

SQA Advanced Unit specification

General information for centres

Unit title: Turf Grass Ecology: An Introduction

Unit code: HW82 47

Unit purpose: This Unit is designed to develop the candidate's knowledge and skills in explaining and applying the concepts and applications of turf grass ecology in the context of Golf Course Management. Candidates will gain the knowledge and skills to identify the components of a turf grass ecosystem and describe the effect of these components on the quality of turf grass swards.

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

- 1 Examine the fundamental concepts of ecology in the context of a turf grass ecosystem.
- 2 Explain turf grass physiological and morphological adaptations with reference to a range of environmental conditions.
- 3 Identify the abiotic components of the turf grass ecosystem and explain their significance in contributing to turf quality.
- 4 Identify the biotic components of the turf grass ecosystem and explain their significance in contributing to turf quality.

Credit points and level: 1 SQA Credit at SCQF level 7: (8 SCQF credit points at SCQF level 7*)

**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 recommended that the candidate has achieved National 5 Biology or an appropriate National Certificate Unit eg D70L 11 *Turf Grass: An Introduction* or D0NC 12 *Soils: Formation and Cropping Potential*.

Core Skills: There are opportunities to develop the Core Skills of *Problem Solving*, *Communication* and *Information Technology* 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 four assessments. The assessments for Outcomes 1 and 2 are combined by means of a closed-book written assessment supported by extended response questions and a closed-book identification exercise. The assessments for Outcomes 3 and 4 are combined by means of a report based on an investigation.

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

Examine the fundamental concepts of ecology in the context of a turf grass ecosystem

Knowledge and/or Skills

- ◆ The fundamental concepts of ecology to include identification of resources eg light, water, space, nutrients and oxygen
- ◆ Ecology and ecological concepts: ecosystem; biosphere; rhizosphere; biotic and abiotic components;
- ◆ The concept of ‘niche’ and the niche of a range of turf grass species
- ◆ Competition for resources by turf grasses and other organisms

Evidence Requirements

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

- ◆ identify the resources required by living organisms
- ◆ define the terms: ecology; ecosystem; biosphere; rhizosphere; biotic and abiotic components
- ◆ explain the concept of niche and describe the niche of a range of turf grass species including warm and cool season grasses used in turf management
- ◆ demonstrate understanding of overlapping niches and therefore competition for resources

Assessment Guidelines

The assessment for Outcome 1 and 2 should be combined in the form of a closed-book written assessment. This should be supported by a series of extended response questions and a brief identification exercise in open-book format.

SQA Advanced Unit Specification

Outcome 2

Explain turf grass physiological and morphological adaptations with reference to a range of environmental conditions

Knowledge and/or Skills

- ◆ The anatomy, morphology and physiology of turf grasses
- ◆ The physiological and morphological adaptations of a range of turf grass species including warm and cool season grasses

Evidence Requirements

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

- ◆ identify the component parts of turf grasses and describe the role of each component
- ◆ describe the particular morphology of the turf grass plant under mown and unmown conditions
- ◆ identify physiological processes of both warm and cool season turf grasses
- ◆ explain how turf grasses have adapted their morphology and physiology to suit their growing environment

Assessment Guidelines

See Assessment guidelines for Outcome 1.

Outcome 3

Identify the abiotic components of the turf grass ecosystem and explain their significance in contributing to turf quality

Knowledge and/or Skills

- ◆ The structure of soils and functions of their components as a medium for plant growth
- ◆ The impact of variation in soil composition on the ability of soils to act as a medium for turf grass growth
- ◆ The impact of climate on the ability of a range of turf grasses to provide the required growth

Evidence Requirements

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

- ◆ identify the structure and function of soils and their ability to provide the conditions for good quality turf growth
- ◆ explain the impact of variation in soil composition on the ability of soils to act as a medium for turf grass growth
- ◆ explain the impact of climate on the ability of a range of turf grasses to provide the required growth characteristics for use

Assessment Guidelines

Outcomes 3 and 4 should be assessed jointly by a comparative ecological investigation of two golf course ecosystems presented in the form a report. The assessment should comply with standard report format and not exceed 1,500 words.

SQA Advanced Unit Specification

Outcome 4

Identify the biotic components of the turf grass ecosystem and explain their significance in contributing to turf quality

Knowledge and/or Skills

- ◆ A range (pests, weeds, diseases, symbionts, fungi, animals) of organisms that coexist with turf grasses in the turf grass ecosystem
- ◆ The interactions between turf grasses and other organisms, both harmful and beneficial
- ◆ The impact that turf management practices can have on these interactions

Evidence Requirements

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

- ◆ identify the organisms that coexist with turf grasses
- ◆ explain the interactions between turf grasses and other organisms with reference to management of good quality turf

Assessment guidelines

See Assessment guidelines for Outcome 3.

SQA Advanced Unit Specification

Administrative Information

Unit code:	HW82 47
Unit title:	Turf Grass Ecology: An Introduction
Superclass category:	RH
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History of changes:

Version	Description of change	Date

Source: SQA

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SQA Advanced Unit Specification

SQA Advanced Unit specification: support notes

Unit title: Turf Grass Ecology: An Introduction

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 forms the scientific basis for understanding how turf grasses respond to their environment. It provides the basis for golf course managers who may have a good working knowledge of the turf but have not studied the fundamental concepts of turf growth and development. The understanding of the ecological processes and events will allow a greater understanding of the effects cultural practices have on species domination, turf density. The typical links, heathland and parkland ecosystems should be used to emphasise the biological, climatic and soil (edaphic) variations which the turfgrass species experience.

Guidance on the delivery and assessment of this Unit

Normally this Unit will be delivered as part of the SQA Advanced Certificate in Golf Course Management and if it is then there will be opportunities for integration of teaching and assessment with other Units in that award. It may also be offered as a standalone Unit for candidates wishing to extend their knowledge of turf grass science and ecology.

Outcomes 1 and 2 may be taught and assessed together. There will be a written assessment (closed-book) covering both Outcomes. In addition candidates will be asked to complete a number of extended response questions (open-book) perhaps taking the form of an unsupervised library research session and a brief identification exercise (closed-book).

Assessment for Outcomes 3 and 4 is fully integrated. Candidates will carry out an investigation; this may be as an individual or more likely as part of a small group. Assessment could be achieved by a comparative ecological investigation of two sites that differ markedly in the abiotic and biotic components of their respective ecosystems. Candidates should identify pests, weeds and diseases and select appropriate control measures. Assessments should comply with a standard report format and should not exceed 750 words ie a combined report total 1,500 words. Candidates must submit a report of the investigation; this must be entirely their own work even where they've carried out the investigation as a member of a group.

Opportunities for developing Core Skills

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

Open learning

The Unit is ideally suited to delivery in an open/distance learning format. Closed-book assessments can either be achieved during in-college supervised sessions or via webCT development in on-line assessment.

SQA Advanced Unit Specification

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.

SQA Advanced Unit Specification

General information for candidates

Unit title: Turf Grass Ecology: An Introduction

This Unit is designed to introduce you to the major concepts of ecology and ecosystems in a turf grass context.

You will study the concepts via a range of turf related ecosystems and habitats. It will allow you to develop some of the investigative skills that are of major importance in the scientific study of a subject.

The four Outcomes of this Unit are:

- 1 Examine the fundamental concepts of ecology in the context of a turf grass ecosystem.
- 2 Explain turf grass physiological and morphological adaptations with reference to a range of environmental conditions.
- 3 Identify the abiotic components of the turf grass ecosystem and explain their significance in contributing to turf quality.
- 4 Identify the biotic components of the turf grass ecosystem and explain their significance in contributing to turf quality.