

SOIL CAPABILITY FOR AGRICULTURE

1. Explanatory Notes

In this classification all mineral and organic soils are grouped into classes on the basis of soil and climate characteristics. The classification rates the soils' potential and limitations for agricultural use. Soils in Classes 1 to 4 are considered capable of sustained production of common cultivated field crops, with the range of crops decreasing, and/or the need for management practices to overcome limitations increasing, from Class 1 to Class 4. Class 5 soils are capable of use only for permanent pasture, hay, or a single specialty crop. Class 6 soils are capable of use only for natural sustained grazing, and those in Class 7 are incapable of use for cultivated crops or grazing.

Note that the agriculture capability classification takes into account the range of crops possible, and not productivity (i.e. yield per hectare) of any crop.

Important factors on which the classification is based are:

- 1) The soils will be managed and cropped, under a largely mechanized system.
- 2) In B.C., most soils have been rated for improved and/or unimproved conditions. Lands requiring improvements, such as drainage, irrigation, stone removal, diking, or clearing which can feasibly (does not require a major reclamation project) be made by the farmer himself, are classified according to their continuing limitations to use after the improvements have been made. Land requiring improvements beyond the means of the farmer is classed according to its' present condition. Where major reclamation projects have been installed, the soils are classed according to the limitations that continue to exist. These assumptions apply to the unimproved ratings.

When improved ratings are shown, they then indicate the increase in capability due to irrigation and drainage (if drainage is not presently in effect).

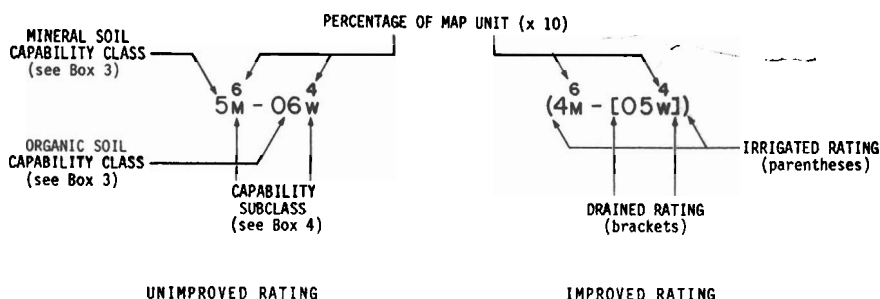
- 3) The following are not considered: distances to market, kind of roads, location, size of farms, type of ownership, cultural patterns, skill or resources of individual operators, and hazard of crop damage by storms.
- 4) The classification does not include capability of soils for trees, small fruits, ornamental plants, recreation, or wildlife. In climatically suitable areas (primarily the Okanagan Valley) the crop range was expanded to include tree fruits and grapes.

The agriculture capability classification consists of two main categories: (1) the capability class, and (2) the capability subclass. The capability class and subclass together provide the map user with information about the degree and kind of limitation for agricultural use for broad land use planning, and for the assessment of management needs.

2. Example of Map Symbol

In many areas of B.C., a dual rating system is applied to mineral soils - one under unimproved (by major reclamation projects) soil conditions and a second (parentheses) for improved (irrigated and/or drained) conditions. Where all the land is irrigated, as in irrigation districts, only the improved rating is shown. The improved rating is applied without taking into consideration the availability of water. The dual rating system was adopted to facilitate a more practical classification where climatic droughtiness and low soil moisture holding capacities are counteracted by irrigation water application as a matter of general practice. Increased production of a wider range of crops generally results under the improved conditions. Since improvement practices are not feasible for soils with Class 6 (except some organic soils) or 7 capability ratings, they are only given one rating.

In most cases organic soils are given two ratings - one in a natural state (unimproved) and an improved rating (brackets) for reclaimed or drained conditions where not already in effect. Where reclamation is not feasible the organic soil will have a single rating. Where reclamation is in effect, only the improved rating (brackets) is shown. In those areas of B.C. where mineral soils are given improved ratings, the improved rating indicates that upon irrigation the mineral soil improves to Class 4 and the organic soils when drained and irrigated improves to Class 5.



Explanation:

This agriculture capability map unit has both unimproved and improved ratings. Under unimproved conditions this unit is comprised of 60% Class 5 mineral soils with a low soil moisture holding capacity which limits crop growth and of 40% Class 6 organic soil with excess water limiting its' use to only natural grazing. The improved rating indicates that upon irrigation the mineral soil improves to Class 4 and the organic soils when drained and irrigated improves to Class 5.

3. Capability Classes

The capability class, the broadest category in this classification, is a grouping of soils 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 soils for agricultural use.

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

MINERAL SOIL CAPABILITY CLASSES

CLASS 1 SOILS IN THIS CLASS HAVE NO SIGNIFICANT LIMITATIONS IN USE FOR CROPS.

Soils in Class 1 are level or have very gentle slopes; they are deep, well to imperfectly drained and hold moisture well. They can be managed and cropped without difficulty. Under good management they are moderately high to high in productivity for a wide range of field crops adapted to the region.

CLASS 2 SOILS IN THIS CLASS HAVE MODERATE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE MODERATE MANAGEMENT PRACTICES.

The soils are deep and hold moisture well. The limitations are moderate and the soils can be managed and cropped with little difficulty. Under good management they are moderately high to high in productivity for a fairly wide range of field crops adapted to the region. Soils in this class are not generally suited to as wide a range of crops as soils in Class 1.

CLASS 3 SOILS IN THIS CLASS HAVE MODERATELY SEVERE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE SPECIAL MANAGEMENT PRACTICES.

The limitations are more severe than for Class 2 soils. They affect one or more of the following practices: timing and ease of tillage, planting and harvesting; choice of crops; and methods of soil conservation. Under good management they are fair to moderately high in productivity for a fair range of field crops adapted to the region.

CLASS 4 SOILS IN THIS CLASS HAVE SEVERE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE SPECIAL MANAGEMENT PRACTICES, OR BOTH.

The limitations may seriously affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of soil conservation. The soils are low to medium in productivity for a narrow range of crops but may be highly productive for a few specially suited crops.

CLASS 5 SOILS IN THIS CLASS HAVE VERY SEVERE LIMITATIONS THAT RESTRICT THEIR CAPABILITY TO PRODUCING PERENNIAL FORAGE CROPS; IMPROVEMENT PRACTICES ARE FEASIBLE.

The limitations are so severe that the soils are not capable of use for sustained production of annual field crops. The soils are capable of producing native or tame species of perennial forage plants, and may be improved by use of farm machinery. The improvement practices may include clearing of bush, cultivation, seeding, fertilizing, or water control. Productivity of certain forage crops may be high to very high. Some soils in Class 5 can be used for cultivated field crops provided unusually intensive management is used.

CLASS 6 SOILS IN THIS CLASS ARE CAPABLE ONLY OF PRODUCING PERENNIAL FORAGE CROPS; IMPROVEMENT PRACTICES ARE NOT FEASIBLE.

The soils provide some sustained natural grazing for farm animals, but the limitations are so severe that improvement by use of farm machinery is impractical. Soils may be placed in this class because the terrain may be unsuitable for use of farm machinery, or the soils may not respond to improvement, or the grazing season may be very short. In the case of organic soils, Class 06, improvement practices may be feasible.

CLASS 7 SOILS IN THIS CLASS HAVE NO CAPABILITY FOR ARABLE CULTURE OR PERMANENT PASTURE.

This class also includes rockland, other non-soil areas; and bodies of water too small to show on the maps.

ORGANIC SOIL CAPABILITY CLASSES

Organic soils are grouped into 7 classes, designated as 01 to 07. The organic soil class definitions are equivalent in terms of the relative capabilities and limitations for agricultural use as defined above for mineral soil capability classes. For this reason the organic soil class definitions are not presented here. For the description of organic soil classes refer to Reference #3 (Box 5).

4. Capability Subclasses

The subclass is a grouping of soils with similar kinds of limitations and hazards. It provides information on the kind of management problem or limitation. Except for Class 1 (mineral soils) and Class 01 (organic soils), which have no limitations, the classes are divided by subclasses on the basis of kinds of limitation to agricultural use. Therefore, each class includes many kinds of soils, similar with respect to degree of limitation; but soils in any class may require unlike management and treatment as indicated by the appended subclasses which provide information on the kinds of limitations or hazards.

SUBCLASS C: adverse climate - Used on a subregional or local basis to indicate an adverse departure from the regional climate. The main limitation is low temperature or low or poor distribution of rainfall during the cropping season, a combination of these, or local frosty areas.

SUBCLASS D: undesirable soil structure and/or low permeability - These soils are difficult to till, absorb water slowly, or the depth of the rooting zone is restricted by conditions other than a high watertable or consolidated bedrock.

SUBCLASS E: erosion damage - Past damage from erosion limits agricultural use of the land due to loss of productivity and the difficulty in farming land with gullies.

SUBCLASS F: fertility - Low natural fertility due to lack of available nutrients, high acidity or alkalinity, low exchange capacity, high levels of calcium carbonate or presence of toxic compounds.

SUBCLASS I: inundation - Where flooding by streams, lakes or marine tides limits agricultural use.

SUBCLASS M: moisture - A low moisture holding capacity, caused by adverse inherent soil characteristics, limits crop growth. (Not to be confused with climatic drought, covered by Subclass C.)

SUBCLASS N: salinity - The soils are adversely affected by soluble salts.

SUBCLASS P: stoniness - Stones interfere with tillage, planting and harvesting.

SUBCLASS R: shallowness to solid bedrock - Solid bedrock is less than one metre from the surface.

SUBCLASS S: soil limitations - A combination of two or more of the subclasses D, F, M and N.

SUBCLASS T: adverse topography - Either steepness or the pattern of slopes limits agricultural use.

SUBCLASS W: excess water - Excess water, other than from flooding, limits use for agriculture. The excess water may be due to poor drainage, a high water table, seepage or runoff from surrounding areas.

SUBCLASS X: minor cumulative limitations - Soils having a moderate limitation due to the cumulative effect of two or more adverse characteristics which individually would not affect the class rating. (This subclass is always used alone and only one class below the best possible in a climatic subregion).

5. Sources of Further Information

REFERENCES

1. Canada Land Inventory, 1972 reprint. Soil Capability Classification for Agriculture. Report No. 2, Department of Regional Economic Expansion, Ministry of Environment, Ottawa. 16 pp.
2. Climate Division, 1978. Climate Capability Classification for Agriculture in British Columbia. RAB Technical Paper 1, Resource Analysis Branch, B.C. Ministry of Environment, Victoria. 23 pp.
3. Runka, G.G., 1973. Methodology - Land Capability for Agriculture - B.C. Land Inventory (CLI). Soil Survey Division, B.C. Dept. of Agriculture, Kelowna. 25 pp.

AGRICULTURE CAPABILITY MAPS ARE AVAILABLE FROM:

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6. Credits

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