

Unit 33: Pests and Disease in Plants

Delivery guidance

Approaching the unit

Pests and diseases can have a significant negative effect on the visual condition of plants and trees, not to mention the economic impacts they can have on production. Knowing what is wrong with a plant, along with the best way to manage it, is essential knowledge that learners will need in order to produce productive and healthy plants.

In '*Unit 33: Pests and Disease in Plants*', learners will discover the features of a range of pathogens that can affect different types of plants. They will study how to identify plant pathogens, along with the signs and symptoms that indicate a plant is under attack from a particular pest or disease. They will explore how to manage those plant pathogens using different methods, equipment and techniques in both organic and conventional systems. They will also be able to carry out their own practical investigations into plant health management.

The unit could be introduced by facilitating a discussion on the economic problems caused to the horticulture industry by pests and diseases.

Learners will require access to appropriate planting where they can demonstrate the practical application of relevant control methods and techniques. They need to demonstrate this across a range of plants and sites. This unit will support their career progression when seeking employment in the land-based sector or onto further study in an apprenticeship or higher educational establishment.

Delivering the learning aims

Learning aim A

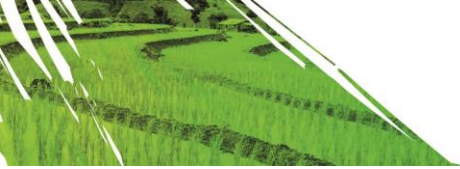
For learning aim A, learners should have the opportunity to give a wide-ranging account of common and uncommon pests and diseases that are relevant to the health management of plants. An approach to this may include practical observations of plants in different habitats, which may be carried out over a period of time, so that learners get the opportunity to observe the development of diseases and long-term effect of pests. This may be carried out in conjunction with images and samples of plants at different stages of infection, especially where the timing of the unit and resources available do not allow for direct observation of a range of live plants.

It would be useful to set aside areas of planting and protected environments where plants are allowed to become infected and/or are deliberately stressed in order to ensure that there is suitable diseased material to study.

There also needs to be a suitable range of material available to study so that the range identified in the unit content can be covered effectively. It may be possible to build up an 'image library', either physically or electronically, for learners to access as a reference guide.

Learning aim B

For learning aim B, learners have to practically demonstrate a holistic understanding of effective plant health management. They need to demonstrate this across a range of plants and sites by selecting appropriate health management strategies, showing the relevant



monitoring, prevention and control methods and then evaluating their effectiveness. Learners may evidence this by keeping an analytical log, including a photographic record combined with observation records of the practical methods demonstrated.

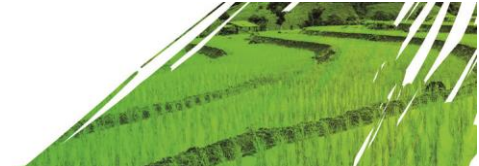
Learning aim C

It involves carrying out different control strategies for pests and diseases. Learners will need to implement the strategies that they have researched, so that some guidance as to what pests and diseases may be available to implement strategies on is advisable. This may be governed by the time of year and geographical location as to the availability of plant material.

For this unit, learners must have access to:

- a range of plants and trees in different habitats
- images and samples of common pests
- images and samples of plants affected by common pests and diseases
- a range of equipment and methods used to monitor, prevent and control pests and diseases
- suitable personal protective equipment (PPE).

Learners have to practically demonstrate their use of monitoring, prevention and control methods for plants across multiple sites, so there must be opportunity for learners to do this individually.



Assessment model

Learning aim	Key content areas	Recommended assessment approach
A Examine pests and diseases for management of plant health	A1 Pests and diseases A2 Signs and symptoms of plant pests and diseases	A report on the identification, spread, reproduction and effect of pests and diseases in plant health management
B Explore strategies for managing plant health	B1 Prevention and control strategies B2 Legislation relating to plant and tree health	Learners selected strategies for a given scenario for organic and conventional systems for plant health management and photographic evidence of the practical activities carried out supported by learner log and observation statements from tutors and/or employers
C Undertake monitoring, prevention and control for effective plant health management	C1 Monitoring and surveillance methods C2 Preventing and controlling plant pathogens	

Assessment guidance

The recommended structure of assessment is shown in the unit summary. The recommended assessment for this unit is two assignment briefs, one to cover learning aim A and the other for learning aims B and C.

Evidence for learning aim A can be a report on the identification, spread, reproduction and effect of pests and diseases in plant health management. This may include images to demonstrate the pest and disease features in the report. If this is not appropriate to the learners' needs, a slide presentation or an illustrated handbook on the identification, spread, reproduction and effect of pests and diseases may be more appropriate. Whichever form is selected, learners must produce their own individual evidence.

For learning aims B and C, a portfolio of evidence would be suitable. This portfolio could include the following:

- strategies for a given scenario for organic and conventional systems
- photographic evidence of the practical activities
- a learner's log
- observation statements from tutors and/or employers.

They could also include a standard operating procedure (SOP) for the strategies they are recommending and implementing.

For both assignments, learners need to demonstrate that they have an understanding of the content that is appropriate in relation to the command verbs used in the relevant grading criteria. It would support the vocational ethos of this unit if learners could use their work experience setting to produce this evidence.

Getting started

This provides you with a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 33: Pests and Disease in Plants

Introduction

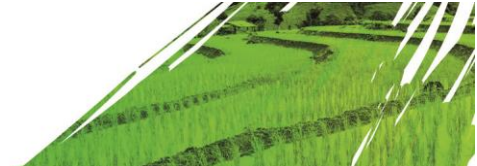
For 'Unit 33: Pests and Disease in Plants', learners will require access to a range of plant and tree species in different habitats. These should display and/or include a variety of pests and diseases that the learners can study in situ. To support this, a range of images and samples of common pests (and plants affected by common pests and diseases) would enable the learner to become familiar with less common pests and diseases. This is particularly important if the unit is being delivered at a time of year when live specimens are less commonly seen.

A range of equipment and methods used to monitor, prevent and control pests and diseases should be available for the learners to become familiar with and use. This will enable them to implement the control strategies they have identified. Suitable PPE must be available for the learners to use. This will support learners with both implementing their monitoring and surveillance methods and strategies and ensuring that they understand the legislative requirements of implementing pest and disease control in plants.

Learning aim A – Examine pests and diseases for management of plant health

As an introduction to the unit content, learners could be given images and samples of plants affected by diseases or pests from each of the causes listed in the specification. In small groups, ask learners to identify the cause of each example. On flipchart paper, ask them to link the causes that they have identified to any control methods they are aware of and/or have used. Ask each group to feed back to the rest of the class and combine the total knowledge of the group onto one chart.

- To deliver learning aim A1, learners could examine and identify the pests and diseases affecting plants. They could examine the affected plants, samples and images of affected plants, turf and trees. This can be delivered throughout the programme, and a different selection of samples and/or images could be provided each week.
- A running score of the correct learner responses on a class 'league table' can be recorded, which will allow for a larger range of diseases and pests to be identified.
- To deliver learning aim A2, learners could work in small groups to produce an information sheet on each section from the unit content. This should include the following:
 - insects
 - gastropods
 - larger animal pests
 - fungal diseases
 - Ascomycota
 - Basidiomycota
 - Oomycota
 - bacterial pathogens
 - viral pathogens.
- Learners must ensure that their information sheet covers the relevant signs and symptoms of each of these identified groups. They can present their information sheet to the class, and this may be followed by a group discussion to compare their findings.



Learning aim B – Explore strategies for managing plant health

Learning aim C – Undertake monitoring, prevention and control for effective plant health management

These two learning aims are heavily interlinked; hence, it is suggested to deliver them at the same time, if possible. Learning aim B focuses on the strategies and legislation involved in pest and disease control, while learning aim C concerns the monitoring, surveillance, prevention and control of the pests and diseases.

- To cover learning aims B1 and B2, learners could select strategies for a given pest or disease (i.e. from organic and conventional systems for plant health management). The unit content can be split up between the learners appropriately for the class size in order to ensure full coverage of all content.
- Learners could get into small groups to produce a slide presentation on their identified strategy and the related legislation. They could then deliver it to the rest of the class, followed by a Q&A session run by the tutor to ensure there is full coverage of the content.
- For learning aim C1, learners could work in small groups to monitor the pests and diseases in an appropriate area of the centre grounds. They could record this in a surveillance log.
- Learners could identify a particular pest or disease to study. Then, to support the delivery of learning aim C2 for their identified pest or disease, learners could produce a standard operating procedure sheet (SOP). This can then be used to inform their practice when they are practically demonstrating disease control for their summative assessed work.

Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

This unit links to:

- Unit 4: Developing a Land-based Enterprise
- Unit 27: Identification, Planting and Care of Plants
- Unit 29: Plant Propagation Activities

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Internationals in Agriculture/Horticulture/Land-based subjects. Check the Pearson website (<http://qualifications.pearson.com/endorsed-resources>) for more information as titles achieve endorsement.

Textbooks

Adams CR, Early MP, Brook JE and Bamford KM, *Principles of Horticulture: Advanced*, Routledge, 2012 ISBN 9780415859097 – it provides an introduction into the fundamentals of growing plants

Hessayon DG, *The Expert Series*, Expert Books (e.g. 'The Flower Expert', Expert), 1999 ISBN 0903505525 – it is an introductory text into the growing conditions and problems associated with many species of plants

Website

Royal Horticultural Society (RHS) – the website includes a lot of advice and general information about gardening

Pearson is not responsible for the content of any external internet sites. It is essential for tutors to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that tutors bookmark useful websites and consider enabling learners to access them through the school/college intranet.