Soil Survey of the

Sweet Grass Indian Reserves Nos. 113A and 113B

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Location

The Sweet Grass Reserves Nos. 113A and 113B are located along the Battle River about 15 miles northwest of the city of North Battleford. Reserve No. 113A is approximately 2,200 acres in extent while No. 113B covers approximately 1,300 acres. (Reserve No. 113A includes portions of Sections 6 and 7 in Township 45, Range 18 and all or portions of Sections 1, 2, 11 and 12 in Township 45, Range 19. Reserve No. 113B includes portions of Sections 14, 15 and 16 in Township 45, Range 20. All locations are 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 Black Chernozemic Soils

Meota - Dominant Black Chernozemic soils developed on coarse to medium textured sandy glacio-fluvial and glacio-lacustrine deposits.

Me1 - Dominant* Orthic Black.

Me9 - Dominant Orthic Black with significant** saline and/or carbonated Chernozemic soils and significant inclusions of undifferentiated Gleysolic soils.

Hamlin - Dominant Black Chernozemic soils developed on medium to moderately fine textured sandy glacio-lacustrine deposits.

Hm1 - Dominant Orthic Black.

Miscellaneous Soils

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

Av17 - Dominant Orthic Chernozemic soils with a significant combination of salinized Rego Chernozems and salinized Orthic Regosols and significant inclusions of undifferentiated Gleysolic soils.

Dune Sand - Dominant Regosolic soils developed on coarse textured aeolian or wind-worked fluvial-lacustrine deposits.

DS1 - Dominant Orthic Regosol.

Hillwash - Hw - A mapping complex of Regosolic and weakly developed Chernozemic and Podzolic soils developed on variable deposits of valley slopes and eroding escarpments.

Runway - Rw - A mapping complex of soils developed on variable deposits of glacial meltwater channels.

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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%.

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 loams (gl) are recorded where present.

Landforms

Name	Symbol	Description
Glacio-Alluvial Landforms		
Glacial Lake Delta and Post Glacial Alluvium Deposits	Aa	Gently undulating plain with a knoll and depression pattern having no external drainage.
	Ad	As above with external drainage.
	Ae	Moderately rolling aeolian plain having no external drainage.
Glacio-Fluvial Landforms		
Outwash Plain	Fd	Undulating plain with external drainage or glacial drainage channels.

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%
Steeply sloping or strongly rolling	6	16-30%

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

Other Map Symbols


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.

n: - excessive soil salinity.

s: - unfavorable soil characteristics. This subclass is used in a collective sense in place of subclasses m (insufficient soil moisture holding capacity), d (poor structure), f (low soil fertility) and n (excessive soil salinity) where more than two of them are present or where two of these limitations are present in addition to some other limitation.

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.

e: - erosion damage.

i: - inundation - applies to soils subjected to flooding due to overflow.

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 SWEET GRASS INDIAN RESERVES NOS. 113A AND 113B

Interpretation of the Soil Symbol Sequence

One report only is being presented for both Reserve No. 113A and Reserve No. 113B, inasmuch as the reserves are both too small to warrant a separate report. The ability to interpret the symbols on the map of one Reserve will enable the reader to do the same for the other Reserve.

The sequence of the soil symbols given for each area separated 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 Me9:sl:Aa3 which occurs in Section 11, Township 45, Range 19.

The letters Me represent the abbreviation for the Meota Association described in the legend as, "Dominant Black Chernozemic soils developed on coarse to medium textured sandy glacio-fluvial and glacio-lacustrine deposits". Coarse to medium textural groups are dominantly sands and sandy loam textural classes. The number 9 indicates a Map Unit of the Meota Association, namely Me9, which is described as "Dominant Orthic Black with significant saline and/or carbonated Chernozemic soils and significant inclusions of undifferentiated Gleysolic soils". The letters sl represent the textural class of the surface soil namely sandy loam. The letters Aa described under the heading "Landforms", signify "A gently undulating plain with a knoll and depression pattern having no external drainage". The topography in the area is indicated by the symbol 3, defined in the legend as slopes ranging from 2-5%.

It will be noted that the soil symbol sequence in certain areas contains two or more Associations and their Map Units, as in Section 14, Township 45, Range 20, where the symbols Me1:sl-Hm1:vl-sl represent both Meota and Hamlin 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 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 Me9:s1:Aa3 the symbols $5^{10}_{n\,w}$ occur and are interpreted as follows. The lower number is the capability class. The small letters indicate the "limitations" or adverse soil features which relegate the soil area to its particular capability class. The upper number indicates 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 $5^{10}_{n\,w}$ describes an area of 100% Class 5 soil which has serious limitations due to excessive soil salinity (n) and excess water (w). It can, therefore, be concluded that because of the seriousness of the limitations, this area is suited only to pasture.

EVALUATION OF THE AGRICULTURAL POTENTIAL OF THE SWEET GRASS RESERVES

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.

Reserve No. 113A does not have any sizeable acreage suitable for the production of annual seeded crops, due to the very sandy nature of the soil. There are only two small areas (approximately 35 acres) of Mel lying adjacent to the Battle River which are rated as Class 3 soils, and, which are suitable to the production of annual crops. The area of Mel:sl-ls which is rated as a Class 4 soil should not be considered for continuous grain production

as it could be better utilized as an area for forage production. All other soils on the reserve are rated as Class 5 and 6 soils and are suited only to pasture.

It can, therefore, be concluded that Reserve No. 113A is not suitable for development for annual seeded crop production. It is best left as pasture, with the possibility of developing some of the better areas for forage production.

The area with the best potential on Reserve No. 113B is the area of Meota-Hamlin (Me-Hm). This area is approximately 340 acres in extent. It is rated as Class 2 and 3 soils which are suitable for the production of annual crops. Other areas which can be utilized for annual crop production are the areas of Meota (Me) on Class 3 and 4 topography, located on the southern edge of the reserve. These areas of Class 3 soils cover approximately 215 acres. The area of Alluvium located along the Battle River is an area of about 730 acres of which approximately 40% is arable. The remainder is suited only to pasture. The arable acres within this area occupy the higher better drained positions in the landscape which do not show signs of excessive salinity.

Acknowledgments

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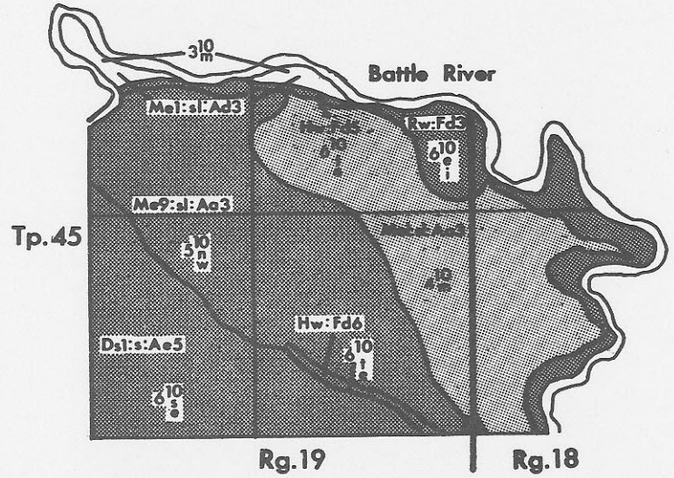
References

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.

SWEET GRASS INDIAN RESERVE NO. 113A



Soil Association (Meota)

Landform (Glacial Lake Delta-knoll and depression)

Map Unit (No.9)

Me9:sl:Aa3

Slope Class (2-5%)

Textural Class (sandy loam)

Class 5 soil

10/10 or 100%

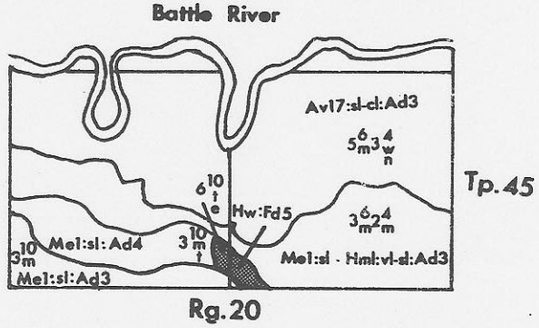
5 10 n w

Limitation due to excess water

Limitation due to excessive soil salinity

Scale - 1.25 inches to 1 mile or 1:50,000 Saskatchewan Institute of Pedology 1968

SWEET GRASS INDIAN RESERVE NO. 113B



Scale - 1.25 inches to 1 mile or 1:50,000 Saskatchewan Institute of Pedology 1968

Soil Association (Meota)

Landform (Glacial Lake Delta-knoll and depression

Map Unit (No. 9)

Me9:sl:Aa3

Slope Class (2-5%)

Textural Class (sandy loam)

Class 5 soil

10/10 or 100%

5 10 n w

Limitation due to excess water

Limitation due to excessive soil salinity