

Update on Detailed Soil Survey Activities in Manitoba

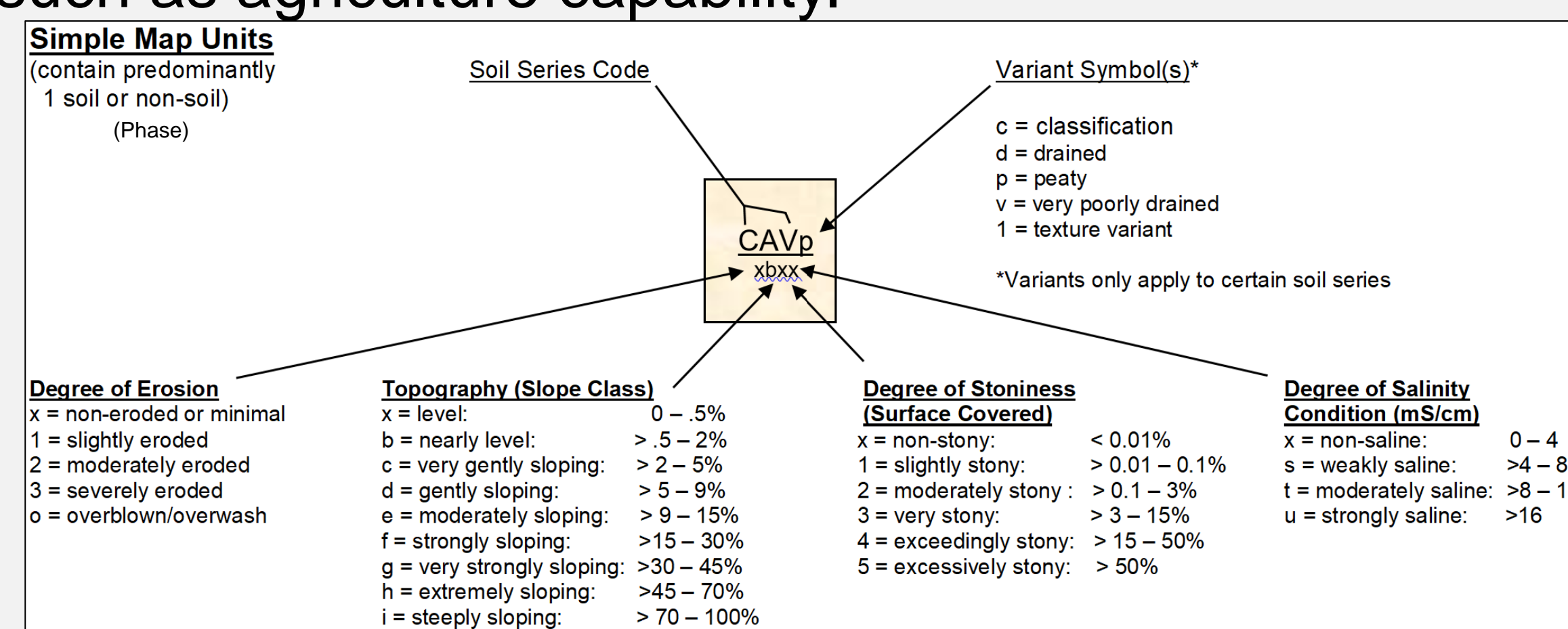
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Soil Survey, Manitoba Agriculture



Introduction:

Detailed soil survey information is used for making appropriate, economical and sustainable land use and land management decisions to assist in improving agricultural production for Manitoba's land and soil resources. Soil surveys provide an inventory of the soil properties and from this information a soil series is determined. Their spatial distribution is mapped over a landscape and a series is assigned as a phase based on its properties and landscape characteristics. This information helps to predict or estimate the potentials and limitations of a soil's behaviour under different uses, such as agriculture capability.



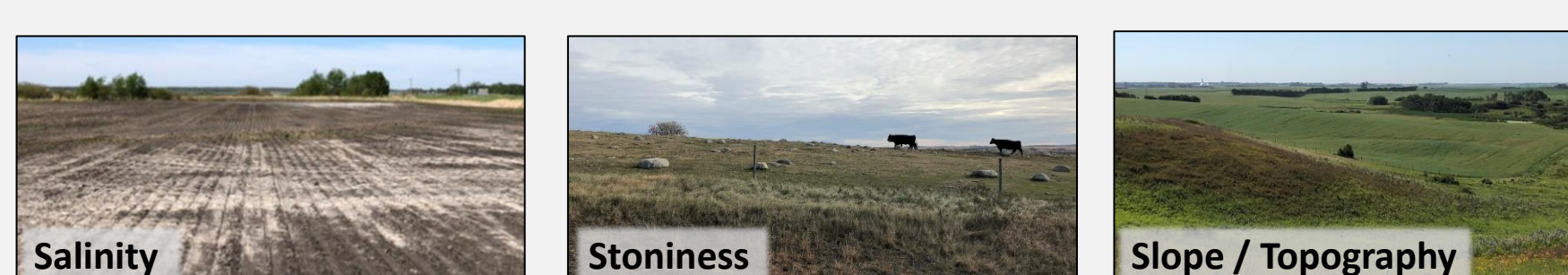
Detailed soil surveys provide accurate and reliable land resource information and are beneficial in a variety of land management activities such as:

- Environmental farm planning,
- Manure management planning,
- Nutrient and soil management planning,
- Precision farming,
- Irrigation or tile drainage development,
- Land use and watershed management planning.

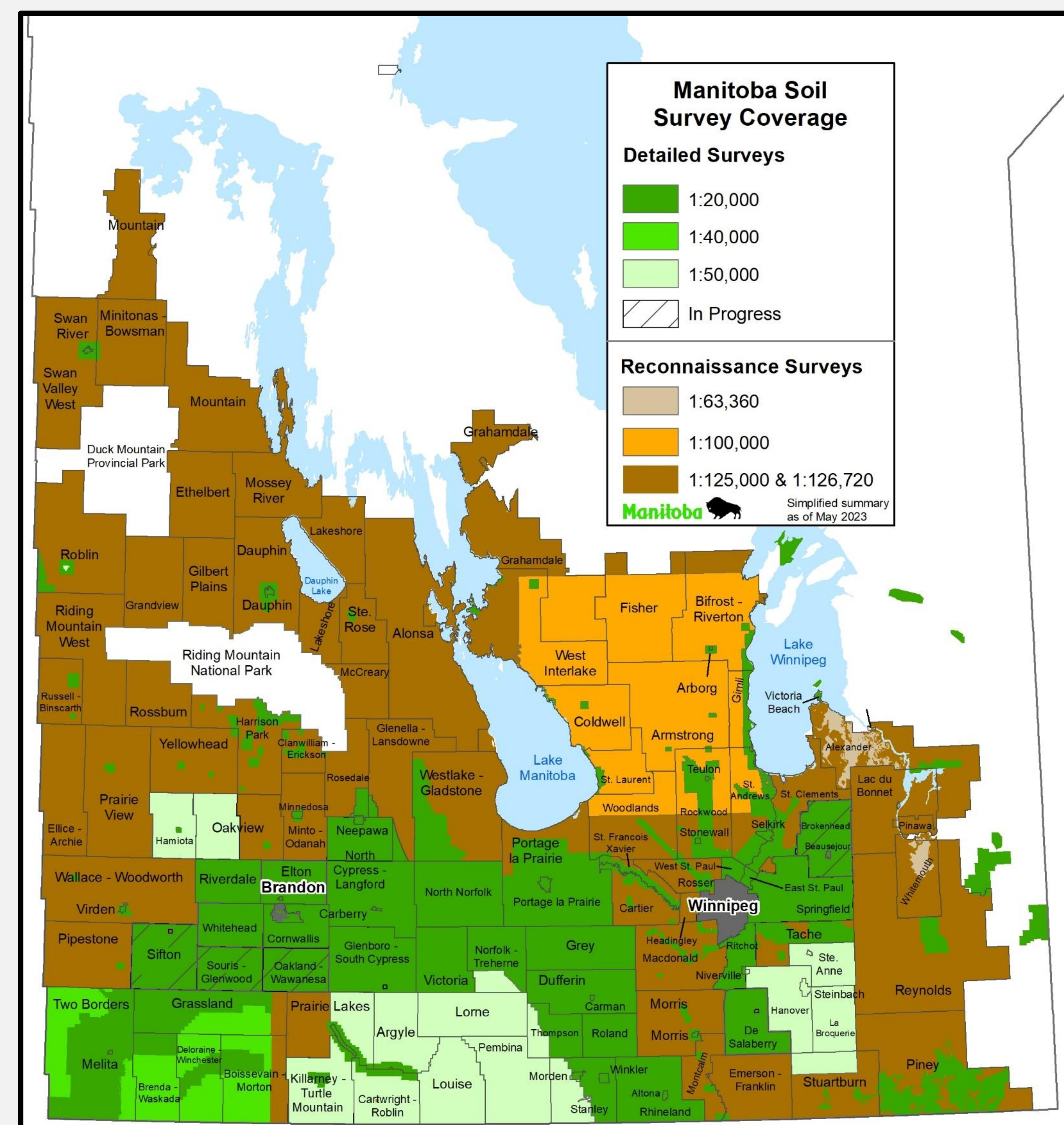
How are these surveys conducted?

Detailed (1:20,000) soil surveys consist of conducting 32 soil inspection pits per section of land and the following are determined:

- Horizons
- Texture
- Internal drainage (mottles / gleying w/in top 50cm → imperfect to poor drainage)
- Parent material
- Carbonates (CaCO₃)
- Depth of A horizon
- Salinity
- Stoniness
- Depth to bedrock and water table
- Landform
- Slope class
- Erosion



Soil samples are taken and analyzed for other properties such as pH and soil organic carbon.



Map 1: Soil survey status map for Manitoba. Approximately 35% of agro-Manitoba has detailed soil survey information available, and additional detailed soil survey activities are ongoing. Manitoba Agriculture's Soil Survey team is currently (2023) conducting field work for detailed soil surveys in the Rural Municipalities of Brokenhead and Sifton.

Table 1: Soil survey information that affects agronomic considerations and use (Adapted from "From the Surface Down - An Introduction to Soil Surveys for Agronomic Use". NCRS 2003)

Agronomic Use	Texture	pH	CaCO ₃	Salinity	Permeability	Flooding	Bedrock	Water Holding Capacity	Stoniness	Water / Wind Erosion	Slope	Water Table
Tillage Suitability	✓				✓	✓	✓		✓		✓	✓
Plant Adaptability	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Erodability												
-Tillage	✓		✓		✓					✓	✓	✓
-Wind												
-Water												
Irrigation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Drainage	✓			✓	✓	✓	✓	✓	✓		✓	✓
Crop Productivity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conservation Practices	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Land Use Capability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

References:

- Government of Manitoba. 2007. Manual for Describing soils in the Field. Revised 2007. Manitoba Agriculture, Food and Rural Initiatives.
- Government of Manitoba. 2010. The Description of Soil Series in Manitoba. Manitoba Agriculture, Food and Rural Initiatives.
- Soil Classification Working Group. 1998. The Canadian System of Soil Classification. Third Edition. Publ. No. 1646. Research Branch, Agriculture and Agri-Food Canada, Ottawa.
- United States Department of Agriculture. 2003. From the Surface Down - An Introduction to Soil Surveys for Agronomic Use. Natural Resources Conservation Services.

Where to find Soil Survey Information:

Manitoba's soil survey information is freely available to the public to use in many facets such as downloadable maps and reports, as well as online interactive maps that help landowners make confident land management decisions.

For more information Manitoba Agriculture's Soil Survey reports and maps are available at the following websites:

MB Agriculture's Soil Survey Website:



DataMB:



AgriMaps:



More than just maps...

Manitoba's soil survey resource information goes beyond providing maps. The Manitoba Agriculture website has reports and documents with very useful information such as "[The Description of Soil Series in Manitoba](#)". The example below illustrates how information found in this document could have prevented a tile drainage issue saving a producer time and money.

"Tile drainage was installed in a producer's field where the topsoil, topography and other variables indicated the field was suitable for tile drainage. For a year it worked well with water running through the tiles, however two years later the tile was no longer draining water out of the field. After consulting with a MB Ag Soils Specialist who utilized the "Description of Soil Series" document it was determined that, while the topsoil texture was loam to fine sandy loam and suitable for tile drainage, clay was present within the top three feet of the soil profile. This clay layer, which is not ideal for tile drainage had resulted in the tiles sealing up after the first year of installation which then prevented the water infiltrating through the topsoil to the tile."

Rignold Soil Series Description:

The Rignold series consists of imperfectly drained Gleyed Black Chernozem soils developed on a mantle (60 to 90 cm) of moderately calcareous, shallow, uniform, loamy (VfSL, L, SiL, SCL, CL, SiCL), fluvial and lacustrine deposits over moderately calcareous, deep, uniform, clayey (SiC, C), lacustrine deposits. These soils occur in middle positions of nearly level slopes on level landscapes and have moderate over slow to very slow permeability, slow surface runoff, and a high-water table during the growing season. Rignold soils are non-eroded, non-stony, and occasionally slightly saline. They have a medium available water holding capacity, medium organic matter content, and medium natural fertility. Native vegetation includes tall prairie grasses, meadow grasses and shrubs. The majority of these soils are currently in annual crop production.

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