

LAND CAPABILITY FOR AGRICULTURE

1. Explanatory Notes

Soil Capability for Agriculture maps at 1:50 000 scale have been available for the map area since the early 1970's and are based on the methodology contained in Canada Land Inventory (1965) and Runka, G.G. (1973). These maps depict both irrigated or non-irrigated ratings (except in irrigation districts where only irrigated ratings are shown) and strongly emphasize the 'range of crops' concept inherent in the methodology.

The current methodology in Ministry of Environment and Ministry of Agriculture and Food (1983), and applied on this map, provides both improved and unimproved ratings which consider the relative intensity of soil conservation and management practices required, in addition to the range of crops concept. Additionally, the methodology provides a modification to be applied in areas where tree fruits and grapes can be grown. This modification has been applied in the appropriate portions of this map area.

In the current classification, mineral and organic soils are each grouped into seven classes on the basis of soil and climate characteristics according to their potentials and limitations for agricultural use. Lands in Classes 1 to 4 inclusive, are considered capable of sustained production of common cultivated field crops. The need for management practices increases, and/or the possible range of crops decreases, from Class 1 to Class 4. Class 5 lands are capable of use only for producing perennial forage crops or specially adapted crops. Class 6 lands are capable of only providing sustained natural grazing for domestic livestock. Class 7 lands are incapable of use for either arable culture or grazing.

This classification takes into account the relative degree and type of limitation or hazard to agricultural use and/or the range of possible crops. It also indicates the type and intensity of management practices required for good management of the soil resource to maintain sustained production. Productivity (i.e. yield per hectare) of any specific crop is not considered.

Important factors on which the classification is based are:

- 1) The soils will be managed and cropped under a largely mechanized system.
- 2) The classification provides most lands with two ratings - one under unimproved conditions, and one for improved conditions. Unimproved ratings are based on the conditions that exist at the time of the survey, without irrigation. Improved ratings indicate the capability after existing limitations and/or hazards have been adequately alleviated. Improvements considered include drainage, irrigation, diking, stone removal, salinity alleviation, subsoiling, and/or the intensive addition of fertilizers or other soil amendments.
- 3) In determining improved ratings, irrigation water is assumed to be available. The extent to which the other types of improvements (drainage, stone removal, fertilization, diking, salinity alleviation, subsoiling and the addition of soil amendments) increase the land capability is determined from site specific assessments.
- 4) The following are not considered in the classification: distance to market, available transportation facilities, location, farm size, type of ownership, cultural patterns, skill or resources of individual operators, and hazard of crop damage by storms.
- 5) The classification addresses, where climatically appropriate, the capability of the land to produce tree fruits and grapes. The modified capability classification is applied in all areas climatically suited for tree fruit and grape production.
- 6) The classification does not include the capability of the land for recreation, wildlife or forestry.

Tree fruits and grapes can be successfully grown on steeper and stonier land than common field crops. Therefore, in the Modified Land Capability Classification for Tree Fruits and Grapes, topography and stoniness limitations are not considered to be as severe for the production of these crops as they are for the production of most common crops. These limitations are rated less severely with the class range being wider in the modified classification. The range of five arable land classes (Classes 1 to 5) in the standard classification is reduced to three, designated as Classes *1 to *3. The asterisk (*) prescript to the class designation indicates that the modified topographic and/or stoniness classes have been used to determine improved ratings.

The agriculture capability classification consists of two main components: (1) the capability class, and (2) the capability subclass. The capability class and subclass together provide information about the degree and kind of limitation for agricultural use. In addition to the land capability designation, they also provide information useful for land use planning and assessment of management needs.

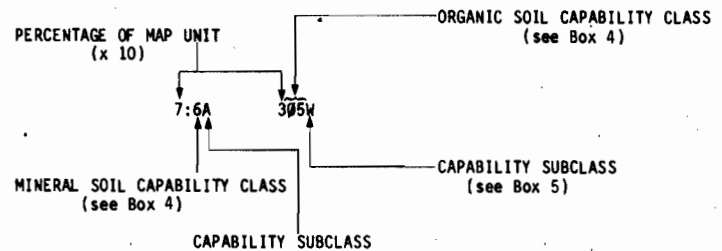
(The publications cited above are fully referenced in Box 3.)

4. Williams, R. J. 1986. Climate Capability for Agriculture Maps (1:100 000 scale); NTS B2E NW and SW, and B2L SW. Environmental Services Section, Waste Management Branch, B.C. Ministry of Environment and Parks, Kelowna, B.C.
5. Wittneben, U. 1986. Soils of the Okanagan and Similkameen Valleys. MOE Technical Report 18; Report No. 52 of the British Columbia Soil Survey. Surveys and Resource Mapping Branch, B.C. Ministry of Environment, Victoria, B.C.

2. Example of Map Symbol

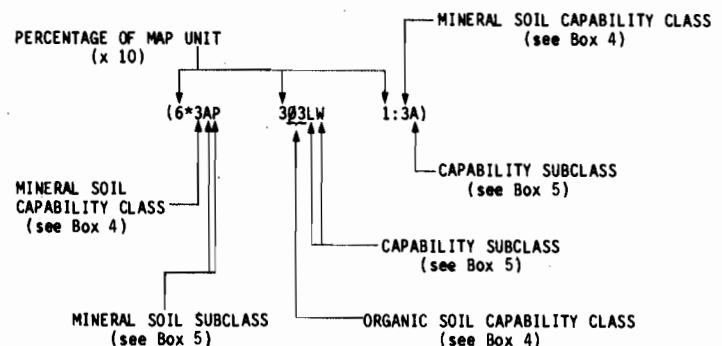
A dual rating system (for unimproved and improved conditions) is applied to most lands. Most Class 6 and 7 lands are not considered capable of improvement. Some Class 6 and 7 lands that are limited by excess water (W), soil moisture deficiency (A), or inundation (I) may be improved by drainage, irrigation and/or diking respectively. The improved rating is contained in parentheses on the map.

a) Unimproved Rating



Explanation: Under unimproved conditions, the map polygon consists of 70% Class 6 mineral soil with soil moisture deficiency (A) limitation and 30% of Class 5 organic soil with frequent or continuous occurrence of excess water (W) limitation during the growing season.

b) Improved Rating



Explanation: The improved rating indicates that 60% of the map polygon, with irrigation, is Class 3 mineral soil and has continuing limitations of soil moisture deficiency (A) and stoniness (P). The asterisk indicates that the modified topographic and/or stoniness classes have been applied to this portion of the polygon.

Class 3 organic soil, with artificial drainage, occupies 30% of the map polygon and has continuing material decomposition/permeability (L) and excess water (W) limitations.

A further 10% of the map polygon is Class 3 mineral soil with only a continuing soil moisture deficiency (A) limitation.

Note: Map Symbol X denotes unclassified map areas. These generally consist of urban areas, gravel pits, and other severely disturbed lands.

3. Sources of Further Information

As a result of on-site inspections, more detailed agriculture capability information may be available for specific locations on this map. These areas are either shaded or are identified by a dot and number (e.g.). This information can be obtained by writing to ~~MAR-B-G~~, Ministry of Environment and Parks, Parliament Buildings, Victoria, British Columbia. V8V 1X5. Please request the data by referring to the mapsheet and on-site number(s).

Highest on-site number _____ Revision Date _____

REFERENCES

1. Canada Land Inventory, 1965, reprinted 1969. Soil Capability Classification for Agriculture. Report No. 2, Department of the Environment, Ottawa. 16 pp.
2. Ministry of Environment and Ministry of Agriculture and Food, 1983. Land Capability Classification for Agriculture in British Columbia. MOE Manual 1, Surveys and Resource Mapping Branch, Ministry of Environment and Soils Branch, Ministry of Agriculture and Food, Kelowna, B.C. 62 pp.
3. Runka, G. G. 1973. Methodology, Land Capability for Agriculture, B.C. Land Inventory (CLI). Soil Survey Division, British Columbia Department of Agriculture, Kelowna, B.C.

4. Capability Classes

The capability class, the broadest category in the classification, is a grouping of lands that have the same relative degree of limitation or hazard for agricultural use. The intensity of the limitation or hazard becomes progressively greater from Class 1 to Class 7. The class indicates the general suitability of the land for agricultural use.

Two sets of classes exist, one for mineral soils and one for organic soils. The classes are as follows:

LAND CAPABILITY CLASSES FOR MINERAL SOILS

The seven land capability classes for mineral soils are defined and described as follows:

CLASS 1 LAND IN THIS CLASS EITHER HAS NO OR ONLY VERY SLIGHT LIMITATIONS THAT RESTRICT ITS USE FOR THE PRODUCTION OF COMMON AGRICULTURAL CROPS.

Land in Class 1 is level or nearly level. The soils are deep, well to imperfectly drained under natural conditions, or have good artificial water table control, and hold moisture well. They can be managed and cropped without difficulty. Productivity is easily maintained for a wide range of field crops.

CLASS 2 LAND IN THIS CLASS HAS MINOR LIMITATIONS THAT REQUIRE GOOD ONGOING MANAGEMENT PRACTICES OR SLIGHTLY RESTRICT THE RANGE OF CROPS, OR BOTH.

Land in Class 2 has limitations which constitute a continuous minor management problem or may cause lower crop yields compared to Class 1 land but which do not pose a threat of crop loss under good management. The soils in Class 2 are deep, hold moisture well and can be managed and cropped with little difficulty.

CLASS 3 LAND IN THIS CLASS HAS LIMITATIONS THAT REQUIRE MODERATELY INTENSIVE MANAGEMENT PRACTICES OR MODERATELY RESTRICT THE RANGE OF CROPS, OR BOTH.

The limitations are more severe than for Class 2 land and management practices are more difficult to apply and maintain. The limitations may restrict the choice of suitable crops or affect one or more of the following practices: timing and ease of tillage, planting and harvesting, and methods of soil conservation.

CLASS 4 LAND IN THIS CLASS HAS LIMITATIONS THAT REQUIRE SPECIAL MANAGEMENT PRACTICES OR SEVERELY RESTRICT THE RANGE OF CROPS, OR BOTH.

Land in Class 4 has limitations which make it suitable for only a few crops, or the yield for a wide range of crops is low, or the risk of crop failure is high, or soil conditions are such that special development and management practices are required. The limitations may seriously affect one or more of the following practices: timing and ease of tillage, planting and harvesting, and methods of soil conservation.

CLASS 5 LAND IN THIS CLASS HAS LIMITATIONS THAT RESTRICT ITS CAPABILITY TO PRODUCING PERENNIAL FORAGE CROPS OR OTHER SPECIALLY ADAPTED CROPS.

Land in Class 5 is generally limited to the production of perennial forage crops or other specially adapted crops. Productivity of these suited crops may be high. Class 5 lands can be cultivated and some may be used for cultivated field crops provided unusually intensive management is employed and/or the crop is particularly adapted to the conditions peculiar to these lands. Cultivated field crops may be grown on some Class 5 land where adverse climate is the main limitation, but crop failure can be expected under average conditions.

CLASS 6 LAND IN THIS CLASS IS NON-ARABLE BUT IS CAPABLE OF PRODUCING NATIVE AND/OR UNCULTIVATED PERENNIAL FORAGE CROPS.

Land in Class 6 provides sustained natural grazing for domestic livestock and is not arable in its present condition. Land is placed in this class because of severe climate, or the terrain is unsuitable for cultivation or use of farm machinery, or the soils do not respond to intensive improvement practices. Some unimproved Class 6 lands can be improved by draining, diking and/or irrigation.

CLASS 7 LAND IN THIS CLASS HAS NO CAPABILITY FOR ARABLE CULTURE OR SUSTAINED NATURAL GRAZING.

All classified areas not included in Classes 1 to 6 inclusive are placed in this class. Class 7 land may have limitations equivalent to Class 6 land but does not provide natural sustained grazing for domestic livestock due to unsuited natural vegetation. Also included are rock-land, other nonsoil areas, and small water-bodies not shown on the maps. Some unimproved Class 7 land can be improved by draining, diking, irrigation, and/or levelling.

LAND CAPABILITY CLASSES FOR ORGANIC SOILS

Organic soils are also grouped into seven classes, designated as #1 to #7. The organic soil class definitions are equivalent in terms of their relative capabilities and limitations for agricultural use to those defined for mineral soils.

5. Capability Subclasses

The subclass indicates lands with similar kinds but varying intensities of limitations and hazards. It provides information on the kind of management problem or use limitation. Except for Class 1 and #1 lands, which have no significant limitations, the capability classes are divided by subclasses on the basis of type of limitation to agricultural use. Each class can include many different kinds of soil, similar with respect to degree of limitation, but soils in any class may require unlike management and treatment as indicated by the subclasses shown.

LAND CAPABILITY SUBCLASSES FOR MINERAL SOILS

- A SOIL MOISTURE DEFICIENCY: Crops are adversely affected by droughtiness caused by low soil water holding capacity or insufficient precipitation.
- *C ADVERSE CLIMATE: Crops are adversely affected by thermal limitations to plant growth such as minimum temperatures near freezing and/or insufficient heat units during the growing season, and/or extreme minimum temperatures during the winter season.
- D UNDESIRABLE SOIL STRUCTURE AND/OR LOW PERVIOUSNESS: Soils are difficult to till, require special management for seedbed preparation, pose traffic-ability problems, have insufficient aeration, absorb and distribute water slowly, and/or have rooting zone depth restricted by conditions other than high water table, bedrock or permafrost.
- E EROSION: Past damage from erosion limits agricultural use due to productivity loss and/or hampers cultivation (eg. gullies).
- *F FERTILITY: Soils are limited by lack of available nutrients, low cation exchange capacity or nutrient holding ability, high acidity or alkalinity, high levels of carbonates, presence of toxic elements or compounds, or high fixation of plant nutrients.
- *I INUNDATION: Soils are limited by overflow from streams, lakes or marine tides which causes crop damage or restricts agricultural use.
- *N SALINITY: Soils are adversely affected by soluble salts which reduce crop growth or restrict the range of crops.
- P STONINESS: Soils are limited by the presence of coarse fragments which significantly hinder tillage, planting and/or harvesting.
- R DEPTH TO SOLID BEDROCK AND/OR ROCKINESS: Soils are limited by bedrock near the surface and/or rock outcrops which restrict rooting depth and cultivation.
- T TOPOGRAPHY: Soils are limited by steepness or pattern of slopes which hinders the use of farm machinery, decreases the uniformity of growth and maturity of crops, and/or increases the potential for water erosion.
- *W EXCESS WATER: Soils are limited by excess water, other than from flooding, which limits agricultural use. The excess water may be due to poor drainage, high water tables, seepage, and/or runoff from surrounding areas.
- *Z PERMAFROST: Soils are limited by a permafrost layer which maintains undesirably cold soil temperatures and causes drainage and subsidence problems when it is near the surface.

LAND CAPABILITY SUBCLASSES FOR ORGANIC SOILS

- B WOOD IN THE PROFILE: Soil is limited by the presence of layers of wood which interfere with cultivation and/or ditching and drain installation.
 - H DEPTH OF ORGANIC SOIL OVER BEDROCK AND/OR ROCKINESS: Soils are limited by bedrock near the surface which restricts rooting depth and the feasibility of subsurface drainage, and/or rock outcrops restrict agricultural cultivation.
 - L DEGREE OF DECOMPOSITION - PERMEABILITY: Soil is limited by the degree of decomposition which affects drainage, permeability, capillary rise of water and rate of subsidence. The presence of mineral soil layers may be limiting to optimum crop yield and to drainage.
- * These subclasses are the same for both organic and mineral soils.

6. Credits

Mapping supervised by: U. Wittneben

Correlated and approved by: J. R. Jungen

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Date and scale of photography: n/a (Capability ratings determined from published soil maps).

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From Soils of the Okanagan Similkameen
(1:20,000 scale mapping)