

MODULE AGR2130: INTEGRATED PEST MANAGEMENT

Level: Intermediate

Theme: Management and Conservation

Prerequisite: None

Module Description: Students apply knowledge of biological, cultural and chemical pest-control measures within the context of an agriculture, horticulture or forest industry.

Module Parameters: Access to an agriculture production, horticulture or forest industry.

Instructor training in the use of pesticides is recommended; e.g., Pesticide Applicator/Dispenser Certificate.

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> describe the life cycle and ecology of common pests in an agriculture, horticulture or forest industry 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> given an agriculture, horticulture or forest industry, identifying and classifying common pests within each of the following categories: <ul style="list-style-type: none"> weed (annual, perennial) insect (order) disease (bacteria, fungus, virus). vertebrate. <p><i>Assessment Tool</i> Backyard Pest Management in Alberta</p> <p><i>Standard</i> <i>Identify and classify three weeds, three insect pests, three diseases and three vertebrate pests</i></p> <ul style="list-style-type: none"> illustrating and describing the anatomy, life cycle <u>and</u> food web for one or more of the pests identified within each category. <p><i>Assessment Tool</i> <i>Assessment Criteria: Diagrams and Technical Drawing, AGRDRA</i></p> <p><i>Standard</i> <i>Complete each illustration/description to a standard of 2 on the rating scale</i></p>	<p>20</p>

MODULE AGR2130: INTEGRATED PEST MANAGEMENT (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • describe biological, cultural and chemical pest-control strategies and basic principles of integrated pest management • explain legislation and policies regarding the safe handling, storage and use of chemical and biological control agents • develop and implement an integrated pest management program • demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • a presentation or report that describes basic principles and practices, examples and the benefits/costs of: <ul style="list-style-type: none"> – biological, cultural and chemical pest control – integrated pest management. <p><i>Assessment Tool</i> <i>Presentations/Reports: Intermediate Level, AGRPRE-2</i></p> <p><i>Standard</i> <i>Complete the presentation or report to a standard of 2 on the rating scale</i></p>	<p>20</p>
	<ul style="list-style-type: none"> • reading and interpreting label information regarding the safe handling, storage and intended application/use of: <ul style="list-style-type: none"> – chemical control agents, including emulsifiable concentrates, liquids, wettable powders, dusts, granules and fumigation materials – biological control agents, including predatory insects, infectious organisms and resistant plants. <p><i>Assessment Tool</i> <i>Task Checklist: Integrated Pest Management, AGR2130-1</i></p> <p><i>Standard</i> <i>Achieve a minimum performance rating of 3 in applicable areas of task assessment</i></p>	<p>20</p>
	<ul style="list-style-type: none"> • developing and implementing a basic integrated pest management program for two or more pests within an agriculture, horticulture or forest industry. <p><i>Assessment Tool</i> <i>Task Checklist: Integrated Pest Management, AGR2130-1</i></p> <p><i>Standard</i> <i>Achieve a minimum performance rating of 2 in applicable areas of task assessment</i></p>	<p>40</p>
	<ul style="list-style-type: none"> • observations of individual effort and interpersonal interaction during the learning process. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

MODULE AGR2130: INTEGRATED PEST MANAGEMENT (continued)

Concept	Specific Learner Expectations	Notes
<p>Life Cycles and Ecology</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • define a pest and describe specific pest problems in agriculture, horticulture or forestry • explain the benefits of pest management to agriculture, horticulture and forestry • describe the biology and life cycles of major groups of pests; e.g.: <ul style="list-style-type: none"> – weeds – insects – diseases – vertebrates • identify and classify a range of common pests; e.g.: <ul style="list-style-type: none"> – mites, ticks – birds – fungi – weeds – insects – rodents • explain the interrelatedness of common pests with ecosystems and environments; e.g.: <ul style="list-style-type: none"> – relationship of soil, water and air characteristics to plant/animal health – food webs and energy chains – environmental factors that limit populations. 	<p>A pest is generally considered to be an organism that adversely affects human activities. Therefore, determination of pests will depend upon context.</p> <p>Diagram and explain ecosystem structures.</p> <p>Consider limiting factors on populations in ecosystems.</p> <p>Collect, identify and mount insect and weed pests.</p> <p>Draw/construct food webs and energy chains involving common pests.</p>
<p>Methods of Pest Control</p>	<ul style="list-style-type: none"> • explain basic principles of biological pest control and give examples of beneficial organisms used to control pest populations; e.g.: <ul style="list-style-type: none"> – predators – parasites – pathogens • explain basic principles of cultural pest control and give examples of cultural practices used to control pest populations; e.g.: <ul style="list-style-type: none"> – soil tillage – crop rotation – clean culture 	<p>Conduct case studies on different techniques of control.</p>

MODULE AGR2130: INTEGRATED PEST MANAGEMENT (continued)

Concept	Specific Learner Expectations	Notes
<p>Methods of Pest Control (continued)</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • explain basic principles of chemical pest control and give examples of chemical families and pesticide formulations used to control pest populations • describe and give examples of physical and mechanical pest-control strategies • identify regulatory bodies and legislation established to assist pest-control programs • explain the role of breeding programs in developing organisms that have genetic resistance to pests • describe and compare the advantages and disadvantages of biological, cultural, chemical, physical, mechanical and regulatory pest-control programs. 	<p>Discuss the importance of rotating chemical groups being used to avoid pest tolerance.</p> <p>Explain genetic resistance.</p>
<p>Integrated Management</p>	<ul style="list-style-type: none"> • describe the history of pest management • define and give reasons for the development of integrated pest management; e.g.: <ul style="list-style-type: none"> – management versus control perspective – environmental and human health concerns • explain the basic principles and strategies of integrated pest management; e.g.: <ul style="list-style-type: none"> – identification of key parts – biology of crop/host and its ecosystem – ecosystem manipulation – economic threshold levels – pest sampling and monitoring • cite benefits and problems related to the use of integrated pest management as a pest-control strategy. 	<p>Compare and contrast the concepts of “pest control” with “pest management.”</p> <p>Explain the significance of:</p> <ul style="list-style-type: none"> • economic thresholds • scouting procedures • record keeping.

MODULE AGR2130: INTEGRATED PEST MANAGEMENT (continued)

Concept	Specific Learner Expectations	Notes
Practical Procedures	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify specific pest problems within an agriculture, horticulture or forest industry • perform pest sampling and monitoring procedures in order to determine the presence of pests, their stage of development and the nature/ extent of damage caused • identify threshold levels that determine when pest control measures should be implemented • identify and apply pest management procedures that are based upon relevant aspects of pest/host biology and the ecosystem • explain safe techniques in pesticide application; e.g.: <ul style="list-style-type: none"> – use of equipment and supplies – mixing and application techniques – clean-up and disposal • describe the impact of pest-control practices on human and environmental health. 	<p>Invite an agricultural specialist to explain the advantages/ disadvantages of different pest control measures.</p> <p>For additional information, see Section 4 in <i>Agriscience Fundamentals and Applications</i>.</p> <p>Potential linkages exist with various pesticide applicator/dispenser certificate courses (see Section H: Linkages/ Transitions).</p>

