

GARDEN DESIGN



ACADEMY

## Horticulture III (Plant Health)

<b>Duration (approx)</b>	100 hours
<b>Qualification</b>	Statement of Attainment

Learn to Manage Pests, Disease and other Plant Health Problems.

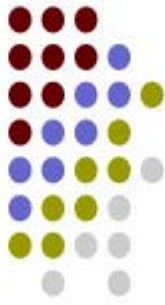
*"If you want to know more about providing optimum care for plants, I suggest this course as a good foundation for learning to deal with any pest or disease problem."*

### Lesson Structure

There are 10 lessons in this course:

1. Introduction- Methods to identify problems on plants from pest and disease damage.
2. Overview of Preventative Controls-Methods for control of the problems found, both with chemical and non chemical methods.
3. Insecticides- Various types of insecticides are discussed
4. Other Pesticides- Other types pesticides are looked at
5. Spray Equipment- The various methods for using the chemicals and the safe application of them.
6. Insect Biology- We have a look at a few of the insects you will come across.
7. Fungal Biology-The various problems caused by fungi and bacteria, descriptions of these types and ways to treat them.
8. Environmental Problems-Sometimes it is the actual environment around the plant that is causing the problem
9. Viruses-Identify some of the characteristics of a virus and ways to treat them.
10. Nematodes, Molluscs and Crustaceans-Some of the creatures that look quite innocent are chewing away on your plants. Ways to identify and treat them.

Each lesson culminates in an assignment which is submitted to the school, marked by the school's tutors and returned to you with any relevant suggestions, comments, and if necessary, extra reading.

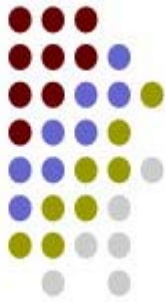


## Aims

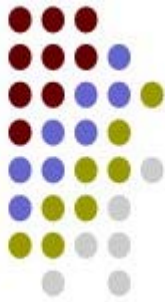
- Identify the characteristics of pests and diseases of plants.
- Explain methods for the control of pests and diseases.
- Describe the characteristics of a range of different pesticides, including insecticides and fungicides.
- Explain the selection and use of spray equipment appropriate for different specified tasks.
- Describe aspects of the biology of an insect which are relevant to pest control.
- Describe aspects of the biology of a fungus which are relevant to disease control.
- Explain how inappropriate environmental conditions can affect plant health.
- Identify the characteristic signs of a range of non-insect pests and select appropriate control methods.

## What You Will Do

- Develop a checklist for determining the significance of pests and diseases, which addresses different criteria including:
  - short term impact
  - long term impact
  - economic impact
  - aesthetic impact.
- Distinguish between the main types of plant diseases, including:
  - fungal
  - viral
  - bacterial.
- Create a standard worksheet for reviewing pest and disease problems of plants.
- Diagnose different problems (ie. pests or diseases), documenting the problem on a standard pest/disease review worksheet.
- Describe different ways to control pests and diseases, including:
  - Application of chemicals
  - Plant selection
  - Companion planting
  - Cultural techniques (i.e. improving ventilation, improving drainage)
  - Physical control (i.e. pruning, hand removal, trapping, hosing off).
  - Explain how plant breeding has been used to improve pest/disease resistance in different plant species.
- Explain three biological control methods for dealing with specific problems.



- Develop an IPM strategy for a specific situation such as a crop or garden, considering:
  - application procedures, remedial action and monitoring.
- Describe plant hygiene practices for a specific situation such as a crop, nursery or garden, in line with industry practice, enterprise guidelines and sound management practice.
- Recommend control methods for different pest and/or disease problems diagnosed.
- List safety procedures to follow when handling pesticides.
- Distinguish between the main groups of pesticides, including:
  - organo-phosphates
  - synthetic pyrethroids
  - carbamates
  - chlorinated hydrocarbons.
  - Explain the difference between the action of systemic and non-systemic pesticides.
- Explain maintenance practices, including cleaning, for a specified sprayer.
- List different uses for several types of sprayers, including a motorised pump sprayer, a knapsack and a PTO driven tractor mounted sprayer.
- Compare different sprayers, in terms of:
  - cost
  - applications
  - maintenance
  - spare parts
  - ease of use
  - safety.
- Explain the application of chemicals in a given situation, including:
  - Calibration
  - Mixing chemicals
  - Equipment operation
  - Safety measures
  - Post spray procedures such as cleaning, and storage of chemicals).
  - Describe the minimum records which should be kept when spraying pesticides.
- Prepare a labelled diagram showing the structural parts of an insect.
- Prepare an insect collection of different insects of significance to agriculture or horticulture.
- Identify to genus level, the insects collected.
- Compare the structural differences between different types of insects.
- Describe the lifecycle of an insect species.
- Explain how an understanding of insect lifecycle can be applied to pest control.
- Describe the lifecycle of a fungal disease species.
- Explain the physiology of tree decay processes, including compartmentalisation.



- Explain aspects of fungal biology, for different types of fungi, which are of horticultural significance, including:
    - Phytophthora
    - Sclerotinia rot
    - Peach leaf curl (*Taphrina deformans*)
    - Powdery Mildew
    - Pythium.
  - List environmental problems which affect plant health and their symptoms.
  - Describe the affect of air pollution on different plants.
  - Identify nutritional deficiency symptoms in specified situations.
  - Develop a fertiliser program in response to a specified nutritional problem.
  - Distinguish between the affects of water deficiency and water excess on plant health.
  - Explain how to diagnose damage by various non-insect pest problems, including:
    - Nematodes
    - Slugs and snails
    - Mites
    - Millipedes
    - Larger animals such as rabbits, possums or birds.
  - Explain how to control different non-insect pests with both chemical and non-chemical methods.
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### **Example of an Assignment:**

#### **ASSIGNMENT**

1. Develop a checklist for determining the significance of pests and diseases, which addresses different criteria, including:

- short term impact on plant
- long term impact on plant
- economic impact
- aesthetic (appearance) impact

2. Explain briefly (in a sentence for each) and in your own words, the following terms used to distinguish between different pests and diseases:

- Rot
- Spot
- Blotch
- Blight
- Scald

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- Die back
- Canker
- Fasciation
- Mosaic
- Gummosis
- Mummification
- Damping Off
- Bleeding
- Blast
- Scorch
- Shot Hole
- Wilting
- Firing
- Rosetting
- Dwarfing
- Scab
- Chewing Insect
- Sucking Insect

3. Distinguish between the main types of plant diseases including fungal diseases, viral diseases and bacterial diseases. Submit approx 400 words.

4. Create a standard worksheet for reviewing pest and disease problems of plants (based on your first set task for this lesson).

5. Submit your first two completed (filled in) pest/disease review sheets.

6. Briefly list the types of information you collected during your second set task for this lesson. Submit no more than 1 page.