



# **RHS Qualifications**

RHS Level 3 Certificate in  
Practical Horticulture

Qualification Specification

**September 2024**

Qualification number: 610/2232/9

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## 1. RHS Qualifications Contact Details

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

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RHS Website: [rhs.org.uk/qualifications](https://rhs.org.uk/qualifications)

## 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 consider 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 RHS website.

The privacy, and security of personal data is extremely important to us. Personal information that centres provide is used for the purposes of furthering our legal obligations as an awarding body for creating qualifications and issuing of certificates. For further information and a detailed explanation, please refer to our Privacy Policy on the RHS website ([rhs.org.uk/privacy](https://rhs.org.uk/privacy)).

## 3. RHS Level 3 Certificate in Practical Horticulture

### 3.1. Introduction and context

Those involved in the field of Garden and Landscape Maintenance have to be able to apply the principles of horticultural science, seek out best practice, select techniques which are cost effective, embrace sustainability, ensure biosecurity and comply with current legislation as they develop the gardens and landscapes under their care.

These horticulturists have to apply the skills developed within the Level 2 qualification, but embrace the concepts of Garden Management Plans, Maintenance Schedules and Garden Health Plans to enable them to manage the many different aspect which make up gardens.

### **3.2. Audience**

The purpose and content of the Level 3 supports specialist / industry-specific pathways informed by the findings of the Ornamental Horticultural Round Table Group (OHRG). It is aimed at those progressing in horticultural roles or having a specialist personal interest in the supervision and development of gardens and landscapes, thus meeting the needs of the amateur gardeners and professional horticulturists alike.

It also provides learners the opportunity of personal development, including the changing of careers and engagement in their learning and offers an opportunity to develop transferable skills such as problem solving, implementing management plans / programmes, and communication as part of their applied learning.

### **3.3. Guided Learning Hours (GLH) and Total Qualification Time (TQT)**

The Guided Learning Hours (GLH) represent the time that the learner spends learning under the immediate guidance and supervision of a tutor and includes assessment by the tutor, as well as invigilated exams. Guided Learning Hours are always less than total qualification time, as learners are expected to complete a certain amount of study in their own time. The Guided Learning Hours for this qualification is 120.

Total Qualification Time (TQT) includes the Guided Learning Hours and represents the notional time that an average learner could reasonably expect to take to complete the learning outcomes of the units to the standard determined by the assessment criteria, and gain the qualification. It includes all face-to-face contact with tutors as well as assessment time and unsupervised directed study, coursework and practice. The Total Qualification Time for this qualification is 180.

### **3.4. 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.

### **3.5. Qualification Structure**

This certificate is divided into eight topics, each made up of elements covering a specific aspect of practical horticulture, as follows:

## RHS Level 3 Certificate in Practical Horticulture

Topic		Elements
<b>1</b>	<b>Plant Knowledge</b>	<ol style="list-style-type: none"> <li>1. The identification and requirements of plant species</li> <li>2. Plant specification and sourcing</li> <li>3. Plants within gardens and designed landscapes</li> <li>4. Propagation techniques.</li> </ol>
<b>2</b>	<b>Creating Planted Areas</b>	<ol style="list-style-type: none"> <li>1. Site preparation</li> <li>2. Planting schemes</li> <li>3. The planting process</li> <li>4. Post-planting management.</li> </ol>
<b>3</b>	<b>Maintaining Planted Areas</b>	<ol style="list-style-type: none"> <li>1. Maintenance of planted areas</li> <li>2. Garden management plans / maintenance schedules</li> <li>3. Evidence-based practice / best practice</li> <li>4. Evaluation of techniques.</li> </ol>
<b>4</b>	<b>Plant Health</b>	<ol style="list-style-type: none"> <li>1. Biosecurity</li> <li>2. Biotic and abiotic impacts on plant health</li> <li>3. Integrated Pest Management</li> <li>4. Planning garden health.</li> </ol>
<b>5</b>	<b>Productive Growing</b>	<ol style="list-style-type: none"> <li>1. Cultivation of vegetables</li> <li>2. Cultivation of top fruit</li> <li>3. Cultivation of soft fruit</li> <li>4. Cultivation of herbs.</li> </ol>
<b>6</b>	<b>Protected Growing</b>	<ol style="list-style-type: none"> <li>1. Siting, design and maintenance of protected structures</li> <li>2. Internal structures and equipment</li> <li>3. Production of crops</li> <li>4. Management of plant collections.</li> </ol>
<b>7</b>	<b>Ecological and Sustainable Plantings</b>	<ol style="list-style-type: none"> <li>1. Purpose of ecological and sustainable plantings</li> <li>2. Species selection</li> <li>3. Establishment of ecological and sustainable plantings</li> <li>4. Maintenance of ecological and sustainable plantings.</li> </ol>
<b>8</b>	<b>Landscaping Materials</b>	<ol style="list-style-type: none"> <li>1. Inspection of existing hard landscaping features</li> <li>2. Maintenance plans and schedules for landscaping materials and features</li> <li>3. Planning a new hard landscaping feature</li> <li>4. Selection and calculation of materials.</li> </ol>

## 4. Assessment

### 4.1. Assessment Outcomes

The content covered in each topic of this syllabus specification is expressed in terms of 'Assessment Outcomes' (AOs).

Assessment Outcomes define the way in which learners demonstrate their abilities under test conditions. The AOs use a 'progressive mastery' model for each topic area. This qualification has three broad categories of assessment outcomes, which are:

***AO1 – knowledge recall of scientific ideas, processes, techniques, procedures, and making correct use of terms, symbols and units of measurement***

***AO2 – application of knowledge and understanding of concepts, theories, facts to different situations and contexts through presentation of reasoned explanations and analysis and interpretation of information and ideas***

***AO3 – application of knowledge and understanding in an integrated and holistic way in order to reach conclusions and make judgements and recommendations.***

The relevant content (elements) for each of these AOs is included against each topic area in the specifications below. It is therefore clear what is to be covered and the nature of how it will be assessed. Each topic will start with knowledge recall (AO1), progress to application of knowledge to situations (AO2), and ultimately to making connections with other relevant topic areas i.e. holistic (AO3). The aim is that those learners who successfully meet all these progressive demands will be able to demonstrate a wide range of skills and especially the ability to apply what they have learned in practical contexts.

### 4.2. Assessment methods

A range of methods will be used to assess this qualification. They include formative assessment of skills by tutors at RHS Centres, and a range of summative short answer tests, professional discussions as well as direct observation by RHS Assessors. All assessments must be conducted in accordance with the RHS requirements (see [rhs.org.uk/qualifications](https://rhs.org.uk/qualifications) for more details).

## 5. Learning Resources

There is a wide range of books, online material and other learning resources published which support the studies of those learning horticulture. RHS Qualifications does not recommend or endorse any specific learning resources as meeting the needs of learners studying for RHS qualifications. Learners are encouraged to seek guidance from their tutors on which learning resources will best support their studies, or to choose the most appropriate resources to support the qualification requirements and their needs from the wealth of material available.

## **6. Approved Centres**

RHS Qualifications can only be delivered by approved centres. Further information regarding the approval process can be found at: [rhs.org.uk/qualifications](https://rhs.org.uk/qualifications).

## **7. Learner Registration**

All learners must be registered with RHS Qualifications at the commencement of this qualification through the RHS Qualifications Web Portal. More information about the registration process is available from RHS Qualifications.

## **8. Reasonable Adjustments and Special Consideration**

RHS Qualifications is committed to ensuring fair assessment for all learners, and will facilitate access to RHS qualifications through reasonable adjustments to assessment arrangements for learners 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 learner with a visual impairment.

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

Full guidance is provided in the document 'Guidance to Centres for Reasonable Adjustments and Special Consideration'. The document is available on the RHS website ([rhs.org.uk/qualifications](https://rhs.org.uk/qualifications)), 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 learner. Application must be made within specified timescales.

## **9. Fees**

For a full list of fees please refer to the RHS Qualifications Fees Notice, which is available on the Qualifications page on the RHS website and on the RHS web portal. All fees are payable prior to confirmation of entry for assessment.

## **10. Late Entries**

RHS Qualifications regularly publishes closing dates for entry for assessments. Entries submitted after the relevant published closing date will be subject to a late entry fee.

## **11. Enquiry about Results service**

An enquiry about results service is available from RHS Qualifications. Applications must be submitted within the specified number of working days of the results release date. Applications received after this date will not be processed. Detailed information and regulations about this service are available from RHS Qualifications.

## **12. Re-mark & Feedback**

The fee for a re-mark and feedback is published on the RHS Qualifications Fees Notice. If a re-mark results in an upgrade of the original result, the re-mark fee paid will be refunded.

## **13. Appeals Procedure**

An appeals procedure exists to conduct appeals lodged by learners against decisions made by RHS Qualifications, concerning their examination and assessment 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 instances where RHS Qualifications has imposed a penalty on a learner, tutor or invigilator, and where 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.

## **14. Replacement Certificate (if lost, damaged or destroyed)**

The fee for a replacement certificate can be found on the RHS Qualifications Fees Notice. Requests for a replacement certificate must be sent to the Qualifications Department.

## **15. 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 will 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 learners 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.



# RHS Level 3 Certificate in Practical Horticulture

## Syllabus Specification

The specific detailed content of the syllabus now follows on the following pages. However, learners should have regard to four overarching qualification-wide outcomes:

Qualification-wide outcomes
<p><b><u>Health and Safety:</u></b></p> <ul style="list-style-type: none"><li>• Knowledge of, and compliance with, current legislation as it relates to horticulture</li><li>• The management of risk within horticulture</li><li>• The storage, care and maintenance of PPE, tools and equipment in horticultural settings.</li></ul>
<p><b><u>Sustainability:</u></b></p> <p>The impact of horticulture on the wider environment, with specific reference to:</p> <ul style="list-style-type: none"><li>• Reduction of the negative impacts of horticultural practices</li><li>• The contribution of horticulture to the three pillars of sustainability (economic viability, social equity and environmental protection)</li><li>• The concept that horticulture should be net positive, benefitting the wider environment</li><li>• The impact of horticulture on climate change</li><li>• The impact of climate change on horticulture.</li></ul>
<p><b><u>Best Practice:</u></b></p> <ul style="list-style-type: none"><li>• Professional approaches and techniques</li><li>• Professional use of named plant species in a wide range of horticultural settings</li><li>• Horticultural practices which are professional, current, effective and sustainable</li><li>• The adoption of trials results, research and development findings.</li></ul>
<p><b><u>Equality and diversity:</u></b></p> <ul style="list-style-type: none"><li>• Knowledge and compliance with all current legislation as it relates to horticulture</li><li>• The concepts of respect, fairness, and dignity</li><li>• Negative impacts of poor practice to include: discrimination, victimisation and harassment</li><li>• The advantages of inclusive cultures.</li></ul>

<b>Topic</b>	<b>1</b>
<b>Title:</b>	<b>Plant Knowledge</b>

### Topic overview

Horticulturists are required to have an in-depth knowledge of a wide and diverse range of plants.

This knowledge includes the identification of plants, the ability to describe plants using scientific names, to specify and source plant material and to appreciate the many roles plant material plays within gardens.

The topic also includes propagation. This includes the practical propagation of a range of plant material using specialist techniques.

Element 1		The identification and requirements of plant species.	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Identify and describe the following plants using scientific names.</p> <ul style="list-style-type: none"> <li>• Alpines</li> <li>• annual plants</li> <li>• aquatics</li> <li>• biennial plants</li> <li>• bulbs, corms, rhizomes and tubers</li> <li>• invasive plants</li> <li>• perennials</li> <li>• short-lived perennials</li> <li>• shrubs</li> <li>• trees</li> <li>• houseplants.</li> </ul> <p>Identify non-cultivated plants using common name, genus and species.</p>	<p>Influence of plant requirement on cultivation practices, to include:</p> <ul style="list-style-type: none"> <li>• impact of origin</li> <li>• impact of provenance</li> <li>• suitability of plant for different situations, e.g. hedging, small garden</li> <li>• management e.g. pruning requirement</li> <li>• adaptability e.g. pH range tolerated.</li> </ul> <p>Impact of incorrect plant selection to include:</p> <ul style="list-style-type: none"> <li>• management e.g. pruning requirement</li> <li>• suitability of plant for different situations, e.g. dry shade, full sun</li> <li>• biotic factors</li> <li>• abiotic factors.</li> </ul>	<p>Wider considerations when managing plants e.g. maintenance of plants, ecological and sustainable plantings.</p>	
Commentary			
<p>In AO1 learners identify and describe plants using scientific names.</p> <p>At AO2 this plant knowledge is applied to the influence of plant requirements on cultivation practices, and the impact of geographic origin and provenance. It then moves on to consider the suitability of the plant species to the site, the management requirements of the species and how adaptable the species is with regards to site requirements. AO2 also considers the impact of incorrect plant selection, with regards to maintenance requirements, suitability to the site, along with the negative influences on the plant of a range of biotic and abiotic factors.</p> <p>At AO3 learners apply their plant-based knowledge across different topic areas to give an integrated knowledge of the topic.</p>			

Element 2		Plant specification and sourcing	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Terminology used in plant specifications e.g. bareroot, containerised.</p> <p>Criteria for plant specification, to include:</p> <ul style="list-style-type: none"> <li>Grafted plants: rootstock, position of bud union, absence of epicormic growth</li> <li>Container-grown trees: container size, height, absence of root circling, root girdling, shelf life, root flare visible on trees at surface of container.</li> </ul> <p>Criteria for supplier selection, to include:</p> <ul style="list-style-type: none"> <li>biosecurity policies</li> <li>quality assurance</li> <li>ability to meet specification</li> <li>reputation</li> <li>previous experience.</li> </ul>	<p>Establish criteria to ensure the quality of plant material, to include:</p> <ul style="list-style-type: none"> <li>true to type</li> <li>stock size</li> <li>quality</li> <li>shape</li> <li>branch structure</li> <li>root health.</li> </ul> <p>Impacts of poor plant quality e.g. aesthetics, plant establishment.</p>	<p>Wider considerations when specifying and sourcing plants e.g. impacts on yield in productive growing, post planting management when establishing new plantings.</p>	
Commentary			
<p>In AO1 learners develop a knowledge of plant specifications. This includes both the specification of plant material along with the criteria that should be used when selecting suppliers of plants for planting. The term grafting includes all associated practices such as budding. The criteria for plant selection should also draw on qualification-wide outcomes, for example the use of peat free growing media and whether plants are grown in heated glasshouses.</p> <p>AO2 applies the concepts of plant specification to include the establishment of criteria that should be used when ascertaining the quality of plants for planting. The impacts of poor plant quality are considered, both from an aesthetic perspective, but also from the influences poor quality plant material may have on establishment.</p> <p>AO3 integrates these concepts to consider the influences of plant quality on yield in protective growing, for example tree quality in top fruit, or on post planting management of new plantings. Qualification-wide outcomes could include the impact of size of plant (or container) on sustainability, e.g. water, growing media and plastic footprint.</p>			

Element 3		Plants within gardens and designed landscapes	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The role of plants within a garden or designed landscape.</p> <p>The functions that plants can perform within a garden, to include:</p> <ul style="list-style-type: none"> <li>• ecosystem services</li> <li>• vertical barriers/hedges</li> <li>• windbreaks</li> <li>• edible plants/fruit/berries</li> <li>• aesthetic.</li> </ul> <p>The design considerations when grouping plants for display, to include:</p> <ul style="list-style-type: none"> <li>• rhythm</li> <li>• colour</li> <li>• shape</li> <li>• texture</li> <li>• movement</li> <li>• sound</li> <li>• scent.</li> </ul> <p>The role of plants in biodiversity e.g. nectar, berries.</p>	<p>Specify plant material for differing functions within a garden, to include:</p> <ul style="list-style-type: none"> <li>• ecosystem services</li> <li>• vertical barriers</li> <li>• floral displays</li> <li>• clipped plants/topiary</li> <li>• reducing noise</li> <li>• scent.</li> </ul> <p>Create plant specifications to meet site and design requirements, to include:</p> <ul style="list-style-type: none"> <li>• formal</li> <li>• naturalistic</li> <li>• prairie</li> <li>• herbaceous</li> <li>• woodland</li> <li>• botanical collections</li> <li>• Mediterranean</li> <li>• cottage gardens</li> <li>• tropical plantings.</li> </ul>	<p>Wider considerations when specifying plants to include ecological services e.g. use in swales and sustainable drainage schemes and in the provision of wildlife corridors in ecological and sustainable plantings.</p>	
Commentary			
<p>In AO1 the range of functions that plants can fulfil within a garden or designed landscape are considered, along with a range of design considerations, and the role that plants can have in enhancing biodiversity.</p> <p>AO2 uses this knowledge to specify plant material for a range of purposes.</p> <p>AO3 considers the roles of plants in the provision of ecological services, for example their role within swales, or their roles in the development of wildlife corridors, both of which are considered in the ecological and sustainable plantings topic.</p>			

Element 4 Propagation techniques		
AO1: Knowledge	AO2: Application	AO3: Integration
<p>Advantages of budding and grafting in plant propagation.</p> <p>Principles of propagation, to include:</p> <ul style="list-style-type: none"> <li>• techniques to break seed dormancy</li> <li>• bulb propagation</li> <li>• corm propagation</li> <li>• root cuttings</li> <li>• layering</li> <li>• stem cuttings to include: <ul style="list-style-type: none"> <li>○ wounding</li> <li>○ heel</li> <li>○ internodal</li> <li>○ stem bud.</li> </ul> </li> </ul>	<p>Carry out plant propagation, to include:</p> <ul style="list-style-type: none"> <li>• techniques to break seed dormancy</li> <li>• bulb propagation</li> <li>• corm propagation</li> <li>• root cuttings</li> <li>• layering</li> <li>• stem cuttings to include: <ul style="list-style-type: none"> <li>○ wounding</li> <li>○ heel</li> <li>○ internodal</li> <li>○ stem bud.</li> </ul> </li> </ul>	<p>Wider considerations to include the advantages of locally propagated plant material in ecological and sustainable plantings, along with the role of propagation in productive and protected growing.</p>
Commentary		
<p>In AO1 learners consider the advantages of budding and grafting in plant propagation, along with the principles involved in the propagation of plants.</p> <p>In AO2 learners develop specialist plant propagation skills in the areas specified above. Learners should be able to perform the most commonly accepted practices within each of these areas. This could include, twin scaling of bulbs, simple, air and serpentine layering, the scarification, stratification and vernalisation of seed.</p> <p>AO3 considers the advantages of locally propagated plant material within the context of ecological and sustainable plantings, productive growing and protected growing.</p>		

<b>Topic</b>	<b>2</b>
<b>Title:</b>	<b>Creating Planted Areas</b>

### Topic overview

Horticulturists create gardens and designed landscapes which improve the lives of people and help to preserve and enhance biodiversity.

Such gardens are created on a range of sites, from mountainsides to valleys. Creating planted areas requires a scientific approach to site assessment, along with a knowledge of how sites can influence plant selection and planting style.

Horticultural techniques are constantly being researched, trialled and developed and so this topic area also includes the investigation into best practice to ensure the techniques being developed are the most appropriate for the given situation.

Element 1		Site preparation	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Considerations when creating planted areas, to include:</p> <ul style="list-style-type: none"> <li>• abiotic factors e.g. service locations, drainage characteristics</li> <li>• biotic factors e.g. soil condition, perennial weeds.</li> </ul> <p>Concept that site preparation should be limited to minimise negative effects on the wider environment.</p>	<p>Plan site preparation to embrace site characteristics prior to planting.</p> <p>Prepare site for planting.</p>	<p>The impact of plant selection on the development of site improvement plans.</p> <p>The impact of horticultural context on the development of horticultural sites e.g. production of fruit, management of grassed areas.</p> <p>The impact of sustainable horticultural practices on the development of sites.</p>	
Commentary			
<p>AO1 introduces learners to the concept of developing sites for planting. This process starts with site improvement, taking account of the key biotic and abiotic factors that may limit the horticultural potential of a site. The principles of minimal soil amelioration, and minimal cultivation link into qualification-wide outcomes relating to current best practice and sustainability.</p> <p>At AO2 learners plan site preparation, to include the best practice concept of embracing site characteristics i.e. changing plant specification to suit the site, rather than the site to suit the plant characteristics.</p> <p>At AO3 this topic integrates with other topic areas to consider the role of site improvement plans, the impact of horticultural context and the application of sustainable practices to reduce negative environmental impacts.</p>			



Element 2		Planting schemes	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Factors that influence and inform a planting scheme to include:</p> <ul style="list-style-type: none"> <li>• function</li> <li>• style</li> <li>• site limitations</li> <li>• client requirement</li> <li>• budget.</li> </ul>	<p>Design a planting scheme to meet site requirements and design criteria.</p> <p>Produce a planting plan to indicate plant names, planting positions, numbers of plants required, suppliers, and costs.</p>	<p>Seasonal interest of different plant species.</p> <p>The application of design principles.</p> <p>The criteria for supplier selection.</p> <p>Integration of productive growing into aesthetic plantings.</p>	
Commentary			
<p>AO1 considers the factors that influence and inform planting schemes, including the function and style of the scheme along with site-based limitations, the requirement and expectations of the client, and the concept of budget. (Nb: the level of detail with regard to budget would be limited to the cost of different sizes of plant material, or the cost of replacing annual plants when compared to the cost of perennial plants).</p> <p>At AO2 learners design a planting scheme to meet given site requirements and design criteria. Learners further refine and develop their skills by producing a planting plan to indicate the position of plants, the use of botanical plant names, the number of plants required, potential plant suppliers and costs. (Nb: the planting scheme and plans should be produced as working documents. Plans do not have to be presented to high professional standards, but must be clear, accurate and readable.)</p> <p>At AO3 other topic areas are integrated to include the application of plant knowledge to inform seasonal interest, the application of design principles. Other areas of integration include supplier selection criteria (from topic 1) and the integration of productive growing, for example the role of potagers within planting schemes.</p>			

Element 3		The planting process	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The stages of the planting process, to include:</p> <ul style="list-style-type: none"> <li>• identification of plant material</li> <li>• quantity checks</li> <li>• quality checks</li> <li>• health checks</li> <li>• quarantine requirements</li> <li>• set out plants</li> <li>• planting technique</li> <li>• irrigation/water management</li> <li>• mulching.</li> </ul> <p>Advantages and limitations of different plant support and plant protection products.</p>	<p>Implement planting scheme/plan, to include:</p> <ul style="list-style-type: none"> <li>• identification of plant material</li> <li>• quantity checks</li> <li>• quality checks</li> <li>• health checks</li> <li>• quarantine requirements</li> <li>• set out plants</li> <li>• planting technique</li> <li>• irrigation/water management</li> <li>• mulching.</li> </ul> <p>Specify plant support and protection products.</p>	<p>Impacts of poor plant specification, and planting on plant health and maintenance.</p> <p>Purpose and importance of good biosecurity practices when specifying / receiving plants for planting.</p>	
Commentary			
<p>In AO1 the stages of the planting process are identified, along with the advantages and the limitations of plant support and protection products.</p> <p>In AO2 learners apply this process to create a planting as specified in a planting scheme or plan.</p> <p>AO3 integrates this element with plant health to consider the impacts of poor plant specifications on plant health and on maintenance. Learners also identify the purpose and the importance of good biosecurity practices when specifying and receiving plants for planting.</p>			

Element 4		Post-planting management	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Management requirements of new plantings for years 1, 2 and 3, to include:</p> <ul style="list-style-type: none"> <li>• health status</li> <li>• replacement of failed plants</li> <li>• water management</li> <li>• provide nutrition if appropriate</li> <li>• cultural requirements (e.g. pruning, plant supports)</li> <li>• weed control techniques and timings (both perennial and annual weeds).</li> </ul>	<p>Manage new plantings, to include:</p> <ul style="list-style-type: none"> <li>• monitoring of health status</li> <li>• replacement of failed plants</li> <li>• water management</li> <li>• provide nutrition if appropriate</li> <li>• cultural requirements (e.g. pruning, plant supports)</li> <li>• plan weed control techniques and timings (both perennial and annual weeds).</li> </ul>	<p>The impact of plant selection on the management of new plantings e.g. relating to nutrition and pruning.</p> <p>Best practice in post planting management.</p>	
Commentary			
<p>In AO1 learners develop an understanding of the critical success factors involved in the management of newly planted areas, and these factors are implemented in AO2.</p> <p>AO3 considers the impact of plant species on the management practices with specific reference to nutrition and pruning requirements. The justification of management techniques against horticultural best practice is also considered.</p>			

<b>Topic</b>	<b>3</b>
<b>Title:</b>	<b>Maintaining Planted Areas</b>

### Topic overview

The management and maintenance of planted areas is a key horticultural skill.

Learners start their journey through this topic area by considering the maintenance requirements of a small garden area before moving on to develop the concept of maintenance schedules.

This concept is built upon to develop the concept of gardens management plans, which inform garden-wide maintenance decisions.

The production of such plans requires the horticulturist to consult information sources to allow the incorporation of best practice into maintenance plans.

The evaluation of techniques is further investigated through garden trials to further inform and evaluate garden management plans.

Element 1		Maintenance of planted areas	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Principles to be applied when planning and prioritising the maintenance of planted areas to include:</p> <ul style="list-style-type: none"> <li>• maintenance standards</li> <li>• maintenance practices</li> <li>• ensuring the integrity of the original design concept</li> <li>• effectiveness of the planted area.</li> </ul>	<p>Identify maintenance operations for existing planted areas e.g. a rose garden or coppice, to include:</p> <ul style="list-style-type: none"> <li>• maintenance standards</li> <li>• maintenance practices</li> <li>• ensuring the integrity of the original design concept</li> <li>• effectiveness of the planted area.</li> </ul>	<p>The impact of garden maintenance techniques and scheduling on biodiversity.</p> <p>The scheduled maintenance of paths and other hard surfaces.</p>	
Commentary			
<p>Horticulturists, as part of their stewardship of gardens and designed landscapes, develop formal or informal management plans.</p> <p>In AO1 learners identify the principles to be considered when planning and prioritising the maintenance of planted areas.</p> <p>At AO2 these critical success factors are applied by learners assessing the maintenance requirements of different garden areas.</p> <p>AO3 then considers the impact of management techniques on biodiversity.</p>			

Element 2	Garden management plans / maintenance schedules		
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The role of garden management plans to inform maintenance and management decisions in gardens and designed landscapes.</p> <p>The role of maintenance schedules in the delivery of garden management plans.</p>	<p>Produce maintenance schedules for garden areas.</p>	<p>The impact of poor garden management on biodiversity, plant health and yield within productive growing settings.</p>	
Commentary			
<p>At AO1 learners build on the knowledge gained in identifying maintenance requirements (element 1) for a garden area through the development of garden management plans.</p> <p>At AO2 learners produce a maintenance schedule for specific garden areas.</p> <p>At AO3 learners consider the impacts of poor garden management on biodiversity, plant health or yield within a productive garden.</p> <p>Learners could develop garden maintenance schedules for their own gardens, or gardens that they are closely involved in managing.</p> <p>Garden management plans are strategic documents that set out the direction and approach that the garden will take. Maintenance schedules include, plant maintenance, pruning, weed control and the management of plant health.</p>			

Element 3		Evidence-based practice / best practice	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Sources of reliable information on plant maintenance techniques and their suitability for different situations and species.</p> <p>The importance of selecting and applying horticultural practices based on evidence and reliable information sources.</p> <p>Finding information on new horticultural practices and techniques e.g. technologies and the advantages of staying up to date on new innovations.</p>	<p>The advantages of evidence-based decisions and the determination of best practice in garden management planning.</p>	<p>Concept of best practice.</p> <p>The impacts on the management of gardens and designed landscapes of not applying evidence based best practice, e.g. plant health implications.</p>	
Commentary			
<p>In AO1 learners are asked, within a practical context, to identify the most efficient, effective and appropriate strategies to manage gardens and designed landscapes, from the use of emerging technologies, through to established techniques.</p> <p>The advantages of evidence-based decisions are considered at AO2, with the wider integration into all topic areas being added at AO3 where the impact of not developing this practice is considered.</p> <p>This element promotes reflective practice. It allows learners to develop frameworks of thinking that will help to ensure they stay abreast of new developments throughout their horticultural careers.</p>			

Element 4		Evaluation of techniques	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The value of trials to evaluate horticultural practices on site, e.g. the control of perennial weed, cultivation techniques.</p> <p>Procedures for running informal site-based trials.</p>	<p>Design and conduct site-based trials to evaluate the efficacy of horticultural practices.</p> <p>Interpret and apply findings of trials to the management of gardens.</p>	<p>Factors that might influence trial results e.g. pest infestations, plant species used.</p>	
Commentary			
<p>AO1 introduces the concept of informal trials being used to identify the techniques which are most appropriate within a given garden or designed landscape. The procedures for running informal site-based trials are introduced to learners.</p> <p>AO2 applies these principles with learners designing and conducting a site-based trial to evaluate the efficacy of a horticultural practice. The findings of the trial are applied to inform the development of the garden management.</p> <p>At AO3 the factors that might influence trials results are considered, for example pest infestations or the use of inappropriate plant species.</p>			



<b>Topic</b>	<b>4</b>
<b>Title:</b>	<b>Plant Health</b>

### Topic overview

As part of the management of gardens and designed landscapes, horticulturists are responsible for ensuring plant health, a role which has become increasingly important as a result of climate change and the spread of new pests and pathogens.

Plant health is managed through a range of techniques. These start with the implementation of biosecurity protocols to limit and control the spread of organisms that can be detrimental to plant health.

The wider environmental impacts on plant health must also be managed, which includes abiotic factors such as wind and frost.

Integrated Pest Management is the model used by horticulturists to inform the control of pests, diseases and pathogens. This model is integrated into the development of garden health plans, which inform the management of all plant health impacts within a garden or designed landscape, both biotic and abiotic.

Element 1		Biosecurity	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The development and role of biosecurity policies within horticulture.</p> <p>Techniques for identifying biosecurity weaknesses in horticultural settings e.g. application of best practice principles.</p> <p>Factors which affect biosecurity risk e.g. pests/pathogens present locally.</p>	<p>Identify areas of weakness within biosecurity policies.</p>	<p>Impact of sourcing policies, quarantine practices, cultivar / variety / species selection, cultivation practices and a changing climate on biosecurity.</p>	
Commentary			
<p>At AO1 the concept of biosecurity is introduced through learners considering the development and role of biosecurity policies. This knowledge is then further developed to consider potential biosecurity weaknesses within horticultural settings, along with the factors that can affect biosecurity risk, for example the presence or absence of fireblight on local hedges. An often overlooked area of biosecurity is plant theft from gardens, which is included within the definition of biosecurity.</p> <p>At AO2 learners identify areas of weakness within biosecurity policies, and AO3 considers the wider contexts of biosecurity as it relates to other topic areas.</p>			

Element 2	Biotic and abiotic impacts on plant health		
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Biotic factors that influence plant health, to include:</p> <ul style="list-style-type: none"> <li>vectors e.g. aphids or wood packaging materials</li> <li>diseases e.g. fungal / viral pathogens</li> <li>pests e.g. adult / larval forms</li> <li>the management of the plant e.g. pruning, husbandry.</li> </ul> <p>Abiotic factors that influence plant health, to include:</p> <ul style="list-style-type: none"> <li>climate (humidity, water, temperature, wind, frost)</li> <li>water storage</li> <li>pollution</li> <li>soil e.g. texture / drainage.</li> </ul> <p>The role of the FERA UK Plant Health Risk Register.</p> <p>The impact of current plant health legislation.</p>	<p>Protocols required to reduce the risk of pest, disease and pathogen infestations.</p> <p>The effect of abiotic factors e.g. temperature, humidity on pest and pathogen fecundity.</p>	<p>The importance of evidence-based decisions when managing pests and diseases.</p> <p>The impact of plant species and the horticultural setting on the management of pests, pathogens and diseases.</p> <p>The management of protected growing environments to promote plant health.</p>	
Commentary			
<p>AO1 identifies the wide range of biotic and abiotic factors that can negatively impact on plant health. The impact and importance of the FERA UK Plant Health Register is considered along with the impacts of current legislation.</p> <p>At AO2 the protocols required to reduce the risk of pest, disease and pathogen are introduced, along with the effect of abiotic factors on pest fecundity.</p> <p>AO3 integrates with other topics to consider the importance of fact-based decision making, the impacts of individual horticultural settings on plant health along with the management of protected growing environments to promote plant health.</p>			

Element 3		Integrated Pest Management	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The concept of Integrated Pest Management (IPM).</p> <p>The steps of an IPM programme, to include:</p> <ul style="list-style-type: none"> <li>• planning</li> <li>• scouting (identification and monitoring)</li> <li>• prevention</li> <li>• mitigation / control (economic threshold, cultural, physical, biological, chemical)</li> <li>• record keeping</li> <li>• communication.</li> </ul>	<p>Create and monitor an IPM programme, to include:</p> <ul style="list-style-type: none"> <li>• planning</li> <li>• scouting (identification and monitoring)</li> <li>• prevention</li> <li>• mitigation / control (economic threshold, cultural, physical, biological)</li> <li>• record keeping</li> <li>• communication.</li> </ul>	<p>The impact of horticultural settings on IPM implementation.</p> <p>IPM programmes for specific horticultural settings e.g. productive growing, management of garden areas.</p>	
Commentary			
<p>At AO1 the concept of Integrated Pest Management is considered to plan, monitor, prevent, mitigate, record and communicate plant health risks caused by pests and pathogens.</p> <p>At AO2 learners create and implement an IPM programme for a small garden area.</p> <p>At AO3 the wider impacts of horticultural settings are considered and IPM programmes are developed for specific settings, integrating this element with other topic areas.</p>			

Element 4		Planning garden health	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The theory of garden health plans, to include:</p> <ul style="list-style-type: none"> <li>• biotic factors, e.g. presence of disease within the geographic locality</li> <li>• abiotic factors, e.g. impact of soil types, frost pockets</li> <li>• IPM principles.</li> </ul>	<p>Create a garden health plan for a specific horticultural setting to include:</p> <ul style="list-style-type: none"> <li>• identification of all risks to plant health e.g. nutrition, pest</li> <li>• methods to limit or mitigate such risks e.g. wind breaks, use of micro climates.</li> </ul>	<p>The impacts of organic and sustainability principles on the management of garden areas.</p>	
Commentary			
<p>AO1 covers garden health plans as holistic tools to manage all the factors (biotic and abiotic) that can affect plant health. Learners create a garden health plan within AO2.</p> <p>At AO3 this involves the application of organic principles along with wider sustainability implications.</p> <p>Garden health plans are an emerging tool to manage plant health. The plans embrace the principles of risk assessment, and risk analysis. All plant health risks are included, along with measure to mitigate these risks, which are based around the principles of IPM.</p> <p>Qualification-wide outcomes are applied in the development of the plan to ensure Health and Safety, Best Practice and Sustainability.</p>			

<b>Topic</b>	<b>5</b>
<b>Title:</b>	<b>Productive Growing</b>

#### Topic overview

Productive growing within a garden setting involves the cultivation of vegetables, herbs and fruit crops for human consumption.

The production of edible crops requires a broad range of skills, including propagation, cultivation and harvesting.

Cultivation techniques include organic growing systems, container growing and the adoption of minimal cultivation, or no dig systems.

Element 1		Cultivation of vegetables	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The advantages and limitations of different growing systems, to include:</p> <ul style="list-style-type: none"> <li>certified organic production</li> <li>minimal cultivation</li> <li>bed systems</li> <li>open ground</li> </ul> <p>Factors when planning a cropping schedule for the production of vegetables, to include:</p> <ul style="list-style-type: none"> <li>space available</li> <li>crop rotations</li> <li>continuity of supply</li> <li>Gantt charts</li> <li>presence of perennial crops.</li> </ul> <p>Factors when harvesting crops, to include:</p> <ul style="list-style-type: none"> <li>the stage of development for harvest</li> <li>the removal of field heat</li> <li>the shelf life and / or storage of the crop.</li> </ul>	<p>Produce a range of vegetable crops, to include:</p> <ul style="list-style-type: none"> <li>soil amelioration</li> <li>growing system</li> <li>cultivar selection</li> <li>sowing</li> <li>planting</li> <li>weed control</li> <li>crop nutrition</li> <li>crop support</li> <li>water management</li> <li>harvest</li> <li>storage.</li> </ul>	<p>Benefits of protected structures such as cold frames and cloches.</p> <p>The importance of evidence-based decisions in productive growing.</p> <p>Apply principles of informal garden trials to productive growing.</p> <p>Planning and maintaining plant health in the cultivation of vegetables</p>	
Commentary			
<p>AO1 introduces learners to a range of horticultural considerations when planning the cultivation of vegetables.</p> <p>AO2 then applies these principles as learners cultivate a range of vegetables in a productive setting.</p> <p>AO3 integrates this element to other topics, applying the concept of evidence-based decision making, the benefits of protective structures, and the application of garden health plans to the cultivation of vegetables.</p>			

Element 2		Cultivation of top fruit	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The advantages and limitations of different growing systems, to include:</p> <ul style="list-style-type: none"> <li>• wall trained</li> <li>• open ground</li> <li>• containers.</li> </ul> <p>Factors when planning a cropping schedule for top fruit, to include:</p> <ul style="list-style-type: none"> <li>• selection of rootstock</li> <li>• pollination group</li> <li>• cultivar</li> <li>• site.</li> </ul> <p>Factors when harvesting fruit, to include:</p> <ul style="list-style-type: none"> <li>• ripeness testing</li> <li>• picking</li> <li>• storage.</li> </ul>	<p>Produce a range of top fruit, to include:</p> <ul style="list-style-type: none"> <li>• tree management e.g. pruning</li> <li>• weed control</li> <li>• crop nutrition</li> <li>• harvest.</li> </ul>	<p>Impact of site on the production of top fruit.</p> <p>The importance of evidence-based decisions in productive growing.</p> <p>Manage risks to crop health.</p> <p>Implement findings of recent horticultural research as it applies to the cultivation of top fruit.</p> <p>Planning and maintaining plant health in the cultivation of top fruit</p>	
Commentary			
<p>AO1 introduces learners to a range of horticultural considerations when planning the cultivation of top fruit, these include the growing system, the factors to consider when planning a fruit garden, (including pollination tables and current thinking on ploidy).</p> <p>AO2 applies these principles as learners manage a range of fruit trees.</p> <p>AO3 integrates this element to other topics, applying the concept of evidence-based decision making, the impact of sites, and the application of garden health plans to the cultivation of top fruit.</p>			



Element 3		Cultivation of soft fruit	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The advantages and limitations of different growing systems, to include:</p> <ul style="list-style-type: none"> <li>protected cropping</li> <li>containers</li> <li>open ground.</li> </ul> <p>Factors when planning a cropping schedule for soft fruit, to include:</p> <ul style="list-style-type: none"> <li>cultivar selection</li> <li>continuity of supply.</li> </ul> <p>Harvesting techniques.</p>	<p>Produce a range of soft fruit, to include:</p> <ul style="list-style-type: none"> <li>soil amelioration</li> <li>growing system</li> <li>cultivar selection</li> <li>planting</li> <li>weed control</li> <li>crop nutrition</li> <li>crop support</li> <li>water management</li> <li>protection from avian pests</li> <li>harvest.</li> </ul>	<p>Benefits of protected structures.</p> <p>The importance of evidence-based decisions in productive growing.</p> <p>Manage risks to crop health.</p> <p>Implement findings of recent horticultural research as it applies to soft fruit production.</p> <p>Planning and maintaining plant health in the cultivation of soft fruit</p>	
Commentary			
<p>AO1 introduces learners to a range of horticultural considerations to be reviewed when planning the cultivation of soft fruit.</p> <p>AO2 applies these principles as learners cultivate a range of soft fruit in a productive setting. The term containers includes tabletop systems for strawberry production.</p> <p>AO3 integrates this element to other topics, applying the concept of evidence-based decision making and the benefits of research findings on the cultivation of soft fruit.</p>			

Element 4		Cultivation of herbs	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The advantages and limitations of different growing systems, to include:</p> <ul style="list-style-type: none"> <li>protected cultivation</li> <li>containers</li> <li>open ground.</li> </ul> <p>Factors when planning a herb garden, to include:</p> <ul style="list-style-type: none"> <li>space available</li> <li>cultivar / variety / species selection</li> <li>containment</li> <li>use.</li> </ul>	<p>Cultivate a range of herbs, to include:</p> <ul style="list-style-type: none"> <li>cultivar selection</li> <li>sowing</li> <li>planting</li> <li>weed control</li> <li>crop nutrition</li> <li>harvest.</li> </ul>	<p>Benefits of protective growing structures for the propagation of young plants.</p> <p>The importance of evidence-based decisions in productive growing.</p> <p>Implement findings of recent horticultural research as it applies to the cultivation of herbs.</p>	
Commentary			
<p>AO1 introduces learners to a range of horticultural considerations when planning the cultivation of herbs. This area should make reference to the qualification-wide outcome of Health and Safety, as some herbs, e.g. <i>Ruta graveolens</i> are harmful to health.</p> <p>AO2 applies these principles as learners cultivate a range of herbs in a productive setting.</p> <p>AO3 integrates this element to other topics, applying the concept of evidence-based decision making, the benefits of protective structures, and the implications of recent horticultural research and development, as it can be applied to the cultivation of herbs.</p>			

<b>Topic</b>	<b>6</b>
<b>Title:</b>	<b>Protected Growing</b>

### Topic overview

This topic covers the principles involved in the design, selection and maintenance of protected structures. Protected growing involves the cultivation of plants in protected structures, which may include productive and ornamental spaces.

In order to produce successful crops or displays, it is important to understand the characteristics of the different structures associated with protected growing along with how growing environments influence health and productivity of plants.

The impacts that internal structures and equipment have on plant growth are considered along with the development of blueprints to produce crops and the principles involved in the management of small plant collections.

The wider impacts of protected growing on the environment are considered, as part of the qualification-wide focus on climate change and sustainability.

Element 1		Siting, design and maintenance of protected structures	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Range of protected structures used in horticulture, to include:</p> <ul style="list-style-type: none"> <li>• cold frames</li> <li>• polytunnels</li> <li>• conservatories</li> <li>• glasshouses.</li> </ul> <p>The orientation of the structure for maximum light.</p> <p>The proximity to services e.g. water, electricity.</p> <p>The maintenance requirements of different structures.</p>	<p>The advantages and limitations of materials used in protective structures e.g. wooden or aluminium structures, the use of glass or polycarbonate glazing.</p> <p>The benefits and limitations of polythene clad structures.</p> <p>Maintain a range of protective structures.</p>	<p>The impacts of siting, design and maintenance of protective structures is considered with reference to plant health and sustainability.</p>	
Commentary			
<p>At AO1 learners are introduced to a range of protected structures used within horticulture, along with the factors that can impact on their orientation and maintenance.</p> <p>At AO2 learners consider the merits of a wide range of materials used in the construction of protected structures. Learners maintain a range of structures, which should include pre-season cleaning of structures, for example greenhouses, tunnels, cloches and cold frames.</p> <p>AO3 considers the wider impacts of siting, design and maintenance, which are considered from a plant health perspective.</p>			

Element 2		Internal structures and equipment	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Design of internal structures, to include:</p> <ul style="list-style-type: none"> <li>• staging</li> <li>• irrigation system</li> <li>• paths</li> <li>• raised beds.</li> </ul> <p>Environmental control systems, to include types of:</p> <ul style="list-style-type: none"> <li>• heating</li> <li>• ventilation</li> <li>• shading</li> <li>• lighting.</li> </ul>	<p>The benefits and limitations of internal structures and equipment on the growing environment e.g. reduced air circulation with capillary matting, impacts of structures on light transmission.</p>	<p>The specific requirements of the crop to be produced.</p> <p>The impacts of poorly specified, designed and constructed structures and equipment on plant health and the management of the greenhouse environment.</p> <p>Sustainability impacts of protected growing.</p>	
Commentary			
<p>At AO1 the range of internal structures and environmental control systems are introduced.</p> <p>At AO2 learners consider these internal structures and environmental control systems by considering their benefits and limitations on the growing environment.</p> <p>At AO3 specific crop-based requirements are considered along with the impacts of growing in poorly specified, designed and constructed structures. For example, the impacts on cropping of poor light transmission or inadequate ventilation. The impacts of protected cultivation on the environment is considered with specific reference to energy utilisation, water and plastic.</p>			

Element 3		Production of crops	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>The principles of crop production within protected structures, to include:</p> <ul style="list-style-type: none"> <li>• growing media</li> <li>• container</li> <li>• cultivar selection</li> <li>• propagation</li> <li>• environmental requirements</li> <li>• crop support systems</li> <li>• crop husbandry.</li> </ul>	<p>Create a blueprint and produce a crop within a protected structure e.g. cut flowers, salad vegetables to include:</p> <ul style="list-style-type: none"> <li>• growing media</li> <li>• container</li> <li>• cultivar selection</li> <li>• propagation</li> <li>• environmental requirements</li> <li>• crop support systems</li> <li>• crop husbandry.</li> </ul> <p>The implication of the law of limiting factors on developing blueprints for crop production.</p>	<p>Application of research and development e.g. the use of LED supplementary lighting.</p>	
Commentary			
<p>At AO1 learners consider the fundamental principles involved in producing a crop within a protected structure.</p> <p>At AO2 these fundamental principles are applied to the creation of a blueprint to produce a crop. Learners produce a crop under protected structures, which can include traditional crops such as sweet peppers or tomatoes under glass, or the production of crops in cold frames or under cloches. The implications of the law of limiting factors is considered when producing cropping blueprints to consider the interplay between irrigation, nutrition, light and temperature.</p> <p>At AO3 the application of research and development is considered, for example the implementation of research into the use of LED supplementary lighting.</p>			

Element 4		Management of plant collections	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Principles of managing a plant collection, to include:</p> <ul style="list-style-type: none"> <li>• irrigation</li> <li>• nutrition</li> <li>• temperature</li> <li>• light</li> <li>• relative humidity</li> <li>• labelling / recording</li> <li>• husbandry.</li> </ul>	<p>Manage a plant collection, to include:</p> <ul style="list-style-type: none"> <li>• irrigation</li> <li>• nutrition</li> <li>• temperature</li> <li>• light</li> <li>• relative humidity</li> <li>• labelling / recording</li> <li>• crop husbandry.</li> </ul>	<p>Impact of plant collections on glasshouse management</p> <p>The importance of evidence-based decisions in managing small plant collections.</p> <p>The impacts of plant collections on sustainability.</p>	
Commentary			
<p>As many glasshouses are used to hold permanent plant collections, AO1 identifies the key criteria in the management of plant collections.</p> <p>AO2 then provides learners with the opportunity to apply this knowledge to manage a plant collection.</p> <p>AO3 integrates this element with other topic areas considering the impact of plant collections on the management of protected cropping environments.</p>			

<b>Topic</b>	<b>7</b>
<b>Title:</b>	<b>Ecological and sustainable plantings</b>

### Topic overview

Ecological and sustainable plantings are growing in popularity. These plantings challenge many of the previously held rules of gardening. Those advocating this approach consider the plants selected to be part of functioning, self-supporting communities and ecosystems.

These plantings are characterised by low inputs, including no or minimal irrigation and zero fertiliser inputs. Other interventions such as staking and maintenance are kept to a minimum.

Ecological plantings are characterised by dense interplantings, the tolerance of spontaneous plants and the simplicity of design. Plant selection includes a heavy reliance on seed grown plants for genetic diversity along with the introduction of plants with ecological benefits. One concept behind such plantings is that some native plants may no longer be seen as robust and resilient as the impacts of a changing climate require the introduction of plants of wider provenance or new species.

As well as providing ecological benefits, such plantings can facilitate specific environmental services such as integrating with sustainable drainage systems (SuDS), the creation of wildlife corridors, and the demonstration of how ecological principles can be applied to the benefit of people and communities.



Element 1	Purpose of ecological and sustainable plantings	
AO1: Knowledge	AO2: Application	AO3: Integration
<p>Characteristics of ecological and sustainable plantings to include:</p> <ul style="list-style-type: none"> <li>• aesthetics</li> <li>• ecologically functioning e.g. seeding, spreading</li> <li>• dense multi-layered plantings</li> <li>• species in dynamic competition</li> <li>• limited maintenance / interventions.</li> </ul>	<p>The benefits of ecological and sustainable plantings to include:</p> <ul style="list-style-type: none"> <li>• ecological services e.g. supporting a wide range of invertebrates, wildlife corridors</li> <li>• component of sustainable drainage systems e.g. plantings within swales and rain gardens</li> <li>• reduced maintenance</li> <li>• resilience to climate change</li> </ul>	<p>Impacts of ecological plantings on traditional horticultural techniques including creating and maintaining planted areas.</p> <p>Bringing people and nature together.</p>
Commentary		
<p>At AO1 learners develop an understanding of the key characteristics of ecological and sustainable plantings. These plantings are characterised by high aesthetic value and are ecologically functioning plant communities with species often self-seeding and spreading. The planting is dense and multi-layered, offering the widest range of invertebrate habitats. A further characteristic is low maintenance requirement once established.</p> <p>At AO2 learners apply this knowledge to consider the wider benefits of ecological and sustainable plantings. This includes the range of ecological services they provide, their potential role as wildlife corridors and their compatibility with sustainable drainage systems.</p> <p>AO3 considers the wider impacts that ecological and sustainable plantings have on traditional horticultural techniques involved in creating and maintaining planted areas.</p>		

Element 2		Species selection	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Criteria for species selection within ecological and sustainable plantings, to include:</p> <ul style="list-style-type: none"> <li>• aesthetics e.g. colour, form</li> <li>• ecological services e.g. habitat, food source</li> <li>• management e.g. nurse plants, reproductive capacity by seed.</li> </ul>	<p>Use current published work to inform species selection for use within ecological and sustainable plantings.</p>	<p>Impacts of the site on species selection.</p> <p>Application of plant knowledge to specify species for inclusion in ecological and sustainable plantings.</p>	
Commentary			
<p>At AO1 the criteria for the selection of species for use within ecological and sustainable plantings are established. The selection of species is based on criteria including aesthetics, the range of ecological services the species offers, along with its management characteristics, for example a species role as a nurse species, or its capacity to reproduce by seed.</p> <p>At AO2 the criteria established within AO1 are used to enable learners to refer to recent publications to specify plant species that could be used within ecological and sustainable plantings.</p> <p>At AO3 the impacts of the site on species selection is considered along with the application of plant knowledge, thus integrating this element into other topic areas.</p>			

Element 3		Establishment of ecological and sustainable plantings	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Principles involved in the establishment of ecological and sustainable plantings, to include:</p> <ul style="list-style-type: none"> <li>• site surveys</li> <li>• soil amelioration</li> <li>• techniques to establish plantings e.g. sowing, plants for planting</li> <li>• planting density</li> <li>• ratios of different growing habits</li> <li>• perennial matrix style approaches.</li> </ul>	<p>Establish an ecological and sustainable planting to a given client brief.</p>	<p>Impacts of ecological plantings on traditional horticultural techniques including creating and maintaining planted areas.</p>	
Commentary			
<p>At AO1 the principles of establishing ecological and sustainable plantings are introduced along with different models of thinking.</p> <p>At AO2 these principles are applied with learners establishing a planting.</p> <p>AO3 considers the impact that ecological plantings have on traditional plant establishment.</p>			

Element 4		Maintenance of ecological and sustainable plantings	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Criteria for the maintenance of ecological and sustainable plantings, to include:</p> <ul style="list-style-type: none"> <li>• monitoring</li> <li>• species specific maintenance</li> <li>• points of intervention</li> <li>• annual maintenance e.g. cutting back / mowing.</li> </ul>	<p>Create a set of principles to inform the management of an ecological planting.</p> <p>Create a maintenance schedule for an ecological / sustainable planting.</p>	<p>The impacts of ecological and sustainable plantings on garden management plans.</p>	
Commentary			
<p>At AO1 learners consider the maintenance requirements of ecological and sustainable plantings. This includes the role of monitoring, species specific maintenance requirements, the points of intervention (in what is a dynamic ecological plant community), and the annual maintenance that may be required.</p> <p>At AO2 this knowledge is applied to create a set of overriding principles for maintenance, including points of intervention and the management of spontaneous plants. Learners will develop maintenance schedules.</p> <p>AO3 considers the impacts of ecological and sustainable plantings on traditional Garden Management Plans.</p>			

<b>Topic</b>	<b>8</b>
<b>Title:</b>	<b>Landscaping Materials</b>

### Topic overview

As part of their management of gardens and designed landscapes, horticulturists manage and plan the maintenance of hard landscaping elements such as paths, terraces, non-porous and porous paved areas along with gravel and other hard surfaces.

The management of hard surfaces includes the inspection and reporting on condition, including weed control, presence of litter and broad aesthetics.

Inspections inform the maintenance and management of hard surfaces, which is often determined by wider garden management plans.

Horticulturists are often involved in planning the refurbishment of surfaces and features or the installation of new ones. These plans include the implementation of sustainable urban drainage protocols (SuDS) the specification of materials and the calculation of quantity and cost.

Element 1	Inspection of existing hard landscaping features		
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Criteria for the evaluation of hard landscape features, to include:</p> <ul style="list-style-type: none"> <li>• inspection intervals</li> <li>• presence of defects</li> <li>• presence of weed</li> <li>• presence of litter</li> <li>• presence of algae / organic debris.</li> </ul>	<p>Inspect existing hard landscape features, to include:</p> <ul style="list-style-type: none"> <li>• identifying condition</li> <li>• health and safety considerations</li> <li>• end of life removal / replacement.</li> </ul>	<p>The role of inspection within the management of other garden areas e.g. productive growing, protected structures and the maintenance of planted areas.</p>	
Commentary			
<p>Hard landscape features require regular inspection to ensure they remain safe and visually appealing. This is introduced at AO1 with the key criteria for such assessments being established.</p> <p>At AO2 those criteria are used to inspect the condition of hard landscape features, and AO3 considers the role of inspection within the management of other garden areas.</p>			

Element 2		Maintenance plans and schedules for landscape materials and features	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Importance of key components of maintenance schedule for landscape materials and features.</p> <p>Surfaces and features, to include:</p> <ul style="list-style-type: none"> <li>• paved areas</li> <li>• gravel areas</li> <li>• drainage systems</li> <li>• porous paving</li> <li>• non-porous paving.</li> </ul> <p>Maintenance, to include:</p> <ul style="list-style-type: none"> <li>• snow and ice</li> <li>• cleaning techniques</li> <li>• weed removal techniques</li> <li>• impacts of chemicals used (phytotoxicity).</li> </ul>	<p>Advantages and limitations of maintenance processes, to include:</p> <ul style="list-style-type: none"> <li>• snow and ice</li> <li>• cleaning techniques</li> <li>• weed removal techniques</li> <li>• impacts of chemicals used (phytotoxicity).</li> </ul> <p>Ecological impact of maintenance processes.</p> <p>Create a maintenance schedule for hard landscaped areas, to include:</p> <ul style="list-style-type: none"> <li>• surfaces and features</li> <li>• inspection process</li> <li>• maintenance techniques.</li> </ul>	<p>The impact on biodiversity of maintenance products / maintenance processes.</p> <p>Impact of hard landscape maintenance on garden management plans.</p>	
Commentary			
<p>Hard landscape features require maintenance to ensure they remain safe and visually appealing. This concept is introduced at AO1 with the key criteria for such assessments being established.</p> <p>At AO2 learners consider the advantages and the limitations of a range of maintenance processes. The criteria considered in AO1 are applied to create a maintenance schedule for hard landscape features.</p> <p>At AO3 the impacts that products used within AO2 can have on biodiversity are considered along with the impacts that hard landscape maintenance schedules have on overall garden management plans.</p>			

Element 3		Planning a new hard landscaping feature	
AO1: Knowledge	AO2: Application	AO3: Integration	
<p>Factors when planning a new hard landscape feature, to include:</p> <ul style="list-style-type: none"> <li>• accessibility</li> <li>• function</li> <li>• site limitations</li> <li>• levels</li> <li>• materials</li> <li>• aesthetics</li> <li>• maintenance</li> <li>• complexity of construction</li> <li>• cost</li> <li>• carbon footprint</li> <li>• environmental impact.</li> </ul>	<p>Plan the installation of a new hard landscaping feature to include consideration of:</p> <ul style="list-style-type: none"> <li>• accessibility</li> <li>• function</li> <li>• site limitations</li> <li>• levels</li> <li>• materials</li> <li>• aesthetics</li> <li>• maintenance</li> <li>• complexity of construction</li> <li>• cost</li> <li>• carbon footprint</li> <li>• environmental impact.</li> </ul>	<p>Assess the impact of a new hard landscape feature on other garden areas.</p>	
Commentary			
<p>Horticulturists are often called upon to plan the installation of hard landscape features, even if they are not involved in the construction. At AO1 the decision-making process for selecting a new hard landscaping feature is considered.</p> <p>At AO2 the installation of a new feature is planned.</p> <p>AO3 considers the impact of new hard landscaping features on the wider garden, for example aesthetics, surface run-off of water and design implications.</p>			



Element 4		Selection and calculation of materials	
AO1: Knowledge	AO2: Application	AO3: Integration	
Materials required for the installation of a hard landscape feature e.g. a path, fence or raised bed.	Calculate quantities of materials, to include: <ul style="list-style-type: none"> <li>• minimum deliveries</li> <li>• wastage</li> <li>• all fixings.</li> </ul> Calculate costs.	Impacts of sustainable sourcing on materials selection and cost.  Concept of cost benefit analysis.	
Commentary			
<p>Horticulturists have to be able to calculate the cost of new hard landscape features, to identify sustainable materials, also to ensure health and safety and deliver good value for money.</p> <p>At AO1 the full range of materials required to construct a feature are considered.</p> <p>At AO2 as a part of their calculation of cost, learners will be expected to use manufacturer / supplier websites and literature as a basis for calculations. Learners are expected to take into account the impact of minimum order quantities, wastage etc to provide accurate and realistic costings.</p> <p>At AO3 the impacts of sustainable sourcing on cost are identified, with the learner being introduced to the concepts of cost benefit analysis.</p>			