

## MODULE AGR3030: FIELD CROPS 2 (MANAGEMENT TECHNIQUES)

**Level:** Advanced

**Theme:** Technology and Applications

**Prerequisite:** AGR2030 Field Crops 1 (Materials & Processes)

**Module Description:** Students demonstrate the techniques used to produce a field crop, focusing attention on industry trends, enterprise selection, genetics and reproduction, and production skills. Potential areas of specialization include the production of cereals, forage, oil seeds, pulse crops, mushrooms, spices/herbs, vegetables, fruits, medicinal plants and exotic plants.

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

Facilities and equipment should permit students to perform practical skills in **two** areas of plant production; e.g., soil preparation, seeding/propagation, cultivation, irrigation, fertilizing, pest and disease control.

Off-campus learning can support the development of practical skills in crop production; consultation with a work site supervisor ensures that relevant safety considerations are addressed and that student learning meets or exceeds the learner expectations in this module.

See the *Off-campus Education Guide for Administrators, Counsellors and Teachers* (Alberta Education, 1995) for further information regarding off-campus learning.

**Note:** This module can be combined with other modules from the Agriculture strand and/or from the Career Transitions strand to provide opportunities for students to develop technical competencies within the Alberta Green Certificate Training Program (Alberta Agriculture, Food and Rural Development). Opportunities may also exist for the completion of practical components of this module through projects undertaken with local youth groups; e.g., 4-H Clubs. See Section H (Linkages/Transitions) of this guide for further information.

**Supporting Module:** CTR2210 Workplace Safety (Practices) [Career Transitions Strand]

Because of the practical nature of this module, students need a general knowledge of accepted practices and potential hazards when performing tasks related to crop production. See Planning for Instruction in Section C for further information on student safety.

**MODULE AGR3030: FIELD CROPS 2 (MANAGEMENT TECHNIQUES) (continued)**

**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>• identify trends in the production and use of new varieties of field crops</li> <br/> <li>• describe principles of genetics and reproduction, and explain their application to field crop species</li> </ul> | <p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• completing a research project on trends in the production and use of new and/or different species/varieties of field crops. Research to focus attention on two or more field crop species/varieties, and address:               <ul style="list-style-type: none"> <li>– production and consumption trends within Alberta, Canada and the global community</li> <li>– factors that determine viability of the production enterprise.</li> </ul> </li> </ul> <p><i>Assessment Tool</i><br/> <i>Research Process: Opportunities in Field Crop Production, AGR3030–1</i></p> <p><i>Standard</i><br/> <i>Conduct research to a standard of 3 on the rating scale.</i></p> <ul style="list-style-type: none"> <li>• identify major components of a strategy used to maintain/improve the quality and productivity of a field crop species. Strategy to address:               <ul style="list-style-type: none"> <li>– principles of heredity</li> <li>– desirable and undesirable plant traits</li> <li>– selection criteria and procedures</li> <li>– applications of hybridization</li> <li>– standards for grading</li> <li>– current and emerging technologies.</li> </ul> </li> </ul> <p><i>Assessment Tool</i><br/> <i>Assessment Criteria: Components of a Plant Breeding Strategy, AGR3030–2</i></p> <p><i>Standard</i><br/> <i>Identify and explain all components of the strategy to a standard of 3 on the rating scale.</i></p> | <p>20</p><br><br><br><br><br><br><br><br><br><p>30</p> |



**MODULE AGR3030: FIELD CROPS 2 (MANAGEMENT TECHNIQUES) (continued)**

| Concept                              | Specific Learner Expectations  | Notes  |
|--------------------------------------|--|--|
| <p>Industry Trends and Viability</p> | <p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• research production and consumption patterns within Alberta, Canada and the global community</li> <li>• describe the impact of economic, environmental and social trends on production practices within the industry; e.g.:               <ul style="list-style-type: none"> <li>– international trade and global competition</li> <li>– trade liberalization</li> <li>– rural and urban populations</li> <li>– food safety and consumer confidence</li> <li>– consumer demands</li> <li>– support for research and development</li> <li>– environmental stewardship and sustainable development</li> </ul> </li> <li>• identify market factors that influence crop selection; e.g.:               <ul style="list-style-type: none"> <li>– market demands</li> <li>– market size, location and access</li> <li>– market competition</li> <li>– market trends</li> </ul> </li> <li>• describe financial opportunities related to crop production; e.g.:               <ul style="list-style-type: none"> <li>– fixed and variable costs</li> <li>– forecast of returns</li> <li>– risk factors</li> <li>– income stabilization programs</li> </ul> </li> <li>• describe land requirements, and the suitability of soil and water conditions to production operations</li> <li>• describe the suitability of Alberta’s climate to potential crops; e.g.:               <ul style="list-style-type: none"> <li>– growing days</li> <li>– frost-free days</li> <li>– ambient temperature</li> <li>– soil temperature</li> </ul> </li> <li>• describe ways in which government regulations, policies and guidelines may influence production</li> <li>• predict future production on the basis of current issues and trends.</li> </ul> | <p>Construct/interpret graphs indicating production/ consumption patterns over a period of time.</p> <p>Consider the impacts of local, national and global trends on industry practices.</p> <p>Plan for individual/group research projects and presentations.</p> <p>Ask students to predict future production practices and give reasons for their predictions.</p> <p>Invite a rural development specialist to discuss enterprise selection.</p> <p>Research the role of advertising and promotion in accessing markets.</p> <p>Identify input costs and potential profits for a production venture.</p> <p>Identify determinants of regional commodity production.</p> |

**MODULE AGR3030: FIELD CROPS 2 (MANAGEMENT TECHNIQUES) (continued)**

| Concept                   | Specific Learner Expectations   | Notes   |
|---------------------------|---|---|
| Genetics and Reproduction | <p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• classify field plants; e.g.:               <ul style="list-style-type: none"> <li>– according to growth habit</li> <li>– according to taxonomy</li> </ul> </li> <li>• identify field plants, e.g.:               <ul style="list-style-type: none"> <li>– using common names</li> <li>– using botanical nomenclature</li> </ul> </li> <li>• research heredity principles and their application to plants that are grown; e.g.:               <ul style="list-style-type: none"> <li>– dominant and recessive traits</li> <li>– selection criteria and procedures</li> <li>– systems of breeding</li> </ul> </li> <li>• research reproduction technologies and their application to plants that are grown; e.g.:               <ul style="list-style-type: none"> <li>– propagation techniques</li> <li>– genetic engineering</li> </ul> </li> <li>• describe procedures used to maintain the quality of plants within the industry; e.g.:               <ul style="list-style-type: none"> <li>– selection criteria and regulations</li> <li>– showing and judging</li> <li>– grading systems and standards</li> <li>– record keeping and record systems.</li> </ul> </li> </ul> | <p>Gather, label and mount collections of plants.</p> <p>Use an identification key to identify previously unknown plants.</p> <p>Visit an agriculture research station.</p> <p>Compare “common” and “certified” seed systems.</p> <p>Conduct breeding experiments with cucumbers, squash, pumpkins and/or gourds.</p> |
| Production Skills         | <ul style="list-style-type: none"> <li>• perform basic field crop production activities; e.g.:               <ul style="list-style-type: none"> <li>– soil preparation</li> <li>– seeding/propagation</li> <li>– crop cultivation</li> <li>– irrigation/fertilization</li> <li>– pest/weed/disease control</li> <li>– harvesting</li> </ul> </li> <li>• apply knowledge of plant management practices; e.g.:               <ul style="list-style-type: none"> <li>– characteristics of plant health and disorders</li> <li>– remedial strategies for plant disorders</li> <li>– disease and pest control</li> <li>– plant growth management</li> </ul> </li> </ul>  | <p>Potential linkages exist with the Alberta Agriculture Green Certificate Training Program:</p> <ul style="list-style-type: none"> <li>• crop production</li> <li>• irrigated crop production.</li> </ul> <p>For further information, see Section H: Linkages/Transitions.</p>                                       |

**MODULE AGR3030: FIELD CROPS 2 (MANAGEMENT TECHNIQUES) (continued)**

| Concept                          | Specific Learner Expectations  | Notes   |
|----------------------------------|--|---|
| Production Skills<br>(continued) | <p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• demonstrate techniques for maintaining sustainable use of natural resources; e.g.:               <ul style="list-style-type: none"> <li>– management practices related to soil fertility and conservation</li> <li>– management practices related to water quality and the hydrologic cycle</li> </ul> </li> <li>• explain concerns regarding plant management practices and sustainable production systems; e.g.:               <ul style="list-style-type: none"> <li>– soil, water and air quality</li> <li>– organic and inorganic amendments</li> <li>– biological and chemical control measures</li> <li>– effluent disposal and pollution</li> <li>– food safety and consumer confidence</li> </ul> </li> <li>• explain relevant legislation and policy through production management activities; e.g.:               <ul style="list-style-type: none"> <li>– environmental constraints</li> <li>– inspection, regulation and quality control.</li> </ul> </li> </ul> | <p>Consider strategies for managing a crop from seed to sale.</p> <p>Develop/implement a crop rotation plan.</p> <p>Plan for individual research regarding relevant issues.</p> <p>Keep a daily log that details production activities.</p> <p>Conduct research on biological control agents.</p> |