

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

**Hanover House
24 Douglas Street
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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- 0068175 -Session-1986-87
-Superclass- SC

-Title- BIOLOGICAL CONTROL OF PESTS AND DISEASES
(x 1/2)

-DESCRIPTION-

Type and Purpose A specialist module ¹/₂ which enables the student to undertake the biological control of pests and certain diseases and to integrate biological control with the selective use of pesticides.

Preferred Entry Level 08033 Plant Protection 1.

Learning Outcomes The student should:

1. identify common beneficial animals and differentiate them from pest species;
2. use procedures to control pests and a disease using a predator, a parasitoid and microbial products;
3. know selective pesticide treatments which can be integrated with biological control;
4. know the main factors involved in the successful commercial practice of biological control;
5. know the limitations of biological control as a general practice in agriculture and horticulture.

Content/ Context Corresponding to the Learning Outcomes:

1. Students should recognise common beneficial animals and be able to distinguish predatory and parasitic insects from pest species.

2. Manipulation of commercially available predator, parasitoid and microbial preparation for the control of pest insects and mites; manipulation of commercially available preparations of soil fungi for the control of either silver leaf or tree stump fungi.
3. Identification, from a list, of selective insecticide treatments and suitable fungicides for use in conjunction with biological control.
4. Knowledge of the duration/sequence of stages of predator and prey, host and parasitoid under contrasting temperature regimes; the influence of light intensity and husbandry practices on the success of biological control of pests of protected crops; the importance of high humidities for some microbial treatments.
5. Costing of a programme of biological control for comparison with chemical treatments; identification of lack of suitable biological control agents for majority of major pests, diseases and weeds; understanding of the process whereby introduced pathogens may lose their virulence.

Suggested
Learning and
Teaching
Approaches

Students should identify common beneficial organisms and the pests, pathogens and weeds that they control, by means of slide presentation and where possible by a laboratory exercise using live material.

Students should learn the duration and sequence of stages in the life-cycles of a predatory mite and its prey, and a parasitic wasp and its host, by examining live material in the laboratory.

Students should rear a commercially acceptable sample of predatory mites and parasitic insects for the control of pest species. They should also keep a record of events.

Students should visit a greenhouse where biological control is being practised and where possible apply and monitor the biological control agents themselves. The costs of applying biological control agents should be estimated for use in a case-study of the economics of biological control - from the points of view of the supplier and the user.

Preparation of spray solutions from commercially available microbial preparations and testing against a range of candidate pests. Students should inoculate trees with a commercial preparation of an antagonistic fungus.

By use of advisory literature, students should select candidate pesticides for use in integration with biological control.

A debate could be arranged to argue the pros and cons of developing the more widespread use of biological control.

Assessment
Procedures

Relating to the Learning Outcomes:

LO1 Identification test - the student is required to identify without the use of a key 6 beneficial animals and 6 pest species.

LO2 Practical exercise on pest control.

The performance criteria should include:

- (a) use of technical literature;
- (b) appropriateness of the control measure;
- (c) techniques used;
- (d) safety precautions taken;
- (e) evaluation of the result;
- (f) cost awareness of the student.

LO3 Written test - 5 short answer questions on selective pesticides which can be incorporated with biological control. (Manufacturers' literature may be made available during the test).

Cutting score 80%.

LO4 Written test of 5 short answer questions on the commercial practice of biological control.

Cutting score 80%.

LO5 Written test of 5 short answer questions on the limitations of biological control.

Cutting score 80%.

Where cutting scores are stated these are intended to be for guidance. The precise cutting score for a test will depend on the difficulty of the test and will have to be decided by the Tutor aided by the Assessor.