



## National Unit specification: general information

**Unit title:** Plant Nutrition

**Unit code:** H1JF 11

**Superclass:** SE

**Publication date:** May 2012

**Source:** Scottish Qualifications Authority

**Version:** 01

### Summary

This Unit is designed to enable the candidate to acquire the skills required for applying fertilisers, supported by the knowledge of plant nutrients and their effects on plants. Candidates will develop the skills necessary to identify deficiency and excess symptoms of major elements. Candidates will be able to use the correct terminology relating to the choice and use of fertilisers. Candidates will be able to calculate quantities required and apply fertiliser in a given situation.

### Outcomes

- 1 Describe the nutrients required for plant growth.
- 2 Describe fertiliser terminology and the effect of a variety of fertilisers.
- 3 Apply fertiliser for a given situation.

### Recommended entry

Entry is at the discretion of the centre.

### Credit points and level

0.5 National Unit credit(s) at SCQF level 5: (3 SCQF credit points at SCQF level 5\*)

*\*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)**

**Unit title:** Plant Nutrition

### **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 components in this Unit.

## **National Unit specification: statement of standards**

**Unit title:** Plant Nutrition

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**

Describe the nutrients required for plant growth.

#### **Performance Criteria**

- (a) Describe the functions of the major and minor nutrients required by plants.
- (b) Identify the symptoms and describe the effects of common nutrient deficiencies.
- (c) Describe the effects of over-application of nutrients.

### **Outcome 2**

Describe fertiliser terminology and the effect of a variety of fertilisers.

#### **Performance Criteria**

- (a) Define terms used to describe fertilisers.
- (b) Describe the effects of different fertiliser formulations and analyses.

### **Outcome 3**

Apply fertiliser for a given situation.

#### **Performance Criteria**

- (a) Select appropriate fertilisers for given situations.
- (b) Calculate the quantity of fertiliser required for given situations.
- (c) Apply fertiliser at a specified rate and in accordance with the manufacturer's recommendations.
- (d) Comply with safe working practices during practical activities.

## National Unit specification: statement of standards (cont)

**Unit title:** Plant Nutrition

### Evidence Requirements for this Unit

Evidence is required to demonstrate that candidates have achieved all Outcomes and Performance Criteria.

#### Outcome 1

Candidates are required to produce written and/or oral recorded evidence that meet the Performance Criteria. The evidence provided should cover the major nutrients:

- ◆ Nitrogen
- ◆ Phosphorus
- ◆ Potassium
- ◆ Magnesium
- ◆ Calcium
- ◆ Sulphur

and minor nutrients:

- ◆ Iron
- ◆ Manganese
- ◆ Boron
- ◆ Zinc
- ◆ Copper
- ◆ Molybdenum
- ◆ Chlorine

#### Outcome 2

Candidates are required to produce written and/or oral recorded evidence that meet the Performance Criteria. The evidence provided should cover a minimum of six terms used in relation to fertilisers and the effects of six different fertiliser formulations.

#### Outcome 3

Candidates will produce written/oral recorded evidence and performance evidence that meet the Performance Criteria. Candidates should select, calculate quantity and apply fertiliser for a minimum of three different situations/areas.

## **National Unit specification: support notes**

### **Unit title: Plant Nutrition**

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 20 hours.

### **Guidance on the content and context for this Unit**

This is a mandatory Unit within the National Certificate in Horticulture at SCQF level 5, but may also be taken as a free standing Unit.

### **Guidance on learning and teaching approaches for this Unit**

#### **Outcome 1**

In this Outcome, candidates gain an understanding of major nutrients (macronutrients) and minor (micronutrients) required by plants within the horticulture industry. It is recommended that reference is made to the importance of the major nutrients Nitrogen, Phosphorus, Potassium, Magnesium, Calcium and Sulphur and the minor nutrients Iron, Manganese, Boron, Zinc, Copper, Molybdenum and Chlorine and some of their most common functions within plants. It is recommended that candidates are made aware of the symptoms of deficiencies and excesses of nutrients on relevant plants.

#### **Outcome 2**

It is recommended that the candidate becomes familiar with the terminology that is commonly used in relation to plant nutrients and fertilisers. Terminology could include Organic and Inorganic fertilisers, Straight and Compound fertilisers, Top dressing, Base dressing and Placement. They could also be introduced to fertiliser formulations such as Liquid, Solid, Granular, Quick release, Slow release and Controlled release. The Analysis of a variety of fertilisers could also be introduced along with their specific uses. Nutrient Ratio/Plant Food Ratio (PFR) may be introduced. It may be useful to consider the sources of some of the most common fertilisers.

#### **Outcome 3**

It is recommended that candidates, working in groups, measure areas with simple shapes and calculate their areas in m<sup>2</sup>. Using the knowledge gained in previous Outcomes they could then be provided with an end-use for each area that is relative to their work situations and select a fertiliser with a suitable formulation and analysis. It is also important that candidates should be able to accurately apply fertiliser. During practical sessions, students should comply with safe working practices.

## National Unit specification: support notes (cont)

**Unit title:** Plant Nutrition

### Guidance on approaches to assessment for this Unit

#### Outcome 1

The candidate should answer questions that test their knowledge of major (macro) and minor (micro) nutrients that are commonly applied within the horticulture industry. The Outcome is assessed by a written or oral short answer question paper.

It is recommended that the candidate should answer correctly a minimum of four out of six short answer questions.

#### Outcome 2

For Outcome 2 (a), the candidate should answer questions that test their knowledge of fertiliser terminology that is relevant to their own work situation. The Outcome could be assessed by a written or oral short answer question paper with the candidate answering correctly a minimum of seven out of ten short answer questions.

For Outcome 2(b), the candidate could be presented with a matching exercise to test their understanding of fertiliser analysis and the specific analysis suitable for use in different situations.

#### Outcome 3

For Outcomes 3(a) and 3(b), it is recommended that three different sites/areas with different fertiliser requirements could be measured by small groups of candidates. Individually, they could then:

- ◆ calculate the size of each area in m<sup>2</sup>.
- ◆ select a fertiliser with a suitable formulation and analysis for each site.
- ◆ calculate the total weight of fertiliser required (in Kg or g) for each site.

For Outcomes 3(c) and 3(d) the candidate should apply fertiliser at a specified rate, and in accordance with the manufacturer's recommendations, whilst complying with safe working practices. It is recommended that a performance checklist be used to establish that the candidate has satisfied all Performance Criteria.

### 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 social software. 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)

**Unit title:** Plant Nutrition

### Opportunities for developing Core Skills

Although there is no automatic certification of Core Skills or Core Skill component in this Unit, the following Core Skills have been identified as necessary for the successful completion of this Unit.

*Communication* — Candidates prove their ability to convey accurate information, either in writing or orally, in the assessments for Outcomes 1 and 2.

*Numeracy* — The successful completion of Outcome 3 requires the application of simple numerical skills and an ability to use a calculator.

*Problem Solving* — In Outcome 3, candidates require the use of critical thinking when selecting a fertiliser with a suitable analysis.

Planning and Organising – Being able to accurately measure the dimensions of an area and then calculate its size, requires planning and organisational skills.

*Working with Others* — Candidates are likely to work in small groups to measure areas for the assessment of Outcome 3. As a group they must plan, agree and each take responsibility for different aspects of the task.

### 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](http://www.sqa.org.uk/assessmentarrangements)

## History of changes to Unit

Version	Description of change	Date

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