

Unit 33: Manage Advanced Nursery Stock Production

Unit code	R/600/9847
QCF Level 3:	BTEC National
Credit value:	10
Guided learning hours	60

● Aim and purpose

This unit aims to provide learners with an understanding of how to manage advanced nursery stock production and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

● Unit introduction

Nursery stock forms a significant sector of the UK horticultural industry. It is extremely diverse, presenting growers with a number of challenges requiring support from the research community.

This unit is ideal for those who are aiming to be supervisors, garden centre managers or nursery owners, but it is also suitable for those already in a supervisory or management post who wish to develop their knowledge and skills. Production can range from growing trees and shrubs in the field over a number of years for direct marketing to growing one-litre pots in a glasshouse which can be turned around for marketing in less than 12 months.

Learners will be taught how to plan for field and container-grown crops taking into account factors such as proximity to a market, soil type and pH, slope of the land, climate, water quality, access to irrigation and availability of labour. Strategies to reduce water use in container nursery stock production, and methods to control excessive vegetative plant vigour, will also be discussed.

Learners will consider the various methods of maintaining and controlling growth, dealing with common pests and diseases, and they will explore ways of reducing the environmental impact of crop growth as well as managing plants in a sales environment.

● Learning outcomes

On completion of this unit a learner should:

- 1 Understand how to plan nursery stock production activities
- 2 Be able to establish container-grown nursery stock
- 3 Be able to manage the development of nursery stock
- 4 Understand field production of nursery stock
- 5 Be able to manage the health and growth of plants in nursery sales environments.

Unit content

1 Understand how to plan nursery stock production activities

Facilities: roadways; windbreaks; irrigation systems; container beds; potting, storage and despatch areas; protected crop areas; planning regulations

Planning: market-driven production systems that produce stock at the correct stage of growth within the intended sales period; health and safety; personal protective equipment (PPE)

2 Be able to establish container-grown nursery stock

Site selection: proximity to markets; availability of labour; climate; topography; soil type and pH

Site preparation: control of weeds, pests and diseases; cultivation methods and equipment; provision of nutrients and irrigation system; health and safety; PPE

Crop establishment: planting; maintenance of suitable environment for newly planted stock; health and safety; PPE

Problems: timing; water quality and supply; weather conditions; market forces; economics; labour availability

3 Be able to manage the development of nursery stock

Maintenance of crop growth: maintaining optimum growth; removal of unwanted growth (including formative pruning); support; control of weeds, pests and diseases; disposal of crop waste; weather and seasonal protection; methods of reducing environmental impact; health and safety; PPE

4 Understand field production of nursery stock

Growing systems: field grown; container grown; combined systems

Plant range: trees; shrubs; climbers; herbaceous; alpine and tender plants

Features: seasonality of sales; sales period; ease of handling; ease of use; size range, species; handling; financial implications of systems

5 Be able to manage the health and growth of plants in nursery sales environments

Display areas: flower beds, benches, supporting plants (to avoid damage); labelling

Maintenance during sales period: watering/feeding systems; removal of unwanted growth; control of weeds, pests and diseases, promoting sales, customer access and safety; health and safety

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P1 evaluate the suitability of sites for nursery stock production [CT]	M1 explain the facilities and materials required to implement a selected cropping plan for field and container-growing systems	D1 discuss different factors which may influence cultivation and cropping plans of nursery stock crops
P2 analyse the facilities and resources required for nursery stock production		
P3 describe the planning process for nursery stock production [IE]		
P4 ensure that sites and resources are available and ready for potting nursery stock [RL]	M2 compare the different growing requirements for selected crops in field and container-growing systems	
P5 pot up, pot on and stand down/set out nursery stock		
P6 manage the growth of nursery stock to ensure development to market requirements [TW]		
P7 identify, control and dispose of unwanted plant growth to meet environmentally sound practice		
P8 manage the collection and despatch of plants [SM]		

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
<p>P9 review the equipment available for the field production of nursery stock</p> <p>P10 explain the production systems available for the production of</p> <ul style="list-style-type: none"> ◇ propagation stock ◇ bare-root woody plants for sale and containerisation ◇ deciduous and evergreen stock <p>P11 explain the formula for specifying nursery stock</p> <p>P12 explain the management of field-grown nursery stock</p>	<p>M3 list detailed maintenance procedures for a given crop to ensure development to market specification</p>	<p>D2 analyse market influences on different growing systems</p>
<p>P13 maintain plants in a nursery sales situation to ensure that optimum condition is maintained for the maximum duration</p> <p>P14 identify and respond to pests, diseases and disorders. [EP]</p>	<p>M4 explain problems that may be encountered in a nursery sales environment.</p>	<p>D3 assess methods of reducing the environmental impact of plant sales.</p>

PLTS: This summary references where applicable in the pass criteria, in the square brackets, the elements of the personal, learning and thinking skills. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Delivery of this unit will involve practical assessments, written assessment, visits to suitable collections and will link to work experience placements.

Tutors delivering this unit have opportunities to use as wide a range of techniques as possible. Lectures, discussions, seminar presentations, nursery visits, internet and/or library-based research and the use of personal and/or industrial experience would all be suitable. Delivery should stimulate, motivate and educate learners.

Work placements should be monitored regularly in order to ensure the quality of the learning experience. It would be beneficial if learners and supervisors were made aware of the requirements of this unit before any work-related activities are undertaken, so that naturally occurring evidence can be collected at the time. For example, learners may have the opportunity to establish a crop and they should ask for observation records and/or witness statements to be provided as evidence of this. Guidance on the use of observation records and witness statements is provided on the Edexcel website.

Visiting expert speakers could add to the relevance of the subject for learners. For example, a commercial nursery stock grower could talk about their work, the situations they face and the techniques they use.

Whichever delivery methods are used, it is essential that tutors stress the importance of sound environmental management and the need to manage the resource using approved methods.

Health and safety issues relating to fieldwork must be stressed and regularly reinforced, and risk assessments must be undertaken before any practical activities. Adequate PPE must be provided and used following the production of suitable risk assessments.

Tutors should consider integrating the delivery, private study and assessment for this unit with other relevant units and assessment instruments learners are taking as part of their programme of study.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives an indication of the volume of learning it would take the average learner to achieve the learning outcomes. It is indicative and is one way of achieving the credit value.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit and its relevance to the industry.
Assignment 1:Facilities and Resources (P1, P2, P3, M1, D1) Tutor introduces the assignment brief.
Introduce methods and techniques; suitability of sites; facilities required; learners to develop skills and techniques for crop planning. Discuss the importance of health and safety, plant health regulations.
Assignment 2:Crop Establishment (P4, P5, P6, P7, P8, M2) Tutor introduces the assignment brief.

Topic and suggested assignments/activities and/assessment

Principles of nursery stock production: theory session: introduce different production methods and skills.

Discuss factors affecting the choice of site.

Learners to demonstrate basic skills using different plant production methods and produce a crop plan.

Learners to record and review the performance of the methods used.

Assignment 3: Growth and Development (P9, P10, P11, P12, M3, D2)

Tutor introduces the assignment brief.

Discuss the merits of the methods and techniques used and demonstrate how the plant type affects the maintenance required. Produce a maintenance plan.

Learners to review the performance of plant material they are producing.

Practical sessions: material to be planted/potted on and maintained.

Assignment 4: Maintaining Plant Quality in the Sales Environment (P13, P14, M4, D3)

Tutor introduces the assignment brief.

Discuss how to manage plants in order to maintain them in optimum condition in the sales environment.

Learners to demonstrate maintenance techniques used and discuss the importance of health and safety in relation to customer safety.

Unit review.

Assessment

For P1, P2 and P3, learners must provide information on the planning of nursery stock production. Evidence could take the form of a pictorial presentation with notes or a report on the subject.

For P4 and P5, learners need to ensure the site and resources are ready and pot up, pot on and stand down/ set out nursery stock. Evidence could be through tutor observations during practical activities.

For P6, P7 and P8, learners must maintain and control the growth and development of the chosen crop until the point of sale and explain the work involved in the management of the crop. This includes controlling and disposing of waste correctly and managing the collection and despatch of plants. Where possible, to ensure assessment is fair, the size and complexity of the tasks should be the same for all learners. Evidence could be through tutor observations during practical activities.

For P11, learners must explain the formula for specifying nursery stock. For P9, P10, and P12, learners must explain the different systems available for the production of nursery stock. They should review the equipment available for commercial nursery stock production systems. Evidence could take the form of a pictorial presentation with notes or a report.

For P13 and P14, learners must maintain their chosen crop in optimum condition in the sales environment and identify and respond to pests, diseases and disorders. Evidence could be in the form of answer to questions asked during practical sessions which are appropriately evidenced using observation records.

For M1, learners must explain the facilities and materials required to implement a cropping plan for field and container-growing systems. Tutors should identify the crop or agree it through discussion with learners. This could be the same crop used for P5. Where possible, to ensure assessment is fair, the size and complexity of the tasks should be the same for all learners. Evidence could take the form of a pictorial presentation with notes or a PowerPoint presentation.

For M2, learners must compare the different growing requirements for selected crops in field and container-growing systems. Tutors should identify the crops or agree them through discussion with learners. Evidence

could be in the same format as for M1.

For M3, learners could produce a maintenance plan for a given crop, giving details of the procedures to follow to produce a healthy crop that meets customer requirements. Evidence could be provided through discussion with the tutor and the production of a plan.

For M4, learners must describe most common problems that may be encountered at point of sale and suggest ways of either eliminating them or reducing their effects. Evidence could be in the same format as for M1.

For D1, learners must discuss different factors which may influence cultivating and cropping plans for nursery stock. Evidence could be contained within a summary report.

For D2, learners must analyse the market influences on selected growing systems. Tutors should identify the growing systems or agree them through discussion with learners. Where possible, to ensure assessment is fair the size and complexity of the tasks should be the same for all learners. Evidence could be in the same format as for M1.

For D3, learners must assess methods of reducing the environmental impact of plant sales. Evidence could be in a similar format to D2.

Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, M1, D1	Facilities and Resources	Research the relevant facilities and techniques used in nursery stock production and from this information prepare to establish a crop.	Pictorial presentation. Written report.
P4, P5, P6, P7, P8, M2	Crop Establishment	Write a crop plan, establish the crop and maintain and control growth. Record and review crop performance.	Tutor observations during practical activities. Written report.
P9, P10, P11, P12, M3, D2	Growth and Development	Crop inspections to be carried out, problems identified and solutions discussed. Review growing systems and equipment available for commercial nursery stock production. Produce a maintenance plan for a crop.	Pictorial presentation. Questions and answers during practical sessions. Written report. Completed crop maintenance plan.
P13, P14, M4, D3	Maintaining Plant Quality in the Sales Environment	Maintain crop in optimum condition to maximise sales. Assess the environmental impact of cropping systems	Pictorial presentation. Written report.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Land-based sector suite. This unit has particular links with:

Level 2	Level 3
Undertake Nursery Stock Production	PH5 Promote the growth and development of crops PH6 Control the preparation of a site for planting PH7 Control the planting of crops PH12 Plan and maintain the collection of orders
	Establish and Manage Exterior Plant Displays
	Establish and Manage Interior Plant Displays
	Understand the Principles of Advanced Horticultural Science
	Manage Plant Propagation Activities

Essential resources

Centres offering this unit should ensure that learners have supervised access to appropriate resources, either at the centre or at nearby commercial premises. Facilities required for this unit must include access to a range of crop production resources. Sufficient cropping areas and a range of plant types are required so that learners have adequate experience of the working environment. Facilities must reflect those found in professional horticulture organisations in the local area, and should give learners the opportunity to develop their practical ability.

The equipment and consumables required include glasshouses and/or polythene tunnels, a range of plant types, a range of suitable growing media, hand tools, pedestrian controlled equipment, packing and grading facilities, crop support and irrigation equipment.

Employer engagement and vocational contexts

This unit focuses on practical aspects of nursery stock production and will give learners the background knowledge relating to a variety of skills and techniques. Centres are encouraged to create and develop links with local nurseries and garden centres. This could be through visits from nursery staff or horticulturalists or visits to commercial growers. When learning about the skills and techniques involved in nursery stock production learners could be encouraged to gain work experience with a local nursery.

Indicative reading for learners

Textbook

Adams C R and Early M P – *Principles of Horticulture* (Butterworth-Heinemann, 2004)
ISBN 978-0750660884

Dawson P – *A Handbook for Horticultural Students* (Peter Dawson, 1994) ISBN 978-0952591115

Lamb K, Kelly J and Bowbrick P – *Nursery Stock Manual* (Grower Books, 1985) ISBN 978-0901361806

Journals

The Grower

Horticulture Week

Websites

www.defra.gov.uk

Department for Environment, Food and Rural Affairs

www.environment-agency.gov.uk

Environment Agency

www.hse.gov.uk

Health and Safety Executive

www.ipps.org.uk

International Plant Propagators Society

www.lantra.co.uk

Lantra Sector Skills Council

www.nfu.org.uk

National Farmers Union

www.rhs.org.uk

Royal Horticultural Society

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are ...
Independent enquirers	researching background information on stock production to apply in their practical work
Creative thinkers	using results from observations of the crop to review its performance and suggest improvements
Reflective learners	planning and implementing at least one way of solving a problem
Team workers	reviewing work with others
Self-managers	organising resources required for crop production
Effective participators	discussing options with their tutor for dealing with crop problems.

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
Independent enquirers	researching production techniques using a variety of sources of information.
Reflective learners	analysing the performance of the production method and suggesting improvements.
Self-managers	monitoring and caring for the crop.

● Functional Skills – Level 2

Skill	When learners are ...
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	using the internet to research the appropriate production techniques for nursery stock plants
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	
Manage information storage to enable efficient retrieval	
Follow and understand the need for safety and security practices	
Troubleshoot	
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> • text and tables • images • numbers • records 	producing written assessments using ICT programmes
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	
Evaluate the selection and use of ICT tools and facilities used to present information	
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	

Skill	When learners are ...
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	evaluating financial implications of different production methods
Identify the situation or problem and the mathematical methods needed to tackle it	
Select and apply a range of skills to find solutions	
Use appropriate checking procedures and evaluate their effectiveness at each stage	
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	
Draw conclusions and provide mathematical justifications	evaluating financial implications of different production methods
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting their report on the facilities and techniques used in nursery stock production
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	completing a written report on equipment used in nursery stock production.