



**Australian Government**

# **AHCPCM505A Conduct environment and food safety risk assessment of plant nutrition and soil fertility programs**

**Release 1**

## **AHCPCM505A Conduct environment and food safety risk assessment of plant nutrition and soil fertility programs**

### **Modification History**

<b>Release</b>	<b>TP Version</b>	<b>Comments</b>
1	AHC10v5	Initial release. Supersedes and is equivalent to RTE5527A

### **Unit Descriptor**

This unit covers the responsibilities of agricultural advisers in conducting an environment and food safety risk assessment on established or developing plant nutrition and soil fertility programs and, where appropriate, developing a nutrient management plan. The risk assessment involves analysing and prioritising environmental risks associated with the program. This risk assessment is combined with the identification of options to manage risk and establish processes for the ongoing monitoring and improvement of plant nutrition and soil fertility programs.

### **Application of the Unit**

This unit of competency applies to agricultural advisers who are providing services to land managers. Conducting the assessment is likely to be undertaken without supervision but includes practical input from the land owner or manager.

### **Licensing/Regulatory Information**

Not applicable

### **Pre-Requisites**

Nil

### **Employability Skills Information**

This unit contains employability skills.

## Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Maintain currency of environment and food safety information relating to fertilisers and soil ameliorants	<p>1.1 Community, government and agricultural industry concerns and legislative requirements in relation to <b>fertiliser and soil ameliorant environmental stewardship</b> and initiatives to address them are identified and documented by actively and regularly researching industry and other information sources</p> <p>1.2 Local information relating to nutrient management, particularly in a catchment or regional context, is identified and documented by active communication with local organisations</p> <p>1.3 National and local information and standards relating to food safety associated with fertiliser and soil ameliorant use are identified and documented by actively and regularly researching industry and other information sources</p> <p>1.4 Information and standards relating to transport, handling, storage and application of fertilisers and soil ameliorants are identified and documented by actively and regularly researching industry and other information sources</p>
2. Evaluate environmental risks and develop a nutrient management plan	<p>2.1 <b>Environmentally significant features</b> of fertiliser, soil ameliorants, soil, landscape and climate that are likely to influence environmental risks associated with plant nutrition and soil fertility program are identified and documented</p> <p>2.2 <b>Agronomic and operational activities</b> associated with fertiliser and/or soil ameliorant program, and associated <b>environmental risk categories</b>, are identified and documented</p> <p>2.3 <b>Environmental risks and impacts</b> associated with agronomic and operational activities are <b>evaluated and prioritised</b></p> <p>2.4 <b>Management options</b> to appropriately address environmental risks are identified and evaluated</p> <p>2.5 Appropriate management options to address any identified environmental risks are discussed and agreed with customer</p> <p>2.6 <b>Nutrient management tools</b> are used in conjunction with land owner/manager to monitor effectiveness of management decisions over time</p> <p>2.7 Opportunities to <b>improve efficiency and effectiveness</b> of plant nutrition and soil fertility program, including use of fertilisers and soil ameliorants, are identified and operational and agronomic recommendations are modified accordingly</p>
3. Identify and communicate relevant best practice in	<p>3.1 Key environmental product stewardship issues in <b>transport, handling and storage</b> of fertilisers and soil ameliorants that are relevant to plant nutrition and soil fertility program (as</p>

**ELEMENT**

**PERFORMANCE CRITERIA**

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transport, handling and storage for environmental stewardship to land owner/manager

contained in codes of practice, legislation and enterprise work procedures) are identified and communicated to land owner/manager

## Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

### Required skills include:

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#### Ability to:

- calculate areas, ratios, proportions and application rates
- assign probability and severity of identified risks
- communicate with work team members, supervisors, contractors and suppliers
- estimate treatment and product requirements, material sizes and quantities
- interpret manufacturer and plant nutrition program specifications
- interpret specifications
- store and retrieve information and reports
- understand labels and symbols
- use paper-based or computer software interpretation system to integrate information and results from multiple sources and produce recommendation reports that are easily implemented
- use pro forma reporting, analysis and work procedure documents

### Required knowledge includes:

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#### Knowledge of:

- soil and water sampling techniques to adapt activities and instructions to a range of environmental contexts
- environmental implications for environment of soil amendment and fertiliser use, that may include nutrient mining, run-off, nutrient loading of soil and water, toxicity, noise and dust
- food safety issues relating to the use of fertilisers and soil ameliorants
- law of the minimum and importance of nutrient interactions
- methods and pathways of nutrient uptake by plants and loss from soil
- nutrient cycling and its practical relevance to specific plants and soils encountered in local area, including role of soil biology
- nutrients required by plants grown within enterprise and effects of nutrient deficiency and toxicity on individual plant species and varieties
- relationship between soil characteristics and the availability of nutrients, including macro and micro elements, to plants
- single nutrient and complete fertiliser products encountered in local area, including physical attributes, nutrient analysis, solubility, salt index, application rates and costs, and appropriate application techniques and equipment
- soil amendments commonly used to treat local soil problems
- techniques for interpreting laboratory results and making fertiliser and amendment recommendations

- techniques to assess effects of fertiliser and amendment recommendations on soil, plants and water

## Evidence Guide

<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
<p>Overview of assessment</p>	
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>The evidence require to demonstrate competency in this unit must be relevant to workplace operations and satisfy holistically all of the requirements of the performance criteria and required skills and knowledge and include achievement of the following:</p> <ul style="list-style-type: none"> <li>• identify environmental parameters at risk</li> <li>• assess magnitude of risk and establish likelihood</li> <li>• assess potential impact on environmental parameters and assign severity rating</li> <li>• develop soil fertility report and fertiliser recommendation with consideration of environmental stewardship principles</li> <li>• communicate recommendation with customer, including methods of assessing outcomes of recommendation</li> <li>• develop a nutrient management plan</li> </ul>
<p>Context of and specific resources for assessment</p>	<p>Competency requires the application of work practices under work conditions. Selection and use of resources for some worksites may differ due to the regional or enterprise circumstances.</p>
<p>Method of assessment</p>	<ul style="list-style-type: none"> <li>• Assessment methods must satisfy the endorsed Assessment Guidelines of the AHC10 Training Package and can be assessed holistically with other units</li> <li>• Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of required knowledge</li> <li>• Assessment must be by direct observation of tasks, with questioning on required knowledge and it must also reinforce the integration of employability skills</li> <li>• Assessment methods must confirm the ability to access, interpret and apply the required knowledge</li> <li>• Assessment may be applied under project-related conditions (real or simulated) and require evidence of process</li> </ul>

	<ul style="list-style-type: none"> <li>• Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances</li> <li>• Assessment may be in conjunction with assessment of other units of competency</li> <li>• The assessment environment should not disadvantage the candidate</li> <li>• Assessment practices should take into account any relevant language or cultural issues related to Aboriginality, gender or language backgrounds other than English</li> <li>• Where the participant has a disability, reasonable adjustment may be applied during assessment</li> <li>• Language and literacy demands of the assessment task should not be higher than those of the work role</li> </ul>
Guidance information for assessment	To ensure consistency of performance, competency should be demonstrated on more than one occasion over a period of time in order to cover a variety of circumstances, cases and responsibilities, and where possible, over a number of assessment activities.

## Range Statement

<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<p><b><i>Fertiliser and soil ameliorant environmental stewardship</i></b> involves:</p>	<ul style="list-style-type: none"> <li>• commitment to actions in line with their effect on the overall environmental outcome as distinct from just the effects of individual components</li> <li>• duty of care for the environmental effects of fertiliser and soil ameliorants that goes beyond a person's direct area of responsibility</li> </ul>
<p>A <b><i>nutrient management plan</i></b> consists of:</p>	<ul style="list-style-type: none"> <li>• consideration of environmental risks and their priority (likelihood/consequence)</li> <li>• management options to address risks</li> <li>• process for ongoing monitoring and management of plant nutrition and soil fertility program</li> </ul>

	<ul style="list-style-type: none"> <li>• strategies to maintain soil fertility and product quantity and quality</li> <li>• understanding of nutrient requirements of region, farm or paddock</li> </ul>
<p><i>Environmentally significant features</i> may include:</p>	<ul style="list-style-type: none"> <li>• biological properties of soil and applied organic products such as:             <ul style="list-style-type: none"> <li>• beneficial macro and micro-organisms</li> <li>• disease potential</li> </ul> </li> <li>• chemical properties of soil such as:             <ul style="list-style-type: none"> <li>• acid/alkaline (pH) balance</li> <li>• carbonate content</li> <li>• cations</li> <li>• nutrient content such as nitrogen</li> <li>• organic matter</li> <li>• phosphorus</li> <li>• potassium</li> <li>• salinity</li> <li>• sulphur</li> <li>• trace elements</li> </ul> </li> <li>• physical properties of soil such as:             <ul style="list-style-type: none"> <li>• colour</li> <li>• depth of root zone and plant available water</li> <li>• soil stability</li> <li>• structure</li> <li>• texture</li> <li>• water-holding capacity</li> </ul> </li> <li>• climatic features such as:             <ul style="list-style-type: none"> <li>• annual diurnal temperature patterns</li> <li>• annual precipitation</li> <li>• prevailing winds</li> <li>• rainfall intensity</li> <li>• seasonal and annual rainfall pattern</li> <li>• wind strength</li> </ul> </li> <li>• fertilisers that are inorganic or organic solids</li> <li>• fertilisers that are fluids applied directly to soil or to plant via foliar sprays such as:             <ul style="list-style-type: none"> <li>• liquefied gases</li> <li>• solutions</li> <li>• suspensions</li> </ul> </li> <li>• location of major water bodies and underground</li> </ul>

	<p>water sources</p> <ul style="list-style-type: none"> <li>• native vegetation in vicinity of proposed plant nutrition or soil fertility program</li> <li>• nitrogen input from leguminous green manure crops or leguminous pastures</li> <li>• properties of fertilisers and soil ameliorants that are environmentally significant such as:             <ul style="list-style-type: none"> <li>• chemical composition</li> <li>• impurity concentration</li> <li>• nutrient content</li> <li>• particle size</li> <li>• particle size distribution</li> <li>• solubility</li> <li>• slope and aspect</li> </ul> </li> <li>• soil ameliorants such as gypsum</li> <li>• liming products including:             <ul style="list-style-type: none"> <li>• dolomite</li> <li>• mixtures of lime and magnesium oxide</li> <li>• any by-product used to change soil acid/alkaline (pH) balance or soil calcium level</li> <li>• biosolids, animal manures and compost</li> </ul> </li> <li>• surface water drainage patterns</li> </ul>
<p><b><i>Agronomic and operational activities</i></b> associated with environmental risks may include:</p>	<ul style="list-style-type: none"> <li>• agronomic activities such as:             <ul style="list-style-type: none"> <li>• crop/pasture production at levels that deplete soil nutrients or adversely affect soil health</li> <li>• form of nutrient</li> <li>• growth of legume species</li> <li>• nutrient placement</li> <li>• rate of nutrient applied</li> <li>• timing of nutrient application</li> </ul> </li> <li>• operational activities such as:             <ul style="list-style-type: none"> <li>• clean-up of spills</li> <li>• application and disposal of animal manures</li> </ul> </li> <li>• fertiliser application activities including:             <ul style="list-style-type: none"> <li>• application as solid or fluid products</li> <li>• application in irrigation water</li> <li>• broadcast or band application</li> <li>• direct injection of anhydrous ammonia</li> </ul> </li> <li>• siting of permanent and temporary fertiliser/ amendment storage</li> <li>• storage and handling on farm</li> </ul>

<p><b>Environmental risk categories</b> include:</p>	<ul style="list-style-type: none"> <li>• blow (airborne losses)</li> <li>• leach (nutrient leaching or change in chemical composition through the soil profile)</li> <li>• load (nutrient loading in soil, water, air or food)</li> <li>• mine (mining soil nutrient by non-maintenance rate strategies)</li> <li>• run-off (nutrient transport in surface water)</li> </ul>
<p>An adviser may <b>evaluate and prioritise environmental risks and impacts</b> based on:</p>	<ul style="list-style-type: none"> <li>• environmental consequence</li> <li>• likelihood of occurrence</li> </ul>
<p><b>Management options</b> appropriate in managing environmental risks may include:</p>	<ul style="list-style-type: none"> <li>• activities directly related to fertiliser use such as:             <ul style="list-style-type: none"> <li>• changing product</li> <li>• method of application</li> <li>• rate applied</li> <li>• timing</li> </ul> </li> <li>• broader range of agricultural management options such as:             <ul style="list-style-type: none"> <li>• changing cultivation practices</li> <li>• land use planning</li> <li>• rotation management</li> </ul> </li> </ul>
<p><b>Nutrient management tools</b> used to monitor the effectiveness of decisions may include:</p>	<ul style="list-style-type: none"> <li>• nutrient budgeting</li> <li>• paddock record keeping</li> <li>• soil, plant tissue and water analysis</li> <li>• yield maps</li> </ul>
<p>Monitoring results consulted to <b>improve efficiency and effectiveness</b> of plant nutrition and soil fertility programs may include:</p>	<ul style="list-style-type: none"> <li>• monitoring results after implementation of recommendations such as:             <ul style="list-style-type: none"> <li>• nutrient and water use efficiency data, including:</li> <li>• changes to nutrient and water use efficiency after implementation of recommendations</li> <li>• changes to production requirements</li> <li>• environmental changes</li> </ul> </li> </ul>
<p>Aspects of fertiliser <b>transport, handling and storage</b> that may raise awareness of environmental issues include:</p>	<ul style="list-style-type: none"> <li>• issues contained in industry codes of practice such as:             <ul style="list-style-type: none"> <li>• Aerial Agriculture Association of Australia</li> <li>• Australian Fertiliser Services Association</li> </ul> </li> </ul>

## Unit Sector(s)

Plants

## **Custom Content Section**

Not applicable.