



National Unit specification: general information

Unit title: Crop Production Equipment (SCQF level 6)

Unit code: H28E 12

Superclass: SK

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Summary

The purpose of this Unit is to develop knowledge and specialist skills which are required to operate and maintain a range of crop establishment, husbandry and harvesting equipment.

This is an optional Unit within the National Certificate in Agriculture at SCQF level 6, but can also be taken as a free-standing Unit.

Outcomes

- 1 Identify the main types of equipment used in crop establishment, husbandry and harvesting.
- 2 Explain the features and working principles of the equipment used in crop establishment, husbandry and harvesting.
- 3 Maintain and set crop establishment, husbandry and harvesting equipment.
- 4 Operate a range of crop establishment and husbandry equipment.

Recommended entry

While entry is at the discretion of the centre, candidates would benefit from having knowledge and skills in tractor operations which may be evidenced by the attainment of the following, or equivalent:

H28R 11 *Tractor Operations and Attachments* (SCQF level 5)

Credit points and level

1 National Unit credit at SCQF level 6: (6 SCQF credit points at SCQF level 6*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

General information (cont)

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Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the support notes of this Unit specification.

There is no automatic certification of Core Skills or Core Skill component in this Unit.

National Unit specification: statement of standards

Unit title: Crop Production Equipment (SCQF level 6)

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Outcome 1

Identify the main types of equipment used in crop establishment, husbandry and harvesting.

Performance Criteria

- (a) Identify the main types of cultivation equipment.
- (b) Identify the main types of seed drills.
- (c) Identify the main types of nutrient applicators.
- (d) Identify the main types of pesticide applicators.
- (e) Identify the main types of harvesting equipment.

Outcome 2

Explain the features and working principles of the equipment used in crop establishment, husbandry and harvesting.

Performance Criteria

- (a) Explain the features and working principles of cultivation equipment.
- (b) Explain the features and working principles of seed drills.
- (c) Explain the features and working principles of nutrient applicators.
- (d) Explain the features and working principles of pesticide applicators.
- (e) Explain the features and working principles of harvesting equipment.

Outcome 3

Maintain and set crop establishment, husbandry and harvesting equipment.

Performance Criteria

- (a) Maintain and set up cultivation equipment.
- (b) Maintain, set and calibrate seed drills.
- (c) Maintain, set and calibrate nutrient applicators.
- (d) Maintain, set and calibrate pesticide applicators.
- (e) Maintain and set up harvesting equipment.

National Unit specification: statement of standards (cont)

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Outcome 4

Operate a range of crop establishment and husbandry equipment.

Performance Criteria

- (a) Operate equipment correctly, under field conditions.
- (b) Operate equipment and safely.

Evidence Requirements for this Unit

Written and/or oral evidence and performance evidence is required to demonstrate that the candidates have achieved all of the Outcomes and Performance Criteria. Evidence will be obtained under supervised conditions at appropriate points throughout the Unit and can be generated holistically or Outcome by Outcome.

Outcomes 1 and 2

Written and/or oral evidence is required to show that candidates can identify at least two examples of each of the following types of equipment and explain their main operating features:

- ◆ Cultivator
- ◆ Seed drill
- ◆ Nutrient applicator
- ◆ Pesticide applicators
- ◆ Harvesting equipment

Outcome 3

Performance evidence is required to show that candidates can carry out routine maintenance, adjustment/calibration of two from the following list:

- ◆ A cultivator
- ◆ A seed drill
- ◆ A nutrient applicator
- ◆ A pesticide applicator

National Unit specification: statement of standards (cont)

Unit title: Crop Production Equipment (SCQF level 6)

Outcome 4

Performance evidence is required to show that candidates can correctly operate a minimum of two pieces of equipment from the following list, under field conditions:

- ◆ Cultivator
- ◆ Seed drill
- ◆ Nutrient applicator
- ◆ Pesticide applicator (in this case operation may be simulated using clean water in accordance with the Code of Practice for Plant Protection Products).

All operations will be carried out in accordance with good farm practice and to a competent commercial standard.

National Unit specification: support notes

Unit title: Crop Production Equipment (SCQF level 6)

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

This Unit is an optional Unit within the National Certificate in Agriculture at SCQF level 6 but may also be taken as a freestanding Unit. Delivery of this Unit could be integrated with the Unit *Tractor Operations and Attachments* (SCQF level 5).

In this Unit candidates will develop knowledge of the different types of equipment used for crop production and how to operate these. While a range of equipment and machinery will be covered, it is recognised that not all centres will have a comprehensive range available or the opportunity to put them into operation. In these cases, field trips will be of particular relevance.

In relation to Outcomes 1 and 2 the range of equipment should include:

- ◆ Primary cultivators such as a plough and a subsoiler
- ◆ Secondary tillage equipment such as discs, tines and power harrows
- ◆ Conventional, combine, air, cultivator, mintill and direct drills
- ◆ Spinning disc, pneumatic, liquid, mounted and trailed fertiliser spreaders
- ◆ Hydraulic boom sprayers
- ◆ Combine and forage harvesters

In relation to Outcomes 3 and 4 the following approaches are suggested to maintain, adjust, calibrate and operate the selected equipment:

- ◆ GPS or marking systems should be used to obtain and demonstrate accurate bout matching
- ◆ Nutrient applicators could include muck and slurry spreading equipment, as well as chemical fertiliser spreaders
- ◆ Seed drill and fertiliser spreader calibration could be conducted out of season with sample quantities of seed and fertiliser in a workshop environment
- ◆ Crop sprayer operation could be simulated using clean water in accordance with the Code of Practice for Plant Protection Products

This Unit is broadly aligned to the following National Occupational Standards (NOS) from Lantra:

- AgC4 Prepare and cultivate sites for planting extensive crops
- AgC5 Prepare for planting and plant extensive crops
- AgC11 Prepare planting equipment and plant extensive crops

National Unit specification: support notes (cont)

Unit title: Crop Production Equipment (SCQF level 6)

Guidance on learning and teaching approaches for this Unit

Candidates would benefit from spending time on farms and on visits in order to identify range of the relevant machinery. This would also permit the layout and working principles to be observed. Class time will be required to reinforce underpinning knowledge through use of pictures, diagrams, videos etc. Wherever possible, marking systems and tramlining should be seen operating. Where this is not possible, videos could be used.

Many of the remaining activities covered in the Unit should be undertaken in practical situations, either in the workshop or in the field. These should involve practical operation and testing of the machines and the completion of report forms where necessary. The use of simulated materials may be necessary, where actual operations are not possible or not appropriate, eg pesticide spraying.

In Outcomes 1 and 2 candidates would benefit from:

- ◆ working as a class to discuss the merits of alternative equipment makes, models and types.
- ◆ guest speakers, eg from manufacturer representatives.
- ◆ visiting shows, tillage events, farms and engineering premises.
- ◆ working individually to review manufacturers' literature and websites.
- ◆ discussing and reviewing equipment use using pictures, diagrams and videos.

In Outcomes 3 and 4 candidates would benefit from:

- ◆ working with equipment relevant to candidates' likely future workplace.
- ◆ working in small groups with access to equipment in a workshop.
- ◆ working on farm for field operation of equipment.
- ◆ completing work sheets to report on machine condition and operations.

The emphasis of learning and teaching activities will be on the practical applications in Outcomes 3 and 4. Candidates should be able to manoeuvre machinery safely on the farm and in the field and be able to operate different machinery effectively for example, maintaining a consistent and even rate of application or maintaining a line.

By adopting the above learning and teaching approaches and/or through the Outcomes and corresponding Evidence Requirements, candidates should have an opportunity to develop the following essential skills for life, learning and work:

- ◆ Employability — through developing practical skills to industry standards and working on time limited tasks.
- ◆ Sustainability — through considering the use of resources such as plant nutrients and seed.
- ◆ Technical skills — through the setting up, maintenance and operation of equipment.
- ◆ Organisational skills — in terms of personal management through punctuality and the practicalities of field operation.
- ◆ Interpersonal skills — through contact with employers and in small groups.

National Unit specification: support notes (cont)

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Guidance on approaches to assessment for this Unit

A holistic approach to assessment of Outcomes is encouraged, and the following approaches to assessment suggested.

Outcomes 1 and 2: Assignment with findings presented as a folio of information including visual material, or series of restricted response questions.

Outcomes 3 and 4: Practical tasks with an assessor observation checklist.

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

Opportunities for developing Core Skills

In this Unit candidates will learn about operating and maintaining a range of crop production equipment. Candidates will:

- ◆ identify a range of equipment for different purposes.
- ◆ explain features and principles.
- ◆ use operator manuals.
- ◆ carry out a series of maintenance tasks.
- ◆ calibrate equipment in relation to a range of factors including size, density, weight and flow-rate.
- ◆ operate equipment.

This means that as they are doing this Unit, candidates may develop aspects of the Core Skills of *Communication*, *Numeracy* and *Problem Solving*.

In addition aspects of the following Core Skills could be developed where particular learning and teaching approaches are adopted:

- ◆ *Working with Others* — through group working in practical sessions

Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements

History of changes to Unit

Version	Description of change	Date

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