

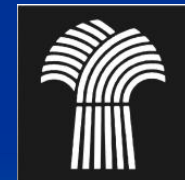
Southwest Saskatchewan Irrigation Districts

2011 Field Projects



Irrigation Crop Diversification Corporation

Gary Kruger PAg CCA
Irrigation Agrologist



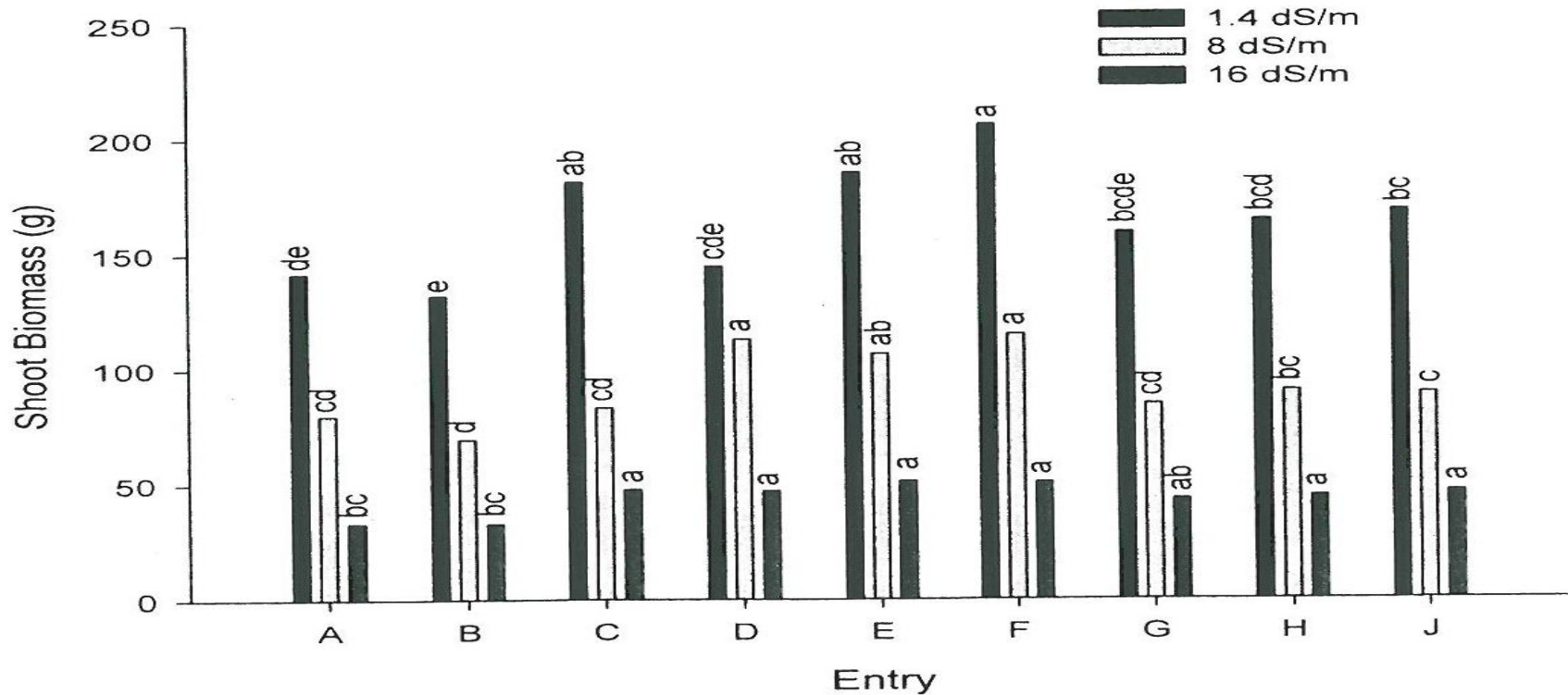
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Program Overview

- Alfalfa Variety Demo at CSIDC – saline soil
- Irrigation scheduling @ Herbert – 3 fields
- Stand termination/tillage (3 sites)
- Soil Fertility Demo
 - PK Zn– cover crop forage yield (Miry Creek)
 - PK – annual crop (Miry Creek)
 - PK – alfalfa forage yield (Chesterfield)
 - P timing - alfalfa (Consul)
 - PKS – alfalfa (Consul)
 - Conventional vs PRS soil test (Eastend)
 - Poor production area investigation (Ponteix)

Salt Lab Alfalfa Variety Screening 2009

Top three out of nine varieties from salt lab trial
with AJ Bluejay as a control



A - Rangelander
 B - L3738 Keho
 C - L4039 SC Salt *Bridgeview*
 D - CW 34024 *Halo*
 E - CW 054038
 F - CW 064027
 G - Rugged
 H - Bullseye
 J - TS 4002

Salt Tolerant Alfalfa Variety Demo

- Sown June 29, 2010 at 1.5 cm depth
Two blocks of four varieties
Plots of 1.5 m x 600 m
- Heavy weed pressure from redroot pigweed and shepherd's purse controlled with Cobotox in late July



Salt Tolerant Alfalfa Demo

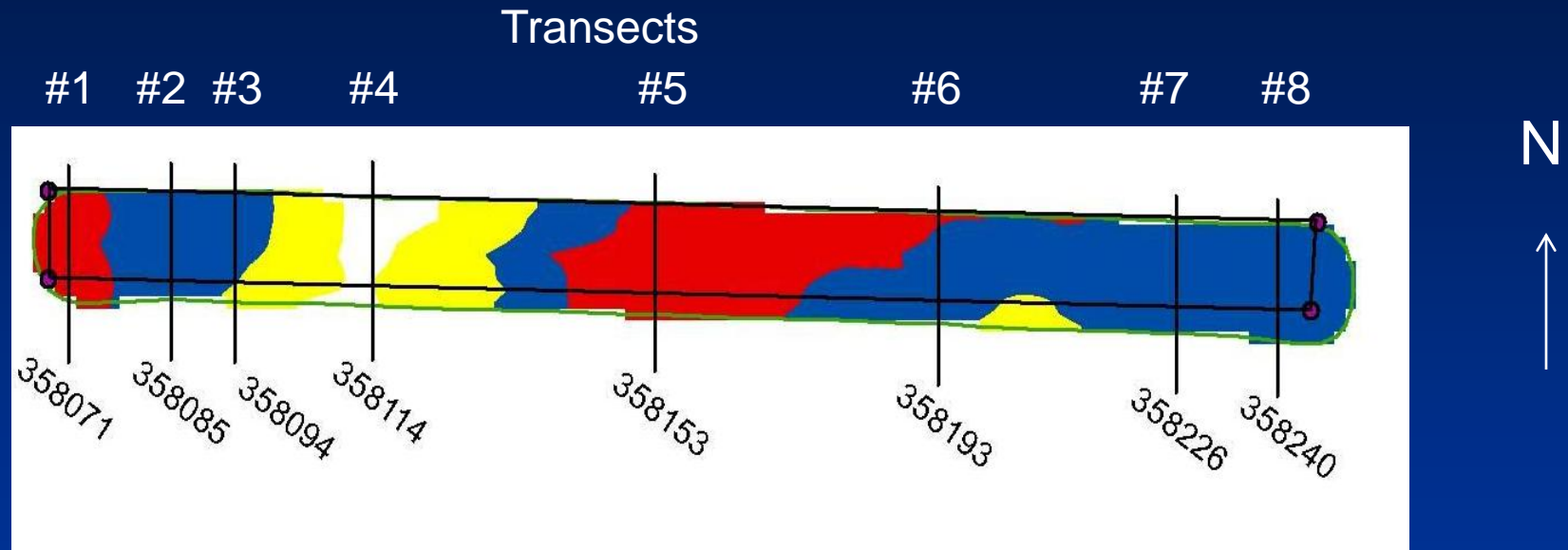
**Excellent emergence of
alfalfa**

**Redroot pigweed and
shepherd's purse abound**



July 29, 2010

Salt Tolerant Alfalfa Variety Demo



Site overview showing salinity classes

Nonsaline #4

Moderately saline #2,3,6,7,8

Severely saline #1 and #5

Salt Tolerant Alfalfa Variety Demo

Transect	Mean E.C. (mS/cm)	Salinity Rating	Mean Regrowth on Aug 30 (cm)	2011 Yield (t/ac)
1	7.6	Moderate	47	5.64
2	6.6	Moderate	47	5.30
3	5.1	Moderate	48	4.28
4	1.7	Nonsaline	46	4.48
5	9.3	Severe	43	5.58
6	6.0	Moderate	49	5.40
7	6.4	Moderate	49	5.67
8	5.4	Moderate	47	5.47

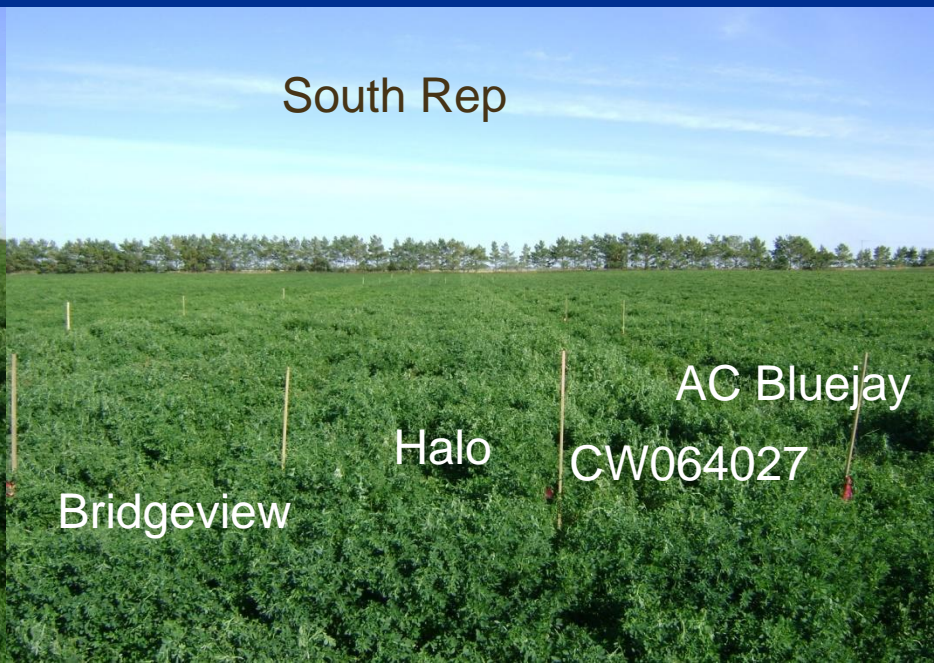
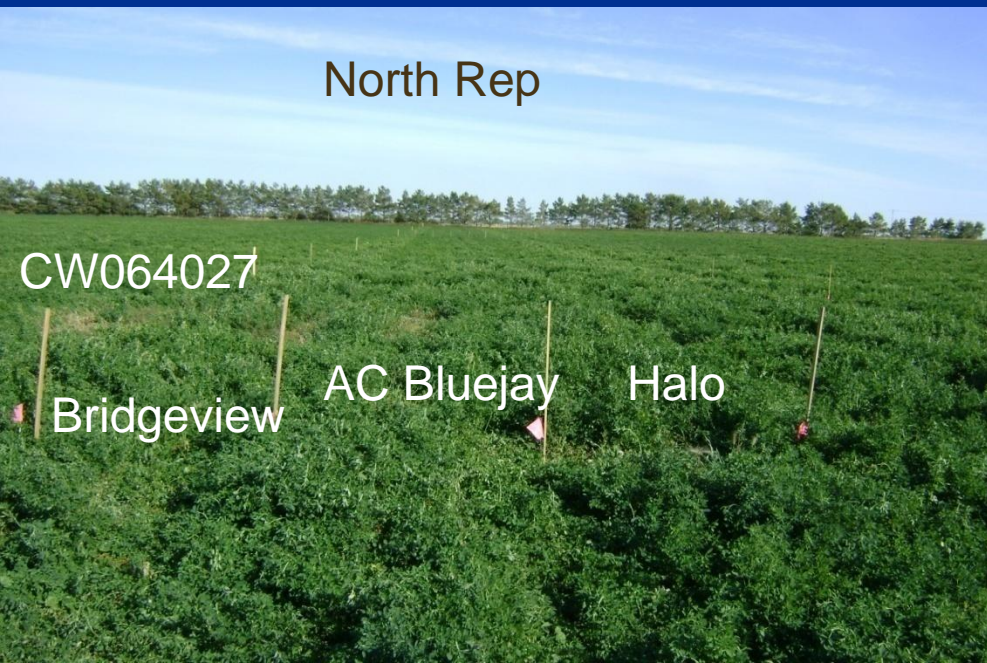


Salt Tolerant Alfalfa Variety Demo

Transect	Mean E.C. (mS/cm)	Range E.C. (mS/cm)	Outliers	Salinity Rating	Mean Regrowth on Aug 30 (cm)	2011 Transect Average Yield (t/ac)
1	7.6	6.9-8.4	Two high	Moderate	47	5.64
2	6.6	5.4-7.3	None	Moderate	47	5.30
3	5.1	4.0-6.0	None	Moderate	48	4.28
4	1.7	1.0-2.6	None	Nonsaline	46	4.48
5	9.3	6.6-10.6	One low	Severe	43	5.58
6	6.0	4.8-7.6	None	Moderate	49	5.40
7	6.4	3.9-8.2	One low One high	Moderate	49	5.67
8	5.4	1.6-8.2	One low One high	Moderate	47	5.47

Salt Tolerant Alfalfa Variety Demo

Variety	Plant Height Aug 30 (cm)	2011 Forage Yield (t/ac)
Halo	50	5.91
CW064027	56	5.44
AC Bluejay	43	5.05
Bridgeview	40	4.51



PK Fertilization of Established Alfalfa

Chesterfield Irrigation District

Bill Coventry - Mantario

- Treatments

- 1) Control
- 2) P Broadcast
- 3) P Band
- 4) K Band
- 5) PK Broadcast
- 6) PK Band



Photo Credit: Terry Motz, Glidden

PK Fertilization of Established Alfalfa

Chesterfield Irrigation District – Soil Test Results

										NEUTRAL AMMONIUM ACETATE (EXCHANGEABLE)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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SOIL FERTILITY RECOMMENDATIONS (POUNDS PER ACRE) by MIDWEST LABORATORIES

SAMPLE ID	CROP		YIELD GOAL	SOIL AMENDMENTS				N	P ₂ O ₅	K ₂ O	Mg	S	Zn	Mn	Fe	Cu	B
	INTENDED	PREVIOUS		LIME LBS/A of CaCO ₃	LIME TONS/A 90 % ECCE	GYPSUM TONS/A	ELEMENTAL SULFUR LBS/A	NITROGEN	PHOSPHATE	POTASH	MAGNESIUM	SULFUR	ZINC	MANGANESE	IRON	COPPER	BORON
280085	ALFALFA - ton	ALFALFA - ton	4					–	75	180	–	14	0.7	2.8	–	–	1.2
	BARLEY FEED - bu	ALFALFA - ton	100					70	45	40	–	12	0.7	2.5	–	–	–

PK Fertilization of Established Alfalfa

Chesterfield Irrigation District

Treatment	Nutrient Applied (lb/ac)	Blend Analysis	Rate of Fertilizer (lb/ac)	Hay Yield (ton/ac)
Control	None	None	None	2.49 ton/ac
P Broadcast	16-75-0-0	11-52-0	144 lb/ac	3.48 ton/ac
P Band	16-75-0-0	11-52-0	144 lb/ac	3.29 ton/ac
K Band	16-0-75-0	10-0-47-0	160 lb/ac	3.40 ton/ac
PK Broadcast	16-75-75-0	6-28-28-0	270 lb/ac	3.08 ton/ac
PK Band	16-75-75-0	6-28-28-0	270 lb/ac	3.33 ton/ac

PK Fertilization of Established Alfalfa

Chesterfield Irrigation District

- Broadcast P 3.28 t/ac vs Band P 3.31 t/ac
- Broadcast PK 3.08 t/ac vs Band PK 3.33 t/ac
- Control 2.49 t/ac vs Band K 3.40 t/ac

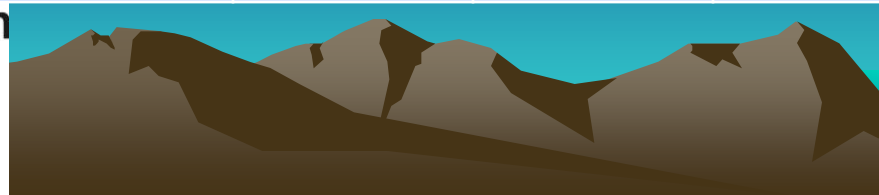


PK Fertilization of Established Alfalfa

Chesterfield Irrigation District

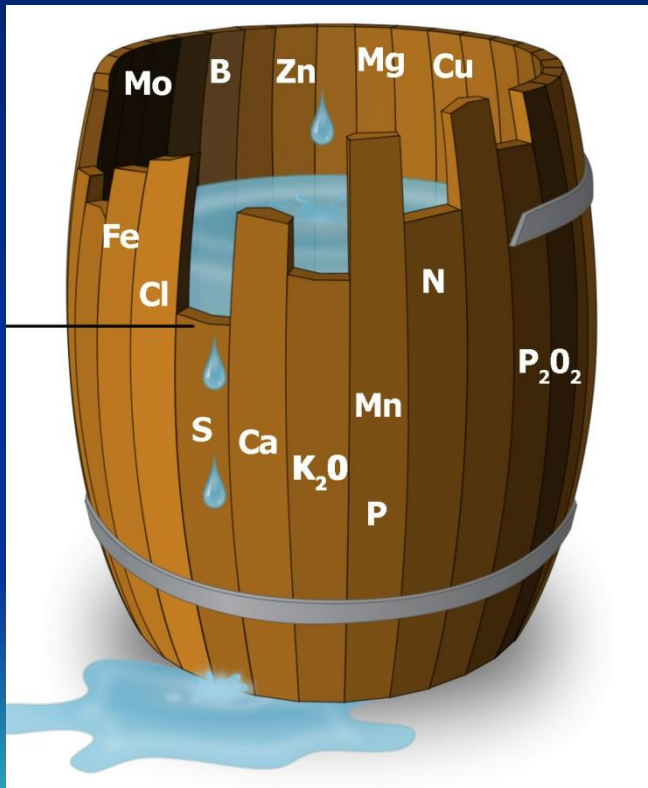
Plant Tissue Analysis

Treatment	N (%)	P (%)	K (%)	S (%)	Zn (ug/g)
Control	2.7	0.15	2.0	0.13	22
P Band	2.3	0.18★	1.6★	0.09★	16★
K Band	3.0★	0.14	2.1	0.14	24
Alfalfa	2.5	0.25	2.0	0.25	20
Grass	2.0	0.25	1.5	0.15	15



PK Fertilization of Established Alfalfa Chesterfield Irrigation District

Liebig's Law of the Minimum



Yield potential is like a barrel with staves of unequal length

Yield is limited by the length of the shortest stave

When that stave is lengthened, the next shortest stave becomes the limiting factor

Stand Termination Tillage Strategies

- Objectives
 - 1) Reduce tillage passes required to prepare field for sowing back to alfalfa
 - 2) Improve water infiltration during irrigation



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Stand Termination Tillage Strategies

- Challenges

- 1) Clay texture

- Sticky when wet

- Crusting

- Poor seedbed

- Inadequate depth control

- Difficult for seedlings to emerge

- 2) Alleopathy of alfalfa residues

- 3) Restricted water infiltration due to hardpan



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Stand Termination Tillage Strategies

- Locations
 - Val Marie – Lynn Grant
 - Rush Lake – Darren Steinley
 - Miry Creek – Bob Stuart



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Broken Foxtail Barley
Sod at Rush Lake



Breaking Alfalfa at
Miry Creek



Tilling Barley Stubble
at Val Marie



Salt Crystals on Surface of
Soil Cores at Rush Lake

Fertilization of Cover Crop

Miry Creek Irrigation District

Stealth alfalfa sown in spring 2011
with Morgan oats as cover crop

Control – no fertilizer

100 lb P_2O_5 banded
November 6, 2010



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Conclusion

- Saline soil reduces crop growth but waterlogging is another constraint
- Soil and plant tissue testing are important tools for managing forage production
- The obvious solution is often not the complete solution. All growth factors need to be considered to provide the best solution!!




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Acknowledgement

- Viterra – fertilizer and blending services
Swift Current, Shaunavon, Consul
 - Crop Production Services – blending services
Outlook
 - G-Mac's Ag Team – Leader and Eatonia
- fertilizer application
 - Cargill AgHorizons Rosetown – supplies
 - Salford Farm Machinery Ltd.- tillage
 - Nexus Ag – Cu and Zn micronutrient fertilizer
 - ADOPT – Agricultural Demonstration of
Practices and Technology
- 

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- Greg Oldhaver – Cabri
- Russ Swihart – Consul
- Scott Sanderson – Consul
- Ken Falk – Herbert
- Larry Verpe – Eastend
- Andy Perrault - Ponteix



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