



Australian Government

Department of Education, Employment and Workplace Relations

RTF5012A Manage a controlled growing environment

Release: 1

RTF5012A Manage a controlled growing environment

Modification History

Not applicable.

Unit Descriptor

This competency standard covers the process of managing controlled growing environments. Management includes assessing a controlled growing environment to establish optimum parameters and resources for a chosen crop, preparing a management plan and monitoring outcomes.

Work is usually undertaken without supervision, with only general guidance on progress sought by senior management. Responsibility for the work of others may be involved and team co-ordination may be required. Management of controlled growing environments requires extensive horticultural knowledge and practical skills, particularly in plant physiology and growth needs, controlled environment systems, monitoring, reporting and forward planning.

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Identify crop requirements	<p>1.1 Crop growth and production requirements are determined according to enterprise production plan.</p> <p>1.2 Environmental parameters for optimal growing conditions for the specific crop are researched using available information resources.</p> <p>1.3 Controlled growing environment factors are identified and evaluated for their ability to provide optimal growing conditions throughout crop development.</p>
2 Determine requirements for controlled growing environment	<p>2.1 Structures, machinery, equipment, and resources required to control environmental conditions are identified, costed and availability confirmed.</p> <p>2.2 OHS hazards are identified, risks assessed and controls implemented.</p> <p>2.3 Detrimental environmental impacts associated with the controlled growing environment system are identified and controls sanctioned.</p>
3 Prepare a management plan for controlled growing environment	<p>3.1 Management objectives for controlled growing environment are determined, consistent with production plan.</p> <p>3.2 A schedule of environmental control procedures is developed according to controlled environment management objectives.</p> <p>3.3 Staff training needs are evaluated in regard to operation and maintenance of environmental control systems, and reported to senior management.</p> <p>3.4 A budget supporting the controlled environment management plan is documented and approval sought by senior management.</p> <p>3.5 The schedule of environmental control procedures is communicated clearly to staff.</p>

- 4 Monitor environmental control systems
 - 4.1 Controlled environment **indicators and thresholds** for **remedial action** are identified for monitoring, according to industry best practice.
 - 4.2 Monitoring frequency and schedule is developed according to the requirements of the production plan and communicated clearly to staff.
 - 4.3 All monitoring data is recorded, analysed and applied to management of the controlled environment system, to ensure optimal plant development.
 - 4.4 Remedial action undertaken is documented and reported to senior management according to enterprise policy.
 - 4.5 Costs of the controlled growing environment system are monitored against budget.

Required Skills and Knowledge

Not applicable.

Evidence Guide

What evidence is required to demonstrate competence for this standard as a whole?

Competence in managing controlled growing environments requires evidence that the environmental requirements of plants can be determined, a management plan for a controlled environment system can be developed, the controlled environment system can be monitored and remedial actions implemented.

The skills and knowledge required to manage controlled growing environments must be **transferable** to a different work environment. For example, this could include different growing environments and systems, plant varieties and enterprise procedures and policies.

What specific knowledge is needed to achieve the performance criteria?

Knowledge and understanding are essential to apply this standard in the workplace, to transfer the skills to other contexts, and to deal with unplanned events. The knowledge requirements for this competency standard are listed below:

legislation and regulations relating to the controlled environment systems

techniques and methods of implementing optimal growing conditions for a range of horticultural crops

controlled environmental conditions in regard to crop plant physiology, growth stages, and product quality and quantity

quality production methods and techniques for a range of controlled environment plants

market requirements for crop quantity and quality

monitoring, analysis and recording systems.

What specific skills are needed to achieve the performance criteria?

To achieve the performance criteria, appropriate literacy and numeracy levels as well as some complementary skills are required. These include the ability to:

- communicate and negotiate verbally and in writing with staff, managers, suppliers, clients and consultants
- research information using available technology
- record information according to enterprise and industry standards
- document plans, specifications and work procedures, and write reports
- prepare budgets
- use a range of financial analysis tools to determine viability of the system.

What processes should be applied to this competency standard?

There are a number of processes that are learnt throughout work and life, which are required in all jobs. They are fundamental processes and generally transferable to other work functions. Some of these are covered by the **key competencies**, although others may be added. The questions below highlight how these processes are applied in this competency standard. Following each question a number in brackets indicates the level to which the key competency needs to be demonstrated where 0 = not required, 1 = perform the process, 2 = perform and administer the process and 3 = perform, administer and design the process.

1. How can **communication of ideas and information** (3) be applied?

Results of analysis and monitoring, and selection of resources and equipment should be communicated with the manager orally and in writing. There is likely to be negotiation with contractors, suppliers and members of the work team to achieve the program objectives.

2. How can **information be collected, analysed and organised** (3)?

Information will need to be obtained from assessment of environmental factors and controls, and monitoring. Information obtained should be analysed and outcomes discussed with senior management and other members of the work team. Information about environmental control strategies should be organised and presented as a documented plan.

3. How are **activities planned and organised** (3)?

The planning process should proceed in an orderly and efficient manner. Timely and appropriate information needs to be available for decision-making. Work activities of self and others may need to be planned and organised in order to meet enterprise objectives within time constraints.

4. How can **team work** (3) be applied?

Management of a controlled growing environment will involve working with other members of a team to optimise growing conditions and achieve enterprise objectives within time constraints.

5. How can the use of **mathematical ideas and techniques** (3) be applied?

Mathematical concepts may be required to measure quantities, distances, depth, and calculate areas, resources, costs, ratios, scales and application rates, and analyse data from instruments and external agents.

6. How can **problem-solving skills (3)** be applied?

Problems relating to detrimental plant symptoms, changing conditions, availability of resources, tools, equipment and machinery, costs, environmental issues and monitoring may arise during management of the controlled environment and require problem-solving skills to rectify.

7. How can the **use of technology (3)** be applied?

Technology will be required to record, store and communicate ideas and information. It will also be used to research relevant information, obtain and analyse data from tests and production statistics, and to produce the plan.

Are there other competency standards that could be assessed with this one?

This competency standard **could** be assessed on its own or in combination with other competencies relevant to the job function.

There is essential information about **assessing this competency standard for consistent performance** and **where and how it may be assessed**, in the Assessment Guidelines for this Training Package. All users of these competency standards must have **access** to the **Assessment Guidelines**. Further advice may also be sought from the relevant **sector booklet**.

Range Statement

Range of Variables

The Range of Variables explains the contexts within which the performance and knowledge requirements of this standard may be assessed. The scope of variables chosen in training and assessment requirements may depend on the work situations available

What **crop** plants are relevant to this standard?

Industry sectors involved in production may include nursery, floriculture and production horticulture.

Plants may include flower, foliage or oil crops, vegetables, fruit, nuts, mushroom crops, containerised and open-rooted grown plants.

What **environmental parameters** may be identified for the specific crop plants?

These should include parameters for optimal range of temperature, light quality, air flow, humidity, media type and components, water quality, flow and components for the required crop performance and minimisation of conditions suitable to identified pests and diseases for the specific crop.

What **available information resources** may be used to research specific crop requirements?

Information resources may include the knowledge of team members, senior managers and self; specific industry, technical and research literature; government, university and library based literature and Internet resources; supplier specifications, catalogues, enterprise sales figures and production records, local historical performance data and industry best practice guidelines.

What **controlled growing environments** may require management for optimal growing conditions?

These may include partially or completely enclosed nursery, growing on, hardening up and hydroponic production and display systems.

What environmental **factors** of the site may need to be assessed?

Growing environment factors may include relevant aspects of ambient humidity, light, growing media mean temperature, season and day length, air quality, nutrient and dissolved gas availability, toxicities and deficiencies, weeds, pests, diseases and beneficial organisms, site aspect and slope, and natural and artificial water supplies.

What **structures, machinery and equipment** may be required to manipulate environmental conditions?

Structures may include adjustable or fixed air vents, shade and windows.

Machinery and equipment may include computerised, LED, or mechanically operated pumps, fans, humidifiers, generators, heaters, reticulation units; growth media, air, plant tissue and water analysis equipment.

What other **resources** may be required to manipulate environmental conditions?

These may include labour, technological qualification of team members, financial resources, and supply of services and materials.

What **OHS hazards** may be identified in the work area?

Hazards may include hazardous chemicals; potentially hazardous pot media, composts and organic products; water and dust and splashed or windborne inoculum; manual handling, moving equipment and vehicles, sharp hand tools, noise, pests, and slippery or uneven surfaces.

What **controls** may be introduced to minimise the risk of OHS hazards?

Controls should be introduced according to enterprise OHS policies and procedures and may include identifying hazards; assessing and reporting risks; cleaning, maintaining and storing tools, equipment and machinery; appropriate use of PPE including sun protection; safe operation of tools, equipment and machinery; safe handling, use and storage of chemicals and hazardous substances; correct manual handling; appropriate use of safety equipment such as signage and protective barriers; basic first aid available on site; personal hygiene, and reporting problems to supervisors.

What detrimental **environmental impacts** may be considered for managing conditions of the controlled growing environment?

Environmental impacts may include nuisance noise and particulate and gaseous emissions associated with the operation of pumps, spray units and cooling/heating equipment.

What **management objectives** may influence the development of the management plan?

Management objectives may include financial, logistical, cultural, aesthetic, legal or environmental considerations; process or product specifications, company policy, OHS, existing equipment and structures, training, maintenance services, and timelines

for the program.

What **indicators and thresholds** would apply when monitoring the controlled environment?

Indicators and thresholds may be included in enterprise quality standards and specifications, customer specifications and industry standards. They will relate to environmental parameters that may be set or adjusted in response to crop health and vigour, size, shape, colour, watering and nutritional requirements.

What **remedial action** may be required for crops that are below defined thresholds?

Remedial action may include watering, pest and disease control, and manipulation of environmental parameters.

For more information on contexts, environment and variables for training and assessment, refer to the Sector Booklet.

Unit Sector(s)

Not applicable.