Candidate Number: ……

Candidate Name: ……

Centre Number/Name: ……..

RHS (LEVEL 3) ADVANCED CERTIFICATE IN HORTICULTURE

WRITTEN EXAMINATION

Wednesday 6th July 2005

IMPORTANT – Please read carefully before commencing.

i) The duration of the papers in Module **D** is **2** hours.
ii) Answer **ALL** questions in Section **A**.
iii) **ALL** questions in Section **A** carry equal marks.
iv) Write your answers legibly in the spaces provided.
v) Use **EITHER** metric **OR** imperial measurements but **NOT** both.
vi) Where plant names are required, they should include genus, species and where appropriate, cultivar.

Module D

Outdoor Plant Production
Protected Plant Production

Section A – Short Answer Questions

Please turn over/……

ANSWER ALL QUESTIONS

MARKS

Q1 Describe **TWO** advantages of intercropping in vegetable growing and name **TWO** crops suitable for this system. **2**

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Q2 Explain the principle involved in frost protection of fruit crops by the use of sprinkler irrigation systems. **2**

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Q3 Explain how the shape and orientation of a protected cropping structure affects winter light transmission. **2**

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Q4 State **FOUR** distinct methods of controlling insect pests in outdoor, organically grown crops. **2**

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Please see over/…..

ANSWER ALL QUESTIONS

Q5 Describe a method of soil sampling an area prior to planting fruit trees. **2**

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Q6 List **FOUR** desirable characteristics of carnation flowers required by a florist. **2**

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Q7 State **TWO** advantages and **TWO** limitations of marketing bare-root shrubs rather than using containers. **2**

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Q8 Explain how the use of floating mulches can be of benefit to a vegetable producer. **2**

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ANSWER ALL QUESTIONS

Q9 List **FOUR** benefits to both the grower and customer of grading an apple crop prior to marketing. **2**

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Q10 State **TWO** advantages and **TWO** limitations of walk-in polythene tunnels for bedding plants. **2**

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RHS (LEVEL 3) ADVANCED CERTIFICATE IN HORTICULTURE
WRITTEN EXAMINATION

Wednesday 6th July 2005

IMPORTANT – Please read carefully before commencing.

i) The duration of the papers in Module **D** is **2** hours.
ii) Answer **TWO** questions from Section **B** and **ONE** question from Section **C**.
iii) **ALL** questions carry equal marks.
iv) Write your answers legibly in the answer booklets provided.
v) Use **EITHER** metric **OR** imperial measurements but **NOT** both.
vi) Where plant names are required, they should include genus, species and where appropriate, cultivar.

Module D

Outdoor Plant Production
Protected Plant Production

Section B & C

Structured Questions

Please turn over/……

Section B – Outdoor Plant Production

Answer TWO questions from this section

MARKS

Q1 Explain how **EACH** of the following will affect a crop:

i)	uniformity of plant density;	**4**
ii)	irrigation;	**4**
iii)	cultivation;	**4**
iv)	fertilizer application;	**4**
v)	direct drilled crops.	**4**

Q2 a) Describe the mechanisation techniques used for harvesting a **NAMED** vegetable crop. **12**

b) Describe the EU grading schedule for the crop named in a). **8**

Q3 Plan the annual maintenance schedules for **TWO** distinct types of stock beds for cuttings production, found on a hardy plant nursery. **20**

Q4 Evaluate cultural methods of avoiding or reducing pest and disease attack in:

i)	soft fruit crops;	**10**
ii)	vegetable crops.	**10**

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Please see over/…..

Section C – Protected Crop Production

Answer ONE question only from this section

MARKS

Q5 Explain the importance of the following on crop production:

i)	integrated pest management;	**4**
ii)	layering of a tomato plant;	**4**
iii)	economic threshold;	**4**
iv)	de-leafing;	**4**
v)	stopping plants.	**4**

Q6 a) Explain what is meant by the term 'risk assessment'. **5**

b) Outline the stages necessary to complete a risk assessment for a specified practical operation under glass. **10**

c) Describe the reasons why a regular review of the process is important. **5**

RHS (LEVEL 3) ADVANCED CERTIFICATE IN HORTICULTURE

Wednesday 6th July 2005

MODULE D

Outdoor Plant Production
Protected Plant Production

Examiners Comments

Candidates Registered	67		Total Candidates Passed		
Candidates Entered	58	85.57%	Passed with Commendation	21	36.21%
Candidates Absent	6	8.96%	Passed	33	56.90%
Candidates Deferred	2	2.98%	Failed	4	6.89%
Candidates Withdrawn	1	1.49%			

Senior Examiners Comments

Structured questions do not require candidates to write in essay form. It is important that candidates answer questions in a style that is appropriate to the question asked. This requires an understanding of the phraseology used.

It is of vital importance that candidates understand the meaning of the key words used in examination questions and respond accordingly. In many instances full marks could not be awarded because candidates had not understood what was required and as a result did not provide an answer that met the question in full, and thus failed to gain the available marks.

Below is provided a definition of the key words used in questions, which may help to clarify the requirement of questions.

State means - ***to write down the facts briefly***

Describe means – ***to give an account of***

Explain means – ***to make the meaning clear – (****answers will normally need to include details of how, when, why and to relate horticultural practice to underlying scientific principles).*

Evaluate means - ***to judge the worth of (state the benefits and limitations of..)***

List means – ***to itemise***

Diagrams must be annotated if they are to be of any value. It is advisable (but not essential) to draw them in pencil as mistakes can easily be rectified. The use of colour is a luxury and should only be carried out when clear differentiation is required.

In some instances handwriting again proved to be difficult to decipher. Candidates should remember that if the examiner cannot read what has been written it will not be possible to award any marks.

Wherever possible, named examples should be given in answers as these indicate to the examiner that the candidate has a comprehensive understanding of the subject concerned.

Where a question is set in different sections, eg a,b,c or i,ii,ii candidates are advised to set out their answers to follow the structure of the question, section by section.

Section A. Short Answer Questions

*Q1. Describe **TWO** advantages of intercropping in vegetable growing and name **TWO** crops suitable for this system.*

Candidates who described intercropping as a practical way to increase yield using rapidly maturing crops sown or planted between slower growing crops obtained good marks. Crops suitable for this method include lettuce and radish growing between brussels sprouts or leeks.

Q2. Explain the principle involved in frost protection of fruit crops by the use of sprinkler irrigation systems.

Most candidates were familiar with the principle of the use or irrigation sprinklers for frost protection in fruit. The blossom must be kept sprinkled, continuously, with droplets about the size of raindrops while the frost is present.

Q3. Explain how the shape and orientation of a protected cropping structure affects winter light transmission.

The advantages of an east-west orientation for greenhouses especially during winter months when light is, in, general insufficient for good plant growth. Several candidates were aware that when the incidence of sunlight is normal about 91% of the light passes through the glass. With blocks of say Venlo type greenhouse orientation is not quite as critical.

Q4. State four distinct methods of controlling insect pests in outdoor, organically grown crops.

Candidates had a good choice of methods for controlling insect pests outdoor in organically grown crops. Rotation, pheromone traps, fleece/netting were all suggested. Although the use of “companion crops” is obviously still taught at some centres, there is scientific evidence to support this theory.

Q5. Describe a method of soil sampling an area prior to planting fruit trees.

When describing sampling the use of an auger, taking cores in a W formation to depths of 0-15cm and 15-30cm should be recommended. Areas not typical of the site should be sampled separately.

*Q6. List **FOUR** desirable characteristics of carnation flowers required by a florist.*

Candidates took the opportunity to present their knowledge of the requirements for carnations flowers by florists. Long straight stems, free from blemishes including P & D, fresh in appearance and bud opening to a suitable stage.

*Q7. State **TWO** advantages and **TWO** limitations of marketing bare-root shrubs rather than using containers.*

Candidates answered this question well. The advantages of bare-root shrubs being cheaper to produce, lighter to transport and not requiring staff and facilities for "potting in to containers". The disadvantages were the shorter marketing period and the need to pack well to avoid drying out.

Q8. Explain how the use of floating mulches can be of benefit to a vegetable producer.

The benefits of using floating mulches were generally well understood, but some candidates confused this with organic mulches. Fleece can forward an iceberg lettuce crop for up to 14 days. Crops become less damaged by wind and water splash.

*Q9. List **FOUR** benefits to both the grower and customer of grading an apple crop prior to marketing.*

Grading was well understood by candidates. Uniformity of size, freedom from pests and diseases, financial returns and the supply to different outlets proved to be good evidence.

*Q10. State **TWO** advantages and **TWO** limitations of walk-in polythene tunnels for bedding plants.*

Advantages included the protection from inclement weather, earlier and more flexible cropping programmes were all stated.
Ventilation and irrigation can be more difficult than in traditional Venlo greenhouses.

Section B. Structured Questions (Outdoor Plant Production)

*Q1. Explain how **EACH** of the following will affect a crop:*

i) uniformity of plant density;
ii) irrigation;
iii) cultivation;
iv) fertilizer application ;
v) direct drilled crops.

This was a popular question, where high marks were awarded to candidates who explained **how EACH** of the following affected the production of a crop:

i) **Uniformity of plant growth and its effects on**: harvesting and marketing, spacing, thinning, pest and disease susceptibility.
ii) **Irrigation:** its timing, amount, quality, field capacity, method, frost - protection, aids distribution of nutrients.
iii) **Cultivation:** methods, when, depth, tilth, lifting of produce, eradication of weeds.
iv) **Fertilizer application**: timing, type, formulation, amount, conductivity, and nutrient availability.
v) **Direct drilled crops:** crop type, timing, mechanisation, harvesting, financial issues, less disturbance, etc

*Q2. a) Describe the mechanisation techniques used for harvesting a **NAMED** vegetable crop.*

b) Describe EU grading schedule for the crop named in (a).

Candidates were expected to show that they had an in – depth knowledge of at least ONE harvesting method for a NAMED crop, which was not always specified.

a) Candidates received high marks, where they described specific harvesting machinery or equipment for the NAMED crop and how it was used, mobile rigs for processing and crating, loading equipment, washing, packaging, controlled storage facilities and labelling.
b) Few candidates were able to give a full answer to this part of the question. Better answers described in relation to NAMED crops, class size, minimum size, differences within bundles, types of packaging, uniformity of produce, weight, head size, trimmed / untrimmed, boxes marked with quality, size, grower origin, weight, and cultivar.

*Q3. Plan the annual maintenance schedules for **TWO** distinct types of stock beds for cuttings production, found on a hardy plant nursery.*

This question was reasonably well answered by most that attempted it. Candidates that NAMED TWO distinctly different types of stock beds and went on to plan a schedule for their maintenance were awarded high marks. This question required candidates to show that they were able to sequence and time maintenance within an overall management plan so that production was maximised. Candidates were expected describe, where appropriate, for the two types of stock beds: spacing, pruning or heading back, earthing – up, feeding, watering, protection from wind, pest, disease and weed control, lifting, replacement planting, labelling and the correct naming of the plants, inspection. Time could have been saved answering this question if candidates had shown in the form of a chart, activity cross – referenced with time of year.

Q4. Evaluate cultural methods of avoiding or reducing pest and disease attach in:

i) soft fruit crops;
ii) vegetable crops.

This was a popular question with candidates, most of whom were able to show that they had a good working knowledge of pest and disease control using cultural or physical practices. However, some candidates lost marks and wasted time, describing the use of chemicals, which was not asked for. Candidates were expected to evaluate, [assess] the use of different non – chemical methods of pest and disease control, and give a reasoned account of why one method, was preferred over another, where it was applicable.
Candidates were expected to include a range of methods specific to fruit or to vegetable crops for example: rotation, weed control and the removal of alternative host plants, the use of resistant cultivars, the removal of crop debris, timing planting or sowing, the use of physical barriers, pruning and the safe disposal of arisings, the use of crop covers, the use of certified stock, timing sowing and harvesting dates, companion planting etc

Section C. Structured Questions (Protected Crop Production)

Q5. Explain the importance of the following on crop production

i) Integrated pest management;
ii) layering of a tomato plant;
iii) economic threshold;
iv) de-leafing;
v) stopping plants.

Most of the candidates answered this question well. Most of the answers illustrated an understanding of the different methods of pest and disease control and how they could be integrated to best advantage. Many candidates emphasised the advantages of less pesticide use however few were able to give good examples of integrated pest management working in practice.

Most candidates understood the importance of tomato layering however few highlighted the importance of this and related it directly to crop production. Some candidates were confused about the methods of tomato layering.

Some candidates related this to the whole production costs rather than the economics of pest control. A few candidates included a graph to illustrate the threshold point where the economics of pest or disease control became worthwhile.

Some confusion resulted from this question. Candidates included the removal of leaves in preparation for marketing cut flowers while others were not clear as to the purpose of leave removal in the production of a tomato crop. The balance of food production rather than a drain on the plant resources was only hinted at rather than a complete or full explanation.

The purpose of stopping plants was well understood together with an understanding of apical dominance and its effect on crop production. Many examples were used to illustrate the effects of stopping on crop production.

Q6. a) Explain what is meant by the term 'risk assessment'.
b) Outline the stages necessary to complete a risk assessment for a specified practical operation under glass.
c) Describe the reasons why a regular review of the process is important.

Most candidates had a good understanding of the term 'risk assessment'. Some were unclear of how it should be applied to a particular operation on the nursery rather than an area or building. There was some confusion as to the stages necessary to complete the risk assessment with some candidates suggesting a very ad hock approach. Most candidates provided a good explanation as to the importance of regular review, with changes in processes, equipment, and legislation being sited as examples.