

Soil Survey of the
Muskowekwan Indian Reserve No. 85

H.B. Stonehouse, J.G. Ellis

Saskatchewan Institute of Pedology Publication S118
University of Saskatchewan,
Saskatoon, Saskatchewan.

1967.

MAP LEGEND

Soils

Dominantly Black Chernozemic Soils

- Cudworth - Dominant Black Chernozemic soils developed on medium to moderately fine textured, moderately to highly calcareous, silty glacio-lacustrine deposits.
- Cd1 - Dominant* combination of Rego and Calcareous Black with significant** Orthic Black.
- Cd4 - Dominant combination of Rego and Calcareous Black with significant salinized and gleyed Rego and Calcareous Black.
- Meota - Dominant Black Chernozemic soils developed on coarse to medium textured sandy glacio-fluvial and glacio-lacustrine deposits.
- Mel - Dominant Orthic Black.
- Oxbow - Dominant Black Chernozemic soils developed on medium to moderately fine textured calcareous glacial till.
- O7 - Dominant Orthic Black with significant Calcareous Black.
- O8 - Dominant Orthic Black with a significant combination of Rego and Calcareous Black and a significant occurrence of undifferentiated Gleysolic soils.
- Oxbow-Whitewood - Dominant Black Chernozemic soils with significant Dark Gray Chernozemic soils developed on medium to moderately fine textured calcareous glacial till.
- OWh5 - Dominant Orthic Black with significant Orthic and Eluviated Dark Gray and a significant occurrence of undifferentiated Gleysolic soils.

*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%.

Whitesand - Dominant Black Chernozemic soils developed on coarse to moderately coarse textured glacio-fluvial deposits.

Wsl - Dominant Orthic Black.

Dominantly Dark Gray Chernozemic Soils

Glenbush - Dominant Dark Gray Chernozemic soils developed on coarse to moderately coarse textured glacio-fluvial deposits.

Gbl - Dominant Orthic Dark Gray.

Corbett - Dominant Dark Gray Chernozemic soils developed on medium to moderately fine textured, silty glacio-lacustrine deposits.

Ct2 - A combination of Orthic and Eluviated Dark Gray.

Touchwood - Dominant Dark Gray Chernozemic soils developed on fine textured glacio-lacustrine deposits.

Twl - A combination of Orthic and Eluviated Dark Gray.

Whitewood-Oxbow - Dominant Dark Gray Chernozemic soils with significant Black Chernozemic soils developed on medium to moderately fine textured calcareous glacial till.

Wh02 - Dominant Orthic Dark Gray with significant Eluviated Dark Gray and significant Orthic Black and a significant occurrence of undifferentiated Gleysolic soils.

Dominantly Podzolic Soils

Waitville - Dominant Podzolic soils developed on medium to moderately fine textured calcareous glacial till.

Wv2 - Dominant Orthic Gray Wooded with a significant occurrence of undifferentiated Gleysolic soils.

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 (gs1) and gravelly loams (gl) are recorded where present.

Landforms

Name	Symbol	Description
<u>Glacial Till Landforms</u>		
Moraine	Ma	Gently to strongly rolling moraine with a knob and kettle pattern having no external drainage.
Ground Moraine	Ga	Gently to roughly undulating ground moraine with a knob and kettle pattern having no external drainage.
<u>Glacio-lacustrine Landforms</u>		
Glacial Lake Plain	La	Undulating plain of knolls and depressions without external drainage.
<u>Glacio-alluvial Landforms</u>		
Glacial Lake Delta	Aa	Undulating plain with a knoll and depression pattern having no external drainage.
<u>Glacio-fluvial Landforms</u>		
Outwash Plain	Fa	Kettled or pitted plain without external drainage.

Topography

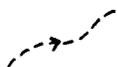
Description	Symbol	Percentage Slope
Gently sloping or roughly undulating	3	2-5%*
Moderately sloping or gently rolling	4	6-9%
Strongly sloping or moderately rolling	5	10-15%

*A slope of 2% means a rise or fall of 2 feet for every 100 feet of horizontal distance.

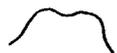
Other Map Symbols



Slough or depression area which is periodically flooded.



Drainage way indicating direction of flow.



Soil boundary.



Township corner.

Tp

Township.

Rg

Range.



Not suitable for grain production.



Marginal 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

Soil limitations - caused by unfavorable soil characteristics.

m: insufficient soil moisture holding capacity.

d: poor structure and/or permeability.

n: excessive soil salinity.

Landscape limitations

t: unfavorable topography.

w: excess water - applies to soils where excess water, apart from 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 MUSKOWEKWAN INDIAN RESERVE NO. 85

Location

The Muskowekwan Reserve is located in the east central part of Saskatchewan, immediately west of the town of Lestock. The reserve is 15,680 acres in extent and includes all or portions of Sections 1 to 13, 15 to 18 inclusive and 24 in Township 27, Range 15; and Sections 1 and 10 to 15 inclusive in Township 27, Range 16, all west of the 2nd Principal Meridian.

INTERPRETATION OF THE SOIL MAP

A map and legend have been prepared and comprise the first portion of this report. 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 describe soils in this province. To properly interpret the legend it is essential that the above-mentioned booklet be used as a reference.

Interpretation of Soil Symbol Sequence

The sequence of the soil symbols is always arranged in the same order in each separate area. This order is as follows: Association Map Unit: Texture:Landform:Percentage Slope. An illustration of this is the symbol sequence Wv2:l:Ma4 which occurs in Section 6, Township 27, Range 15.

By referring to the legend the symbols Wv2:l:Ma4 are interpreted as follows. The letters Wv represent the abbreviation for the Waitville Association which is described in the legend as being "Dominant Podzolic soils developed on medium to moderately fine textured calcareous glacial till". Medium to moderately fine textures are described under the heading "Textural Groupings and Classes". Glacial till soils are very seldom silty but the

remainder of the textures in the two textural groupings under discussion could occur in the Waitville Association. The number 2 indicates the Map Unit in the Waitville Association, namely Wv2 which is described as "Dominant Orthic Gray Wooded with a significant occurrence of undifferentiated Gleysolic soils". The letter l is the abbreviation for loam. All textural abbreviations are listed under the sub-heading "Textural Class". The letters Ma are described in the legend under the heading "Landforms" as "Gently to strongly rolling moraine with a knob and kettle pattern having no external drainage". The number 4 is the symbol for the Percentage Slope which is defined under the heading "Topography" as being between 6-9%.

It will be noted, for example, in Section 5, Township 27, Range 15 that the symbols Wsl:sl(g)-Gbl:sl(g) represent two 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.

When glacial till soils and glacio-lacustrine soils occur in complex, the usual sequence is that the glacial till soils occur above the glacio-lacustrine soils. However, this sequence does not always occur. In areas where there has been ice collapse the sequence is unpredictable, as is the case on the Muskowekwan Reserve. An example of this is the area of Whitewood-Oxbow-Touchwood in Section 15, Township 27, Range 16 where the glacio-lacustrine soils were found to occur above the glacial till soils in some instances.

Interpretation of Soil Capability² Symbol Sequence

Each area separated on the map by a soil boundary, contains not only the soil symbol sequence already described but also a soil capability sequence. In the area containing the symbols Wv2:1:Ma4 (which have been described above) the symbols $3\overset{8}{d}5^2\underset{t}{w}$ occur and are interpreted as follows. The lower numbers are the capability class, the small letters indicate the "limitation" or adverse soil features which relegate the soil area to its particular capability class. The upper numbers indicate the percentage of the soil area designated to specific capability classes. By referring to the heading in the legend designated as "Soil Capability for Agriculture" it can be seen that $3\overset{8}{d}5^2\underset{t}{w}$ means this is an area made up of 80% Class 3 soil which has moderately severe limitations due to poor structure and/or permeability (d) as well as unfavorable topography (t) and 20% Class 5 soil which has serious limitations due to excess water (w) in the depressions. It can, therefore, be concluded that while this area of rolling Waitville loam has certain limitations it is still suitable for the production of annual crops.

EVALUATION OF THE AGRICULTURAL POTENTIAL OF THE MUSKOWEKWAN 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.

The area with the best potential is the area of Oxbow-Cudworth in Sections 10, 11 and 15 in Township 27, Range 15. This is an area of about 175 acres of dominantly Class 2 soils, which are well suited to the production of annual seeded crops. Other areas with a good potential are the areas of Oxbow on Class 3 and 4 topography in Sections 1 to 3, 10 to 13, 15 and 24 in Township 27, Range 15. These areas represent about 5,100 acres of 60%

Class 2 soils and 20% Class 3 soils which are suitable for cultivation. Areas which are not as good but which could be used for grain production are the area of Oxbow-Whitewood on Class 4 topography and the area of Waitville on Class 4 topography in the western half of the reserve. This is an area of about 7,500 acres of 80% Class 3 soils which have moderately severe limitations.

The remainder of the reserve is made up of largely Podzolic soils on rough topography or sandy and gravelly soils. The sandy and gravelly areas are considered marginal for grain production and should not be considered for grain production as a forage and a livestock type of farming operation is recommended in areas which are classified as marginal for continuous crop production. The Podzolic soils on rough topography are not suitable for grain production and should remain uncultivated.

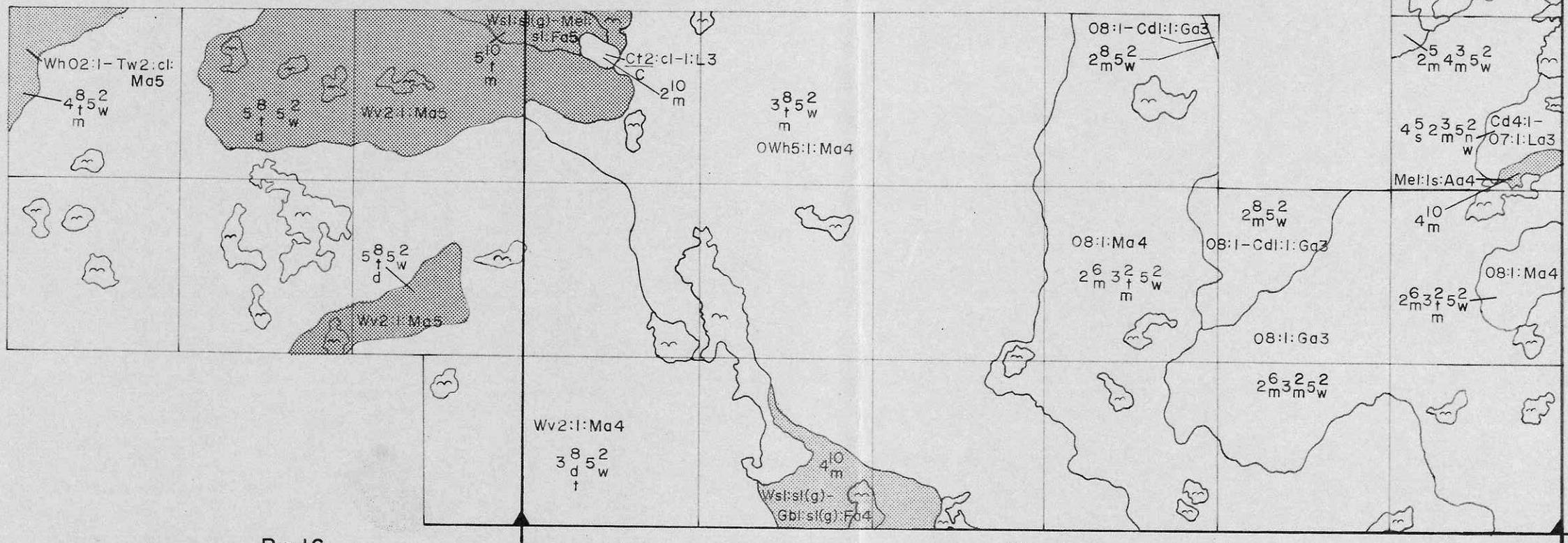
Acknowledgments

The authors wish to acknowledge the assistance of Mr. J. A. Shields who reviewed the soil capability of the reserve, and Messrs. G. Shaw, L. Babiuk and G. Luciuk 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 M2. Department of Soil Science, University of Saskatchewan, Saskatoon. 1966.

MUSKOWEKWAN I.R. NO. 85



Tp. 27

Rg. 16

Rg. 15

Scale—1.25 inches to 1 mile or 1:50,000