

Next Generation Higher National Unit Specification

Applied Horticultural Research (SCQF level 8)

Unit code: J7A5 48
SCQF level: 8 (24 SCQF credit points)
Valid from: session 2023–24

Prototype unit specification for use in pilot delivery only (version 1.0) September 2023

This unit specification provides detailed information about the unit to ensure consistent and transparent assessment year on year.

This unit specification is for teachers and lecturers and contains all the mandatory information required to deliver and assess the unit.

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This edition: September 2023 (version 1.0)

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Unit purpose

This unit provides learners with the knowledge and skills they need to understand and apply research techniques in the context of horticultural research and plant trials. They can pursue their own interests to develop specialist knowledge.

Before starting the unit, learners should have a foundation knowledge of practical trials and experimental design, ideally having completed Plant Biology at SCQF level 7 and/or Production Horticulture at SCQF level 7, on which this unit expands. You should provide supplementary resources to support learning where possible.

On completion of the unit, and on achievement of the Higher National Diploma (HND), learners may be able to progress to the BSc in Horticulture, or they may wish to apply directly to the horticulture industry and related work placements.

Unit outcomes

Learners who complete this unit can:

- 1 appraise research techniques in the context of horticultural research
- 2 demonstrate analytical techniques and experimental design that are appropriate to horticultural research
- 3 report their findings on a topic relevant to horticultural research

Evidence requirements

You should assess this unit through a project. For their projects, learners must plan, carry out and produce a final report on a research question.

Outcome 1

Learners gather evidence that demonstrates that they have:

- ◆ carried out a literature review
- ◆ created a reference list or bibliography in an appropriate format
- ◆ created a research question and hypothesis based on their literature review
- ◆ created a plan of work and Gantt chart to answer the research question in a timely manner

Outcome 2

Learners gather evidence that demonstrates that they have:

- ◆ used appropriate data collection techniques
- ◆ collected data
- ◆ analysed data using digital software

Outcome 3

Learners gather evidence that demonstrates that they have:

- ◆ presented information in a scientific manner
- ◆ effectively communicated data
- ◆ discussed their findings in relation to relevant literature
- ◆ orally presented their findings

You should assess evidence for each outcome in a sequence of submissions. This ensures that learners' projects are appropriate, and that they can be completed in the timescale set by your centre.

Knowledge and skills

The following table shows the knowledge and skills covered by the unit outcomes:

Knowledge	Skills
<p>Outcome 1 Learners should understand:</p> <ul style="list-style-type: none"> ◆ the difference between primary, secondary and tertiary sources of information ◆ how to use appropriate search engines to source information ◆ how to present sources of information, both in text and as a reference list or bibliography (in accordance with the delivery centre's preferences) ◆ how to use academic literature to phrase a research question and hypothesis ◆ how to plan a plant trial or horticultural study within a set timeframe 	<p>Outcome 1 Learners can:</p> <ul style="list-style-type: none"> ◆ source and reference academic literature ◆ phrase research questions and hypotheses, basing them on academic literature ◆ create a plan of work to answer research questions ◆ produce a Gantt chart using digital software
<p>Outcome 2 Learners should understand:</p> <ul style="list-style-type: none"> ◆ different types of data ◆ different types of variables ◆ collection methods for gathering data <ul style="list-style-type: none"> — experimental design principles — survey design principles ◆ data handling methods, using appropriate digital software ◆ how to implement a plant trial or horticultural study within a set timeframe 	<p>Outcome 2 Learners can:</p> <ul style="list-style-type: none"> ◆ apply a scientific method to design a plant trial or horticultural study within a set timeframe ◆ collect data from a plant trial or horticultural study ◆ distinguish between data types and use appropriate digital software to carry out data management and analysis
<p>Outcome 3 Learners should understand:</p> <ul style="list-style-type: none"> ◆ how to present information in a scientific manner ◆ how to effectively communicate data ◆ how to make inferences from results and findings 	<p>Outcome 3 Learners can:</p> <ul style="list-style-type: none"> ◆ produce a scientific-style paper based on a plant trial or horticultural study ◆ present their findings verbally, digitally and graphically

Meta-skills

Throughout the unit, learners develop meta-skills to enhance their employability in the horticulture sector.

Self-management

This meta-skill includes:

- ◆ focusing: independent data collection; sourcing and referencing academic literature
- ◆ adapting: implementing a plant trial or horticultural study within a set timeframe; using experimental design principles; using appropriate data collection techniques
- ◆ initiative: distinguishing between data types and using appropriate digital software to carry out data management and analysis

Social intelligence

This meta-skill includes:

- ◆ communicating: presenting findings verbally, digitally and graphically
- ◆ collaborating: working effectively in groups

Innovation

This meta-skill includes:

- ◆ curiosity: sourcing information, using appropriate search engines
- ◆ sense-making: producing an academic paper based on a plant trial or horticultural study
- ◆ critical thinking: reaching conclusions from results and findings

Literacies

Learners develop core skills in the following literacies:

Numeracy

Learners develop numeracy skills through statistical analyses.

Communication

Learners develop communication skills through group work.

Digital

Learners develop digital skills and computer literacy by using analysis software.

Delivery of unit

We recommend that you deliver this unit within the limitations of your centre's facilities and resources, focusing on areas of speciality. You should take advantage of industry contacts where possible, and we recommend site visits.

You can integrate the unit with Advanced Plant Biology at SCQF level 8.

The notional design length for the unit is 120 hours. However, the amount of time you allocate to each outcome is at your discretion.

We suggest the following distribution of time, including assessment:

Outcome 1 — appraise research techniques in the context of horticultural research
(20 hours)

Outcome 2 — demonstrate analytical techniques and experimental design that are appropriate to horticultural research
(70 hours)

Outcome 3 — report their findings on a topic relevant to horticultural research
(30 hours)

Additional guidance

The guidance in this section is not mandatory.

Content and context for this unit

The evidence examples listed in this section are not exclusive or exhaustive.

Outcomes 1 and 2

Learners complete a project proposal for a plant trial or horticultural study. This could include:

- ◆ key literature
- ◆ data to be collected and method of collection
- ◆ a research question and hypothesis
- ◆ experimental design
- ◆ possible analytical methods
- ◆ a timeline

In addition, learners could collate a logbook of data and research recordings during the running of the plant trial or horticultural study.

Outcome 3

Learners could complete a report, in the form of a journal article, based on the study. They should present their findings to their peers through a simulated conference, as a presentation or poster presentation.

Approaches to assessment

You should assess learners through their projects. For their projects, learners must plan, carry out and produce a final report on a research question.

Equality and inclusion

This unit is designed to be as fair and as accessible as possible with no unnecessary barriers to learning or assessment.

You should take into account the needs of individual learners when planning learning experiences, selecting assessment methods or considering alternative evidence.

Guidance on assessment arrangements for disabled learners and/or those with additional support needs is available on the assessment arrangements web page:

www.sqa.org.uk/assessmentarrangements.

Information for learners

Applied Horticultural Research (SCQF level 8)

This information explains:

- ◆ what the unit is about
- ◆ what you should know or be able to do before you start
- ◆ what you need to do during the unit
- ◆ opportunities for further learning and employment

Unit information

You develop your knowledge of research techniques in the context of horticultural research, and demonstrate the analytical techniques and experimental design methods that are appropriate to horticultural research.

Before starting the unit, you should have a foundation knowledge of practical trials and experimental design, ideally having completed Plant Biology at SCQF level 7 and/or Production Horticulture at SCQF level 7, on which this unit expands. You should be provided with supplementary resources to support learning, where possible.

You should actively participate in achieving learning outcomes and with class activities. Throughout the unit, you develop meta-skills covering self-management, social intelligence and innovation.

You are assessed through a project. For your project, you must plan, carry out and produce a final report on a research question.

On completion of the unit, and on achievement of the Higher National Diploma (HND), you may be able to progress to the BSc in Horticulture. Alternatively, you may wish to apply directly to the horticulture industry and related work placements.

Administrative information

Published: September 2023 (version 1.0)

Superclass: RA

History of changes

Version	Description of change	Date

Note: please check [SQA's website](#) to ensure you are using the most up-to-date version of this document.