The Green Book
Best Management Practice Guide

4. Air

Best Management Practice (BMP) on horticultural farms strives to prevent impacts on farm, neighbours and the community from airborne pesticide sprays and other sources of pollution such as burning, dust and odour. Best Management Practices also address minimising greenhouse gas emissions from activity on horticultural farms.

This section of *The Green Book* provides the key objectives of BMP for air quality 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).

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 – AIR.

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BMP objectives

Objective 1 – Identify and protect sensitive areas (including endangered or protected species) from the impacts of airborne pesticide sprays

Off-target spray drift poses risks to the environment, public health and property. Landholders are responsible for ensuring chemical applications are contained within the boundary of their property. They must identify and manage potential risks to others and the environment.

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

- Select and use pesticides based on integrated pest and disease management principles (IPDM) – see PESTS & WEEDS section.
- Apply pesticides according to product label and with particular attention to the weather.
- Identify and locate sensitive areas on farm and adjoining property boundaries on a Whole Farm Plan.
- Take steps to prevent damage to sensitive areas including:
  - installation of buffer zones
  - establishment and maintenance of riparian vegetation to protect water bodies
  - communication and agreement with neighbours regarding timing of sprays and chemical selection – particularly where apiarists, alternative farming systems or non-farming neighbours are involved.

In focus - Measuring wind speed

The modified Beaufort Scale has been identified as a useful tool to assist in recording wind speed for pesticide record keeping purposes. Estimating wind speed and direction will also help to identify (and manage) potential off-farm effects of air contamination from dust, smoke and odours.

Beaufort or force number	Wind speed (km/h)	Description
0	less than 1.6	Calm: Smoke will rise vertically.
1	1.6–4.8	Light air: Weather vane is inactive, rising smoke drifts.
2	6.4–11.3	Light breeze: Leaves rustle, can feel wind on your face, weather vane is inactive
3	12.9–19.3	Gentle breeze: Leaves and twigs move around. Lightweight flags extend.
4	20.9–29.0	Moderate breeze: Moves thin branches, raises dust and paper.
5	30.6–38.6	Fresh Breeze: Small trees move or sway.

Note: this table only includes the lower wind speed portion of the Beaufort scale. The full Beaufort Scale also includes higher force numbers that describe stronger wind speeds.

Source: http://www.im.nbs.gov/beaufort.html

Objective 2 – Minimise the contribution of perennial horticulture to greenhouse gas emissions

Nitrogen losses from agricultural soils account for 18% of agricultural greenhouse gas emissions. Nitrous oxide is a very potent greenhouse gas that remains in the atmosphere for 120 years. Heavy rates of nitrogen fertiliser and intensive cultivation contribute most to the release of nitrous oxide from irrigated agricultural systems (Australian Greenhouse Office, 2000).

Management to minimise greenhouse gas emissions can be demonstrated on farm through the following actions:

- Reduce nitrous oxide emissions by:
  - aligning nitrogen fertiliser applications with crop use
  - effective on-farm drainage to minimise waterlogging
  - minimum till farming
  - managing soil sodicity and compaction
  - banding fertilisers close to the crop root system (see SOILS section).
- Consider energy efficiency when selecting new or replacement farm equipment (eg pumps, generators, vehicles).
- Service all farm machinery and vehicles annually, and maintain as required to minimise vehicle emissions.

Objective 3 – Minimise the impact of other forms of air pollution, including from burning, dust and odours

Burning of agricultural wastes results in particle pollution of the air. Very fine particles (10 µm) can be transported some distance from their source affecting air quality on a regional scale. These particles are small enough to be inhaled into the lungs and have an impact on health (particularly cardiovascular and respiratory illnesses, and asthma in children).

Management to minimise air pollution can be demonstrated on farm through the following actions:

- Identify sensitive areas (public amenities, schools, residential housing).
- Minimise the impacts of smoke and odours on others by paying attention to wind direction and weather conditions and ensuring that materials to be burnt are dry.
- Do not burn prohibited materials including: tyres, coated wire, paint containers and residues, solvent containers and residues, timber treated with copper chromium arsenate (CCA) or pentachlorophenol (PCP).
- Burn wastes away from property boundaries and remnant vegetation and ensure that adequate water is available for fire containment.
- Install buffer zones (and wind breaks if required) to limit impacts from odours, dust and smoke.
- Consult with neighbours to reduce potential for conflict arising from odours, dust and smoke.
- Cultivate at optimum soil moisture content to reduce dust (see SOILS section).
- Maintain ground cover (at least 70% of farm) to prevent soil loss to wind erosion (see SOILS section).

In focus - Burning and agriculture

It is not an offence to burn vegetation in the course of carrying out agricultural operations, however conditions relating to the Protection of the Environment Operations (Control of Burning) Regulation do apply. In particular:

- all practical means must be used to prevent or minimise air pollution from burning
- materials that are likely to produce harmful emissions or cause air pollution that is injurious to any person or is likely to cause serious discomfort or inconvenience must not be burnt (eg rubber, paint, plastic, rice hulls, treated posts).

The bush fire danger period extends from 1 October to 31 March (unless revoked or extended due to seasonal conditions). During this period a permit must be obtained from local Rural Fire Brigade Officers to burn off. Where a permit is obtained neighbours must be notified at least 24 hours before the fire is lit. A responsible person must be in attendance while the fire is alight.

All conditions of the permit including any conditions pertaining to the *Native Vegetation Act 2003 (NSW)* and/or *Threatened Species Conservation Act 1995* (NSW) must be observed.

Key legislation and codes of practice

- *Rural Fires Act 1997* (NSW)
- *Native Vegetation Act 2003* (NSW)
- *Threatened Species Conservation Act 1995 (NSW)*
- *Occupational Health and Safety Act 2000* (NSW)
- Occupational Health and Safety Regulation 2001 (NSW): Chapter 6, Part 6.4: Use of hazardous substances
- Pesticides Amendment (Records) Regulation 2001under the *Pesticides Act 1999*
- Protection of the Environment Operations (Clean Air) Regulation 2002: Part 2A
- NSW Rural Fire Service: Total fire bans and fire permits www.rfs.nsw.gov.au
- Spray drift management - principles, strategies and supporting information (2002). NSW Department of Primary Industries.
- 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/

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

More information

Key contacts

NSW Department of Environment & Climate Change (Griffith) 02 6969 0700
NSW Department of Environment & Climate Change (general)..... 131 555
NSW Department of Primary Industries (Griffith) 02 6960 1300
Griffith City Council..... 02 6962 8100
Leeton Shire Council 02 6953 2611
NSW Rural Fire Service (Griffith)..... 02 6964 1144
NSW Rural Fire Service (Leeton)..... 02 6964 1144

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..... www.affa.gov.au
NSW Department of Primary Industries ..... www.dpi.nsw.gov.au
Department of Environment, Water, Heritage and the Arts ..... www.environment.gov.au
NSW Department of Environment and Climate Change..... www.environment.nsw.gov.au
Environment Protection and Heritage Council ..... www.ephc.gov.au
Australian Greenhouse Office ..... www.climatechange.gov.au

Best Management Practice checklist for air management in the MIA

Use this checklist to assess how you are managing the air around 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	Spray drift is contained within the property boundary.	☐	☐	☐	☐
2	Sensitive areas on farm or adjoining the property boundary are identified and risks from pesticide application are managed through chemical selection and application, use of buffer zones and communication.	☐	☐	☐	☐
3	Nitrous oxide release from soils is minimised by aligning nitrogen fertiliser applications with crop needs, and attention to soil structure and irrigation efficiency.	☐	☐	☐	☐
4	Energy efficiency is considered when selecting farm equipment (eg pumps, generators, vehicles).	☐	☐	☐	☐
5	Agricultural machinery and farm vehicles are serviced annually and maintained as required to minimise vehicle emissions.	☐	☐	☐	☐
6	When burning waste on farm, volatile and prohibited materials are removed and steps are taken to ensure fire containment (immediate water available).	☐	☐	☐	☐
7	Burning waste takes place away from property boundaries and sensitive areas (eg remnant vegetation).	☐	☐	☐	☐
8	Neighbours are notified in advance of farm operations that may impact on air quality. Buffer zones are created if required.	☐	☐	☐	☐
9	Air pollution due to dust is minimised by soil surface management to reduce wind erosion (see SOILS section).	☐	☐	☐	☐
10	Cultivation is timed to reduce soil mobility by attention to soil moisture and wind conditions.	☐	☐	☐	☐