



National Unit specification: general information

Unit title: Combinable Crop Production (SCQF level 6)

Unit code: H28D 12

Superclass: SD

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Summary

This Unit develops candidates' knowledge and skills in growing and managing combinable crops in the UK and the key aspects of combinable crop production and utilisation. Candidates will develop knowledge of a range of combinable crops and will consider end uses and storage requirements.

This is a mandatory Unit within the National Certificate in Agriculture at SCQF level 6 but is also available as a free-standing Unit.

This Unit is suitable for candidates who have no previous knowledge in agriculture. Successful completion of the Unit may facilitate progression to further study or to employment.

Outcomes

- 1 Select crop varieties to meet the quality requirements for given markets and uses.
- 2 Produce an annual combinable crop production programme for a range of crops.
- 3 Describe the operation of machinery for growing and harvesting combinable crops.
- 4 Describe the principles of harvesting and storage of combinable crops.

Recommended entry

Entry is at the discretion of the centre.

General information (cont)

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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.*

Core Skills

Achievement of this Unit gives automatic certification of the following Core Skills component:

Complete Core Skill None

Core Skill component Critical Thinking at SCQF level 5

There are also opportunities to develop aspects of Core Skills which are highlighted in the Support Notes of this Unit specification.

National Unit specification: statement of standards

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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

Select crop varieties to meet the quality requirements for given markets and uses.

Performance Criteria

- (a) Identify the main combinable crops and their end uses.
- (b) Describe the characteristics of crops for potential end uses and markets.
- (c) Explain the main factors that influence crop quality for potential end uses and markets.
- (d) Select varieties for given end uses and markets.

Outcome 2

Produce an annual combinable crop production programme for a range of crops.

Performance Criteria

- (a) Select a suitable seed variety and seed rate for a given situation.
- (b) Describe an appropriate crop establishment programme for a given situation.
- (c) Outline a suitable fertiliser policy during the growing season for a given situation.
- (d) Describe a suitable crop protection plan for a given situation.
- (e) Identify common weeds, pests, diseases and nutritional disorders.

Outcome 3

Describe the operation of machinery for growing and harvesting combinable crops.

Performance Criteria

- (a) Identify a range of machinery for growing a crop in a given situation.
- (b) Describe the use, layout and operation of machinery for growing crops.
- (c) Identify a range of machinery for harvesting a crop in a given situation.
- (d) Describe the use, layout and operation of machinery for harvesting crops.

Outcome 4

Describe the principles of harvesting and storage of combinable crops.

Performance Criteria

- (a) Explain the factors to be taken into account when determining whether to harvest combinable crops.
- (b) Describe the range of preservation techniques suitable for combinable crops.
- (c) Describe the methods and conditions for storing harvested crops.

National Unit specification: statement of standards (cont)

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Evidence Requirements for this Unit

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

For Outcome 1, candidates must provide evidence of the following in closed-book conditions:

- ◆ identification of the following combinable crops, their characteristics, end uses and markets:
 - wheat
 - barley
 - oats
 - oilseed rape
 - peas
 - beans.
- ◆ explanation of how seed variety and fertiliser levels influence crop quality for the following end uses: milling, malting, feed and crushing.
- ◆ selection of four varieties of seed for four different end uses/markets, with justification for the selection.

For Outcome 2, candidates must prepare a minimum of two crop production plans in open-book conditions, one for a cereal crop and one for a non-cereal crop. Each plan must describe the required operations and inputs to produce the crop in a specified field, to include:

- ◆ suitable seed selection and seed rate.
- ◆ an appropriate crop establishment programme.
- ◆ a suitable fertiliser policy during the growing season.
- ◆ a suitable crop protection plan.
- ◆ identification of four common weeds, four pests, four diseases and three nutritional disorders which are likely to occur.

For Outcome 3, candidates must provide evidence of the following in open-book conditions:

- ◆ identification of the following items of machinery for growing crops and description of their use, layout and operation: cultivator, drill, roller, fertiliser sprayer.
- ◆ identification of the following items of machinery for harvesting crops and description of their use, layout and operation: combines and balers.

National Unit specification: statement of standards (cont)

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For Outcome 4, candidates must provide evidence of the following in closed-book conditions:

- ◆ explanation of factors to be taken into account, to include visual, moisture, weather and ground conditions.
- ◆ description of preservation techniques to include dry grain, caustic soda, sealed moist stores and propionic acid.
- ◆ description of methods and conditions to include: airtight tower; in-bin and on-floor (pest free), rodent control, storage temperatures.

National Unit specification: support notes

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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 is a mandatory Unit within the National Certificate in Agriculture at SCQF level 6, but is also available as a free-standing Unit.

In this Unit candidates will look at the range of markets and uses for which combinable crops are grown. Candidates will also look at the methods of growing and managing a range of combinable crops, including the harvesting, drying and storage needs of these crops.

This Unit should prepare candidates for progression to Higher National Units, Scottish Vocational Qualifications or other land-based qualifications.

In Outcome 1, candidates should learn about the identification, characteristics and factors that affect the quality of wheat, barley, oats, oilseed rape, peas, and beans. Candidates should learn the main characteristics required in crops for them to be put to certain uses and know how to develop certain characteristics in a crop. They will learn to identify suitable varieties for different end uses of the crop, when grown in a range of farms.

In Outcome 2, candidates will choose how crops fit into the intended whole farm rotation and be able to explain their reasons for choosing appropriate combinable crops and variety for different end uses. They will learn about establishment techniques in seedbed preparation including the choice of seed rate and sowing date. They will produce a fertiliser plan including nitrogen, phosphate and potash requirements as well as timing and application rate(s). They will also provide crop protection plans including methods for the control of common weeds, pests and diseases. Candidates will study the effect of rotations on crop yield and quality and also soil structure and fertility including key growth stages for the crops.

Candidates will learn how to calculate fertiliser requirements for producing combinable crops, and recommendations about fertiliser types, rates and timing to be used.

They will also learn about main weeds, pests and diseases that affect the range of crops being covered as well as when and how to control the effect of weeds, pests and diseases on the range of crops.

In Outcome 3, candidates will look at the way cultivators, drills, rollers, fertiliser spreaders, sprayers, combine harvesters and balers operate and their effects on the operations being carried out. They will study the yield and quality of the crops being produced. This will be done through the use of field visits, practical demonstrations, examination of machines, manufacturers' literature, websites and books to develop knowledge of equipment for growing and harvesting a range of combinable crops.

In Outcome 4, candidates will participate in discussions relating to the condition of the crop when ready for harvesting, and the issues associated with early or delayed harvesting. They will demonstrate the use of a moisture meter and consider the causes of inaccurate readings.

National Unit specification: support notes (cont)

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In addition, they will look at systems for the preservation and storage of crops, including drying, moist storage, chilling. They will also learn about types of drying and storage facilities such as batch, continuous flow, on-floor and in-bin. They will be able to explain the reasons for drying crops at different temperatures, and the correct ways of preparing and using the storage facility. Candidates will learn how to tell when a crop is ready for harvest by its colour, look, feel and through moisture measurements. They will understand the effect on the crops from both early and delayed harvesting of the crop and the risks that are to be taken in the timing of harvest. They should be shown a range of wet and dry storage systems available to farmers wishing to store crops, with the advantages and disadvantages of the various systems explained. The range of drying temperatures that can be used for different drying and how to prepare a storage system for harvest, as well as how to control pests and vermin will also be covered.

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

- AgC5 Prepare for planting and plant extensive crops
- AgC6 Monitor and maintain the healthy growth of extensive crops
- AgC9 Prepare, monitor and cultivate sites for planting
- AgC12 Control the harvesting of extensive crops by mechanical means
- AgC13 Monitor and maintain the storage of harvested crops

Guidance on learning and teaching approaches for this Unit

The Unit should be delivered in as practical a context as possible with delivery taking place both in the field to investigate various crops, cultivation, planting, harvesting and storage equipment and in a classroom/workshop setting. Where possible, candidates should carry out inspections, repairs and maintenance of equipment. The emphasis should always be on the practical application of knowledge and understanding.

Candidates would benefit from a balanced approach to learning by undertaking field visits to farms growing a range of combinable crops and participating in classroom activities to develop crop production, harvesting, drying and storage knowledge and understanding. Working in small groups during workshop practical sessions will help develop understanding of equipment design and operation.

For Outcomes 1 and 2, the use of field visits, samples, books and images in the identification of crops and common weeds, pests and diseases, is encouraged.

For Outcome 3, the use of field visits, practical demonstrations, examination of machines, manufacturers' literature, websites and books are encouraged.

For Outcome 4: the use of field visits, examination of websites and farm records is encouraged.

National Unit specification: support notes (cont)

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This Unit should provide candidates with an opportunity to develop the following essential skills for life, learning and work:

- ◆ Employability — through developing skills to industry standards and working on time limited tasks.
- ◆ Sustainability — through considering the use of resources, fertilisers, pesticides, etc.
- ◆ Technical skills — through investigations into the use and maintenance of equipment.
- ◆ Organisational skills — in terms of personal management through punctuality, record keeping.
- ◆ Interpersonal skills — through contact with farm staff, supervisors and class teams.

Guidance on approaches to assessment for this Unit

The following approaches to assessment are suggested.

Outcome 1: Identification and short answer questions.

Outcome 2: Candidates could gather evidence for each programme in a portfolio to include their web research, information from farm records, Gantt charts for timings and operations, fertiliser companies' recommendations, photographic images of weeds, pests and disorders. An assessor checklist could be used.

Outcome 3: Researching information on machinery from manufacturers' catalogues; machinery handbooks and web sources. An assessor checklist could be used.

Outcome 4: Restricted response or short answer questions could be used.

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)*.

National Unit specification: support notes (cont)

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Opportunities for developing Core Skills

In this Unit candidates will learn about combinable crop production, storage and use, develop knowledge of the main combinable crops, consider how to choose varieties and learn how to plan and monitor the growth, harvesting, drying and storage of combinable crops. They will also learn about use and maintenance of machinery.

Candidates will justify the selection of crops for given situations, identify solutions to growing and harvesting problems and calculate seed and fertiliser requirements. This means that as they are doing this Unit, candidates may develop aspects of the Core Skills of *Communication, Problem Solving* and *Numeracy*.

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

- ◆ *Working with Others* — through group work to collect data, eg for crop evaluation
- ◆ *ICT* — through electronic recording of data and web research

This Unit has the Critical Thinking component of Problem Solving embedded in it. This means that when candidates achieve the Unit, their Core Skills profile will also be updated to show they have achieved Critical Thinking at SCQF level 5.

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
02	Core Skills Component Critical Thinking at SCQF level 5 embedded.	09/10/2012

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