



Australian Government

Department of Education, Employment and Workplace Relations

FDFWGG3001A Apply chemicals and biological agents

Release: 2

FDFWGG3001A Apply chemicals and biological agents

Modification History

This unit supersedes and is equivalent to FDFWGGCBAB Apply chemicals and biological agents.

April 2012: Minor typographical corrections.

Unit Descriptor

Unit descriptor	This specialist unit has been developed for the wine grape growing stream of the wine sector. It covers the skills and knowledge required to interpret a spraying schedule and then set up, calibrate and monitor spraying activities to meet those requirements, with limited consultation.
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Application of the Unit

Application of the unit	This unit covers the calculation and mixing of spray applications and the operation of the spraying equipment.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills	This unit contains employability skills
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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. Prepare for spraying activities	<ul style="list-style-type: none">1.1 Spraying schedule is interpreted correctly1.2 Materials are confirmed as available and ready to meet spraying requirements1.3 Equipment is checked to confirm readiness for use1.4 Environmental conditions are checked and confirmed as acceptable1.5 Sprays are prepared according to instructions1.6 Equipment is calibrated and set up to deliver application requirements
2. Carry out spraying activities	<ul style="list-style-type: none">2.1 Equipment is started up according to workplace procedures2.2 Spraying activity is monitored to confirm that performance is maintained within specifications2.3 Out-of-specification performance is identified, rectified and/or reported2.4 Vineyard is sprayed according to schedule2.5 Problems and anomalies are recognised and rectified and/or reported
3. Complete spraying activities	<ul style="list-style-type: none">3.1 Spraying equipment is shut down according to workplace procedures3.2 Spraying equipment is prepared for cleaning3.3 Spraying equipment is cleaned according to workplace procedures3.4 Unused chemicals are stored according to instructions3.5 Waste generated by the process and cleaning procedures is collected, treated, disposed of or recycled according to workplace procedures3.6 Work is conducted in accordance with workplace environmental guidelines
4. Record information	<ul style="list-style-type: none">4.1 Workplace information is recorded in the appropriate format

Required Skills and Knowledge

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

Required skills include:

Note: The following required skills should be applied as appropriate to the equipment and processes that are used in the particular winery or workplace.

Ability to:

- access workplace information and interpret spraying schedules to identify spraying requirements. This may include:
 - identifying the correct block and vines
 - identifying requested equipment and materials
 - calculating required concentration, ground speed and application rate
 - identifying specific occupational health and safety (OHS) requirements and hazards
 - calculating area to be sprayed
 - identifying appropriate environmental conditions for specific spraying activity
 - identifying canopy coverage required
- select, fit and use personal protective clothing and/or equipment
- liaise with other work areas
- assess suitability of environmental conditions (e.g. wind speed and direction, rain and heat)
- confirm equipment status and condition. This may include checking hoses, nozzles, regulators, gauges, filters and pumps
- calibrate and set up sprayer and associated equipment to deliver spraying requirements
- mix sprays to required concentration and ensure homogenous mix
- handle sprays correctly
- operate spraying equipment and spray the vineyard according to instructions. This may include consideration of:
 - location
 - chemical used
 - application rate
 - OHS precautions
 - other vineyard personnel and neighbouring properties
 - existing and forecast weather conditions
- monitor spraying activities. This may include monitoring:
 - off-target damage
 - ground speed
 - estimated versus actual usage of chemicals
 - stock levels versus estimated requirements
 - OHS precautions
 - equipment performance and calibration

- weather conditions
- take corrective action in response to out-of-specification results or non-compliance
- report and/or record problems and/or corrective action
- shut down equipment in response to an emergency situation
- shut down equipment in response to routine requirements
- prepare equipment for cleaning
- sort, collect, recycle or dispose of waste according to workplace procedures
- identify, rectify and/or report environmental non-compliance
- maintain work area to meet housekeeping standards
- clean and store equipment
- maintain spray records according to workplace and industry standards
- operate information technology systems according to enterprise procedures
- conduct routine maintenance of equipment according to enterprise procedures
- use oral communication skills/language to fulfil the job role as specified by the organisation, including questioning, active listening, asking for clarification and seeking advice from supervisor
- work cooperatively within a culturally diverse workforce.

Required knowledge includes:

Note: The following required knowledge should be applied as appropriate to the equipment and processes that are used in the particular winery or workplace.

Knowledge of:

- range of common sprays, their purpose and the basic principles of how they work, including:
 - specified droplet size
 - suitability of application to production requirements, plant physiology and soil characteristics
- operating parameters and procedures
- chemical legislation relevant to immediate responsibilities
- basic vine physiology, where it applies to:
 - water intake
 - nutrient uptake
 - photosynthesis
 - respiration, transpiration
 - translocation
- parts of the root, trunk, shoot and fruit systems of the grapevine, their role in how the vine works and their contribution to fruit quality, including:
 - buds, nodes and tendrils
 - cambium, epidermis, phloem and xylem
 - leaf blade, bract and petiole
 - bunch, berries and flowers
- vine types, their characteristics and uses, including:

- family, genus and species
- *Vitis vinifera* and commercial varieties
- native species and hybrids (e.g. *labrusca*)
- rootstocks and scion stock
- industry processes for new variety development
- annual grapevine growth stages, including:
 - budburst
 - flowering
 - veraison
 - maturity
- key grape varieties and their distinguishing features. This may include factors, such as:
 - berry and bunch characteristics
 - frost and disease resistance
 - flavour and style
- common pests and diseases and associated treatments
- licensing requirements
- required environmental conditions for safe and effective spraying operations
- safe handling and mixing of chemicals
- spray application calculations
- equipment set-up and calibration requirements and procedures, including:
 - droplet size and suitability of use
 - spray droplet spectrum and selection of nozzles
 - manufacturer specifications for nozzles
 - droplet behaviour and target coverage
- significance and method of monitoring spraying activities
- causes of off-target damage and how to minimise it
- purpose and components of spraying equipment
- common faults and corrective action required
- OHS hazards and controls
- environmental issues and controls
- procedures and responsibility for reporting problems
- recording and reporting procedures and requirements
- cleaning requirements associated with changeovers and shutdowns
- shutdown sequence for spraying equipment
- cleaning procedures
- information technology systems where relevant
- routine maintenance procedures for equipment where relevant.

Evidence Guide

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>Assessment must be carried out in a manner that recognises the cultural and literacy requirements of the assessee and is appropriate to the work performed. Competence in this unit must be achieved in accordance with food safety standards and regulations.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Evidence of ability to:</p> <ul style="list-style-type: none"> • use personal protective clothing and equipment as required • correctly select and prepare spraying materials • correctly pre-start checks of equipment • prepare chemicals safely and according to specification • conduct spraying activity correctly • monitor spraying process and equipment, including checking for environmental compliance, usage rates and dilution • take corrective action in response to out-of-specification results or non-compliance • perform routine and emergency shutdowns • handle and/or remove waste in accordance with specified procedures • record information appropriately.
<p>Context of and specific resources for assessment</p>	<p>Assessment must occur in a real or simulated workplace where the assessee has access to:</p> <ul style="list-style-type: none"> • personal protective clothing and equipment as required • work procedures, including advice on company practices, safe work practices, food safety, quality and environmental requirements • instructions, information, specifications and schedules as required • equipment, services and corresponding information as required • products and materials as required • internal and external customers and suppliers as required

EVIDENCE GUIDE	
	<ul style="list-style-type: none"> • cleaning procedures, materials and equipment as required • documentation and recording requirements and procedures.
Method of assessment	This unit should be assessed together with other units of competency relevant to the function or work role.
Guidance information for assessment	To ensure consistency in one's performance, competence 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

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>	
Policies and procedures	Work is carried out in accordance with workplace procedures, licensing requirements and legislative requirements
Workplace information	<p>Workplace information can include:</p> <ul style="list-style-type: none"> • Standard Operating Procedures (SOPs) • specifications • spray schedules • routine maintenance schedules • work notes • product labels • Material Safety Data Sheets (MSDS) • manufacturer instructions • integrated pest management (IPM) programs • verbal directions from manager, supervisor or senior operator
Equipment	Equipment may include:

RANGE STATEMENT	
	<ul style="list-style-type: none"> • spray plant (e.g. foliar spray units, booms, covered sprayers, back-pack and hand sprayers) • personal protective clothing and/or equipment
Materials	<p>Materials may include:</p> <ul style="list-style-type: none"> • equipment spare parts and consumables • chemical sprays and ingredients
Sprays	<p>Sprays may include:</p> <ul style="list-style-type: none"> • foliar fertilisers • growth regulants • pheromones • pesticides • herbicides • fungicides • insecticides • molluscicides • miticides
Services	<p>Services may include:</p> <ul style="list-style-type: none"> • suitable water supply
Terrain	<p>Terrain must enable safe and effective operation of equipment. It may include:</p> <ul style="list-style-type: none"> • tracks • access roads • vineyard rows • open paddocks • flat, undulating, steep, hilly or terraced land • on- and off-road environments.
Conditions	<p>Conditions must enable safe and effective operation of equipment. These may include:</p> <ul style="list-style-type: none"> • dry • wet • slippery • boggy • day and night conditions
Vineyard health problems	<p>Vineyard health problems may include:</p> <ul style="list-style-type: none"> • common pests (e.g. light brown apple moth (LBAM), vine moth, mealy bugs, garden weevil, borer, grasshopper, black beetle, weeds)

RANGE STATEMENT	
	<ul style="list-style-type: none"> diseases (e.g. powdery mildew, downy mildew, botrytis, phomopsis, eutypa and crown gall)
Waste	<p>Waste may include:</p> <ul style="list-style-type: none"> unused chemical mixture empty containers\washing water
Problems and anomalies	<p>Problems and anomalies may include:</p> <ul style="list-style-type: none"> change in environmental conditions obstructions hazards other work operations application rate equipment malfunction
Information systems	<p>Information systems may be:</p> <ul style="list-style-type: none"> print or screen based and may include information technology systems, such as weather forecasting, reporting and/or recording systems
Work hazards	<p>Work may involve exposure to:</p> <ul style="list-style-type: none"> chemical, dangerous or hazardous substances

Unit Sector(s)

Unit sector	Wine operations
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