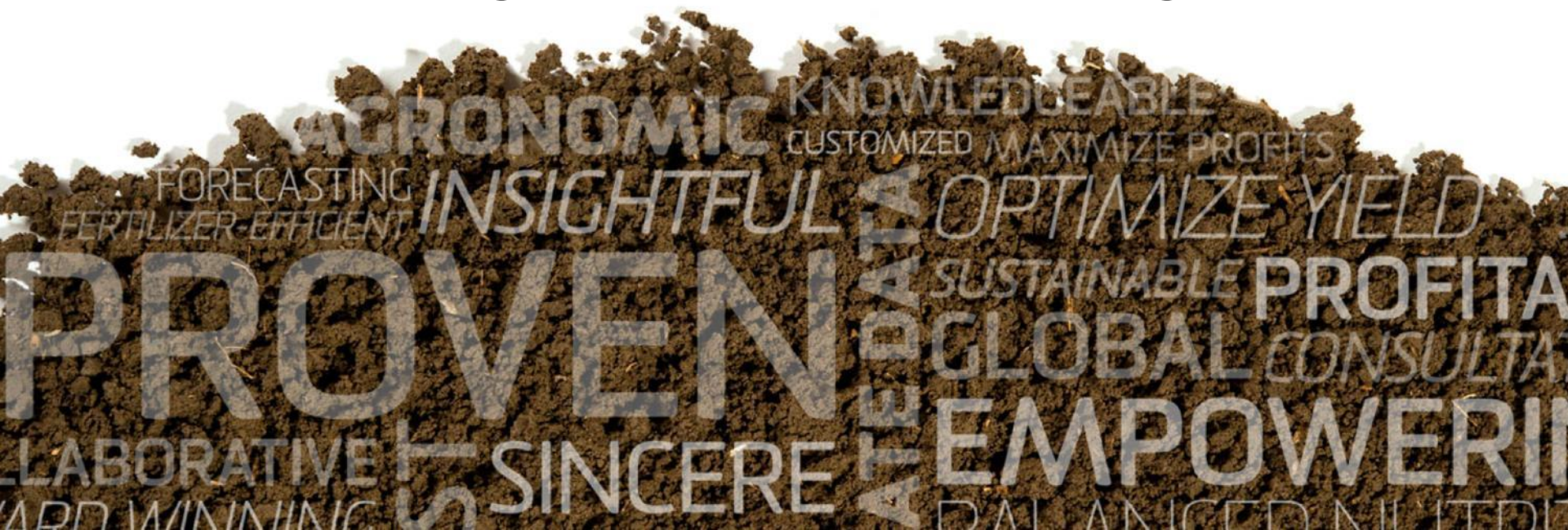




WESTERN AG

After a crazy year, what's going on in our soils?

Edgar Hammermeister, PAg





WESTERN AG

20 YEARS OF GROWTH

WESTERN AG
PROFESSIONAL AGRONOMY

Plant Root Simulator (PRST[™]) Probes

Anion probe



College of Agriculture
and Bioresources

Inventor:

Dr. Jeff Schoenau,
Professor and Ministry of
Agriculture Strategic Research
Chair



Cation probe

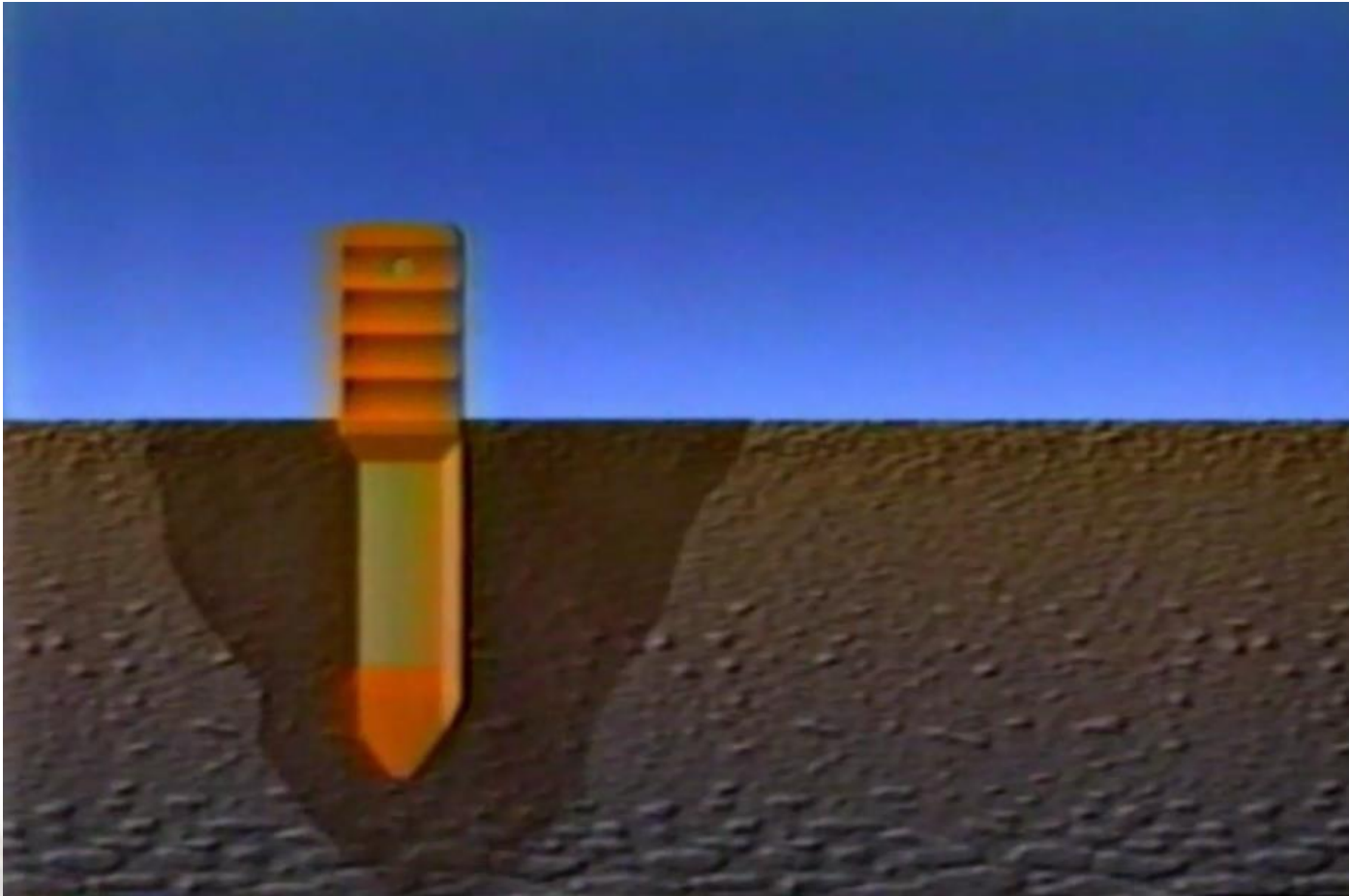
Patented in
Australia, Canada,
Europe, New
Zealand and the
United States.

US patent #6,242,261



PRS Probes

Patented technology that adsorbs nutrients like a plant root.





Total Available Water

Growing Degree Days 1295

Soil Moisture: 3.5
 Precipitation: 7.1 11
 Irrigation: 0

HO Spring Wheat
 Max Yield: 78.9
 Yield: 72.6



Gross Income

\$/bushel	\$/acre
\$6.25	\$453.85

Other Expenses

\$200.00

Fertilizer Cost

	\$/lb	\$/acre
N	\$0.50	\$56.00
P	\$0.45	\$14.85
K	\$0.40	\$8.00
S	\$0.35	\$1.40
Total:		\$80.25



Water Storage Sandy

Soil Density 35% Clay

Soil pH 1.365

Soil EC 6.32

Soil EC 1:1 0.48

Sample SW 25-08-01 W2

N	20.9	165.8	112.0
P₂O₅	6.8	53.7	33.0
K₂O	72.5	126.3	20.0
S	15.6	20.5	4.0
Ca		715.9	14.2
Mg		111.7	19.7
Cu	0.07		0.12
Zn	0.30		0.39
Mn		0.79	0.47
Fe		1.09	0.39
B		0.45	0.05

Grow More Profit

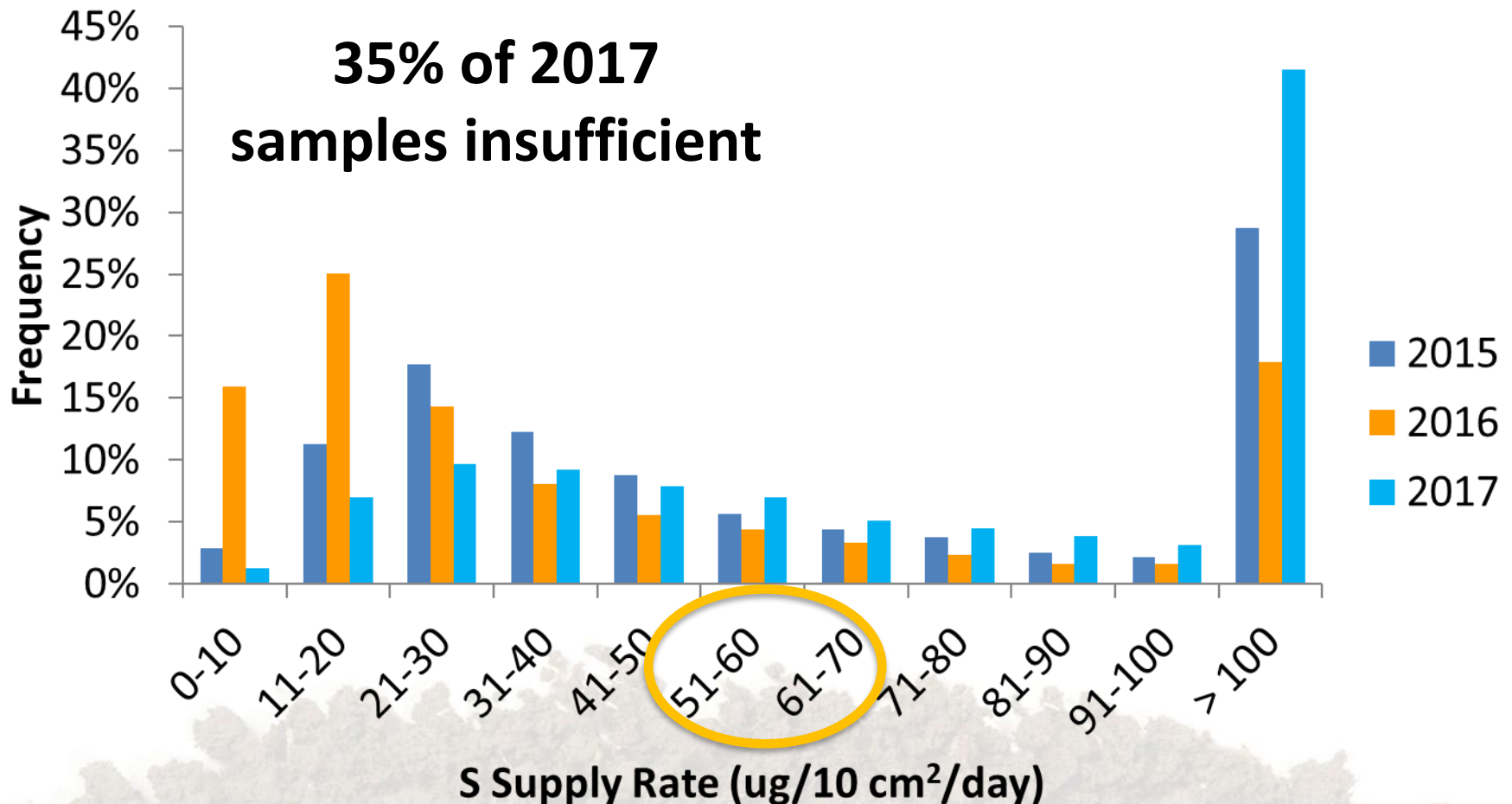
Net \$/acre:	\$173.60
Production	
Cost \$/bu:	\$3.86

Field Map

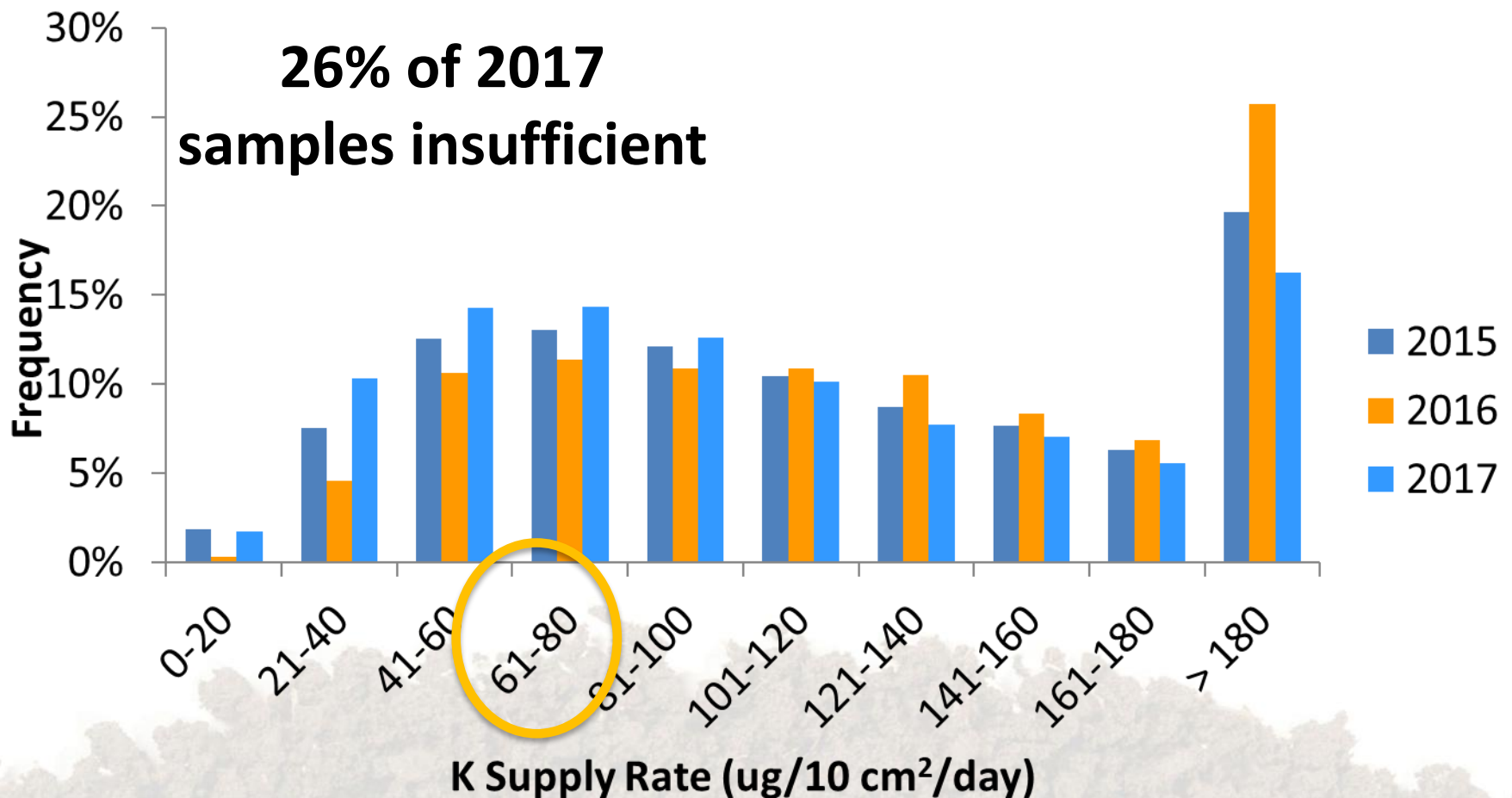


Summary

Three Year Trend Comparison Sulphur Supply Rate



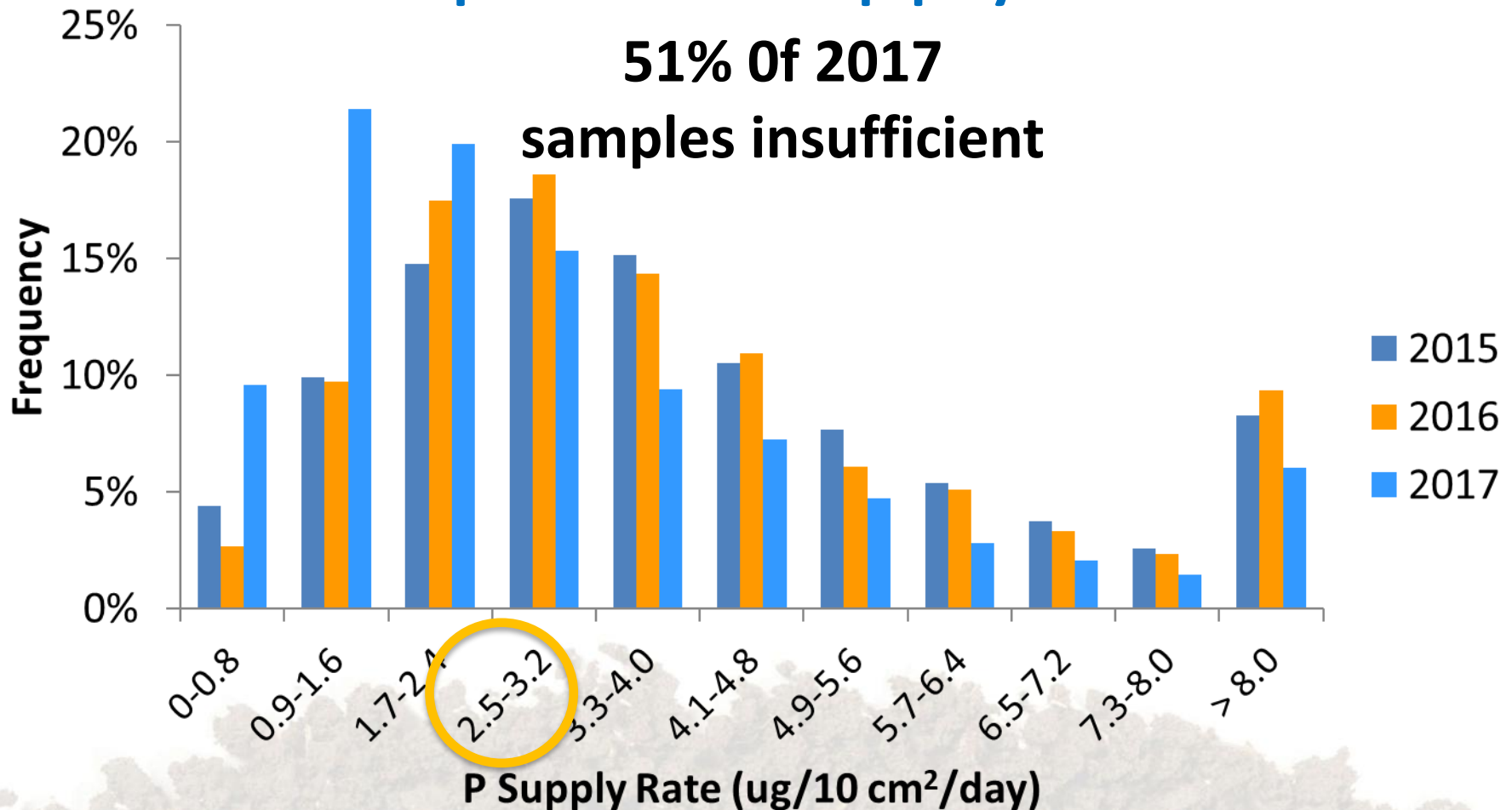
Three Year Trend Comparison Potassium Supply Rate



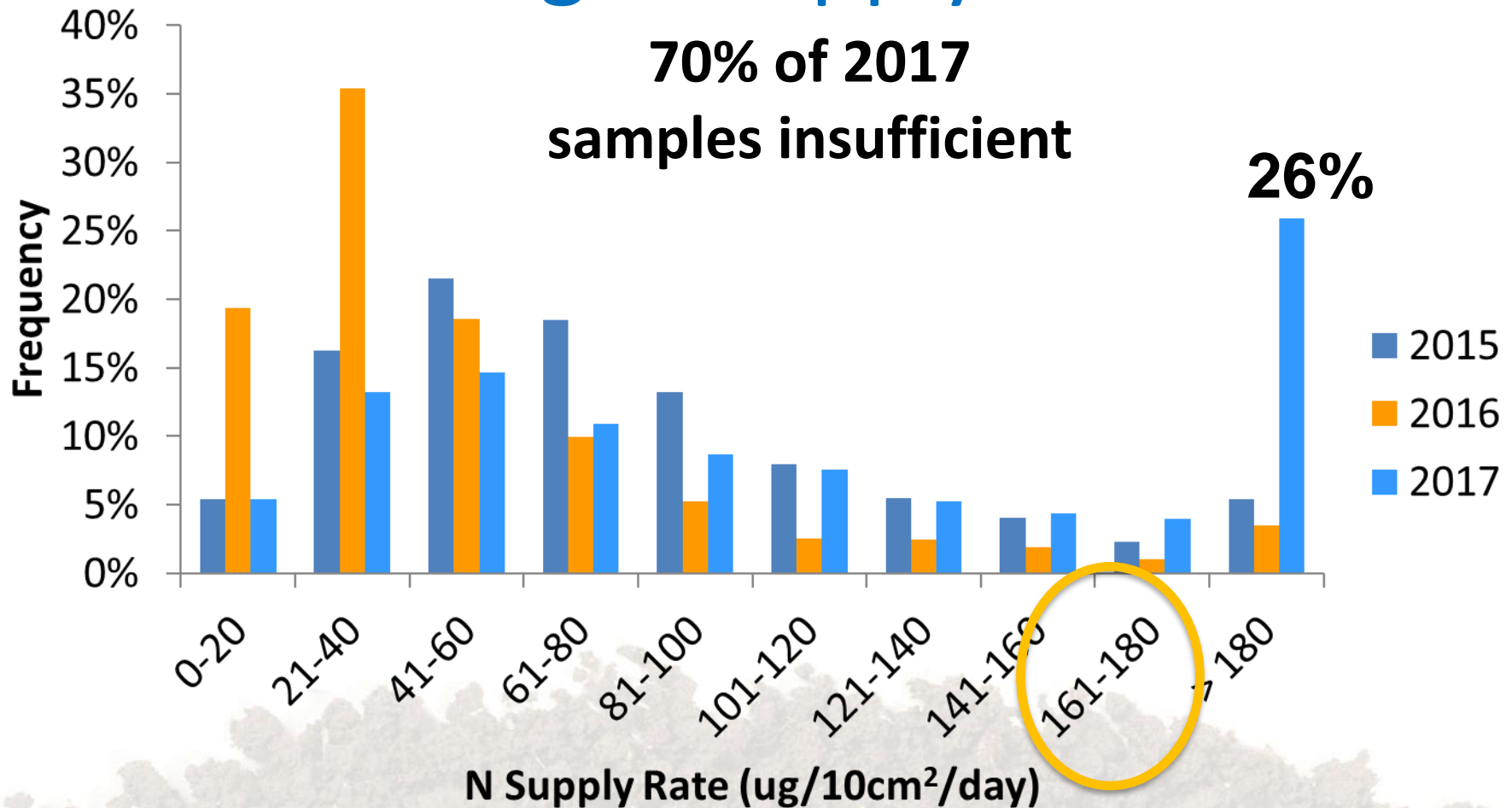
Three Year Trend Comparison Phosphorus Supply Rate

51% of 2017

samples insufficient



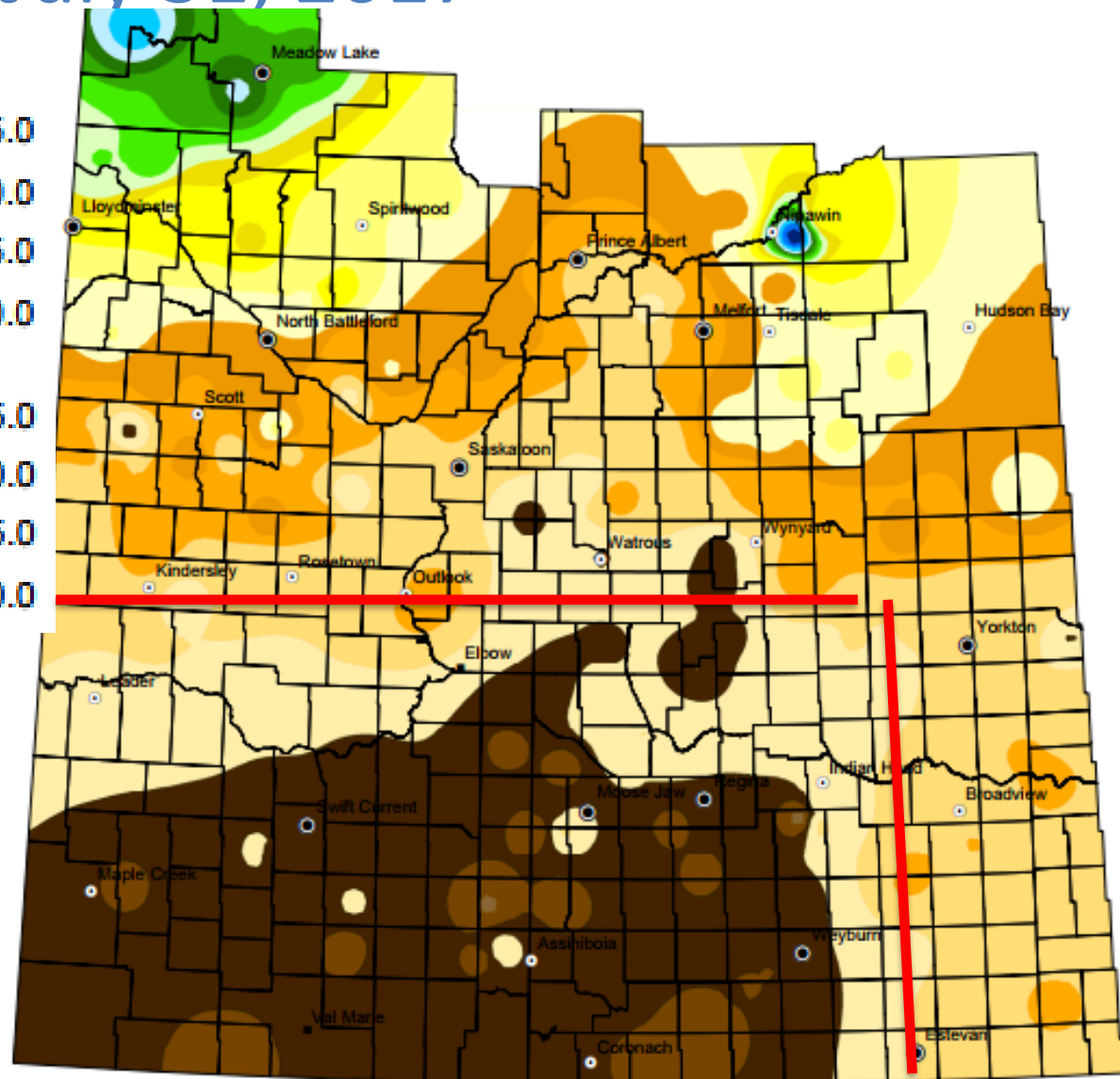
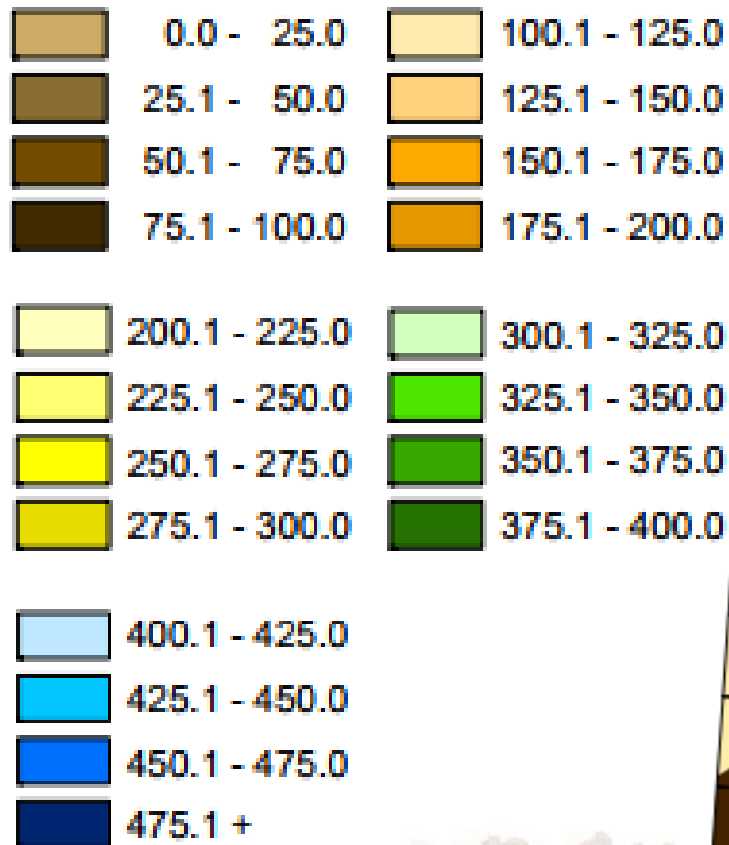
Three Year Trend Comparison Nitrogen Supply Rate



Saskatchewan Cumulative Rainfall: WESTERN AG

April 1 – July 31, 2017

Rainfall (mm)



What is instigating high N supply rates?

- 2017 drought
 - Under utilized fertilizer N
 - N movement upward from depth
- 2017 fertilizer agronomy
 - Top dressed N getting stranded
- Organic Matter mineralization
 - 2016 growing season
 - Moisture impacting crop yield

Lewvan – Milestone Area

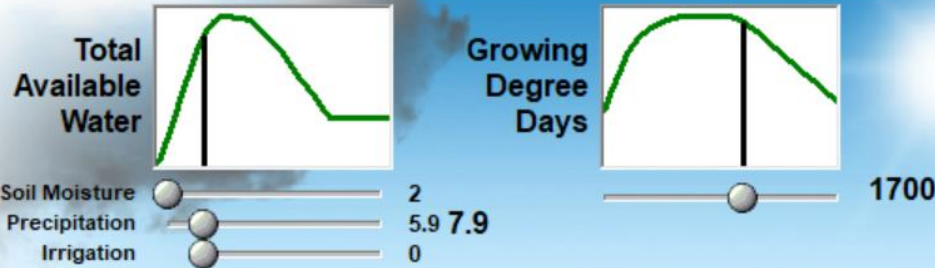
2016 lentils



Nitrogen contribution of various legumes.

Legume	Plant N derived from atmosphere (%)	N fixed symbiotically Kg/ha
Alfalfa	80	102 - 268
Sweet Clover	90	11 - 223
Fababean	90	159 - 268
Field Pea	80	2 - 178
Lentil	80	22 - 134

Source: www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/agribusiness-farmers-and-ranchers/crops-and-irrigation/soils-fertility-and-nutrients/green-manuring-with-legumes



HO Spring Wheat
Max Yield: 83.9



Water Storage



Sandy 75% Clay

soybean st.
10224946

2016 lentils, hailed out - green

N	120.1	<input type="range"/>	176.2	56.1
P ₂ O ₅	22.8	<input type="range"/>	57.1	34.3
K ₂ O	50.4	<input type="range"/>	134.3	83.9
S	13.4	<input type="range"/>	21.8	8.4
Ca	924.7	<input type="range"/>	15.1	56.1
Mg	107.9	<input type="range"/>	21.0	34.3
Cu	0.90	<input type="range"/>	0.13	83.9
Zn	0.22	<input type="range"/>	0.42	8.4
Mn	4.58	<input type="range"/>	0.50	0.200
Fe	2.37	<input type="range"/>	0.42	0.200
B	0.21	<input type="range"/>	0.05	0.200

Field Map



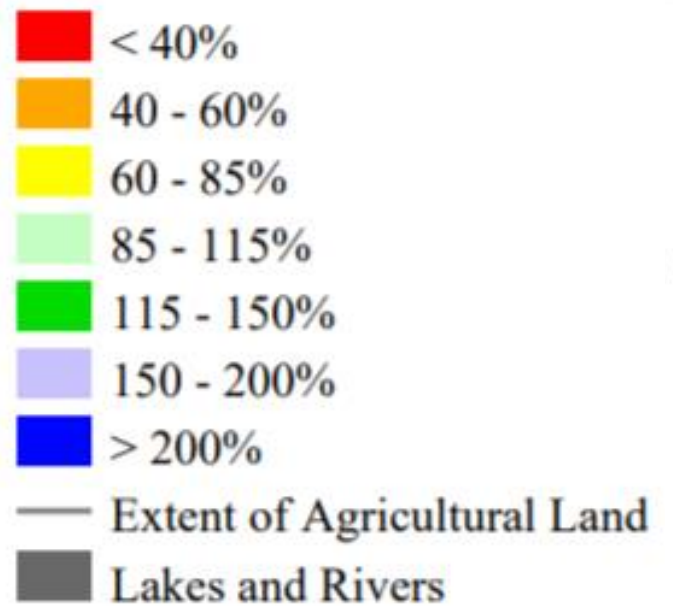
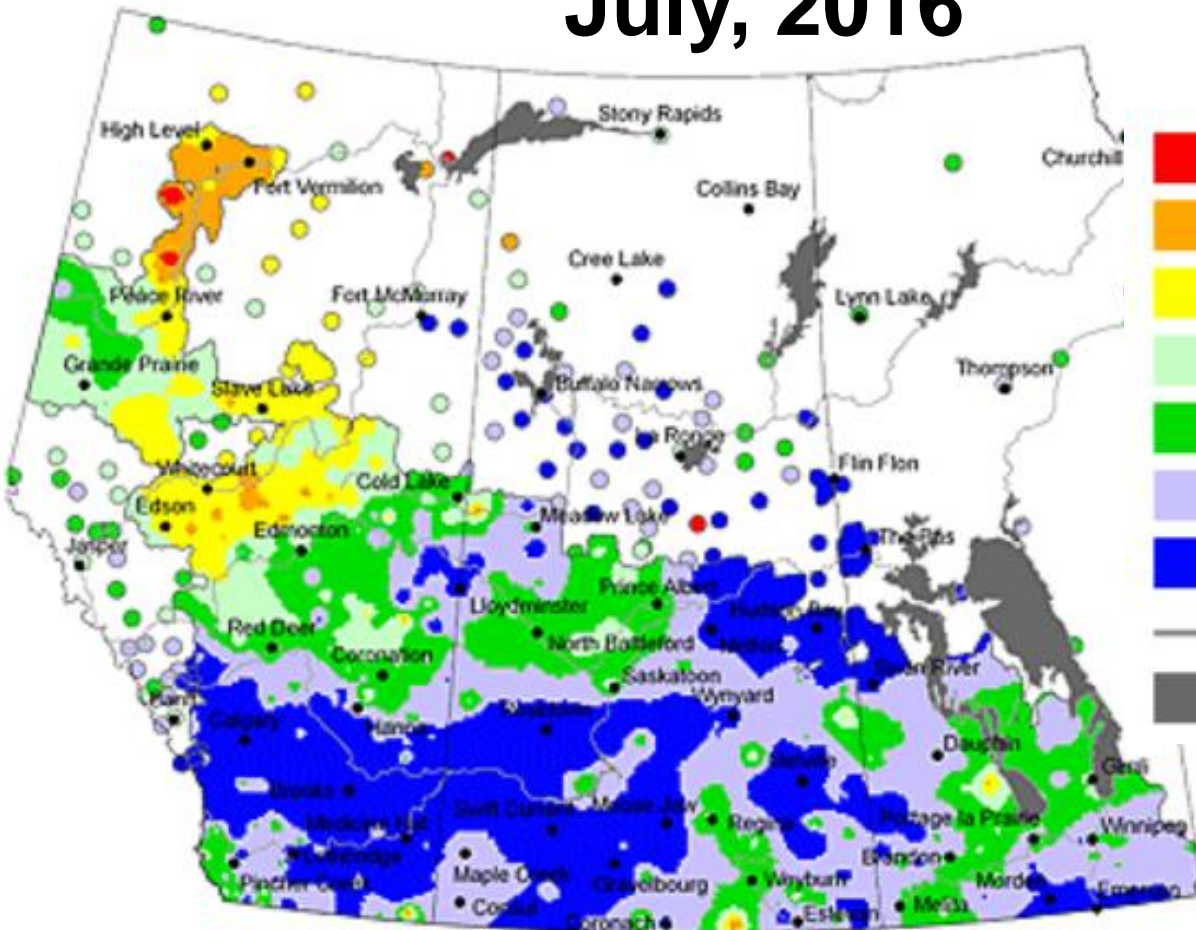
Summary



1 Month (30 Days) Percent of Average Precipitation (Prairie Region)

July 3, 2016 to August 1, 2016

July, 2016



Produced using near real-time data that has undergone initial quality control. The map may not be accurate for all regions due to data availability and data errors.

Root rots and leaf disease impacting pulse yield

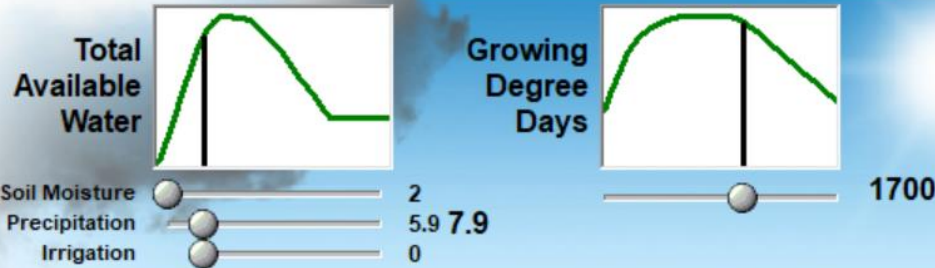


Figure 1. *Evidence of root rot in a lentil field in Saskatchewan in 2016*

1. Fixed N not harvested in seed...
2. Next crop fertilized as per “normal”...
3. 2017 drought affected yields...

= Big N supply rates

Figure 1. *Evidence of root rot in a lentil field in Saskatchewan in 2016*



HO Spring Wheat
Max Yield: 83.9



Water Storage



Sandy 75% Clay

soybean st.
10224946

2016 lentils, hailed out - green

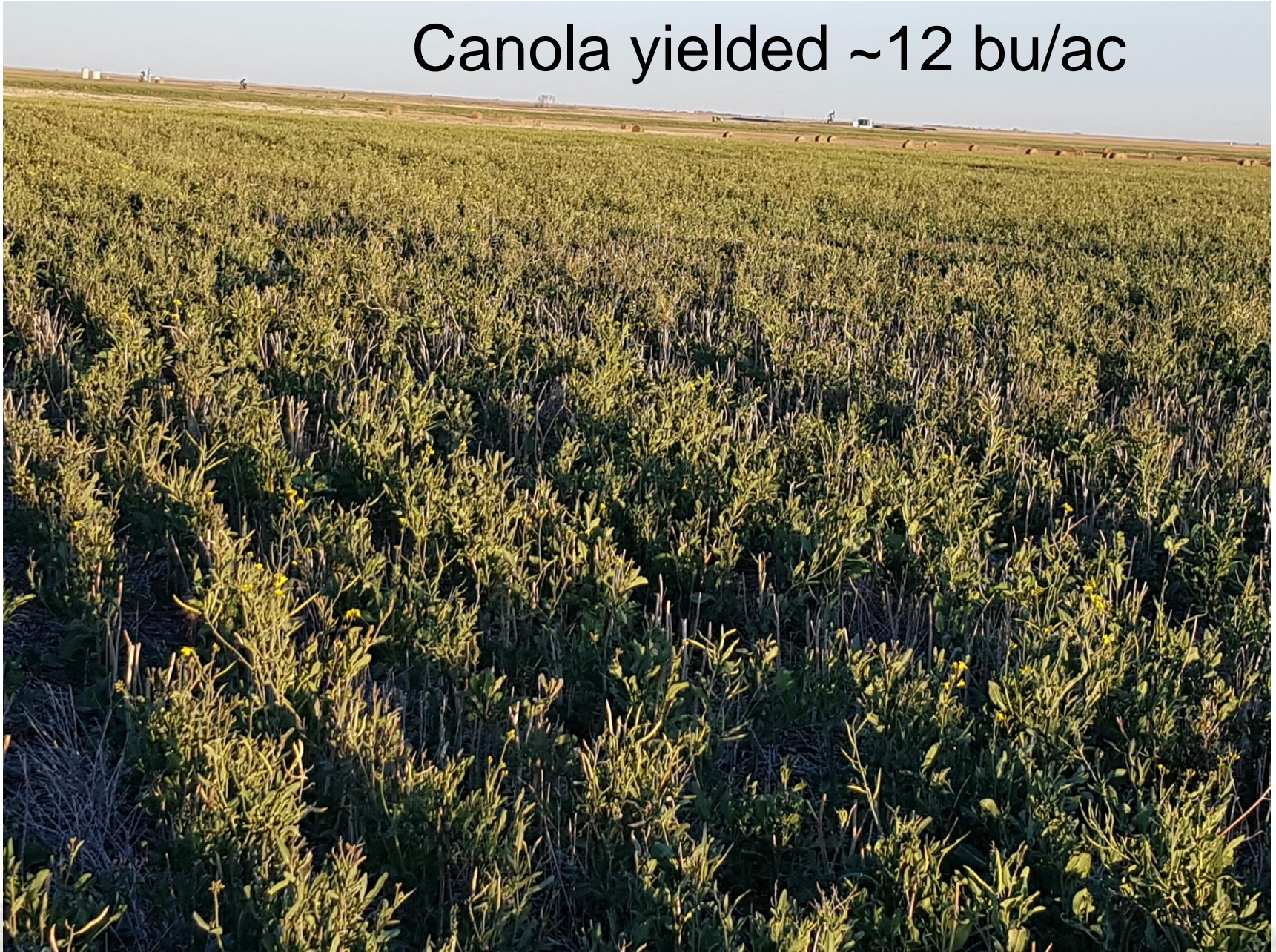
N	120.1	<input type="range"/>	176.2	56.1
P ₂ O ₅	22.8	<input type="range"/>	57.1	34.3
K ₂ O	50.4	<input type="range"/>	134.3	83.9
S	13.4	<input type="range"/>	21.8	8.4
Ca	924.7	<input type="range"/>	15.1	56.1
Mg	107.9	<input type="range"/>	21.0	34.3
Cu	0.90	<input type="range"/>	0.13	83.9
Zn	0.22	<input type="range"/>	0.42	8.4
Mn	4.58	<input type="range"/>	0.50	0.200
Fe	2.37	<input type="range"/>	0.42	0.200
B	0.21	<input type="range"/>	0.05	0.200

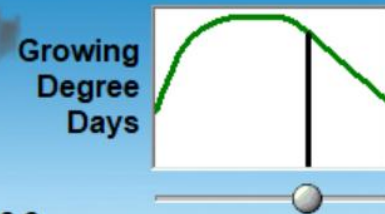
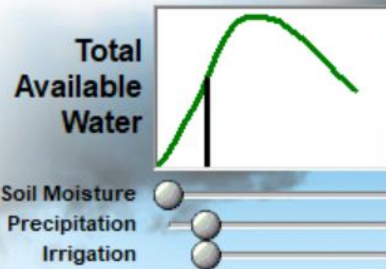
Field Map



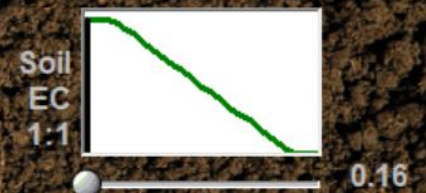
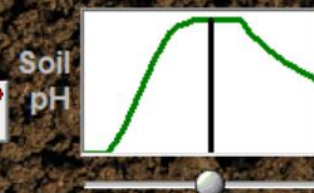
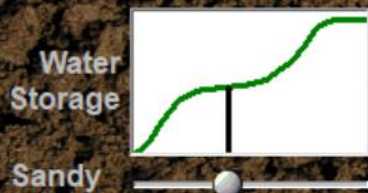
Summary

Canola yielded ~12 bu/ac





Durum Wheat
 Max Yield: 54.3



-01-11 W2

10193389

canola st.
 2017 crop ~12 bu/ac

Canola had a significant amount of regrowth after swathing.
 Field was in flower again when soil samples were collected.

N	4.9	<input type="range" value="95.1"/>	95.1	90.2
P ₂ O ₅	6.3	<input type="range" value="35.3"/>	35.3	29.0
K ₂ O	85.5	<input type="range" value="86.9"/>	86.9	1.4
S	99.8	<input type="range" value="16.3"/>	16.3	
Ca	455.7	<input type="range" value="9.8"/>	9.8	
Mg	101.8	<input type="range" value="13.6"/>	13.6	
Cu	0.20	<input type="range" value="0.08"/>	0.08	
Zn	0.27	<input type="range" value="0.27"/>	0.27	
Mn	25.68	<input type="range" value="0.33"/>	0.33	
Fe	6.44	<input type="range" value="0.27"/>	0.27	
B	0.26	<input type="range" value="0.03"/>	0.03	

Field Map



Summary

In summary

- 2017 was a crazy year, one for the record books
- 2016 growing season having a big impact
- Assuming poor yields = left over N is misguided
- Over applying fertilizer for insurance has its risks
- To know is to “Grow More Profit”.

Discussion?



Contacting Western Ag:

www.GrowMoreProfit.com

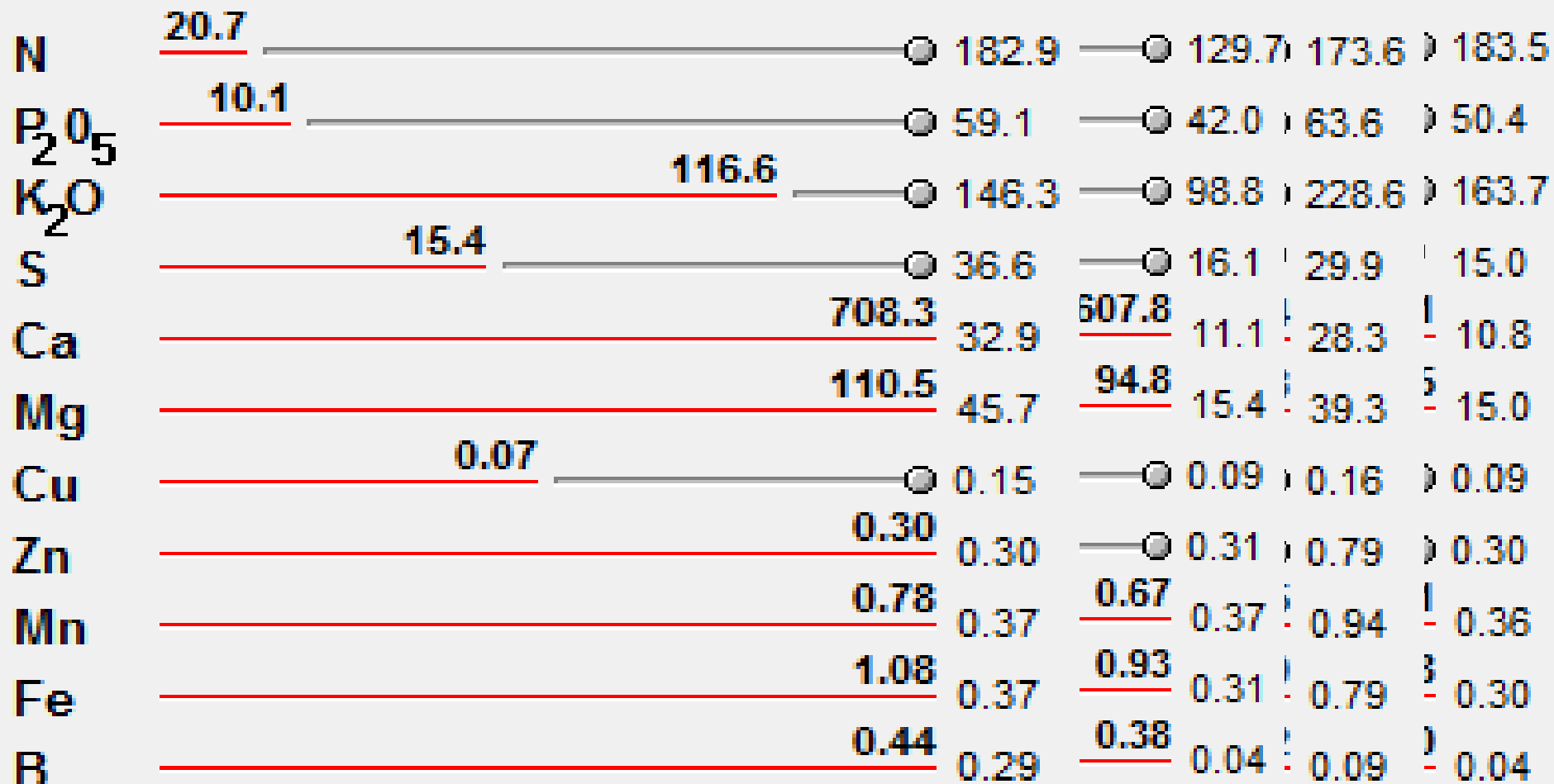
1-877-978-1777



WESTERN  **AG**

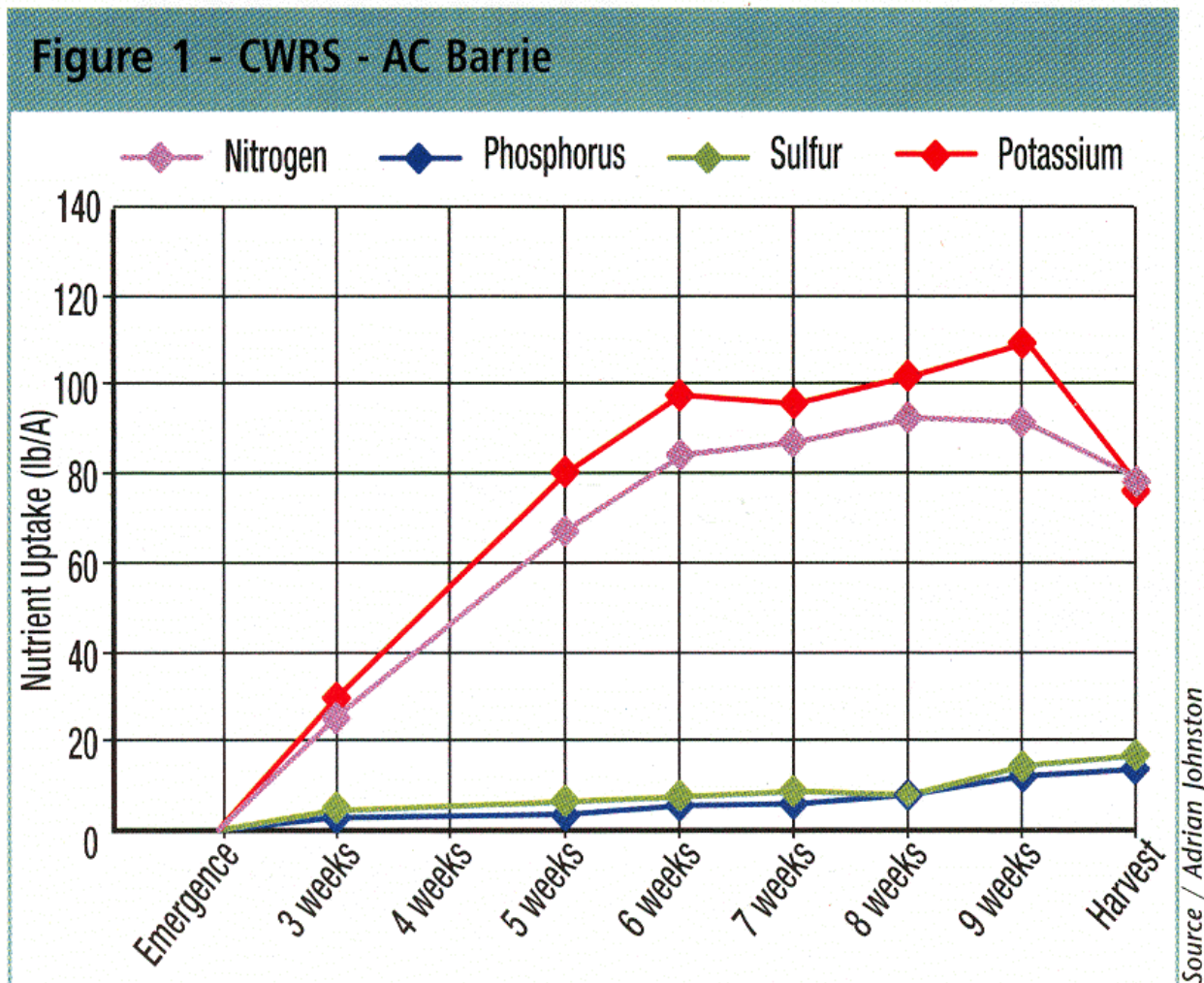
Different rooting characteristics, different supply rates

Canola, Wheat, Oat, Peas



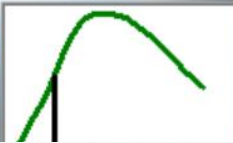
Nutrient Uptake in HRS Wheat

Source: Adrian Johnston, Farming, April 2002

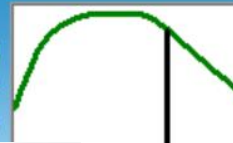




Total Available Water



Growing Degree Days



Durum Wheat
Max Yield: 54



10195192

flax st. Yielded ~11 bu/ac Applied 66-16-0-7.5

2017 flax, 2016 durum, 2015 canola, 2014 w wheat

There was a significant vol winter wheat even after the 2015 canola.

Vol W/Wht treated with pre-seed glyphosate 4-5 lf stage.

2016 durum was very low yielding

- suspect wheat streak mosaic along with water and nutrient use by the vol. winter wheat.
- fertilizer applied to durum was underutilized.
- suspect we are seeing that N availability here now.
- Applied 84-21-0-10 to the durum.

use by the vol. winter wheat.

- fertilizer applied to durum was underutilized.
- suspect we are seeing that N availability here now.
- Applied 84-21-0-10 to the durum.

1775



Soil EC 1:1



5.84

0.16

-01-11 W2

N	153.1	94.4	
P ₂ O ₅	8.2		26.9
K ₂ O			15.6
S			
Ca	153.1	94.4	
Mg			26.9
Cu		35.1	
Zn	70.7	86.3	15.6
Mn			
Fe	18.9	16.2	
B	347.9		

Field Map



Summary

Lewvan-Milestone Area Farm

Single Blend **85-25-0-5**

Blend Cost **\$53.00** **Catered Blend**

Field	Yield	\$ Net/ac	Blend	Cost	Yield	Net
-------	-------	-----------	-------	------	-------	-----

★ SW 7*	68	\$ 187	45-20-30-5	\$ 41.25	77	\$ 258
---------	----	--------	------------	----------	----	--------

NE 11	62	\$ 151	105-30-30-5	\$ 75.00	76	\$ 218
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SE 11	70	\$ 201	75-25-0-5	\$ 48.50	69	\$ 203
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★ SW 11	68	\$ 187	85-25-0-5	\$ 53.00	68	\$ 187
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★ SE 25*	51	\$ 79	60-30-25-0	\$ 50.75	62	\$ 150
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SE 30	55	\$ 102	60-35-25-5	\$ 55.50	67	\$ 181
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★ NE 31#	72	\$ 216	120-15-20-0	\$ 68.50	80	\$ 248
----------	----	--------	-------------	----------	----	--------

NE 32	59	\$ 130	80-20-20-0	\$ 46.00	58	\$ 131
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NE33	71	\$ 209	90-25-0-0	\$ 53.00	71	\$ 209
------	----	--------	-----------	----------	----	--------

NW 33	70	\$ 202	75-20-25-0	\$ 52.50	78	\$ 255
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Ave Net/ac	\$ 166	Ave Cost	\$ 54.40	Ave Net	\$ 204
-------------------	---------------	-----------------	-----------------	----------------	---------------

Total Ac Net	\$240,948	Additional Net \$54,534		\$ 295,482
---------------------	------------------	--------------------------------	--	-------------------

10 fields x 145 ac = 1450 ac	Extra fert cost = \$2,030	Other Costs
------------------------------	----------------------------------	-------------

Assumptions: Wheat \$6.50/bu, N \$0.45, P \$0.50, K \$0.35, S \$0.45	\$200
--	-------



Soil Moisture: 3.5
 Precipitation: 7.1 11
 Irrigation: 0

1295

HO Spring Wheat
 Max Yield: 78.9



Gross Income

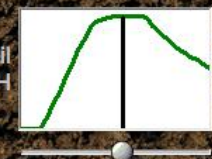
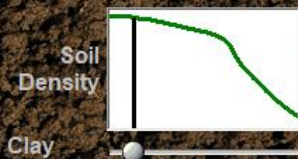
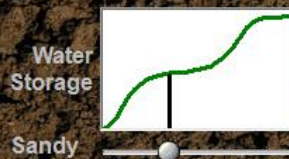
\$/bushel	\$/acre
\$6.25	\$454.61

Other Expenses

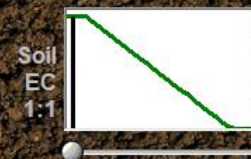
\$200.00

Fertilizer Cost

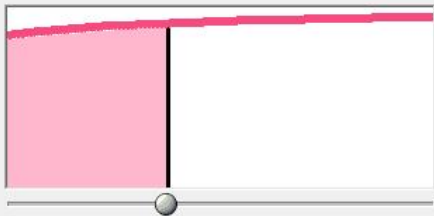
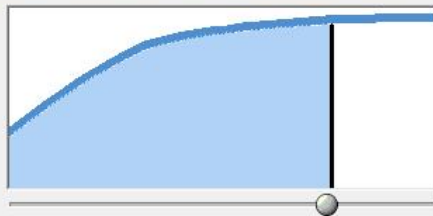
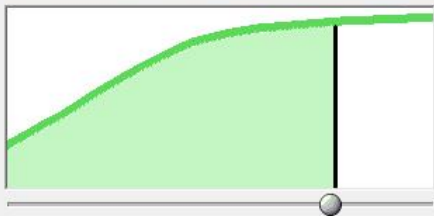
	\$/lb	\$/acre
N	\$0.50	\$55.00
P	\$0.45	\$15.75
K	\$0.40	\$8.00
S	\$0.35	\$1.40
Total:		\$80.15



6.32



0.48



Sample SW 25-08-01 W2

N	20.9	165.8	110.0
P ₂ O ₅	6.8	53.7	35.0
K ₂ O	72.5	126.3	20.0
S	15.6	20.5	4.0
Ca	715.9	14.2	
Mg	111.7	19.7	
Cu	0.07	0.12	
Zn	0.30	0.39	
Mn	0.79	0.47	
Fe	1.09	0.39	
B	0.45	0.05	

Field Map



Summary

Grow More Profit

Net \$/acre:	\$174.46
Production Cost \$/bu:	\$3.85

Thank you

westernag.ca

N Supply Rate – Factors impacting the Cropcaster

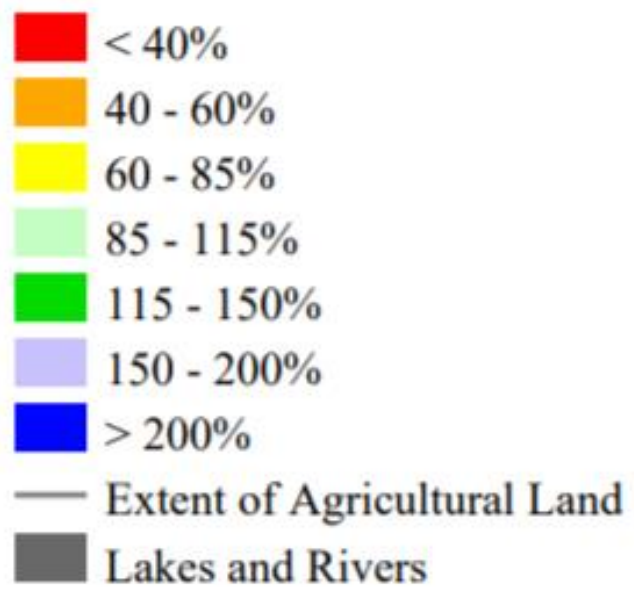
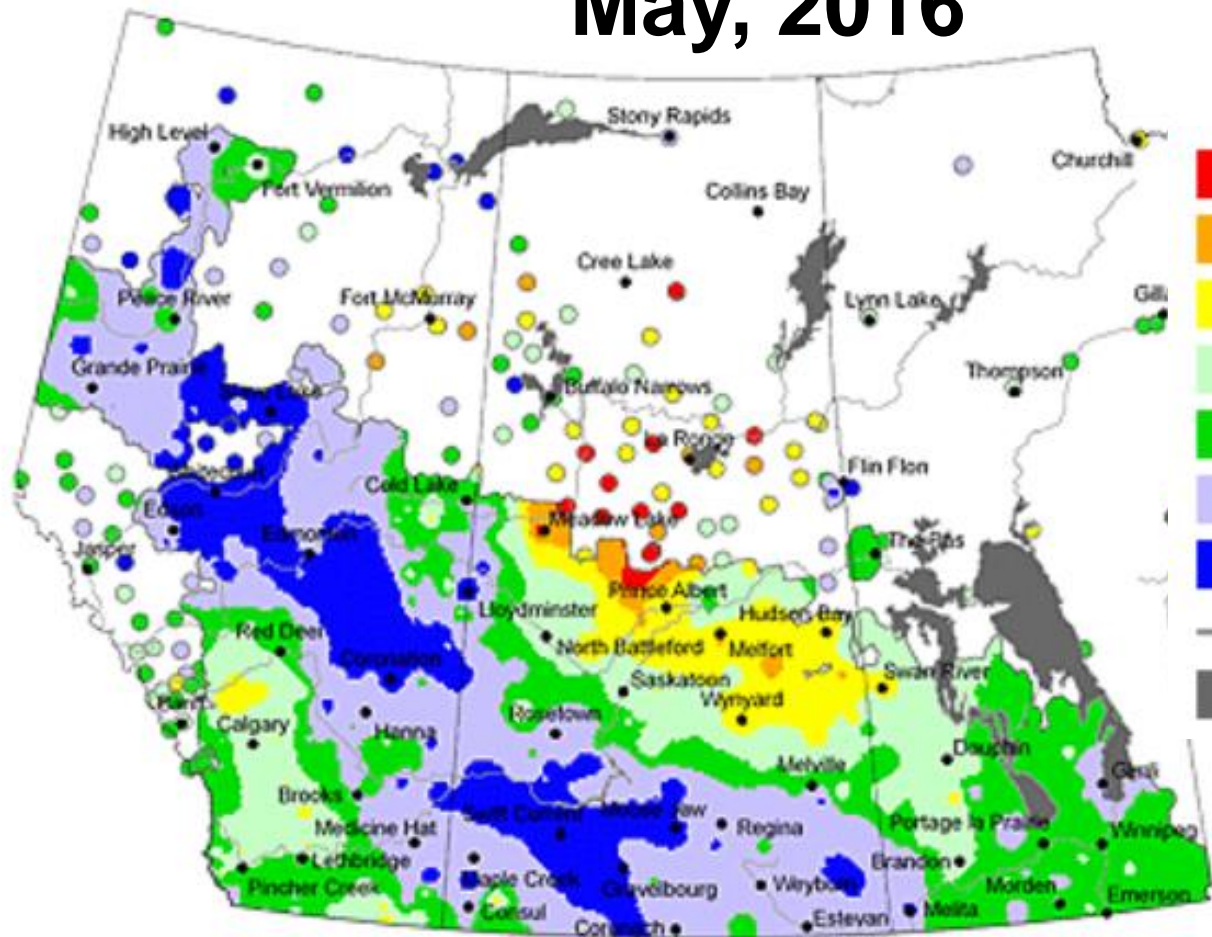
- Success of previous cropping history
 - Off season soil N mineralization
 - In season soil N mineralization
- Soil water movement
- Under utilized applied N



1 Month (30 Days) Percent of Average Precipitation (Prairie Region)

May 8, 2016 to June 6, 2016

May, 2016

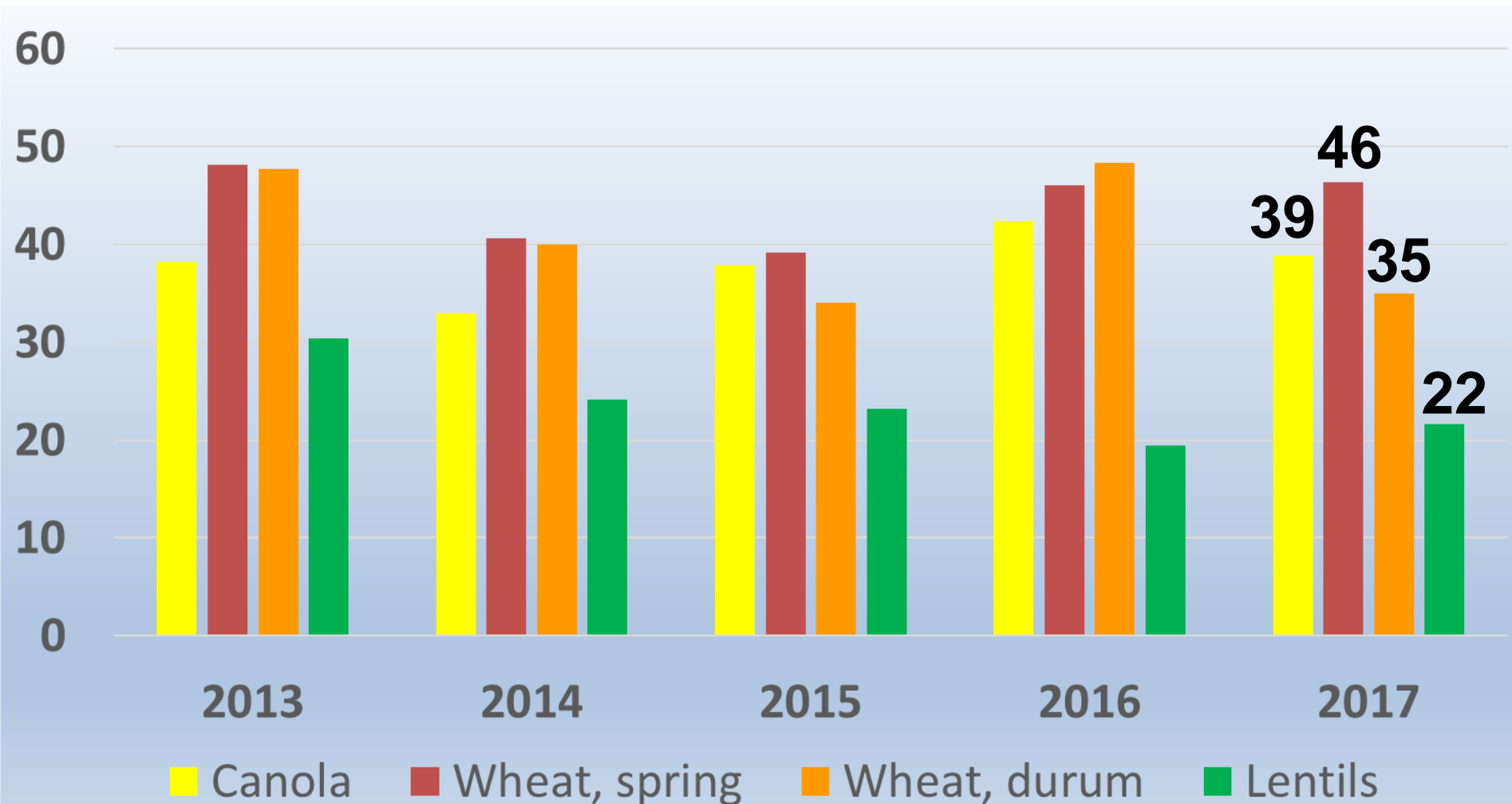


Produced using near real-time data that has undergone initial quality control. The map may not be accurate for all regions due to data availability and data errors.

Saskatchewan Average Crop Yields

(Bu/ac)

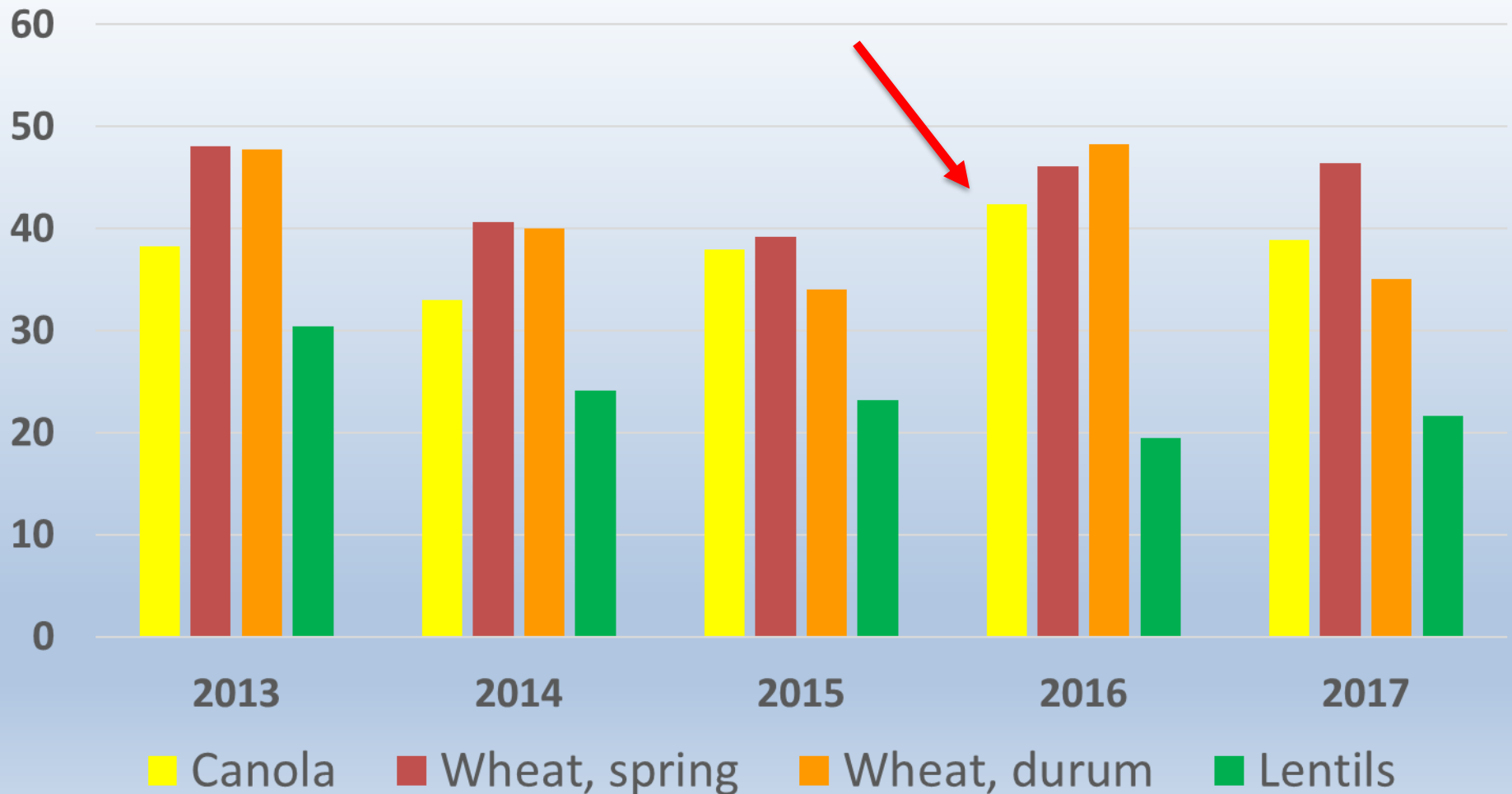
Source: Statistics Canada



Saskatchewan Average Crop Yields

(Bu/ac)

Source: Statistics Canada



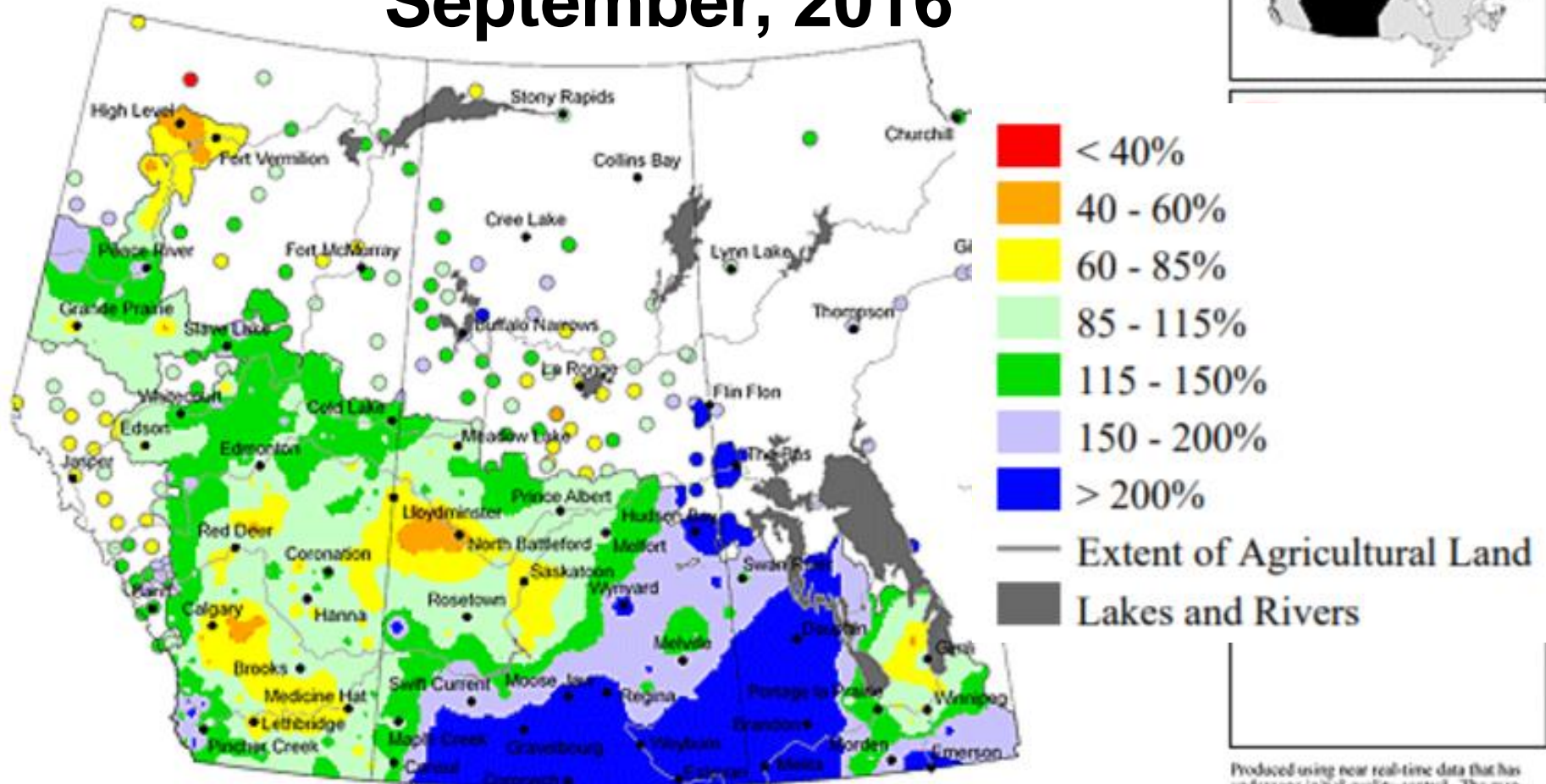


1 Month (30 Days) Percent of Average Precipitation (Prairie Region)

September 4, 2016 to October 3, 2016



September, 2016



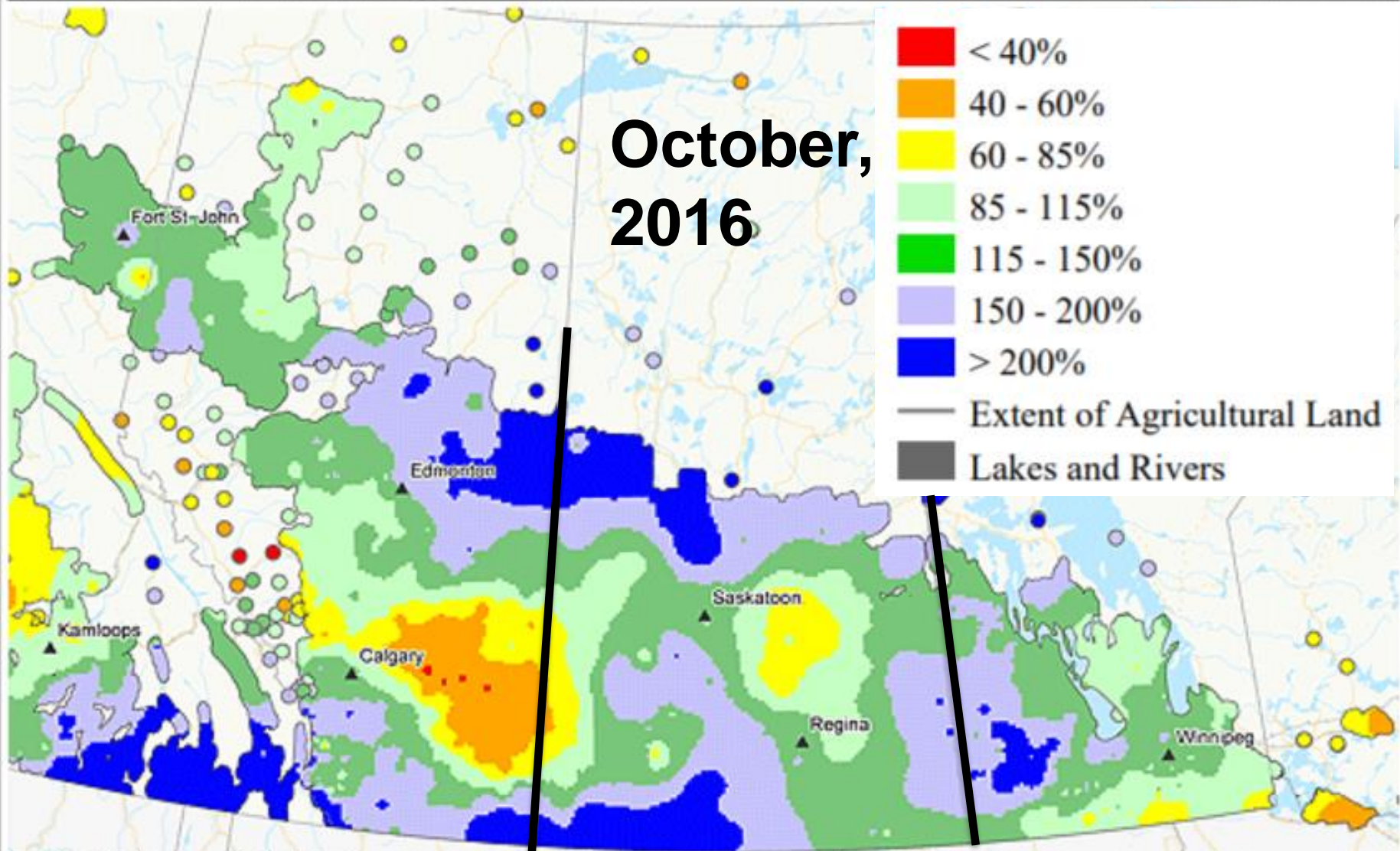
Produced using near real-time data that has undergone initial quality control. The map may not be accurate for all regions due to data availability and data errors.



30 Day Percent of Average Precipitation

October 9, 2016 to November 7, 2016

October, 2016



Copyright © 2016 Agriculture and Agri-Food Canada

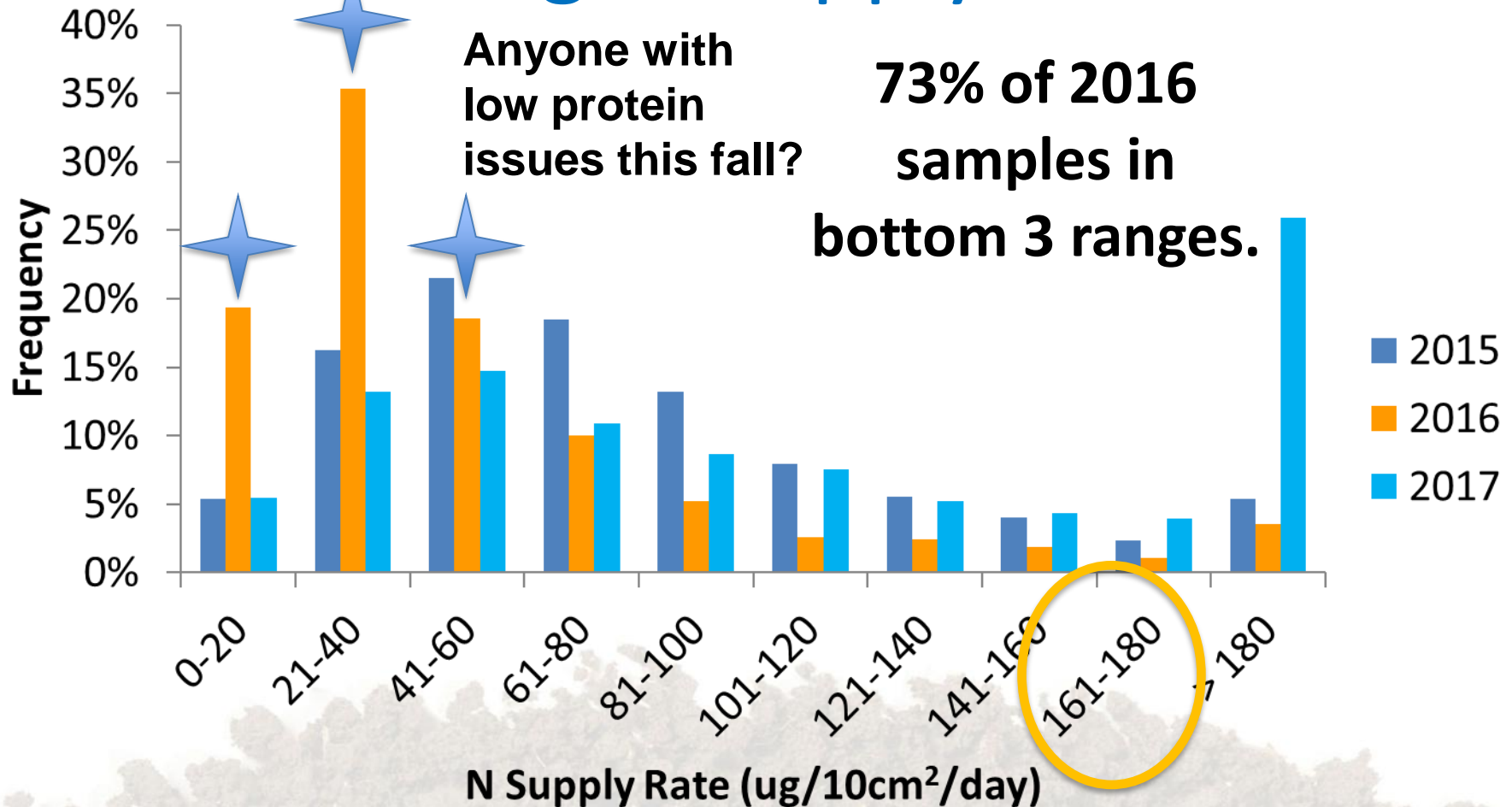
Prepared by Agriculture and Agri-Food Canada's Science and Technology Branch. Data provided through partnership with Environment Canada, Natural Resources Canada, Provincial and private agencies.

Produced using near real-time data that has undergone some quality control. The accuracy of this map varies due to data availability and potential data errors.

Created: 2017-01-17
www.agr.gc.ca/drought

Three Year Trend Comparison

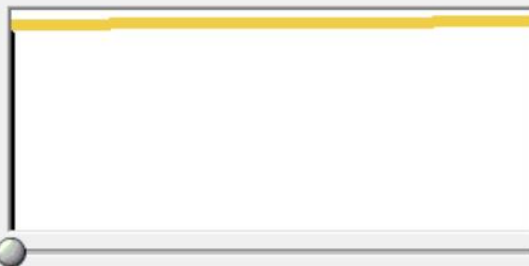
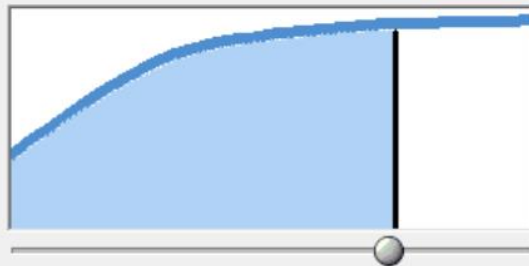
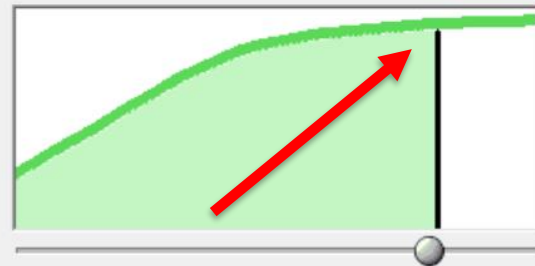
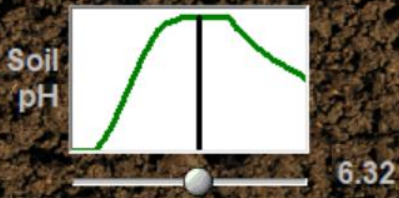
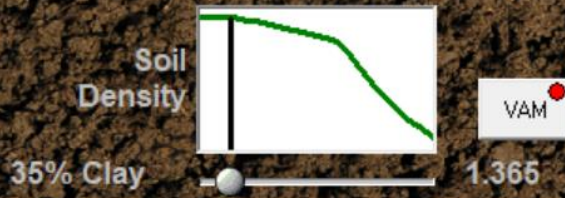
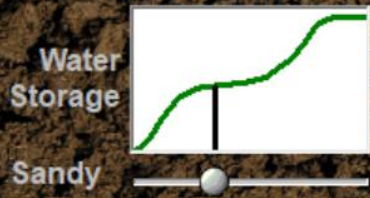
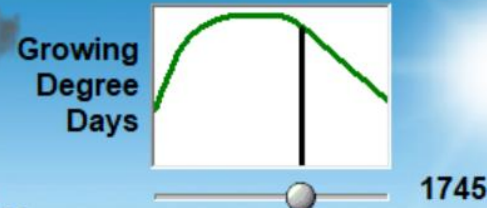
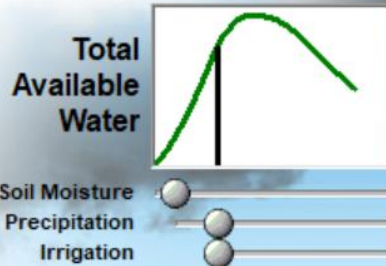
Nitrogen Supply Rate



A possible cause to all the low protein wheat?

- Above average 2016 canola yields
- Large amount of fall 2016 rains
- Adoption of new wheat genetics

= a heavy draw on soil supply N



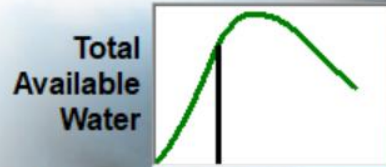
Sample SW 25-08-01 W2

N	17.2	<input type="range" value="85.0"/>	85.0	85.0
P ₂ O ₅	5.6	<input type="range" value="25.0"/>	25.0	25.0
K ₂ O	59.4	<input type="range" value="0.0"/>	25.0	0.0
S	12.8	<input type="range" value="0.0"/>	0.0	0.0
Ca		<input type="range" value="0.0"/>	0.0	
Mg		<input type="range" value="0.0"/>	0.0	
Cu	0.06	<input type="range" value="0.30"/>	0.30	
Zn	0.25	<input type="range" value="0.35"/>	0.35	
Mn	0.65	<input type="range" value="0.30"/>	0.30	
Fe	0.90	<input type="range" value="0.04"/>	0.04	
B	0.37			

Field Map



Summary



Soil Moisture 3.5
 Precipitation 7.1 11
 Irrigation 0

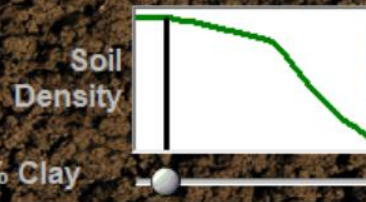
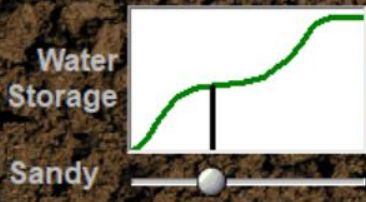
HO Spring Wheat
 Max Yield: 73.8



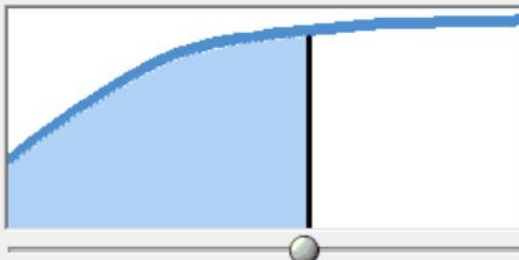
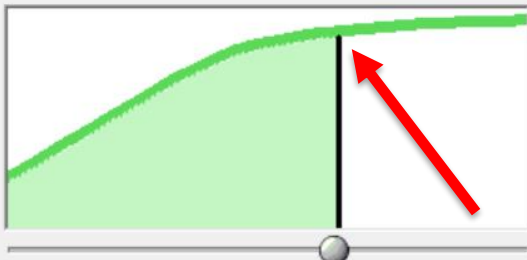
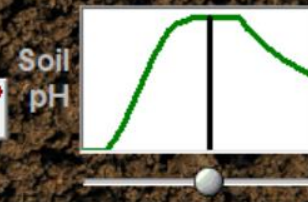
Wheat
 I: 73.8

58.2

0.48



VAM



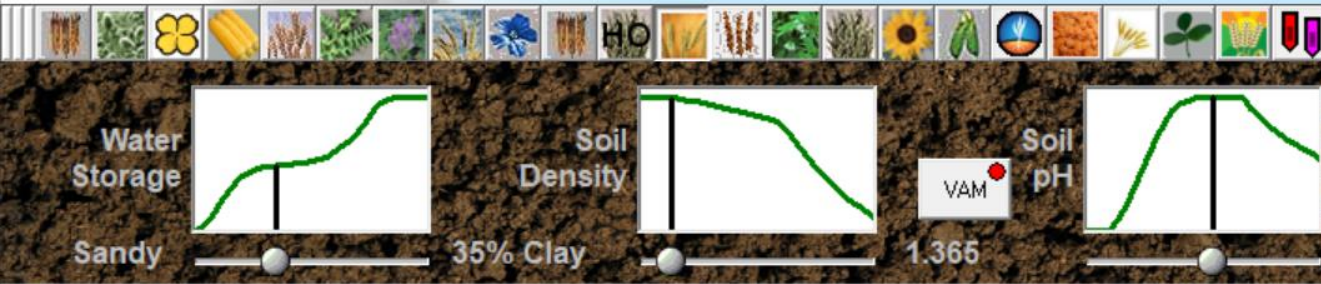
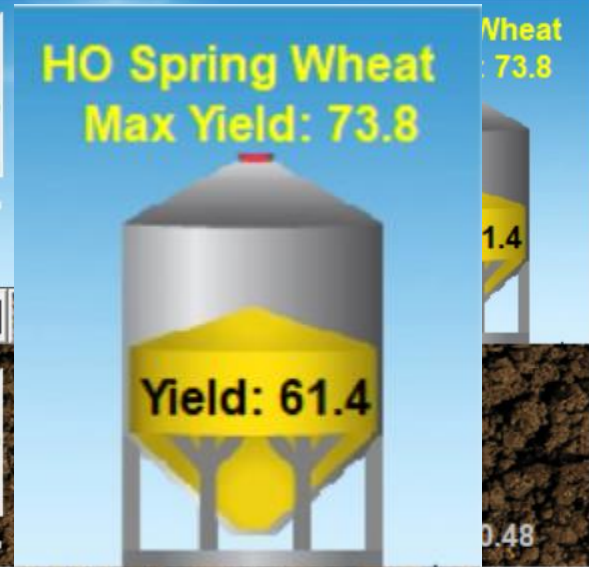
Sample SW 25-08-01 W2

N	19.6	<input type="range"/>	85.0	0 85.0
P ₂ O ₅	6.4	<input type="range"/>	25.0	2 25.0
K ₂ O	67.7	<input type="range"/>	0.0	.1 0.0
S	14.5	<input type="range"/>	0.0	2 0.0
Ca		<input type="range"/>	0.0	3
Mg		<input type="range"/>	0.0	4
Cu	0.07	<input type="range"/>	0.11	
Zn	0.28	<input type="range"/>	0.37	
Mn	0.74	<input type="range"/>	0.44	
Fe	1.02	<input type="range"/>	0.37	
B	0.42	<input type="range"/>	0.04	

Field Map



Summary



Lost yield potential – 3 bu x \$6.50/bu = \$19.50

Protein discount 12.5% vs 13.5%,
\$0.05/10th 61 bu x \$0.50/bu = \$30.50

Total = \$50.00/ac

Sample SW 25-08-01 W2

N	19.6				
P ₂ O ₅	6.4			105.0	30.0
K ₂ O		67.7		30.0	0.0
S			14.5	0.0	0.0
Ca				0.0	
Mg				0.0	
Cu		0.07			
Zn			0.28		0.37
Mn				0.74	0.44
Fe				1.02	0.37
B				0.42	0.04

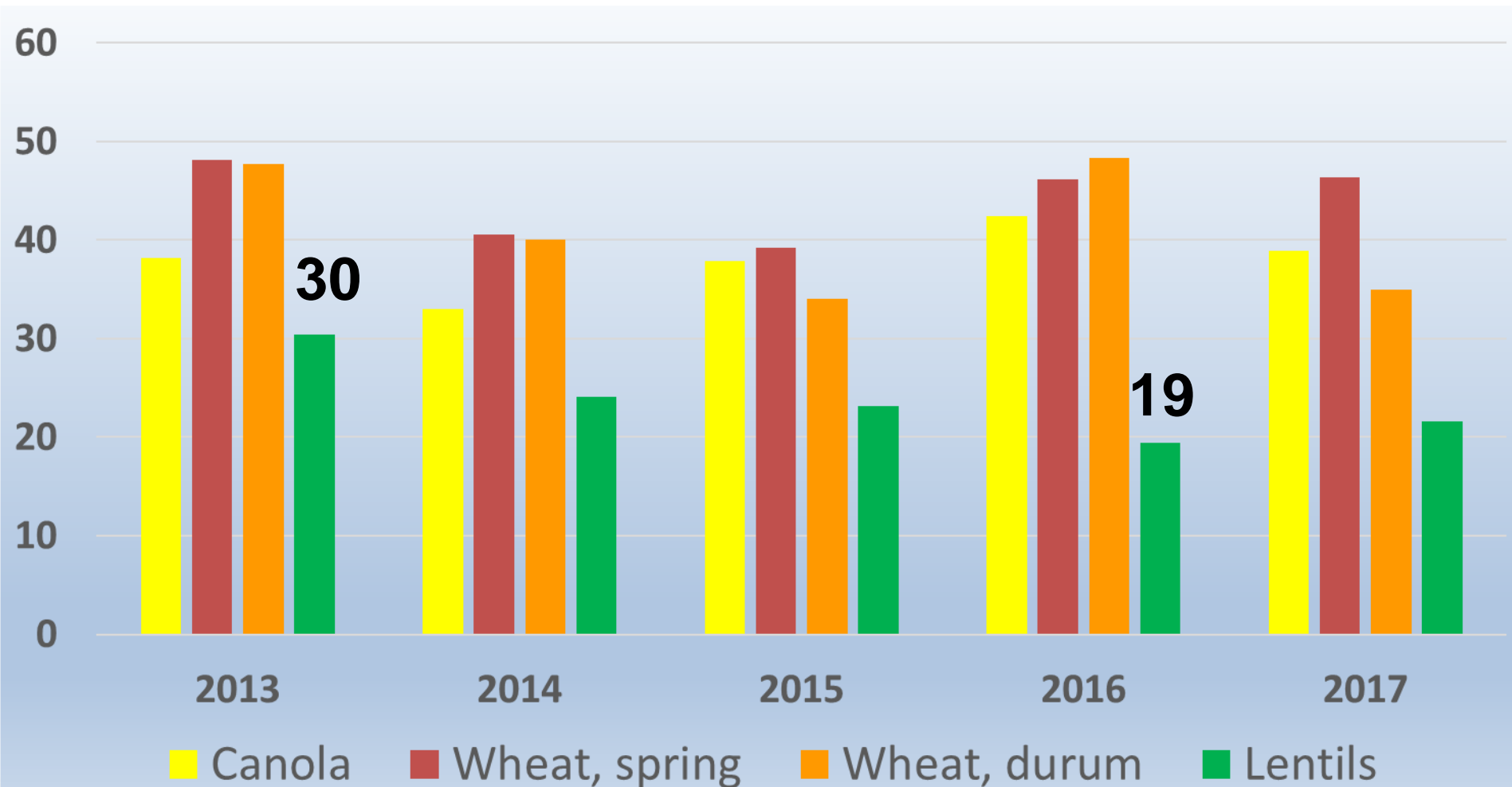
Field Map



Summary

Saskatchewan Average Crop Yields

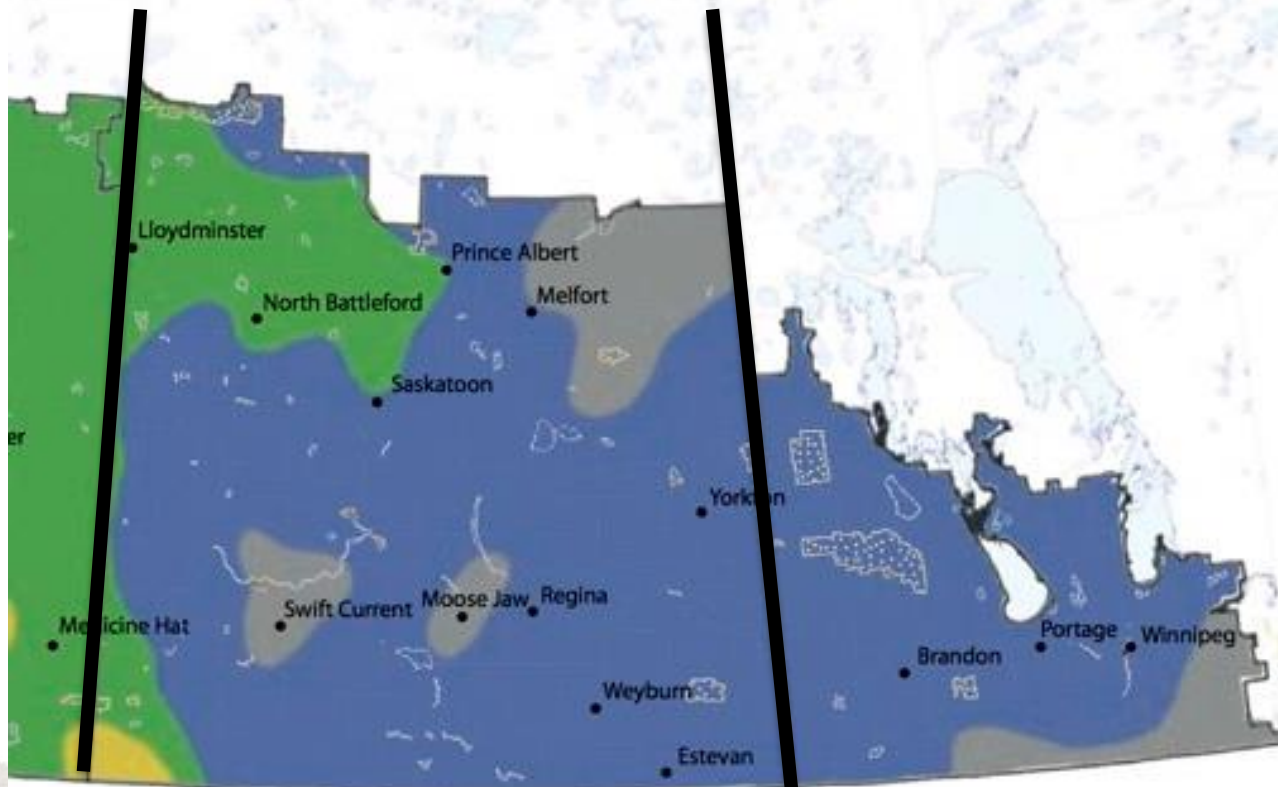
(Bu/ac) Source: Statistics Canada



STUBBLE SOIL MOISTURE: NOVEMBER 1, 2016

(General guide only — check
your own fields in spring)

Prepared by Les Henry, January 5, 2017



VERY DRY

Stubble has essentially no
moisture storage below 6 inches
— not mapped this year

DRY

Sandy Soils Wet to 12-24"
Medium Soils Wet to 6-18"
Heavy Soils Wet to 6-12"
(About 1 to 2 inches of available water)

MOIST

Sandy Soils Wet to 24-48"
Medium Soils Wet to 18-30"
Heavy Soils Wet to 12-24"
(About 2 to 4 inches of available water)
Will include local areas
with no dry layer

WET

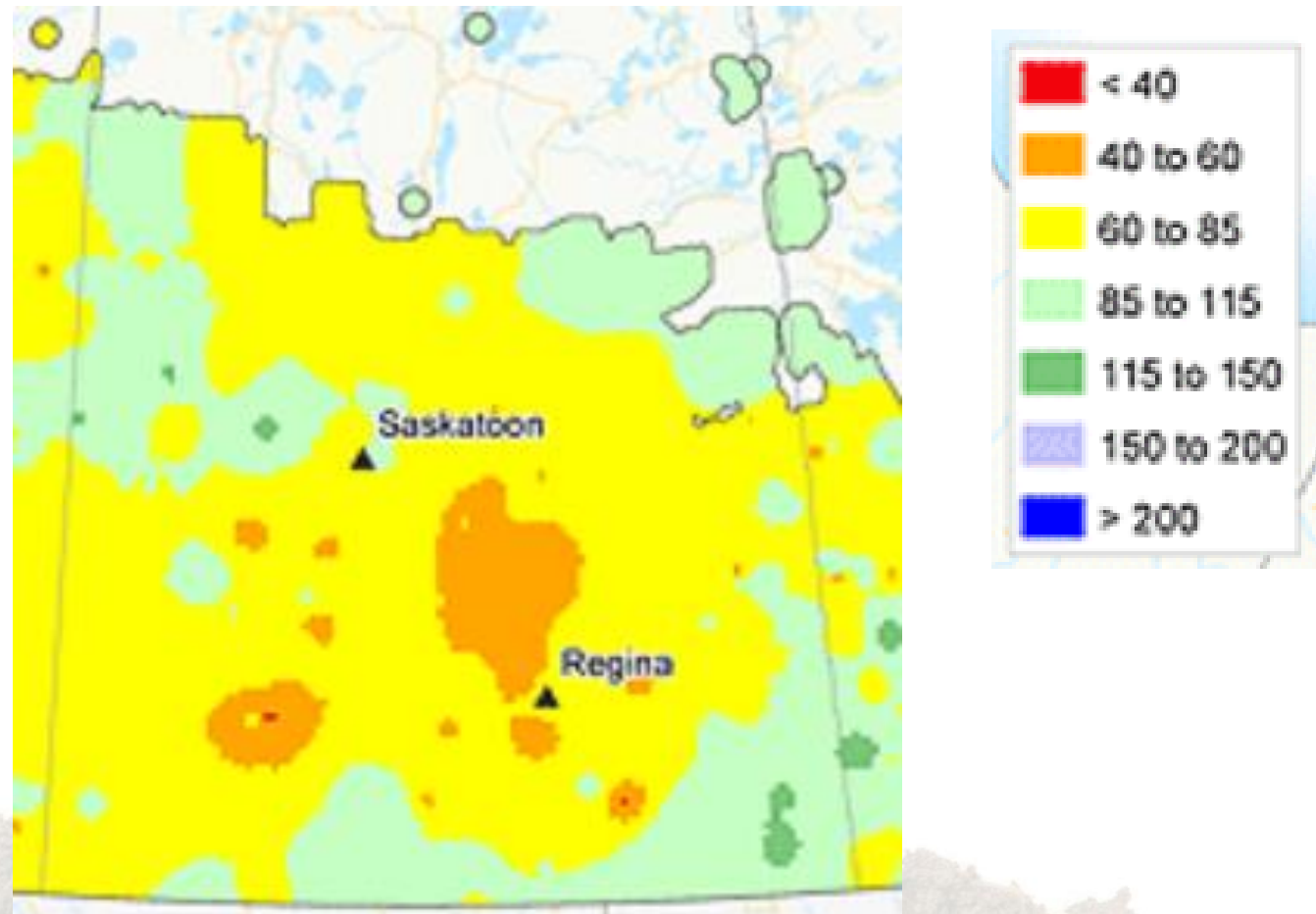
No dry layer in sandy,
medium or heavy soils
(Sandy = 4, Medium = 6, Heavy = 8
inches of available water)
Will include local areas of Super Wet

SUPER WET

Excess rain — water table
rise might occur

Source:
Grainews 2016-2-17

Percent of Average Precipitation November 1, 2016 – March 31, 2017



Saskatchewan Cumulative Rainfall: WESTERN AG

April 1 – July 31, 2017

Rainfall (mm)

