RHS Qualifications Awarding Body

RHS Level 2 Certificate in Horticulture

General Guidance Notes and Syllabus

Horticulture I
(Planning, Principles & Production)

Horticulture II
(Ornamental, Principles & Maintenance)

RHS Qualifications, The Royal Horticultural Society,
Wisley, Woking, Surrey GU23 6QB

November 2010

CONTENTS

For an alternative format of this document, please call the Qualifications Section on 01483 226500 or email qualifications@rhs.org.uk

1 EXAMINATION DATES

2011

Units	Date	Time
Horticulture I	16 February 2011	10.00am – 11.30am
Horticulture II	16 February 2011	2.00pm – 3.30pm

Closing date for entries by Centres 30 November 2010

Horticulture I	22 June 2011	10.00am – 11.30am
Horticulture II	22 June 2011	2.00pm – 3.30pm

Closing date for entries by Centres 6 May 2011

2 BACKGROUND AND PURPOSE OF THE EXAMINATION

2.1 The RHS Level 2 Certificate in Horticulture (formerly the RHS General Certificate in Horticulture) is a National Examination established in 1893 which continues to provide an industry recognised qualification as a basis for those wishing to pursue a professional career in horticulture. Many leading professional horticulturists have used this qualification as a starting point in their career. It is also suitable for leisure gardeners who seek to have their horticultural knowledge formally assessed. The qualification is eminently suitable for use with open access learning opportunities.

2.2 The Examination assesses candidates' basic horticultural knowledge and its application, and also communication skills. Possession of the Certificate provides evidence of a broad understanding of the fundamentals of horticultural practice and science, especially as required in professional employment to support career progression.

2.3 As a result of success in the Examination, candidates will be able to:

a) demonstrate evidence of a broad base of horticultural knowledge;

b) communicate in writing, clearly and coherently on horticultural matters;

c) relate horticultural science to its practical application.

2.4 Success in the Examination approximates in broad terms to a good GCSE grade/NVQ Level 2 award.

2.5 The RHS Level 2 Certificate in Horticulture is an accredited award granted through the Office of the Qualifications and Examinations Regulator (Ofqual). **Accreditation No. 100/4284/2**.

3 STRUCTURE AND CONTENT

3.1 The syllabus is detailed at Appendix 1 page 12.

3.2 The syllabus in a unitised format is the basis for the Examination, which comprises two question papers, each 1½ hours duration, designed to test understanding of a range of aspects of horticulture as practised within the British Isles. Both papers comprise fifteen compulsory short-answer questions in Section 1 and three structured essay style questions to be answered from a choice of six in Section 2.

3.3 Examinations will be conducted bi-annually, in February and again in June.

3.4 The structure is entirely theory-based and takes in both principles and practices of horticulture.

3.5 The Structure of the Examination, comprising of two units is as follows:

Horticulture I – Planning, Principles & Production 50% of total marks

Section 1

Short Answer Questions – 15 Compulsory questions.
(Each question is worth 2 marks)

Section 2

Structured Questions – 3 selected questions from 6 offered.
(Each question is worth 10 marks)

- The Plant (The Plant Kingdom)
- Plant Propagation (Flora)
- Outdoor Food Production
- Garden Planning

Horticulture II – Ornamental, Principles & Maintenance 50% of total marks

Section 1

Short Answer Questions – 15 Compulsory questions.
(Each question is worth 2 marks)

Section 2

Structured Questions – 3 selected questions from 6 offered.
(Each question is worth 10 marks)

- The Root Environment and Plant Nutrition (Flora)
- Protected Cultivation (Horticulture)
- Horticultural Plant Selection, Establishment & Maintenance
- Horticultural Plant Health Problems

4 DURATION OF COURSE AND INTERPRETATION OF THE SYLLABUS

4.1 There is no required fixed duration of a course but it should be sufficient to give a thorough treatment of the topics in the syllabus.

As a guide, a minimum of **120 tutor-led taught hours** should be adequate for students in possession of good written communication skills. Students who lack ability in written expression or who are weak in basic science or an appreciation of craft skills will require more time. It is expected that all students will need to supplement the taught course with additional personal study.

4.2 Teachers will need to cover all the major headings in the syllabus which is set out in each of the eight prescribed units. The Examination, which comprises two question papers, each of 1½ hours duration, offering both short-answer questions and structured questions, is designed to test a range of aspects of horticulture as practised in the British Isles. In each unit paper, candidates will be required to provide answers to **all** of the 15 questions in Section 1, followed by **3** structured questions from a choice of 6 in section 2.

Each question paper will test candidates' basic understanding of scientific principles and their relationship and application to horticultural skills and practices. Candidates should be given practice in the techniques of answering examination questions from previous examination papers.

4.3 Candidates are not expected to have a detailed knowledge of unusual plants, crops or specialist techniques. A scheme of work to support the syllabus should, therefore, focus principally upon basic horticulture. It should include reference, wherever applicable, to the need for environmental and conservation awareness and practice.

Candidates need to appreciate the legal requirements and other measures related to the protection and enhancement of the environment.

The selection and use of plants and other features to attract wildlife and the provision and management of native trees, shrubs and hedges are useful ways of exemplifying the environmental basis of horticulture.

4.4 Candidates should be made aware of the alternatives to chemical pesticides, fungicides and growth regulators, and be able to offer critical appraisal of environmentally friendly or organic and non-organic techniques.

4.5 It is prudent for teachers to maintain up-to-date knowledge of horticultural research and developments.

5 RESOURCES

5.1 Candidates will need access to the following resources:

a) Qualified tuition of a kind to give support in all aspects of the course and its assessment. Students need to be aware of the Examination regulations and procedures and they should be given advice about their progress during the course;

b) A library with an appropriate range of up to date horticultural books, scientific journals and other sources of reference material. A suggested Reading List is available on the RHS website;

c) Some practical horticultural facilities and a suitable range of plants/crops to study and handle. Students may have suitable facilities at home or work for this purpose;

d) A laboratory/room, together with suitable related equipment, for the study of plant and soil science, and plant pests, diseases and disorders;

e) Previous examination papers including the Examiners' Reports are available to download from the RHS website.

6 CANDIDATE GUIDANCE

6.1 As is the case for all the Society's examinations, it is for candidates to decide when they feel they are sufficiently prepared to present themselves for examination. It is however expected that professional guidance on a potential candidate's prospects will be offered by Centres promoting learning opportunities.

In addition to revising theory, candidates need to learn and be given practice in examination techniques and discipline, for example: taking time to read and understand the precise requirements of each question, including relevant factual information, defining and explaining terms; separating the answers to different sections in a structured question; writing answers in the third person.

6.2 Candidates should be instructed to follow the specific instructions on the Examination papers, concerning the **number** of questions to be answered; candidates will not be given credit for answering more than the required number of questions. They should also study the requirements of each question. Particular care is needed in answering questions which offer a choice, or state that a limited number of parts are to be answered, or that a specified number of examples are to be used.

6.3 Candidates should be aware that only **metric units** will be used, and all answers must be given using metric units.

6.4 Candidates should be advised that it is the quality of their answers, not length, which will gain the highest marks. Quality of an answer is a function of relevant information, clarity, conciseness and logical presentation.

6.5 Candidates should be offered guidance on:

a) Legibility, clarity, and neatness which are essentials assisted by effective layout and presentation;

b) The importance of attention to correct grammar and spelling and clear writing style;

c) The value of large, simple clearly-labelled diagrams, graphs, histograms and tabulated data, which can enhance and clarify answers and reduce the need for lengthy descriptions;

d) The presentation of maximum possible marks against each question, or part of a question, which offers a good guide to the depth of answer required;

e) The importance of answers always being related to the nature of the question; there is no ideal or optimum length of answer.

6.6 Each question is marked by a different examiner or group of examiners and therefore **in the case of structured answers it is most important that candidates are directed to commence the answer to each question on a fresh answer booklet (as instructed by the invigilator)**. They should also indicate in the margin the question number and, where applicable, the part of the question being answered.

7 ELIGIBILITY AND EXEMPTIONS

7.1 There are no minimum academic entry requirements for the Examination.

7.2 Candidates resident overseas are eligible to take the Examination. They should, however, be aware that the Examination is based on British horticulture.

With the approval of RHS Qualifications candidates may make arrangements for taking the Examination in their country of residence but they will be responsible for any cost incurred for local invigilation and examination facilities. (See also paragraph 8.9)

7.3 If a candidate is unable to take the Examination at one of the approved Examination Centres, the Society is willing to consider approving arrangements for exceptional supervision. (See also paragraph 8.9).

7.4 No exemptions are given for any part of the Examination.

8 REGISTRATION REQUIREMENTS

8.1 To enrol for the Examination, entries will normally be made through the candidate's centre of study, to arrive not later than the closing dates.

8.2 Candidates will normally pay their entry fee direct to the centre of study. The fee is £35.00 (£ Sterling) per unit. The fee is **not refundable**.

8.3 The unit examinations can be taken at different sessions and in any order.

8.4 Candidates needing to re-sit either unit should enter through their centre and pay the fee per unit in the same way as the first registration.

8.5 It is the candidate's responsibility to ensure that they have been entered for the examination.

8.6 Candidates who wish to defer their entry to another date may do so without incurring any penalties; provided RHS Qualifications is notified up to **6 weeks** prior to an examination. Inside of six weeks, candidates will lose the **fee** unless exceptional circumstances prevail (medical grounds, or similar).

8.7 Candidates following distance-learning courses towards this examination should contact and enrol through the Examinations office at their local approved centre. If candidates require further information, they should contact RHS Qualifications on 01483 226500.

8.8 Candidates not enrolled on courses at their chosen Examination Centre may be subject to a nominal fee, payable directly to the centre.

8.9 In exceptional circumstances, the Examination may be taken at a place other than an approved centre, under the supervision of a person acceptable to The Royal Horticultural Society. In such cases, an Exceptional Supervision Application Form should be requested from the RHS Qualifications.

8.10 Candidates entered for the examination must bring photographic proof of identity before being allowed to sit the examination (driving licence or similar photo ID).

8.11 In order to avoid loss or delay in the post, the examination centre must be notified of any change of surname, address, or telephone number.

8.12 Candidates must be punctual for the examination and make allowances for unfamiliar journeys, car parking etc.

9 NOTIFICATION OF RESULTS

9.1 The results of the examination will be notified during April for the February Examination series and September for the June series by post from the nominated centre. Candidates who successfully complete both units (Horticulture I & Horticulture II) will receive a Certificate indicating the grade of Pass. The regulatory authorities' logos on the certificates issued for this Qualification indicate that the Qualification is accredited for England, Wales and Northern Ireland. Candidates who undertake only one unit at an examination session will be notified by a notification of pass or fail.

9.2 Centres will be notified, by post, of their candidates' results in the Examination. Candidates who successfully complete both units will receive a Certificate indicating the grade of Pass.

9.3 Centres will also be sent a list of their candidates' results which will include the overall mark gained by each candidate.

9.4 Candidates who are unsuccessful or who consider that their result was not as good as they expected should be aware that Examination Papers including the Examiners' Reports are available to download from the RHS website. As well as the examination results in summary it will give general guidance, based on candidates' performance in that examination, on how higher marks might be achieved with specific comments on each question.

Please refer to the Enquiries About Results Service (page 10) for further information about the options for the clerical checking and remarking of individual candidates scripts.

10 QUALIFYING AND GRADING REQUIREMENTS

10.1 RHS Examiners consider the most positive answers to be those which fulfil the following criteria:

a) Relate specifically to the question set, and in the case of structured answers are illustrated by clearly labelled diagrams where appropriate;

b) Include appropriate factual information;

c) Are presented legibly, clearly and logically, with appropriate headings and paragraphs in the case of structured questions.

10.2 Candidates need to obtain 50% in each unit in order to obtain an overall pass. Candidates failing to do this will be required to resit the unit in which they do not achieve 50%.

10.3 A **Pass** will be awarded to candidates who achieve a mark between 50% and 69% for both of the units.

Candidates who pass both units and achieve an average mark of 70% or more for the two combined units of the total available marks will be awarded a **Pass with Commendation** (84 or more out of 120).

11 PRIZES

11.1 In 1993 the Society inaugurated the Centenary Prize, donated by Mr Oliver Menhinick, to be awarded annually at a special presentation ceremony to the candidate obtaining the highest number of marks in the examination.

The Anne Menhinick Prize is a subsequent introduction available to the candidate who obtains the second highest overall mark **and** who is under 30 years of age at the time of sitting the examination.

12 PREVIOUS EXAMINATION PAPERS

12.1 Past examination papers are available to download free-of-charge from the RHS website. Alternatively, printed copies can be ordered for a fee from RHS Qualifications.

13 ENQUIRIES ABOUT RESULTS SERVICE

13.1 An Enquiry about Results Service administered by RHS Qualifications is available to candidates.

13.2 The service provides two options which will be at a cost to the candidate, payable to the Society. Re-mark £40.00 per unit. Re-mark and Report £60.00 per unit.

13.3 Should the findings result in a change of grade, the candidate's fee will be refunded.

13.4 Applications for this service should be made through the candidate's examination centre. All centres have been provided with full details of this service.

14 REASONABLE ADJUSTMENTS

14.1 Applications for Reasonable Adjustments should be made through the centre providing the course of study.

14.2 Evidence should be provided at the time of entry for the examination. However, if this is not available at the time of entry, it must be submitted no later than 31 December for the February examination and 29 May for the June examination.

14.3 All centres have been provided with full details and application forms for this service.

15 RHS QUALIFICATIONS POLICIES

15.1 The conduct of RHS Examinations is covered by the RHS Qualifications Equal Opportunities Policy, Customer Service Statement and Appeals Policy. Copies of the above policies are available from RHS Qualifications on request. Alternatively, copies can be obtained through our website: http://www.rhs.org.uk/Courses/Qualifications/RHS-qualification-policies

15.2 The Council of the Royal Horticultural Society reserves the right to modify the Regulations. In any question of interpretation the decision of the Council is final.

16 COMMUNICATION

16.1 Requests for information about the Royal Horticultural Society's other qualifications and any correspondence relating to RHS qualifications should be addressed to:

RHS Qualifications
The Royal Horticultural Society
Wisley
Woking
Surrey
GU23 6QB.
Telephone: 01483 226500 email: qualifications@rhs.org.uk

Appendix 1

Horticulture I
Planning, Principles & Production

Unit Title: **The Plant (Plant Kingdom)**

Level: **RHS Level 2 Certificate in Horticulture**

Description of unit

This unit will enable candidates to develop an understanding of the basis on which higher plants are classified and named and to appreciate the role and function of morphological and anatomical features in higher plants. The unit will ensure that the fundamental physiological processes within the plant are understood including photosynthesis, respiration and water movement. Additionally, students will understand the mechanisms of pollination, fertilisation, seed formation and subsequent germination.

Summary of outcomes

1. The relationship between scientific principles and horticultural practices.
2. The classification and taxonomic hierarchy of seed bearing plants.
3. Plant growth and life cycles.
4. Identification of plant cells and tissues together with their structure and function.
5. Identification and function of the external vegetative parts of the plant.
6. Identification and function of the reproductive parts of the plant.
7. Identification and function of fruits and seeds.
8. The importance of photosynthesis and respiration.
9. The importance of transpiration and translocation of water throughout the plant.
10. The process of pollination and fertilisation in higher plants.
11. Seed and fruit development and the germination and development of the seed and seedling.
12. Growth and developmental relationships including growth regulation, phototropism and photoperiodism.

Content

Identifying safe, healthy and environmentally friendly practices at all times.

1. The relationship between scientific principles and horticultural practices.

2. The classification and taxonomic hierarchy of seed bearing plants.

Gymnosperms, angiosperms; monocotyledons, dicotyledons; reasons for botanical/horticultural nomenclature; family, genus, species, subspecies, variety and cultivar.

3. Plant growth and life cycles.

Timing in relation to life cycles of ephemerals, annuals, biennials, herbaceous and woody perennials; evergreen and deciduous; juvenility, maturity and senescence.

4. Identification of plant cells and tissues together with their structure and function.

The basic cell, its components (cell wall, cell membrane, nucleus, vacuole, cytoplasm, organelles - chloroplast and mitochondria) and division (mitosis and meiosis); specific tissues: parenchyma, collenchyma, sclerenchyma, epidermis, cortex, phloem, xylem, cambium, endodermis, pericycle; secondary growth in dicotyledons and perennial growth in monocotyledons; lignin, cork, medullary rays and lenticels. Internal differences between monocotyledons and dicotyledons.

5. Identification and function of the external vegetative parts of the plant.

Roots: adventitious, lateral; root cap, root tip, root hair. Root adaptations: tubers and aerial roots. Stems: nodes, internodes, apical, lateral/axillary, adventitious buds; stem adaptations: hairs, thorns, corms, tubers, stolons and rhizomes. Leaves: petiole, lamina, midrib, shape and colour; leaf adaptations: bulbs, tendrils, hairs and bracts. External differences between monocotyledons and dicotyledons.

6. Identification and function of the reproductive parts of the plant.

Types of inflorescence: solitary and multiple inflorescence, spike, raceme, panicle, umbel, corymb and composite. Parts of the flower: sepals, petals, tepals, calyx, corolla, nectaries, androecium, anther, filament, gynoecium, stigma, style, ovary, and ovule. Characteristics of flowers: monoecious, dioecious and hermaphrodite.

7. Identification and function of fruits and seeds.

Types of fruit: dry, hard, fleshy, succulent, dehiscent, indehiscent to include berry, capsule, drupe, legume, nut. False fruits. Seeds: size and shape, testa, hilum, micropyle, cotyledon, endosperm, plumule, radicle, hypocotyl and epicotyl.

8. The importance of photosynthesis and respiration.

Photosynthesis: the basic equation (in words) and constituent parts; factors limiting its efficiency. Respiration: the basic equation (in words) and constituent parts, aerobic and anaerobic conditions, factors limiting its efficiency.

9. The importance of transpiration and translocation of water throughout the plant.

Water uptake and movement within the plant, osmosis, diffusion, role of stomata, evaporation and the effect of humidity and temperature on transpiration.

10. The process of pollination and fertilisation in higher plants.

Pollen movement from stamen to stigma: types of pollination, self/cross, and compatible/incompatible. Fertilisation: pollen tube development, fusion, and embryo development. Horticultural significance: fertility/sterility, triploid apples, parthenocarpy, hybrid vigour and F_1 hybrids.

11. Seed and fruit development and the germination and development of seed and seedling.

Factors affecting germination of the seed: water, air, light, heat, viability and inhibitors. Physical and physiological dormancies. Epigeal and hypogeal germination. Horticultural significance: storage conditions, sowing times and soil/compost conditions.

12. Growth and developmental relationships including growth regulation, phototropism and photoperiodism.

The nature of growth resulting from cell division and the increase in cell numbers. Factors affecting growth including the basic role of the growth regulator auxin and its horticultural significance, competition for moisture, nutrients light and space. Basic concept of growth towards light (phototropism) and vegetative and reproductive development determined by daylength (photoperiodism).

Unit Title: **The Plant (Plant Kingdom)**

Level: **RHS Level 2 Certificate in Horticulture**

Identifying safe, healthy and environmentally friendly practices at all times

Learning outcomes	**Assessment criteria**
1. Demonstrate an understanding of the relationship between scientific principles and horticultural practices in this unit.	1.1 Relate the scientific principles to plants and horticultural practices.
2. Demonstrate a knowledge of the classification and taxonomic hierarchy of seed Bearing plants.	2.1 State the major divisions found in the plant kingdom.
	2.2 Identify the basic differences between gymnosperms and angiosperms.
	2.3 State how angiosperms are subdivided into monocotyledons and dicotyledons.
	2.4 State the reasons why botanical/ horticultural nomenclature is important.
	2.5 Define the meaning of ‘family’, ‘genus’, ‘species, ‘subspecies’, ‘variety’ and ‘cultivar’.
3. Demonstrate a knowledge of plant development and life cycles.	3.1 Define the terms: ‘annual’, ‘ephemeral’, ‘biennial’ and ‘perennial’.
	3.2 Define the terms: ‘tender’, ‘half-hardy’ and ‘hardy’ in relation to annuals.
	3.3 Define the terms: ‘tender’, ‘half-hardy’, ‘hardy’, ‘herbaceous’ and ‘woody’ in relation to perennials.
	3.4 State the meaning of the terms: ‘evergreen’, ‘semi-evergreen’ and ‘deciduous’.

		3.5	Describe what is meant by the terms: ‘juvenility’, ‘maturity’ and ‘senescence’ in the development cycle of a plant and state their horticultural significance.
4.	Identify plant cells and tissues and demonstrate an understanding of their structure and function.	4.1	Describe the structure of the basic plant cell and state the function of the basic components.
		4.2	State where active cell division is located within the plant (apical and lateral meristems).
		4.3	Define the term: ‘plant tissue’.
		4.4	Describe the basic characteristics and role of the tissues found in flowering plants.
		4.5	State the basic changes that occur when woody dicotyledons undergo secondary growth/thickening.
		4.6	State how strengthening tissue can be established in monocotyledons allowing perennial growth to occur.
		4.7	State the internal differences between monocotyledons and dicotyledons.
5.	Demonstrate an understanding of the function of the external vegetative parts of the plant.	5.1	Describe how the root system develops from the radicle.
		5.2	Define the meaning of ‘primary’, ‘secondary’, ‘tap’, ‘lateral’, ‘fibrous’, and ‘adventitious’ roots.
		5.3	Describe the external structure of the root tip and the role of the root cap and root hairs.
		5.4	Describe how the root is adapted in order to perform specific functions.
		5.5	Describe how the stem develops.
		5.6	Describe different types of buds and state where they occur in the plant.
		5.7	Describe how the stem is adapted in order to perform specific functions.

		5.8	Describe the structure of the leaf.
		5.9	Describe how leaf shape, size, form and colour can vary.
		5.10	Describe how leaves are adapted in order to perform certain functions.
		5.11	State the external differences between monocotyledons and dicotyledons.
6.	Demonstrate an understanding of the function of the reproductive parts of the plant.	6.1	Name the main types of inflorescence found on plants.
		6.2	Describe the structure of a typical dicotyledonous flower.
		6.3	State the role of each component of the flower.
		6.4	Define the terms: ‘monoecious’, ‘dioecious’ and ‘hermaphrodite’.
		6.5	Describe how petals and sepals are modified to tepals in specific genera.
7.	Demonstrate an understanding of the function of fruits and seeds.	7.1	Define the term: ‘seed’ and state the role of seeds in plant reproduction.
		7.2	Define the term ‘fruit’ and state the role of fruit in plant reproduction.
		7.3	State that fruit can be divided into dry, hard, fleshy, succulent dehiscent and indehiscent types.
		7.4	Name one example of each type of fruit listed in 7.3.
		7.5	State what is meant by the term false fruit.
		7.6	Describe the structure of typical monocotyledonous and dicotyledonous seeds.
8.	Demonstrate an understanding of the importance of photosynthesis and respiration.	8.1	State the basic equation for photosynthesis in words.

		8.2	Describe how the efficiency of photosynthesis is determined by temperature, light, carbon dioxide and water.
		8.3	State the basic equation for respiration in words.
		8.4	Describe how the efficiency of respiration is determined by oxygen, water and temperature.
9.	Demonstrate an understanding of the movement of water, minerals and sugar through the plant.	9.1	Define the term: 'transpiration' and state how water and minerals move through the plant.
		9.2	Name the tissue that is involved in this process.
		9.3	Explain the role of phloem and describe its location within stems and roots.
		9.4	Describe osmosis and diffusion and their roles within the plant.
		9.5	Describe how stomata control the release of water from the leaf.
		9.6	State what is meant by evaporation and how the plant may limit water loss.
		9.7	State the effects of humidity and temperature on transpiration and water loss.
10.	Demonstrate an understanding of the process of pollination and fertilisation in higher plants.	10.1	Define the term: 'pollination'.
		10.2	Define the terms: 'cross-pollination' and 'self-pollination'.
		10.3	State two characteristics of wind pollinated plants and two characteristics of insect pollinated plants.
		10.4	Define the term: 'fertilisation'.
		10.5	Define the terms: 'incompatible' and 'compatible' in relation to fertilisation.

		10.6 Define the term: ‘parthenocarpy’ and state its horticultural significance.
		10.7 State the horticultural significance of triploid cultivars.
		10.8 State the significance of F_1 hybrid seeds and explain the term hybrid vigour.
11.	Demonstrate an understanding of seed germination.	11.1 State the factors affecting germination of a seed.
		11.2 Define the terms: ‘viability’ and ‘dormancy’.
		11.3 Define: ‘epigeal’ and ‘hypogeal’ germination.
12.	Demonstrate an understanding of plant growth and developmental relationships.	12.1 State what is understood by growth and development.
		12.2 State that simple cell division produces growth and results in an increase in size.
		12.3 Describe how competition for water, nutrients, light and space can influence growth.
		12.4 Describe two examples of how auxin influences plant growth.
		12.5 Describe what is meant by the term phototropism.
		12.6 Define the term: ‘photoperiodism’.

Unit Title: **Plant Propagation (Flora)**

Level: **RHS Level 2 Certificate in Horticulture**

Description of unit

This unit will enable candidates to develop an understanding of the principles and main practices of plant propagation in horticulture.

Summary of outcomes

1. The relationship between horticultural practices and scientific principles.
2. The importance of safe, healthy and environmentally sustainable practices.
3. Properties of plants produced by sexual and vegetative propagation.
4. Conditions for propagation by seed in a garden situation.
5. Factors which influence successful propagation by cuttings.
6. The production of plants by vegetative techniques in a garden situation.
7. The production of plants by budding and grafting.

Content

Identifying safe, healthy and environmentally friendly practices at all times.

1. The relationship between scientific principles and horticultural practices.

2. The importance of safe, healthy and environmentally sustainable practices.

3. Properties of plants produced by seed propagation and vegetative propagation.

The characteristics of plants requiring seed and vegetative propagation. The circumstances under which each method would be chosen, and the main properties of the plants produced in each case. State at least three plant examples to illustrate the methods above. The benefits and limitations of seed and vegetative propagation.

4. Conditions for successful propagation by seed in a garden situation.

Using named plant examples throughout. The environmental requirements for successful propagation by seed. Types of seed, and their treatment to overcome physical and physiological dormancies: stratification, scarification. Harvesting seed of one annual, one biennial and one woody perennial plant: collection and storage of seed. Descriptions of soil preparation and seed sowing in open ground. Descriptions of container preparation, choice of media and seed sowing in protected situations (to include fine, medium and large seed). After-care of plants produced from seed up to pricking out/thinning.

5. Factors which influence successful propagation by cuttings.

Environmental and growth factors affecting rooting of cuttings. Management of the rooting process. The effects of juvenility, moisture loss, auxin production, nutritional status, health status and temperature upon the speed and success of propagation by cuttings.

6. Production of plants by vegetative techniques in a garden situation.

Distinction between the following types of stem cutting material: Softwood, Semi-ripe and Hardwood. Techniques used in the successful propagation of plant material from each. Propagation by leaf bud, leaf petiole, leaf lamina and root cuttings. The conditions required for successful propagation by layering. Propagation by simple, serpentine and air layering. The conditions required for successful propagation by division. Methods used for the propagation of herbaceous perennial plants by division. Definition of the terms: grafting, budding, rootstock and scion. Description of one common budding and one common grafting technique. After-care of plants produced by vegetative techniques up to potting on/planting out. Examples of plants propagated by each of the above techniques. Use of heated propagators, heating cables, mist units, plastic covers. Different knives used in propagation.

7. Production of plants by budding and grafting.

Definition of the terms budding and grafting. Reasons for the use of budding and grafting to propagate particular plants.

Unit Title: **Plant Propagation (Flora)**

Level: **RHS Level 2 Certificate in Horticulture**

Identifying safe, healthy and environmentally friendly practices at all times

Learning outcomes	Assessment criteria
1. Demonstrate an understanding of the relationship between horticultural practices and scientific principles in this unit.	1.1 Relate the scientific principles to horticultural practices.
2. Describe the importance of using safe, healthy and environmentally sustainable practices.	2.1 Describe the health and safety considerations of the practices included within the unit.
	2.2 Describe how practices included in the unit can affect the environment.
	2.3 Identify how practices within the unit can be adapted to reduce their impact on the environment.
3. Differentiate between the characteristics of plants produced by seed and plants produced by vegetative propagation methods.	3.1 Define the terms: 'seed propagation' and 'vegetative propagation'.
	3.2 Compare two characteristics of plants produced from seed as compared to those produced by vegetative methods.
	3.3 State the relative benefits and limitations of seed propagation and vegetative propagation.
4. Describe the conditions for successful propagation by seed.	4.1 Define the terms: 'physical' and 'physiological' dormancy.
	4.2 Describe one method of overcoming a named physical and a named physiological dormancy.
	4.3 State the conditions for successful germination of viable seed.
	4.4 Describe the seed harvesting and collection of a range of different plants.
	4.5 Describe the effects of storage on seed.

		4.6 Describe how conditions for successful germination can be achieved in a protected environment.
		4.7 Describe the sowing and aftercare of a range of seed types sown in containers.
		4.8 Describe how the conditions for successful germination can be achieved in the open.
		4.9 Describe the sowing and aftercare of a range of seed types sown outdoors.
5.	Demonstrate an understanding of the factors which influence successful propagation by cuttings.	5.1 State the role of physiological factors upon the speed and success of rooting of cuttings.
6.	Describe the production of plants by vegetative techniques in a garden situation.	6.1 Name the types of stem cuttings.
		6.2 Describe the propagation of plants using a range of stem cuttings.
		6.3 Describe the propagation of plants using a range of leaf cuttings.
		6.4 Describe the propagation of one plant using root cuttings.
		6.5 State the environmental requirements for successful rooting of each of the types of cutting in 6.1, 6.2, 6.3 and 6.4.
		6.6 Describe the equipment required to propagate plants by cuttings.
		6.7 Describe the aftercare required for plants raised by cuttings.
		6.8 State the physiological factors to be fulfilled for successful propagation by layering.
		6.9 Describe a range of different types of layering.
		6.10 Describe the aftercare required for plants raised by layering.

		6.11 State the conditions which have to be met to ensure successful propagation by division.
		6.12 Describe the propagation of plants by division.
		6.13 Describe the aftercare of plants propagated by division.
7.	Understand the use of budding and grafting for the propagation of plants .	7.1 Define the terms: ‘budding’ and ‘grafting’.
		7.2 State the reasons for use of budding and grafting for the production of particular plants.

Unit Title: **Outdoor Food Production**

Level: **RHS Level 2 Certificate in Horticulture**

Description of unit

This unit will enable candidates to develop an understanding of the basic cultural operations and production methods necessary to obtain outdoor food crops.

Summary of outcomes

1. The relationship between horticultural practices and scientific principles.
2. The importance of safe, healthy and environmentally sustainable practices.
3. Site selection for the production of outdoor food crops in a garden situation.
4. Cultural operations used to produce outdoor food crops in a garden situation.
5. Production methods for a range of vegetable crops.
6. Production methods for a range of top and soft fruits.

Content

Identifying safe, healthy and environmentally friendly practices at all times.

1. The relationship between scientific principles and horticultural practices.

2. The importance of safe, healthy and environmentally sustainable practices.

3. Site selection for outdoor food production in a garden situation.

Factors to be considered when selecting a site for outdoor food production: aspect, soil type, gradient, frost inclination, shelter, access to facilities. Reasons for providing shelter. Advantages and disadvantages of hedges/shelter belts and artificial windbreaks.

4. Cultural operations used to produce outdoor food crops in a garden situation.

Primary and secondary cultivations. Timing in relation to soil texture and weather/ground conditions. Protection from severe weather and to advance crop - windbreaks, mulches, polythene, fleece, cloches, low tunnels, frames. Management of crops grown under protection: nutrition, irrigation, pest, disease and weed control, weaning, removal of covers. Appropriate propagation methods: seed - direct drilling, blocks/modules, transplants. Runners, hardwood cuttings, suckers. Grafting/budding.

5. Production methods for a range of vegetable crops.

Crop rotation, successional sowing, bed systems, intercropping, effects of crop spacing. Production of a named legume, bulb, brassica, root crop, lettuce, outdoor tomatoes and potatoes from sowing/planting until harvesting to include: base and top dressing, weed control, crop support and irrigation. Identification and control of major pest and diseases for each named crop. Basic storage methods available to the gardener to extend post harvest life.

6. Production methods for a range of top and soft fruit.

Production of a named cane fruit, bush fruit, tree fruit and strawberries to include planting, crop management; support, weed control, base and top dressing, appropriate pruning methods. Plant health: certification schemes, major pests and diseases for each named fruit. Factors affecting pollination/fertilisation: cultivars, flowering periods, necessity for cross pollination. Weather conditions. Pollinating insects. Harvesting. Basic storage methods available to the gardener to extend post harvest life.

Unit Title: **Outdoor Food Production**

Level: **RHS Level 2 Certificate in Horticulture**

Identifying safe, healthy and environmentally friendly practices at all times

Learning outcomes	Assessment criteria
1. Demonstrate an understanding of the relationship between horticultural practices and scientific principles in this unit.	1.1 Relate horticultural practices to scientific principles.
2. Describe the importance of using safe, healthy and environmentally sustainable practices.	2.1 Describe the health and safety considerations of the practices included within the unit.
	2.2 Describe how practices included in the unit can affect the environment.
	2.3 Identify how practices within the unit can be adapted to reduce their impact on the environment.
3. Demonstrate an understanding of the importance of site selection for outdoor food production in a garden situation.	3.1 State the factors to be considered when selecting a site for outdoor food production.
	3.2 Describe the reasons for providing shelter for an outdoor food production area in a garden.
	3.3 Compare the advantages and disadvantages of using natural and artificial windbreaks.
4. Describe the cultural operations used to produce outdoor food crops in a garden situation.	4.1 Describe a range of soil cultivation techniques used in outdoor food production.
	4.2 Describe the methods used to advance and extend the productive season of outdoor food crops.
	4.3 State the benefits and limitations of the use of the bed system in outdoor crop production.
	4.4 Identify a range of propagation methods used in the production of a range of outdoor food crops.

5.	Describe the production of a range of vegetable crops.	5.1	State the benefits and limitations of using crop rotation.
		5.2	Describe how crop rotation can be used in the vegetable garden.
		5.3	Describe two methods by which successional cropping can be achieved in the production of a range of vegetable crops.
		5.4	Define the term: ‘intercropping’.
		5.5	Explain how intercropping can be used to maximise production.
		5.6	Describe the effects of spacing on a named crop.
		5.7	Describe the production of a range of vegetable crops.
		5.8	Describe the symptoms of attack and control measures for two pests and two diseases associated with vegetable crops.
		5.9	Describe how the vegetable crops in 5.7 can be successfully harvested and stored.
6	Describe the production of top and soft fruit crops.	6.1	List the factors to be considered when choosing suitable cultivars and rootstocks for top fruit.
		6.2	Describe the factors to be considered when selecting suitable cultivars of soft fruits.
		6.3	Describe the production of a range of top and soft fruits.
		6.4	Explain the importance of the need for effective fertilisation in fruit production.
		6.5	Describe four methods of ensuring effective fertilisation in fruit production.
		6.6	State the advantages of the certification schemes available for fruit plants.

6.7 Describe the symptoms of and control measures for a range of pests and diseases associated with two top fruit and two soft fruit crops.

6.8 Describe how one top and one soft fruit can be successfully harvested and stored.

Unit Title: **Garden Planning**

Level: **RHS Level 2 Certificate in Horticulture**

Description of unit

This unit will enable candidates to develop an understanding of basic surveying and design principles and to apply them to basic garden design and planning requirements.

Summary of outcomes

1. The importance of safe, healthy and environmentally sustainable practices.
2. Basic surveying techniques.
3. Site appraisal and collection of data for planning purposes.
4. Principles and elements of design.
5. Characteristics of garden styles.
6. Use of hard and soft landscaping materials.

Content

Identifying safe, healthy and environmentally friendly practices at all times.

1. The importance of safe, healthy and environmentally sustainable practices.

Identification of risk factors associated with site features such as access, slope, choice and location of features to include: use of water, boundaries, electricity, choice of materials and choice of plants.

2. Basic surveying techniques.

Direct linear surveying, extensions from a building, offset measurements, triangulation. Plotting of boundaries and other fixed points. Recording data. Production of a simple plan.

3. Site appraisal and data collection for planning purposes.

Site appraisal: topographical, physical and environmental factors to include: dimensions, orientation, aspect, altitude, soil, water drainage, existing planting, structures, views, screening, shelter, shade, pollution, access and services. Client brief, functional requirements. Determination of garden function: recreation, ornamentation, food production and utility.

4. Basic principles and elements of design used in garden planning.

The relevance of design principles used in garden planning to include the following: balance, colour, form, movement, proportion, scale, space, focal and asymmetry, texture and unity.

5. Characteristics of garden styles.

Features of formal and informal styles of small gardens. Effect of size and shape on style of design chosen. Gardens for specific purposes: ornamental, productive vegetable and fruit plots, greenhouses, conservatories, walled gardens, plant collections, low maintenance, wildlife.

6. Use of hard and soft landscaping materials.

Choice of materials for: paths, patios, walls, steps, ramps, furniture, fences, screens, decking, plant supports, pergolas, rock gardens, water features and statuary. Choice of plant material to include beds, borders, containers, rock and water features, walls, sheltered areas, hedges, planted screens, small trees, naturalised areas, ground cover and lawns. Use of native species.

Unit Title: **Garden Planning**

Level: **RHS Level 2 Certificate in Horticulture**

Identifying safe, healthy and environmentally friendly practices at all times

Learning outcomes	**Assessment criteria**
1. Describe the importance of using safe, healthy and environmentally sustainable practices.	1.1 Describe the health and safety considerations of the practices included within the unit.
	1.2 Describe how practices included in the unit can affect the environment.
	1.3 Identify how practices within the unit can be adapted to reduce their impact on the environment.
	1.4 State potential risks to garden users which should be considered when planning gardens.
	1.5 Describe a range of safety factors for a specific garden plan.
2. Describe a range of basic surveying techniques.	2.1 Describe the linear surveying of a site using appropriate equipment.
	2.2 Describe the methods used for recording surveying data.
	2.3 Produce a simple plan using data supplied.
3. Appraise a site and collect data for planning purposes.	3.1 Describe how to appraise a garden site and the garden users requirements in preparation for the production of a plan.
	3.2 State the importance of existing site characteristics and features when developing a garden plan.
	3.3 Describe how the layout of a site may be influenced by topographical and environmental factors.
	3.4 Describe how planning may contribute towards offsetting adverse environmental conditions within a garden.

		3.5	List the user requirements which must be considered before preparing the basic outline plan of the garden.
		3.6	Describe how a range of garden user requirements should be incorporated into a basic outline plan.
4.	Relate principles and elements of design to garden planning.	4.1	State the principles of design that apply to the planning of gardens.
		4.2	Describe how to achieve unity in the overall layout through rhythm, balance, proportion, scale, colour, texture and form.
		4.3	Plan a layout for an area of garden to demonstrate three named principles of design.
5.	Appreciate the characteristics of garden styles and their application to small garden planning.	5.1	Describe three differences between formal and informal styles of design.
		5.2	Identify three formal and three informal features of garden styles.
		5.3	Describe the chief characteristics of one style of garden design.
		5.4	Describe how garden size and shape may affect the style of design chosen.
		5.5	Describe the factors to consider when planning a garden for a named function.
		5.6	Prepare a sketch plan of a garden identifying features suitable for specific functions.
		5.7	Describe how planning may contribute towards the development of specific micro-climates within a garden.
6	Review the choice and use of different hard and soft landscaping materials in garden planning.	6.1	List a range of hard landscaping materials used in garden planning.

6.2 Describe a range of hard landscaping materials in garden planning.

6.3 State the aesthetic considerations which should be made when choosing hard landscaping materials.

6.4 Describe how the choice of soft landscaping for a site may be affected by environmental factors.

6.5 Describe how the choice of materials may affect the unity of a plan.

6.6 Describe the effect that the choice of materials might have on garden maintenance requirements.

Horticulture II
Ornamental, Principles & Maintenance

Unit Title: **The Root Environment and Plant Nutrition (Flora)**

Level: **RHS Level 2 Certificate in Horticulture**

Description of unit

This unit will enable candidates to develop an understanding of the constituents, properties and management of soils and growing media.

Summary of outcomes

1. The relationship between scientific principles and horticultural practices.
2. The importance of safe, healthy and environmentally sustainable practices.
3. Horizons found in the soil profile.
4. Physical properties of soils.
5. Organic matter and living organisms in the soil.
6. Soil water.
7 Soil pH.
8 Plant nutrition from the root environment.
9 Soil cultivations and their effect on the soil.
10 Properties and management of growing media.

Content

Identifying safe, healthy and environmentally friendly practices at all times.

1. The relationship between scientific principles and horticultural practices.

2. The importance of safe, healthy and environmentally sustainable practices.

3. Horizons found in the soil profile.

The properties of each layer; organic, topsoil, sub-soil, rock; including leaching and deposition.

4. Physical properties of soil.

Definition of soil texture and soil structure. Characteristics and properties of sand, silt, clay and loam. The management of each in horticulture. Types of aggregation i.e. single grain, crumbly and solid mass and the effect of each on plant growth. Methods by which structure is improved and damaged. Effects of soil structure on plant growth. Compaction, surface capping and soil pans. The relationship between pore space, air and water.

5. Organic matter and living soil organisms in the soil.

Origins of soil organic matter. The effects of organic matter in the soil. The benefits and limitations of living organisms in the soil. The contribution of earthworms, nematodes, bacteria and fungi. The benefits and limitations of a range of soil ameliorants/conditioners e.g. manures, garden compost, mushroom compost, leaf mould. Four methods of composting garden waste e.g. aerobic and anaerobic composting, worm bins, open trench, leaf mould etc.

6. Soil water.

Definition of saturation, field capacity, permanent wilting point, available water; the relationship of these to soil texture, structure, pore space and organic matter content. Symptoms of poor drainage. Drainage systems used in garden situations. Irrigation systems used in garden situations.

7. Soil pH.

The pH scale. The effects of soil pH on nutrient availability. Two methods of changing soil pH. Calcifuges and calcicoles.

8. Plant nutrition provided by the root environment.

The function of major, minor and trace elements in plant growth.. The carbon and nitrogen cycles. Types of fertilizer: single (straight), compound, controlled-release and mixed fertilizers. Benefits and limitations of organic and inorganic fertilizers; base and top dressing and liquid feeding. The advantages and disadvantages of green manures and description of the use of green manures.

9. Soil cultivations and their effects on the soil.

Primary and secondary soil cultivations using hand tools and pedestrian-operated machines. Bed systems. Minimum cultivation systems. Effects of cultivations on soil structure. Use of soil conditioners.

10. Properties and management of growing media.

Basic understanding of physical properties of growing media; air-filled porosity, water-holding capacity and stability. The properties of a range of growing media constituents: loam, peat, coir, perlite, vermiculite, grit, sand. The properties of potting, seed and cuttings compost; loam-based and loam-less composts. The properties and management of a range of alternative growing media: coir, bark, rockwool, perlite, vermiculite, Nutrient Film Technique (NFT). The environmental implications of the use of peat and its alternatives.

Unit Title: **The Root Environment (Flora)**

Level: **RHS Level 2 Certificate in Horticulture**

Identifying safe, healthy and environmentally friendly practices at all times

Learning outcomes	Assessment criteria
1. Demonstrate an understanding of the relationship between scientific principles and horticultural practices in this unit.	1.1 Relate the scientific principles to horticultural practices.
2. Describe the importance of using safe, healthy and environmentally sustainable practices.	2.1 Describe the health and safety considerations of the practices included within the unit.
	2.2 Describe how practices included in the unit can affect the environment.
	2.3 Identify how practices within the unit can be adapted to reduce their impact on the environment.
3. Describe the horizons found in the soil profile.	3.1 List four horizons found in a typical soil profile and describe the characteristics of each.
	3.2 Describe the properties of top soil that contribute to the healthy growth of plants.
	3.3 Describe the differences between top-soil and subsoil.
4. Demonstrate an understanding of the physical properties of soil.	4.1 Define: ‘soil texture’.
	4.2 Describe the characteristics of a range of soil textures.
	4.3 Describe the management of a range of soils.
	4.4 Define: ‘soil structure’.
	4.5 Describe types of soil aggregation and their effects on plant growth.
	4.6 Describe two methods by which soil structure can be improved and two methods by which it can be damaged.

		4.7 Define the term: ‘pore space’.
		4.8 Describe the relationship between pore space, water and air in growing media.
		4.9 Describe the influence of soil structure on plant growth.
		4.10 Describe how surface capping and soil pans are formed and their effects on plant growth.
5.	Describe the importance of organic matter and living soil organisms in the root environment.	5.1 State four sources of organic matter in the soil.
		5.2 Explain how organic matter decomposes.
		5.3 Describe the beneficial effects and limitations of organic matter in the soil.
		5.4 List four bulky organic materials used for soil amelioration and/or mulching.
		5.5 Describe the benefits and limitations of each of the materials listed in 5.4.
		5.6 Describe four methods of composting garden waste.
		5.7 Describe the roles of earthworms, nematodes, bacteria and fungi in the soil.
6	Demonstrate an understanding of the factors that determine the water status in the soil.	6.1 Define the terms: ‘saturation point’, ‘field capacity’, ‘permanent wilting point’ and ‘available water’.
		6.2 Describe the symptoms of poor drainage.
		6.3 Identify a range of management techniques for maintaining soil moisture at appropriate levels.
7	Describe the importance of soil pH.	7.1 Define the term: ‘soil pH’.
		7.2 Describe the pH scale and the pH range that supports plant growth.
		7.3 Describe the effects of pH on nutrient availability.

		7.4	State two methods by which soil pH can be changed.
		7.5	Define the terms: ‘calcicole’ and ‘calcifuge’.
		7.6	Explain the effect of soil pH on plant selection.
8.	Demonstrate an understanding of plant nutrition provided by the root environment.	8.1	List the major and minor nutrients required for plant growth and development.
		8.2	Describe the typical effects of nitrogen, phosphorus, potassium, magnesium, calcium and iron on plant growth.
		8.3	Describe the sources of nitrogen, phosphorus and potassium in the soil.
		8.4	Outline the nitrogen and carbon cycles.
		8.5	List organic and inorganic fertilizers which supply nitrogen, phosphorus and potassium.
		8.6	Describe the benefits and limitations of using organic and inorganic fertilizers.
		8.7	Describe properties and uses of single/straight, compound, and controlled-release fertilizers.
		8.8	Describe the benefits and limitations of base dressing, top dressing and liquid feed.
		8.9	Define the term: ‘green manure’.
		8.10	State the benefits and limitations of using green manures.
		8.11	Describe the use of green manures in a soil management programme.
9.	Demonstrate a knowledge of soil cultivations and their effects on the soil.	9.1	Describe basic cultivations used in a garden situation.
		9.2	Describe the benefits and limitations of basic cultivation techniques.

		9.3 Describe the use of pedestrian operated soil cultivating machines.
		9.4 Describe the management of minimal cultivation systems e.g. no dig systems.
10.	Demonstrate an understanding of the uses of alternative growing media	10.1 List a range of alternative growing media.
		10.2 State the advantages and disadvantages of the use of a range of alternative growing media and systems.
		10.3 Describe the differences between a range of different types of compost.
		10.4 State the properties of a range of compost additives.
		10.5 State how air-fill porosity, water-holding capacity, and stability of growing media affect plant growth.
		10.6 Describe the environmental implications of the use of peat and two alternatives.

Unit Title: **Protected Cultivation (Horticulture)**

Level: **RHS Level 2 Certificate in Horticulture**

Description of unit

This unit will enable candidates to develop an understanding of the control of the environment in greenhouses, frames, polythene tunnels and cloches; the horticultural uses of protected environments; the production of a range of plants in greenhouse's and tunnels and the care of plants in the house and conservatory.

Summary of outcomes

1. The relationship between horticultural practices and scientific principles.
2. The importance of safe, healthy and environmentally sustainable practices.
3. Elements of the environment under protection.
4. Structural and cladding materials.
5. Controlling the environment under protection.
6. Containers used in the protected environment.
7 Plants in greenhouses, frames, cloches and polythene tunnels.
8 Care of plants in an interior situation.

Content

Identifying safe, healthy and environmentally friendly practices at all times.

1. The relationship between horticultural practices and scientific principles.

2. The importance of safe, healthy and environmentally sustainable practices.

3. Elements of the environment under protection.

Difference between the protected environment and natural outdoor conditions. Benefits and limitations of protected growing situations. The relationship between: light; temperature; relative humidity; oxygen and carbon dioxide; pests and diseases; and plant growth.

4. Structural and cladding materials for greenhouses, frames and polythene tunnels.

The characteristics of a range of structural materials: steel, aluminium, wood and plastic for the structure of greenhouse, frames, polythene tunnels and cloches. The benefits and limitations and characteristics of cladding materials - glass, rigid plastics and film plastics.

5. Controlling the environment under protection.

Factors affecting light transmission: shape of the structure, site, orientation, cladding material, condition of cladding material. Control of temperature, humidity, irrigation, moisture, light/shade and pests and diseases. Two types of irrigation equipment (to include one non-manual). One type of heating and one type of lighting equipment.

6. Containers used in the protected environment.

Containers used in production: Seed trays, cell trays, pots. Containers used in display: Terracotta, plastic, polystyrene, peat and paper, glazed, improvised containers. Maintenance of plants grown in containers: feeding, irrigation, mulching, choice of growing media, re-potting.

7. Plants in greenhouses, frames, cloches and polythene tunnels.

Use of the protected environment for over-wintering, production, display of ornamental plants and production of food crops and relate to appropriate examples. The establishment and maintenance (to include: propagation, potting, feeding, watering, trimming, tying, staking, harvesting, pruning, pest and disease identification and control, as appropriate) of one decorative pot plant, one salad crop, one bedding plant, one cut flower and one bulb for forcing. Relate the principles of production to appropriate examples.

8. Care of plants in an interior situation.

Factors to consider when siting plants inside buildings. Use of a conservatory to display plants; control of the environment. Maintenance of one foliage and one seasonal flowering houseplant to include potting, feeding, watering, dead heading, re-potting, pest and disease identification and control as appropriate.

Unit Title: **Protected Cultivation (Horticulture)**

Level: **RHS Level 2 Certificate in Horticulture**

Identifying safe, healthy and environmentally friendly practices at all times

Learning outcomes	Assessment criteria
1. Demonstrate an understanding of the relationship between horticultural practices and scientific principles in this unit.	1.1 Relate horticultural practices to scientific principles.
2. Describe the importance of using safe, healthy and environmentally sustainable practices.	2.1 Describe the health and safety considerations of the practices included within the unit.
	2.2 Describe how practices included in the unit can affect the environment.
	2.3 Identify how practices within the unit can be adapted to reduce their impact on the environment.
3. Demonstrate an understanding of the environment provided by a range of protected structures.	3.1 List six environmental differences between the protected environment and outdoors.
	3.2 List the benefits and limitations of using a range of protected structures relative to growing similar crops outdoors.
	3.3 Explain the effect of a range of environmental factors on plants in a protected environment.
4. Describe structural and cladding materials used for a range of protected structures.	4.1 List and describe the characteristics of a range of structural materials used for the construction of protected structures.
	4.2 State the benefits and limitations of the materials listed in 4.1.
	4.3 List and describe the properties of cladding materials for greenhouses, frames, cloches and polythene tunnels.
	4.4 State the benefits and limitations of the materials described in 4.3.

5.	Describe the control of the environment in greenhouses, cloches and polythene tunnels.	5.1	Describe four factors which affect light transmission into greenhouses and polythene tunnels.
		5.2	Describe how the temperature can be controlled in greenhouses, frames, cloches and polythene tunnels.
		5.3	Describe two methods of raising and two methods of reducing relative humidity in a protected environment.
		5.4	Describe two methods of irrigating and two methods of applying nutrients to plants in a protected environment.
		5.5	Describe how light levels are manipulated in a protected environment.
		5.6	Describe two measures that can be taken to minimize attack by pests and two measures to reduce infection by diseases in the protected environment.
6	Describe the types of container used for production and display in protected environments.	6.1	Describe the characteristics of a range of containers used for production, and state the benefits and limitations of each type.
		6.2	Describe the factors to consider when choosing containers for the display of plants in greenhouses and interior displays.
		6.3	Describe the maintenance requirements of plants grown in a range of containers.
7	Describe the horticultural uses of the protected environment.	7.1	Describe the use of protected environments for over-wintering of tender plants, production of ornamental plants, display of plants and production of food crops.
		7.2	Describe the production of a range of plants grown in the protected environment in a garden situation under the following headings: Propagation and establishment; Maintenance, control of pests, diseases and disorders.

8.	Describe the care of plants in an interior situation.	8.1	Describe four environmental factors which must be accommodated when displaying plants in interior situations.
		8.2	Describe the care of a range of plants in interior situations.

Unit Title: **Horticultural Plant Selection, Establishment & Maintenance**

Level: **RHS Level 2 Certificate in Horticulture**

Description of unit

This unit will enable candidates to develop an understanding of plant selection, establishment and maintenance of a range of ornamental plants.

Summary of outcomes

1. The relationship between horticultural practices and scientific principles.
2. The importance of safe, healthy and environmentally sustainable practices.
3. Selection and establishment of a range of plants.
4. Establishment of lawns and other grass areas.
5. Requirements of plants for seasonal display.
6. Maintenance of non-woody plants.
7 Maintenance of woody plants.
8 Maintenance of turf areas.

Content

Identifying safe, healthy and environmentally friendly practices at all times.

1. The relationship between horticultural practices and scientific principles.

2. The importance of safe, healthy and environmentally sustainable practices.

3. Selection and establishment of a range of plants.

Selection and characteristics of plants suitable for specific effects, location or display: trees, shrubs, climbers, evergreens and herbaceous plants, groundcover, herbaceous borders, formal and informal hedges, shrub borders, mixed borders, annual borders, colour effects, seasonal flowering, scent, berries, fruits, bark, planting for wildlife habitats, shelter and food. Name three plants for each of the locations and effects. Site preparation and planting techniques for woody plants to include trees, shrubs, climbers, herbaceous perennials. Site preparation and planting techniques for hedging and screens. Site preparation and establishment of hardy annuals. Name three plants for specific locations to include walls, fences, dry soils, damp soils, acid/alkaline soils, shade, different aspects and screening.

4. Establishment of lawns and grassed areas.

Benefits and limitations of lawns from seed and turf. Describe the site preparation and establishment of lawns from seed and turf. Selection of grass/plant species for fine turf and general purpose lawns, wildflower grassland.

5. Requirements of plants for seasonal display.

Selection and characteristics of seasonal bedding plants including winter/spring and summer display for a range of situations to include: bedding schemes for a small border, hanging baskets, containers and window boxes. Site preparation establishment and maintenance of bedding displays including ground preparation, planting, dead-heading, irrigation, feeding, weed control, support, removal procedures, two control measures for three pests and three diseases. Named examples of five plants used for spring bedding and five plants used for summer bedding for each of the situations above.

6. Maintenance of non-woody plants.

Maintenance of hardy annual borders and hardy annuals grown for cut flowers to include thinning, dead heading, supporting/training, pinching, harvesting, pest, disease, weed control and crop removal as appropriate. Annual maintenance of herbaceous perennials to include mulching, pruning, feeding, irrigation, supporting, dead-heading, lifting and dividing, weed control. Description and two control measures for three pests and three diseases associated with non-woody plants.

7. Maintenance of woody plants.

Pruning techniques and timing for a range of young and established woody plants to include, roses, ornamental trees, shrubs, hedging, climbers and ground cover. Mulching, feeding, irrigation, weed, pest and disease control, support. Pruning equipment to include: loppers, secateurs and knives. Description and two control measures for three pests and three diseases associated with woody plants.

8. Maintenance of turf areas.

Annual maintenance of lawns and wildflower grassland. Turf equipment including mowers, scarifiers, spikers, and fertilizer applicators. Description and two control measures for three pests and three diseases associated with turf.

Unit Title: **Horticultural Plant Selection, Establishment & Maintenance**

Level: **RHS Level 2 Certificate in Horticulture**

Identifying safe, healthy and environmentally friendly practices at all times

Learning outcomes	**Assessment criteria**
1. Demonstrate an understanding of the relationship between horticultural practices and scientific principles in this unit.	1.1 Relate horticultural practices to scientific principles.
2. Describe the importance of using safe, healthy and environmentally sustainable practices.	2.1 Describe the health and safety considerations of the practices included within the unit.
	2.2 Describe how practices included in the unit can affect the environment.
	2.3 Identify how practices within the unit can be adapted to reduce their impact on the environment.
3. Describe the selection and establishment of a range of plants.	3.1 Select and describe trees and shrubs for a range of purposes and situations.
	3.2 Describe the planting and establishment of a range of woody plants.
	3.3 State the factors to be considered when selecting climbing plants for a range of situations.
	3.4 Select and describe climbing plants and wall shrubs for a range of situations.
	3.5 Select and describe hedging plants for a range of functions and situations.
	3.6 Describe a procedure for planting a hedge.
	3.7 Select and describe herbaceous perennials for a range of purposes and situations.
	3.8 Describe the planting and establishment techniques for a range of herbaceous perennials.

		3.9	Select and describe hardy annuals for a range of purposes and situations.
		3.10	Describe the establishment techniques for a range of hardy annuals.
4.	Describe the procedure for establishing lawns and turf.	4.1	State the benefits and limitations of establishing lawns from seed.
		4.2	State the benefits and limitations of establishing lawns from turf.
		4.3	Select appropriate grass species for the establishment of a range of different types of turfed area.
		4.4	Describe the procedure for establishing a lawn from turf.
		4.5	Describe the procedure for establishing a lawn from seed.
5.	Describe the cultural requirements of plants for seasonal display.	5.1	Select and describe plants used for spring and summer bedding for a range of purposes and situations.
		5.2	Define the terms: 'hardy' and 'half-hardy' bedding plants.
		5.3	Describe the planting and maintenance of bedding schemes for summer and winter effects.
		5.4	Select plants for hanging basket and container displays.
		5.5	Describe the maintenance of hanging baskets and containers for summer and winter effects.
6	Describe the maintenance of non-woody plants.	6.1	Describe the maintenance of annual plants used in a range of situations.
		6.2	Describe the maintenance of herbaceous plants used in a range of situations.
		6.3	Describe the symptoms of and control measures for a range of pests and diseases associated with non-woody plants.

7	Describe the maintenance of a range of woody plants.	7.1	Describe the maintenance of young and established woody species of ornamental plants used in a range of situations.
		7.2	Describe the pruning methods used for a range of woody and ornamental species.
		7.3	List the pruning equipment available to gardeners and describe its use.
		7.4	Identify the symptoms of, and control measures for pests and diseases associated with woody plants.
8.	Describe the maintenance of turfed areas.	8.1	Describe the annual maintenance of a range of different types of turfed areas.
		8.2	Describe the range of equipment used for the maintenance of turf.
		8.3	Identify the symptoms of and describe control measures for a range pests and diseases associated with turf.

Unit Title: **Horticultural Plant Health Problems**

Level: **RHS Level 2 Certificate in Horticulture**

Description of unit

This unit will enable candidates to develop an understanding of pest, disease and weed life cycles including modes of infestation. Cultural, biological, chemical and integrated systems are explored. Hazards involved in crop protection are described.

Summary of outcomes

1. The relationship between scientific principles and horticultural practices.
2. The importance of safe, healthy and environmentally sustainable practices.
3. Effects of weed competition, and methods of weed control.
4. Damage caused by typical plant pests, and methods commonly used to limit the effects.
5. Damage caused by typical plant diseases and methods commonly used to limit the effects.
6. Effects of plant physiological disorders, and strategies for avoidance.
7 Methods of crop protection.

Content

Identifying safe, healthy and environmentally friendly practices at all times.

1. The relationship between scientific principles and horticultural practices.

2. The importance of safe, healthy and environmentally sustainable practices.

Hazards associated with chemical, physical, cultural, biological, integrated pest management, and government legislation. Methods of minimising the risks associated with each method. Achieving natural balances in garden and cropping situations. How the use of pesticides can be minimised. The importance of plant selection in minimising the effects of problems.

3. Effects of weed competition, and methods of weed control.

Competitive pressures on plants and crops. Role of weeds as alternative hosts. Description of types of weed, methods of spread and life cycles. Possible methods of weed control using cultural and chemical means. The application and uses of selective herbicides. Mode of action of contact, translocated and residual herbicides. Relation of the control measures to appropriate horticultural situations.

4. Damage caused by typical plant pests, and methods commonly used to limit the effects.

The damage caused, life cycles of, and the control of three pests from the following: vertebrates, insects with incomplete metamorphosis, insects with complete metamorphosis, molluscs, mites and nematodes. Cultural, physical, biological and chemical methods of controlling and minimising the effects of each of the examples.

5. Effects of typical plant diseases and methods of controlling them.

The damage caused by, life cycle of and control of, diseases limiting plant growth and development, or affecting their appearance to include: three named fungal, one bacterial and one viral infection. The main types of organism encountered, and their control. Cultural and chemical methods of controlling and minimising the effects of each of the above.

6. Effects of plant physiological disorders, and strategies for avoidance.

Recognition of the disorders caused by deficiencies of nitrogen, phosphorus, potassium and magnesium. Methods of avoidance and amelioration. Symptoms of disorders caused by environmental conditions to include frost, high temperature, lack of light, lack of water, over-watering.

7. Methods of crop or plant protection.

Crop or plant protection using chemical, physical, cultural, biological, integrated pest management, and outline government legislation in this area. Relate each to a named crop or plant species and a relevant horticultural situation.

Unit Title: **Horticultural Plant Health Problems**

Level: **RHS Level 2 Certificate in Horticulture**

Identifying safe, healthy and environmentally friendly practices at all times

Learning outcomes	Assessment criteria
1. Demonstrate an understanding of the relationship between scientific principles and horticultural practices in this unit.	1.1 Relate the scientific principles to horticultural practices.
2. Describe the importance of using safe, healthy and environmentally sustainable practices.	2.1 State the hazards associated with chemical, cultural, biological and integrated pest controls.
	2.2 State how the risks to people, and the environment can be minimised, when using chemical, cultural and biological pest controls.
	2.3 State the importance of natural balances in crop/plant protection and describe how gardening can disturb this balance.
	2.4 Describe the methods by which natural balances can be maintained and restored, in cultivation, in order to minimise the use of pesticides.
	2.5 Describe how the selection of plants can help to avoid plant health problems.
3. Describe the effects of weed competition, and methods of weed control.	3.1 Define the term: ‘weed’.
	3.2 Describe how weeds reduce plant productivity.
	3.3 Describe the role of weeds as alternate/alternative hosts for plant pathogens.
	3.4 Define the terms: ‘ephemeral’, ‘annual’, and ‘perennial weeds’.
	3.5 Describe the characteristics of ephemeral, annual and perennial weeds.

		3.6 Describe the methods by which weeds spread.
		3.7 Describe a physical method of control for each type of weed noted in 3.4.
		3.8 Describe a chemical method of control for each type of weed noted in 3.4.
		3.9 Describe the mode of action of herbicides, with reference to a named ornamental or cropping situation.
4.	Identify the damage caused by typical plant pests, and describe methods commonly used to limit the effects.	4.1 Define the term: 'pest'.
		4.2 Describe the life cycle of three plant pests.
		4.3 Describe the damage caused by three plant pests.
		4.4 Describe the relationship between life cycle and control for the plant pests in 4.2.
		4.5 Describe methods of limiting the effects of a range of plant pests on plant growth.
5.	Identify the effects of typical plant diseases and describe methods of controlling them.	5.1 Define the term: 'disease'.
		5.2 State the damage caused by three fungal diseases.
		5.3 Describe the life cycle of one named fungal disease.
		5.4 Describe the relationship between life cycle and control for the disease in 5.3.
		5.5 Describe one control method for the disease in 5.3.
		5.6 State the damage caused by one, named bacterial disease.
		5.7 Describe one method of minimising the damage caused by the named bacterial disease.
		5.8 State the damage caused by one named virus.

		5.9	State two methods by which virus can be spread.
		5.10	Describe two possible methods of minimising the spread of the virus named in 5.8.
6	Describe the effects of plant physiological disorders, and strategies for avoidance.	6.1	Define the term: 'physiological disorder'.
		6.2	Describe the symptoms of three environmental disorders in a named ornamental plant or crop.
		6.3	State a method of avoiding the problems described in 6.2.
7	Describe the main methods of crop protection used in a garden situation.	7.1	Define the terms: 'biological', 'chemical' and 'physical/cultural' control of plant problems.
		7.2	State the benefits and limitations of using physical, biological, chemical and cultural control.
		7.3	Describe one physical method of crop protection.
		7.4	Describe one cultural method of crop protection.
		7.5	Describe one biological method of crop protection.
		7.6	Describe one chemical method of crop protection.