



Sharing the best in Gardening

RHS Qualifications

RHS Level 2 Diploma in the Principles and Practices of Horticulture

Qualification Specification

Contents

1.	RHS Qualifications Contact Details	4
2.	Equality and Diversity Policy Statement	4
3.	RHS Level 2 Diploma in the Principles and Practices of Horticulture	5
	Introduction	5
	Credit Value	5
	Teaching Pattern	5
	Qualification Structure	6
	Assessment	8
	Language	8
	Grading	8
4.	Approved Centres	9
5	Candidate Registration	9
6.	Reasonable Adjustments and Special Consideration	9
7.	Enquiry about Results Service	10
8.	Examination Dates	10
9.	Fees	10
10.	Exemptions	11
11.	Appeals Procedure	12
12.	Policy on Malpractice and Maladministration	12
13.	Units	
	R2101 - Plant classification, structure, and function	13
	R2102 - Plant nutrition and the root environment	17
	R2103 - Maintaining plant health	21
	R2104 - Understanding plant propagation	24

R2111 - Understanding garden features, plant selection and planning	27
R2112 - Understanding the choice, establishment and maintenance of garden plants and lawns	31
R2113 - Understanding the production of outdoor vegetables and fruit	34
R2114 - Understanding protected environments and their use in plant cultivation	37
R2100 – Soil testing	40
R2121 - Sowing seeds and vegetative propagation techniques	41
R2122 - Practical skills in ground preparation for seeding and planting	44
R2123 - Practical skills in establishing seeds and plants in soil	45
R2124 - Care and pruning of plants	46
R2125 - Identification of a range of common garden plants, weeds, pests, diseases, disorders and beneficial organisms	47
Optional	
R2126 - Sustainable garden practice	48
R2127 - Safe operation of powered garden machinery	51

1. RHS Qualifications Contact Details

RHS Qualifications is the Awarding Organisation of the Royal Horticultural Society.

RHS Qualifications
RHS Garden Wisley
Woking
Surrey
GU23 6QB
UK

Tel: 01483 226500

Email: qualifications@rhs.org.uk

Approved Centre Web Portal: www.rhsq.org.uk

2. Equality and Diversity Policy Statement

RHS Qualifications is committed to policies that will promote equal opportunities in all its operations, regardless of age, disability, ethnic origin, gender, marital status, religion, sexual orientation or any other factor.

RHS Qualifications is committed to ensuring that there is no unfair discrimination in any of its operations and will take into account all current legislation in relation to the equality of opportunity.

RHS Qualifications will constantly monitor and review its policies and practices pertaining to equal opportunities, to ensure that they remain consistent with its equal opportunities objectives and continue to comply with all relevant legislation.

RHS Qualifications will strive to make awareness of and respect for equality and diversity, an integral part of the culture of the organisation.

A copy of the RHS Qualifications Equality and Diversity Policy is available on the Approved Centre Web Portal.

3. RHS Level 2 Diploma in the Principles and Practices of Horticulture

3.1 Introduction

This qualification provides a route to employment in professional horticulture by assessing knowledge of the principles underpinning horticultural practices, and a range of essential practical skills in horticulture.

It supports career development for those already working in professional horticulture by assessing knowledge of the principles underpinning horticultural practices and a range of essential practical skills in horticulture.

It provides a foundation for further learning or training in the field of horticulture

There are no pre-requisites for entry to the qualification.

The qualification is accredited within the Qualifications and Credit Framework.

Accreditation Number: 501/0208/4

3.2 Credit Value

The qualification has a credit value of 43.

This equates to 430 learning hours. Learning time is defined as the time taken by learners at the level of the qualification, on average, to complete the learning outcomes of the units to the standard determined by the assessment criteria.

3.3 Teaching Pattern

The qualification is designed to be studied on a part-time basis. No particular teaching pattern is specified, and centres offering courses leading to the qualification are free to define their own teaching structure and teaching hours.

3.4 Qualification Structure

The qualification will be awarded to those who gain the credits for the following fourteen mandatory units and one optional unit:

RHS Ref	Unit	Credits	Level
R2101	Plant classification, structure, and function Unit reference number H/601/0307	5	2
R2102	Plant nutrition and the root environment Unit reference number A/601/0314	3	2
R2103	Maintaining plant health Unit reference number K/601/0342	3	2
R2104	Understanding plant propagation Unit reference number M/601/0343	3	2
R2111	Understanding garden features, plant selection and planning Unit reference number F/601/0251	5	2
R2112	Understanding the choice, establishment and maintenance of garden plants and lawns Unit reference number T/601/0263	3	2
R2113	Understanding the production of outdoor vegetables and fruit Unit reference number A/601/0264	3	2
R2114	Understanding protected environments and their use in plant cultivation L/601/0267	3	2
R2100	Soil testing Unit reference number K/601/7503	1	2
R2121	Sowing seeds and vegetative propagation techniques Unit reference number A/601/7666	2	2
R2122	Practical skills in ground preparation for seeding and planting Unit reference number F/601/7667	2	2
R2123	Practical skills in establishing seeds and plants in soil Unit reference number L/601/7669	2	2
R2124	Care and pruning of plants Unit reference number J/601/7671	3	2

R2125	Identification of a range of common garden plants, weeds, pests, diseases, disorders and beneficial organisms Unit reference number K/601/7680	3	2
	Optional Units (credit value 2)		
R2126	Sustainable garden practice Unit reference number M/601/9155	2	2
R2127	Safe operation of powered garden machinery Unit reference number T/601/7682	2	2

3.5 Assessment

Each theory unit will be assessed by a separate written examination covering all learning outcomes specified in the unit.

Examinations must be taken in a centre approved by RHS Qualifications, or under arrangements for exceptional supervision agreed by RHS Qualifications.

Examinations must be conducted in accordance with the RHS Regulations for the Conduct of Examinations.

Theory examinations will be offered twice a year in February and June.

Assessment of the practical units will be conducted by the centre using RHS criteria. Assessment information and guidance documents can be found in the Guidance for Centres Delivering Practical Assessment

3.6 Language

Examinations will be offered in English.

3.7 Grading

Where a candidate receives credit with commendation in all eight theory mandatory units, and a pass in all the practical units the qualification will be awarded with commendation.

RHS Ref	Unit	Mark	Pass with Commendation	Pass
R2101	Plant classification, structure, and function	100	70	50
R2102	Plant nutrition and the root environment	60	42	30
R2103	Maintaining plant health	60	42	30
R2104	Understanding plant propagation	60	42	30
R2111	Understanding garden features, plant selection and planning	100	70	50
R2112	Understanding the choice, establishment and maintenance of garden plants and lawns	60	42	30
R2113	Understanding the production of outdoor vegetables and fruit	60	42	30
R2114	Understanding protected environments and their use in plant cultivation	60	42	30

4. Approved Centres

Centres wishing to offer examinations leading to RHS qualifications must be approved by RHS Qualifications.

Applications for approval should be sent to the Quality Assurance and Relationships Officer at the contact details in section 1.

5. Candidate Registration

Candidates should be registered for examinations in the units of the qualification through the RHS Qualifications Web Portal.

Approved Centres undertake to obtain on behalf of their learners a Unique Learner Number (ULN) and a learner record, unless the learner chooses not to have one.

If centres supply an email address for candidates at the time of registration, candidates will be invited to open an account on the RHS Qualifications Web Portal, and will be able to view their examination history, their current registrations, and their results when available.

6 Reasonable Adjustments and Special Consideration

RHS Qualifications is committed to ensuring fair assessment for all candidates, and will facilitate access to its qualifications through reasonable adjustments to assessment arrangements for candidates with an identified specific need. An example of a reasonable adjustment which could be made is the production of a modified examination paper for a candidate with a visual impairment.

Special consideration is given following the examination to candidates who are present for the examination but may have been disadvantaged by temporary illness, injury or adverse circumstances which arose at, or near, the time of examination.

Full guidance is provided in the document 'Guidance to Centres for Reasonable Adjustments and Special Consideration'. The document is available on the RHS website (www.rhs.org.uk), the RHS Qualifications Approved Centre Web Portal, or can be obtained from RHS Qualifications.

Applications for reasonable adjustments or special consideration must be made by the Approved Centre on behalf of the candidate. Application must be made within specified timescales.

7. Enquiry about Results service

The following service is available to candidates who have a query regarding their theory examination result:

Re-mark and Feedback

Re-marking of the examination paper by an independent examiner. Feedback will be provided identifying areas of strength and weakness with constructive suggestions for improvement.

Candidates requesting a re-mark need to be aware that grades may go down as a result of the re-marking.

Applications for the 'Enquiry about Results Service' must be made through the Approved Centre where the candidate registered for the examination. This service will be available for 28 days from the date of release of the results to Approved Centres on the RHS webportal.

8. Examination Dates

For a full list of examination dates please see the Qualifications and Credit Framework Examination Dates, this document is available on the Qualifications page on the RHS website and on the RHS Webportal.

9. Fees

For a full list of fees please see the Qualifications and Credit Framework Fees Notice, this document is available on the Qualifications page on the RHS website and on the RHS Webportal.

All fees are payable prior to confirmation of service or entry for the examination.

Late Entries

RHS Qualifications publishes annually, and distributes to Approved Centres, the closing dates of entry for each examination for the following year.

Entries submitted after the published closing date will be subject to a late entry fee. The total fee charged for late entries is twice the standard examination fee for each unit

Replacement Certificate (if lost, damaged or destroyed)

The fee for a replacement certificate can be found on the Qualifications and Credit Framework Fees Notice. Please send your request to the Qualifications Department.

Re-mark & Feedback

The fee for a remark and feedback can be found on the Qualifications and Credit Framework Fees Notice.

If a re-mark results in an upgrade of the result, the fee paid will be refunded.

10. Exemptions

The 'Regulatory arrangements for the Qualifications and Credit Framework' allow exemptions to be granted for units based upon certificated achievement in other qualifications. RHS Qualifications will grant exemption from specified units in RHS QCF qualifications where a candidate has passed certain components of RHS qualifications in the National Qualifications Framework (current RHS qualifications).

- All requests for exemption will be reviewed on a case by case basis. Applications must be made to RHS Qualifications and an administration fee will be charged
- Candidates will need to have obtained 50% of the available marks for the NQF component (within the Paper/Module) in order to obtain exemption from the QCF unit
- All exemptions are treated as equivalent to a pass. No certificate or credit is awarded for units for which exemption has been granted

Applications for exemptions must be made through the Approved Centre where the candidate is registered. The fee for applying for exemptions can be found on the Qualifications and Credit Framework Fees Notice.

RHS Qualification	Component	Exemption given for:
Level 2 Horticulture II	Horticultural Plant selection, Establishment and Maintenance	Understanding the choice, establishment and maintenance of garden plants and lawns
Level 2 Horticulture I	Outdoor Food Production	Understanding the production of outdoor vegetables and fruit
Level 2 Horticulture II	Protected Cultivation (Horticulture)	Understanding protected environments and their use in plant cultivation
Level 2 Horticulture I	The Plant (Plant Kingdom)	Plant classification, structure and function
Level 2 Horticulture I	Plant Propagation (Flora)	Understanding plant propagation
Level 2 Horticulture II	The Root Environment and Plant Nutrition (Flora)	Plant nutrition and the root environment
Level 2 Horticulture II	Horticultural Plant Health Problems	Maintaining Plant Health

11. Appeals Procedure

An Appeals procedure exists to conduct appeals lodged by candidates against decisions made by RHS Qualifications, concerning their examination performance, the granting of an award and/or the closure of their entry to an award on academic grounds.

The procedure is also followed in cases where there is irregularity or malpractice in the conduct of examinations and where RHS Qualifications has imposed a penalty on a candidate, tutor or invigilator, and the Centre wishes to appeal against this decision after results are published.

A copy of the procedure is available on the RHS Qualifications Web Portal and on the RHS website.

12. Policy on Malpractice and Maladministration

Malpractice consists of those acts which undermine the integrity and validity of the assessment or examination, the certification of qualifications and/or damage the authority of those responsible for conducting the assessment, examination and certification.

RHS Qualifications does not tolerate actions or attempted actions of malpractice by learners or centres in connection with RHS qualifications. RHS Qualifications may impose penalties and/or sanctions on candidates or centres where incidents, or attempted incidents, of malpractice have been proven.

A copy of the full policy is available on the RHS Qualifications Web Portal and on the RHS website.

Plant classification, structure and function

RHS Reference Number: R2101

Unit Reference Number: H/601/0307

Unit guided learning hours: 38

Level: Level 2

Credit Value: 5

Unit purpose and aim(s): 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.

Learning Outcomes

The learner will:

1. Know the basic classification and taxonomy of plants.

2. Know the stages of plant development and life cycles

Assessment Criteria

The learner can:

- 1.1 Identify the basic differences between gymnosperms and angiosperms
- 1.2 Describe differences between the monocotyledon and dicotyledon divisions of the angiosperms, including the external features of root type, leaf shape and venation, and internal differences in the distribution of vascular bundles, lignification, and secondary growth.
- 1.3 State the reasons why a universal system of plant names is important.
- 1.4 Describe the use of the terms 'genus', 'species, and 'cultivar'.
- 2.1 Describe the five stages of the life cycle of plants: seed, juvenile, adult, senescent, death.
- 2.2 Define the terms: 'annual', 'ephemeral', 'biennial' and 'perennial'.
- 2.3 Define the terms: 'tender', 'half-hardy' and 'hardy' as applied to annuals.
- 2.4 Define the terms: 'tender', 'half-hardy', 'hardy', 'herbaceous' and 'woody' in relation to perennials, including the process of lignification.
- 2.5 State the meaning of the terms 'evergreen', 'semi-evergreen' and 'deciduous'.

- | | | |
|-----------|--|---|
| 3 | Know the structure and function of plant cells and tissues | <p>3.1 Describe the structure of the basic plant cell and state the function of the basic components, including the cell wall, cell membrane, nucleus, vacuole, cytoplasm, chloroplasts & mitochondria.</p> <p>3.2 State where active cell division is located within the plant (apical and lateral meristems).</p> <p>3.3 Define the term: 'plant tissue'.</p> <p>3.4 Describe the basic characteristics and role of the tissues found in flowering plants, identifying protective, meristematic, transport, packing, strengthening, and support functions.</p> |
| 4 | Know the function of the external vegetative parts of the plant. | <p>4.1 Define: 'primary', 'secondary', 'tap', 'lateral', 'fibrous', and 'adventitious' roots.</p> <p>4.2 Describe the external structure of the root tip and the role of the root cap and root hairs.</p> <p>4.3 Describe how the root is adapted in order to perform specific functions, including storage (e.g. tap root, tuber); and climbing.</p> <p>4.4 Describe the external structure of the stem.</p> <p>4.5 Describe how the stem is adapted in order to perform specific functions, including protection; storage (e.g. corms, tubers, rhizomes); climbing; natural vegetative reproduction (e.g. stolons, rhizomes, tubers, runners).</p> <p>4.6 Describe the external structure of the leaf, including the petiole, lamina, and midrib; its shape and colour, and arrangement on the stem.</p> <p>4.7 Describe how leaves are adapted to perform other functions including storage (eg bulbs); protection; climbing; and attraction of pollinators.</p> <p>4.8 Describe transverse sections of the young dicotyledon root, stem, and leaf; these should include the location of the following: epidermis, cortex, xylem, phloem, pith, cambium, vascular bundles, endodermis, pericycle, palisade & spongy mesophyll, cuticle, stomata.</p> |
| 5. | Know the function of the reproductive parts of the plant | <p>5.1 Describe the structure of a typical dicotyledon flower, including sepals, petals, tepals, calyx, corolla, nectaries, anther, filament, stigma, style, ovary and ovule.</p> |

- 5.2 State the role of each component of the flower listed in 5.1
- 5.3 State the meaning of the terms: 'monoecious', 'dioecious' and 'hermaphrodite'.
- 5.4 Describe the process of pollination, including self-pollination and cross-pollination.
- 5.5 Compare the characteristics of wind and animal pollinated plants, including the exposure of reproductive structures, pollen surface roughness, and quantity of pollen produced.
- 5.6 Describe the process of fertilisation, including the meaning of the terms 'gametes', 'zygote', 'incompatible', and 'compatible'.
- 6. Know the function of fruits and seeds.
 - 6.1 Define the term 'fruit' and state the role of the fruit in plant reproduction.
 - 6.2 State that fruits can be divided into dry types (dehiscent and indehiscent) and fleshy (succulent) types (true and false); and that these can be distributed by wind, water, animals (externally), and animals (internally).
 - 6.3 Name one example of each type of fruit listed in 6.2, and one example for each distribution method.
 - 6.4 Describe the internal and external structure of the seed of a monocotyledon (examples to include maize, *Zea mays*) and a dicotyledon (examples to include French bean, *Phaseolus vulgaris* and broad bean, *Vicia faba*).
 - 6.5 Describe the behaviour of French bean (*Phaseolus vulgaris*), and broad bean (*Vicia faba*) as examples of epigeal and hypogeal germination.
- 7. Understand the importance of photosynthesis and respiration.
 - 7.1 State the basic equation for photosynthesis in words.
 - 7.2 Describe how levels of temperature, light, carbon dioxide water and mineral nutrients determine the efficiency of photosynthesis.
 - 7.3 State the basic equations for aerobic and anaerobic respiration in words.
 - 7.4 Describe how levels of oxygen and temperature determine the efficiency of respiration.

- 8. Understand the movement of water and minerals through the plant.
 - 8.1 Define the term: 'transpiration', and describe how water and minerals move through the plant.
 - 8.2 Describe diffusion and osmosis and their roles within the plant, including gaseous and liquid diffusion, transpiration, and water uptake.
 - 8.3 Describe how the plant may limit water loss, including the action of stomata and specific leaf adaptations (hairs, thick cuticle, needles).
 - 8.4 Describe the effects of relative humidity and temperature on transpiration.
- 9. Understand plant growth and development relationships
 - 9.1 Describe the stages of growth and development during the life cycle of a plant.
 - 9.2 Describe how simple cell division and enlargement produces growth and results in an increase in size of plants
 - 9.3 Describe how competition for water, nutrients, light and space influences the growth of plants.
 - 9.4 Describe the role of auxin in plant development (influencing shoot and roots), and in phototropic responses.

Plant nutrition and the root environment

RHS Reference Number: R2102

Unit Reference Number: A/601/0314

Unit guided learning hours: 23

Unit Level: Level 2

Credit Value: 3

Unit purpose and aim(s): This unit will enable candidates to develop an understanding of the constituents, properties and management of soils and growing media.

Learning Outcomes

The learner will:

1. Understand the importance of using safe, healthy and environmentally sustainable practices.
2. Know the main horizons found in soil profiles.
3. Know the physical properties of soil.

Assessment Criteria

The learner can:

- 1.1 Describe how horticultural practices can affect the environment, including examples of: soil cultivations; irrigation and drainage; soil improvement; composting; choice of growing media.
- 1.2 Explain how the practices listed in 1.1 can be adapted to reduce the impact on the environment.
- 2.1 Name the main horizons found in a typical soil profile, including the organic horizon, topsoil, subsoil, and parent material (rock).
- 2.2 Describe the typical characteristics of each horizon, in terms of: the presence of organic matter; soil organisms; pore space; products of leaching and deposition such as nutrients (iron), clay and stones.
- 2.3 Describe the properties of top soil that contribute to the healthy growth of plants, in terms of: the presence of organic matter; soil organisms; soil structure; air content; water content; nutrient content.
- 2.4 State the purposes of primary and secondary soil cultivations, including the addition of soil conditioners.
- 3.1 Explain what is meant by 'soil texture'.
- 3.2 Describe the physical characteristics of the soil particles sand, silt and clay.
- 3.3 Describe how the characteristics of each of the soil particles listed in 3.2 affect soils and their suitability for horticultural use.

- 3.4 Explain what is meant by 'soil structure' (soil aggregates) and state how root establishment and growth are affected by different soil structures.
- 3.5 State that a crumb soil is the ideal structure for horticultural use.
- 3.6 Describe two methods by which soil structure can be improved and two practices which damage soil structure, to include: incorporation of organic matter; addition of inorganic soil improvers; compaction; and cultivation techniques.
- 3.7 State what is meant by 'surface capping'; explain how it may happen and what effects it can have on plant establishment and growth.
- 3.8 Describe how a cultivation pan can be formed, what effect it has on plant growth, and how it can be rectified.
- 4. Understand the factors that determine the water status in the soil.
 - 4.1 Describe the relationship between air and water content in the pore space of soils and growing media.
 - 4.2 Explain the importance of an appropriate balance between air and water for the healthy growth of plants.
 - 4.3 Identify the surface symptoms of poor drainage, to include: standing water, surface run-off and indicator plant species.
- 5. Understand the importance of organic matter and living soil organisms in the root environment.
 - 5.1 State the main sources of organic matter in the soil, to include: recycling of natural resources (plant and animal remains); incorporation of imported resources, e.g. farm-yard manure and garden compost; incorporation of crop debris.
 - 5.2 Describe TWO beneficial effects and TWO limitations of organic matter in the soil.
 - 5.3 List four bulky organic materials that can be used for soil improvement in a garden, including farmyard manures; garden compost; mushroom compost; composted municipal waste.
 - 5.4 Compare the benefits and limitations of each of the materials listed in 5.3 for soil improvement.

- 5.5 List FOUR bulky organic materials used as organic soil mulches, including chipped bark products, leaf mould, composted straw products, cocoa shell.
 - 5.6 Compare the benefits and limitations of each of the materials listed in 5.5 for use as a mulch.
 - 5.7 Describe FOUR methods of composting garden waste, including aerobic and anaerobic methods, production of leaf mould and the use of wormeries.
 - 5.8 Describe the contribution made by earthworms, bacteria and fungi to the organic matter content of the soil.
 - 5.9 State the importance of the ratio of 'green' to 'woody' material in the breakdown of organic matter, and the importance of lime to the composting process.
 - 5.10 Describe what is meant by the term 'green manure' and name TWO plant species that can be grown for this purpose.
 - 5.11 State TWO benefits and TWO limitations of using green manures.
6. Understand the importance of soil pH.
- 6.1 Describe the pH scale and state the pH range that normally supports healthy plant growth.
 - 6.2 Explain the effect that soil pH has on plant selection.
 - 6.3 Describe what is meant by 'lime-induced chlorosis'.
 - 6.4 Name TWO plants that require an acid soil.
 - 6.5 State TWO methods by which soil pH can be raised, including the application of garden lime, use of composted green waste and wood ash.
 - 6.6 State TWO methods by which soil pH can be lowered, including the application of Sulphur and use of an acidic form of organic matter.

- | | | |
|----|--|---|
| 7. | Understand plant nutrition provided by soil and growing media. | <p>7.1 List the major and minor (trace) nutrients required for plant growth and development, to include:</p> <p style="margin-left: 40px;">Major nutrients: Nitrogen, Phosphorus, Potassium, Magnesium, Calcium, Sulphur.</p> <p style="margin-left: 40px;">Minor (trace) nutrients: Iron, Manganese, Boron, Copper, Zinc, Molybdenum.
<i>(Chemical symbols are not required for minor nutrients)</i></p> <p>7.2 Describe the typical effects of a deficiency of Nitrogen, Iron, Magnesium and Calcium.</p> <p>7.3 State what is meant by the terms 'organic fertiliser' and 'inorganic fertiliser' and list TWO examples of EACH.</p> <p>7.4 State TWO benefits and TWO limitations of using organic fertilisers and inorganic fertilisers.</p> <p>7.5 State what is meant by: single or straight fertilisers; compound fertilisers. List TWO examples of EACH.</p> <p>7.6 State what is meant by the terms 'Base dressing', 'Top dressing', 'Liquid feed' and 'Foliar feed'. Describe ONE situation where EACH type of fertiliser application would be appropriate.</p> <p>7.7 Describe the use of Controlled Release Fertiliser (CRF) granules and state TWO benefits and TWO limitations of their use in growing media.</p> |
| 8. | Understand the uses of alternative growing media | <p>8.1 Describe the range of compost types available, and the use of EACH of these growing media as alternatives to growing in soil: including peat-based, loam-based, peat-free, multipurpose, ericaceous, seed and cutting and container composts.</p> <p>8.2 Describe the environmental implications of the use of peat, coir and municipal green waste in growing media.</p> |

Maintaining plant health

RHS Reference Number: R2103

Unit Reference Number: K/601/0342

Unit guided learning hours: 23

Unit level: Level 2

Credit Value: 3

Unit purpose and aim(s): 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.

Learning Outcomes

The learner will:

1. Understand the importance of using safe, healthy and environmentally sustainable practices for the maintenance of plant health.

2. Understand the problems posed by weeds in horticulture and how these problems can be minimised.

Assessment Criteria

The learner can:

- 1.1 State what is meant by biological, chemical, physical (or cultural) and integrated methods of pest and disease control.
- 1.2 Describe ONE example of each type of control named in 1.1.
- 1.3 State the benefits and limitations of using each of the types of control named in 1.1.
- 1.4 Describe how risks to people and the environment can be minimised when using the control methods stated in 1.1.
- 1.5 State the importance of natural balances in plant protection and describe how garden practices can disturb this balance.
- 1.6 Describe methods which can be used to restore and maintain these natural balances to minimise the need for pesticides.
- 1.7 Describe how the selection of plants can help to avoid plant health problems, including the choice of resistant cultivars and growing plants appropriate to a situation and soil.
- 2.1 Describe what is meant by a weed.
- 2.2 Describe how weeds reduce crop productivity and reduce the visual appeal of plantings for display.

- 2.3 Describe the role of weeds as alternative hosts for plant pathogens.
 - 2.4 Describe the biology of ephemeral, annual and perennial weeds.
 - 2.5 State the botanical names of TWO examples of EACH of the types described in 2.4.
 - 2.6 Describe how the types of weed described in 2.4 relate to horticultural situations, including recently cultivated soil; herbaceous perennial borders; woody perennial plantings; and lawns.
 - 2.7 State the botanical names of TWO weeds associated with EACH of the situations described in 2.6.
 - 2.8 State what is meant by contact, residual, translocated and selective herbicides, and describe ONE situation where EACH type would be used appropriately.
 - 2.9 State the active ingredient of ONE example of EACH type of herbicide described in 2.8.
3. Know the problems posed by pests in horticulture and ways in which these can be minimised.
 - 3.1 Define 'plant pest'.
 - 3.2 Describe the damage caused by rabbits, cabbage white butterfly larva, black bean aphid, two-spotted spider mite, glasshouse whitefly, vine weevil, slugs, snails, and stem (or bulb) eelworm.
 - 3.3 Describe in outline the life-cycles of cabbage white butterfly, black bean aphid, glasshouse whitefly and vine weevil.
 - 3.4 Describe TWO different methods of reducing the effects of EACH of the plant pests named in 3.2; methods should be selected from more than one of the control options (chemical, physical, cultural or biological) available.
 - 3.5 Describe how a knowledge of the life cycles of the cabbage white butterfly, black bean aphid, glasshouse whitefly and vine weevil contribute to the success of their control.

4. Know the problems posed by diseases in horticulture and ways in which these can be minimised.
 - 4.1 Define 'plant disease'.
 - 4.2 Describe the damage caused by grey mould, powdery mildew, damping off, honey fungus, rose black spot, potato blight and clubroot.
 - 4.3 Describe TWO different methods of reducing the effects of EACH of the diseases stated in 4.2; methods should be selected from more than one of the control options (chemical, physical, cultural or biological) available.
 - 4.4 Describe the damage caused by fire blight and describe TWO methods used to limit the spread of the disease.
 - 4.5 Describe the damage caused by TWO named plant viruses.
 - 4.6 Describe TWO methods by which viruses can be spread.
 - 4.7 Describe TWO methods of avoiding the spread of plant viruses.
5. Know the problems posed by plant disorders in horticulture and ways in which these can be minimised.
 - 5.1 Define 'plant physiological disorder'.
 - 5.2 Describe the symptoms of lime-induced chlorosis, and how plants and their growth are affected by frost; shade; drought; and water-logging.
 - 5.3 State ONE method of avoiding EACH of the problems described in 5.2.

Understanding plant propagation

RHS Reference Number: R2104

Unit Reference Number: M/601/0343

Unit guided learning hours: 23

Unit level: Level 2

Credit Value: 3

Unit purpose and aim(s): This unit will enable candidates to develop an understanding of the principles and main practices of plant propagation in horticulture.

Learning Outcomes

The learner will:

1. Understand how plant physiology affects the ways in which plants can be propagated.

2. Understand the appropriate methods of harvesting and storing different types of seed.

Assessment Criteria

The learner can:

- 1.1 Describe the characteristics of plants that can be propagated from seed.
- 1.2 State FIVE benefits of propagating plants from seed.
- 1.3 State FIVE limitations of propagating plants from seed.
- 1.4 Describe the characteristics of plants requiring propagation by vegetative means.
- 1.5 State FIVE benefits of propagating plants by vegetative means.
- 1.6 State FIVE limitations of propagating plants by vegetative means.
- 1.7 State FIVE examples of plants that are propagated from seed.
- 1.8 State FIVE examples of plants that are propagated by vegetative means.
- 2.1 Describe the preparation of fleshy berries for seed storage, under the following headings: harvesting; maceration; separation; cleaning and drying.
- 2.2 State FOUR NAMED examples of seeds requiring cool dry storage.
- 2.3 State FOUR NAMED examples of seeds requiring cool moist storage.
- 2.4 State the effect that storage has on the viability and germination potential of seed.

3. Understand the conditions required for successful plant propagation from seed.
 - 3.1 State the environmental requirements for seeds to germinate successfully: light levels; moisture; temperature; oxygen.
 - 3.2 State the meaning of the term 'seed dormancy'.
 - 3.3 Describe methods of overcoming seed dormancy, including soaking; hot water treatment; nicking (chipping); abrasion; and warm and cold treatments; stating an appropriate plant example for EACH.
 - 3.4 Describe the changes that take place in a germinating seed, including taking in water; rising respiration rate; rapid cell division; and the splitting of the seed coat.
 - 3.5 Describe the preparation of suitable containers and growing media for sowing the following types of seed: fine, medium and large.
 - 3.6 Describe the preparation of a seedbed on an outdoor site
 - 3.7 Describe appropriate methods of sowing seed in containers and in the open ground, including broadcast, sowing in drills and station sowing.
 - 3.8 Describe the care of seedlings to include: provision of the most suitable environmental conditions; watering; the avoidance of pests and diseases; the control of THREE commonly encountered pests and THREE commonly encountered diseases.
 - 3.9 Describe the pricking out into containers, thinning out, or transplanting of seedlings to a new site.
4. Understand the conditions required for successful plant propagation from cuttings.
 - 4.1 Describe the effects of juvenility and plant health on the ability of a section of plant to produce roots/shoots.
 - 4.2 Describe how to collect and prepare the following types of cutting: 'soft tip' (deciduous with leaves); 'semi-ripe' (green wood deciduous with leaves); small hairy or grey-leaved semi-evergreen with leaves; hardwood evergreen with leaves; hardwood deciduous without leaves; and conifers.
 - 4.3 State FOUR NAMED plant examples for EACH type of cutting material described in 4.2.

- 4.4 State a propagation facility that provides the best possible conditions for rooting EACH of the types of cutting described in 4.2. (Examples to include a propagator, mist bench, cold frame, and the open ground.)
- 4.5 State the environmental conditions required by EACH of the types of cutting described in 4.2.
- 4.6 Describe how to manage the environment (temperature, moisture, airflow) to encourage the rooting process and help to avoid THREE NAMED pests and THREE NAMED diseases.
- 4.7 Describe the aftercare of cuttings, including the removal of diseased, dying or dead material; feeding; and hardening off in preparation for potting off.
- 5 Understand how to propagate specific plants using appropriate vegetative techniques.
 - 5.1 Describe how to propagate by division ONE NAMED plant of EACH of the following types: a suckering shrub; a fibrous-rooted perennial; a perennial with distinct buds (eyes).
 - 5.2 Describe how to propagate ONE NAMED plant for EACH of the following types of leaf cutting: leaf petiole; leaf lamina; leaf squares; midrib; and chevrons.
 - 5.3 Describe how to propagate ONE NAMED plant by leaf bud cuttings.
 - 5.4 Describe how to propagate ONE NAMED plant for EACH of the following sizes of root cutting: thick (over 2mm diameter); and thin (less than 2mm diameter).
 - 5.5 Describe how to propagate ONE NAMED plant for EACH of the following types of layering: air; simple; and serpentine.
 - 5.6 State the meaning of the terms 'budding' and 'grafting'.
 - 5.7 State FOUR reasons why budding and grafting are carried out.
 - 5.8 State TWO benefits and TWO limitations of grafting.
 - 5.9 Describe how to propagate ONE NAMED plant by EACH of the following types of budding: 'T'; and 'Chip'.
 - 5.10 Describe how to propagate ONE NAMED plant by EACH of the following types of grafting: 'whip and tongue' (in the field); 'side veneer graft' (bench grafting).
 - 5.11 For EACH method of propagation specified in 5.1 to 5.8, state what aftercare is required to ensure success.

Understanding garden features, plant selection and planning

RHS Reference Number: R2111

Unit Reference Number: F/601/0251

Unit guided learning hours: 38

Unit Level: Level 2

Credit Value: 5

Unit purpose and aim(s): 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. Additionally, the unit will enable candidates to develop an understanding of plant selection for soft landscaping.

Learning Outcomes

The learner will:

1. Know how to carry out and record a garden survey.

Assessment Criteria

The learner can:

- | | |
|--|---|
| <ol style="list-style-type: none">1. Know how to carry out and record a garden survey. | <ol style="list-style-type: none">1.1 Describe how to identify potential hazards and risks on a site, including overhead and underground hazards (eg electric cables); unsafe buildings, features and trees; topography and existing features, e.g. watercourses and ponds.1.2 Describe potential restrictions which may limit work on the site, including financial constraints; difficulties with access for plant, equipment and materials; topography (degree and extent of slopes); boundary constraints; and restrictions on the time the works can be carried out.1.3 State what existing garden features need to be identified, including buildings, hard landscape features, and the trees and plants that are to be retained.1.4 State why it is necessary to identify the existence of overhead and underground services.1.5 Describe how to carry out basic linear surveying techniques, including the use of tapes, offsets and triangulation. |
| <ol style="list-style-type: none">2. Know how to carry out a site appraisal and record essential data. | <ol style="list-style-type: none">2.1 State what needs to be recorded when carrying out a site appraisal, including soil type, contour, aspect, microclimate, exposure and drainage. |

- | | |
|---|---|
| 3. Understand basic garden planning principles and the elements that contribute to a good design. | 3.1 Describe the relevance of garden planning principles to the production of a garden design that 'works', - one that follows accepted 'rules' or 'conventions', and which is pleasing to the eye.

3.2 State the meaning of the following terms: symmetry; asymmetry; colour; focal points. |
| 4. Understand the characteristics of accepted garden design styles. | 4.1 Describe the difference between formality and informality in garden design.

4.2 Describe the main characteristics of a knot garden, a landscape garden and a cottage garden. |
| 5. Understand the effective and appropriate use of hard landscaping materials. | 5.1 Describe a range of horizontal elements: paths, steps, patios and decking. Compare the benefits and limitations of a range of materials for each of the above, including concrete, paving and wood.

5.2 Describe a range of vertical elements: wall fences, screens, pergolas, furniture, statuary. For each of the above, compare TWO examples of natural and man-made materials used in their manufacture.

5.3 Describe rock gardens and water features. State TWO examples of manufactured and TWO of natural materials for EACH element. |
| 6. Understand the effective use of soft landscaping elements. | 6.1 Name appropriate grass species for the following types of lawn: hard wearing utility; high quality ornamental; shade tolerant.

6.2 Name FIVE evergreen and FIVE deciduous trees (large shrubs), suitable for planting in a domestic garden. State details of their decorative merits, height and spread and site requirements; describe a situation where each could be used effectively.

6.3 Name FIVE evergreen and FIVE deciduous plant species, suitable for hedging or screening (including formal or informal use). State details of their decorative merits, height and spread and site requirements; describe a situation where each could be used effectively.

6.4 Name TEN deciduous and TEN evergreen shrubs suitable for planting in a variety of garden situations. State details of their decorative merits, height and spread and site requirements; describe a situation where each could be used effectively. |

- 6.5 Name TEN herbaceous perennials suitable for planting in a variety of garden situations. State details of their decorative merits, height and spread and site requirements; describe a situation where each could be used effectively.
 - 6.6 Name TEN Alpine or Rock garden plants suitable for planting in a variety of garden situations. State details of their decorative merits, height and spread and site requirements; describe a situation where each could be used effectively.
 - 6.7 Name FIVE plants grown as biennials, which are suitable for planting in a variety of garden situations. State details of their decorative merits, height and spread and site requirements; describe a situation where each could be used effectively.
 - 6.8 Name TEN hardy plants grown as annuals, suitable for planting in a variety of garden situations. State details of their decorative merits, height and spread and site requirements; describe a situation where each could be used effectively.
 - 6.9 Name TEN half-hardy plants suitable for seasonal bedding. State details of their decorative merits, height and spread and site requirements and describe a situation where each could be used effectively.
 - 6.10 Name TEN patio or basket plants suitable for planting in a variety of garden situations. State details of their decorative merits, height and spread and site requirements; describe a situation where each could be used effectively.
 - 6.11 Name FIVE bulbs, corms or tuberous plants used for winter or spring interest, and FIVE for summer or autumn interest, in a variety of garden situations. State details of their decorative merits, height and spread and site requirements; describe a situation where each could be used effectively.
- 7. Understand how to incorporate key elements into a cohesive design.
 - 7.1 Describe how elements of hard landscaping should be selected and used to ensure that a design is cohesive.
 - 7.2 Describe how elements of soft landscaping should be selected and used to ensure that a design is cohesive.

- | | | |
|---|-----|---|
| | 7.3 | Describe how other materials and items (e.g. garden furniture) should be selected and used to ensure that a design is cohesive. |
| 8. Understand the importance of safe, healthy, environmentally-sensitive and sustainable development of garden sites. | 8.1 | Describe TWO hazards associated with EACH of the following: access; slope; location of features; water; electricity; materials; plants. |
| | 8.2 | State how the risks related to the hazards identified in 8.1 can be minimised by careful planning during the planning and design stage. |
| | 8.3 | Describe how the environmental sustainability of landscaping materials may affect choices made during the planning and design stage. |
| | 8.4 | State how sustainable practices in the maintenance of a garden can be integrated successfully during the planning and design stage. |
| | 8.5 | State how sustainable practices can be undertaken during the construction stage. |

Understanding the choice, establishment and maintenance of garden plants and lawns

RHS Reference Number: R2112

Unit Reference Number: T/601/0263

Unit guided learning hours: 23

Unit Level: Level 2

Credit Value: 3

Unit purpose and aim(s): This unit will enable candidates to develop an understanding of plant selection, establishment and maintenance of a range of ornamental plants.

Learning Outcomes

The learner will:

1. Understand the choice of plants for seasonal display and their establishment and maintenance.

Assessment Criteria

The learner can:

- 1.1 Describe, in the context of seasonal displays, what is meant by the terms: bedding, hardy, half-hardy, tropical, edging, groundwork (infill) and dot plant ; give TWO plant examples of EACH
- 1.2 Explain the importance of F1 hybrid plants and the term 'hybrid vigour'. State FOUR specific plant examples.
- 1.3 Name TEN plants suitable for growing in an annual border.
- 1.4 Name TEN plants suitable for summer bedding displays.
- 1.5 Name FIVE plants suitable for spring bedding displays, including TWO bulbs (or corms or tubers).
- 1.6 Name TEN plants suitable for summer display in containers or hanging baskets.
- 1.7 Name FIVE plants suitable for winter display in containers or hanging baskets.
- 1.8 Describe the soil or growing media preparation, sowing or planting out of plants for seasonal display for the situations listed in 1.3 – 1.7.
- 1.9 Describe the routine maintenance of seasonal bedding, including control of weeds and common pests and diseases (aphids, slugs and snails, vine weevil, grey mould, powdery mildew) for the situations listed in 1.3-1.7.

2. Understand the choice of herbaceous perennial plants and 'bulbs' for display, and how to grow them
 - 2.1 Name TEN herbaceous perennial plants suitable for growing in an herbaceous border.
 - 2.2 Name FIVE herbaceous perennials suitable for growing in shade and FIVE suitable for use as ground cover.
 - 2.3 Name TEN bulbs or corms or tubers, of which FOUR should be suitable for growing in the border, FOUR for containers and FOUR for naturalizing.
 - 2.4 Describe the soil preparation, planting, routine maintenance and control of weeds, pests and diseases (aphids, slugs and snails, vine weevil, grey mould, powdery mildew, stem or bulb eelworm) required for growing herbaceous perennials and bulbs, corms or tubers.
3. Understand the choice of woody plants for display and their establishment and maintenance.
 - 3.1 Name TEN trees suitable for growing in a domestic garden.
 - 3.2 Name TEN shrubs suitable for growing in a domestic garden.
 - 3.3 Name FIVE trees grown for winter interest and FIVE grown for autumn display.
 - 3.4 Name FIVE shrubs grown for winter interest and FIVE grown for autumn display.
 - 3.5 Name FIVE lime-hating trees or shrubs.
 - 3.6 Name FIVE bush roses suitable for growing in a rose bed, including cluster-flowered (floribunda) and large-flowered (hybrid tea) examples.
 - 3.7 Name FIVE climbers and FIVE wall shrubs suitable for a variety of garden situations including shaded and north-facing.
 - 3.8 Describe the soil preparation and planting for trees and woody shrubs.
 - 3.9 Describe the routine maintenance for trees and woody shrubs, to include pruning and the control of weeds and common pests and diseases (aphids, powdery mildew, black spot of roses, canker, coral spot, honey fungus).

- | | |
|--|--|
| <p>4. Understand the choice of alpine and rock garden plants and how to grow them</p> | <p>4.1 Name FIVE alpine or rock garden plants for spring display and FIVE for summer display.</p> <p>4.2 Describe soil characteristics, soil preparation and routine maintenance for the display of alpine or rock garden plants in open soil.</p> <p>4.3 Describe choice of container, the characteristics and preparation of the growing medium, and the routine maintenance required for an alpine or rock garden display in containers.</p> |
| <p>5. Understand the planting and maintenance of a garden pool.</p> | <p>5.1 Name TWO AQUATIC plants from each of the following groups: floating, deep-water, marginal and bog plants.</p> <p>5.2 Describe the planting and establishment of aquatic plants in a garden pool.</p> <p>5.3 Describe the annual maintenance of a garden pool, including possible controls for algae including blanket weed.</p> |
| <p>6. Understand the establishment and maintenance of lawns.</p> | <p>6.1 State appropriate grass mixtures for the establishment of a high quality ornamental lawn and for a hard-wearing utility lawn.</p> <p>6.2 State the benefits and limitations of establishing lawns from seed.</p> <p>6.3 Describe the procedure for establishing a lawn from seed.</p> <p>6.4 State the benefits and limitations of establishing a lawn from turf.</p> <p>6.5 Describe the procedure for establishing a lawn from turf.</p> <p>6.6 Describe the annual maintenance programme for quality ornamental and for hard-wearing utility lawns.</p> <p>6.7 Describe the range of equipment used for mowing, feeding, scarifying and aerating lawns.</p> <p>6.8 Describe the symptoms of a range of common lawn pests and diseases, including red thread, Fusarium patch, fairy rings, leatherjackets and moles; state an appropriate control measure for EACH.</p> |

Understanding the production of outdoor vegetables and fruit

RHS Reference Number: R2113

Unit Reference Number: A/601/0264

Unit guided learning hours: 23

Unit Level: Level 2

Credit Value: 3

Unit purpose and aim(s): This unit will enable candidates to develop an understanding of the basic cultural operations and production methods necessary to obtain outdoor vegetable and fruit crops.

Learning Outcomes

The learner will:

1. Know the importance of site selection for outdoor food production in a garden or allotment
2. Understand the cultural operations used to produce outdoor food crops in a garden or allotment.

Assessment Criteria

The learner can:

- 1.1 State the factors to be considered when selecting a site: including soil depth, texture and structure, drainage, pH, aspect, slope, susceptibility to frost and wind, area of land available and availability of water.
- 1.2 Describe the reasons for providing shelter for an outdoor food production area, including the effects of wind reduction, frost potential and influences upon pollination.
- 1.3 State the benefits and limitations of living and non-living windbreaks.
- 1.4 Name FOUR plant species suitable for a living windbreak.
- 1.5 Name FOUR types of non-living permeable windbreak.
- 2.1 Describe a range of soil cultivation techniques suitable for the vegetable garden: including digging rotary cultivation, consolidation and tilth production.
- 2.2 Describe how the timing of soil cultivations will be influenced by soil texture, structure, weather and climate.
- 2.3 Describe what is meant by the bed system for growing vegetables. Compare this with open ground production.
- 2.4 Describe what is meant by a raised bed, giving a specification for a typical raised bed and paths.
- 2.5 Explain the no-dig system of managing raised beds.

- 2.6 State the methods used to advance and extend the productive season of outdoor food crops, including the use of polythene, mulches, fleece, 'enviromesh', low tunnels, cloches and cold frames.
- 2.7 Describe propagation methods used in the production of vegetable crops, including direct sowing and raising plants in seed beds, blocks and modules.
- 3. Understand the principles of vegetable crop production
 - 3.1 Describe the individual production of vegetable crops including runner beans, winter cabbage, Brussels sprouts, carrots, courgettes, onions, leeks, beetroot, potatoes and salad crops to include lettuce and radish.
 - 3.2 Describe how quality and yield may be determined by the following: base and top dressings, thinning, weed control, crop support, irrigation and pest and disease control.
 - 3.3 Describe how EACH of the vegetables in 3.1 may be harvested and stored successfully.
 - 3.4 State ONE common pest and ONE common disease of the vegetables named in 3.1, describing symptoms and control measures.
 - 3.5 State the benefits and limitations of crop rotation.
 - 3.6 Describe a four-bed system of crop rotation.
 - 3.7 Explain how successional cropping can be achieved for a NAMED crop by using sowing and planting dates, choice of cultivars and environmental protection.
 - 3.8 Explain how intercropping can be used to maximise production.
 - 3.9 Describe the effect of plant spacing on a named crop.
 - 3.10 Describe what is meant by 'cut and come again' vegetables.
- 4. Understand the production of top and soft fruit for a garden or allotment
 - 4.1 Distinguish between top and soft fruit.
 - 4.2 List the types of top fruit (including apples, pears, plums and cherries) and factors for their selection, to include dessert and culinary cultivars; harvesting season; and storage capability.

- 4.3 List the major types of soft fruit (strawberries, raspberries, blackcurrants, gooseberries, blueberries and grapes) and factors to be considered when choosing suitable cultivars, to include the fruit type; choice of early, mid and late season cultivars; flavour; and freezing capability.
- 4.4 Describe the production of top fruit (apples and plums) and state the factors to be considered when choosing plants, including fruit type; plant quality; rootstock choice; size of tree; training style; pollination compatibility; and cultural requirements.
- 4.5 Describe the production of soft fruit, including raspberries, blackcurrants and strawberries.
- 4.6 State the advantages of purchasing certified stock.
- 4.7 Describe how quality and yield can be determined by the following: planting; base and top dressings; mulching; weed control; irrigation; training systems; appropriate pruning; and pest and disease control.
- 4.8 Describe the importance of formative and maintenance pruning for tree shape and yield.
- 4.9 Explain the importance of cross pollination and fertilisation in top fruit, including flowering periods, compatibility, diploid and triploid cultivars.
- 4.10 State four methods of ensuring effective pollination in fruit production.
- 4.11 Describe the harvesting and storage of the fruit crops named in 4.4 and 4.5.
- 4.12 State ONE common pest and ONE common disease of the fruits named in 4.4 and 4.5, describing symptoms and control measures.

Understanding protected environments and their use in plant cultivation

RHS Reference Number: R2114

Unit Reference Number: L/601/0267

Unit guided learning hours: 23

Unit Level: Level 2

Credit Value: 3

Unit purpose and aim(s): 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 greenhouses and tunnels; and the care of plants in the house and conservatory.

Learning Outcomes

The learner will:

1. Know a range of types of protected structure, and their use in growing plants.

2. Know the environment provided by a range of protected structures.

3. Know the structural and cladding materials used for a range of protected structures.

Assessment Criteria

The learner can:

1.1 Describe a range of protected structures, to include greenhouses, cold frames, polythene tunnels, cloches and conservatories.

1.2 Describe horticultural uses for each of the structures listed in 1.1, including plant propagation, crop production, and decorative display.

2.1 Describe the environmental differences between the protected environment and outdoors, including temperature; humidity; light; concentration of atmospheric gases; air movement; and irrigation requirements.

2.2 State the benefits and limitations of using protected structures for growing plants, (for example tomato, *Lycopersicon esculentum*) compared with growing the same plants outdoors.

2.3 Describe the effect of the environmental factors listed in 2.1 on plants in a protected environment.

3.1 List and describe the characteristics of a range of materials used for framework construction, including steel, aluminium, wood, and plastics. State the benefits and limitations of EACH.

3.2 Describe the properties of different cladding materials which can be used for structures, including glass; polyethylene film; polycarbonate; acrylic sheets; shade netting; and horticultural fleece. State the benefits and limitations of EACH.

- | | |
|---|--|
| <p>4. Understand the control of the environment in protected structures.</p> | <p>4.1 Describe the factors that affect light levels in protected structures, including shape of structure; site factors; orientation; type and condition of cladding materials.</p> |
| | <p>4.2 Describe how the temperature can be maintained in structures, including heating by gas, oil or electricity; heat distribution using circulating water and air; cooling by forced or natural ventilation; evaporation; and shading.</p> |
| | <p>4.3 Describe methods of changing the relative humidity (RH) in a protected environment, including the effects of 'damping down', ventilation and temperature changes.</p> |
| | <p>4.4 Describe manual and automated methods of irrigation, including the use of watering cans, hose pipes, capillary systems and 'drip' systems.</p> |
| | <p>4.5 Describe how light levels can be manipulated, by the use of supplementary lighting and shading, including blinds and shading paints.</p> |
| | <p>4.6 Describe the importance of cultural and biological controls to limit the damage caused by plant pests and diseases.</p> |
| <p>5 Know the types of container and growing media used for production and display in protected environments.</p> | <p>5.1 Compare the properties and characteristics of materials used in the manufacture of plant containers, including terracotta, plastic, polystyrene, peat, paper, natural and reconstituted stone, and recycled materials.</p> |
| | <p>5.2 Describe the factors that should be considered when choosing containers for the display of plants in greenhouses and interior displays, including management considerations and visual appeal.</p> |
| <p>6. Understand the horticultural uses of the protected environment.</p> | <p>6.1 Describe the use of protected environments for the over-wintering, production and display of plants.</p> |
| | <p>6.2 Describe the production of a range of plants which can be grown in a protected environment in a garden situation under the following headings: propagation and establishment; maintenance; control of pests, diseases and disorders. Examples should include one decorative pot plant (<i>Cyclamen persicum</i>), one salad crop (<i>Lycopersicon esculentum</i>), one cut flower (<i>Chrysanthemum x morifolium</i>), one bedding plant (<i>Impatiens walleriana</i>) and one bulb for forcing (<i>Narcissus 'Tete a Tete'</i>).</p> |

7. Understand the care of plants in an interior situation.
- 7.1 Describe the environmental factors that must be taken into account when displaying plants inside domestic buildings.
 - 7.2 Describe the choice of suitable containers and growing media for houseplants.
 - 7.2 Describe the management of one fern (*Adiantum raddianum*), one foliage (*Ficus benjamina*) and three seasonal flowering plants (*Euphorbia pulcherrima*, *Kalanchoe blossfeldiana*, and *Saintpaulia ionantha*) under the following headings: potting; feeding; watering; deadheading; re-potting; pest and disease identification and control.

Soil testing

RHS Reference Number: R2100

Unit Reference Number:- K/601/7503

Unit guided learning hours: 8

Unit level: Level 2

Credit Value: 1

Unit purpose and aim(s): This unit provides the learner with the skills and knowledge to accurately test a range of soils

Learning Outcomes

The learner will:

1. Understand the reasons for soil testing
2. Be able to collect and prepare soil samples for testing
3. Be able to identify the textural class of soils
4. Be able to determine the pH of soils

Assessment Criteria

The learner can:

- 1.1 State the reasons for soil testing
- 2.1 Collect a soil sample from the topsoil of a given site (without using the ADAS method)
- 2.2 Demonstrate how to prepare a soil sample for testing
- 3.1 Perform soil texture tests by feel using the ADAS 1985 soil texture key
- 3.2 Distinguish between distinctly different textural classes
- 4.1 Perform a pH test using an industry standard soil testing kit
- 4.2 Differentiate between prepared soil samples

Sowing seeds and vegetative propagation techniques

RHS Reference Number: R2121

Unit Reference Number: A/601/7666

Unit guided learning hours: 15

Unit level: Level 2

Credit Value: 2

Unit purpose and aim(s): This unit provides the learner with the knowledge and skills to propagate a diverse range of plants and to provide appropriate aftercare.

Learning Outcomes

The learner will:

1. Be able to fill containers appropriately to a consistent standard in readiness to accept seed or propagules
2. Be able to sow seed to a consistent and uniform standard in containers and carry out appropriate aftercare to ensure successful germination
3. Be able to prick out seedlings into containers

Assessment Criteria

The learner can:

- 1.1 Demonstrate how to fill a range of containers
- 1.2 Demonstrate how to 'strike off' (level) a range of containers
- 1.3 Consolidate growing media in a range of containers appropriately
- 2.1 Sow seed and label appropriately
- 2.2 Cover seeds appropriately
- 2.3 Perform the task of watering selecting an appropriate method
- 2.4 Select the appropriate environmental conditions for sown seed
- 2.5 Specify the appropriate temperature range required for successful germination of different types of seeds sown
- 2.6 Describe how to ensure successful germination of seed
- 3.1 Prick out seedlings singly into pots
- 3.2 Prick out seedlings into seed trays at stated densities
- 3.3 Prick out seedlings into modular trays at stated densities

- | | |
|--|--|
| 4. Be able to propagate plants from stem cuttings | 4.1 Collect suitable material from the mother plant |
| | 4.2 Demonstrate how to protect collected material appropriately to prevent desiccation |
| | 4.3 Prepare uniform stem cuttings for insertion |
| | 4.4 Propagate plants from stem cuttings |
| | 4.5 Apply appropriate root promotion material to the base of the propagule (if required) |
| | 4.6 Demonstrate how to insert propagules into growing media |
| 5. Be able to propagate plants from leaf petiole and leaf lamina cuttings | 5.1 Collect material from the mother plant |
| | 5.2 Demonstrate how to protect collected material appropriately to prevent desiccation |
| | 5.3 Propagate by leaf petiole cuttings |
| | 5.4 Perform leaf lamina propagation techniques |
| | 5.5 Prepare and insert propagules into growing media appropriately |
| 6. Be able to propagate plants from root cuttings during dormant season | 6.1 Collect material from the mother plant |
| | 6.2 Demonstrate how to protect collected material appropriately to prevent desiccation |
| | 6.3 Propagate by root cuttings |
| | 6.4 Prepare and insert propagules into growing media |
| 7. Be able to propagate plants by division during the appropriate season | 7.1 Lift the mother plant (if necessary) |
| | 7.2 Demonstrate how to carry out the process of division using a suitable method |
| | 7.3 Perform the technique of division on a range of plants |
| | 7.4 Prepare the propagules for replanting / potting |

- | | | | |
|----|--|-----|---|
| | | 7.5 | Demonstrate how to protect newly prepared material from desiccation |
| | | 7.6 | Replant or pot propagules in prepared soil or appropriate media in containers |
| 8. | Be able to provide aftercare to propagules | 8.1 | Select a suitable environment for newly propagated material and carry out appropriate aftercare to ensure success |

Practical skills in ground preparation for seeding and planting

RHS Reference Number: R2122

Unit Reference Number: F/601/7667

Unit guided learning hours: 15

Unit level: Level 2

Credit Value: 2

Unit purpose and aim(s): The aim of this unit is to provide the learner with the knowledge and skills required in preparing the ground for planting plants and seeds. The preparation of the ground may cover the use of both hand tools and powered machinery such as tractor mounted equipment.

Learning Outcomes

The learner will:

1. Be able to select, use and maintain equipment
2. Be able to prepare ground for seeding and planting
3. Be able to work safely and minimise environmental damage

Assessment Criteria

The learner can:

- 1.1 Select appropriate equipment for this area of work
- 1.2 Use equipment according to instructions
- 1.3 Prepare, maintain and store equipment in a safe and effective working condition throughout
- 2.1 Prepare the ground in a way that is appropriate to the plants/seeds being established, the soil type and ground conditions
- 2.2 Add the materials specified for the operation. (it may be compost, fertiliser or sand)
- 2.3 Produce the required tilth for the specified finish.
- 2.4 Clear debris from the site effectively, safely, tidily and legally
- 2.5 Complete work to the agreed schedule
- 3.1 Work in a way which maintains health and safety and is consistent with current legislation, codes of practice and any additional requirements
- 3.2 Carry out work in a manner which minimises environmental damage
- 3.3 Dispose of waste safely and correctly

Practical skills in establishing seeds and plants in soil

RHS Reference Number: R2123

Unit Reference Number: L/601/7669

Unit guided learning hours: 15

Unit level: Level 2

Credit Value: 2

Unit purpose and aim(s): The aim of this unit is to provide the learner with the knowledge, understanding and skills required to plant and establish plants and or seeds in soil. The learner will also provide aftercare to meet specifications for newly established plants or seeds.

Learning Outcomes

The learner will:

1. Be able to select, use and maintain equipment
2. Be able to select and transport plants and or seeds
3. Be able to establish plants and or seeds in soil
4. Be able to work safely and minimise environmental damage

Assessment Criteria

The learner can:

- 1.1 Select appropriate equipment for this area of work
- 1.2 Use equipment according to instructions
- 1.3 Prepare, maintain and store equipment in a safe and effective working condition throughout
- 2.1 Select plants and or seeds as requested
- 2.2 Identify a representative sample of plants
- 2.3 Handle, prepare and transport plants and seeds in a way that maintains their health and condition
- 3.1 Position and plant the plants and or seeds according to instructions / drawings
- 3.2 Provide aftercare to meet the planting specifications
- 4.1 Work in a way which maintains health and safety and is consistent with current legislation, codes of practice and any additional requirements
- 4.2 Dispose of waste safely and correctly

Care and pruning of plants

RHS Reference Number: R2124

Unit Reference Number: J/601/7671

Unit guided learning hours: 23

Unit level: Level 2

Credit Value: 3

Unit purpose and aim(s): This unit provides the learner with the knowledge and skills to successfully plant, prune and care for a wide range of hardy plants.

Learning Outcomes

The learner will:

1. Be able to re-pot and pot on
2. Be able to provide aftercare to aid the establishment of plants that have been re-potted and those growing in the open ground
3. Know how to apply the principles of pruning
4. Be able to prune a range of plants to achieve specified outcomes

Assessment Criteria

The learner can:

- 1.1 Assess the condition of the plant and report
- 1.2 'Knock out' an established container grown plant
- 1.3 Remove dead, diseased or damaged parts of plants
- 1.4 Remove old media from surface and ease compaction of the root ball
- 1.5 Trim the roots and aerial growth (if appropriate)
- 1.6 Select an appropriate container
- 1.7 Select an appropriate growing media for the subject
- 1.8 Perform the task of potting on
- 2.1 Demonstrate how to provide appropriate aftercare
- 2.2 Demonstrate how to apply fertilisers
- 2.3 Report changes in the conditions of plants indicating possible causes
- 3.1 Define the term '3 Ds' and state the order in which the 3 D's are carried out
- 3.2 Define pruning terminology
- 4.1 Perform formative and maintenance pruning operations on a range of plants

Identification of a range of common garden plants, weeds, pests, diseases, disorders and beneficial organisms

RHS Reference Number: R 2125

Unit Reference Number: K/601/7680

Unit guided learning hours: 23

Unit level: Level 2

Credit Value: 3

Unit purpose and aim(s): This unit provides the learner with the knowledge required to identify a range of common garden plants, weeds, seeds, pests, diseases, disorders and beneficial organisms.

Learning Outcomes

The learner will:

1. Understand how plants are botanically named
2. Be able to identify a range of plants
3. Be able to identify a range of seeds
4. Be able to identify a range of pests, diseases and disorders
5. Know a range of beneficial birds, animals and insects

Assessment Criteria

The learner can:

- 1.1 Name plants correctly using the accepted botanical nomenclature
- 2.1 Identify a range of plants by botanical name from each of the following categories:
 - (a) deciduous or evergreen trees
 - (b) conifers
 - (c) deciduous shrubs
 - (d) evergreen shrubs
 - (e) non-woody herbaceous plants
 - (f) rock garden and alpine plants
 - (g) aquatic plants
 - (h) weeds
- 3.1 Identify a range seeds by generic name.
- 4.1 Identify a range of pests, diseases and disorders by common name.
- 5.1 Identify a range of beneficial birds, animals, or insects by common name.
- 5.2 State why the animals, birds and insects identified in 5.1 are beneficial to horticulture

:

Sustainable garden practice

RHS Reference Number: R2126

Unit Reference Number: M/601/9155

Unit guided learning hours: 15

Unit level: Level 2

Credit Value: 2

Unit purpose and aim(s): This unit enables the learner to understand and apply a range of sustainable gardening practices.

Learning Outcomes

The learner will:

1. Be able to identify potential hazards and risks associated with sustainable garden practice

2. Be able to select and use appropriate personal protective equipment and clothing

3. Be able to select and use a range of tools, equipment and materials

4. Be able to make and use garden compost

Assessment Criteria

The learner can:

- 1.1 Define the hazards associated with handling plant waste and composting
- 1.2 Define the hazards associated with preparing and applying compost teas and other organic materials
- 1.3 Define the hazards associated with water storage and use
- 1.4 Assess the hazards associated with handling potentially injurious plants
- 2.1 Identify and wear the appropriate personal protective equipment and clothing required
- 3.1 Perform sustainable garden operations using a range of equipment and tools
- 3.2 Select and use sustainable materials in a range of garden operations
- 4.1 Collect garden waste and separate for processing
- 4.2 Select and process suitable material for composting (shredding if required) and add to compost heap
- 4.3 Dispose of unsuitable material in an environmentally acceptable manner
- 4.4 Monitor compost and assess the need for aeration and turning

- | | | |
|----|-----|--|
| | 4.5 | Select and apply composted material for a range of uses to include |
| | | <ul style="list-style-type: none"> a) conservation / protection of un-cropped areas b) mulching around established plants c) soil improvement prior to sowing or planting |
| 5. | | Be able to harvest rainwater, conserve grey water, store appropriately and use to irrigate plants |
| | 5.1 | Harvest/recycle water and store appropriately |
| | 5.2 | Assess the quality of harvested/ recycled water for horticultural use |
| | 5.3 | Apply adequate amounts of water to plants outdoors to maintain growth |
| 6. | | Be able to use green manure, compost and natural materials to enhance soil fertility and feed plants |
| | 6.1 | Name suitable plant species for use as green manure |
| | 6.2 | Sow green manure between crops |
| | 6.3 | Incorporate green manure by digging in prior to re-sowing or planting |
| 7. | | Be able to prepare liquid organic materials and apply to plants |
| | 7.1 | Prepare liquid organic materials |
| | 7.2 | Apply liquid organic materials to plants |
| 8. | | Be able to select plant species adapted for specific environmental conditions |
| | 8.1 | Select plant species adapted for specific environmental conditions to include <ul style="list-style-type: none"> (a) dry soils (b) waterlogged soils (c) reduced light |
| | 8.2 | Report changes in the condition of plants, indicating possible causes to include <ul style="list-style-type: none"> (a) water deficiency/excess (b) disease (c) pests (d) environmental damage |

- | | |
|--|--|
| <p>9. Be able to select and make provision for beneficial birds, animals and insects</p> | <p>9.1 Perform activities in a garden setting which encourage beneficial organisms</p> <p>9.2 State the ecological advantages of a range of beneficial birds, animals and insects in a garden setting</p> |
| <p>10. Be able to prevent and control pests, weeds and diseases using sustainable practices</p> | <p>10.1 Demonstrate suitable cultural methods to prevent / reduce the occurrence of pests, weeds and diseases</p> <p>10.2 Demonstrate suitable cultural methods of control on a range of established pests, weeds and diseases</p> <p>10.3 Apply biological controls to a range of pests</p> |

Safe operation of powered garden machinery

RHS Reference Number: R2127

Unit Reference Number: T/601/7682

Unit guided learning hours: 15

Unit level: Level 2

Credit Value: 2

Unit purpose and aim(s): This unit provides the learner with the knowledge and skills to safely operate a range of powered garden machinery, and includes pre-start checks, adjustment, effective operation and basic maintenance.

Learning Outcomes

The learner will:

1. Be able to identify potential hazards and risks associated with powered garden machinery
2. Be able to select and wear appropriate personal protective equipment and clothing
3. Be able to carry out pre-start checks on powered garden machinery
4. Be able to check that all safety signage, guards and devices are in position and operating correctly
5. Be able to identify the controls and define their function
6. Be able to adjust a limited range of garden machinery for specified tasks

Assessment Criteria

The learner can:

- 1.1 Identify the risks associated with powered garden machinery
- 1.2 Assess the hazards associated with powered garden machinery
- 2.1 Select and correctly wear the appropriate personal protective equipment and clothing/equipment required
- 3.1 Assess the condition and serviceability of powered garden machines
- 4.1 Define the meaning of the different safety decals (signage)
- 4.2 Identify the position of guards and confirm that they are in place correctly fitted and secure
- 4.3 Demonstrate that all safety devices are operational (as applicable to machine)
- 5.1 Identify the controls of a range of powered garden machinery, and demonstrate their correct use
- 6.1 Perform pre-operation adjustments to powered garden machines prior to 'work' to accommodate the operator
- 6.2 Carry out simple adjustments to different types of powered garden machine prior to 'work' to suit task

- | | | |
|--|-----|---|
| 7. Be able to use garden machinery safely and effectively | 7.1 | Demonstrate safe use of different powered garden machinery |
| | 7.2 | Demonstrate efficient working practice and correct technique using different powered garden machinery |
| 8. Be able to clean and check garden machinery after use | 8.1 | Wear correct personal protective equipment for cleaning garden machinery |
| | 8.2 | Perform post operative cleaning operations and checks on powered garden machinery |
| 9. Know how to correctly dispose of waste associated with the use of powered garden machinery | 9.1 | Specify how to dispose of waste correctly |