



## The Green Book Best Management Practice Guide

### 1. Chemicals

Best Management Practice (BMP) of chemicals on horticultural farms strives to protect the health of horticulturalists, their employees, their families and the community; prevent unintended impacts of chemical use; and use chemicals wisely to prevent/limit the development of resistance to certain chemicals by pests, diseases and weeds.

This section of *The Green Book* provides the key objectives of BMP for chemical management and presents a list of management actions to help achieve those objectives. At the end of this section is a checklist of BMPs recommended for sustainable management of horticulture farms in the Murrumbidgee Irrigation Area (MIA). A quick link to each component of this section is provided in the contents lists on this page.



The actions for BMP presented in this document are a summary of the key issues for environmentally sustainable horticulture in the MIA. Full details and references can be found in *The Green Book* companion chapter – CHEMICALS.

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## BMP objectives

### Objective 1 – Protect the health of horticultural farmers, their employees, their families and the community

Most agricultural chemicals registered under the *Pesticide Act 1999* are hazardous to health. Their use can result in poisoning, skin/eye irritations or ongoing health effects (including respiratory and hormonal). Farm owners and managers are legally responsible for protecting the health of their workers and the community from the harmful effects of pesticide storage and application.

Responsible management of chemicals can be demonstrated on farm through the following actions:

- Ensure that the Material Safety Data Sheet (MSDS) accompanying the pesticide is read by, or to, farm workers who handle chemicals (including contractors).
- Follow MSDS safety directions regarding personal protective equipment, the concentration of the mixture, and application conditions.
- Ensure farm workers who handle chemicals have ongoing training (every five years) in the handling and application of chemicals (Chemcert or equivalent).
- Make a record of all pesticide applications within 24 hours. The record must comply with the revised *Pesticide Act 1999* regulations, be in legible English and kept for three years. Details that must be recorded include:
  - product name
  - description of crop or situation
  - date and time of application
  - rate of application and quantity applied
  - address of the property and contact details of the applicator
  - wind speed and direction, and other relevant weather conditions (eg humidity, temperature).
- Restrict unauthorised access to chemicals (especially by children) by storing them in a separate, lockable, labeled building (or compartment) and in a locked/supervised vehicle during transport.
- Store chemicals with their MSDS and in their original container or a clearly marked substitute (NOT a food or drink container).
- Restrict farm access after chemical application unless appropriate personal protective equipment is worn or the recommended re-entry period has elapsed.
- Use the lowest dose and least hazardous chemical for the situation.



## Objective 2 – Prevent or contain unintended impacts from chemical application and storage (particularly spray drift and contamination of surface and groundwater)

Off-target spray drift, chemical spills and water contamination through surface run-off and drainage can have significant and long-term environmental effects. Downstream water quality and the aquatic environment are particularly at risk. It is the farm owner's responsibility to ensure that chemical use and storage does not negatively impact on others or the environment.

Effective management for prevention or containment of impacts can be demonstrated on farm through the following actions:

- During transport, ensure that chemical containers are intact, protected from the weather and secured in the vehicle.
- Ensure that the chemical store has good ventilation, impermeable floors and door sills (bund) and be located away from waterways and flood prone areas. The bund should be capable of containing 25% of total stored liquid chemical and 100% of the largest container.
- Locate a spill kit where chemicals are stored and mixed. The kit should include clean up materials described in the Material Safety Data Sheets (MSDS) of chemicals in storage.
- Clean up or contain spills immediately.
- Store incompatible chemicals apart, as advised on MSDS. DO NOT store liquids above solids.
- Mix and apply chemicals as detailed on the product label (or permit).
- Do not mix chemicals or wash down application equipment within 15 m of a water body (or where run-off can flow into a water body).
- Avoid pesticide application immediately prior to irrigation or rainfall. Irrigate efficiently to prevent excess drainage – see WATER section.
- Ensure spray drift is contained on farm –see AIR section.
- Have an identified wash down area (with a sump or soak-away pit) located away from water bodies and shallow watertables.
- Dispose of empty, triple-rinsed containers through an approved collection program (eg **drumMUSTER**). Add rinse water to the spray tank (or store in labeled containers if this is not possible) - see WASTES section.
- Identify risks to sensitive areas (eg water bodies, protected species) from chemical application and implement a management plan (eg install buffer zones, silt traps).



Photo - drumMUSTER

### Objective 3 – Prevent avoidable disease/pest resistance

The development of resistance to chemicals by pest and disease organisms results in increased farm costs (as larger doses or more specialised chemicals are required); greater impacts on regional and industry sustainability (from uncontrollable disease or plague outbreaks); and increased threat to the environment through species displacement and habitat destruction (eg resistant weed invasion).

Sustainable management of chemicals can be demonstrated on farm through the following actions:

- Follow CropLife resistance management guidelines for herbicides, fungicides and insecticides.
- Have a pest and disease management strategy that identifies:
  - key monitoring sites for target pest/diseases (eg area where crop previously infested)
  - frequency and timing of monitoring based on high risk periods (pest/disease life cycles, weather conditions)
  - level of infestation required before action (severity vs cost of chemical application).
- Use biological agents where possible and the lowest dose and “softest” chemical for the situation.
- After chemical application check to ensure infestation has been reduced. If not ensure spray coverage was adequate and/or seek advice (DPI Agronomist/Horticultural Adviser) on alternative measures including testing for resistance.
- Include monitoring thresholds and activities as part of pesticide application records – see PESTS & WEEDS section.
- Alternate chemicals used for control of target disease and pests.

#### In focus – Deregistered pesticides

The following organochlorine pesticides are no longer registered and it is an offence to use them:

- |             |                     |           |
|-------------|---------------------|-----------|
| • Aldrin    | • Endrin            | • Isodrin |
| • Chlordane | • Heptachlor        | • Lindane |
| • Dieldrin  | • Hexachlorobenzene | • 2,4,5-T |
| • DDT       | • Hexachlorophene   |           |

These pesticide wastes cannot be disposed of to landfill or buried on premises where concentration is above certain thresholds. Owners of any of these pesticide wastes should store them pending collection or arrange collection for storage with a licensed waste contractor. Pesticide wastes and containers, or other material contaminated with any of these wastes, are classified as scheduled chemical wastes. Advice on storage and disposal of these wastes should be sought from the NSW Department of Environment and Climate Change (131 555) or the ChemClear® program (1800 008 182).

NSW WorkCover has an extensive Code of Practice – *Safe Use and Storage of Chemicals (including Herbicides and Pesticides) in Agriculture* – for the storage and use of agricultural pesticides (including herbicides) which can be found at [www.workcover.nsw.gov.au](http://www.workcover.nsw.gov.au) or obtained by contacting WorkCover on 13 10 50.

## Key legislation and codes of practice

- *Pesticides Act 1999* (NSW)
- *Occupational Health and Safety Act 2000* (NSW)
- Pesticides Amendment (Records) Regulation 2001 under the *Pesticides Act 1999*
- Pesticides Amendment (User Training) Regulation 2003 under the *Pesticides Act 1999*
- Occupational Health and Safety Regulation 2001 (NSW): Chapter 6, Part 6.4: Use of hazardous substances
- Safe Use and Storage of Chemicals (including Herbicides and Pesticides) in Agriculture: Code of Practice 2006. WorkCover NSW Publication Number - 0422.  
[www.workcover.nsw.gov.au/Publications/LawAndPolicy/CodesofPractice/](http://www.workcover.nsw.gov.au/Publications/LawAndPolicy/CodesofPractice/)
- CropLife resistance management guidelines for herbicides, fungicides and insecticides  
[www.croplifeaustralia.org.au](http://www.croplifeaustralia.org.au) and follow link from 'Resistance Management'

Acts, and amendments and regulations relating to acts, of the NSW Government can be found at [www.legislation.nsw.gov.au/](http://www.legislation.nsw.gov.au/) and then easily found using the 'Browse' or 'Search' facilities at the site.

### **In focus – Chemical residues in drainage water**

Murrumbidgee Irrigation is licensed by the Environment Protection Authority (EPA), which operates within the Department of Environment and Climate Change, and the Department Water and Energy to distribute and drain water to various parts of the region. The EPA sets specific limits for residues of commonly used pesticides in drainage water. Horticultural farms in the MIA are not currently required to retain irrigation drainage water on farm after pesticide application. However, farming practices that result in excessive water run-off or drainage can compromise Murrumbidgee Irrigation's licences through the release of contaminated drainage water. If licence conditions are not met, Murrumbidgee Irrigation's licence can be revoked.

Horticultural chemicals, particularly residual herbicides, are detected from time to time in Murrumbidgee Irrigation's Drainage Water Quality Monitoring Program. The levels detected at the various sampling points are generally well below those that leave the farm in drainage water and are highest in the first two irrigations following chemical application.

Irrigators (as shareholders) are responsible for ensuring that breaches of Murrumbidgee Irrigation's licence requirements do not occur. The Murrumbidgee Irrigation Member's Handbook details shareholders' responsibilities in this respect. Where an irrigator's actions have caused or are likely to cause harm to the environment (either **ON** or **OFF** farm) penalties will apply and can include: cost recovery for remedial action; limiting the area where crops can be grown; suspension of water allocation; and suspension of drainage service entitlement.

## More information

### Key contacts

NSW Department of Environment & Climate Change (Griffith) .....	02 6969 0700
NSW Department of Environment & Climate Change (general) .....	131 555
NSW WorkCover (Griffith).....	02 6962 8900
NSW Department of Primary Industries (Griffith) .....	02 6960 1300
Murrumbidgee Irrigation .....	02 6962 0200
Chemcert Australia.....	02 9387 4714
drumMUSTER (Griffith City Council) .....	02 6962 8100
drumMUSTER (Leeton City Council).....	02 6953 2611
drumMUSTER National Office.....	02 6230 6712
CropLife Australia .....	02 6230 6399

**Poisons Information Centre - 24 hour Emergency Helpline..... 13 11 26**

### Industry

Murrumbidgee Horticulture Council.....	02 6964 2420
Wine Grapes Marketing Board.....	02 6962 3944
Australian Prune Industry Association.....	03 5023 5174
Riverina Citrus .....	02 6964 4333

### Web sites

Department of Agriculture, Fisheries & Forestry.....	<a href="http://www.affa.gov.au">www.affa.gov.au</a>
CropLife Australia .....	<a href="http://www.croplifeaustralia.org.au">www.croplifeaustralia.org.au</a>
Australian Pesticide and Veterinary Medicine Association.....	<a href="http://www.apvma.org.au">www.apvma.org.au</a>
CSIRO Land & Water .....	<a href="http://www.clw.csiro.au">www.clw.csiro.au</a>
Chemcert .....	<a href="http://www.chemcert.org.au">www.chemcert.org.au</a>
Agsafe .....	<a href="http://www.agSAFE.com.au">www.agSAFE.com.au</a>
drumMUSTER .....	<a href="http://www.drummuster.com.au">www.drummuster.com.au</a>
ChemClear .....	<a href="http://www.chemclear.com.au">www.chemclear.com.au</a>
Department of Environment, Water, Heritage and the Arts .....	<a href="http://www.environment.gov.au">www.environment.gov.au</a>
Irrigation Australia .....	<a href="http://www.irrigation.org.au">www.irrigation.org.au</a>
Land & Water Australia .....	<a href="http://www.lwa.gov.au">www.lwa.gov.au</a>
Murray-Darling Basin Commission .....	<a href="http://www.mdbc.gov.au">www.mdbc.gov.au</a>
MIA EnviroWise.....	<a href="http://www.mirrigation.com.au/envirowise">www.mirrigation.com.au/envirowise</a>
Murrumbidgee Irrigation .....	<a href="http://www.mirrigation.com.au">www.mirrigation.com.au</a>
Land & Water Australia - River Landscapes .....	<a href="http://www.rivers.gov.au">www.rivers.gov.au</a>
NSW WorkCover .....	<a href="http://www.workcover.nsw.gov.au">www.workcover.nsw.gov.au</a>

## Best Management Practice checklist for chemical management in the MIA

Use this checklist to assess how you are managing chemicals on your farm.  
Depending on your answers, this list can form the basis of a plan for  
improving the sustainability of your farm management practices.

Best Management Practice	Yes	Partly achieved	To do	N/A
1 Safety information (including MSDS) is provided to all farm workers who handle chemicals; and safety directions (including use of appropriate personal protective equipment) are followed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Farm workers who handle chemicals have been trained in accordance with <i>Pesticide Act 1999</i> regulations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Storage of farm chemicals is in a separate, lockable, labeled building or compartment; with ventilation, impermeable floors and door sills, and located away from waterways and flood prone areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 A spill or clean up kit, first aid kit and wash water are located where chemicals are mixed and/or stored.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Storage and mixing of all farm chemicals occurs away from any water body, areas of high watertables or where run-off may contaminate a water body.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Details of all chemical applications recorded in a format consistent with <i>Pesticide Act 1999</i> regulations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Post spray re-entry periods are notified and enforced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 Spray drift is contained on farm. Risks to sensitive areas from pesticides are identified and managed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 Chemicals are applied as specified on the product label and only in response to an identified need (based on pest/disease monitoring and/or nutrient requirements).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 CropLife resistance management guidelines for herbicides, fungicides and insecticides are followed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>