

Beginner Farmland Assessment

Professional Development Series (based on the Lakeland College AP 310 course)

Course Syllabus

Module 1: Introductory Soils

Farmland assessment is based on the quality of the soil and its ability to produce crops for direct sale, forage, or for animal production. Module 1 provides a brief overview of how land is assessed in Alberta. The main purpose of this module is to introduce the student to soil science, including soil formation and the main soil characteristics that determine land value. Concepts of soil productivity and soil fertility are also discussed.

Module Outcome:

Explain fundamental soil concepts and terminology as they relate to farmland assessment.

Module Objectives:

- 1.1 Explain how understanding soil allows an appraiser to justify an assessment decision in court.
- 1.2 Define soil and the terminology that is used to describe it.
- 1.3 Characterize soil components in detail.
- 1.4 Explain how time, topography, pH, climate and vegetation impact the formation of soil.
- 1.5 Explain the origins of soil (how rocks are transformed into soil) and name the different parent materials.
- 1.6 Describe the role of soil texture in the assessment of farmland.
- 1.7 Explain how to use the soil textural triangle.
- 1.8 Describe soil structure and its visual characteristics.
- 1.9 Explain what predictions can be made about a soil based on its colour.
- 1.10 Explain how to use the Munsell Colour Chart relative to soil analysis.
- 1.11 Explain how soil acidity and Salinity affects soil productivity.
- 1.12 Explain the concept of soil productivity.
- 1.13 Explain the concept of soil fertility.

Module 2: Soil Classification

In this module the student is introduced to the *Canadian Soil Classification System*. While the 10 soil orders in Canada are described, the dominant soil orders in Alberta are the focus of the module. Defining and distinguishing mineral and organic soil horizons and using the proper notation to classify them are important components to understand. A brief description of the climate of Alberta and its relation to soil zones and great groups is presented.

Outcome

Relate soil characteristics, dominant soil orders and great groups in Alberta to agricultural capability.

Objectives

- 2.1 Explain the purpose and function of the Canadian System of Soil Classification.
- 2.2 Name the 10 soil orders in Canada.
- 2.3 Describe the dominant soil orders in Alberta.
- 2.4 Characterize each of the great groups and relate them to the soil zones in Alberta.
- 2.5 Recognize the notation used to classify soil horizons.
- 2.6 Differentiate between chernozemic, solonchic, luvisolic, gleysolic and organic soils by diagnostic horizon sequences.

- 2.7 Explain the relationship between the climate of Alberta and soil formation.

Module 3: Soil Maps and Surveys

Understanding how to locate parcels of land in Alberta is critical when appraising farmland. With a legal land description, the student must be able to locate the land on an agricultural land capability map (Canada Land Inventory or CLI map) and interpret the soil quality using the map legend. Another way to determine soil quality for a particular parcel of land is to use the Alberta Soils Viewer online. Most, but not all land in Alberta is digitized and soil quality is easily accessed in this way. An assignment that demonstrates your ability to use the maps and soil viewer is required for this module.

Outcome

Use a CLI map and the Alberta Soils Viewer to locate parcels of farmland and determine soil quality.

Objectives

- 3.1 Explain how the grid system of the Dominion Land Survey works and how to find sections and quarter sections of land using legal land descriptions.
- 3.2 Outline the function and features of CLI maps.
- 3.3 Explain how farmland soils are classified and how to determine soil quality and agricultural capability in Alberta when using CLI maps.
- 3.4 Explain how to access the Alberta Soils Viewer online and obtain a description of the soil.

Module 4: The Farmland Assessment Manual

In geography, **arable land** is an agricultural term, meaning *land that can be used for growing crops*. The purpose of the Farmland Assessment Manual is to help you determine how arable farmland is and acts as your main resource to assessing the agricultural land in Alberta. In this section of the course you will learn how the manual is used to assess agricultural land in Alberta. The value of farmland in Alberta is based on its agricultural production, in other words, how well it produces a crop. The manual takes a step-by-step approach to help you assess how productive land is with regards to agriculture. For all assessment purposes, all agricultural land is classified as *one* of the following three classes: **arable**, **non arable** or **no economic value**.

Module Outcome

Explain the purpose, function and components of the Farmland Assessment Manual.

Module Objectives

- 4.1 Identify where to locate and obtain a current Farmland Assessment Manual.
- 4.2 Explain why it is important for a Farmland Appraiser to be familiar with the Farmland Assessment Manual.
- 4.3 Identify how the information in the Farmland Assessment Manual is organized.
- 4.4 Explain how to determine the differences in agricultural regions and soil types by using the Farmland Assessment Manual.
- 4.5 Describe the different types of calculations and how to make calculations as outlined in the farmland assessment manual.
- 4.6 Explain what role and input the government has in relation to the standards and methods for the assessment of farmland.

Module 5: Rating for Agricultural Regions

A 'parcel' is a fundamental cadastral unit: a piece of land which can be owned, sold, and developed. Parcels have legal descriptions which not only describe their boundaries but also contain information concerning rights and interests. Most landscape definitions in the western world are based on soil, climatic, or physiographic features. Agricultural regions are based on the most important type of farm in each rural municipality. Statistics Canada classifies farms from data in its agricultural censuses. Farm type is determined by the single crop or type of livestock (or, if necessary, group) that provides 51% or more of total farm cash receipts. For example, a farm on which 60% of potential farm cash receipts are from Wheat would be classified as a wheat farm. Agricultural regions based on the two main types of farms combined reveal a close relationship between these regions and the main soil zones.

Module Outcome

Outline how to determine the final rating on a parcel of land

Module Objectives

- 5.1 Distinguish between the various types of agricultural regions.
- 5.2 Identify the various types of ratings that land can be used for (highest/best to the lowest).
- 5.3 Explain the relationship between agricultural regions and soil types.
- 5.4 Explain whether or not it is possible for a region to change ratings.
- 5.5 Outline the process on how agricultural regions become classified and who does it.
- 5.6 Determine how the soil texture, Surface depth, subsoil, pH, flooding and grade variations affect the net productivity rating
- 5.7 Determine how topography, rocks and obstacles affect the final rating
- 5.8 Differentiate between Native or Tame pasture lands
- 5.9 Describe how to use the Farmland Assessment Manual to determine a final rating utilizing specific maps and data.

Module 6: Aerial Photos

Aerial photography can help assist in many ways. The aerial photo gives you a top down view of the land that you are assessing. One can look at the shape, size and also detected so of the obstacles that may interfere with agricultural production. Lots of information can be attained for an aerial photograph. Most are used with regards to size of land, shapes and any obstacles and the shapes and sizes of those obstacles. Aerial photos do not play a role in the farmland assessment manual; however they are a valuable tool in help the assessor to make the appropriate assessment on the land. Aerial photos are similar to a map in that they have a top down approach. The most significant difference is that aerial photos are actual pictures of land; they come in all sorts of different colors. They do not include legends on them and for the most part it is like looking at a picture that you have taken with your own camera. Aerial photography is not required in doing farmland assessments but it is a great tool to help and potentially defend in an appeal why you selected some of the ratings that you did but it is not necessary for your assessments.

Module Outcome

Identify the purpose, features, functionality of aerial photos in relation to Farmland evaluation.

Module Objectives

- 6.1 Explain how an aerial photo is used to help assist farmland evaluation
- 6.2 Outline what type of information or data that can be used from an Aerial Photo
- 6.3 Explain the role that the Farmland Assessment Manual has in reading Aerial Photos
- 6.4 Describe how to compare an aerial photo to a map.

- 6.5 Explain when an aerial photo is required and when it is not required in the evaluation of farmland.

Module 7: Irrigation and Farmland Assessment

Irrigation is essentially applying water to crop with some kind of sprinkler system. There are many different systems used to irrigate crops throughout the world. Irrigation plays a major role in Alberta agriculture and it primarily is located in the southern region of the province. There are however other areas or operations that will use irrigation, vegetable production uses irrigation and can be found in the Edmonton area. Irrigation has had a major impact on agriculture in Alberta. It is said to be the life blood of the southern part of the province. The economic benefits from the agricultural prospective far out way any of the drawbacks. The use of good clean quality of water for irrigation verses drinking water for town and cities have been and ongoing debate.

Module Outcome

Explain how irrigation impacts productivity of the land with regards to crop production

Module Objectives

- 7.1 Explain what irrigation is
- 7.2 Describe the various methods (types, forms or approaches) of irrigation typically used on Alberta Farmland.
- 7.3 Identify the regions in Alberta where irrigation is commonly used
- 7.4 Identify the environmental and economic benefits or drawbacks of irrigation
- 7.5 Identify what Farmland Assessors should know about irrigation to perform a proper assessment on the farmland
- 7.6 Explain when irrigation issues would impact a farmland assessment.

Module 8: Face to Face Component of Course

The face to face section of the course will be organized by your instructor. You will be notified as to the specific dates and location. This is the opportunity to interact with your instructor and to ask questions about materials or concepts covered in modules 1-7. It is recommended to take careful notes regarding concepts that you are having troubles with, or if you have specific questions that require further clarification. During the Face to Face class you will have an opportunity to do some hands-on labs and field analysis with the guidance and support of your instructor.

Face to Face Workshop takes place at Olds College April 9th & 10th, 2010.

Completion of assignments, readings and self-tests are an integral part of the course. There is, however, no exam or grading assessments for the course at this time.

AP 310 Module Readings List

Module 1

Gardiner, D.T. and R.W. Miller 2008. Soils in Our Environment, 11th ed. Pearson Education Inc., Upper Saddle River, NJ. ISBN 978-0-13-219104-3

- Pages 1-8
- Pages 159 -181
- Pages 26-35
- Pages 45-48
- Pages 229-233
- Pages 243-254

Soil Classification Working Group. 1998. The Canadian System of Soil Classification. Agric. and Agri-Food Can. Publ. 1646 (Revised). ISBN 0-660-17404-9

http://sis.agr.gc.ca/cansis/references/1998sc_a.html

- Pages 9-12
- Page 136

Module 2

Soil Classification Working Group. 1998. The Canadian System of Soil Classification. Agric. and Agri-Food Can. Publ. 1646 (Revised). ISBN 0-660-17404-9

http://sis.agr.gc.ca/cansis/references/1998sc_a.html

- Read Pages: 1-8, 12-16, 17-18
- Read Pages: 61-71, 81-87, 89-95, 121-129, 135

Module 3

- (reading assignment attached in a PDF)
 - **Read the following document that is in the table of Contents for Module 3 called *Required Reading for Module 3*: McKercher, R.B. & Wolfe, B. 1986. Understanding Western Canada's Dominion Land Survey. University of Saskatchewan. (ISBN0-88880-164-5) (Pages 1-12)**

Module 4

1984 Alberta Assessment Manual (Farm Land) ISBN 07732-7337-9

- Read sections 7.010.000-7.010.002
- Read Sections 7.010.000-7.010.513
- Read Sections 7.020.000-7.020.355
- Read Sections 7.070.000-7.070.050
- Read the Calculation Section 7.570.000 (Appendix Index)

Module 5

1984 Alberta Assessment Manual (Farm Land) ISBN 07732-7337-9

- Read Sections 7.020.100 – 7.020.450
- Read sections 7.020.500 – 7.020.837
- Read sections 7.030.000 – 7.030.441
- Read sections 7.040.010 – 7.040.400
- Read sections 7.060.100 – 7.060.220
- Read sections 7.070.010 – 7.070.040
- Read the Calculation Section 7.570.000 (Appendix Index)

Module 6

- Included in the module

Module 7

Gardiner, D.T. and R.W. Miller 2008. Soils in Our Environment, 11th ed. Pearson Education Inc., Upper Saddle River, NJ. ISBN 978-0-13-219104-3

- Pages 407 - 436