

## MODULE AGR3120: SOILS MANAGEMENT 2 (SOIL TESTING & AMENDING)

**Level:** Advanced

**Theme:** Management and Conservation

**Prerequisite:** AGR2120 Soils Management 1 (Soil Properties/Classification)

**Module Description:** Students demonstrate knowledge of appropriate soil testing and amending techniques, and they interpret soil survey maps and reports.

**Module Parameters:** Access to a science laboratory and land laboratory.

**Note:** Specific learner expectations in AGR2120 Soils Management 1 and AGR3120 Soils Management 2 are consistent with Soils Investigations (SOIL 100–35) at Olds College, Alberta. Teachers should contact the Registrar’s Office, Olds College, regarding transfer of credit for competencies developed in this module and AGR3120 Soils Management 2.

### Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"><li>select appropriate fertilization techniques based on an analysis of the nutrient requirements of plants</li></ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"><li>a theory test in which the student demonstrates knowledge of the nutrient requirements of plants and soil fertility. <i>Assessment Tool</i> <i>Sample Test Items: Nutrient Requirements of Plants, Soils Investigations Facilitator’s Manual</i> <i>Standard</i> <i>Response indicating 75% mastery</i></li><li>given soil characteristics and plant nutrient requirements, calculating an appropriate blend of fertilizer. <i>Assessment Tool</i> <i>Soils Investigations II Assignment Book (LRDC)</i> <i>Standard</i> <i>Complete all related exercises in the assignment book</i></li></ul>	40

**MODULE AGR3120: SOILS MANAGEMENT 2 (SOIL TESTING & AMENDING) (continued)**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate appropriate soil sampling techniques, and interpret soil test reports</li> <li>describe the legal location of a parcel of land, using the Western Grid Survey System</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>a theory test in which the student demonstrates knowledge of soil sampling and testing. <i>Assessment Tool</i> <i>Sample Test Items: Soil Sampling and Testing, Soils Investigations Facilitator's Manual</i> <i>Standard</i> <i>Response indicating 75% mastery</i></li> <li>given a soil test report, interpret and elaborate on soil and cropping information and fertilizer recommendations. <i>Assessment Tool</i> <i>Presentation/Reports: Advanced Level, AGRPRE-3</i> <i>Soils Investigations II Assignment Book</i> <i>Soils Investigations Materials Kit</i> <i>Standard</i> <i>Interpret information on soil, cropping and fertilizers to a standard of 3 on the rating scale</i></li> <li>a theory test in which the student demonstrates knowledge of the Western Grid Survey System. <i>Assessment Tool</i> <i>Sample Test Items: Western Grid Survey System, Soils Investigations Facilitator's Manual</i> <i>Standard</i> <i>Response indicating 75% mastery</i></li> <li>given the legal description of a parcel of land, locate the parcel of land on a map. <i>Assessment Tool</i> <i>Soils Investigations I Assignment Book</i> <i>Standard</i> <i>Complete all related exercises in the assignment book</i></li> </ul>	<p>20</p> <p>10</p>



**MODULE AGR3120: SOILS MANAGEMENT 2 (SOIL TESTING & AMENDING) (continued)**

Concept	Specific Learner Expectations	Notes
Soil Fertility	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• list the names and sources of essential nutrients and macronutrients for plants</li> <li>• describe soil colloids and their role in storing and releasing plant nutrients</li> <li>• identify major fertilizer nutrients and describe their benefits to plant growth</li> <li>• distinguish between natural and synthetic fertilizers, and explain the advantages and disadvantages of each</li> <li>• define fertilizer grade and give examples of commonly used grades</li> <li>• describe the pros and cons of specialty fertilizer products</li> <li>• describe common methods of fertilizer application</li> <li>• calculate an appropriate amount and blend of fertilizer based upon plant nutrient requirements.</li> </ul>	<p>Grow plants under hydroponic conditions to observe macro nutrient deficiencies.</p> <p>Contact Department of Instructional Design, Olds College, for additional support materials.</p> <p>Invite a soils specialist from government, industry or post-secondary to discuss nutrient requirements of plants and fertilization techniques.</p>
Soil Testing	<ul style="list-style-type: none"> <li>• identify reasons for soil testing</li> <li>• identify major soil nutrients and soil quality factors evaluated through a soil test</li> <li>• describe the steps involved in conducting a soil test; e.g.:               <ul style="list-style-type: none"> <li>– soil sampling</li> <li>– laboratory analysis</li> <li>– interpretation of results</li> </ul> </li> <li>• demonstrate accurate soil sampling techniques</li> <li>• describe the major elements of a soil test report; e.g.:               <ul style="list-style-type: none"> <li>– soil and cropping information</li> <li>– fertilizer recommendations</li> <li>– soil analysis results</li> <li>– yield increase data</li> </ul> </li> <li>• interpret a soil test report.</li> </ul>	<p>Collect soil samples in local area and obtain laboratory analysis. Interpret laboratory report and apply to production methods.</p>

**MODULE AGR3120: SOILS MANAGEMENT 2 (SOIL TESTING & AMENDING) (continued)**

Concept	Specific Learner Expectations	Notes
Western Grid Survey System	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• identify and describe components of the Western Grid Survey System; e.g.:               <ul style="list-style-type: none"> <li>– lines of latitude and longitude</li> <li>– townships and ranges</li> <li>– sections and legal subdivisions</li> <li>– roads</li> </ul> </li> <li>• identify the area of a parcel of land based upon information provided through its legal land description</li> <li>• describe and provide reasons for correction lines, partial sections and acreage anomalies</li> <li>• locate a specific parcel of land on a soil map by applying knowledge of its legal land description.</li> </ul>	<p>Obtain survey maps of the local area from government agencies. Locate known reference points on the maps.</p>
Soil Survey Maps and Reports	<ul style="list-style-type: none"> <li>• describe key components of the Canada Land Inventory (CLI) system; e.g.:               <ul style="list-style-type: none"> <li>– soil classes and subclasses</li> <li>– climatic subregions</li> </ul> </li> <li>• describe the agricultural capacity of a given piece of land by interpreting a CLI Soil Capability for Agriculture map</li> <li>• describe the strengths and limitations of information provided through CLI maps in establishing agriculture management and conservation practices</li> <li>• describe the nature and purpose of information conveyed through a soil survey map and report; e.g.:               <ul style="list-style-type: none"> <li>– overview of natural environment</li> <li>– classification of soils</li> <li>– potential land use</li> </ul> </li> <li>• identify and explain components of a soil survey map; e.g.:               <ul style="list-style-type: none"> <li>– map units</li> <li>– map legend</li> <li>– map symbols</li> <li>– reference section</li> <li>– key map</li> </ul> </li> <li>• interpret a soil survey map and report.</li> </ul>	<p>Read and interpret local soil survey maps and reports.</p> <p>Invite a rural development specialist as a resource person.</p>

