SASKATCHEWAN SOIL SURVEY MAPS:
APPLICATION TO AGRONOMY AND
PRECISION AGRICULTURE

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SOILS AND CROPS
PRAIRIELAND PARK, SASKATOON
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OUTLINE

1. PRECISION AG – 18 YEARS : THE JOURNAL

2. SASK. THE FIRST SOIL SURVEY

3. SASK. THE SECOND SOIL SURVEY

4. SOILS & CROPS 2018 – PAPER MAPS CANSIS SK SIS : THE FUTURE
1. PRECISION AGRICULTURE – THE JOURNAL

1. Began in 1999 – now 18 years - all online

2. Most papers are about the technology – not agronomy

3. The few that deal with variable rate N show little benefit to variable rate

4. Almost none even mention the soil(s)

5. How can we compare methods if we do not know the soil??
How can we compare methods of Prec Ag if we do not know the soil ??
How can we develop protocols for Prec Ag if we do not know the soil??
The soil map info provides the framework to develop discreet methods based on SOIL types.
2. The First Soil Survey 1920-1950

The first survey mapped the LAND not the SOIL

Regina: Hv Clay

Weyburn: Loam

Soils described in report only

Regina Heavy Clay and Weyburn Loam were household names
All agronomic research and extension was based on the unified concept of

SOIL SURVEY REPORT & MAP # 12

AND

SOIL SURVEY REPORT & MAP # 13
SOIL SURVEY REPORT # 12

Up to Township 48 (Prince Albert)

Scale 1 inch = 8 miles
Scale 1 inch = 8 miles
Soil Association, Texture & topography tell it all

Soil Association = One Parent Material

in One Soil Zone
<table>
<thead>
<tr>
<th>Soil Zone</th>
<th>Glacial Till</th>
<th>Lacustrine (Medium)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BROWN</td>
<td>Haverhill</td>
<td>Fox Valley</td>
</tr>
<tr>
<td>DARK BROWN</td>
<td>Weyburn</td>
<td>Elstow</td>
</tr>
<tr>
<td>BLACK</td>
<td>Oxbow</td>
<td>Blaine Lake</td>
</tr>
<tr>
<td>THICK BLACK</td>
<td>Yorkton</td>
<td>Melfort</td>
</tr>
<tr>
<td>GREY BLACK</td>
<td>Whitewood</td>
<td>Kamsack</td>
</tr>
<tr>
<td>GREY</td>
<td>Waitville</td>
<td>(Dorintosh)</td>
</tr>
</tbody>
</table>
SOIL SURVEY REPORT # 13

Ag areas north of Township 48

Scale 1 inch = 3 miles
Np soils – Mother Nature provided good internal drainage

North of Tp 48 i.e. P A

Scale 1 inch = 3 miles

Carrot R soils K deficient

#13

K no K
HOW WAS #12 & #13 INFORMATION USED FOR GOOD AGRONOMY?
You are from Cupar. Are you north of town in the rolling land with stones (Oxbow Loam) or south of town in the flat clay with no stones (Indian Head Clay)?
SASK. SOIL TESTING LAB
1966-1994

* EVERY FARM SAMPLE WAS ASSIGNED A SOIL ASSOCIATION AND TEXTURE

* THE FIRST FARM SOIL TEST REPORT IN 1966 WAS GENERATED BY COMPUTER

*SOIL TEST SUMMARYSES BY SOIL ASSOCIATION WERE GENERATED
* WHEN THE FIRST SURVEY WAS COMPLETED IT FORMED THE FRAMEWORK TO COORDINATE ALL RESEARCH AND EXTENSION WORK FOR DECADES.

* SOIL ASSOCIATION AND TEXTURE (e.g. REGINA HEAVY CLAY OR WEYBURN LOAM) WERE ‘EVERYDAY TERMS’ TO DESCRIBE THE SOIL WHERE RESEARCH WAS CONDUCTED OR FARM RECOMMENDATIONS WERE MADE.

* EVERY SOIL SAMPLE SUBMITTED TO THE SASK SOIL TESTING LAB FROM 1966 TO 1994 WAS LABELLED WITH SOIL ASSOCIATION AND TEXTURE.

* SOIL TEST DATA SUMMARIES BY ASSOCIATION WERE USED TO FURTHER CHARACTERIZE SOILS
Let us look at an example of the necessity of soil map info to do good agronomy:

Kelvington Area 1960s/70s
Waitville Loam  Grey Wooded (Luvisol) 
Minky Farm : North of Nut Mountain

Wheat ~ 1966  No N fertilizer = No Crop
N as broadcast ammonium nitrate 34-0-0

N 60 lb/ac  N 0

½ mile strip tests for N soil test correlation
Kelvington Hall
Al Slinkard preaching pulses
3. The Second Soil Survey 1950 to 1990s

The second survey used a map unit that showed approximate distribution of individual soil profiles within a land unit. e.g. Weyburn 3 : Loam

3 = Soil Profile types

The additional information is very useful in understanding how the soils relate to the landscape and to WATER over and through the soils. The soil profile is the 10,000 year record of water flux at soil surface.
The Second Soil Survey was published in 3 formats
The Second Soil Survey was published in 3 formats

1. **Colored maps** on basis of National Topographic System Map Sheets ~ 1/3 of Ag area - 89 RMs

2. **Detailed Atlases** of small groups of RMs with colored maps of basic soils information plus several themes e.g. salinity, topography, geology, et al. 24 RMs only

3. **Individual RM reports** and maps 8 ½ x 11 inch and in black and white- good information but hard to use. 186 RMs

**SCALE = 1 INCH = 2 MILES**
SOIL SURVEYS IN SASKATCHEWAN

SASKATCHEWAN LAND RESOURCE CENTRE

Report and Map Format
- Provincial Forest
- Rural Municipality
- Mapsheet

Atlas RMs outlined in RED

Atlas RMs
SOILS MAP:
SOLONETZIC SOILS
Able to interpret groundwater from this soil info
Atlases Provide:
- Soils
- Geology
- Interpretive maps
- Salinity
- Capability
- Surface Drainage
- & Wetlands
- Productivity
- Stones & more
Format 3: B&W e.g. Craik RM 186 RM
(not an easy read but GOOD information)

Windfong
Concaves etc
228 acres salty ground

Good information but needs better format
Can be directly accessed from Google
4. The Need for the Future

*To be useful for agronomy, the second survey needed be combined into one uniform format which will form the base on which to build Precision Ag and Agronomy for the future.

*Thanks to Dr. Angela Bedard-Haughn this has been done in the on-line form of SK SIS

........... a sneak peak
Tp 29 R13 W3 – between Rosetown and Sovereign

**RED**-Regina 3 Heavy Clay:3 = Gleysolic (poorly drained)

Field work done in mid 1960s.
ALSO FROM SK SIS

~ 2012 AIR PHOTO: RA 3 HC - IS NOW A 2000 ACRE SLOUGH

THE KEY IS IN THE MAP UNIT 3 = GLEY SOLIC = POORLY DRAINED
For Soils and Crops 2018 we have:

A large screen and an IMAC running SK SIS
(Large screen compliments AAFC – Erl Svendsen- Thanks Erl)

An IMAC running CANSIS – which provides PDFs of ALL Canadian soil maps

Displays of paper copies of First and Second Soil survey
Paper copies of First Soil Survey maps #12 #13

Paper copies of Second soil survey:
NTS Map Sheets (all of them)
Atlases (all of them)
RM maps (a few examples)

We have copies of most maps that you can take with you at no charge
If we run out today we can get more for tomorrow
REMEMBER:

PDFs of all paper maps are available at CANSIS

THE
END
?????????????