SQA Advanced unit specification

General information for centres

Unit title: Soil Science for Turf Managers 2

Unit code: HW8C 48

Unit purpose: This unit is designed to enable candidates to develop the knowledge and skills required to evaluate different soils for turf management including rootzones and top dressings, demonstrate understanding of soils chemical properties, and evaluate and select fertilisers for a given turf situation.

On completion of the unit the candidate should be able to:

1 Select appropriate soils for a variety of turfgrass situations.
2 Describe soils and plant interactions in relation to their ability to retain and release nutrients to the soil solution and their subsequent uptake by the plant root.
3 Identify and describe the properties of a range of fertilisers for turf.

Credit points and level: 1 SQA Credit at SCQF level 8: (8 SCQF credit points at SCQF level 8*)

**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 National 1 to Doctorates.*

Recommended prior knowledge and skills: Access to this unit is at the discretion of the centre, however, it is strongly recommended that prior to studying this unit the candidate has achieved *Soil Science for Turf Managers 1*. Candidates will also ideally have a standard grade or equivalent in chemistry.

Core Skills: There are opportunities to develop the Core Skills of *Problem Solving*, *Communication*, *Numeracy* and *IT* at SCQF level 6 in this unit, although there is no automatic certification of Core Skills or Core Skills components.

Context for delivery: If this unit is delivered as part of a group award, it is recommended that it should be taught and assessed within the subject area of the group award to which it contributes.

Assessment: This unit is assessed by three assessments. A practical assignment (open-book); a short answer/extended response 1.5 hour closed-book examination; and an open-book written test using manufacturer's literature and a brief practical assignment.

SQA Advanced unit specification: statement of standards

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The sections of the unit stating the outcomes, knowledge and/or skills, and evidence requirements are mandatory.

Where evidence for outcomes is assessed on a sample basis, the whole of the content listed in the knowledge and/or skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed, and different items should be sampled on each assessment occasion.

Outcome 1

Select appropriate soils for a variety of turfgrass situations

Knowledge and/or Skills

- Measurement of particle size distribution and presentation of data
- Use of grading curves to evaluate suitable materials for topdressings, rootzones and other construction materials

Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can:

- complete a particle size distribution test
- present the data in a variety of formats: % passing; % retained; grading curve
- interpret the data to make a recommendation of suitability

Assessment Guidelines

This outcome is assessed by an open-book practical exercise, working from given samples.

Outcome 2

Describe soils and plant interactions in relation to their ability to retain and release nutrients to the soil solution and their subsequent uptake to the plant root

Knowledge and/or Skills

- Available and unavailable chemical forms of nutrients
- Factors which determine the ratios of available to unavailable chemical forms
- The properties of humus
- The properties of clay minerals
- Cation exchange capacity and its determining factors

Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can:

- explain the factors which determine nutrient availability in soils, including humus and clay content, cation exchange capacity and soil pH

Assessment Guidelines

This outcome should be assessed by short answer and extended response questions, in a closed-book invigilated test of 1½ hours duration.

Outcome 3

Identify and describe the properties of a range of fertilisers for turf

Knowledge and/or Skills

- Chemical forms of nutrients
- Properties of these forms including solubility and factors affecting it
- Use of different formulations of fertiliser by manufacturers
- Design of fertiliser programmes

Evidence Requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by showing that they can:

- identify the forms of nutrients within a range of fertilisers
- describe the properties of these forms of nutrients
- describe the formulations of fertilisers which exploit these properties

Assessment Guidelines

The first three evidence requirements listed above should be assessed by open-book written test using manufacturers' literature and appropriate textbooks.

The fourth evidence requirement should be a practical assignment.

Administrative Information

Unit code: HW8C 48

Unit title: Soil Science for Turf Managers 2

Superclass category: SF

Original date of publication: November 2017

Version: 01

History of changes:

Version	Description of change	Date

Source: SQA

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of SQA Advanced Qualifications.

FURTHER INFORMATION: Call SQA's Customer Contact Centre on 44 (0) 141 500 5030 or 0345 279 1000. Alternatively, complete our Centre Feedback Form.

SQA Advanced unit specification: support notes

Unit title: Soil Science for Turf Managers 2

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

The unit should be taught within the context of the practising greenkeeper or turf manager. While theoretical understanding is required and will be developed the value of this in practical turf management situations is emphasised. The assessment strategy is designed to develop this in terms of evaluating information on various aspects of soils, and making informed decision on the basis of that evaluation.

Guidance on the delivery and assessment of this unit

Delivery will be through a variety of means, including didactic teaching, discussion, site visit, guest lecturer from industry, visit to appropriate soil laboratories. Assessment will be based on 'real life' decision making faced by managers in the turf industry.

There may be opportunities to integrate the assessment for Outcome 3 with the unit Integrated Pest Management for Sportsturf.

Opportunities for developing Core Skills

While there may be opportunities to develop the Core Skills of *Problem Solving, Communication, Numeracy* and *IT*, all at SCQF level 6 (SCQF level 6), there is no automatic certification of Core Skills or Core Skills components.

Open learning

This unit may be suitable for delivery via Open Learning; however, the delivering centre would be responsible for ensuring the validity of all evidence.

Equality and inclusion

This unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

General information for candidates

Unit title: Soil Science for Turf Managers 2

This unit is intended to develop your knowledge and skills in aspects of soil science and management within the turf industry. A deeper understanding of particle size distribution and its measurement will enable the evaluation of materials for top dressings and rootzones, while understanding of fertiliser properties and the release of nutrients from soils will enable development of more efficient and cost-effective fertiliser programmes which lead to required turf quality.

On completion of this unit you will be able to:

1 Select appropriate soils for a variety of turfgrass situations.
2 Describe soils and plant interactions in relation to their ability to retain and release nutrients to the soil solution and their subsequent uptake by the plant root.
3 Identify and describe the properties of a range of fertilisers for turf.

You will be assessed in this unit by a practical exercise for Outcome 1, a series of restricted and extended response questions for Outcome 2 and by a written test and a short practical exercise for Outcome 3.