ppm				Mn	0		Mn	0	Mn				
Magnesium	396 ppm				Cu	1	Band (Trial)	Cu	1	Cu				
Calcium	2583 ppm				Mg	0		Mg	0	Mg				
Sodium	21 ppm				Lime			Lime		Lime				
Org.Matter	2.3 %				Soil pH		Buffer pH	Cation Exchange Capacity		% Base Saturation (Typical Range)				
Carbonate(CCE)	0.5 %				0-6" 7.8			17.2 meq		% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.21 mmho/cm 6-12" 0.29 mmho/cm				6-24" 8.1					(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
										75.1	19.2	5.1	0.5	

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

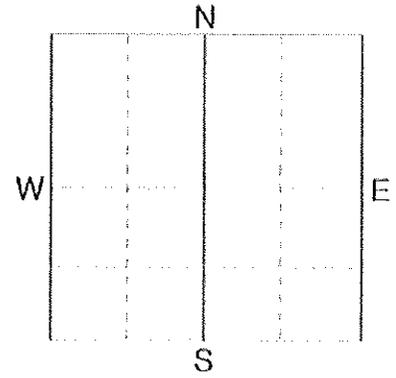
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



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 (http://www.agvise.com)
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 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 497
 SAMPLE ID
 FIELD NAME
 COUNTY 05
 TWP 03 RANGE
 SECTION 27 QTR NW ACRES 40
 PREV. CROP



SUBMITTED FOR:
PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046528 BOX # 0
 LAB # NW26814

Date Sampled 04/28/2016

Date Received 05/01/2016

Date Reported 2/8/2017

Nutrient In The Soil		Interpretation			1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
			Low	Med	High								
Nitrate	0-6"	4 lb/ac				Potatoes-Irr.		Potatoes-Irr.					
	6-12"	7 lb/ac				YIELD GOAL		YIELD GOAL					
	12-24"	6 lb/ac				400 Cwt		400 Cwt					
	0-24"	17 lb/ac				SUGGESTED GUIDELINES		SUGGESTED GUIDELINES					
						Band		Broadcast					
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION		
Phosphorus	Olsen	33 ppm				N	203			N			
Potassium		281 ppm				P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅	50	Band (2x2) *		
Chloride	0-6"	1 lb/ac				K ₂ O	50	Band (2x2) *	K ₂ O	50	Band (2x2) *		
	6-12"	8 lb/ac											
Sulfur	0-6"	10 lb/ac				Cl		Not Available	Cl		Not Available		
	6-12"	10 lb/ac											
Boron		0.7 ppm				S	9	Band (Trial)	S	20	Broadcast		
Zinc		2.07 ppm				B	1	Broadcast	B	1	Broadcast		
Iron		8.9 ppm				Zn	0		Zn	0			
Manganese		1.4 ppm				Fe	0		Fe	0			
Copper		0.58 ppm				Mn	0		Mn	0			
Magnesium		351 ppm				Cu	1	Band (Trial)	Cu	1	Broadcast (Trial)		
Calcium		2761 ppm				Mg	0		Mg	0			
Sodium		20 ppm				Lime			Lime				
Org. Matter		1.6 %											
Carbonate(CCE)		0.7 %											
Sol. Salts	0-6"	0.2 mmho/cm				Sol pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
	6-12"	0.26 mmho/cm				0-6" 8.0		17.5 meq	% Ca	% Mg	% K	% Na	% H
						6-24" 8.2			(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
									78.7	16.7	4.1	0.5	

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

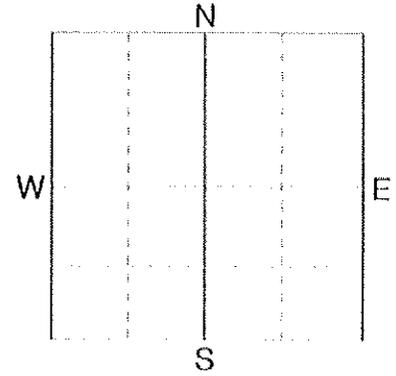
Crop 2: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 584
 SAMPLE ID
 FIELD NAME
 COUNTY 5
 TWP 4 RANGE
 SECTION 11 QTRSW ACRES 70
 PREV. CROP



SUBMITTED FOR:
 PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046566 BOX # 0
 LAB # NW66052

Date Sampled 09/08/2016

Date Received 09/09/2016

Date Reported 2/8/2017

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice			3rd Crop Choice			
		Low	Med	High	Potatoes-Irr.			Potatoes-Irr.			YIELD GOAL				
					YIELD GOAL			YIELD GOAL			YIELD GOAL				
					400 Cwt			400 Cwt							
					SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES				
					Band			Broadcast							
					LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		LB/ACRE	APPLICATION			
Nitrate	0-6" 29 lb/ac 6-12" 20 lb/ac 12-24" 28 lb/ac 0-24" 77 lb/ac				N	143		N	143		N				
Phosphorus	Olsen 23 ppm				P ₂ O ₅	50	Band (2x2) *	P ₂ O ₅	54	Broadcast	P ₂ O ₅				
Potassium	180 ppm				K ₂ O	122	Band *	K ₂ O	168	Broadcast	K ₂ O				
Chloride	0-6" 30 lb/ac 6-12" 23 lb/ac				Cl		Not Available	Cl		Not Available	Cl				
Sulfur	0-6" 14 lb/ac 6-12" 20 lb/ac				S	9	Band (Trial)	S	20	Broadcast	S				
Boron	0.8 ppm				B	0		B	0		B				
Zinc	2.00 ppm				Zn	3	Band (Trial)	Zn	4	Broadcast(Trial)	Zn				
Iron	11.0 ppm				Fe	0		Fe	0		Fe				
Manganese	1.8 ppm				Mn	0		Mn	0		Mn				
Copper	0.97 ppm				Cu	0		Cu	0		Cu				
Magnesium	348 ppm				Mg	0		Mg	0		Mg				
Calcium	4254 ppm				Lime			Lime			Lime				
Sodium	27 ppm				Soil pH			Cation Exchange Capacity			% Base Saturation (Typical Range)				
Org.Matter	2.0 %				Buffer pH						% Ca	% Mg	% K	% Na	% H
Carbonate(CCE)	1.5 %							24.7 meq			(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
Sol. Salts	0-6" 0.33 mmho/cm 6-12" 0.32 mmho/cm				0-6" 8.1 6-24" 8.3						85.9	11.7	1.9	0.5	

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

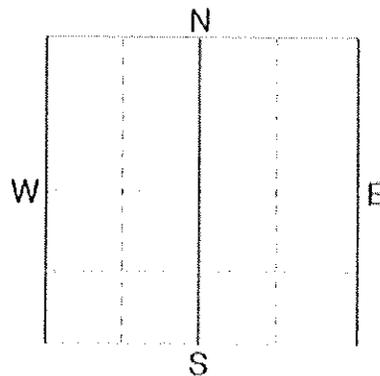
Crop 2: ** Chloride yield data is limited for this crop. Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
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 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID 617
 SAMPLE ID
 FIELD NAME
 COUNTY 6
 TWP 4 RANGE
 SECTION 24 QTR NW ACRES 24
 PREV. CROP



SUBMITTED FOR:
 PGF

SUBMITTED BY: KR0320
 KROEKER FARMS-WINKLER
 777 CIRCLE K DRIVE
 WINKLER, MB R6W 4B4

REF # 14046565 BOX # 0
 LAB # NW66050

Date Sampled 09/08/2016

Date Received 09/09/2016

Date Reported 2/8/2017

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice			3rd Crop Choice			
		Very Low	Low	Med	High	Potatoes-Irr.			Potatoes-Irr.			YIELD GOAL			
Nitrate	0-6"	12 lb/ac				YIELD GOAL			YIELD GOAL			YIELD GOAL			
	6-12"	9 lb/ac				400 Cwt			400 Cwt						
	12-24"	34 lb/ac				SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			
	0-24"	55 lb/ac				Band			Broadcast						
Olsen Phosphorus	16 ppm				N	165		N	165		N				
Potassium	154 ppm				P ₂ O ₅	68	Band *	P ₂ O ₅	96	Broadcast	P ₂ O ₅				
Chloride	0-6"	7 lb/ac				K ₂ O	162	Band *	K ₂ O	220	Broadcast	K ₂ O			
	6-12"	35 lb/ac				Cl		Not Available	Cl		Not Available	Cl			
Sulfur	0-6"	14 lb/ac				S	9	Band (Trial)	S	20	Broadcast	S			
	6-12"	60 lb/ac				B	0		B	0		B			
Boron	1.2 ppm				Zn	3	Band (Trial)	Zn	4	Broadcast (Trial)	Zn				
Zinc	1.38 ppm				Fe	0		Fe	0		Fe				
Iron	10.6 ppm				Mn	0		Mn	0		Mn				
Manganese	2.2 ppm				Cu	1	Band (Trial)	Cu	2	Broadcast (Trial)	Cu				
Copper	0.41 ppm				Mg	0		Mg	0		Mg				
Magnesium	449 ppm				Lime			Lime			Lime				
Calcium	4526 ppm				Soil pH			Cation Exchange Capacity			% Base Saturation (Typical Range)				
Sodium	34 ppm				Buffer pH						% Ca	% Mg	% K	% Na	% H
Org.Matter	2.8 %				0-6" 8.3			26.9 meq			(65-75)	(15-20)	(1-7)	(0-5)	(0-5)
Carbonate(CCE)	1.4 %				6-24" 8.5						84.1	13.9	1.5	0.5	
Sol. Salts	0-6"	0.19 mmho/cm													
	6-12"	0.27 mmho/cm													

General Comments: Texture is not estimated on high pH soils.

Crop 1: ** Chloride yield data is limited for this crop. * Caution: Seed Placed Fertilizer Can Cause Injury * Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

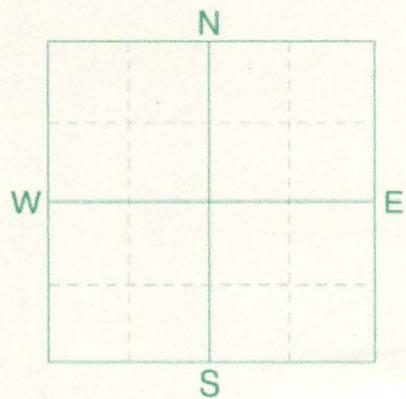
Crop 2: ** Chloride yield data is limited for this crop. Many crops may respond to a starter application of P & K even on high soil tests. Phosphorus guidelines for irrigated potatoes have been adjusted based on carbonate levels. Crop Removal: P2O5 = 72 K2O = 200 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **610**
 SAMPLE ID
 FIELD NAME
 COUNTY **06**
 TWP **04** RANGE
 SECTION **24** QTR **SE** ACRES **168**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB R6W 4A5

REF # **18791347** BOX # **0**
 LAB # **NW25205**

Date Sampled **04/25/2016**

Date Received **04/26/2016**

Date Reported **4/28/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		VLow	Low	Med	High									
Nitrate	0-6" 14 lb/ac					Corn-Grain		Corn-Grain		Corn-Grain				
						YIELD GOAL		YIELD GOAL		YIELD GOAL				
	0-24" 88 lb/ac					120 BU		140 BU		140 BU				
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES				
Phosphorus	Olsen 25 ppm					Broadcast		Broadcast		Band				
	Potassium 322 ppm					LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION			
Chloride						N 56		N 80		N 80				
	0-6" 26 lb/ac 0-24" 480 +lb/ac					P ₂ O ₅ 0		P ₂ O ₅ 0		P ₂ O ₅ 15	Band (2x2) *			
Sulfur						K ₂ O 0		K ₂ O 0		K ₂ O 10	Band (2x2) *			
						Cl		Cl		Cl				
Boron						S 10	Broadcast (Trial)	S 10	Broadcast (Trial)	S 0				
Zinc	2.27 ppm					B		B		B				
Iron						Zn 0		Zn 0		Zn 0				
Manganese						Fe		Fe		Fe				
Copper	0.59 ppm					Mn		Mn		Mn				
Magnesium						Cu 0		Cu 0		Cu 0				
Calcium						Mg		Mg		Mg				
Sodium						Lime		Lime		Lime				
Org.Matter	2.8 %					Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)				
Carbonate(CCE)	1.4 %					Buffer pH				% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.29 mmho/cm					0-6" 8.1								
	0-24" 0.48 mmho/cm					6-24" 8.3								

Crop 1: Crop Removal: P205 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

Crop 2: Crop Removal: P205 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

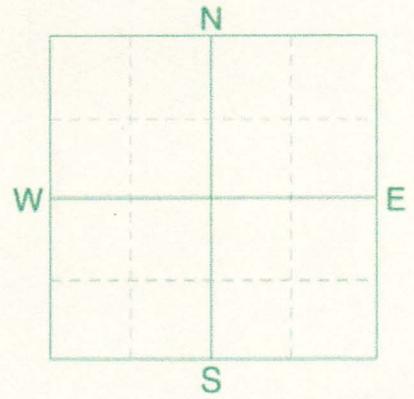
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P205 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **598**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **17** QTR **NW** ACRES **54**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB R6W 4A5

REF # **18791348** BOX # **0**
 LAB # **NW25204**

Date Sampled **04/25/2016**

Date Received **04/26/2016**

Date Reported **4/28/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice			
		VLow	Low	Med	High	Corn-Grain		Corn-Grain		Corn-Grain			
Nitrate	0-6" 9 lb/ac					YIELD GOAL		YIELD GOAL		YIELD GOAL			
	0-24" 64 lb/ac	*****				120 BU		140 BU		140 BU			
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES			
						Broadcast		Broadcast		Band			
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION		
Phosphorus	Olsen 20 ppm	*****				N 80		N 104		N 104			
Potassium	315 ppm	*****				P ₂ O ₅ 28 Broadcast		P ₂ O ₅ 32 Broadcast		P ₂ O ₅ 15 Band (2x2) *			
Chloride						K ₂ O 0		K ₂ O 0		K ₂ O 10 Band (2x2) *			
Sulfur	0-6" 14 lb/ac 0-24" 112 lb/ac	*****				Cl		Cl		Cl			
Boron						S 10 Broadcast		S 10 Broadcast		S 0			
Zinc	1.81 ppm	*****				B		B		B			
Iron						Zn 0		Zn 0		Zn 0			
Manganese						Fe		Fe		Fe			
Copper	0.59 ppm	*****				Mn		Mn		Mn			
Magnesium						Cu 0		Cu 0		Cu 0			
Calcium						Mg		Mg		Mg			
Sodium						Lime		Lime		Lime			
Org.Matter	3.6 %	*****											
Carbonate(CCE)	1.4 %	*****				Soil pH	Buffer pH	Cation Exchange Capacity	% Base Saturation (Typical Range)				
									% Ca	% Mg	% K	% Na	% H
						0-6" 8.0							
Sol. Salts	0-6" 0.26 mmho/cm 0-24" 0.27 mmho/cm	*****				6-24" 8.4							

Crop 1: Crop Removal: P2O5 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

Crop 2: Crop Removal: P2O5 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

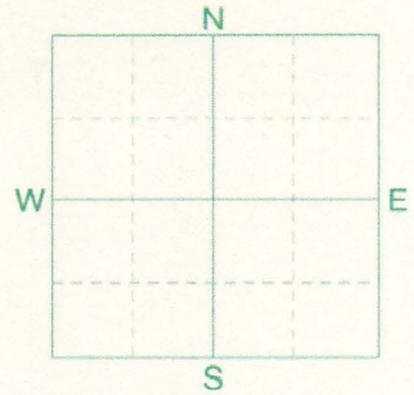
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **530**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **5** QTR **SW** ACRES **56**
 PREV. CROP **Soybeans**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **18791350** BOX # **0**
 LAB # **NW25203**

Date Sampled **04/25/2016**

Date Received **04/26/2016**

Date Reported **4/28/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice		
		VLow	Low	Med	High	Corn-Grain		Corn-Grain		Corn-Grain		
Nitrate	0-6" 5 lb/ac					YIELD GOAL		YIELD GOAL		YIELD GOAL		
	0-24" 40 lb/ac	*****				120 BU		140 BU		140 BU		
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		
						Broadcast		Broadcast		Band		
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	
Olsen Phosphorus	14 ppm	*****					N 98		N 98			
Potassium	200 ppm	*****					P ₂ O ₅ 62 Broadcast	P ₂ O ₅ 62 Broadcast	P ₂ O ₅ 27	Band *		
Chloride							K ₂ O 0	K ₂ O 0	K ₂ O 10	Band (2x2) *		
Sulfur	0-6" 72 lb/ac 0-24" 480 +lb/ac	*****					Cl	Cl	Cl			
Boron							S 0	S 0	S 0			
Zinc	1.82 ppm	*****					B	B	B			
Iron							Zn 2 Broadcast(Trial)	Zn 2 Broadcast(Trial)	Zn 2	Band (Trial)		
Manganese							Fe	Fe	Fe			
Copper	0.6 ppm	*****					Mn	Mn	Mn			
Magnesium							Cu 0	Cu 0	Cu 0			
Calcium							Mg	Mg	Mg			
Sodium							Lime	Lime	Lime			
Org.Matter	2.4 %	*****										
Carbonate(CCE)	4.7 %	*****										
Sol. Salts	0-6" 0.33 mmho/cm 0-24" 0.63 mmho/cm	*****				Soil pH	Buffer pH	Cation Exchange Capacity		% Base Saturation (Typical Range)		
		*****				0-6" 8.1 6-24" 8.3			% Ca	% Mg	% K	% Na

Crop 1: Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P205 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

Crop 2: Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P205 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

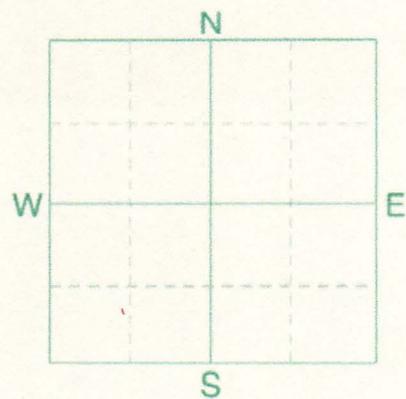
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P205 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **531**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **5** QTR **SW** ACRES **90**
 PREV. CROP **Potatoes**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **18791349** BOX # **0**
 LAB # **NW25202**

Date Sampled **04/25/2016**

Date Received **04/26/2016**

Date Reported **4/28/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		VLow	Low	Med	High									
Nitrate	0-6" 7 lb/ac					Corn-Grain		Corn-Grain		Corn-Grain				
						YIELD GOAL		YIELD GOAL		YIELD GOAL				
	0-24" 56 lb/ac					120 BU		140 BU		140 BU				
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES				
						Broadcast		Broadcast		Band				
Olsen Phosphorus	23 ppm					N	88	N	112	N	112			
Potassium	292 ppm					P ₂ O ₅	0	P ₂ O ₅	0	P ₂ O ₅	15 Band (2x2) *			
Chloride						K ₂ O	0	K ₂ O	0	K ₂ O	10 Band (2x2) *			
Sulfur	0-6" 10 lb/ac 0-24" 64 lb/ac					Cl		Cl		Cl				
Boron						S	15 Broadcast	S	15 Broadcast	S	4 Band (Trial)			
Zinc	2.45 ppm					B		B		B				
Iron						Zn	0	Zn	0	Zn	0			
Manganese						Fe		Fe		Fe				
Copper	0.55 ppm					Mn		Mn		Mn				
Magnesium						Cu	0	Cu	0	Cu	0			
Calcium						Mg		Mg		Mg				
Sodium						Lime		Lime		Lime				
Org.Matter	2.5 %					Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)				
Carbonate(CCE)	1.3 %					Buffer pH				% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.23 mmho/cm 0-24" 0.34 mmho/cm					0-6" 8.0								
						6-24" 8.2								

Crop 1: Crop Removal: P2O5 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

Crop 2: Crop Removal: P2O5 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

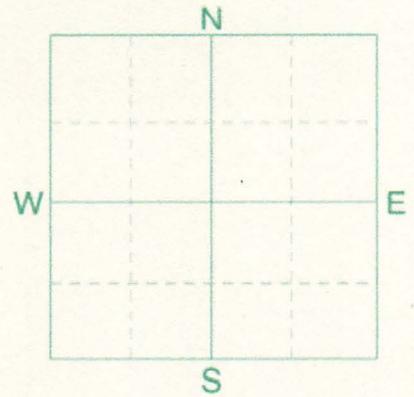
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **583**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **11** QTR **SW** ACRES **40**
 PREV. CROP **Beans-Edible**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **18790993** BOX # **0**
 LAB # **NW26095**

Date Sampled **04/27/2016**

Date Received **04/28/2016**

Date Reported **5/2/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		VLow	Low	Med	High									
Nitrate	0-6" 25 lb/ac					Corn-Grain		Corn-Grain		Corn-Grain				
						YIELD GOAL		YIELD GOAL		YIELD GOAL				
						120 BU		140 BU		140 BU				
	0-24" 104 lb/ac					SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES				
						Broadcast		Broadcast		Band				
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION			
Olsen Phosphorus	46 ppm					N 25		N 34		N 34				
Potassium	195 ppm					P ₂ O ₅ 0		P ₂ O ₅ 0		P ₂ O ₅ 15	Band (2x2) *			
Chloride						K ₂ O 0		K ₂ O 0		K ₂ O 10	Band (2x2) *			
Sulfur	0-6" 30 lb/ac					Cl		Cl		Cl				
	0-24" 128 lb/ac					S 10	Broadcast (Trial)	S 10	Broadcast (Trial)	S 0				
Boron						B		B		B				
Zinc	3.09 ppm					Zn 0		Zn 0		Zn 0				
Iron						Fe		Fe		Fe				
Manganese						Mn		Mn		Mn				
Copper	1.54 ppm					Cu 0		Cu 0		Cu 0				
Magnesium						Mg		Mg		Mg				
Calcium						Lime		Lime		Lime				
Sodium														
Org.Matter	2.5 %													
Carbonate(CCE)	0.3 %													
Sol. Salts	0-6" 0.37 mmho/cm					Soil pH	Buffer pH	Cation Exchange Capacity		% Base Saturation (Typical Range)				
	0-24" 0.4 mmho/cm					0-6" 7.8				% Ca	% Mg	% K	% Na	% H
						6-24" 8.2								

Crop 1: Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P2O5 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

Crop 2: Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P2O5 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

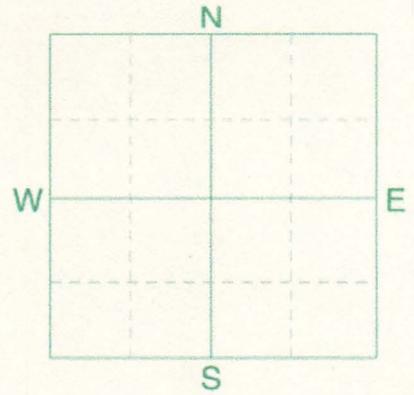
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Nitrogen is credited 30 lbs for the previous crop. Nitrogen credits may need to be adjusted based on local conditions. Crop Removal: P2O5 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.

SOIL TEST REPORT



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

FIELD ID **558**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **04** RANGE
 SECTION **2** QTR **NE** ACRES **47**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **18790994** BOX # **0**
 LAB # **NW26097**

Date Sampled **04/27/2016**

Date Received **04/28/2016**

Date Reported **5/2/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice			2nd Crop Choice			3rd Crop Choice				
		VLow	Low	Med	High	Corn-Grain			Corn-Grain			Corn-Grain				
Nitrate	0-6" 8 lb/ac					YIELD GOAL			YIELD GOAL			YIELD GOAL				
	0-24" 44 lb/ac	*****				120 BU			140 BU			140 BU				
						SUGGESTED GUIDELINES			SUGGESTED GUIDELINES			SUGGESTED GUIDELINES				
						Broadcast			Broadcast			Band				
						LB/ACRE	APPLICATION		LB/ACRE	APPLICATION		LB/ACRE	APPLICATION			
Olsen Phosphorus	15 ppm	*****				N	100		N	124		N	124			
Potassium	202 ppm	*****				P ₂ O ₅	49	Broadcast	P ₂ O ₅	57	Broadcast	P ₂ O ₅	24	Band *		
Chloride						K ₂ O	0		K ₂ O	0		K ₂ O	10	Band (2x2) *		
Sulfur	0-6" 6 lb/ac	*****				Cl			Cl			Cl				
	0-24" 32 lb/ac	*****				S	25	Broadcast	S	25	Broadcast	S	12	Band		
Boron						B			B			B				
Zinc	1.64 ppm	*****				Zn	0		Zn	0		Zn	0			
Iron						Fe			Fe			Fe				
Manganese						Mn			Mn			Mn				
Copper	1.03 ppm	*****				Cu	0		Cu	0		Cu	0			
Magnesium						Mg			Mg			Mg				
Calcium						Lime			Lime			Lime				
Sodium																
Org.Matter	2.8 %	*****				Soil pH			Cation Exchange Capacity			% Base Saturation (Typical Range)				
Carbonate(CCE)	0.0 %					Buffer pH			Capacity			% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.24 mmho/cm	*****				0-6" 7.0										
	0-24" 0.33 mmho/cm	*****				6-24" 8.0										

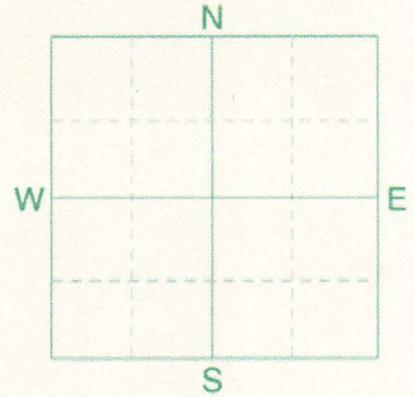
Crop 1: Crop Removal: P2O5 = 48 K2O = 32 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
Crop 2: Crop Removal: P2O5 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P2O5 = 56 K2O = 38 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **470**
 SAMPLE ID
 FIELD NAME
 COUNTY **05**
 TWP **03** RANGE
 SECTION **14** QTR **SE** ACRES **72**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
BIRKLAND FARMS

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **18790997** BOX # **0**
 LAB # **NW26093**

Date Sampled **04/27/2016**

Date Received **04/28/2016**

Date Reported **5/2/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice		
		VLow	Low	Med	High	Beans-Edible		Beans-Edible		Beans-Edible		
Nitrate	0-6" 7 lb/ac					YIELD GOAL		YIELD GOAL		YIELD GOAL		
	0-24" 96 lb/ac	*****				2000 LBS		2500 LBS		2500 LBS		
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		
						Broadcast		Broadcast		Band		
						LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	
Olsen Phosphorus	23 ppm	*****				N	28	N	29	N	29	
Potassium	194 ppm	*****				P ₂ O ₅	0	P ₂ O ₅	0	P ₂ O ₅	15 Band *	
Chloride						K ₂ O	0	K ₂ O	0	K ₂ O	0	
						Cl		Cl		Cl		
Sulfur	0-6" 10 lb/ac	*****				S	20 Broadcast	S	20 Broadcast	S	9 Band (Trial)	
	0-24" 176 lb/ac	*****				B		B		B		
Boron						Zn	2 Broadcast(Trial)	Zn	2 Broadcast(Trial)	Zn	2 Band (Trial)	
Zinc	1.71 ppm	*****				Fe		Fe		Fe		
Iron						Mn		Mn		Mn		
Manganese						Cu	0	Cu	0	Cu	0	
Copper	0.43 ppm	*****				Mg		Mg		Mg		
Magnesium						Lime		Lime		Lime		
Calcium												
Sodium												
Org.Matter	1.9 %	*****										
Carbonate(CCE)	0.5 %	***										
Sol. Salts	0-6" 0.19 mmho/cm	****				Soil pH	Buffer pH	Cation Exchange	% Base Saturation (Typical Range)			
	0-24" 0.38 mmho/cm	*****				Capacity	% Ca	% Mg	% K	% Na	% H	
						0-6" 8.0						
						6-24" 8.3						

Crop 1: Crop Removal: P205 = 28 K2O = 28 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

Crop 2: Crop Removal: P205 = 35 K2O = 35 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

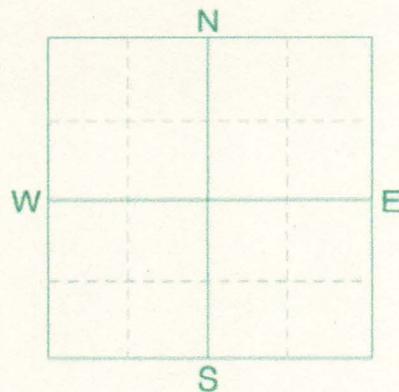
Crop 3: * Caution: Seed Placed Fertilizer Can Cause Injury * Crop Removal: P205 = 35 K2O = 35 AGVISE Band guidelines will build P & K test levels to the medium range over many years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **KFL471**
 SAMPLE ID **ZION**
 FIELD NAME
 COUNTY **5**
 TWP **3** RANGE
 SECTION **14** QTR **NE** ACRES **144**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:
GEORGE FROESE-BIRKLAND

SUBMITTED BY: **KR3239**
KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB **R6W 4A5**

REF # **17341651** BOX # **0**
 LAB # **NW181542**

Date Sampled **11/16/2016**

Date Received **11/17/2016**

Date Reported **11/29/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		VLow	Low	Med	High									
Nitrate	0-6" 13 lb/ac					Beans-Edible		Corn-Grain		Corn-Grain				
	0-24" 64 lb/ac	*****				YIELD GOAL		YIELD GOAL		YIELD GOAL				
						2500 LBS		140 BU		160 BU				
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES				
						Broadcast		Broadcast		Broadcast				
Phosphorus	Olsen 16 ppm	*****				LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION			
Potassium	163 ppm	*****				N	61	N	104	N	128			
Chloride						P ₂ O ₅ 44 Broadcast	P ₂ O ₅ 52 Broadcast	P ₂ O ₅ 60 Broadcast	P ₂ O ₅ 60 Broadcast	P ₂ O ₅ 60 Broadcast				
Sulfur	0-6" 120 +lb/ac 0-24" 480 +lb/ac	*****				K ₂ O 27 Broadcast	K ₂ O 39 Broadcast	K ₂ O 44 Broadcast	K ₂ O 44 Broadcast	K ₂ O 44 Broadcast				
Boron						Cl		Cl		Cl				
Zinc	2.25 ppm	*****				S	0	S	0	S	0			
Iron						B		B		B				
Manganese						Zn	0	Zn	0	Zn	0			
Copper	0.6 ppm	*****				Fe		Fe		Fe				
Magnesium						Mn		Mn		Mn				
Calcium						Cu	0	Cu	0	Cu	0			
Sodium						Mg		Mg		Mg				
Org.Matter	3.0 %	*****				Lime		Lime		Lime				
Carbonate(CCE)	1.0 %	*****												
Sol. Salts	0-6" 0.81 mmho/cm 0-24" 1.2 mmho/cm	*****				Soil pH	Buffer pH	Cation Exchange Capacity		% Base Saturation (Typical Range)				
						0-6" 7.3 6-24" 7.8			% Ca	% Mg	% K	% Na	% H	

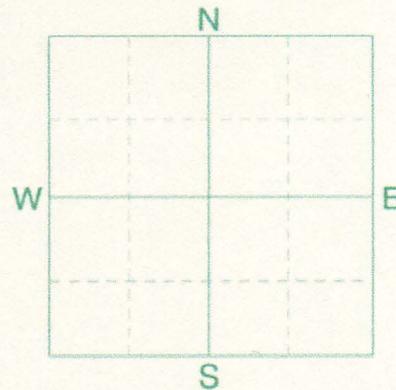
Crop 1: Crop Removal: P205 = 35 K20 = 35 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
 Crop 2: Crop Removal: P205 = 56 K20 = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
 Crop 3: Crop Removal: P205 = 64 K20 = 43 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.



Soil Analysis by Agvise Laboratories
 (http://www.agvise.com)
 Northwood: (701) 587-6010
 Benson: (320) 843-4109

SOIL TEST REPORT

FIELD ID **SE 26-3-5**
 SAMPLE ID **NORTH 60**
 FIELD NAME
 COUNTY **5**
 TWP **3** RANGE
 SECTION **26** QTR **SE** ACRES **60**
 PREV. CROP **Corn-Grain**



SUBMITTED FOR:

GEORGE FROESE
BIRKLAND FARMS

SUBMITTED BY: KR3239

KR CROP CHECK LIMITED
12085 RD 23 W (DICKE
BOX 240
WINKLER, MB

R6W 4A5

REF # **17341652** BOX # **0**
 LAB # **NW181547**

Date Sampled **11/16/2016**

Date Received **11/17/2016**

Date Reported **11/29/2016**

Nutrient In The Soil		Interpretation				1st Crop Choice		2nd Crop Choice		3rd Crop Choice				
		VLow	Low	Med	High									
Nitrate	0-6" 21 lb/ac					Beans-Edible		Soybeans		Corn-Grain				
						YIELD GOAL		YIELD GOAL		YIELD GOAL				
	0-24" 32 lb/ac	*****				2500 LBS		50 BU		140 BU				
						SUGGESTED GUIDELINES		SUGGESTED GUIDELINES		SUGGESTED GUIDELINES				
						Broadcast		Broadcast		Broadcast				
Olsen	14 ppm	*****				LB/ACRE	APPLICATION	LB/ACRE	APPLICATION	LB/ACRE	APPLICATION			
Phosphorus						N 93		N ***		N 136				
Potassium	301 ppm	*****				P ₂ O ₅ 52	Broadcast	P ₂ O ₅ 44	Broadcast	P ₂ O ₅ 62	Broadcast			
Chloride						K ₂ O 0		K ₂ O 0		K ₂ O 0				
Sulfur	0-6" 90 lb/ac	*****				Cl		Cl		Cl				
	0-24" 480 +lb/ac	*****				S 0		S 0		S 0				
Boron						B		B		B				
Zinc	3.40 ppm	*****				Zn 0		Zn 0		Zn 0				
Iron						Fe		Fe		Fe				
Manganese						Mn		Mn		Mn				
Copper	2.25 ppm	*****				Cu 0		Cu 0		Cu 0				
Magnesium						Mg		Mg		Mg				
Calcium						Lime		Lime		Lime				
Sodium														
Org. Matter	5.7 %	*****				Soil pH		Cation Exchange Capacity		% Base Saturation (Typical Range)				
Carbonate(CCE)	1.1 %	*****				Buffer pH				% Ca	% Mg	% K	% Na	% H
Sol. Salts	0-6" 0.55 mmho/cm	*****				0-6" 7.4								
	0-24" 1.35 mmho/cm	*****				6-24" 7.5								

Crop 1: Crop Removal: P2O5 = 35 K2O = 35 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.
Crop 2: The risk of the development of iron chlorosis on soybeans on this field is moderate based on the salt and carbonate levels. Crop Removal: P2O5 = 44 K2O = 75 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years. Soybeans may respond to nitrogen on fields testing less than 60 lb/ac with a limited soybean history.
Crop 3: Crop Removal: P2O5 = 56 K2O = 38 AGVISE Broadcast guidelines will build P & K test levels to the high range over several years.

BEEF QUANTITIES

Species	Type	Storage Type	Volatilization	Animal Numbers	Weight In (lb)	Weight Out (lb)	Average Animal Wt (lb)	Days per Cycle (Days)	Cycles per Year	Rate of Gain (lb/day)	Days Place is Occupied per Year (days)	N Excreted Per Herd Adjusted for Storage N Loss (lb N/yr/herd)	P2O5 Excreted Per Herd Per Year (lb P2O5/year)
Cow Calf	Mature Cows (>2 years old)	Field Storage	40%	0	1375	1375	1375	365	1.0		365	0.0	0.0
Cow Calf	Bred Heifer (14 mo - 2 years)	Field Storage	40%	0	926	1238	1082	280	1.0	1.42	280	0.0	0.0
Cow Calf	Replacement Heifers (7 mo-14 mo)	Field Storage	40%	0	581	926	754	225	1.0	1.53	225	0.0	0.0
Cow Calf	Unweaned Calves (0-7 mo)	Field Storage	40%	0	86	581	334	210	1.0	2.35	210	0.0	0.0
Cow Calf	Bulls	Field Storage	40%	0	2100	2200	2150	365	1.0		365	0.0	0.0
Cow Calf	Mature Cows and Bred Heifers, plus associated livestock	Field Storage	40%	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0	0.0
Feeder	Feedlot Cattle - long keep	Field Storage	40%	2000	600	1500	1050	250	1.0	3.59	250	99360.0	54049.7
Feeder	Feedlot Cattle - short keep	Field Storage	40%	2500	600	950	775	116	2.0	3.01	232	81863.0	42881.1
Feeder	Backgrounders - pasture	Field Storage	40%	0	793	975	884	105	1.0	1.73	105	0.0	0.0
Feeder	Backgrounders - confined	Field Storage	40%	0	500	793	647	180	2.0	1.62	360	0.0	0.0

Specific to Birkland Farms

(Production confirmed with Conrad Rempel via telephone February 6, 2017.)

Note: Animal Numbers are based on animal places (i.e. pen space), not animals marketed.

CROP ROTATION TABLE #1

Crop	Removal		Uptake		Yield	Units	Acreage	Removal		Uptake
	P2O5	N	N	Units				P2O5 (lb)	N (lb)	N (lb)
Alfalfa	13.8	58	58	lb/ton	3.228	ton/ac	150	6682	28084	28084
Barley Grain	0.42	0.97	1.39	lb/bu		bu/ac		-	-	-
Barley Silage	11.8	34.4	34.4	lb/ton		ton/ac		-	-	-
Canola	1.04	1.93	3.19	lb/bu		bu/ac		-	-	-
Corn Grain	0.44	0.97	1.53	lb/bu		bu/ac		-	-	-
Corn Silage	12.7	31.2	31.2	lb/ton	5.67	tons/ac	452	32548	79961	79961
Dry Edible Beans	1.39	4.17		lb/cwt		cwt/ac		-	-	-
Fababeans	1.79	5.02	8.4	lb/cwt		cwt/ac		-	-	-
Flax	0.65	2.13	2.88	lb/bu		bu/ac		-	-	-
Grass Hay	10	34.2	34.2	lb/ton		tons/ac		-	-	-
Lentils	1.03	3.39	5.08	lb/cwt		cwt/ac		-	-	-
Oats	0.26	0.62	1.07	lb/bu	92.8	bu/ac	160	3860	9206	15887
Pasture (grazed)	10	34.2	34.2	lb/ton	0.5	ton/ac		-	-	-
Peas	0.69	2.34	3.06	lb/bu	24.7	bu/ac	160	2727	9248	12093
Potatoes	0.09	0.32	0.57	lb/cwt	220.24	cwt/ac	311	6165	21918	39042
Rye	0.45	1.06	1.67	lb/bu		bu/ac		-	-	-
Soybeans	0.84	3.87	5.2	lb/bu		bu/ac		-	-	-
Sunflower	1.1	2.8		lb/cwt		cwt/ac		-	-	-
Wheat - Spring	0.59	1.5	2.11	lb/bu	44.9	bu/ac	100	2649	6735	9474
Wheat - Winter	0.51	1.04	1.35	lb/bu		bu/ac		-	-	-
Sub Total							1333	54631	155151	184541
Estimated Average Removal/Uptake (lb/ac)								41.0	116.4	138.4
Additional Acres										
Crop Planned on Additional Acres										
Total Acreage							1333			

CROP ROTATION TABLE #2

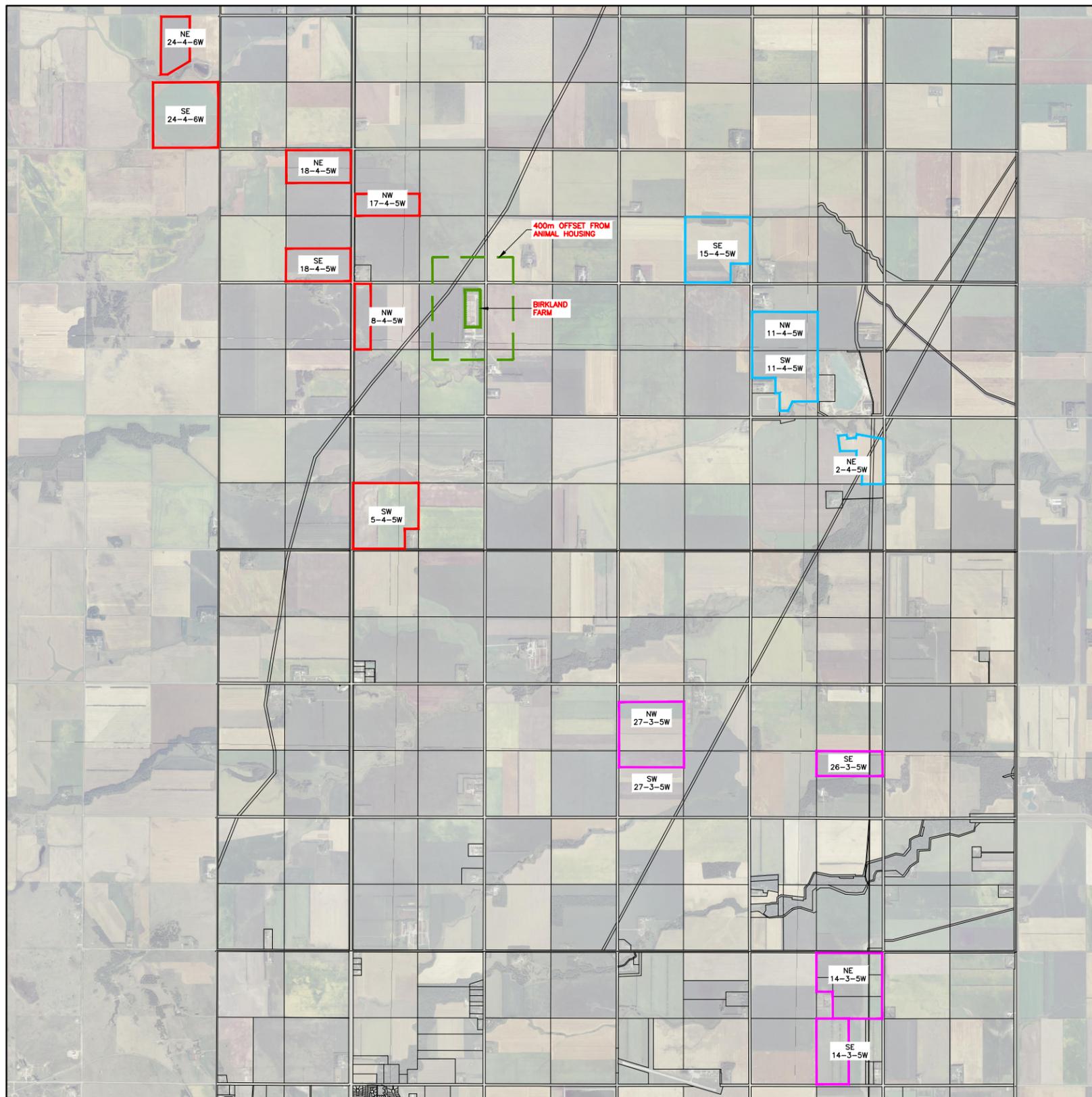


A	B	C	D	E
Expected Crops in the Rotation	Acreage	Historical Yield	Units	Source of Yield Information
Total Net Acreage for Manure Application				

- A. List all of the crop(s) to be grown in the rotation on the acreage that will receive manure.
- B. Indicate the average acreage for each crop over the rotation. For example, if there are 720 suitable acres available for manure and approximately 40 these acres will be used to grow canola, enter 288. The total of column B should add up to Total Net Acreage for Manure Application provided in the Manure Application Field Characteristic Table.
- C. Enter the historical yield average for each crop. Long-term yield averages can be determined using MASC data (<http://www.masc.mb.ca/masc.nsf/index.html?OpenPage>) or on-farm yield records. If on-farm yield records are used, please provide copies.
- D. Enter the units for the yields provided (e.g. bu/acre, tons/acre).
- E. Enter the source of the historical yield average provided.

FARM EXCRETION

Species	Animal Category/Operation type	N (lb/year)	P2O5 (lb/year)
Pigs	Gestating Sow	0	0
	Nursing Sow	0	0
	Nursing Litter	0	0
	Live Cull Sows	0	0
	Bred Gilts	0	0
	Gilts	0	0
	Boars	0	0
	Weanlings	0	0
	Growers/finishers	0	0
	Sows, farrow to 5 kg	0	0
	Sows, farrow to 23 kg	0	0
	Sows, farrow to finish	0	0
Beef	Mature Cows (>2 years old)	0	0
	Bred Heifer (14 mo - 2 years)	0	0
	Replacement Heifers (7 mo-14 mo)	0	0
	Unweaned Calves (0-7 mo)	0	0
	Bulls	0	0
	Mature Cows and Bred Heifers, plus associated livestock	0	0
	Feedlot Cattle - long keep	99360	54050
	Feedlot Cattle - short keep	81863	42881
	Backgrounders - pasture	0	0
Backgrounders - confined	0	0	
Dairy	Lactating cow	0	0
	Dry cow	0	0
	Calf, 0-3 months	0	0
	Calf, 4-13 months	0	0
	Replacements, >13 months	0	0
	Mature Cows, plus assoc livestock	0	0
Sheep	Ewes	0	0
	Replacement Ewes	0	0
	Rams	0	0
	Lambs	0	0
	Ewes, plus assoc livestock	0	0
	Feeder	0	0
Chickens	Broilers	0	0
	Broiler Breeder Pullets	0	0
	Broiler Breeder Hens	0	0
Layers	Layer Pullets	0	0
	Layer Hens	0	0
	Breeder Pullets	0	0
	Breeder Hens	0	0
Turkeys	Broiler Hens (0-9 wks)	0	0
	Hens (0-11 wks)	0	0
	Heavy Hens (0-14 wks)	0	0
	Light Toms (0-12 wks)	0	0
	Toms (0-13 wks)	0	0
	Heavy Toms (0-15 wks)	0	0
	Breeding Hen Growers (0-30 wks)	0	0
	Breeding Hens (30-60 wks)	0	0
	Breeding Tom Grower (0-18 wks)	0	0
	Breeding Tom Grower (0-30 wks)	0	0
	Breeding Tom (30-60 wks)	0	0
Total		181223	96931



- RM OF THOMPSON
- RM OF ROLAND
- RM OF STANLEY

jdb project engineering inc.
 ROBLIN PLAZA, BUILDING L 880 - 15TH STREET WINKLER, MB R6W 0H5
 PH: (204) 331-4440 EMAIL: jbotha@jdbprojects.ca



FIGURE 2

BIRKLAND FARMS
 BOX 879 WINKLER, MB R6W 4A9
 PHONE: (204) 362-3075

BIRKLAND FARMS
 MANURE APPLICATION

LAND BASE SUMMARY

Nutrients Excreted	lbs
Nitrogen	181223
P2O5	96931
Crop Nutrient Use	lb/ac
Nitrogen Uptake	138.4
P2O5 Removal	41.0
Land Base Requirements	acres
Acres for Nitrogen Uptake	1309
Acres for 2 x P2O5 Removal	1183
Acres for 1 x P2O5 Removal	2365

The screenshot shows a web browser window titled "Fertilizer Data Browser" with the URL "https://www.masc.mb.ca/masc.nsf/mmpp_brows". The page has a "Summary" tab selected. Under "Search Summary", the search criteria are: Region(s) Selected: THOMPSON; Crop(s) Selected: ALFALFA; Soil Zone(s) Selected: All; Period Selected: 1993 to 2015. A summary table indicates 24 records were returned, with a total of 2,755 acres and a yield of 3.228 tons per acre. A second table lists fertilizer application rates per acre: Nitrogen (15.1 lbs / acre), Phosphorus (24.8 lbs / acre), Potassium (15.7 lbs / acre), and Sulfur (6.8 lbs / acre). Buttons for "View Raw Data", "Save Raw Data", and "New Search" are visible.

This search returned 24 records from the MASC database, summarized below:		
Total Acres:	2,755 acres	
Yield per Acre:	3.228 Tons / acre	(2.929 tonnes / acre)

Fertilizer Applied per Acre (actual product):		
Nitrogen:	15.1 lbs / acre	(0.007 tonnes / acre)
Phosphorus:	24.8 lbs / acre	(0.011 tonnes / acre)
Potassium:	15.7 lbs / acre	(0.007 tonnes / acre)
Sulfur:	6.8 lbs / acre	(0.003 tonnes / acre)

The screenshot shows the same "Fertilizer Data Browser" window, but with the search criteria changed to: Region(s) Selected: THOMPSON; Crop(s) Selected: FIELD PEAS; Soil Zone(s) Selected: All; Period Selected: 1993 to 2015. The summary table shows 23 records returned, with a total of 4,559 acres and a yield of 24.7 bushels per acre. The fertilizer application rates per acre are: Nitrogen (13.9 lbs / acre), Phosphorus (24.9 lbs / acre), Potassium (6.1 lbs / acre), and Sulfur (1.9 lbs / acre). Buttons for "View Raw Data", "Save Raw Data", and "New Search" are visible.

This search returned 23 records from the MASC database, summarized below:		
Total Acres:	4,559 acres	
Yield per Acre:	24.7 Bushels / acre	(0.672 tonnes / acre)

Fertilizer Applied per Acre (actual product):		
Nitrogen:	13.9 lbs / acre	(0.006 tonnes / acre)
Phosphorus:	24.9 lbs / acre	(0.011 tonnes / acre)
Potassium:	6.1 lbs / acre	(0.003 tonnes / acre)
Sulfur:	1.9 lbs / acre	(0.001 tonnes / acre)

The screenshot shows a web browser window titled "Fertilizer Data Browser" with the URL "https://www.masc.mb.ca/masc.nsf/mmpp_brows". The page has a "Summary" tab selected. Under "Search Summary", the search criteria are: Region(s) Selected: THOMPSON, Crop(s) Selected: SILAGE CORN, Soil Zone(s) Selected: All, and Period Selected: 1993 to 2015. A summary box states "This search returned 43 records from the MASC database, summarized below:" and contains two tables. The first table shows "Total Acres: 7,341 acres" and "Yield per Acre: 16.212 Tons / acre (14.711 tonnes / acre)". The second table, titled "Fertilizer Applied per Acre (actual product):", lists Nitrogen (95.4 lbs / acre), Phosphorus (27.9 lbs / acre), Potassium (14.7 lbs / acre), and Sulfur (6.4 lbs / acre). Buttons for "View Raw Data", "Save Raw Data", and "New Search" are visible.

This search returned 43 records from the MASC database, summarized below:		
Total Acres:	7,341 acres	
Yield per Acre:	16.212 Tons / acre	(14.711 tonnes / acre)

Fertilizer Applied per Acre (actual product):		
Nitrogen:	95.4 lbs / acre	(0.043 tonnes / acre)
Phosphorus:	27.9 lbs / acre	(0.013 tonnes / acre)
Potassium:	14.7 lbs / acre	(0.007 tonnes / acre)
Sulfur:	6.4 lbs / acre	(0.003 tonnes / acre)

The screenshot shows the same "Fertilizer Data Browser" window with the "Crop(s) Selected" changed to TABLE POTATOES. The search criteria are: Region(s) Selected: THOMPSON, Crop(s) Selected: TABLE POTATOES, Soil Zone(s) Selected: All, and Period Selected: 1993 to 2015. A summary box states "This search returned 26 records from the MASC database, summarized below:" and contains two tables. The first table shows "Total Acres: 2,627 acres" and "Yield per Acre: 220.24 CWT / acre (9.990 tonnes / acre)". The second table, titled "Fertilizer Applied per Acre (actual product):", lists Nitrogen (160.4 lbs / acre), Phosphorus (56.3 lbs / acre), Potassium (73.3 lbs / acre), and Sulfur (12.1 lbs / acre). Buttons for "View Raw Data", "Save Raw Data", and "New Search" are visible.

This search returned 26 records from the MASC database, summarized below:		
Total Acres:	2,627 acres	
Yield per Acre:	220.24 CWT / acre	(9.990 tonnes / acre)

Fertilizer Applied per Acre (actual product):		
Nitrogen:	160.4 lbs / acre	(0.073 tonnes / acre)
Phosphorus:	56.3 lbs / acre	(0.026 tonnes / acre)
Potassium:	73.3 lbs / acre	(0.033 tonnes / acre)
Sulfur:	12.1 lbs / acre	(0.005 tonnes / acre)

The screenshot shows a web browser window titled "Fertilizer Data Browser" with the URL "https://www.masc.mb.ca/masc.nsf/mmpp_brows". The page displays a search summary for Oats in the Thompson region. The search parameters are: Region(s) Selected: THOMPSON, Crop(s) Selected: OATS, Soil Zone(s) Selected: All, and Period Selected: 1993 to 2015. The search returned 90 records. The summary table shows a total of 74,472 acres and a yield of 92.8 Bushels per acre (1.431 tonnes per acre). The fertilizer applied per acre (actual product) is: Nitrogen: 57.9 lbs / acre (0.026 tonnes / acre), Phosphorus: 23.8 lbs / acre (0.011 tonnes / acre), Potassium: 5.3 lbs / acre (0.002 tonnes / acre), and Sulfur: 1.6 lbs / acre (0.001 tonnes / acre). Buttons for "View Raw Data", "Save Raw Data", and "New Search" are visible.

Summary **Raw Data**

Search Summary

Your selected search:

Region(s) Selected: THOMPSON
Crop(s) Selected: OATS
Soil Zone(s) Selected: All
Period Selected: 1993 to 2015

This search returned 90 records from the MASC database, summarized below:

Total Acres:	74,472 acres
Yield per Acre:	92.8 Bushels / acre (1.431 tonnes / acre)

Fertilizer Applied per Acre (actual product):

Nitrogen:	57.9 lbs / acre	(0.026 tonnes / acre)
Phosphorus:	23.8 lbs / acre	(0.011 tonnes / acre)
Potassium:	5.3 lbs / acre	(0.002 tonnes / acre)
Sulfur:	1.6 lbs / acre	(0.001 tonnes / acre)

[View Raw Data](#) [Save Raw Data](#) [New Search](#)

The screenshot shows a web browser window titled "Fertilizer Data Browser" with the URL "https://www.masc.mb.ca/masc.nsf/mmpp_brows". The page displays a search summary for Red Spring Wheat in the Thompson region. The search parameters are: Region(s) Selected: THOMPSON, Crop(s) Selected: RED SPRING WHEAT, Soil Zone(s) Selected: All, and Period Selected: 1993 to 2015. The search returned 109 records. The summary table shows a total of 385,897 acres and a yield of 44.9 Bushels per acre (1.223 tonnes per acre). The fertilizer applied per acre (actual product) is: Nitrogen: 79.8 lbs / acre (0.036 tonnes / acre), Phosphorus: 25.6 lbs / acre (0.012 tonnes / acre), Potassium: 5.6 lbs / acre (0.003 tonnes / acre), and Sulfur: 3.6 lbs / acre (0.002 tonnes / acre). Buttons for "View Raw Data", "Save Raw Data", and "New Search" are visible.

Summary **Raw Data**

Search Summary

Your selected search:

Region(s) Selected: THOMPSON
Crop(s) Selected: RED SPRING WHEAT
Soil Zone(s) Selected: All
Period Selected: 1993 to 2015

This search returned 109 records from the MASC database, summarized below:

Total Acres:	385,897 acres
Yield per Acre:	44.9 Bushels / acre (1.223 tonnes / acre)

Fertilizer Applied per Acre (actual product):

Nitrogen:	79.8 lbs / acre	(0.036 tonnes / acre)
Phosphorus:	25.6 lbs / acre	(0.012 tonnes / acre)
Potassium:	5.6 lbs / acre	(0.003 tonnes / acre)
Sulfur:	3.6 lbs / acre	(0.002 tonnes / acre)

[View Raw Data](#) [Save Raw Data](#) [New Search](#)

APPENDIX B

THE RURAL MUNICIPALITY OF THOMPSON

UNDER THE PLANNING ACT

VARIATION ORDER

VARIATION ORDER NO. 2/16

WHEREAS Kroeker Farms Ltd., owners of the property legally described as the North East ¼ 8-4-5 WPM, Miami, Manitoba applied to the Council of the Rural Municipality of Thompson to vary the Rural Municipality of Thompson Zoning By-law No.3/08 provided under:

Part 6, Section 94 of *The Planning Act* as it applies to the property in order to vary the established requirements as follows:

From (zoning requirements): to establish and allow the property line distance to 50 meters from 100 meters AND to vary the zoning requirement from 80 acres to 50 acres
- for the purpose of subdividing

And after careful consideration of the application and any representations made for or against the variation sought by the applicant, the Council of the Rural Municipality of Thompson in meeting duly assembled this 24th day of March A.D. 2016

APPROVED the said Variation.

This order shall expire if not acted upon within 12 months of the date of making.



Jody Oakes
Chief Administrative Officer



Brian Callum
Reeve

FIGURE 1: Runoff & Evaporation

