RHS Qualifications
Examiner Comments

Examination:	RHS Level 2
Unit:	Unit 1
Examination date:	February 2025

General Introductory Comments

Examiners' comments are produced by RHS Qualifications following each examination series. They are intended to help students to prepare for RHS examinations by having a better understanding of the requirements of the paper. These comments are also intended to help tutors to understand the challenges that candidates may have in developing their responses to the questions.

There have now been multiple papers for the Level 2 examinations and all stakeholders are now familiar with the format, structure and demand of the papers.

The RHS Level 2 examination papers are designed to assess the contents of the Qualification Specification according to Ofqual's level descriptors.

At Level 2 these state that candidates should:

- possess a knowledge and understanding of facts, procedures and ideas within the field of horticulture
- be able to complete well defined tasks and address straightforward problems
- be aware of a range of information that is relevant to horticulture and demonstrate an ability to interpret and use relevant information and ideas to inform actions
- be able to apply knowledge, both to unfamiliar situations and by exploring links within and across Topics and Elements.

Overview of Examination

Levels of demand

Questions were set at three levels of demand within this paper.

Questions that require a recall of basic factual knowledge are classified as being **low demand**.

Questions that require the recall of more technical concepts or the application of knowledge are classified as **medium demand**.

Questions that require the recall of advanced technical concepts; and which require the application of knowledge, both to unfamiliar situations and by exploring links within and across Topics and Elements are classified as **high demand**.

General comments

Many candidates failed to get the marks that reflected their horticultural knowledge due to poor examination technique, for example through missing or ignoring key demands within questions. These responses often contained advanced horticultural knowledge and concepts, which were however, outside the scope of the question, and so marks could not be awarded.

To further support candidates this report discusses and identifies good examination technique, to help future candidates to secure marks that more accurately reflect their horticultural capabilities.

Candidates scoring high marks on this paper:	Candidates scoring lower marks on this paper:
▪ demonstrated that they had prepared well for the paper and were able to write with confidence to meet the theme and demand of the question ▪ used appropriate and correct technical language ▪ demonstrated sound knowledge of horticultural principles and practices ▪ gave the appropriate number of responses as required in the question ▪ provided responses that contained significant detail, which was relevant to the theme and demand of the question ▪ brought their own knowledge and understanding to the paper ▪ produced sustained lines of reasoning.	▪ found it difficult to apply what they had learnt to the theme and demand of the question ▪ produced responses that were undeveloped, lacked depth, or which did not respond to the command word* within the question ▪ produced responses that simply repeated information contained in the stem of the question ▪ demonstrated a lack of underpinning scientific knowledge or understanding ▪ were unable to explain or define terms ▪ stated common, or incorrect names, when providing plant examples ▪ provided an inappropriate number of responses.

*RHS Qualifications shared the list of approved command words for Level 2 examinations in the Qualification Guidance Document. This list is shown in the table below to help candidates to prepare for future examinations.

Command word	Definition
Annotate	Learners should be able to apply labels and supporting information on diagrams
Assess	Learners are required to give a statement relating to the overall quality of the issue being considered. This could include an argument about an issue (for and against). The statement should provide evidence, with appropriate use of examples, and express an opinion about the merits of each side considered
Calculate	Learners should be able to carry out basic calculations, or estimate quantities of materials
Choose	Learners should be able to select from a range of alternatives
Compare	Provide a response that identifies similarities between things
Compare and contrast	Provide a response that both identifies similarities and identifies and evaluates differences between things
Complete	Learners should be able to provide short responses, or complete statements and tables
Deduce	Come to a decision based on information provided in the question
Define	Learners should be able to state formal definitions
Describe	Learners should be able to recall facts or applied processes in an accurate way
Discuss	Identify key points, explore all aspects, provide a conclusion
Evaluate	Learners should be able to use information supplied, as well as their own knowledge and understanding, to consider evidence for and against when making basic decisions
Estimate	Roughly calculate or judge the value, number, quantity, or extent of
Explain	Learners should be able to make clear, short, reasoned statement to explain a process or similar factor
Explain how and why	Learners should be able to make clear, short, reasoned statement to explain a process or similar factor The 'how' asks about the procedure or process The 'why' asks about the purpose of something
Give (a reason)	Learners should be able to clearly state reasons (facts) as directed
Identify	Name or characterise, for example the identification of type of plant tissue, or floral part of a plant
Justify	Learners should be able to provide evidence to support an answer
Label	Apply information to diagrams
List	Learners provide single word, or short phrase answers

Command word	Definition
Name	Learners should be able to provide a single word or short phrase answer
Outline	Learners should be able to provide short descriptions, for example the stages that make up a task
Predict	State what you think will happen, based on a given scenario and your own knowledge
Show that	Prove the statement in the question is correct
State	Learners should be able to provide brief descriptive points
State and explain	Make a point, and then explain or justify key aspects
Suggest	Learners should be able to apply their knowledge and understanding to make recommendations for actions
Use	Learners should be able to use information provided within the question, sometimes in conjunction with their own knowledge, to carry out a task
Write	Learners should be able to provide a short answer as directed

Guide to terminology used within questions:

Term	Explanation
Horticultural situation	Candidates may be required to state a horticultural situation, for example the planting of whips, the pruning of fruit trees*. This allows the candidate to focus their response to the situation and allows the examiner to calibrate their thinking.
Horticultural setting	Candidates may be required to state a horticultural setting, this would include garden areas, for example a productive garden, or an herbaceous border. This allows the candidate to focus their response to the setting and allows the examiner to calibrate their thinking.
Growing system	Candidates may be required to state different growing systems to add context to their responses. Growing systems can be traditional, raised beds, container growing, organic, biodynamic as appropriate.

*This example relates to edible landscapes.

Qualification Specification and Guidance Document

The Qualification Specification outlines the curriculum that candidates will be examined on. The Guidance Document (which is freely available from RHS Qualifications and can be downloaded from Quartz) was developed to provide centres with additional guidance with regards to the interpretation of the Assessment Outcomes in terms of breadth and depth that is appropriate to a Level 2 qualification.

It should be noted that the Guidance Document is not intended to be a comprehensive guide to teaching and learning. Instead, it is designed to provide examples of some of the key areas contained within an Assessment Outcome.

Where an Assessment Outcome in the Qualification Specification formally lists 5 areas that should be included, the Guidance Document may only unpack one of these areas as an example. The candidate/centre is then expected to apply the same level of breadth and depth provided in the exemplar to the other areas defined in the Assessment Outcome.

Section A

Questions 1 – 20

General comments on Section A

Forced answer questions are designed to test candidate's knowledge and understanding of the concepts covered in the 4 Topics and the 4 Qualification-wide outcomes that make up this unit.

Many candidates were able to score high marks in Section A, indicating a sound grasp of horticultural knowledge, and the application of good examination technique.

Some centres have asked for the correct answers for Section A questions to be made available. As all Section A questions are part of a bank of questions, which may be used in future examination series it is not appropriate to publish the correct answers.

Candidates and centres are reminded of good examination technique with regards to forced answer questions. Candidates should:

- Carefully read the question
- Underline any key or important words in the stem of the question
- Score through inappropriate answers
- Select the correct answer to be recorded on the response grid.

Please note that due to a printing error in the examination paper, one of the questions relating to plant naming conventions (Question 13) and one further question on plant life cycles (Question 15) had two possible correct answers. In both cases the two possible answers were credited with marks.

Section B

Each question is considered separately.

Question 1

Part a) of this question required candidates to demonstrate their Plant Science knowledge, by stating one difference in flower structure between the flowers of a eudicotyledon and a monocotyledon. The majority of candidates correctly answered this question by stating that the floral parts in monocotyledonous plants are in 3s or multiples of three, while eudicotyledonous plants have floral parts in 4s or 5s or multiples of 4 or 5.

In part b) of this question candidates were required to further demonstrate their knowledge of Plant Science by stating one difference in leaf structure between the leaves of a gymnosperm and those of a monocotyledon. The majority of candidates answered this question correctly by suggesting that gymnosperms often have needles, or scale like leaves, and that monocotyledonous leaves are often lanceolate, or possess parallel venation.

Some candidates confused the word gymnosperm with eudicotyledon and so gave only partially correct answers. Other candidates continued to relate their responses to flowers rather than leaves. These errors reinforce the importance of candidates carefully reading the key requirements of the question.

In part c) of the question candidates were required to provide a named example of a plant that is a gymnosperm. Correct answers included *Ginkgo biloba*, or *Pinus sylvestris.*

In part d) there was a printing error in the question, and so all candidates were credited with 1 mark for this part of the question to ensure that no candidate was disadvantaged.

Question 2

Part a) of this question required candidates to define the term exposure in the context of site assessments and the planting of a new garden.

Stronger candidate responses stated that exposure is the result of an abiotic element, with the second developed mark being awarded for suggesting the nature of this abiotic element, for example, wind. Other strong responses included the lack of shelter, from, for example wind, or strong sunlight.

Weaker candidate responses used the wording from the stem of the question, for example stating that the term exposure means to be exposed. Other weaker candidate responses were vague, for example stating weather rather than wind, sunlight etc.

In part b) of the question candidates were required to discuss the potential impact of exposure on plants.

Stronger candidate responses included direct impacts, for example higher wind speeds resulting in physical damage to leaves, or wind scorch to the leaves.

Weaker candidate responses were often vague or lacking in the required level of detail, for example stating that wind can impact on the transpiration of plants, without stating what the impact would be, and so not answering the question.

In part c) of the question candidates were required to state two characteristics which would enable plants to grow in exposed conditions.

Stronger candidate responses often included plants with narrow or reduced leaves. Other candidates stated leaves with a reduced surface area or related their answer to growth characteristics such as cushioned or low growth.

Weaker candidate responses included aspects that were outside of the scope of the question, or which were not related to the area, for example, that native plants should be grown on the site without stating the characteristic that these plants might possess, that plants should be selected that are sun loving or capable of withstanding strong winds, without stating the characteristic that allows this. Other candidates simply stated the importance of right plant right place.

Helpful hint

RHS Qualifications has noted that some candidates struggle to correctly apply the term characteristic to their responses.

A *characteristic* is a feature or quality that helps identify something or enables it to survive or function in a certain way. In this question, it refers to specific **adaptations** or **traits** that help plants survive in harsh, exposed environments (such as having a thick waxy leaf cuticle).

Question 3

This question required candidates to explain how three distinct, named environmental factors affect the rate of transpiration in plants.

Please note that the word distinct in this question is included to guide candidate responses to ensure a broader range of environmental factors are considered, making higher and lower winds inappropriate, while wind speed, temperature and light levels would be appropriate as they cover a wider range of environmental factors.

The rubric at the start of the examination contains instructions relating to the use of the word distinct (see point vi) below)

Please note:

i)	The duration of this paper is **120** minutes.
ii)	Write all answers legibly in the spaces provided and use black or blue ink only.
iii)	Use **METRIC** measurements only.
iv)	Where plant names are required, they should include genus, species and where appropriate, cultivar.
v)	Where a question requires a specific number of answers, only the first answers given will be marked regardless of the number of answers offered.
vi)	Please note, when the word **'distinct'** is used within a question, it means that the items have different characteristics or features.

Stronger candidate responses clearly stated the environmental response for one mark with the explanation as to how they affect the rate of transpiration being awarded for the second mark. For example, high temperatures accelerating the process of transpiration, high winds impact on stomatal closure, which reduce the rate of transpiration, and high levels of humidity also reducing the rate of transpiration.

Weaker candidates sometimes correctly stated the three environmental factors but were unable to correctly explain this impact on transpiration.

Part b) of this question required the candidate to explain how leaf hairs conserve water. This part of the question was well answered.

Stronger candidate responses included the concept that the leaf hairs, or trichomes reduce the flow of air around the leaf, and so reduce transpiration, and conserve water, other responses included that the trichomes can reflect light, cooling the leaf, helping to reduce transpiration and so conserve water.

Weaker candidates provided vague or incorrect responses, for example stating that leaf hairs store water, or that leaf hairs hold onto water as it exits the stomata through evaporation.

Question 4

This question required candidates to demonstrate their knowledge and understanding of Garden Health Plans. Part a) of the question required candidates to list two distinct cultural control practices that are used within professional horticulture.

In assessing this question RHS Qualifications took a broad definition of cultural control practices, as differing texts apply slightly different interpretations to the term. Physical control measures for example were fully credited.

Stronger candidate responses included, regular inspection of plants for the presence of pest or symptoms of plant disease. The removal of dead leaves, the use of resistant cultivars, crop rotation, quarantine of new plant arrivals, and companion planting.

Weaker candidate responses included the use of Integrated Pest Management which was not accepted as this is a tool that includes cultural, but also chemical and biological control; the use of right plant, right place, which, while being good horticultural practice is not a method of cultural control. Some candidates incorrectly suggested growing a diversity of trees and shrubs to provide shelter for beneficial insects and nesting spaces for birds. This was considered to be incorrect as as these are methods of biological rather than cultural control.

The second part of the question offered candidates the opportunity to explain how each of the practices that were listed in a) promote plant health. 2 marks were available with the first mark being available for the basic information on how the practice promotes plant health, with the second mark being available for developed points. As an example, quarantine of plants promotes plant health by ensuring unintended pests or pathogens are not present on new plants. Effective quarantine will also prevent any pest, or pathogens present from spreading onto other plants in the garden.

Weaker candidate responses were often vague, unrelated to the question or incorrect.

Question 5

This question required candidates to state three characteristics of horticultural grit. Stronger candidate responses included that grit is inert, has a high bulk density, and is free draining.

Weaker candidate responses included stating that grit is light, holds nutrients and retains moisture. Other weaker candidates repeated their responses to meet the requirement of stating three characteristics. Other weaker responses included grit being lumps of rock, being cheap to buy and easy to obtain.

Helpful hint

We defined the meaning of the word characteristic in our report on Question 2.

In this context, the word ***characteristic*** means a **quality, feature, or property** that helps to **identify or describe** something. So, when you're asked to **state three characteristics of horticultural grit**, you're being asked to describe three features that define what horticultural grit is like, or what it does.

In this context, being free draining, inorganic, stable, and having angular particles would all be correct. However, being cheap to buy, and easy to obtain do not describe what horticultural grit is like or what it does and so are incorrect.

In part b), most candidates correctly stated that horticultural grit improves drainage and air-filled porosity, earning one mark for each. Some gave more detailed answers, noting that grit increases weight and thus container stability, which gained an extra developed point mark.

Some weaker candidate responses suggested that grit is added to growing media as it holds water itself, or because it increases water holding capacity. Other incorrect responses related to the use of grit in soil, rather than in growing media.

Question 6

This question required candidates to state (provide brief descriptive points) five techniques that can be used to ameliorate soil.

Strong candidate responses stated:

- adding organic matter to the soil
- using green manures
- forking the soil
- breaking up surface capping
- adding lime
- applying no dig (minimal cultivation) principles
- apply crop rotation principles
- incorporation of biochar
- single digging
- ploughing
- addition of organic fertilisers.

Weaker candidate responses stated:

- adding mulch (without stating that it should be an organic mulch)
- repeating points
- adding grit
- improve drainage by adding a French drain
- adding vermiculite
- adding perlite
- promoting soil biology
- testing soil pH
- use a rotovator
- use a hoe.

Question 7

Part a) of this question required the candidate to name three pests or pathogens that plants have been bred to be resistant to. This question was answered well by many candidates who demonstrated a knowledge that plants had been bred to be resistant to a number of pests and/or pathogens including slugs, botrytis, rust, and clubroot.

Weaker candidate responses included parasitic wasps, ladybirds which were incorrect, with other candidates giving vague responses, for example rose leaf fungus, without naming the actual fungus.

In part b) of this question candidates were required to state one plant that has proven resistance to each of the pests and or pathogens named in a).

Candidates who were able to state a specific plant, using its scientific name and including the cultivar where this was necessary scored full marks for this part of the question. Candidates who stated a common name for a plant, for example Hollyhock, were not awarded marks as not all Hollyhocks have been bred for resistance to the named pest and pathogen.

Question 8

This question required candidates to describe four ways that the industry is preparing for peat-free to become a legislated requirement. This question was poorly answered by the majority of candidates.

Most candidates shared information about peat alternatives, rather than meeting the requirements of the question.

Stronger candidate responses included:

- Trials for new growing media are being conducted by many organisations, with the results being shared to allow organisations to learn from each other
- The industry has been moving from selling peat based growing media to reduced peat and then to peat free as a phased introduction to aid the transition
- The industry is employing more people in sustainability roles to help in the development of peat free growing media that is in itself not damaging to the environment
- Consumers are being encouraged to produce their own compost to be used in refreshing used growing media
- Developing the concept of legacy peat so that larger plants that were started in a peat plug several years ago, but have been potted on into peat free growing media can still be sold.

Weaker candidate responses included:

- Stating that peat was going to be removed from sale which is within the stem of the question
- Preparation for peat free is enforcing greater controls and legislation on where the plants are grown and re-potted
- To buy locally as an initiative to encourage organic matter and composts to be selected within the area rather than travelling/importing from peat farms
- Growers and gardeners are avoiding products and calling for an end to products that have legacy peat in them
- Working with environmentalists and companies who mine for peat to find alternatives.

Section C

Section C candidate responses are graded against the assessment ladder, which is on the next page of this report. Candidates and centres are advised to review the ladder as this indicates how the assessment decisions are made, when grading long form responses.

To further inform candidates and centres in the assessment process this report includes examples of candidate responses, with a narrative that explains the assessment decisions that were made.

Candidate performance in Section C ranges from those candidates who:

- carefully read and responded to the key requirements of the question
- provided concise, logical responses that answered the question
- provided detailed responses that demonstrated an advanced level of current understanding
- were able to relate relevant information from different topic areas to provide holistic responses
- produced responses that fully met the requirement of the question, avoiding the inclusion of irrelevant information, or the omission of key information.

Weaker candidate responses:

- produced very short answers which did not provide the required level of depth and breadth
- picked up on certain words in the question, and wrote all they knew about these words, rather than answering the question
- provided responses which were either basic or lacking in technical content.

In addition to the assessment ladder, candidate responses are also reviewed against the criteria set out below:

Indicative content

- Strength of response
- Integration
- Horticultural knowledge.

Strength of response:

Strong candidate responses:

- developed a logical argument to answer the question
- drew on reliable information sources
- were relevant to the question
- expressed clarity of thought
- demonstrated knowledge of horticultural practices.

Integration:

Candidate responses should integrate with other relevant areas of the syllabus.

Assessment ladder (for information)

Band	Mark range	Summary	Description
4	12 - 15	Fully developed (Total)	**A highly detailed, comprehensive, fully relevant response, addressing all aspects of the question** ☐ No irrelevant or incorrect material or observations at the top end of the mark range: otherwise only very minor errors/omissions (which do not detract from an otherwise strong response) ☐ Full integration/clear links demonstrated with other appropriate topics as required: a holistic approach ☐ Advanced current professional horticultural knowledge/principles demonstrated (and evidence of advanced material beyond the specification at the top end of mark range) ☐ Consistent use of correct and appropriate technical language.
3	9 -11	Mainly developed (Solid)	**A reasonably detailed and fairly comprehensive response, with mostly relevant observations, addressing most of the key elements of the question** ☐ Some minor evidence of irrelevant or incorrect material or observations (in what is otherwise a good response), with occasional lack of detail/omissions at times ☐ Secure evidence of some appropriate integration with other topics but some linked topic areas are occasionally overlooked or incorrect associations are made: a partially holistic approach ☐ Current professional horticultural knowledge/principles demonstrated most of the time, with occasional errors, but largely appropriate explanations and application ☐ Correct and appropriate technical language demonstrated most of the time, with some minor errors.
2	6 - 8	Rudimentary (Basic)	**A largely basic response with some relevant observations, addressing some key elements of the question** ☐ Some significant evidence of irrelevant or incorrect material and frequent lack of detail, with some key areas overlooked ☐ Occasional evidence of correct integration with other topics, but many areas are overlooked and incorrect associations made: little evidence of a holistic approach ☐ Current professional horticultural knowledge/principles demonstrated some of the time, but with frequent errors, and only basic explanations or application ☐ Correct and appropriate technical language only partially demonstrated but limited. Some key errors.
1	0 - 5	Undeveloped (Unsatisfactory)	**A largely poor response with few relevant observations, addressing few of the key elements of the question** ☐ Material is largely irrelevant or incorrect and lacking in any detail, with many key areas overlooked ☐ No, or very little evidence of correct integration with other topics, with many areas overlooked and incorrect associations made: no evidence of a holistic approach ☐ No or little evidence of current professional horticultural knowledge/principles demonstrated, with poor or incorrect explanations or application ☐ Little (if any) technical language demonstrated. Often incorrect. Key errors.

Question 1

This question required candidates to describe the potential environmental impacts of bare root, pot grown and root balled tree and shrub production. Candidates were further required to suggest ways in which the nursery could reduce its negative impact on environmental sustainability and increase net-positive benefits to the wider environment.

Some centres have contacted RHS Qualifications to ask for clarification as to how section C answers are marked, along with examples of strong candidate responses. An example of a strong candidate response (based on several responses to maintain anonymity) is shown below:

Pot grown plants

Pot grown plants have significant environmental impacts compared to the other two methods. They require a growing media, depending on the composition of the growing media, this can have various environmental impacts. Peat, sometimes used in growing media, has dire effects on the environment, as it releases carbon to the environment in extraction and transport. It also decomposes as growing media releasing carbon. Looking at Coir, this has to be imported from more tropical regions, so has a high carbon footprint. However, Coir has its benefits with it being a waste product from the coconut trade. The nursery could replace peat and coir with a locally produced peat free growing media that is made from the waste materials when forests are cleared for wood.

Pot grown plants also use non-recyclable pots that will get thrown away and put in landfill. These can turn into pollutants of water ways and cause harm to wildlife if not properly disposed of. Not only this, but many pots have to be used to pot up the plant to a mature size in which it can be sold.

Pot grown plants are regularly watered, and use a lot more water than ones grown in the ground. They are also grown on standing grounds that require construction and maintenance. These are covered in a woven mulches which can lead to an increase in micro plastics on the site. The plants also need fertilisers and these can be controlled release which are bound in plastic, causing more microplastics and pollution. The nursery could switch to using fertilisers bound in degradable coatings to reduce plastic.

Some plants are also grown in polytunnels that cause plastic pollution and waste when they need to be recovered.

Bare root plants

Bare root plants have better environmental benefits as they are grown in a large field. They take less water, fertiliser and plastic to get them to maturity and are dug up only when they are needed. They are transported in old compost bags so therefore is better for the environment. The bare root plants weigh less and have a lower carbon footprint than transporting pot grown plants. The lifting can use machinery, but I have read about new hydrogen powered machines being used which would make lifting better.

Root balled plants

These require less maintenance to get them to the size. Some root balled plants use a plastic mesh to hold the root ball together. The nursery could use hessian which can be left in place to rot in the ground after planting to reduce the plastic footprint. The root ball can be quite heavy and so this would increase the carbon footprint when transporting. The water and fertiliser usage would be the same as bare root plants. As a lot of soil is lost with every tree this may lead to the soil level reducing and this is not sustainable.

All of these methods of growing trees and shrubs produce a lot of waste. This waste could be composted on site and then used in the fields to replace the soil lost in the root balls.

To offset some of the negative environmental impacts and be net positive the nursery could look to plant native trees and plants that are good for wildlife at the edges of the site, for example Quercus robur provides a good habitat for many animals. Leaving areas wild for example letting Urtica dioica grow at field margins would allow for butterflies to breed and feed, this would increase their net positive benefits.

One of the other ways the nursery could reduce its negative impact is by selling smaller plants which would be much more sustainable.

RHS markers would review this piece of work against a mark scheme, which indicates the key points that candidates may bring to their answer. The list is not exhaustive, nor is it expected that candidates include all points in their response.

Bare root
Potential impacts considered

- soil disturbance
- packing material selection
- failure rate
- lifted when dormant, impact of machinery on soil structure
- carbon footprint of operations, undercutting

To reduce negative impact

- choose sustainable medium e.g. wool/wood shaving
- sustainable wrap
- raise from seed on site
- practice no dig to prepare site/carbon sequestration practices
- herbicide/weed control discussed
- irrigation discussed to minimise water usage
- biodiversity positive measures
- use of leys, wildflowers, legumes

Pot grown

Potential impacts

- Non-recyclable pots
- Unsustainable growing media
- Increased use of water
- Increased use of fertilisers
- Waste from failed plants is more significant

To reduce negative impact

- Apply net positive concepts, i.e. tree planting and carbon offsetting
- Use sustainable growing media
- Use air pots, which can be reused, and offer other benefits, i.e. increase oxygen levels to reduce crop failure
- Use of electric cultivation equipment/delivery vehicles
- Offer pot deposit
- Collect water
- Use solar energy and battery to reduce mains electricity usage
- Opt for low pesticide
- Use non synthetic fertilisers

Root balled
Potential impacts

- Soil disturbance on lifting
- Need to replace soil
- Wrap is sustainable
- Other relevant points from bare root/field grown

To reduce negative impact

- Use biodegradable wrap
- Use repurposed wrap
- Use low carbon transport
- Intercrop with wild flowers to boost biodiversity

Candidates may apply the same point to numerous growing systems.

RHS Markers then review the candidate response against the assessment ladder.

The marker highlights areas of strength (green highlight) and areas of weakness in the response (pink highlight), for example irrelevance, or key omissions, and areas of advanced technical knowledge.

The piece of work as marked is shown below:

Pot grown plants

Too Vague

Too Vague

Pot grown plants have significant environmental impacts compared to the other two methods. They require a growing media, depending on the composition of the growing media, this can have various environmental impacts. Peat, sometimes used in growing media, has dire effects on the environment, as it releases carbon to the environment in extraction and transport. It also decomposes as growing media releasing carbon. Looking at Coir, this has to be imported from more tropical regions, so has a high carbon footprint. However, Coir has its benefits with it being a waste product from the coconut trade. The nursery could replace peat and coir with a locally produced peat free growing media that is made from the waste materials when forests are cleared for wood.

Pot grown plants also use non-recyclable pots that will get thrown away and put in landfill. These can turn into pollutants of water ways and cause harm to wildlife if not properly disposed of. Not only this, but many pots have to be used to pot up the plant to a mature size in which it can be sold.

Pot grown plants are regularly watered, and use a lot more water than ones grown in the ground. They are also grown on standing grounds that require construction and maintenance. These are covered in a woven mulches which can lead to an increase in micro plastics on the site. The plants also need fertilisers and these can be controlled release which are bound in plastic, causing more microplastics and pollution. The nursery could switch to using fertilisers bound in degradable coatings to reduce plastic.

Some plants are also grown in polytunnels that cause plastic pollution and waste when they need to be recovered.

Bare root plants

Bare root plants have better environmental benefits as they are grown in a large field. They take less water, fertiliser and plastic to get them to maturity and are dug up only when they are needed. They are transported in old compost bags so therefore is better for the environment. The bare root plants weigh less and have a lower carbon footprint than transporting pot grown plants. The lifting can use machinery, but I have read about new hydrogen powered machines being used which would make lifting better.

Root balled plants

What size?

These require less maintenance to get them to the size. Some root balled plants use a plastic mesh to hold the root ball together. The nursery could use hessian which can be left in place to rot in the ground after planting to reduce the plastic footprint. The root ball can be quite heavy and so this would increase the carbon footprint when transporting. The water and fertiliser usage would be the same as bare root plants. As a lot of soil is lost with every tree this may lead to the soil level reducing and this is not sustainable.

All of these methods of growing trees and shrubs produce a lot of waste. This waste could be composted on site and then used in the fields to replace the soil lost in the root balls.

To offset some of the negative environmental impacts and be net positive the nursery could look to plant native trees and plants that are good for wildlife at the edges of the site, for example Quercus robur provides a good habitat for many animals. Leaving areas wild for example letting Urtica dioica grow at field margins would allow for butterflies to breed and feed, this would increase their net positive benefits.

One of the other ways the nursery could reduce its negative impact is by selling smaller plants which would be much more sustainable.

The marker having marked up areas of strength and weakness then reviews the assessment ladder, and starts at the bottom of the answer…

Does this response match or exceed the descriptor for Band 1, 'A largely poor response with few relevant observations, addressing few of the key elements of the question'.

As the response exceeds Band 1, the examiner moves to Band 2, 'A largely basic response with some relevant observations, addressing some key aspects of the question'.

As the response exceeds Band 2 the examiner moves to Band 3, 'A reasonably detailed and fairly comprehensive response with mostly relevant observations, addressing most of the key elements of the question'.

On review, and considering the qualities in the candidate response, the length of time available to the candidate and the level of the qualification the examiner determined that the response exceeded Band 3, moving to Band 4, 'A highly detailed, comprehensive, fully relevant response addressing all aspects of the question.'

The response had some areas where the examiner identified weakness and so it is not placed at the top of the 12 – 15 mark range, however when the descriptors are reviewed there is no irrelevant of incorrect material, these are links to other topic areas, and there is advanced knowledge for the level of the qualification. Therefore, the examiner awarded a mark of 14.

Helpful hint

- Underline key words in the question, bare root, pot grown, root-balled and use these as headings.
- Underline the key things to consider, trees and shrubs, environmental impacts, how the nursery can reduce negative impacts and make sure the response deals with these areas.
- Underline the command word, here it is describe (Identify key points, explore all aspects, provide a conclusion) The full list of command words and what they mean are on page 3 of this report.
- Ask yourself if you can bring in Health & Safety, Sustainability, Best Practice, Equality and Diversity or other topic areas to build a more holistic, yet totally relevant response.

Question 2

This question required candidates to think on their feet and explore links across topics, in this case plant science, plant health and plant specification to discuss how post planting care can impact on plant establishment.

This question was well answered by the majority of candidates.

Stronger candidate responses included:

- the need to link the provision of irrigation to the plant and site requirements, with further discussion on quantity, frequency and delivery
- the need to apply mulch to reduce water loss and improve the soil around the root zone, with reference to the depth of material and a suitable range of organic mulches
- maintenance of plantings to include checking any stakes, and replacing broken stakes and damaged or missing tree tubes, guards as appropriate on a minimum of an annual basis
- scouting for the incidence of pests and pathogens, (named) the reporting of outbreaks and suggested preventative and corrective actions
- the need to review plantings to ensure that there are no developing deficiency symptoms. Recommendations of remedial action in the event of nutrient deficiencies.
- the provision of post planting wind protections/shade as appropriate
- inspections for weed growth in particular in tree tubes, which can compete for light and create disease problems with increased humidity
- the removal of dead/failed plants, rectifying frost heave, or sunken ground
- formative pruning.

Weaker candidate responses included:

- plant selection/specification decisions, when the question is requiring the candidate to relate their response to post planting care, to include:
    - the concept of right plant right place
    - the need to test soil for pH
    - presence of sun and shade
    - assessing soil texture and structure

- maintenance beyond the period of plant establishment
- the setting up of hydroponic growing system
- the division of herbaceous perennials
- the design of rainwater harvesting systems
- detailed explanations of the process of photosynthesis

Question 3

This question required candidates to describe the process of fertilisation in flowering plants. Candidates were further required to explain how environmental factors can affect the process of fertilisation.

Fewer candidates selected this question. Some candidates scored high marks within the question by meeting the full requirement of the question. Many candidates limited their response to the first sentence in the question; 'Describe the process of fertilisation in flowering plants'. A significant number of candidates either gave unsatisfactory or no responses to 'explain how environmental factors can affect the process of fertilisation'. A significant number of candidates based their response on the process of pollination despite the instruction within the question 'your answer should assume that successful pollination has taken place'.

Candidate responses were graded against the assessment ladder. Responses that included significant reference to pollination were consistent with 'some significant evidence of irrelevant material' at Band 2. Candidate responses that were limited in detail relating to environmental factors were consistent with 'largely basic response', and 'only basic explanations or application'.

2	6 - 8	Rudimentary (Basic)	**A largely basic response with some relevant observations, addressing some key elements of the question** ☐ Some significant evidence of irrelevant or incorrect material and frequent lack of detail, with some key areas overlooked ☐ Occasional evidence of correct integration with other topics, but many areas are overlooked and incorrect associations made: little evidence of a holistic approach ☐ Current professional horticultural knowledge/principles demonstrated some of the time, but with frequent errors, and only basic explanations or application ☐ Correct and appropriate technical language only partially demonstrated but limited. Some key errors.

Candidate responses that were entirely related to pollination, were consistent with 'material is largely irrelevant' .

1	0 - 5	Undeveloped (Unsatisfactory)	**A largely poor response with few relevant observations, addressing few of the key elements of the question** ☐ Material is largely irrelevant or incorrect and lacking in any detail, with many key areas overlooked ☐ No, or very little evidence of correct integration with other topics, with many areas overlooked and incorrect associations made: no evidence of a holistic approach ☐ No or little evidence of current professional horticultural knowledge/principles demonstrated, with poor or incorrect explanations or application ☐ Little (if any) technical language demonstrated. Often incorrect. Key errors.

Question 4

This question related to soil management plans. Candidates were asked the question, what information is needed to develop the plan.

Stronger candidate responses clearly stated the information that should be collected for the consultant to include:

- soil texture
- soil structure
- proximity to bodies of water or wildlife habitat
- current management
- risk factors for soil erosion
- areas of capping, soil compaction, or poor growth
- pH
- depth of topsoil
- drainage characteristic
- organic matter content
- presence and numbers of earth worms
- soil risk assessment
- results of laboratory analysis, for example regarding pollutants or nutrient status.

Weaker candidate responses tended to discuss:

- methods of soil amelioration to include single digging
- methods of identifying soil texture
- methods of testing for soil pH
- site characteristics
- site appraisal, including aspect and presence of sun and shade
- the concept of minimal cultivation strategies, such as 'no dig'
- the use and benefit of organic mulches.