

**Enviroveg manual new  
sections - hydroponic,  
greenhouse and organic  
production**

Helena Whitman  
AUSVEG Ltd

Project Number: VG06003

## **VG06003**

This report is published by Horticulture Australia Ltd to pass on information concerning horticultural research and development undertaken for the vegetable industry.

The research contained in this report was funded by Horticulture Australia Ltd with the financial support of the vegetable industry.

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ISBN 0 7341 1924 0

Published and distributed by:  
Horticulture Australia Ltd  
Level 7  
179 Elizabeth Street  
Sydney NSW 2000  
Telephone: (02) 8295 2300  
Fax: (02) 8295 2399  
E-Mail: [horticulture@horticulture.com.au](mailto:horticulture@horticulture.com.au)

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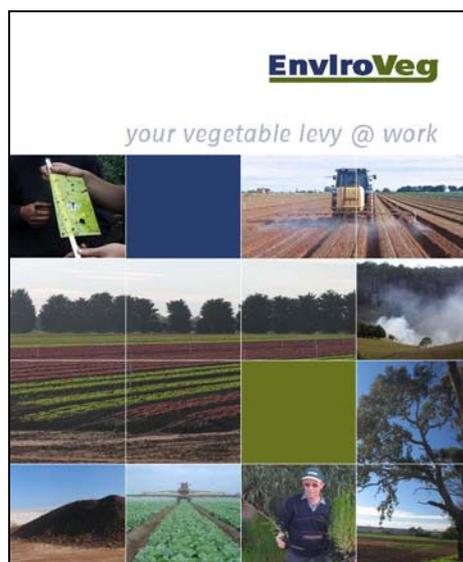
*Know-how for Horticulture™*

# Horticulture Australia Ltd.

## *Project VG06003*

(Completion Date November 2008)

EnviroVeg manual new sections – hydroponic,  
greenhouse and organic production



**Helena Whitman**  
Environmental Manager  
**AUSVEG Ltd**

Project: VG06003

**Principal Investigator** Mrs. Helena Whitman

**Contact Details** AUSVEG Ltd  
PO Box 563  
MALVERN VIC 3170  
Tel: 03 5429 5220  
Fax: 03 5429 5224  
Web: [www.ausveg.com.au/EnviroVeg.cfm](http://www.ausveg.com.au/EnviroVeg.cfm)

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### **Purpose of the Report**

To provide a Final Report on the outcomes of this project and to meet the reporting requirements as per the agreement with HAL.

### **Funding Sources**

*This project is facilitated by HAL in partnership with AUSVEG and is funded by the National Vegetable Levy. The Australian Government provides matched funding for all HAL's R&D activities.*



Date of Report  
30 November, 2008

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## **MEDIA SUMMARY**

As environmental issues become increasingly prominent on Government agendas and in the media, growers are becoming more conscientious about their methods of production and the impact their methods may have on the environment.

The EnviroVeg program which was introduced as a national vegetable industry program in 2000 has since that time also continued to evolve to ensure it can meet these agendas and requirements.

Following the re-write of the EnviroVeg manual in 2006-07 greenhouse and organic members stated that the information was based on conventional field production and didn't address some of the issues specific to their methods of production.

Following consultation with growers these gaps were identified and incorporated into the EnviroVeg manual and the update version has been made available to members.

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## TECHNICAL SUMMARY

Two desktop audits were conducted of existing material not covered in the EnviroVeg manual – one for greenhouse practices utilising current best practice as the baseline and the other to add practices identified from the AOS 2006 and NASSA 2004 Standards.

Once these were identified it was decided that rather than write up specific sections for each group, an onerous and repetitive process, it would be more beneficial to incorporate this information into the current material. This was also more practical as many growers were not just ‘conventional’ growers integrating some greenhouse or organic production on their farms.

The material was trialled with growers before final adaption to the EnviroVeg manual.

The updated EnviroVeg manual will be available to all levy paying vegetable growers. Availability will be promoted in all industry magazines, EnviroVeg & AUSVEG websites, papers, newsletters, through the IDO networks, grower associations, etc.

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## INTRODUCTION

EnviroVeg, a vegetable industry initiative, provided a set of guidelines for vegetable growers based on 'conventional' growing practices to identify, self-assess and continually improve environmental management on-farm. The guidelines did not include specific information for hydroponic, greenhouse or organic vegetable growers.

Following requests from members and other growers it was agreed by the Environmental Committee that it was necessary to provide these growers with a similar production method specific set of guidelines and tools to assist them to implement responsible environmental management practices on-farm.

Also members of the Australian Hydroponic & Greenhouse Association and also the Organic Federation of Australia were supportive and provided written endorsement and commented that it was very timely for their respective industries.

The integration of this specific material into the EnviroVeg program will assist growers using these methods of production to achieve one of the elements of the Vision Statement of the Vegetable Industry "that the Australian Vegetable Industry by 2010 will be cohesive, market focused, profitable and environmentally responsible; positioned as a serious competitor in the global food business and with a reputation for quality."

The updated EnviroVeg manual provides the supporting material and articulated structure to enable hydroponic, greenhouse and organic vegetable growers to demonstrate through self assessment and certification that they are being environmentally responsible both on-farm and to their surrounding environment through:

- Improved environmental practices on farm
- Identification and risk assessment of potential environmental impact through farming practices
- Adoption of best environmental management practices by growers

The benefits to Industry will be:

- Growers demonstrating their commitment to the adoption of best environmental practices to the community and other stakeholders.
  - Support for the implementation and achievement of Environmental Assurance for the vegetable industry
  - Growers being proactive and developing their own program for best environmental management practices
  - Continual improvement and profitability through best practice
-

## **MATERIALS & METHODS**

The methodology used to determine the gaps in information was quite simple

### **DEVELOPMENT OF GUIDELINES**

- EnviroVeg selected a consultant working within each industry to work with a technical committee to develop the guidelines.
- A literature review was conducted of all available information to identification of any gaps or existing guidelines.
- Existing and new material was used to fill the gaps.
- The modules were drafted.

### **TRIALS OF MATERIAL**

- Small trial groups of growers in each industry sector worked through the guidelines
- The results of trails were collated and material amended where necessary
- Final draft material was sent for design and printing
- The checklist, training material and records were updated to include new material.

### **DESIGN & PRINTING**

- The information was collated and incorporated into the existing EnviroVeg manual which then was redesigned, edited and printed.
- Documents and records were also amended where necessary.

### **DISSEMINATION OF MATERIAL**

- The availability of the material has been made known to growers through
  - the various industry media
  - EnviroNews
  - EnviroVeg & AUSVEG websites and publications.
  - The AHGA & OFA

### **MATERIALS DEVELOPED**

As all the information was incorporated into existing documentation, there is no specific “new” material. The EnviroVeg manual, Self-Assessment Checklist and training material have all been amended and updated to reflect the additional information.

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## RESULTS

The result of the project is a comprehensive EMS manual (EnviroVeg) that now incorporates all methods of production in one program.

All EnviroVeg manuals have been updated with the new inserts and sent to members.

### OUTPUTS:

- Industry specific information added to EnviroVeg manual
- Updated documentation and records to enable growers to achieve certification
- Ongoing support through the website

### OUTCOMES:

- Increase participation by growers other than “conventional” in the industry’s environmental program
  - An opportunity to work with the hydroponic and organic industries to incorporate their environmental issues into one document under one managed system
  - Minimising duplication of resources (and HAL expenditure)
  - Demonstrable records and practices
-

## TECHNOLOGY TRANSFER

The two consultants Jason Huggins (organics) and Domenic Cavallaro (greenhouse) trialled the information with small groups of growers. These growers were assisted to complete their EnviroVeg self-assessment and signed on as members of the Program.



*Domenic Cavallaro working with Virginia (SA) greenhouse grower Dihn Thi Vu*



The new manual was also presented at a hydroponic growers meeting in Coffs Harbour resulting in 6 new memberships with others taking the self-assessment home to complete.

*Hydroponic growers at Coffs Harbour (NSW) meeting.*

Jason also met with various Market Agents and distributors of “organic” produce to explain the Program and manual to them and seek their support in promoting it to growers.



*Granite Belt (Qld) organic growers – Ray Palmer and David Hardwick following a visit from Jason Huggins*



At this time the manual is not available on the EnviroVeg website, however Registration Forms and Self-Assessment Checklists as well as other material is available for download. Consideration will be given to making the manual available in a downloadable format.

## RECOMMENDATIONS

As previously demonstrated by the EMS Pathways project, unless there is interaction through workshop style delivery of EnviroVeg, the uptake will continue to be slow. Workshops and grower meetings present an ideal opportunity to explain to growers the detail of the Program and answer any questions.

The biggest hurdle to overcome with greenhouse growers is the terminology – ‘environment’ – surrounding v’s inside greenhouse. Making many of these growers aware that they need to manage the environment outside of their greenhouses as well as inside will take some effort. There is also the perennial issue of literacy both in the English and non-English languages.

### **Recommendations to EnviroVeg:**

1. Any future funding of the EnviroVeg Program should include a significant component of grower training and delivery.
  2. Make the EnviroVeg manual available on the EnviroVeg website.
  3. Consider producing a demonstrative DVD to enhance delivery of EnviroVeg training.
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## EXAMPLES OF CHANGES

### GREENHOUSE:

# Energy management

## About energy management

Vegetable growers use large quantities of energy to power vehicles, machinery, irrigation systems, coolrooms, lighting and equipment.

Most of the energy in Australia (including more than 90% of our electricity) comes from fossil fuels including oil, coal and gas. These energy sources are non-renewable, and are likely to become more costly in the future, as supplies run low

Use of fossil fuels has a significant effect on the environment.

- Use of fossil fuels releases carbon dioxide, nitrous oxide and methane into the atmosphere. These gases help to create the ‘greenhouse effect’ which is changing the Earth’s climate. In Australia our climate is becoming warmer.
- Use of fossil fuel also causes other forms of air pollution.

For further information on greenhouse gases and other forms of air pollution, refer to ‘Air quality management’.

## Objectives

- ✓ Energy use is managed responsibly. This means, where practical:
  - ✓ Energy use is minimised
  - ✓ Responsible energy sources are used
  - ✓ Energy use is managed to meet legal requirements
  - ✓ Energy use is managed to meet community expectations
-

## Responsible energy use

This section contains suggestions to help you to minimise your energy use and energy costs. **These principles should be adopted not only within production systems but also in your homes. There are many sources of information on becoming energy efficient that you can refer to that will assist in making changes, to limit the impact of the change and allow the change to be adopted easily.**

### Use off-peak (low cost) power where available

Schedule your activities which use large amounts of power (including irrigation and cooling of produce) for times when rates are lowest.

### Purchase energy-using products

Consider the following issues before you purchase products which use energy. Work with your suppliers to identify alternatives that will help you to minimise energy use.

Issue	Consider
Is the product needed?	Is the product necessary? Can you manage with a product that uses less energy (eg a vehicle with a less powerful motor)?
Does the product help to reduce energy use and greenhouse gas emissions?	Does the product have an energy-efficiency rating? Does the product have a high energy-efficiency rating?

### Crop production and property management

Manage your crop production, packing and transport to avoid and reduce energy use.

- Consider the layout of your farm. Identify any changes that you could make to reduce the amount of travelling you do on your farm.
- Plan your activities to improve the efficiency of your vehicle and machinery use. Minimise unnecessary journeys. Identify opportunities to do more than one job at a time.
- Minimise unnecessary cultivation passes (**see soil for benefits to reduced cultivation**) or where feasible, install a GPS on your machinery to prevent overlap or missed coverage.

### Irrigation management

Irrigation is one of the biggest users of energy in vegetable production.

Manage your irrigation to avoid and reduce energy use

- Use an efficient irrigation system which delivers only the water needed. **Refer to water (?) to assist with planning efficient irrigation systems and schedules. Assistance can be provided by primary industries.**
- Apply water only where and when it is needed. Plan your irrigation to irrigate when water loss from evaporation will be less.
- Use an efficient pump that provides only the pressure that you need.
- Develop a program to check, service and repair your pump and irrigation system regularly.
- Use an agricultural service provider to check that your pumps are running at or above 65% efficiency.

### Vehicles and machinery

- Develop a program to check, service and repair your vehicles and machinery regularly. Keeping engines tuned can reduce greenhouse emissions by 15%, as well as saving you money.
- Identify opportunities to reduce vehicle and machinery use and to save fuel.
- Use energy-efficient vehicles (dedicated LPG, electric, small or hybrid vehicles). Use of LPG can reduce greenhouse gas emissions by 15% compared with petrol or diesel.
- Use energy-efficient machinery. **Operate machinery efficiently. The car engine runs most efficiently between around 1,500 and 2,500 rpm (lower in diesels).**
- **Minimise fuel wastage by idling or leaving the vehicle/machine running when not in immediate use. Stop the engine whenever your vehicle/machinery is stopped or not in use for an extended period of time. By switching the engine off, even for a short time, you could save more fuel than is lost within the burst of fuel needed to restart it.**
- Select machinery that is appropriate for the task. Use the lowest-powered tractor capable of doing the task.
- Use the power that your machinery has. Increase the width of implements to match the tractor power.
- Use electric forklifts to minimise greenhouse gas emissions, and heating of your cool room.
- Use biodiesel (which is made from renewable resources and results in lower greenhouse emissions) where available.
- Subscribe to 'Greenfleet'. Greenfleet is a not-for-profit organisation that establishes trees to absorb greenhouse gas emissions from vehicles. Subscribers to the Greenfleet program get 17 native trees planted each year to absorb the greenhouse gases that the average vehicle produces.

### Office management

- Use 'power-save' functions on office equipment, including computers and photocopiers.
- Stand-by mode on office equipment still consumes energy. Turn off all office equipment and the lights when you finish work. If you will be away from the office for an extended period turn appliances off rather than leaving on in stand-by mode. This includes equipment such as monitors but also kitchen appliances such as microwaves and urns that can be turned off when not in use. Microwaves are not energy efficient clocks.
- Use energy-efficient office equipment, heating (gas rather than electric if possible) and lighting.

### Lighting

Turn lights off **at all** times when not needed, even if it is a short time. It does **not** take more energy to turn off a light then back on again if you leave the room for a short time than if you leave it on while you are away.

Establish a maintenance schedule

- Dirt and dust build-up can reduce light output by up to 50 per cent and can also decrease the life expectancy of fixtures and lamps, increasing costs.

Use energy-efficient lighting **in buildings and greenhouses**

- Compact fluorescent bulbs use five times less power than standard bulbs and last eight times longer.
- Metal halide or high-pressure sodium lights are more efficient than mercury vapour lights.
- Mercury lights create waste disposal problems as mercury is toxic. Check with your Council or waste management provider for waste management options. Check for recycling options.
- Fluorescents use about 70% less power than incandescent lamps of similar output.
- The most efficient fluorescent tubes have a 'triphosphor' coating and will produce about 15% more light for the same electrical energy as a standard tube. They also have a longer life and can be recycled.

Consider the design of your buildings

- Consider ways in which you can provide more natural light, or improve the layout of your lighting.
- Install daylight or movement sensors, and/or timers so that lights are only on when you need them.

**Consider positioning and aspect of new or extended buildings to maximise energy efficiency**

### Building design and management

- Ensure any new, altered or extended buildings meet standards for energy efficiency.
- Consider modifications to existing buildings to improve energy efficiency, including insulation and window coverings. **For example curtains and blinds, shade sails or shade cloth and planting hardy deciduous trees to screen in summer but allow sun to heat in winter.**
- **These principles also apply to greenhouse design, consult your g/h supplier for advice on chalking and shade-cloth and other ways to reduce the impact of heat and sun on your crops. Using native trees as a barrier for hot winds and dust and hardy deciduous trees to shade in summer can help reduce energy costs. This can also have added benefit of helping to reduce recharge and soil salinity.**
- Manage your buildings to keep them at a comfortable temperature with minimal energy input. For example, shade windows to reduce heating by the sun.

### Cool rooms

Design and manage your cool rooms to ensure that energy is not wasted.

- Build cool rooms within a shed, or where there is shade (eg next to a windbreak) to reduce the heating of the cool room.
- Ensure that your cool room, including the floor, is well-insulated.
- Install temperature control devices and calibrate them regularly. A one degree change in temperature can greatly increase your running costs and may affect the quality of your stored produce.
- Maintain door seals, hinges and catches to prevent leaking of warm air into your coolrooms. **To test door seals place a piece of paper in the door and close. If the paper can be pulled out easily with the door closed then you may need to reseal the door.**
- Check for and repair damage to the insulation, roof and walls.
- Minimise the amount of time that cool room doors stay open.
- If doors need to be kept open for long periods of time, use plastic door strips, automatic doors or rapid rise curtains to help keep warm air out of your cool room.
- Pre-cool vegetables before putting them into cool rooms.
- Operate your refrigeration unit only when needed to maintain produce at the required temperature. A locked-down and energy-efficient cool room should require less refrigeration.
- Use timers or thermostats to help you to minimise your refrigeration.
- Where possible schedule refrigeration during off-peak (low cost) periods.

## Responsible energy sources

This section contains suggestions to help you to reduce your reliance upon energy from non-renewable fossil fuels, and reduce your greenhouse gas production. Some alternative sources of energy may save you money. Check for information on rebates or other government incentives that may assist you.

### **Purchase ‘green power’**

Most electricity companies offer ‘green power’. This power is produced from energy sources that can be renewed including wind, water and the sun.

Green power costs a little more than electricity produced by conventional methods. However, you may be able to offset the cost of green power by improving your overall energy use efficiency.

Check with your energy authority to see if you are required to purchase green power.

### **Consider generating your own power**

Consider generating solar, wind or water power on your farm or the use of solar panels to power pumps or heating for greenhouses.

Many organisations offer grants/[rebates](#) to encourage installation of solar panels and other power generation equipment.

### **Consider using biodiesel fuel**

Biodiesel is a relatively new fuel and is only just starting to be come more widely available. It can be used to replace conventional diesel or in combination with conventional diesel.

## ORGANICS

# Pest management

## About pest management

Good pest management is essential to protect the health of soil, waterways and native vegetation and to support productive agriculture.

However, care is needed to ensure that pest management does not degrade soil, water or biodiversity.

Refer to (AOS 2006, Part 4.5. Pest, Disease and Weed Management, Sections 4.5.1-4 and NASAA, 2004, Part 4.14. Sections - 4.14.1-12).

## Objectives

Pests (including insects, nematodes, diseases, weeds and pest animals) are managed responsibly. This means that, where practical:

- ✓ Recognised Integrated Pest Management (IPM) techniques are used to manage pests
    - The health of soil, crops, native vegetation and other hosts is maximised
    - Appropriate natural predators and other beneficial organisms are encouraged
    - Use of chemicals is minimised
  - ✓ Pest management does not
    - Damage non-target vegetation or beneficial predators
    - Pollute soil or waterways
    - Cause chemical tolerance
  - ✓ Pest management is carried out to protect and improve biodiversity
    - Non-native pest animals are managed
    - Management of native pest animals does not impact on biodiversity
    - Weeds in native vegetation and waterways are managed
  - ✓ Pest management meets legal requirements
  - ✓ Pest management meets community expectations
-

## Responsible pest management

This section contains suggestions to help you to manage pests in your cropping areas, native vegetation and other parts of your property with minimal impact on soil, water, air and biodiversity.

### *Pest management options*

Pest problems occur when three things are present:

- the pest is present
- there is a host (your crop, or your native vegetation or waterway)
- site conditions are favourable (eg weather, soil moisture, temperature).

Integrated pest management involves changing one or more of these factors to help to prevent the pest from establishing and spreading.

Responsible pest management involves choosing the combination of options that will have least impact on the environment.

Goals	Options
Manage your property	Make site conditions less favourable for the pest to establish and spread
Manage the host	Create a healthy, more pest-resistant host
Learn to live with reasonable levels of the pest	Identify the level of pests that you are able to accept before you implement pest management methods ('pest threshold'). For example, the pest may be present, but not causing damage to the produce.
Manage the pest	<p>Use mechanical tools where practical</p> <ul style="list-style-type: none"> <li>Weed removal eg brushweeding</li> <li>Habitat removal eg for native animals</li> <li>Trapping eg for native animals, insects</li> <li>Barriers eg netting of crops</li> </ul> <p>Use biological tools where available</p> <ul style="list-style-type: none"> <li>Natural predators and other beneficial organisms</li> <li>Biological pesticides</li> </ul> <p>Use chemical tools where required to supplement other methods</p> <ul style="list-style-type: none"> <li>Narrow-spectrum pesticides</li> <li>'Soft' chemicals including biological sprays</li> </ul>

Refer to (AOS 2006, Part 4.5. Pest, Disease and Weed Management, Sections 4.5.1-4 and NASAA, 2004, Part 4.14. Sections - 4.14.1-12).

## Property and host management

### *Hygiene*

- Practice good hygiene across your whole property to avoid bringing pests onto your property and spreading them.

### *Crop production (See also 'Soil management' and 'Water and waterway management')*

- ***Ensure seedlings, other propagation material, and mulches and composts are pest-free.***
- Consider using approved pest-resistant varieties where this will not cause other problems (eg spread of herbicide-resistant plants into native vegetation)
- Consider alternate hosts. For example, weeds may harbour thrips and other insects which can transmit viral diseases.
- Plan crop spacing and row orientation to provide air flow and allow for space for pest management (eg weed cultivation).
- Use organic mulches and compost to help manage weeds, as well as to improve soil structure and reduce water evaporation. Compost should be free of disease and weed seeds. Ensure crop and other plant residues break down.
- Break the reproduction cycles of pests, and encourage natural predators and other beneficial organisms. Where possible, rotate crops regularly, fallow between crops and grow two crops in the same area (inter-cropping or alley cropping)
- Consider planting your crop outside the time when a pest is most active.

- Manage nutrition and irrigation to maintain healthy soil and crops. Avoid creating conditions which may encourage pests. For example, high nutrient levels or soil moisture may encourage weeds.

### Native vegetation management (*See also 'Biodiversity management'*)

- Maintain the health of your native vegetation to increase resistance to pests.
- Avoid creating conditions which may encourage pests. For example, high nutrient levels or soil moisture may encourage weeds. Soil-borne disease (eg cinnamon fungus) may be encouraged by waterlogging of soil.
- Protect and restore the vegetation layers (trees, shrubs, grasses, ground covers and leaf litter) you would expect to find in your native vegetation. This will help provide habitat for natural predators, and help to discourage weeds.

### Water storage and waterway management (*See also 'Biodiversity management' and 'Water and waterway management'*)

- Maintain the health of your waterways to increase resistance to pests.
- Avoid creating conditions which may encourage pests. For example, high nutrient levels may encourage weeds or algae.
- Where appropriate, protect and restore the vegetation and other habitat layers (including logs, snags and rocks) you would expect to find in and around your waterways.
- Provide this habitat around your farm water storages. This will help provide habitat for natural predators and other beneficial organisms, and maintain water quality.

Refer to (AOS 2006, Part 4.5. Pest, Disease and Weed Management, Sections 4.5.1-4 and NASAA, 2004, Part 4.14. Sections - 4.14.1-12).

## Pest management tools

### *Natural predators and other 'beneficials'*

- Improve and extend habitat around your crop production areas to encourage a range of native predators including insects (eg lacewings, ladybirds), amphibians (eg frogs), insect-eating birds (eg honeyeaters), predatory birds (eg hawks) (see also 'Biodiversity management' and 'Water and waterway management').
- Manage your crops to increase habitat for natural predators and other beneficial organisms (see 'Crop production' above).
- Take natural predators into account before deciding to use chemicals, or selecting specific chemicals.
- Consider introducing approved predators or other beneficial organisms to manage pests.
- Check with DPI or other advisors to ensure that non-native beneficial organisms will not cause damage to your native biodiversity.

## Chemical use

Inappropriate use of chemicals can:

- contaminate soil and waterways,
- affect non-target species eg native vegetation, beneficial organisms, or native wildlife (eg from poison baiting of animal pests) and
- create tolerance to chemicals.

Refer to (AOS 2006, Part 4.5. Pest, Disease and Weed Management, Sections 4.5.1-4 and NASAA, 2004, Part 4.14. Sections - 4.14.1-12).

## Minimise impacts on the environment

### *For further information, see also 'Chemical management'.*

- Avoid routine chemical application. Only use chemicals as part of a plan, and if pest levels exceed pre-determined threshold levels.
  - Minimise use of chemicals. Apply chemicals only to the target, when the pest is present, and at a stage where it is most easily managed.
  - Take natural predators into account before deciding to use chemicals.
  - Only use chemicals which are registered for the target pest and follow instructions on the label.
  - Consider 'soft' options for pest management including soaps and oils and narrow-spectrum pesticides.
  - Use biological pesticides where available and practical.
  - Apply chemicals in the right weather conditions to minimise the risk of spray drift or washing of the chemical by rain.
  - Consider alternatives to fumigants. Use fumigants only as a last resort.
-

- Use alternatives to methyl bromide (an ozone-depleting substance which is to be phased out by 2010 under the terms of the Montreal Protocol).
- To minimise the risk of chemical tolerance, rotate between chemicals which have a different mode of action.

***Develop a chemical management plan for each pest:***

- Recognised ‘soft’ and other chemicals to be used
- Stage of pest life cycle where chemicals to be used
- Application rates
- Frequency of use
- Rotation plan

Refer to (AOS 2006, Part 4.5. Pest, Disease and Weed Management, Sections 4.5.1-4 and NASAA, 2004, Part 4.14. Sections - 4.14.1-12).

***Managing specific pests***

**Insects**

- Practice good hygiene and property and crop management to minimise the risk of pests occurring and spreading.
- Monitor crops for signs of insect attack on a regular basis

**Disease**

- ***Disease of crops and other hosts may be caused by fungi, bacteria, viruses or nematodes.***
- Practice good hygiene and property and crop management to minimise the risk of disease occurring and spreading.
- Monitor site conditions (including weather) and use scientific prediction models to help you to predict likely outbreaks of disease and to restrict disease spread early.
- Monitor crops for signs of disease on a regular basis.

**Weeds**

- Consider how you can alter conditions eg wet soil which may be encouraging weed invasion.
- ***Before managing weeds, consider what you will replace them with. Bare soil will only encourage further weeds.***
- ***To retain soil cover, consider if you can tolerate weeds, or slash them, rather than removing them.***
- Use organic mulches and compost to help manage weeds.
- Consider mechanical weed removal methods, where these will not damage soil.
- Native pest plants may be protected under legislation.
- You may have obligations to control certain weeds. Landowners must take all reasonable steps to control ‘declared’ weeds on their property, and prevent them from spreading to other areas.
- Work with your neighbours for more effective results over a wider area.

***Pest animals***

Check for legal requirements before starting any pest management program.

- Native pest animals may be protected under legislation.
- You may have obligations to control certain pest animals.
- Lethal methods such as shooting or baiting may require permits or licences.

Obtain specialist advice on managing native animal pests. Consider options which allow you to live with native animal pests, and increase biodiversity on your property.

- Encourage natural predators eg hawks.
- Fence your crop to exclude browsing animals like wallabies.
- Net your crop to exclude birds.
- Provide alternative habitat (eg nesting boxes for possums).
- Reduce access to water.
- Sound and light systems (eg for birds).

Consider methods which stress or kill native animals as a last resort.

- Trapping and relocation (eg of possums) can stress the animals so much that most will die.

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Manage non-native pest animals including foxes and rabbits and other ‘declared’ pests to protect your crop and increase biodiversity on your property.

- Use the most humane methods.
- Remove dens and other harbour.
- Work with your neighbours for more effective results over a wider area.

Refer to (AOS 2006, Part 4.5. Pest, Disease and Weed Management, Sections 4.5.1-4 and NASAA, 2004, Part 4.14. Sections - 4.14.1-12).

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