

MODULE AGR3130: SUSTAINABLE AGRICULTURE SYSTEMS

Level: Advanced

Theme: Management and Conservation

Prerequisite: None

Module Description: Students examine the impact of a range of agriculture practices on the environment, and they propose strategies for ensuring the sustainable use of natural resources.

Module Parameters: Access to community and government agencies responsible for sustainable agriculture management.

Note: This is a summative module requiring prior knowledge of the principles of sustainable resource development. It should be the last module studied in a series of Agriculture modules.

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">describe the structure and functioning of ecosystems	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none">a teacher-prepared assessment in which the student demonstrates knowledge of interrelationships among living and non-living ecosystem components. <p><i>Assessment to address:</i></p> <ul style="list-style-type: none">the relationship of soil, water and air characteristics to plant and animal health/distributioninteractions and dependencies among living organismsnatural recycling processes that involve soil, water and air. <p><i>Assessment Tool</i> Ecosystems (<i>Teacher Resource Book</i>)</p> <p><i>Standard</i> Response indicating 60% mastery</p>	20

MODULE AGR3130: SUSTAINABLE AGRICULTURE SYSTEMS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • explain potential impacts of agriculture systems on the environment • develop and present strategies for ensuring the sustainable use of natural resources • demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • given access to information on two or more agricultural systems (e.g., field crop production, greenhouse production, feedlot production, range grazing, food processing), completing a research project on the potential impacts of each on land, water, air and wildlife. <p><i>Assessment Tool</i> <i>Research Process: Environmental Impacts of Agriculture, AGR3130-1</i></p> <p><i>Standard</i> <i>Complete all components of research to a standard of 3 on the rating scale</i></p> <ul style="list-style-type: none"> • developing and presenting plans for an agriculture venture that demonstrate principles of sustainable development. Venture plan to address: <ul style="list-style-type: none"> – background information regarding conservation, preservation and sustainable development – a strategy for multiple land use – a strategy for soil fertility and conservation – a strategy for water management practices – interrelationships and dependencies among domestic and non-domestic plant and animal species – legislated environmental regulation and constraints. <p><i>Assessment Tool</i> <i>Assessment Criteria: Venture Plan for Sustainable Production, AGR3130-2</i></p> <p><i>Standard</i> <i>Complete the venture plan to a standard of 3 on the rating scale</i></p> <ul style="list-style-type: none"> • observations of individual effort and interpersonal exploration during the learning process. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>30</p> <p>50</p> <p>Integrated throughout</p>

MODULE AGR3130: SUSTAINABLE AGRICULTURE SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
Dynamic Ecosystems	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify major living and non-living ecosystem components; e.g.: <ul style="list-style-type: none"> – soil, water and air – domestic/non-domestic plant and animal species – climate and temperature • describe interrelationships among ecosystem components; e.g.: <ul style="list-style-type: none"> – relationship of soil, water and air characteristics to plant and animal distribution/health – interactions and dependencies among living organisms • explain natural recycling processes that involve soil, water and air; e.g.: <ul style="list-style-type: none"> – exchange of gases – water cycle – nutrient cycles. 	<p>Obtain the “Wetland Environments” kit (available from Ducks Unlimited). See Section I: Learning Resource Guide.</p>
Environmental Impacts	<ul style="list-style-type: none"> • explain the impact of deforestation, land clearing and cultivation practices on ecosystems • describe ways in which water diversion and irrigation projects have changed the environment • describe potential impacts of chemical and solid wastes on soil, water and air characteristics • explain potential impacts of selective breeding and genetic engineering on biodiversity of plant and animal populations • identify environmental pollutants resulting from large-scale and specialized production and/or processing practices. 	

MODULE AGR3130: SUSTAINABLE AGRICULTURE SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
Environmental Management	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • define conservation, preservation and sustainable development • identify a rationale for the retention of land as a natural habitat • explain applications of multiple land use in an agriculture enterprise • explain the benefits and costs of wetlands in an agriculture system • describe soil management practices relevant to an agriculture system; e.g.: <ul style="list-style-type: none"> – soil fertility – soil conservation • describe water management practices relevant to an agriculture system; e.g.: <ul style="list-style-type: none"> – water quality – hydrologic cycle • identify government policies and regulations that support sustainable development; e.g.: <ul style="list-style-type: none"> – environmental constraints – inspection and regulation • explain potential impacts of agricultural systems on ecosystem dynamics • describe the benefits and costs of specific management practices in maximizing sustainable development and minimizing environmental impacts within an agriculture system • identify potential careers in environmental management; e.g.: <ul style="list-style-type: none"> – environmental assessment – environmental regulation. 	<p>Consider using computer simulations.</p> <p>Invite resource persons from environmental <u>and</u> industry organizations to discuss achievements and challenges related to sustainable agriculture systems.</p>