Soil Survey of the

Witchekan Lake Indian Reserve No. 117

H.B. Stonehouse, J.L. Henry

Saskatchewan Institute of Pedology, Publication S166
University of Saskatchewan,
Saskatoon, Saskatchewan.

1969.

Location

The Witchekan Lake Indian Reserve, located on the west side of Witchekan Lake about 10 miles northeast of the town of Spiritwood, includes an area of approximately 4,400 acres. (All or portions of Sections 31 and 32 in Township 51, Range 11 and Sections 5 to 8, 16 to 20 and 30 in Township 52, Range 11, all west of the 3rd Principal Meridian).

MAP LEGEND

The series of symbols which appear within each area, separated on the map by a soil boundary, are interpreted by means of the map legend.

There may be some terms in the legend which are unfamiliar to the reader. The booklet, "A Guide to Understanding Saskatchewan Soils"[1], will familiarize the reader with the terms used. To properly interpret the legend it is essential that the above-mentioned booklet be used as a reference.

Soils

Dominantly Dark Gray Chernozemic Soils

Weirdale - Dominant Dark Gray Chernozemic soils developed on moderately fine textured, highly calcareous, glacio-lacustrine deposits.

Wel - Dominant* Calcareous Dark Gray.

Paddockwood - Dominant Dark Gray Chernozemic soils developed on medium to moderately fine textured, highly calcareous, modified glacial till.

Pwl - Dominant Rego and Calcareous Dark Gray with a significant** occurrence of undifferentiated Gleysolic soils.

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*Series which are Dominant occupy over 40% of the Map Unit.

**Series which are Significant occupy over 15% of the Map Unit but less than 40%.

Dominantly Thick*** Dark Gray Chernozemic Soils

Pelly - Dominant Dark Gray Chernozemic soils (thick phase) developed on medium textured, calcareous, modified glacial till.

P2 - Dominant Orthic Dark Gray with a significant occurrence of undifferentiated Gleysolic soils.

Miscellaneous Soils

Alluvium - A group of soils developed on variable textured alluvial deposits.

Av6 - Dominant saline and carbonated Rego Humic Gleysols.

Av13 - Dominant saline and carbonated Chernozemics with significant saline and carbonated Gleysolics.

Textural Groupings and Classes

Textural Group	Textural Class
Coarse textured	Sands (s), loamy sands (ls)
Moderately coarse textured	Sandy loam (sl), fine sandy loam (fl)
Medium textured	Very fine sandy loam (vl), loam (l), silt loam (sil)
Moderately fine textured	Sandy clay loam (scl), clay loam (cl), silty clay loam (sicl)
Fine textured	Sandy clay (sc), clay (c), silty clay (sic), heavy clay (hc)

Gravelly sandy loam (gsl) and gravelly loam (gl) are recorded where present.

*** Soils which are designated as being thick have an Ap or Ah horizon depth of 8 inches or more.

Landforms

Name	Symbol	Description
Glacial Till Landforms		
Ground Moraine	G	Gently undulating, unpatterned ground moraine, without external drainage.
	Ga	Gently to roughly undulating ground moraine with a pattern of knolls and depressions, without external drainage.
Glacio-Lacustrine Landforms		
Glacial Lake Plain	L	Gently undulating, unpatterned glacial lake plain, without external drainage.
Glacio-Alluvial Landforms		
Post Glacial Alluvium Deposits	A	Depressional to nearly level post glacial alluvium deposits which are not externally drained.

Topography

Description	Symbol	Percentage Slope
Depressional to nearly level	1	0-0.5%*
Very gently sloping or gently undulating	2	0.5-2%
Gently sloping or roughly undulating	3	2-5%

*A 0.5% slope means a rise or fall of one-half a foot for every 100 feet of horizontal distance.

Other Map Symbols

Slough or depressional area which is periodically flooded.

Soil boundary.

Township corner.

Tp — Township.

Rg — Range.

Not suitable for grain production.

SOIL CAPABILITY FOR AGRICULTURE

Class	Soil Capability for Agriculture
1	No significant limitations.
2	Moderate limitations.
3	Moderately severe limitations.
4	Severe limitations.
5	Serious limitations - not suitable for annual crops but suitable for improved pasture.
6	Very serious limitations - suited only for permanent pasture.

Kind of Limitations

Climatic limitations - expressed on the basis of adverse subregional climate where there are no other limitations except climate.

Cs - heat deficiency expressed in terms of length of growing season and frost-free period.

Soil limitations - caused by unfavorable soil characteristics.

m - insufficient moisture holding capacity.

n - excessive soil salinity.

Landscape limitations

w - excess water - applies to soils where excess water, apart from that brought about by inundation, is a limitation in their use for agriculture.

Guiding Criteria for Capability Classes in Saskatchewan

Class	Degree of Limitations	Range of Adaptability	Productivity*	Other Characteristics
1	No significant limitations.	Wide range of field crops.	Moderately high to high, 20-25 bu/acre (30.0 to 35.0 bu/acre)**	Deep, well drained, good water holding capacity. Natural high fertility.
2	Moderate limitations due to climate, soil or landscape.	Fairly wide range of field crops.	Moderately high to high, 15.5-20 bu/acre (24.0 to 30.0 bu/acre)**	Good water holding capacity. Natural high fertility or highly responsive to fertilizer.
3	Moderately severe limitations due to climate, soil or landscape.	Moderate range of field crops.	Medium to moderately high, 11.0 -15.5 bu/acre (19-24 bu/acre)**	Limitations adversely affect the timing and ease of tillage, planting, harvesting, and application of conservation practices.
4	Severe limitations due to climate, soil or landscape.	Narrow range of field crops.	Low to medium 9.0-11.0 bu/acre (13-15 bu/acre)**	The high incidence of low yields or disastrous failures suggests that some of these soils be removed from continued cultivation.
5	Serious soil or landscape limitations make them unsuitable for the production of annual crops.	Suited for the production of adapted grasses and legumes.		Soils within this class are responsive to improvement practices through the use of farm machinery. Improvement of 25% of an area can double the carrying capacity.
6	Very serious soil or landscape limitations restrict their use to native grazing.	Suited only to native pasture.		Soils in this class are not responsive to improvement practice.
7	Prevent agricultural use.	Unsuited for agricultural use.		Bodies of water, townsites, parks, airports, railroads.

*Estimated productivity of arable Classes 1-4 is expressed in terms of long-time (1932-1961) average wheat yields in bu/acre.

**Estimated potential productivity.

THE SOILS OF THE WITCHEKAN LAKE INDIAN RESERVE NO. 117

Interpretation of the Soil Symbol Sequence

The sequence of the soil symbols given for each area reported on the map is always arranged in the following order: Soil Association and Map Unit:Texture: Landform:Percentage Slope. An illustration of this is the symbol sequence P2:1:Ga2 which occurs in Section 19, Township 52, Range 11.

The letter P represents the abbreviation for the Pelly Association described in the legend as "Dominant Dark Gray Chernozemic soils (thick phase) developed on medium textured, calcareous, modified glacial till". The medium textural group is made up of very fine sandy to silty loam textural classes. The number 2 indicates a Map Unit in the Pelly Association, namely P2, which is described as "Dominant Orthic Dark Gray with a significant occurrence of undifferentiated Gleysolic soils". The letter 1 represents the specific textural class of the surface soil, namely loam. The letters Ga described under the heading "Landforms", signify a gently to roughly undulating ground moraine with a pattern of knolls and depressions, without external drainage. The topography in the area is indicated by the number 2, defined in the legend as slopes ranging from 0.5-2%.

It will be noted that the soil symbol sequence in one area contains two Associations and their Map Units. That is, in Section 30, Township 52, Range 11, the symbols P2:1-Pwl:1 represent Pelly and Paddockwood Associations and their Map Units. Where two or more Associations and their Map Units occur in the one sequence, the first mentioned Association is dominant. The reason that some areas are indicated as a complex, such as the one above, is that at the present scale of mapping and the expected land use it was not considered practical to separate these soils.

Interpretation of the Soil Capability[2] Symbol Sequence

Each area separated on the map (by a soil boundary) contains not only the soil symbol sequence already described, but also a capability sequence. In the area containing the symbols P2:1:Ga2 the symbols $2^{8}_{Cs}\ 5^{2}_{w}$ occur and are interpreted as follows. The lower numbers indicate the capability class, the small letters indicate the "limitations" or adverse, climatic, soil or landscape features which relegate the soil to its particular capability class. The upper numbers indicate the percentage of the soil area designated to a specific capability class. By referring to the heading in the legend designated as "Soil Capability for Agriculture", it can be seen that $2^{8}_{Cs}\ 5^{2}_{w}$ describes an area of 80% Class 2 soil, which has moderate limitations due to a limited growing season and frost-free period (Cs), and 20% Class 5 soil which has serious limitations due to excess water (w). It can, therefore, be concluded that this area of gently undulating Pelly loam, is well suited to the production of annual crops, with the exception of the low lying areas which are wet.

EVALUATION OF THE AGRICULTURAL POTENTIAL OF THE WITCHEKAN LAKE INDIAN RESERVE

An evaluation of the agricultural potential may be made of any portion of the map area by interpreting the map symbols by means of the legend.

All soil areas on the Witchekan Lake Reserve, with the exception of the Alluvium areas which are shown on the soil map as shaded areas, have the same agricultural potential. These soils are all rated as dominantly Class 2 soils and offer an area of approximately 3,250 acres, of which approximately 80% is well suited to the production of annual grain crops.

The remainder of the reserve is made up of Alluvium soils which are saline and usually excessively wet. These soils are rated as Class 5 and 6 and are suited only to permanent pasture with the possibility that under suitable conditions they may also produce some native hay.

Acknowledgments

The authors wish to acknowledge the assistance of Mr. J.A. Shields who reviewed the soil capacility of the reserve and Mr. J. Schmidt who assisted with the field work.

References

1. A Guide to Understanding Saskatchewan Soils. H.C. Moss. 1965. Saskatchewan Institute of Pedology Publication M1. Extension Publication 175. Distributed by Extension Division, University of Saskatchewan, Saskatoon.

2. A Guide to Soil Capability and Land Inventory Maps in Saskatchewan. Saskatchewan Institute of Pedology Publication M8. Department of Soil Science, University of Saskatchewan, Saskatoon. 1968.

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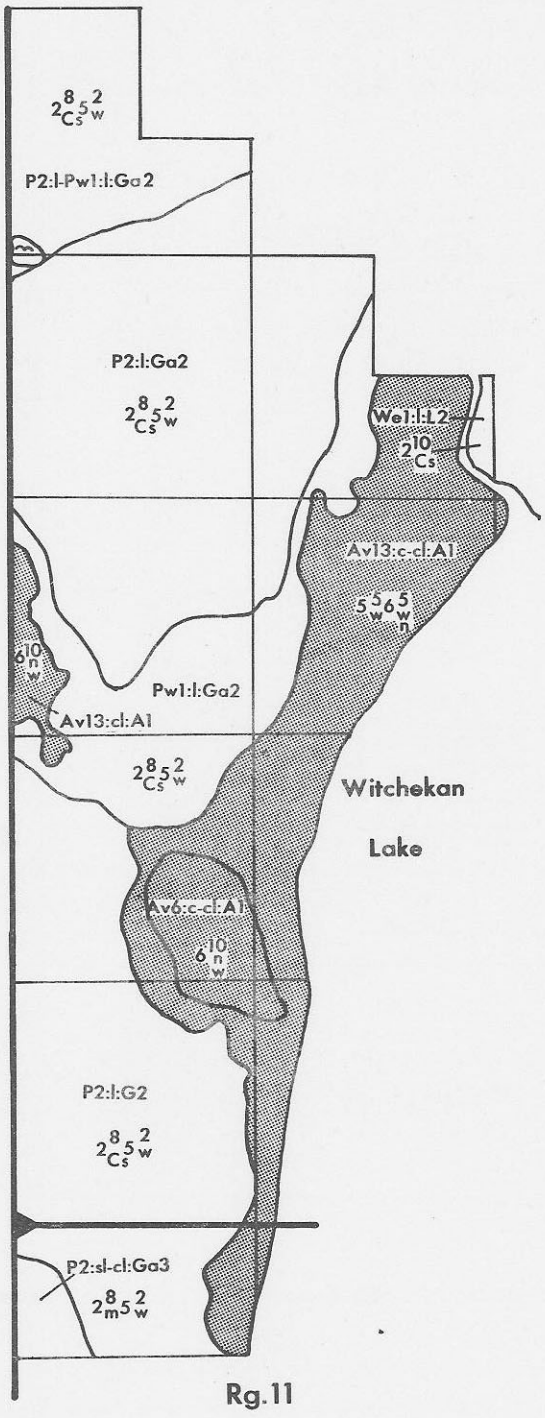

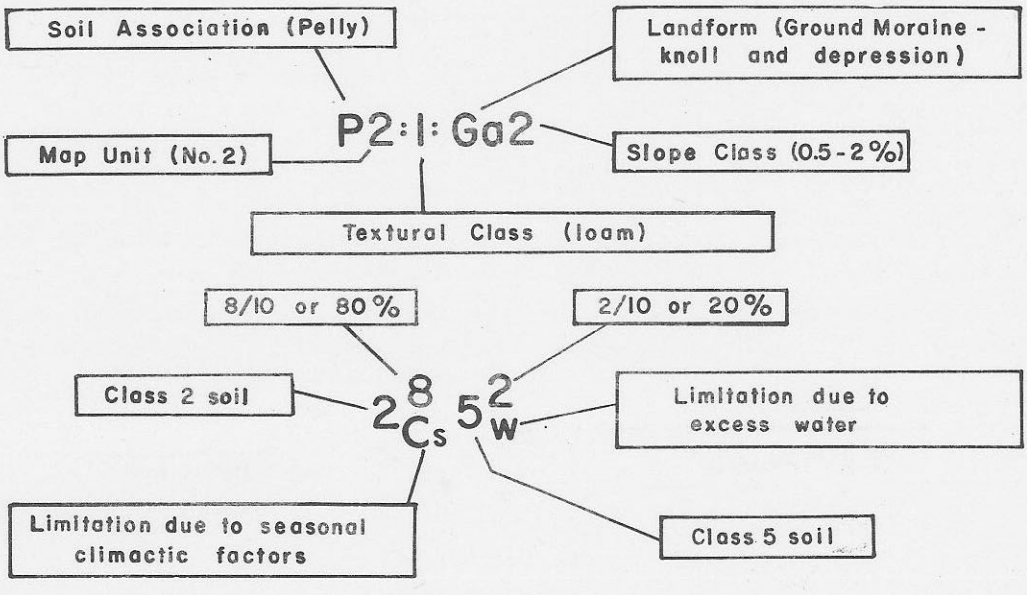

Scale-1.25 inches to 1 mile or 1:50,000 Saskatchewan Institute of Pedology 1969