

**Building partnerships with
regional NRM bodies using
EnviroVeg as a resource
management tool**

Richard Mulcahy
AUSVEG Ltd

Project Number: VG08110

VG08110

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**Building Partnerships with NRM Regional Bodies using
EnviroVeg as a Resource Management Tool**

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Know-how for Horticulture™

Building Partnerships with NRM Regional Bodies using EnviroVeg as a Resource Management Tool

Project Code: VG08110

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Project Purpose:

The purpose of this project was to build upon the momentum developed during the Environmental Management System Pathways Project entitled 'Building a cooperative partnership between Regional NRM Bodies and the Vegetable Industry – a national approach', as well as to continue the work undertaken through the Healthy Soils for Sustainable Vegetable Farms Project. Key outputs of these earlier projects were the production of an updated version of the EnviroVeg Manual, checklist and workshop program, as well as the development and dissemination of the popular Healthy Soils Ute Guide, DVD and workshop series. The current project was designed to continue to raise awareness, educate and train vegetable growers in the use of these products, with a particular focus on further developing relationships with Natural Resources Management (NRM) regional bodies. One of the main outcomes of the work was to benchmark the EnviroVeg Manual against environmental issues and targets in NRM regions, and to encourage vegetable growers to become more involved in wider catchment management decision-making processes.

Acknowledgements:

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Date of report: 30th November 2009

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Building Partnerships with NRM Regional Bodies using EnviroVeg as a Resource Management Tool

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Building Partnerships with NRM Regional Bodies using EnviroVeg as a Resource Management Tool

Project/Technical Summary:

Vegetable growers across Australia live and work in diverse catchment communities, vital contributors to the cultural, economic and social life of their local communities. The environments in which vegetables are grown are also diverse, and vegetable growers need to work closely with their local Natural Resources Management (NRM) body to ensure they are aware of wider catchment decisions, incentives and approaches to sustainably manage shared land and water resources. This project was designed to build on previous work that established relationships with NRM bodies and started to raise awareness about the potential benefits for vegetable growers in accessing and getting involved in wider catchment management activities and decision making processes. The project was guided by four outcomes:

1. The development of a matrix of NRM objectives and targets by region against current recommended industry environmental practice (EnviroVeg).
2. The facilitation of partnerships between Industry, through AUSVEG, and regional NRM bodies leading to a better understanding and cooperation between the sectors.
3. The demonstration of responsible environmental stewardship by vegetable growers to the community as well as to domestic and international markets.
4. Increased grower understanding and skills for soil health testing and interpretation.

The project achieved the first of these outcomes through an analysis of the EnviroVeg Manual against a representative sample of NRM objectives and targets for each State and Territory. This analysis revealed that the EnviroVeg Manual is well placed to link vegetable growers to wider NRM activities, providing practical management strategies that relate directly to the

achievement of NRM objectives and targets. Further work now needs to be done with NRM bodies to tailor the EnviroVeg Manual at a regional level so that it provides vegetable growers with information about the initiatives their local NRM body is undertaking, and the opportunities that exist for them to engage with, and contribute to, wider catchment management activities and decisions.

The latter three outcomes involved face-to-face interaction with NRM Regional Bodies and vegetable growers, with the running of twelve regional workshops and three soil pit demonstrations used to achieve this. Four of these workshops focused specifically on the EnviroVeg Manual and its' on-ground implementation, with another four taking a broader approach and considering 'Climate Change Impacts on the Vegetable Industry: Opportunities and Risks'. The healthy soils component of the project involved the running of four practical workshops where the latest science and its application on-farm was discussed, as well as three soil-pit demonstrations at large industry field day events. Over the eighteen months of the program 41 new EnviroVeg members were recruited following attendance at one of the workshops/pit demonstrations. This brings the total number of EnviroVeg members up to 153, with 38 of these moving through to audited EnviroVeg status.

Overall, this project has further strengthened relationships between NRM regional bodies and vegetable growers, with the EnviroVeg Program being a critical linking agent for the two groups. Vegetable growers have also had the opportunity to attend informative workshops with access to researchers, the latest science and practice, and supporting materials to enable them to implement sustainable management strategies on-farm. This work now needs to continue with another phase of the EnviroVeg Program continuing the promotion and practice of sustainable vegetable growing.

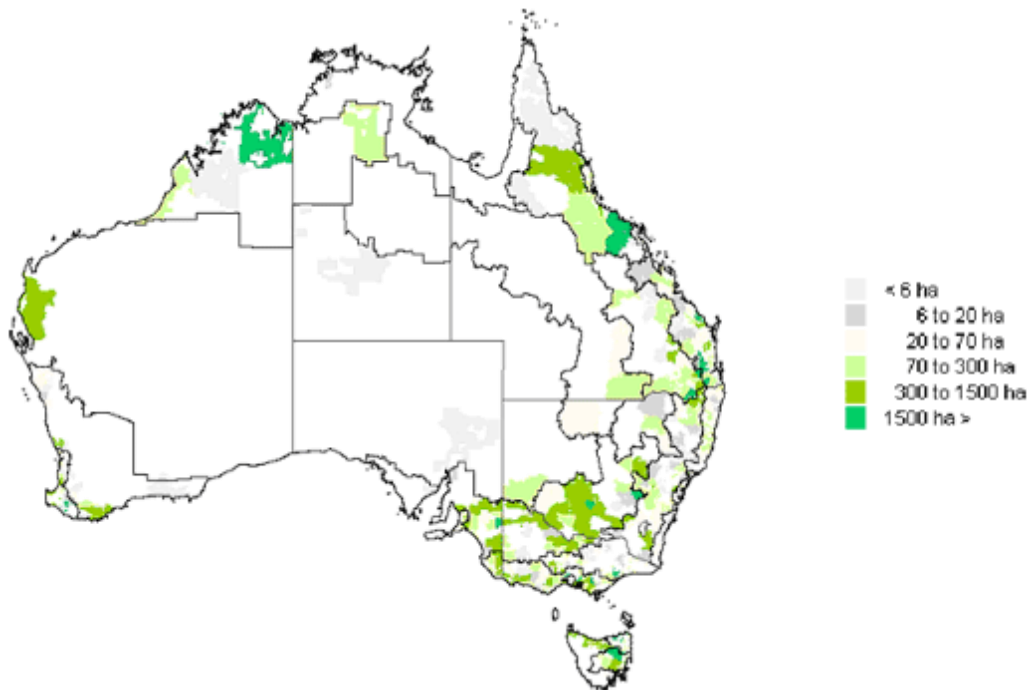
Introduction:

In order to facilitate the integrated delivery of NRM priority issues, the Australian Government, in association with state and territory governments, has identified 56 regions covering all of Australia. In most cases, regions are based on catchments or bioregions. An integrated NRM Catchment Management Plan, developed within local communities, and supported by government and the best available science, has now been developed for each region. These plans consider the environmental, social and economic impacts of NRM decisions on a regional basis, and aim to improve the sustainable management of natural resources on a regional scale. In order to ensure the best outcomes, investment in NRM Catchment Management Plans by governments and other organisations is based on the establishment of clear targets and appropriate monitoring. At least one NRM body was formed in each region to undertake the important task of managing and protecting the region's natural resources. The 56 NRM regions are shown in the map below:



Source: <http://www.environment.gov.au/biodiversity/threatened/nrm-regions-map.html>

Every vegetable grower in Australia lives and works in one of these NRM regions, yet in previous projects that investigated the links between NRM bodies and local growers, it was discovered that there was a low level of awareness and involvement by vegetable growers in local decision making processes and catchment planning. The map below shows those regions where vegetable growing occurs.



Source: <http://www.anra.gov.au/topics/agriculture/>

Given the important economic, cultural and social roles played by vegetable growers in their local communities, as well as the proximity of vegetable growing industries to urban and peri-urban areas, the lack of connection between NRM bodies and vegetable growers is a cause for concern. Vegetable production relies on access to secure, good quality water, and this has become a fundamental issue for the ongoing viability of the sector in many regions. Vegetable growers need to be aware of the NRM Catchment Management Plans for their region and know what is likely to occur in terms of future water allocation and land management strategies. One

of the best ways to do this is for vegetable growers to be involved in the decision making processes governing land and water management in their region.

This project has sought to build on previous work and establish stronger linkages between vegetable growers and NRM bodies, as well as demonstrating the mutual benefits that each group can accrue as a result of working together.

National NRM Objectives

The following specific national objectives were developed for NRM Catchment Management Plans to guide investment strategies that:

- » promote sustainable resource use, particularly sustainable agriculture.
- » protect and improve the condition of land, water (including groundwater) and vegetation resources that provide the ecosystem services that support sustainable resource use industries.
- » improve water quality and environmental condition in surface and ground water systems, including wetlands and estuaries, while maintaining the economic and social values derived from water use.
- » protect our coastal catchments, ecosystems and the marine environment.
- » reverse the decline in the extent and quality of native vegetation and maintain and restore habitat for flora and fauna.
- » protect and manage places and values of national environmental significance, including threatened species and communities, listed migratory species, RAMSAR wetlands of international importance, world heritage areas and national heritage places.
- » promote Indigenous community participation in the planning and delivery of regional NRM outcomes.

These national objectives have been considered in each of the NRM regions through the development of their Catchment Management Plans. The focus of these objectives is on sustainable environmental and productivity outcomes, with agricultural industries specifically mentioned as key stakeholders. Given this emphasis, vegetable growers need to ensure their needs are considered in the activities and decisions made by NRM bodies. One of the ways of doing this is to ensure strong organisational links exist between local NRM bodies and vegetable growing groups.

To commence this process, this project has reviewed a sample of NRM Catchment Management Plans against the EnviroVeg Manual, a key document for vegetable growers containing practical management advice for improving on-farm environmental and productivity outcomes. Linking the two documents together, has revealed that vegetable growers complying with EnviroVeg Manual recommendations will generally meet their local NRM Catchment Management Plan objectives and targets and, in some cases, qualify for incentive funding to assist them to further improve their environmental credentials.

The synergy between these documents can now be further developed so that each vegetable growing region tailors their EnviroVeg Manual so that it links directly to the local NRM Catchment Management Plan, and is endorsed by the NRM body and other agencies working in the region, such as the Environment Protection Authority and Department of Primary Industries. Having this joint agency support would enable vegetable growers to feel confident that following the EnviroVeg Manual ensures they are meeting any regulatory and recommended management practices encouraged by the range of different land and water management agencies that operate in vegetable growing regions.

A further aspect to this project has been to raise awareness about environmental issues and to disseminate the latest research to vegetable growers and how it can be applied on-farm. To do this, twelve workshops and three soil-pit demonstrations have been undertaken in different regions across Australia. The workshops have featured experts from research, practice and grower organisations, and have demonstrated how environmental and productivity benefits can

be improved. Importantly, each of these events has been attended by the relevant regional NRM body, as well as other local agencies working in the region (Dept of Primary Industry, industry groups, Landcare, Drum Muster etc.). The workshops have attracted a minimum of 7 (Cowra) growers through to a maximum of 25-30 growers in our Bowen and Cranbourne Healthy Soils event.

The workshops have been featured in Vegetables Australia magazine with supporting documentation, and new web resources have also been provided. Workbooks, flyers and links to other relevant websites have also been developed so that interested vegetable growers and NRM bodies can seek more information about different topics. Three topics have been used to focus the workshops; the first has been the EnviroVeg program with four workshops featuring the EnviroVeg Manual and self-assessment checklist process; the second group of workshops selected climate change as a topical issue, with forums investigating 'Climate Change Impacts on Vegetable Growing: Opportunities and Risks'; the third group of workshops focused on managing for healthy soils, with some practical pit demonstrations, as well as the latest research being discussed and on-ground application practices outlined.

Overall, this project has raised awareness about the EnviroVeg Program and its' supporting resources amongst the NRM regional bodies involved in the workshops. It has provided an effective vehicle for demonstrating linkages between vegetable growers and NRM bodies through the development of the NRM/EnviroVeg matrix and the on-ground workshops. This sound basis can now be further built upon to further develop the capability of vegetable growers to get involved in their local NRM region, and to better manage their farm for environmental and productivity objectives.

Materials and Methods:

The following section is organized against the project's two main methods used to achieve outcomes:

1. The development of a matrix of NRM objectives and targets by region against current recommended industry environmental practice (EnviroVeg Manual)
2. Raise Awareness and Increase Uptake of EnviroVeg by NRM Regional Bodies and Vegetable Growers

1. The development of a matrix of NRM objectives and targets by region against current recommended industry environmental practice (EnviroVeg Manual)

As discussed previously, at least one regional body has been formed in each region to undertake the important task of managing and protecting the region's natural resources. Members of the body represent a broad cross section of the local community including landholders, as well as local NRM and agriculture (horticulture) government employees. Each body, in consultation with the local community, has developed an integrated NRM Catchment Management Plan which has been accredited by the Commonwealth Government. Following accreditation of a region's NRM plan, regional bodies are responsible for developing investment strategies to achieve Catchment Management targets. Essentially, these strategies form the region's business plan, and are used to attract investment from the Commonwealth and State governments. The main sources of funding that are relevant to vegetable growers and which can be accessed through the regional NRM Investment Plans are '*Caring for our Country*' and '*Water for the Future*'.

- » *Caring for our Country* is the main source of funding through which regional bodies access Commonwealth funding for NRM activities within their catchments. Proposals for funding have to show how the activities will contribute to the achievement of targets in six priority areas. One priority area is 'Sustainable Farm Practices'. This provides funds to encourage the adoption of on-farm land management practices that maintain and improve production and deliver ecosystem services for the whole community. Targets in this area include; assisting farmers to improve their management to reduce the risk of soil acidification and soil loss through wind erosion, water erosion and improve carbon content of soil. The program also encourages the adoption of property management plans to improve the environment, as well as improving the knowledge and skills of natural resource managers.

- » *Water for the Future* is a Commonwealth program that will invest \$12.9 billion over 10 years in strategic programs, improved water management arrangements and water policy reforms. The priorities for *Water for the Future* are:
 - Taking action on climate change
 - Using water wisely
 - Securing water supplies
 - Supporting healthy rivers

Of particular interest to vegetable growers is the \$5.8 billion committed to help irrigators make better use of the water that is available by upgrading infrastructure. This includes identifying water-loss hotspots in existing irrigation delivery systems, as well as pilot projects to improve the efficiency of on-farm irrigation infrastructure.

What are the benefits for Vegetable Growers?

Regional NRM bodies are keen to involve as many of the local community, especially landholders, in the development and implementation of their Catchment Management Plans. Benchmarking the EnviroVeg Manual against a sample of NRM Catchment Management Plans

reveals that it matches very well with the priority areas and targets that can be funded by Government programs. Vegetable growers are more likely to access these funds by working with their local regional NRM bodies. Other benefits for vegetable growers include:

- » Participating in relevant field days e.g. soil management, weeds and pest management.
- » Exchanging ideas with other landholders.
- » Having an input into the NRM of the catchment.
- » Getting assistance to achieve implementation of the EnviroVeg Manual and industry accreditation.

What does the NRM matrix look like?

The NRM matrix benchmarks the EnviroVeg Manual against targets and objectives developed through a particular region's Catchment Management Plan. Each of these Plans reflects the National priorities outlined in policy documents like *Caring for our Country*, *Water for the Future* and other Commonwealth and State initiatives. In effect, the NRM matrix provides a 'cascade' of National through to State, Regional and finally on-farm application of NRM priorities. Ideally, this process is iterative, with feedback built in so that priorities and approaches are updated as new information and experience becomes available (see Figure 1).

Figure 1: Cascade of NRM Priorities through to On-farm level



A further level of detail is provided by linking the EnviroVeg Self-Assessment checklist recommendation to the NRM Catchment Management Plan objectives. Interestingly, the EnviroVeg material is more detailed and explicit than that provided by the NRM body. This is because when the EnviroVeg Manual and Self-Assessment checklist were developed, attention was paid to ensuring that growers were given clear, unambiguous guidance about what they needed to do on-farm to address particular aspects of environmental management. NRM bodies will find this level of detail extremely useful, as it automatically provides them with specific vegetable industry information that can be applied and easily measured. The following section demonstrates how the NRM matrix can be used to establish clear links between the targets and management objectives of the NRM regional body, with the recommendations provided in the EnviroVeg Manual and Self-assessment checklist. The example below shows one of the more general Port Phillip and Westernport Catchment (Vic) Targets and how it links across to the Property and Business Management component of the EnviroVeg Manual and Self Assessment Checklist.

Figure 2: Example of NRM/EnviroVeg Matrix

| Port Phillip and Westernport Catchment Targets Source: Catchment Plan | EnviroVeg Management Objectives Source: EnviroVeg Manual | Port Phillip and Westernport Management Targets Source: Catchment Plan | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
|--|---|---|---|
| Catchment Target The community valuing, | Property & Business Management Property and business | Community Participation Targets | EnviroVeg checklist » Own and use a copy of |

| | | | |
|--|---|---|---|
| <p>understanding and celebrating the region's catchment assets and acting to achieve sustainability</p> <p>PT5. Increase community awareness and understanding of the condition of catchment assets and associated trends.</p> <p>Maintain the region's ecological footprint at or below the 2003 level, and reduce the average ecological footprint (per capita) by 25% by 2030.</p> | <p>management is environmentally-responsible. This means that, where practical:</p> <ul style="list-style-type: none"> » Protection and improvement of the environment is considered in daily decisions and activities » Growers support environmental improvement in their catchment and supply chain » Property plans include environmental as well as other personal, farm and business goals » Property and business management meets community needs for healthy and productive catchments | <ul style="list-style-type: none"> » Plan and conduct community involvement in integrated catchment management » Facilitate coordination and share information » Enable rural communities, industries and landholders to identify, discuss and resolve priority issues relevant to catchment management. | <p>the EnviroVeg Manual</p> <ul style="list-style-type: none"> » Conduct EnviroVeg Self Assessment annually » Develop an Environmental Action Plan taking account of legal farm business requirements » Be aware of catchment priorities and targets for region and incentives to further on-farm environmental activities » Have a property map showing farm paddocks, production areas, water storage, waterways, buffer zones, |
|--|---|---|---|

Six States and one Territory (there is no commercial vegetable growing in the Australian Capital Territory) have been analysed using this matrix, with one of the EnviroVeg/Healthy Soils regions chosen as the 'worked' example. In the next phase of EnviroVeg it would be good to take each of these examples and get 'sign off' in the regions they ~~are~~ represent from the relevant land and water management agencies. The EnviroVeg Manual could then be tailored for each of those regions, with the process of how this is done clearly documented so other regions can do the same.

NRM / EnviroVeg Matrix: Easy Index

Tasmania
NRM North
pgs 14-23

Victoria
Westerport & Port Phillip Bay
CMA
pgs 24-30

New South Wales
Lachlan CMA
pgs 31-37

Queensland
Burdekin Dry Tropics
pgs 38-45

Western Australia
Swan Catchment
pgs 46-53

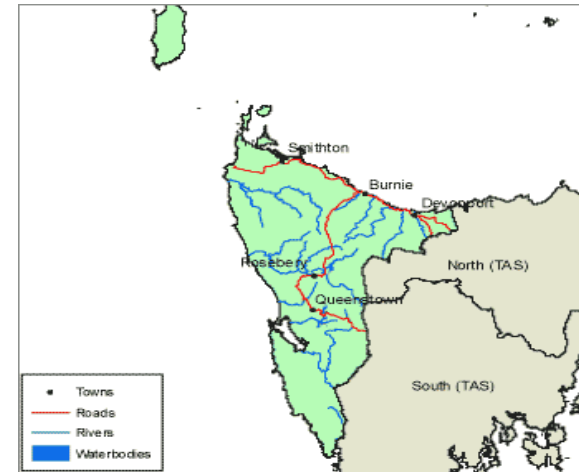
Northern Territory
NT NRM Region
pgs 54-60

South Australia
pgs 61-68

Natural Resources Management and EnviroVeg Matrix Tasmania - Northern Tasmania Natural Resource Management

Key NRM Agencies:

Northern Tasmania Natural Resource Management Association; Environment Protection Authority; and the Commonwealth Department of Climate Change



| Northern Tasmania Catchment Targets Source: | EnviroVeg Management Objectives Source: EnviroVeg Manual | Northern Tasmania Catchment Management Targets Source: | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
|--|--|---|--|
| <p>The community understanding NRM issues and appreciating the region's natural resources</p> <p>The community is actively engaged in, and taking care of the regions natural resources.</p> <p>Natural resource managers, including landholders and community groups, are equipped with the skills needed to be effective NRM managers.</p> <p>Appropriate institutional arrangements, structures and policies in place to enable effective community engagement in NRM.</p> | <p>Property & Business Management</p> <p>Property and business management is environmentally-responsible. This means that, where practical:</p> <ul style="list-style-type: none"> » Protection and improvement of the environment is considered in daily decisions and activities » Growers support environmental improvement in their catchment and supply chain » Property plans include environmental as well as other personal, farm and business goals » Property and business management meets | <p>Community Participation Targets</p> <ul style="list-style-type: none"> » By 2010 60% of people in the region understand the meaning of NRM and accept best practice as an integral part of their lives. » Land managers utilizing science based information systems put in place under the NRM strategy to improve understanding, awareness and skills to achieve improve NRM. » All the Northern Municipalities have effective mechanisms in place to guide local level NRM decision-making activities. | <p>EnviroVeg checklist</p> <ul style="list-style-type: none"> » Own and use a copy of the EnviroVeg Manual » Conduct EnviroVeg Self Assessment annually and review progress » Develop an Environmental Action Plan taking account of legal farm business requirements » Be aware of catchment priorities and targets for region and use incentives to further on-farm environmental activities » Have a property map showing farm paddocks, production areas, water storage and waterways, buildings, access |

| | | | |
|--|--|---|---|
| | community needs for healthy and productive catchments | | roads, buffer zones and sensitive areas, and develop management strategies that promote sustainable outcomes in each area |
| <p>Balance between production and conservation vales</p> <p>The soil condition for specified soil/land use combinations will be maintained at 2005 benchmarks.</p> <p>The rate of increase of groundwater height and salinity concentration, and the area affected by salt reduced compared with trends in 2015.</p> <p>Increase the area for which land use matches land capability.</p> | <p>Soil & Nutrition Management</p> <p>Healthy soils are managed to support productive agriculture and protect the environment. Soils need to be managed responsibly so that where practical they are protected from degrading processes and are managed so that:</p> <ul style="list-style-type: none"> » Soil structure, carbon, biodiversity, fertility and condition is improved using methods which do not pollute waterways or air » Soil is managed to meet community needs for healthy and productive catchments | <p>Soil Health Targets</p> <ul style="list-style-type: none"> » Planning and policy frameworks in place to manage the impact of salinity on critical assets. » Planning and policy frameworks in place to mitigate decline in land condition. » Agricultural land managers participating in property planning courses. » Land managers implementing best practices to minimise degradation of geo-heritage | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Know soil types and soil testing to find out pH value, organic matter, nutrient, salinity and sodicity levels » Assess soil health on farm and put in place practices to prevent erosion and degradation » Have all weather access for vehicles » Manage irrigation to minimise damage to soil from runoff, erosion, water logging, rising water tables, nutrient and salinity transport » Apply fertiliser and nutrient only when needed to meet crop needs » Maintain high soil organic matter and biodiversity levels by using compost or crop rotation or intercropping » Locate manure and fertiliser storages to ensure no runoff into crops or pollution of waterways or groundwater |

| | | | |
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| <p>Sustainable balance between environmental, economic and social use of water while enhancing water quality</p> <p>The region will achieve a permanent reduction in peak concentrations and total nutrients, sediment and salinity at key stream monitoring sites compared to 2006 levels.</p> <p>All water will be managed consistent with sustainable yields of water and the provision of water for ecosystems.</p> <p>Estuarine marine and water quality at key estuary and in-shore monitoring sites will be at, or better than 2010 benchmarks.</p> | <p>Water & Waterway Management</p> <p>Clean water and healthy waterways, including rivers, creeks and wetlands, are important for your farm, the rest of your catchment, and your community. Water and waterways need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Community water resources are used responsibly » Water is taken from sustainable sources » Water storages contribute to biodiversity and wherever possible waterway health is improved and maintained » All waterway works are carried out only with the approval of the waterway manager » Water is managed to meet community needs for drinking, recreation, biodiversity, scenery » and agriculture | <p>Water Management Targets</p> <ul style="list-style-type: none"> » Catchment specific water quality targets and monitoring developed. » Industry organisations are involved in partnership with water resource managers. » Water quality of rivers and stormwater input into key estuaries is improved as measured by nutrients, turbidity and point and diffused source pollutants compared to 2006 levels. | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Water harvesting complies with regulatory requirements » Risk assessment used to assess water sources and future water supply » Irrigation water treated to minimise the risk of environmental harm » Irrigation schedules and plans used to take account of weather patterns and predictions; water stress symptoms; rainfall and wetting front detectors » Efficient irrigation system used that minimises energy use and is checked regularly » Supply and discharge water monitored to check pH and electrical conductivity » Water loss minimised by checking and repairing leaks; recycling water where possible, reducing evaporative losses and catching runoff and tailwater into sumps, settling ponds or grassed channels before it goes into storage. |
| <p>Managing invasive pests and diseases</p> <p>The extent and impact of</p> | <p>Pest Management</p> <p>Good pest management is essential to protect the health of soil,</p> | <p>Pest Management Targets</p> <ul style="list-style-type: none"> » Planning and policy frameworks in place to | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Use an Integrated Pest Management for the |

| | | | |
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| <p>regionally significant invasive vertebrates, invertebrates and vegetative pests and diseases will be below 2005 levels.</p> | <p>waterways and native vegetation and to support productive agriculture. Care is needed to ensure that pest management does not degrade soil, water or biodiversity.</p> <ul style="list-style-type: none"> » Pests (including insects, nematodes, diseases, weeds and pest animals) need to be managed responsibly. » This means that, where practical: Recognised Integrated Pest Management (IPM) techniques are used to manage pests » The health of soil, growing media, » crops, native vegetation and other hosts is maximised » Appropriate natural predators and other beneficial organisms are encouraged » Pest management meets community expectations | <p>support integrated management of potential pest plant, animals and diseases.</p> <ul style="list-style-type: none"> » Planning and policy programs in place to support introduced fauna (e.g. feral cats, rabbits pigs and foxes) implemented. » The extent of weed infestation on private land is contained and reduced by levels to be determined compared to 2006 levels. | <p>monitoring of pests and diseases that takes account of legal requirements for responsible pest management</p> <ul style="list-style-type: none"> » Apply products only when pest monitoring or advice from experts indicates that treatment is needed to prevent unacceptable damage to crops or other hosts » Practice good hygiene to minimise introduction and spread of pests and diseases » Recognise and promote beneficial insects for pest and disease control » Ensure management of native pest animals and disease does not impact on biodiversity |
| <p>Protecting, conserving and enhancing the regions biodiversity</p> <p>The extent and distribution of present and priority native vegetation types will be maintained above 1996 levels, and specified native vegetation classes will be maintained above 2006 levels.</p> | <p>Biodiversity Management</p> <p>biodiversity (or biological diversity) means 'the variety of life'. Biodiversity helps to support a healthy environment, and to support and improve human life. On-farm biodiversity needs to be managed responsibly. This means</p> | <p>Biodiversity Management Targets</p> <ul style="list-style-type: none"> » 80% of regional vegetation is being managed in a manner consistent with regionally agreed codes of practice. » There is no net decrease in the extent of riparian | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and protect areas that are significant native habitat, vegetation and wildlife corridors, riparian areas and other significant water habitats » Biodiversity Action Plan is part of the Property Management |

| | | | |
|--|--|---|---|
| <p>The conservation status of significant native species and their habitats will be maintained at or above 2006 levels.</p> | <p>that, where practical:</p> <ul style="list-style-type: none"> » Native vegetation is protected, improved and increased to meet catchment goals » Native wildlife is protected and its habitat is improved and increased » Biodiversity in and around waterways and water storages is protected, improved and increased » Soil biodiversity is increased » Biodiversity is managed to meet community expectations | <p>vegetation in all catchments.</p> <ul style="list-style-type: none"> » Planning and policy frameworks are in place to mitigate loss of threatened populations, species and communities. | <p>Plan and takes account of all legal requirements in relation to biodiversity management</p> <ul style="list-style-type: none"> » Farming activities minimise the risk of damage to native vegetation from threats including sediment, pesticide and fertiliser drift, vehicles, cultivation and pest plants, animals and diseases » Efforts made to increase biodiversity habitat on-farm |
| <p>Achieving an ambient air quality and low level of greenhouse gas emissions that protects current and future generations</p> <p>Greenhouse gas emissions will be no more than 8% above 1990 levels.</p> <p>By 2015 , the amount if gren waste burned reduced by 100% excluding planned burning operations.</p> <p>The area of carbon sinks will be at leaset 10% greater than 2008 levels. (see also below)</p> | <p>Air Quality Management</p> <p>Air pollution is minimised, this means where practical:</p> <p>Farm activities are managed to minimise production of greenhouse gas</p> <p>Greenhouse gas is stored using native vegetation or other methods</p> <p>Other air pollution is minimised in accordance with legal requirements.</p> | <p>Management Objectives</p> <ul style="list-style-type: none"> » Scientifically informed and publicly accessible information system in place to improve understanding, awareness and skills to facilitate management of ambient air quality. | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Comply with the relevant regulatory requirements for air quality management and ensure activities cause minimal offensive odour, soot, smoke, light or noise to neighbours » Consider establishing native vegetation to create a ‘carbon sink’ to take up green house gases » Manage crop nutrition to minimise nitrogen loss to the atmosphere |

Other Natural Resources Management Policy/Regulation and links to EnviroVeg Manual

| Environmental Management and Pollution Control Act 1994 (EMPCA), State Environment Protection Policies, (e.g. Air Quality) Administered by the Environment Protection Authority Source: | EnviroVeg Management Objectives Source: EnviroVeg Manual | Management objectives based on the EMPCA Act: | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
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| <p>The fundamental basis of EMPCA is the prevention, reduction and remediation of environmental harm. This is defined very broadly in section 5 of the Act as: "any adverse effect on the environment (of whatever degree or duration) and includes an environmental nuisance" (the latter is defined as 'the emission of a pollutant that unreasonably interferes with, or is likely to interfere with, a person's enjoyment of the environment'). The focus of the Act is on preventing environmental harm from pollution and waste management</p> | <p>Chemical Management</p> <p>Chemicals commonly used by growers include: pesticides, growth regulators, cleaning products, sanitisers water treatment products, fuel and oil, fertiliser and soil improvement products</p> <p>Chemicals need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Chemicals are used only where and when needed » Chemical use can be justified » Pollution of soil and water is minimised » Chemical management meets community expectations | <p>Management Objectives</p> <ul style="list-style-type: none"> » Protect and enhance the quality of the Tasmanian environment. » Prevent environmental degradation and adverse risks to human and ecosystem health by promoting pollution prevention, clean production technology, reuse and recycling of materials and waste minimisation programs. » Regulate, reduce or eliminate the discharge of pollutants and hazardous substances to air, land or water consistent with maintaining environmental quality | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Risk assessment undertaken to identify any areas of potential contamination from persistent chemicals or heavy metals » Responsible chemical management used that complies with all legal requirements » Minimise use of chemicals and other pest treatments and observe all withholding periods » Chemical use, disposal and storage all complies with recommended best practice » Chemicals only used in weather conditions that minimise spray drift |
| <p>As above</p> | <p>Waste Management</p> <p>Vegetable growing can result in the</p> | <p>Management Objectives</p> <p>Regulate, reduce or eliminate the</p> | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and record the various |

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| | <p>creation of large amounts of unwanted materials (waste). Waste can create problems for growers the community and the environment.</p> <p>Waste needs to be managed correctly so that:</p> <ul style="list-style-type: none"> » there is no litter or offensive odour » pests are controlled » runoff will not pollute waterways or groundwater » waste is not unsightly <p>Where it cannot be reused or recycled, waste is disposed of responsibly.</p> | <p>discharge of pollutants and hazardous substances to air, land or water consistent with maintaining environmental quality</p> <p>Control the generation, storage, collection, transportation, treatment and disposal of waste with a view to reducing, minimising and, where practicable, eliminating harm to the environment</p> <ul style="list-style-type: none"> » The discharge or deposit of waste onto land shall at all times be in accordance with State environment protection policy » A person shall not pollute the land so that its condition becomes poisonous, noxious or harmful to the health or welfare of human beings OR harmful to flora and fauna OR obnoxious or unduly offensive to the senses of human beings. | <p>types of waste produced on-farm</p> <ul style="list-style-type: none"> » Develop a Waste Management Plan to deal with wastes » Store wastes to ensure that there is no litter, offensive odour or pests created by the waste and no runoff from stored waste into waterways or groundwater » Dispose of unusable wastes responsibly. Waste is disposed of at a licensed landfill site and on-farm dumping avoided. » Waste is managed to meet legal requirements for health, safety and the environment » Waste is managed to meet community expectations |
| <p>As above and also:</p> <p><i>The Environment Protection Policy (Air Quality) 2004</i> provides a framework for the management and regulation of both point and</p> | <p>Air Quality Management</p> <p>Air pollution is minimised, this means where practical:</p> <ul style="list-style-type: none"> » Farm activities are managed | <p>Management Objectives</p> <ul style="list-style-type: none"> » Best management environmental management practice should be employed to reduce noise emissions to the greatest extent that is | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Comply with the relevant regulatory requirements for air quality management and ensure activities cause minimal |

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| <p>diffuse sources of emissions to air for pollutants with the potential to cause environmental harm.</p> <p>The environmental values to be protected under the Air Quality Policy include:</p> <ul style="list-style-type: none"> » the life, health and well-being of humans, » the life, health and well-being of other forms of life, and » visual amenity | <p>to minimise production of greenhouse gas</p> <ul style="list-style-type: none"> » Greenhouse gas is stored using native vegetation or other methods » Other air pollution is minimised in accordance with legal requirements. | <p>practicable</p> <ul style="list-style-type: none"> » The measures that should be used to protect environmental values, in order of priority are: » Avoidance; » Reuse; » Recycling; recovery of energy; » Treatment; containment; and » Disposal | <p>offensive odour, soot, smoke, light or noise to neighbours</p> <ul style="list-style-type: none"> » Consider establishing native vegetation to create a ‘carbon sink’ to take up green house gases » Manage crop nutrition to minimise nitrogen loss to the atmosphere |
| <p>The Department of Climate Change</p> <p>The Department of Climate Change is responsible for reducing Australia’s emissions through the development of policy, regulatory and educational initiatives. The Government is committed to creating a prosperous low-pollution economy in which Australia’s environment is protected.</p> | <p>Energy Management</p> <p>Vegetable growers use large quantities of energy to power vehicles, machinery, irrigation systems, cool-rooms, lighting and equipment. Energy use should be managed responsibly, this means where practical:</p> <ul style="list-style-type: none"> » 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 | <p>Extract from the Department Website</p> <ul style="list-style-type: none"> » A crucial part of addressing climate change is to reduce the carbon pollution Australia releases into the atmosphere. All Australians need to do their bit – whether individuals, governments or businesses | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Review consumption of electricity and fuel and where possible implement efficient operating practices |

Natural Resources Management and EnviroVeg Matrix Victoria - Port Phillip and Westernport NRM Region

Key NRM Agencies: Port Phillip and Westernport Catchment Management Authority; Environment Protection Authority; and the Department of Climate Change



| Port Phillip and Westernport Catchment Targets Source: NRM Plan | EnviroVeg Management Objectives Source: EnviroVeg Manual | Port Phillip and Westernport Management Targets Source: NRM Plan | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
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| <p>The community valuing, understanding and celebrating the region’s catchment assets and acting to achieve sustainability</p> <p>Increase community awareness and understanding of the condition of catchment assets and associated trends.</p> <p>Maintain the region’s ecological footprint at or below the 2003 level, and reduce the average ecological footprint (per capita) by 25% by 2030.</p> | <p>Property & Business Management</p> <p>Property and business management is environmentally-responsible. This means that, where practical:</p> <ul style="list-style-type: none"> » Protection and improvement of the environment is considered in daily decisions and activities » Growers support environmental improvement in their catchment and supply chain » Property plans include environmental as well as other personal, farm and business goals » Property and business management meets | <p>Community Participation Targets</p> <ul style="list-style-type: none"> » Plan and conduct community involvement in integrated catchment management » Facilitate coordination and share information » Enable rural communities, industries and landholders to identify, discuss and resolve priority issues relevant to catchment management. | <p>EnviroVeg checklist</p> <ul style="list-style-type: none"> » Own and use a copy of the EnviroVeg Manual » Review EnviroVeg Self Assessment annually » Develop an Environmental Action Plan requirements » Be aware of catchment priorities and targets for region and use incentives to further on-farm environmental activities » Have a property map showing farm paddocks, production areas, water storage and waterways, buildings, access roads, buffer zones and sensitive areas, and develop management strategies that |

| | community needs for healthy and productive catchments | | promote sustainable outcomes |
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| <p>Healthy land used appropriately and productively</p> <p>Increase the overall real net farm income per hectare and increase the proportion of rural land being used for profitable and sustainable agriculture.</p> <p>The structure and biological health of the region’s soils maintained.</p> <p>Increase the area for which land use matches land capability.</p> | <p>Soil & Nutrition Management</p> <p>Healthy soils are managed to support productive agriculture and protect the environment. Soils need to be managed responsibly so that where practical they are protected from degrading processes and are managed so that:</p> <ul style="list-style-type: none"> » Soil structure, carbon, biodiversity, fertility and condition is improved using methods which do not pollute waterways or air » Soil is managed to meet community needs for healthy and productive catchments | <p>Soil Health Targets</p> <ul style="list-style-type: none"> » Develop and implement a strategic plan to promote productive and sustainable agriculture in the region » Design and deliver programs to achieve adoption of environmental management systems by landholders » Develop and apply a methodology for comprehensive risk assessment of soil health as a basis for development of a Regional Soil Health Plan | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Know soil types and soil testing to find out pH value, organic matter, nutrient, salinity and sodicity levels » Assess soil health on farm and put in place practices to prevent erosion and degradation » Have all weather access for vehicles » Manage irrigation to minimise damage to soil from runoff, erosion, water logging, rising water tables, nutrient and salinity transport » Apply fertiliser and nutrient only when needed to meet crop needs » Maintain high soil organic matter and biodiversity levels by using compost or crop rotation or intercropping » Locate manure and fertiliser storages to ensure no runoff into crops or pollution of waterways or groundwater |

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| <p>Sustainable water use and healthy waterways, wetlands, estuaries,coasts, bays and seas.</p> <p>Diversions from all waterways to be within Sustainable Diversion Limits by 2015.</p> <p>Improve the condition of the region’s waterways so that all natural waterways will be in good or better condition by 2025.</p> | <p>Water & Waterway Management</p> <p>Clean water and healthy waterways, including rivers, creeks and wetlands, are important for your farm, the rest of your catchment, and your community. Water and waterways need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Community water resources are used responsibly » Water is taken from sustainable sources » Water storages contribute to biodiversity and wherever possible waterway health is improved and maintained » All waterway works are carried out only with the approval of the waterway manager » Water is managed to meet community needs for drinking, recreation, biodiversity, scenery » and agriculture | <p>Water Management Targets</p> <ul style="list-style-type: none"> » Benchmark rural water use efficiency in major agricultural areas and increase water use efficiency » Review and implement a surface and ground water quality monitoring system to ensure adequate and coordinated coverage across the region » Consolidate and distribute data on wetlands to relevant stakeholders including landholders | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Water harvesting complies with regulatory requirements » Risk assessment used to assess water sources and future water supply » Irrigation water treated to minimise the risk of environmental harm » Irrigation schedules and plans used to take account of weather patterns and predictions; water stress symptoms; rainfall and wetting front detectors » Efficient irrigation system used that minimises energy use and is checked regularly » Supply and discharge water monitored to check pH and electrical conductivity » Water loss minimised by checking and repairing leaks; recycling water where possible, reducing evaporative losses and catching runoff and tailwater into sumps, settling ponds or grassed channels before it goes into storage. |
| <p>Managing pest animals and environmental weeds.</p> | <p>Pest Management</p> <p>Good pest management is essential</p> | <p>Pest Management Targets</p> <ul style="list-style-type: none"> » Implement the regional | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Use an Integrated Pest |

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| <p>Long term' rabbit control achieved on 400,000 ha of rural land by 2008.</p> <p>No establishment of 'new and emerging' weed species and no further spread of 'high-priority established' weeds.</p> | <p>to protect the health of soil, waterways and native vegetation and to support productive agriculture. Care is needed to ensure that pest management does not degrade soil, water or biodiversity.</p> <ul style="list-style-type: none"> » Pests (including insects, nematodes, diseases, weeds and pest animals) need to be managed responsibly. » This means that, where practical: Recognised Integrated Pest Management (IPM) techniques are used » Appropriate natural predators and other beneficial organisms are encouraged » Pest management meets community expectations | <p>Weed and Rabbit Action Plans.</p> <ul style="list-style-type: none"> » Improve coordination of effort and information sharing to reduce the impact of invasive species. | <p>Management for the monitoring of pests and diseases that takes account of legal requirements for responsible pest management</p> <ul style="list-style-type: none"> » Apply products only when pest monitoring or advice from experts indicates that treatment is needed to prevent unacceptable damage to crops or other hosts » Practice good hygiene to minimise introduction and spread of pests and diseases » Recognise and promote beneficial insects for pest and disease control » Ensure management of native pest animals and disease does not impact on biodiversity |
| <p>Healthy and enduring ecosystems with a diversity of habitats and native species.</p> <p>The total extent of indigenous vegetation increased by at least 30% of the region by 2030</p> <p>Significantly reduce the number of threatened flora and fauna by 2030</p> | <p>Biodiversity Management</p> <p>Biodiversity (or biological diversity) means 'the variety of life'.</p> <p>Biodiversity helps to support a healthy environment, and to support and improve human life. On-farm biodiversity needs to be managed responsibly. This means that, where practical:</p> <ul style="list-style-type: none"> » Native vegetation is protected, | <p>Biodiversity Management Targets</p> <ul style="list-style-type: none"> » Undertake a program of education , training and support for stakeholders to achieve understanding and application of guidelines for vegetation protection » Protect, maintain or enhance existing high quality vegetation and revegetate heavily-depleted native | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and protect areas that are significant native habitat, vegetation and wildlife corridors, riparian areas and other significant water habitats » Biodiversity Action Plan is part of the Property Management Plan and takes account of all legal requirements in relation to biodiversity management » Farming activities minimise the |

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| | <p>improved and increased to meet catchment goals</p> <ul style="list-style-type: none"> » Native wildlife is protected and its habitat is improved and increased » Biodiversity in and around waterways and water storages is protected, improved and increased » Soil biodiversity is increased » Biodiversity is managed to meet community expectations | vegetation types | <p>risk of damage to native vegetation from threats including sediment, pesticide and fertiliser drift, vehicles, cultivation and pest plants, animals and diseases</p> <ul style="list-style-type: none"> » Efforts made to increase biodiversity habitat on-farm |
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Other Natural Resources Management Policy/Regulation and links to EnviroVeg Manual

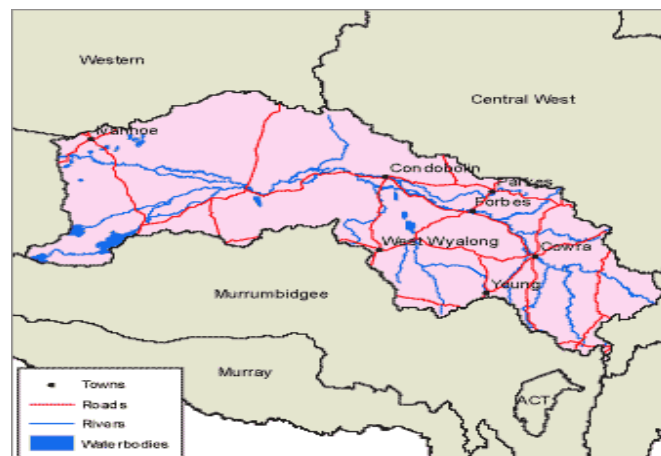
| Protection of the Environment Operations Act 1970 (EPA), State Environment Protection Policies, (e.g. Waters of Victoria), Waste Management Policies Administered by the Environment Protection Authority | EnviroVeg Management Objectives Source: EnviroVeg Manual | Management objectives based on the Environment Protection Authority Act | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
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| <p>The Principles of the Act include:</p> <p>a) Sound environmental practices and procedures should be adopted as a basis for ecologically sustainable development for the benefit of all human beings and the environment.</p> <p>b) This requires the effective</p> | <p>Chemical Management</p> <p>Chemicals commonly used by growers include: pesticides, growth regulators, cleaning products, sanitisers water treatment products, fuel and oil, fertiliser and soil improvement products</p> <p>Chemicals need to be managed</p> | <p>Management Guidelines</p> <ul style="list-style-type: none"> » A person shall not pollute any waters so that its condition becomes so changed that it becomes poisonous, noxious or harmful to the health or welfare of human beings OR flora or fauna or detrimental to the beneficial use of those | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Risk assessment undertaken to identify any areas of potential contamination from persistent chemicals or heavy metals » Responsible chemical management used that complies with all legal requirements |

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| <p>integration of economic, social and environmental considerations in decision making processes with the need to improve community well-being and the benefit of future generations</p> | <p>responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Chemicals are used only where and when needed » Chemical use can be justified » Pollution of soil and water is minimised » Chemical management meets community expectations | <p>waters/</p> <ul style="list-style-type: none"> » Reduce the number of significantly contaminated sites » Reduce harmful emissions to air, land and water. Diffuse, source pollution (e.g. nutrients, sediments, pesticides) is one of the key impacts on water quality in our waterways | <ul style="list-style-type: none"> » Minimise use of chemicals and other pest treatments and observe all withholding periods » Chemical use, disposal and storage all complies with recommended best practice » Chemicals only used in weather conditions that minimise spray drift. |
| <p>As above</p> | <p>Waste Management</p> <p>Vegetable growing can result in the creation of large amounts of unwanted materials (waste). Waste can create problems for growers the community and the environment. Waste needs to be managed correctly so that:</p> <ul style="list-style-type: none"> » there is no litter or offensive odour » pests are controlled » runoff will not pollute waterways or groundwater » waste is not unsightly <p>Where it cannot be reused or recycled, waste is disposed of responsibly.</p> | <p>Management Objectives</p> <ul style="list-style-type: none"> » The discharge or deposit of waste onto land shall at all times be in accordance with State environment protection policy » A person shall not pollute the land so that its condition becomes poisonous, noxious or harmful to the health or welfare of human beings OR harmful to flora and fauna OR obnoxious or unduly offensive to the senses of human beings | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and record the various types of waste produced on-farm » Develop a Waste Management Plan to deal with wastes » Store wastes to ensure that there is no litter, offensive odour or pests created by the waste and no runoff from stored waste into waterways or groundwater » Dispose of unusable wastes responsibly. Waste is disposed of at a licensed landfill site and on-farm dumping avoided. » Waste is managed to meet legal requirements for health, safety and the environment » Waste is managed to meet community expectations |
| <p>As above</p> | <p>Air Quality Management</p> | <p>Management Objectives</p> | <p>EnviroVeg Checklist</p> |

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| | <p>Air pollution is minimised, this means where practical:</p> <p>Farm activities are managed to minimise production of greenhouse gas</p> <p>Greenhouse gas is stored using native vegetation or other methods</p> <p>Other air pollution is minimised in accordance with legal requirements.</p> | <ul style="list-style-type: none"> » The emission of noise shall at all times comply with the standards of the EPA 1970 » A person shall not pollute the atmosphere so that its condition is harmful to the health, welfare, safety or property of human beings OR harmful to flora or fauna » The regional NRM Plan encourages the establishment of native vegetation to act as a 'carbon sink'. | <ul style="list-style-type: none"> » Comply with the relevant regulatory requirements for air quality management and ensure activities cause minimal offensive odour, soot, smoke, light or noise to neighbours » Consider establishing native vegetation to create a 'carbon sink' to take up green house gases » Manage crop nutrition to minimise nitrogen loss to the atmosphere |
| <p>The Department of Climate Change</p> <p>The Department of Climate Change is responsible for reducing Australia's emissions through the development of policy, regulatory and educational initiatives. The Government is committed to creating a prosperous low-pollution economy in which Australia's environment is protected.</p> | <p>Energy Management</p> <p>Vegetable growers use large quantities of energy to power vehicles, machinery, irrigation systems, cool-rooms, lighting and equipment. Energy use should be managed responsibly, this means where practical:</p> <ul style="list-style-type: none"> » 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 | <p>Extract from the Department Website</p> <ul style="list-style-type: none"> » A crucial part of addressing climate change is to reduce the carbon pollution Australia releases into the atmosphere. All Australians need to do their bit – whether individuals, governments or businesses | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Review consumption of electricity and fuel and where possible implement efficient operating practices |

Natural Resources Management and EnviroVeg Matrix New South Wales - Lachlan NRM Region

Key NRM Agencies: Lachlan Catchment Management Authority; Environment Protection Authority; and the Department of Climate Change



| Lachlan Catchment Targets Source: Catchment Plan | EnviroVeg Management Objectives Source: EnviroVeg Manual | Lachlan Management Targets Source: Catchment Plan | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
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| <p>Community participation in Natural Resource Management</p> <p>By 2016, the Lachlan community is actively involved in sustainable NRM with the capacity and motivation to achieve sustainable landscapes.</p> | <p>Property & Business Management</p> <p>Property and business management is environmentally-responsible. This means that, where practical:</p> <ul style="list-style-type: none"> » Protection and improvement of the environment is considered in daily decisions and activities » Growers support environmental improvement in their catchment and supply chain » Property plans include environmental as well as other personal, farm and business goals » Property and business | <p>Community Participation Targets</p> <ul style="list-style-type: none"> » Support systems will be put in place to foster broad community engagement in NRM and adoption of sustainable practices. » Skilled NRM managers will exercise ownership over regional decision-making and implementation processes. | <p>EnviroVeg checklist</p> <ul style="list-style-type: none"> » Own and use a copy of the EnviroVeg Manual » Review EnviroVeg Self Assessment annually » Develop an Environmental Action Plan » Be aware of catchment priorities and targets for region and use incentives to further on-farm environmental activities » Have a property map showing farm paddocks, production areas, water storage and waterways, buildings, access roads, buffer zones and sensitive areas, and develop |

| | management meets community needs for healthy and productive catchments | | management strategies that promote sustainable outcomes in each area |
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| <p>Improving soil health.</p> <p>By 2016, soil health has improved on 870,000 ha of agricultural land.</p> | <p>Soil & Nutrition Management</p> <p>Healthy soils are managed to support productive agriculture and protect the environment. Soils need to be managed responsibly so that where practical they are protected from degrading processes and are managed so that:</p> <ul style="list-style-type: none"> » Soil structure, carbon, biodiversity, fertility and condition is improved using methods which do not pollute waterways or air » Soil is managed to meet community needs for healthy and productive catchments | <p>Soil Health Targets</p> <ul style="list-style-type: none"> » Increase cropping land managed for optimal ground cover to protect the soil resource. » Stabilise and rehabilitate eroding gullies and fragile soils experiencing sheet erosion, salt, and sodic scalds and saline discharge areas | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Know soil types and soil testing to find out pH value, organic matter, nutrient, salinity and sodicity levels » Assess soil health on farm and put in place practices to prevent erosion and degradation » Have all weather access for vehicles » Manage irrigation to minimise damage to soil from runoff, erosion, water logging, rising water tables, nutrient and salinity transport » Apply fertiliser and nutrient only when needed to meet crop needs » Maintain high soil organic matter and biodiversity levels by using compost or crop rotation or intercropping » Locate manure and fertiliser storages to ensure no runoff into crops or pollution of waterways or groundwater |

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| <p>Improving riverine and aquifer ecosystems.</p> <p>By 2016, riverine and aquifer ecosystem condition and quality is maintained and improved.</p> | <p>Water & Waterway Management</p> <p>Clean water and healthy waterways, including rivers, creeks and wetlands, are important for your farm, the rest of your catchment, and your community. Water and waterways need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Community water resources are used responsibly » Water is taken from sustainable sources » Water storages contribute to biodiversity and wherever possible waterway health is improved and maintained » All waterway works are carried out only with the approval of the waterway manager » Water is managed to meet community needs for drinking, recreation, biodiversity, scenery » and agriculture | <p>Water Management Targets</p> <ul style="list-style-type: none"> » Water is delivered more efficiently. » Protect and enhance the condition of in-stream habitat including pools and riffles aquatic vegetation and large woody debris and rocks. » Manage property to protect water quality according to plans that are to be developed at the catchment level. | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Water harvesting complies with regulatory requirements » Risk assessment used to assess water sources and future water supply » Irrigation water treated to minimise the risk of environmental harm » Irrigation schedules and plans used to take account of weather patterns and predictions; water stress symptoms; rainfall and wetting front detectors » Efficient irrigation system used that minimises energy use and is checked regularly » Supply and discharge water monitored to check pH and electrical conductivity » Water loss minimised by checking and repairing leaks; recycling water where possible, reducing evaporative losses and catching runoff and tailwater into sumps, settling ponds or grassed channels before it goes into storage. |
| <p>Managing pest animals and environmental weeds.</p> | <p>Pest Management</p> <p>Good pest management is essential</p> | <p>Pest Management Targets</p> <ul style="list-style-type: none"> » By 2010, develop, at the | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Use an Integrated Pest |

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| <p>By 2016, restrict the extent of priority pest animals and environmental weeds.</p> | <p>to protect the health of soil, waterways and native vegetation and to support productive agriculture. Care is needed to ensure that pest management does not degrade soil, water or biodiversity.</p> <ul style="list-style-type: none"> » Pests (including insects, nematodes, diseases, weeds and pest animals) need to be managed responsibly. » This means that, where practical: Recognised Integrated Pest Management (IPM) techniques are used to manage pests » The health of soil, growing media, » crops, native vegetation and other hosts is maximised » Appropriate natural predators and other beneficial organisms are encouraged » Pest management meets community expectations | <p>catchment level, an Integrated Weed Management Strategy and an Integrated Pest Management Plan.</p> <ul style="list-style-type: none"> » Improve coordination of effort and information sharing to reduce the impact of invasive species. | <p>Management for the monitoring of pests and diseases that takes account of legal requirements for responsible pest management</p> <ul style="list-style-type: none"> » Apply products only when pest monitoring or advice from experts indicates that treatment is needed to prevent unacceptable damage to crops or other hosts » Practice good hygiene to minimise introduction and spread of pests and diseases » Recognise and promote beneficial insects for pest and disease control » Ensure management of native pest animals and disease does not impact on biodiversity |
| <p>Increasing the area of vegetation.</p> <p>By 2016 there is an increase of 145,000 hectares of terrestrial native vegetation that is being actively managed for biodiversity</p> | <p>Biodiversity Management</p> <p>biodiversity (or biological diversity) means ‘the variety of life’.</p> <p>Biodiversity helps to support a</p> | <p>Biodiversity Management Targets</p> <ul style="list-style-type: none"> » Native vegetation established through revegetation using local | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and protect areas that are significant native habitat, vegetation and wildlife corridors, riparian areas and |

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| <p>conservation Managing the native flora and fauna.</p> <p>By 2016, the highest priority terrestrial and aquatic threatenend floran and fauna species, endangered populations and significant species will be managed for conservation.</p> | <p>healthy environment, and to support and improve human life. On-farm biodiversity needs to be managed responsibly. This means that, where practical:</p> <ul style="list-style-type: none"> » Native vegetation is protected, improved and increased to meet catchment goals » Native wildlife is protected and its habitat is improved and increased » Biodiversity in and around waterways and water storages is protected, improved and increased » Soil biodiversity is increased » Biodiversity is managed to meet community expectations | <p>endemic species.</p> <ul style="list-style-type: none"> » Fragmented patches of vegetation in cleared landscapes are linked through the protection or establishment of a corridor habitat. | <p>other significant water habitats</p> <ul style="list-style-type: none"> » Biodiversity Action Plan is part of the Property Management Plan and takes account of all legal requirements in relation to biodiversity management » Farming activities minimise the risk of damage to native vegetation from threats including sediment, pesticide and fertiliser drift, vehicles, cultivation and pest plants, animals and diseases » Efforts made to increase biodiversity habitat on-farm |
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Other Natural Resources Management Policy/Regulation and links to EnviroVeg Manual

| <p>Protection of the Environment Operations Act 1997 (EOA) Administered by the Environment Protection Authority</p> | <p>EnviroVeg Management Objectives Source: EnviroVeg Manual</p> | <p>Management objectives based on the EOA Act:</p> | <p>Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist</p> |
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| <p>Objects of the Act include:</p> <p>c) to protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development,</p> | <p>Chemical Management</p> <p>Chemicals commonly used by growers include: pesticides, growth regulators, cleaning products, sanitisers water treatment products, fuel and oil, fertiliser and</p> | <p>Management Objectives</p> <ul style="list-style-type: none"> » Reduce the exposure of the community and the environment to chemicals » Reduce the number of significantly contaminated | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Risk assessment undertaken to identify any areas of potential contamination from persistent chemicals or heavy metals » Responsible chemical |

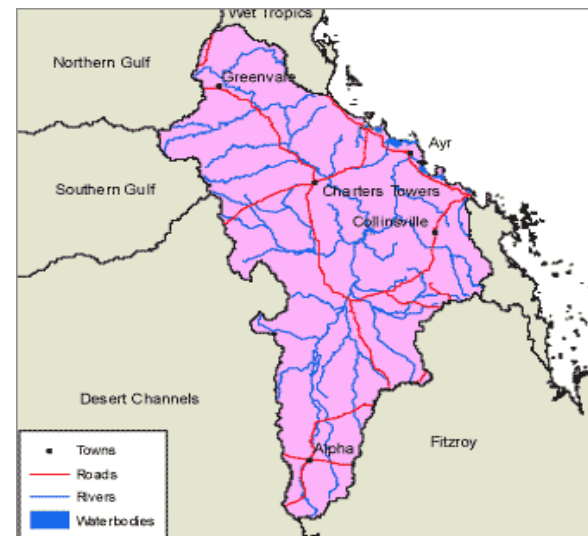
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| <p>d) to provide increased opportunities for public involvement and participation in environment protection,</p> <p>e) to reduce risks to human health and prevent the degradation of the environment</p> | <p>soil improvement products</p> <p>Chemicals need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Chemicals are used only where and when needed » Chemical use can be justified » Pollution of soil and water is minimised » Chemical management meets community expectations | <p>sites</p> <ul style="list-style-type: none"> » Reduce harmful emissions to air, land and water. Diffuse, source pollution (e.g. nutrients, sediments, pesticides) is one of the key impacts on water quality in our waterways/ | <p>management used that complies with all legal requirements</p> <ul style="list-style-type: none"> » Minimise use of chemicals and other pest treatments and observe all withholding periods » Chemical use, disposal and storage all complies with recommended best practice » Chemicals only used in weather conditions that minimise spray drift |
| <p>As above</p> | <p>Waste Management</p> <p>Vegetable growing can result in the creation of large amounts of unwanted materials (waste). Waste can create problems for growers the community and the environment.</p> <p>Waste needs to be managed correctly so that:</p> <ul style="list-style-type: none"> » there is no litter or offensive odour » pests are controlled » runoff will not pollute waterways or groundwater » waste is not unsightly <p>Where it cannot be reused or recycled, waste is disposed of responsibly.</p> | <p>Management Objectives</p> <ul style="list-style-type: none"> » Reduce the exposure of the community and the environment to waste » Promote the reduction in the use of materials and the re-use, recovery or recycling of materials » Reduce harmful emissions to air, land and water | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and record the various types of waste produced on-farm » Develop a Waste Management Plan to deal with wastes » Store wastes to ensure that there is no litter, offensive odour or pests created by the waste and no runoff from stored waste into waterways or groundwater » Dispose of unusable wastes responsibly. Waste is disposed of at a licensed landfill site and on-farm dumping avoided. » Waste is managed to meet legal requirements for health, safety and the environment » Waste is managed to meet community expectations |

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| <p>As above</p> | <p>Air Quality Management Air pollution is minimised, this means where practical:</p> <p>Farm activities are managed to minimise production of greenhouse gas Greenhouse gas is stored using native vegetation or other methods Other air pollution is minimised in accordance with legal requirements.</p> | <p>Management Objectives</p> <ul style="list-style-type: none"> » Reduce the exposure of the community and the environment to noise dust odour and vibration » Reduce harmful emissions to air, land and water. The NSW Government recognises that mitigating and adapting to climate change will continue to present challenges for the foreseeable future | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Comply with the relevant regulatory requirements for air quality management and ensure activities cause minimal offensive odour, soot, smoke, light or noise to neighbours » Consider establishing native vegetation to create a ‘carbon sink’ to take up green house gases » Manage crop nutrition to minimise nitrogen loss to the atmosphere |
| <p>The Department of Climate Change</p> <p>The Department of Climate Change is responsible for reducing Australia’s emissions through the development of policy, regulatory and educational initiatives. The Government is committed to creating a prosperous low-pollution economy in which Australia’s environment is protected.</p> | <p>Energy Management</p> <p>Vegetable growers use large quantities of energy to power vehicles, machinery, irrigation systems, cool-rooms, lighting and equipment. Energy use should be managed responsibly, this means where practical:</p> <ul style="list-style-type: none"> » 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 | <p>Extract from the Department Website</p> <ul style="list-style-type: none"> » A crucial part of addressing climate change is to reduce the carbon pollution Australia releases into the atmosphere. All Australians need to do their bit – whether individuals, governments or businesses | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Review consumption of electricity and fuel and where possible implement efficient operating practices |

NB: In addition, the EnviroVeg Manual responds to issues covered by the Contaminated Land Act 1997 and The Pesticides Act 1999

Natural Resources Management and EnviroVeg Matrix Queensland – Burdekin (NQ) Dry Tropics Natural Resource Management NRM Region

Key NRM Agencies: Burdekin (NQ) Dry Tropics NRM; Department of Natural Resources and Water, Environment Protection Authority; and the Commonwealth Department of Climate Change



| Burdekin and Dry Tropics NRM Plan Source: Catchment Management Plan | EnviroVeg Management Objectives Source: EnviroVeg Manual | Burdekin and Dry Tropics NRM Plan Management Targets | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
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| <p>Community capacity building</p> <p>By 2010, 25% of landholders have developed and are implementing voluntary property management plans.</p> <p>By 2005 (and ongoing) support stakeholders to become involved in NRM and implement action plans.</p> | <p>Property & Business Management</p> <p>Property and business management is environmentally-responsible. This means that, where practical:</p> <ul style="list-style-type: none"> » Protection and improvement of the environment is considered in daily decisions and activities » Growers support environmental improvement in their catchment and supply chain » Property plans include environmental as well as other | <p>Community Participation Targets</p> <ul style="list-style-type: none"> » Facilitate development and implementation of voluntary PMPs through provision of mapping , information, extension support and training » Facilitate stakeholder engagement and participation in NRM through regional staff » Support regional staff through development and training, mentoring and guidance and provision of | <p>EnviroVeg checklist</p> <ul style="list-style-type: none"> » Own and use a copy of the EnviroVeg Manual » Conduct EnviroVeg Self Assessment annually and review progress » Develop an Environmental Action Plan taking account of legal farm business requirements » Be aware of catchment priorities and targets for region and use incentives to further on-farm environmental activities |

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| | <p>personal, farm and business goals</p> <ul style="list-style-type: none"> » Property and business management meets community needs for healthy and productive catchments | <p>expert advice</p> | <ul style="list-style-type: none"> » Have a property map showing farm paddocks, production areas, water storage and waterways, buildings, access roads, buffer zones and sensitive areas, and develop management strategies that promote sustainable outcomes in each area |
| <p>Land, soil and agricultural production systems</p> <p>Maintain status quo for good condition lands, and make significant improvement in other land condition types by 2014 with further improvement by 2024.</p> <p>By 2024, achieve a 10% improvement in soil health in extensive and intensive agricultural areas.</p> <p>By 2024, land is protected from ineffective/unproductive use.</p> | <p>Soil & Nutrition Management</p> <p>Healthy soils are managed to support productive agriculture and protect the environment. Soils need to be managed responsibly so that where practical they are protected from degrading processes and are managed so that:</p> <ul style="list-style-type: none"> » Soil structure, carbon, biodiversity, fertility and condition is improved using methods which do not pollute waterways or air » Soil is managed to meet community needs for healthy and productive catchments | <p>Land, soil and agricultural production systems</p> <ul style="list-style-type: none"> » Obtain a soil health benchmark by soil type and assess the variability in agricultural soil » Develop the links between land capacity/suitability and land use » Develop, promote and instigate an active property level land condition monitoring program, consistent with a regional monitoring framework | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Know soil types and soil testing to find out pH value, organic matter, nutrient, salinity and sodicity levels » Assess soil health on farm and put in place practices to prevent erosion and degradation » Have all weather access for vehicles » Manage irrigation to minimise damage to soil from runoff, erosion, water logging, rising water tables, nutrient and salinity transport » Apply fertiliser and nutrient only when needed to meet crop needs » Maintain high soil organic matter and biodiversity levels by using compost or crop rotation or intercropping |

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| | | | » Locate manure and fertiliser storages to ensure no runoff into crops or pollution of waterways or groundwater |
| <p>Surface Water</p> <p>By 2015, improve water quality (suspended sediments, nutrients, pesticides) at a catchment and sub-catchment level based on 2005 levels.</p> <p>By 2015 establish and implement an environmental flow plan.</p> <p>By 2010, there is a 10% decrease in in bank and gully erosion.</p> <p>By 2020, water is used more efficiently through 50% adoption of a range of water use efficiency practices.</p> | <p>Water & Waterway Management</p> <p>Clean water and healthy waterways, including rivers, creeks and wetlands, are important for your farm, the rest of your catchment, and your community. Water and waterways need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Community water resources are used responsibly » Water is taken from sustainable sources » Water storages contribute to biodiversity and wherever possible waterway health is improved and maintained » All waterway works are carried out only with the approval of the waterway manager » Water is managed to meet community needs for drinking, recreation, biodiversity, scenery and agriculture | <p>Water Management Targets</p> <ul style="list-style-type: none"> » Develop an integrated and coordinated multi-stakeholder monitoring program to include the monitoring and assessment of water quality, wetland and aquatic habitats and contaminants » Improve regional stakeholder’s understanding of environmental flow requirements through community, agency and water provider consultation » Improve uptake of water use efficiency technology across a range of industries » Encourage adoption of guidelines and sustainable NRM practices in relevant polluting industries, grazing, and irrigated crops (considering soil, water and ecosystem impacts) | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Water harvesting complies with regulatory requirements » Risk assessment used to assess water sources and future water supply » Irrigation water treated to minimise the risk of environmental harm » Irrigation schedules and plans used to take account of weather patterns and predictions; water stress symptoms; rainfall and wetting front detectors » Efficient irrigation system used that minimises energy use and is checked regularly » Supply and discharge water monitored to check pH and electrical conductivity » Water loss minimised by checking and repairing leaks; recycling water where possible, reducing evaporative losses and catching runoff and tailwater into sumps, settling ponds or grassed channels |

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| | | | before it goes into storage. |
| <p>Managing pest animals and environmental weeds.</p> <p>By 2015, contain and reduce the infestations of priority pest plant and feral animals.</p> | <p>Pest Management</p> <p>Good pest management is essential to protect the health of soil, waterways and native vegetation and to support productive agriculture. Care is needed to ensure that pest management does not degrade soil, water or biodiversity.</p> <ul style="list-style-type: none"> » Pests (including insects, nematodes, diseases, weeds and pest animals) need to be managed responsibly. » This means that, where practical: Recognised Integrated Pest Management (IPM) techniques are used to manage pests » The health of soil, growing media, » crops, native vegetation and other hosts is maximised » Appropriate natural predators and other beneficial organisms are encouraged » Pest management meets community expectations | <p>Pest Management Targets</p> <ul style="list-style-type: none"> » Develop weed and feral species management plans in consultation with key stakeholder groups and landholders » Facilitate cooperative approaches between Local Governments, Queensland Government and other key stakeholders to tackle pest management issues on their land | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Use an Integrated Pest Management for the monitoring of pests and diseases that takes account of legal requirements for responsible pest management » Apply products only when pest monitoring or advice from experts indicates that treatment is needed to prevent unacceptable damage to crops or other hosts » Practice good hygiene to minimise introduction and spread of pests and diseases » Recognise and promote beneficial insects for pest and disease control » Ensure management of native pest animals and disease does not impact on biodiversity |
| <p>Conservation of Biodiversity</p> <p>By 2006, remnant vegetation</p> | <p>Biodiversity Management</p> <p>biodiversity (or biological</p> | <p>Biodiversity Management Targets</p> | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and protect areas that |

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| <p>remains at 100% of current extent except where clearing is permissible under the Vegetation Management Act and other legislation.</p> <p>By 2020, the population viability of 100% of rare and threatened native plants and is improved.</p> | <p>diversity) means ‘the variety of life’.</p> <p>Biodiversity helps to support a healthy environment, and to support and improve human life. On-farm biodiversity needs to be managed responsibly. This means that, where practical:</p> <ul style="list-style-type: none"> » Native vegetation is protected, improved and increased to meet catchment goals » Native wildlife is protected and its habitat is improved and increased » Biodiversity in and around waterways and water storages is protected, improved and increased » Soil biodiversity is increased » Biodiversity is managed to meet community expectations | <ul style="list-style-type: none"> » Provide financial incentives and extension services to support landholder protection, rehabilitation and management of priority native vegetation/habitat for biodiversity purposes » By 2010, implement all existing threatened species recovery plans and develop plans for remaining species in the recovery program | <p>are significant native habitat, vegetation and wildlife corridors, riparian areas and other significant water habitats</p> <ul style="list-style-type: none"> » Biodiversity Action Plan is part of the Property Management Plan and takes account of all legal requirements in relation to biodiversity management » Farming activities minimise the risk of damage to native vegetation from threats including sediment, pesticide and fertiliser drift, vehicles, cultivation and pest plants, animals and diseases » Efforts made to increase biodiversity habitat on-farm |
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Other Natural Resources Management Policy/Regulation and links to EnviroVeg Manual

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| <p>Environmental Protection Act 1994), State Environment Protection Policies, (e.g. Water 2009), (Noise 2008), (Waste 2009), (Air 2008) Administered by the Environment Protection Authority</p> | <p>EnviroVeg Management Objectives Source: EnviroVeg Manual</p> | <p>Management objectives based on the EPA Act:</p> | <p>Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist</p> |
| <p>The Act is primarily concerned</p> | <p>Chemical Management</p> | <p>Management Objectives</p> | <p>EnviroVeg Checklist</p> |

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| <p>with environmental pollution. Its stated objective is to achieve ecologically sustainable development with emphasis on point-source pollution and land contamination. Other legislation e.g. the <i>Nature Conservation Act 1992</i> deals with other aspects of the environment.</p> <p>The Act creates a general duty for all to take all reasonable and practicable steps to avoid harm to the environment. It is an offence under the Act to cause serious or material harm.</p> | <p>Chemicals commonly used by growers include: pesticides, growth regulators, cleaning products, sanitisers water treatment products, fuel and oil, fertiliser and soil improvement products</p> <p>Chemicals need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Chemicals are used only where and when needed » Chemical use can be justified » Pollution of soil and water is minimised » Chemical management meets community expectations | <ul style="list-style-type: none"> » A person must not unlawfully deposit a prescribed water contaminant in water. » To the extent that it is reasonable to do so, the release of water or contaminants to water must be dealt with in the following order of preference: <ul style="list-style-type: none"> - Reduce the use of water and the production of waste water or contaminants - Implement appropriate waste prevention measures - Implement appropriate recycling measures - Implement appropriate treatment before release | <ul style="list-style-type: none"> » Risk assessment undertaken to identify any areas of potential contamination from persistent chemicals or heavy metals » Responsible chemical management used that complies with all legal requirements » Minimise use of chemicals and other pest treatments and observe all withholding periods » Chemical use, disposal and storage all complies with recommended best practice » Chemicals only used in weather conditions that minimise spray drift |
| <p>As above</p> | <p>Waste Management</p> <p>Vegetable growing can result in the creation of large amounts of unwanted materials (waste). Waste can create problems for growers the community and the environment.</p> <p>Waste needs to be managed correctly so that:</p> <ul style="list-style-type: none"> » there is no litter or offensive | <p>Management Objectives</p> <p>Waste management</p> <ul style="list-style-type: none"> » Waste management practises listed in the preferred order of adoption: <ul style="list-style-type: none"> - Waste avoidance - Waste re-use - Waste recycling - Energy recovery from waste | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and record the various types of waste produced on-farm » Develop a Waste Management Plan to deal with wastes » Store wastes to ensure that there is no litter, offensive odour or pests created by the waste and no runoff from |

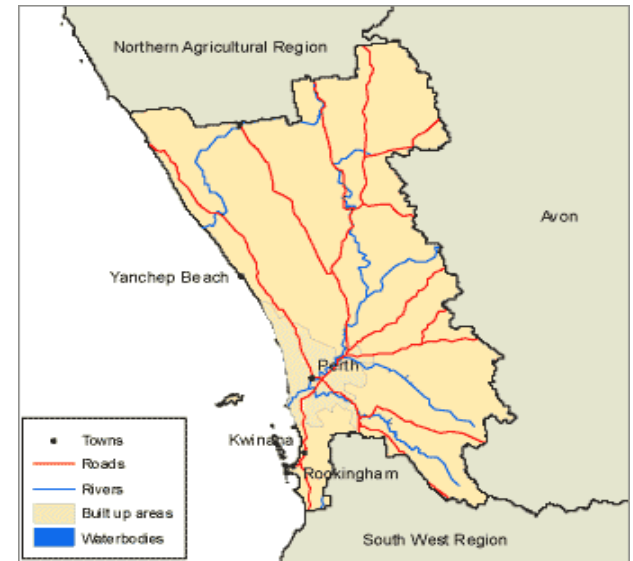
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| | <p>odour</p> <ul style="list-style-type: none"> » pests are controlled » runoff will not pollute waterways or groundwater » waste is not unsightly <p>Where it cannot be reused or recycled, waste is disposed of responsibly.</p> | <p>- Waste disposal</p> | <p>stored waste into waterways or groundwater</p> <ul style="list-style-type: none"> » Dispose of unusable wastes responsibly. Waste is disposed of at a licensed landfill site and on-farm dumping avoided. » Waste is managed to meet legal requirements for health, safety and the environment » Waste is managed to meet community expectations |
| As above | <p>Air Quality Management</p> <p>Air pollution is minimised, this means where practical:</p> <p>Farm activities are managed to minimise production of greenhouse gas.</p> <p>Greenhouse gas is stored using native vegetation or other methods Other air pollution is minimised in accordance with legal requirements.</p> | <p>Management Objectives</p> <ul style="list-style-type: none"> » To the extent that it is reasonable to do so, noise must be dealt with in the following order of preference – avoidance, minimise or manage » Environmental values to be enhanced or protected are- <ul style="list-style-type: none"> - Those conducive to protecting health and biodiversity of ecosystems - Those conducive to human health and wellbeing - Those conducive to protecting the aesthetics of buildings and property - Those that are conducive to protecting agricultural use of the environment | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Comply with the relevant regulatory requirements for air quality management and ensure activities cause minimal offensive odour, soot, smoke, light or noise to neighbours » Consider establishing native vegetation to create a ‘carbon sink’ to take up green house gases » Manage crop nutrition to minimise nitrogen loss to the atmosphere |

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| <p>The Department of Climate Change</p> <p>The Department of Climate Change is responsible for reducing Australia’s emissions through the development of policy, regulatory and educational initiatives.</p> <p>The Government is committed to creating a prosperous low-pollution economy in which Australia’s environment is protected.</p> | <p>Energy Management</p> <p>Vegetable growers use large quantities of energy to power vehicles, machinery, irrigation systems, cool-rooms, lighting and equipment. Energy use should be managed responsibly, this means where practical:</p> <ul style="list-style-type: none"> » 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 | <p>Extract from the Department Website</p> <ul style="list-style-type: none"> » A crucial part of addressing climate change is to reduce the carbon pollution Australia releases into the atmosphere. All Australians need to do their bit – whether individuals, governments or businesses | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Review consumption of electricity and fuel and where possible implement efficient operating practices |
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Natural Resources Management and EnviroVeg Matrix

Western Australia – Perth Region (formerly Swan) Natural Resource Management (NRM) Region

Key NRM Agencies: Perth Region NRM; Environment Protection Authority; and the Commonwealth Department of Climate Change



| Swan Region Catchment Targets Source: Swan Region NRM Strategy & Investment Plan 2006-2008 | EnviroVeg Management Objectives Source: EnviroVeg Manual | Northern Tasmania Catchment Management Targets Source: | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
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| <p>Regional Capacity</p> <p>Build regional capacity to promote attitudinal, behavioural and institutional change to achieve sustainable NRM outcomes.</p> | <p>Property & Business Management</p> <p>Property and business management is environmentally-responsible. This means that, where practical:</p> <ul style="list-style-type: none"> » Protection and improvement of the environment is considered in daily decisions and activities » Growers support environmental improvement in their catchment and supply chain » Property plans include | <p>Community Participation Targets</p> <ul style="list-style-type: none"> » Coordinate, support and motivate community stakeholders through the regional Coordinators and Facilitators Network » Coordinate an integrated regional education and training program addressing land, water and biodiversity and cultural heritage themes » Develop and implement communications and engagement strategies for key | <p>EnviroVeg checklist</p> <ul style="list-style-type: none"> » Own and use a copy of the EnviroVeg Manual » Conduct EnviroVeg Self Assessment annually and review progress » Develop an Environmental Action Plan taking account of legal farm business requirements » Be aware of catchment priorities and targets for region and use incentives to further on-farm environmental |

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| | <p>environmental as well as other personal, farm and business goals</p> <ul style="list-style-type: none"> » Property and business management meets community needs for healthy and productive catchments | <p>stakeholder groups for implementation and investment phases of NRM strategy</p> | <p>activities</p> <ul style="list-style-type: none"> » Have a property map showing farm paddocks, production areas, water storage and waterways, buildings, access roads, buffer zones and sensitive areas, and develop management strategies that promote sustainable outcomes in each area |
| <p>Land</p> <p>Reduction in the area of land affected by salinity, within the Avon Upper Swan National Action Plan Region, by 2020 (targets set in 2005).</p> <p>Maintain and Improve soil condition including extent of water erosion, waterlogging and acid sulfate soil, by 2020 (targets set 2005).</p> | <p>Soil & Nutrition Management</p> <p>Healthy soils are managed to support productive agriculture and protect the environment. Soils need to be managed responsibly so that where practical they are protected from degrading processes and are managed so that:</p> <ul style="list-style-type: none"> » Soil structure, carbon, biodiversity, fertility and condition is improved using methods which do not pollute waterways or air » Soil is managed to meet community needs for healthy and productive catchments | <p>Soil Health Targets</p> <ul style="list-style-type: none"> » Identify priority areas for protection including areas of high biodiversity values, high value water resources, and land of high value for primary production » Assist development and implementation of management strategies for saline sites or those at risk, including property and catchment planning » Develop a landholder information service on sustainable land management. | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Know soil types and soil testing to find out pH value, organic matter, nutrient, salinity and sodicity levels » Assess soil health on farm and put in place practices to prevent erosion and degradation » Have all weather access for vehicles » Manage irrigation to minimise damage to soil from runoff, erosion, water logging, rising water tables, nutrient and salinity transport » Apply fertiliser and nutrient only when needed to meet crop needs » Maintain high soil organic matter and biodiversity levels by using compost or crop |

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| | | | <ul style="list-style-type: none"> » rotation or intercropping » Locate manure and fertiliser storages to ensure no runoff into crops or pollution of waterways or groundwater |
| <p>Water</p> <p>Maintain and improve condition of inland aquatic ecosystems integrity by 2020, with quantified targets for major rivers, waterways and priority wetlands set in 2005.</p> <p>Maximum concentration for priority waterways do not exceed 0.1mg/L for total phosphorous and 1.0mg/L for total nitrogen by 2020.</p> <p>Maintain and improve condition of aquatic environments by 2020 with quantified targets for turbidity/particulate matter set in 2005.</p> | <p>Water & Waterway Management</p> <p>Clean water and healthy waterways, including rivers, creeks and wetlands, are important for your farm, the rest of your catchment, and your community. Water and waterways need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Community water resources are used responsibly » Water is taken from sustainable sources » Water storages contribute to biodiversity and wherever possible waterway health is improved and maintained » All waterway works are carried out only with the approval of the waterway manager » Water is managed to meet community needs for drinking, recreation, biodiversity, scenery » and agriculture | <p>Water Management Targets</p> <ul style="list-style-type: none"> » Develop and implement catchment report card program to monitor changes in resource condition over time » Develop environmental water Provision projects in selected rivers » Continue to provide incentives for land managers through such ways as landcare programs » Develop an integrated regional information system to enhance planning, implementation, monitoring and evaluation. » Continue and expand existing community training programs | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Water harvesting complies with regulatory requirements » Risk assessment used to assess water sources and future water supply » Irrigation water treated to minimise the risk of environmental harm » Irrigation schedules and plans used to take account of weather patterns and predictions; water stress symptoms; rainfall and wetting front detectors » Efficient irrigation system used that minimises energy use and are checked regularly » Supply and discharge water monitored to check pH and electrical conductivity » Water loss minimised by checking and repairing leaks; recycling water, reducing evaporative losses, catching runoff and tailwater into settling ponds or grassed |

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| | | | channels before storage. |
| <p>Managing invasive pests and diseases</p> <p>Reduction in impact of regionally significant invasive species by 2020 (with quantified target by 2005).</p> <p>.</p> | <p>Pest Management</p> <p>Good pest management is essential to protect the health of soil, waterways and native vegetation and to support productive agriculture. Care is needed to ensure that pest management does not degrade soil, water or biodiversity.</p> <ul style="list-style-type: none"> » Pests (including insects, nematodes, diseases, weeds and pest animals) need to be managed responsibly. » This means that, where practical: Recognised Integrated Pest Management (IPM) techniques are used to manage pests » The health of soil, growing media, » crops, native vegetation and other hosts is maximised » Appropriate natural predators and other beneficial organisms are encouraged » Pest management meets community expectations | <p>Pest Management Targets</p> <ul style="list-style-type: none"> » Implement priority programs for feral animal control by State, Local and other stakeholders » Regional implementation of State Weed Plan » Facilitate, coordinate and support community and stakeholder involvement in remedial action » Provision of training in feral, pest animal and disease identification and management | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Use an Integrated Pest Management for the monitoring of pests and diseases that takes account of legal requirements for responsible pest management » Apply products only when pest monitoring or advice from experts indicates that treatment is needed to prevent unacceptable damage to crops or other hosts » Practice good hygiene to minimise introduction and spread of pests and diseases » Recognise and promote beneficial insects for pest and disease control » Ensure management of native pest animals and disease does not impact on biodiversity |
| <p>Biodiversity</p> <p>The comprehensiveness,</p> | <p>Biodiversity Management</p> <p>Biodiversity (or biological</p> | <p>Biodiversity Management Targets</p> <ul style="list-style-type: none"> » Develop and implement | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and protect areas that |

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| <p>adequateness and representativeness of the protected area system (including formal reserves and off-reserves) is improved by 50% by 2015 based on 2005 baseline data.</p> <p>Maintain and improve the condition of high priority native vegetation (including formal reserves and off-reserves) by 2020, based on 2005 baseline data.</p> <p>50% of critical habitat for identified significant species and ecological communities protected by 2014.</p> | <p>diversity) means ‘the variety of life’. Biodiversity helps to support a healthy environment, and to support and improve human life. On-farm biodiversity needs to be managed responsibly. This means that, where practical:</p> <ul style="list-style-type: none"> » Native vegetation is protected, improved and increased to meet catchment goals » Native wildlife is protected and its habitat is improved and increased » Biodiversity in and around waterways and water storages is protected, improved and increased » Soil biodiversity is increased » Biodiversity is managed to meet community expectations | <p>incentive mechanisms for private landholders to protect natural diversity (including mechanisms such as conservation covenants and informal agreements such as Land for Wildlife)</p> <ul style="list-style-type: none"> » Revegetate cleared areas designated as ecological linkages » Establish collaborative partnerships to ensure the conservation management and recovery planning of significant ecological communities | <p>are significant native habitat, vegetation and wildlife corridors, riparian areas and other significant water habitats</p> <ul style="list-style-type: none"> » Biodiversity Action Plan is part of the Property Management Plan and takes account of all legal requirements in relation to biodiversity management » Farming activities minimise the risk of damage to native vegetation from threats including sediment, pesticide and fertiliser drift, vehicles, cultivation and pest plants, animals and diseases » Efforts made to increase biodiversity habitat on-farm |
| <p>Air Quality</p> <p>Continue progress towards improved air quality targets set by 2005</p> <p>Set Resource Condition Targets to manage climate risk and reduce risk of major environmental, economic or social outcomes from drought or coastal land impact. burning operations.</p> | <p>Air Quality Management</p> <p>Air pollution is minimised, this means where practical:</p> <ul style="list-style-type: none"> » Farm activities are managed to minimise production of greenhouse gas » Greenhouse gas is stored using native vegetation or other methods » Other air pollution is minimised in accordance | <p>Management Objectives</p> <ul style="list-style-type: none"> » Support regional community and stakeholder participation in programs relating to air quality improvement. » Support an education program on Climate Change and long-term climate variability | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Comply with regulatory requirements for air quality management and ensure activities cause minimal offensive odour, soot, smoke, light or noise to neighbours » Consider establishing native vegetation to create a ‘carbon sink’ for greenhouse gases » Manage crops to minimise nitrogen loss to the |

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| (See Air Quality below also) | with legal requirements. | | atmosphere |
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Other Natural Resources Management Policy/Regulation and links to EnviroVeg Manual

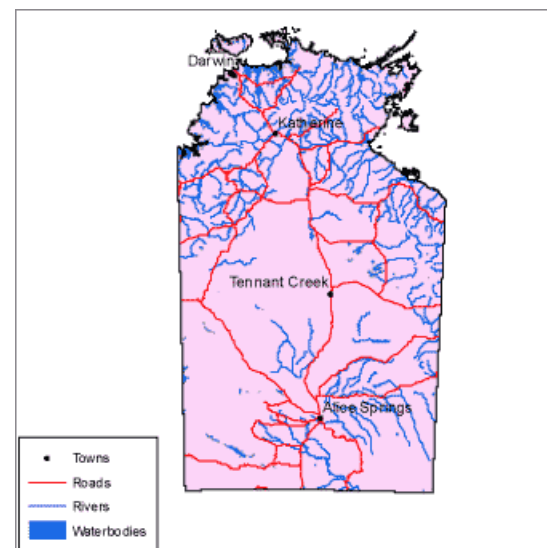
| Environmental Protection Act 1986, Environment Protection Policies, (EPP) (Swan and Canning Rivers) Administered by the EPA | EnviroVeg Management Objectives Source: EnviroVeg Manual | Management objectives based on the EMPCA Act: | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
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| <p>An Act to provide for an Environment Protection Authority, for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental or connected with the foregoing.</p> <p>The EPP (Swan and Canning Rivers) 1998 aims to ensure that the values of these rivers are restored maintained and protected by managing the activities that affect them.</p> | <p>Chemical Management</p> <p>Chemicals commonly used by growers include: pesticides, growth regulators, cleaning products, sanitisers water treatment products, fuel and oil, fertiliser and soil improvement products</p> <p>Chemicals need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Chemicals are used only where and when needed » Chemical use can be justified » Pollution of soil and water is minimised » Chemical management meets community expectations | <p>Management Objectives</p> <p>The EPP provides protection of lakes by:</p> <ul style="list-style-type: none"> » Prohibiting the carrying out of activities which cause destruction and degradation (e.g. disposal of effluent, drainage or filling the lake with materials). | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Risk assessment undertaken to identify any areas of potential contamination from persistent chemicals or heavy metals » Responsible chemical management used that complies with all legal requirements » Minimise use of chemicals and other pest treatments and observe all withholding periods » Chemical use, disposal and storage all complies with recommended best practice » Chemicals only used in weather conditions that minimise spray drift |
| As above | <p>Waste Management</p> <p>Vegetable growing can result in the creation of large amounts of unwanted materials (waste). Waste</p> | <p>Management Objectives</p> <p>A person discharging waste in circumstances in which it is likely to cause pollution commits and</p> | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and record the various types of waste produced on-farm |

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| | <p>can create problems for growers the community and the environment. Waste needs to be managed correctly so that:</p> <ul style="list-style-type: none"> » there is no litter or offensive odour » pests are controlled » runoff will not pollute waterways or groundwater » waste is not unsightly <p>Where it cannot be reused or recycled, waste is disposed of responsibly.</p> | <p>offence <i>Pollution</i> includes the direct or indirect alteration of the environment –</p> <ul style="list-style-type: none"> (a) to its detriment or degradation; (b) to the detriment of an environmental value | <ul style="list-style-type: none"> » Develop a Waste Management Plan to deal with wastes » Store wastes to ensure that there is no litter, offensive odour or pests created by the waste and no runoff from stored waste into waterways or groundwater » Dispose of unusable wastes responsibly. Waste is disposed of at a licensed landfill site and on-farm dumping avoided. » Waste is managed to meet legal requirements for health, safety and the environment » Waste is managed to meet community expectations |
| As above | <p>Air Quality Management</p> <p>Air pollution is minimised, this means where practical:</p> <ul style="list-style-type: none"> » Farm activities are managed to minimise production of greenhouse gas » Greenhouse gas is stored using native vegetation or other methods » Other air pollution is minimised in accordance with legal requirements. | <p>Management Objectives</p> <p>A person who causes an unreasonable emission to be emitted from any premises, causes an offence</p> <p><i>Unreasonable emission</i> includes an emission or transmission of noise or odour which unreasonably interferes with the health, welfare, convenience comfort or amenity of any person.</p> | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Comply with regulatory requirements for air quality management and ensure activities cause minimal offensive odour, soot, smoke, light or noise to neighbours » Consider establishing native vegetation to create a ‘carbon sink’ to take up green house gases » Manage crop to minimise nitrogen loss to the atmosphere |

| The Department of Climate Change | Energy Management | Extract from the Department Website | EnviroVeg Checklist |
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| <p>The Department of Climate Change is responsible for reducing Australia’s emissions through the development of policy, regulatory and educational initiatives.</p> <p>The Government is committed to creating a prosperous low-pollution economy in which Australia’s environment is protected.</p> | <p>Vegetable growers use large quantities of energy to power vehicles, machinery, irrigation systems, cool-rooms, lighting and equipment. Energy use should be managed responsibly, this means where practical:</p> <ul style="list-style-type: none"> » 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 | <ul style="list-style-type: none"> » A crucial part of addressing climate change is to reduce the carbon pollution Australia releases into the atmosphere. All Australians need to do their bit – whether individuals, governments or businesses | <ul style="list-style-type: none"> » Review consumption of electricity and fuel and where possible implement efficient operating practices |

Natural Resources Management and EnviroVeg Matrix Northern Territory – Northern Territory Natural Resource Management (NRM) Region

Key NRM Agencies: Landcare Council of the Northern Territory ; Department of Natural Resources, Environment, the Arts and Sport, Environment Protection Authority; and the Commonwealth Department of Climate Change



| Integrated Natural Resource Management (NRM) Plan for the NT Targets Source: Management Plan | EnviroVeg Management Objectives Source: EnviroVeg Manual | Integrated NRM Plan for the NT Management Targets | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
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| <p>Community capacity building</p> <p>By 2015, increasing numbers of land and sea managers surveyed report more equitable access to resources and skills to participate actively in NRM</p> <p>By 2015, a measureable increase in the number of sustainable, economically and socially viable industries is evident.</p> | <p>Property & Business Management</p> <p>Property and business management is environmentally-responsible. This means that, where practical:</p> <ul style="list-style-type: none"> » Protection and improvement of the environment is considered in daily decisions and activities » Growers support environmental improvement in their catchment and supply chain » Property plans include | <p>Community Participation Targets</p> <ul style="list-style-type: none"> » Use extension officers to increase the promotion of Best Management Practice Programs and Integrated Property Management Plans » Deliver targeted NRM awareness and capacity building programs through methods appropriate to each stakeholder » NRM on-ground facilitators are adequately resourced and trained | <p>EnviroVeg checklist</p> <ul style="list-style-type: none"> » Own and use a copy of the EnviroVeg Manual » Conduct EnviroVeg Self Assessment annually and review progress » Develop an Environmental Action Plan taking account of legal farm business requirements » Be aware of catchment priorities and targets for region and use incentives to further on-farm environmental |

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| | <p>environmental as well as other personal, farm and business goals</p> <ul style="list-style-type: none"> » Property and business management meets community needs for healthy and productive catchments | | <p>activities</p> <ul style="list-style-type: none"> » Have a property map showing farm paddocks, production areas, water storage and waterways, buildings, access roads, buffer zones and sensitive areas, and develop management strategies that promote sustainable outcomes in each area |
| <p>Land Use</p> <p>By 2015, no increase from 2005 to extent of land affected by dryland and irrigation salinity.</p> <p>By 2020, landscape health for all land types will be maintained at levels set in 2006</p> <p>.</p> | <p>Soil & Nutrition Management</p> <p>Healthy soils are managed to support productive agriculture and protect the environment. Soils need to be managed responsibly so that where practical they are protected from degrading processes and are managed so that:</p> <ul style="list-style-type: none"> » Soil structure, carbon, biodiversity, fertility and condition is improved using methods which do not pollute waterways or air » Soil is managed to meet community needs for healthy and productive catchments | <p>Soil Health Targets</p> <ul style="list-style-type: none"> » Develop and implement a soil and ground water monitoring program in horticultural and agricultural areas to detect potential occurrence of irrigation salinity and prioritise and support works to prevent salinisation » Raise industry and community awareness of the environmental, social and economic implications of soil erosion and of correct remedial or preventative practices » Increase stakeholder awareness of the anticipated impacts of climate change on biodiversity and sustainable production » Improve access of land | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Know soil types and soil testing to find out pH value, organic matter, nutrient, salinity and sodicity levels » Assess soil health on farm and put in place practices to prevent erosion and degradation » Have all weather access for vehicles » Manage irrigation to minimise damage to soil from runoff, erosion, water logging, rising water tables, nutrient and salinity transport » Apply fertiliser and nutrient only when needed to meet crop needs » Maintain high soil organic matter and biodiversity levels by using compost or crop |

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| | | suitability and capability information to local communities and local government | rotation or intercropping » Locate manure and fertiliser storages to ensure no runoff into crops or pollution of waterways or groundwater |
| <p>Inland waters and coastal and marine ecosystems</p> <p>By 2020 water resources will maintain aquatic biodeiversity, sustain water-dependent wcosystems and support enterprise and domestic use requirements.</p> <p>By 2020, regional water resources including groundwater are allocated equitably within defined sustainable yields.</p> <p>Nutrient and toxin levels and suspended sediment loads entring coastal and marine environments from point and diffuse sources on land are identified and methods developed to measure and manage trends by 2015.</p> | <p>Water & Waterway Management</p> <p>Clean water and healthy waterways, including rivers, creeks and wetlands, are important for your farm, the rest of your catchment, and your community. Water and waterways need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Community water resources are used responsibly » Water is taken from sustainable sources » Water storages contribute to biodiversity and wherever possible waterway health is improved and maintained » All waterway works are carried out only with the approval of the waterway manager » Water is managed to meet community needs for drinking, recreation, biodiversity, scenery » and agriculture | <p>Water Management Targets</p> <ul style="list-style-type: none"> » Implement water allocation plans » Support local programs that incorporate local industry, landholder and/or indigenous local knowledge into survey and monitoring programs » By 2010, adopt Best Management Practices for 50% of all inland aquatic ecosystems subject to land use and development pressures | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Water harvesting complies with regulatory requirements » Risk assessment used to assess water sources and future water supply » Irrigation water treated to minimise the risk of environmental harm » Irrigation schedules and plans used to take account of weather patterns and predictions; water stress symptoms; rainfall and wetting front detectors » Efficient irrigation system used that minimises energy use and is checked regularly » Supply and discharge water monitored to check pH and electrical conductivity » Water loss minimised by checking and repairing leaks; recycling water, reducing evaporative losses, catching runoff /tailwater into sumps, settling ponds or grassed |

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| | | | channels before storage. |
| <p>Managing pest animals and environmental weeds.</p> <p>By 2020 there is strategic containment of declared weeds, ecologically invasive plants and feral animals.</p> | <p>Pest Management</p> <p>Good pest management is essential to protect the health of soil, waterways and native vegetation and to support productive agriculture. Care is needed to ensure that pest management does not degrade soil, water or biodiversity.</p> <ul style="list-style-type: none"> » Pests (including insects, nematodes, diseases, weeds and pest animals) need to be managed responsibly. » This means that, where practical: Recognised Integrated Pest Management (IPM) techniques are used to manage pests » The health of soil, growing media, » crops, native vegetation and other hosts is maximised » Appropriate natural predators and other beneficial organisms are encouraged » Pest management meets community expectations | <p>Pest Management Targets</p> <ul style="list-style-type: none"> » Develop weed and feral species management plans in consultation with key stakeholder groups and landholders » Undertake targeted declared weeds, ecologically invasive plant and feral animal control programs | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Use an Integrated Pest Management for the monitoring of pests and diseases that takes account of legal requirements for responsible pest management » Apply products only when pest monitoring or advice from experts indicates that treatment is needed to prevent unacceptable damage to crops or other hosts » Practice good hygiene to minimise introduction and spread of pests and diseases » Recognise and promote beneficial insects for pest and disease control » Ensure management of native pest animals and disease does not impact on biodiversity |
| <p>Conservation of Biodiversity</p> <p>By 2020 the extent, condition and</p> | <p>Biodiversity Management</p> <p>Biodiversity (or biological</p> | <p>Biodiversity Management Targets</p> <ul style="list-style-type: none"> » By 2008 incentives and other | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and protect areas that |

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| <p>functionality of all native territory environments will be maintained at levels set in 2006.</p> <p>By 2020 there will be no decline in the conservation status of any 2005 listed threatened species or communities and no further additions required due to threatening processes.</p> | <p>diversity) means 'the variety of life'. Biodiversity helps to support a healthy environment, and to support and improve human life. On-farm biodiversity needs to be managed responsibly. This means that, where practical:</p> <ul style="list-style-type: none"> » Native vegetation is protected, improved and increased to meet catchment goals » Native wildlife is protected and its habitat is improved and increased » Biodiversity in and around waterways and water storages is protected, improved and increased » Soil biodiversity is increased » Biodiversity is managed to meet community expectations | <p>support programs will be in place and capacity building programs implemented across all land tenures and also to improve stewardship and promote off-reserve biodiversity conservation and sustainable use of natural resources</p> <ul style="list-style-type: none"> » Develop guidelines for landholders to help them develop the skills and capacity to make best management decisions to achieve biodiversity and ecosystem sustainability outcomes. | <p>are significant native habitat, vegetation and wildlife corridors, riparian areas and other significant water habitats</p> <ul style="list-style-type: none"> » Biodiversity Action Plan is part of the Property Management Plan and takes account of all legal requirements in relation to biodiversity management » Farming activities minimise the risk of damage to native vegetation from threats including sediment, pesticide and fertiliser drift, vehicles, cultivation and pest plants, animals and diseases » Efforts made to increase biodiversity habitat on-farm |
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Other Natural Resources Management Policy/Regulation and links to EnviroVeg Manual

| <p>Waste Management and Pollution Control Act 1998 administered the Department of Natural Resources, Environment, the Arts and Sport and the EPA</p> | <p>EnviroVeg Management Objectives Source: EnviroVeg Manual</p> | <p>Management objectives based on the EPA Act:</p> | <p>Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist</p> |
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| <p>The objectives of the this Act include- To protect and where practicable, restore and enhance the quality of</p> | <p>Chemical Management Chemicals commonly used by growers include: pesticides, growth</p> | <p>Management Objectives</p> <ul style="list-style-type: none"> » The Act establishes a General Environmental Duty. This | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Risk assessment undertaken to identify any areas of potential |

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| <p>the environment by-</p> <ul style="list-style-type: none"> » Preventing pollution; » Reducing the likelihood of pollution occurring; » Avoiding and reducing the generation of waste; » Increasing the re-use and recycling of waste; » Effectively managing waste disposal. » Encouraging ecologically sustainable development. | <p>regulators, cleaning products, sanitisers water treatment products, fuel and oil, fertiliser and soil improvement products</p> <p>Chemicals need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Chemicals are used only where and when needed » Chemical use can be justified » Pollution of soil and water is minimised » Chemical management meets community expectations | <p>means that a person that conducts an activity that causes or is likely to cause pollution resulting in environmental harm or that generates waste must take all measures that are reasonable to prevent or minimise pollution and reduce the amount of waste.</p> <p>» Chemical management should comply with the any environment protection objectives specified under the Act.</p> | <p>contamination from persistent chemicals or heavy metals</p> <ul style="list-style-type: none"> » Responsible chemical management used that complies with all legal requirements » Minimise use of chemicals and other pest treatments and observe all withholding periods » Chemical use, disposal and storage all complies with recommended best practice » Chemicals only used in weather conditions that minimise spray drift |
| <p>As above</p> | <p>Waste Management</p> <p>Vegetable growing can result in the creation of large amounts of unwanted materials (waste). Waste can create problems for growers the community and the environment. Waste needs to be managed correctly so that:</p> <ul style="list-style-type: none"> » there is no litter or offensive odour » pests are controlled » runoff will not pollute waterways or groundwater | <p>Management Objectives</p> <ul style="list-style-type: none"> • A person shall not willfully cause,(either directly or indirectly) waste to come into contact with water or for water to be polluted causing serious environmental harm • A person must not cause or permit a contaminant or waste to be stored in a manner or place from which it could leak, spill, or escape from storage to the | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and record the various types of waste produced on-farm » Develop a Waste Management Plan to deal with wastes » Store wastes to ensure that there is no litter, offensive odour or pests created by the waste and no runoff from stored waste into waterways or groundwater » Dispose of unusable wastes responsibly. Waste is disposed |

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| | <p>» waste is not unsightly</p> <p>Where it cannot be reused or recycled, waste is disposed of responsibly.</p> | <p>environment and cause environmental harm</p> | <p>of at a licensed landfill site and on-farm dumping avoided.</p> <p>» Waste is managed to meet legal requirements for health, safety and the environment</p> <p>» Waste is managed to meet community expectations</p> |
| <p>As above</p> | <p>Air Quality Management</p> <p>Air pollution is minimised, this means where practical:</p> <p>» Farm activities are managed to minimise production of greenhouse gas</p> <p>» Greenhouse gas is stored using native vegetation or other methods</p> <p>» Other air pollution is minimised in accordance with legal requirements.</p> | <p>Management Objectives</p> <p>» A person must comply with any environment protection objectives relating to air quality</p> <p>» Ambient air quality parameters set under the National Environment Protection Measure 1998 must be complied with-monitoring plan developed for Darwin</p> | <p>EnviroVeg Checklist</p> <p>» Comply with the relevant regulatory requirements for air quality management and ensure activities cause minimal offensive odour, soot, smoke, light or noise to neighbours</p> <p>» Consider establishing native vegetation to create a 'carbon sink' to take up green house gases</p> <p>» Manage crop nutrition to minimise nitrogen loss to the atmosphere</p> |
| <p>The Department of Climate Change</p> <p>The Department of Climate Change is responsible for reducing Australia's emissions through the development of policy, regulatory and educational initiatives.</p> <p>The Government is committed to</p> | <p>Energy Management</p> <p>Vegetable growers use large quantities of energy to power vehicles, machinery, irrigation systems, cool-rooms, lighting and equipment. Energy use should be managed responsibly, this means where practical:</p> <p>» Energy use is minimised</p> | <p>Extract from the Department Website</p> <p>» A crucial part of addressing climate change is to reduce the carbon pollution Australia releases into the atmosphere. All Australians need to do their bit – whether individuals, governments or businesses</p> | <p>EnviroVeg Checklist</p> <p>» Review consumption of electricity and fuel and where possible implement efficient operating practices</p> |

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| <p>creating a prosperous low-pollution economy in which Australia's environment is protected.</p> | <ul style="list-style-type: none"> » Responsible energy sources are used » Energy use is managed to meet legal requirements » Energy use is managed to meet community expectations | | |
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Natural Resources Management and EnviroVeg Matrix South Australia - Adelaide and Mount Lofty Ranges Natural Resource Management (NRM) Region

Key NRM Agencies: Adelaide and Mount Lofty Ranges (NRM) Board ; Department of Environment and Heritage, Department of Water, Land and Biodiversity Conservation, Environment Protection Authority; and the Commonwealth Department of Climate Change



| Adelaide and Mount Lofty Ranges NRM Plan 2008-2028 Targets Source: Catchment Plan | EnviroVeg Management Objectives Source: EnviroVeg Manual | Adelaide and Mount Lofty Ranges Management Targets 2009-2012 | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
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| <p>Community capacity building</p> <p>Improve, by 20%, the capacity of people in the community, institutions and regional organisations to sustainably manage their natural resources.</p> | <p>Property & Business Management</p> <p>Property and business management is environmentally-responsible. This means that, where practical:</p> <ul style="list-style-type: none"> » Protection and improvement of the environment is considered in daily decisions and activities » Growers support environmental improvement in their catchment and supply chain » Property plans include environmental as well as other | <p>Community Participation Targets</p> <ul style="list-style-type: none"> » Technical information on a range of land management issues provided to 3,000 property managers » 250 property plans completed » A 10% increase in the knowledge of sustainable NRM amongst the general community | <p>EnviroVeg checklist</p> <ul style="list-style-type: none"> » Own and use a copy of the EnviroVeg Manual » Conduct EnviroVeg Self Assessment annually and review progress » Develop an Environmental Action Plan taking account of legal farm business requirements » Be aware of catchment priorities and targets for region and use incentives to further on-farm environmental activities » Have a property map showing |

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| | <p>personal, farm and business goals</p> <ul style="list-style-type: none"> » Property and business management meets community needs for healthy and productive catchments | | <p>farm paddocks, production areas, water storage and waterways, buildings, access roads, buffer zones and sensitive areas, and develop management strategies that promote sustainable outcomes in each area</p> |
| <p>Land</p> <p>Maintain productive capacity of agriculture at current levels.</p> <p>Improve land condition for primary production by 15%.</p> <p>Land based impacts (eg sediment load) on coastal, estuarine and marine habitats reduced from current levels.</p> <p>Halt the decline (due to land based activities) in seagrass, reef and other coast, estuarine and marine habitats and trend towards restoration.</p> | <p>Soil & Nutrition Management</p> <p>Healthy soils are managed to support productive agriculture and protect the environment. Soils need to be managed responsibly so that where practical they are protected from degrading processes and are managed so that:</p> <ul style="list-style-type: none"> » Soil structure, carbon, biodiversity, fertility and condition is improved using methods which do not pollute waterways or air » Soil is managed to meet community needs for healthy and productive catchments | <p>Land Targets</p> <ul style="list-style-type: none"> » An increase in sustainable NRM behaviours by the community, institutions and regional organisations » 50% of agri-services providers in the region include sustainable resource management in information provided to landholders | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Know soil types and soil testing to find out pH value, organic matter, nutrient, salinity and sodicity levels » Assess soil health on farm and put in place practices to prevent erosion and degradation » Have all weather access for vehicles » Manage irrigation to minimise damage to soil from runoff, erosion, water logging, rising water tables, nutrient and salinity transport » Apply fertiliser and nutrient only when needed to meet crop needs » Maintain high soil organic matter and biodiversity levels by using compost or crop rotation » Locate manure and fertiliser storages to ensure no runoff into crops or pollution of waterways |

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| | | | or groundwater |
| <p>Water resources</p> <p>75% of stormwater used and 100% of waste water reused</p> <p>All water resources(including coastal, estuarine and marine) meet the water quality guidelines to protect defined environmental values.</p> <p>All water resources used within sustainable yields (allowing for variability).</p> <p>Reduce average annual cost of flood damage.</p> | <p>Water & Waterway Management</p> <p>Clean water and healthy waterways, including rivers, creeks and wetlands, are important for your farm, the rest of your catchment, and your community. Water and waterways need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Community water resources are used responsibly » Water is taken from sustainable sources » Water storages contribute to biodiversity and wherever possible waterway health is improved and maintained » All waterway works are carried out only with the approval of the waterway manager » Water is managed to meet community needs for drinking, recreation, biodiversity, scenery » and agriculture | <p>Water Management Targets</p> <ul style="list-style-type: none"> » Water quality objectives established for watershed, groundwater and coastal water resources in the region » Coast, estuarine and marine community and professional NRM practitioner networks and community monitoring established » Four water allocation plans completed and in operation » Watercourse rehabilitation for water quality improvement being undertaken along an additional 40km above 2008 commitments » Six irrigation courses completed | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Water harvesting complies with regulatory requirements » Risk assessment used to assess water sources and future water supply » Irrigation water treated to minimise the risk of environmental harm » Irrigation schedules and plans used to take account of weather patterns and predictions; water stress symptoms; rainfall and wetting front detectors » Efficient irrigation system used that minimises energy use and is checked regularly » Supply and discharge water monitored to check pH and electrical conductivity » Water loss minimised by checking and repairing leaks; recycling water where possible, reducing evaporative losses and catching runoff and tailwater into sumps, settling ponds or grassed channels before it goes into storage. |
| <p>Managing pest animals and environmental weeds.</p> <p>See biodiversity</p> | <p>Pest Management</p> <p>Good pest management is essential to protect the health of soil,</p> | <p>Pest Management Targets</p> <ul style="list-style-type: none"> » Baseline information for distribution and abundance | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Use an Integrated Pest Management for the monitoring |

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| | <p>waterways and native vegetation and to support productive agriculture. Care is needed to ensure that pest management does not degrade soil, water or biodiversity.</p> <ul style="list-style-type: none"> » Pests (including insects, nematodes, diseases, weeds and pest animals) need to be managed responsibly. » This means that, where practical: Recognised Integrated Pest Management (IPM) techniques are used to manage pests » The health of soil, growing media, » crops, native vegetation and other hosts is maximised » Appropriate natural predators and other beneficial organisms are encouraged » Pest management meets community expectations | <p>of proclaimed plant and priority vertebrate pests established</p> <ul style="list-style-type: none"> » Management plans developed and implemented for priority pest species | <p>of pests and diseases that takes account of legal requirements for responsible pest management</p> <ul style="list-style-type: none"> » Apply products only when pest monitoring or advice from experts indicates that treatment is needed to prevent unacceptable damage to crops or other hosts » Practice good hygiene to minimise introduction and spread of pests and diseases » Recognise and promote beneficial insects for pest and disease control » Ensure management of native pest animals and disease does not impact on biodiversity |
| <p>Conservation of Biodiversity</p> <p>Increase extent of functional ecosystems (terrestrial, marine, aquatic) by 30%.</p> <p>No decline in conservation status of native species ((terrestrial, marine, aquatic) from current</p> | <p>Biodiversity Management</p> <p>Biodiversity (or biological diversity), means ‘the variety of life’. Biodiversity helps to support a healthy environment, and to support and improve human life. On-farm biodiversity needs to be managed responsibly. This means</p> | <p>Biodiversity Management Targets</p> <ul style="list-style-type: none"> » 2,500ha of native vegetation on private land being actively managed » Priority actions from recovery Plans being implemented | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and protect areas that are significant native habitat, vegetation and wildlife corridors, riparian areas and other significant water habitats » Biodiversity Action Plan is part of the Property Management Plan |

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| levels. | <p>that, where practical:</p> <ul style="list-style-type: none"> » Native vegetation is protected, improved and increased to meet catchment goals » Native wildlife is protected and its habitat is improved and increased » Biodiversity in and around waterways and water storages is protected, improved and increased » Soil biodiversity is increased » Biodiversity is managed to meet community expectations | | <p>and takes account of all legal requirements in relation to biodiversity management</p> <ul style="list-style-type: none"> » Farming activities minimise the risk of damage to native vegetation from threats including sediment, pesticide and fertiliser drift, vehicles, cultivation and pest plants, animals and diseases » Efforts made to increase biodiversity habitat on-farm |
|---------|--|--|---|

Other Natural Resources Management Policy/Regulation and links to EnviroVeg Manual

| Environment Protection Act 1993), State Environment Protection Policies (EPP), (e.g. Water Quality 2003), Waste Management Policies Administered by EPA | EnviroVeg Management Objectives Source: EnviroVeg Manual | Management objectives based on the EPA Act: | Vegetable Grower Farm Guidelines Source: EnviroVeg Self Assessment Checklist |
|---|---|--|---|
| The Act imposes the general environmental duty on all people undertaking an activity that can pollute, to take all reasonable and practicable measures to prevent or minimize any resulting | Chemical Management Chemicals commonly used by growers include: pesticides, growth regulators, cleaning products, sanitisers water treatment products, fuel and oil, fertiliser and soil improvement products | Management Objectives » An occupier of land must take all reasonable and practicable measures to avoid the discharge of waste into any waters or onto land from where it might enter any | EnviroVeg Checklist » Risk assessment undertaken to identify any areas of potential contamination from persistent chemicals or heavy metals » Responsible chemical management used that complies |

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| <p>environmental harm. The EPP (Water Quality) aims to achieve the sustainable management of waters by protecting or enhancing water quality while allowing economic and social development.</p> | <p>Chemicals need to be managed responsibly, this means that, where practical:</p> <ul style="list-style-type: none"> » Chemicals are used only where and when needed » Chemical use can be justified » Pollution of soil and water is minimised » Chemical management meets community expectations | <p>water</p> <ul style="list-style-type: none"> » A person must not cause environmental harm by discharging a pollutant into any waters which may cause - a reduction in native species, a reduction in aquatic organisms necessary to a healthy aquatic ecosystem, an increase in algal growth or aquatic plant growth, the water to be harmful or offensive to humans, animals or cause an increase in turbidity or sediment levels | <p>with all legal requirements</p> <ul style="list-style-type: none"> » Minimise use of chemicals and other pest treatments and observe all withholding periods » Chemical use, disposal and storage all complies with recommended best practice » Chemicals only used in weather conditions that minimise spray drift |
| <p>As above</p> | <p>Waste Management</p> <p>Vegetable growing can result in the creation of large amounts of unwanted materials (waste). Waste can create problems for growers the community and the environment. Waste needs to be managed correctly so that:</p> <ul style="list-style-type: none"> » there is no litter or offensive odour » pests are controlled » runoff will not pollute waterways or groundwater » waste is not unsightly <p>Where it cannot be reused or</p> | <p>Management Objectives</p> <p>Ensure that waste management will be based on the on the following in order of priority</p> <ul style="list-style-type: none"> » avoiding the production of waste » minimising the production of waste » reusing waste » recycling waste » treating waste to reduce potentially degrading impacts » depositing of waste in an environmentally sound manner | <p>EnviroVeg Checklist</p> <ul style="list-style-type: none"> » Identify and record the various types of waste produced on-farm » Develop a Waste Management Plan to deal with wastes » Store wastes to ensure that there is no litter, offensive odour or pests created by the waste and no runoff from stored waste into waterways or groundwater » Dispose of unusable wastes responsibly. Waste is disposed of at a licensed landfill site and on-farm dumping avoided. » Waste is managed to meet legal requirements for health, safety |

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| | recycled, waste is disposed of responsibly. | | and the environment » Waste is managed to meet community expectations |
| As above | <p>Air Quality Management</p> <p>Air pollution is minimised, this means where practical:</p> <p>Farm activities are managed to minimise production of greenhouse gas Greenhouse gas is stored using native vegetation or other methods Other air pollution is minimised in accordance with legal requirements.</p> | <p>Management Objectives</p> <p>» Noisy equipment should be used in such a way as its impact on neighbouring premises should be minimised. The maximum permissible noise level for the rural industry should not exceed 57 dB (A) between 7 am-10 pm and 50 dB(b) overnight</p> <p>» The emission of any pollutant (a substance that may cause environmental harm) into the air must comply with levels prescribed by the EPA</p> | <p>EnviroVeg Checklist</p> <p>» Comply with the relevant regulatory requirements for air quality management and ensure activities cause minimal offensive odour, soot, smoke, light or noise to neighbours</p> <p>» Consider establishing native vegetation to create a 'carbon sink' to take up green house gases</p> <p>» Manage crop nutrition to minimise nitrogen loss to the atmosphere</p> |
| <p>The Department of Climate Change</p> <p>The Department of Climate Change is responsible for reducing Australia's emissions through the development of policy, regulatory and educational initiatives. The Government is committed to creating a prosperous low-pollution economy in which</p> | <p>Energy Management</p> <p>Vegetable growers use large quantities of energy to power vehicles, machinery, irrigation systems, cool-rooms, lighting and equipment. Energy use should be managed responsibly, this means where practical:</p> <p>» Energy use is minimised » Responsible energy sources</p> | <p>Extract from the Department Website</p> <p>» A crucial part of addressing climate change is to reduce the carbon pollution Australia releases into the atmosphere. All Australians need to do their bit – whether individuals, governments or businesses</p> | <p>EnviroVeg Checklist</p> <p>» Review consumption of electricity and fuel and where possible implement efficient operating practices</p> |

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| Australia's environment is protected. | are used » Energy use is managed to meet legal requirements » Energy use is managed to meet community expectations | | |
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2. Raise Awareness and Increase Uptake of EnviroVeg by NRM Regional Bodies and Vegetable Growers

Key Activities: Eight Regional EnviroVeg Workshops

Four Regional Soil Health Workshops

Three Soil-Pit Demonstrations

The past eighteen months have been extremely busy for the EnviroVeg Program, with twelve workshops and three soil-pit demonstrations run in different locations across Australia. Four EnviroVeg workshops were held in late 2008-early 2009, these were run in Bathurst – Central West CMA; Bundaberg – Burnett Mary Regional Group; Logan – South-East Queensland NRM; and, Carnarvon – Rangelands CMA. Two soil health workshops were also held, with one in Myrtleford (Victoria) and the other in Myalup (Western Australia). These six workshops were successfully managed, and involved the NRM Regional Bodies listed above. The previous Milestone Report 102 provides details of these events.

In the completion stage of this project, a different approach was taken so that growers were exposed to new research as it related to climate change and soil health, with less of a focus on the EnviroVeg Manual and self-assessment process. By focusing on research and practice relating to *Climate Change: Opportunities and Risks for Vegetable Growing*, the four EnviroVeg workshops brought together a wider audience of growers, researchers, local industry representatives, local NRM bodies and agricultural extension officers, to discuss how climate change could potentially impact on their region. The idea behind this approach was that it would encourage growers to think about being part of a wider 'catchment community', with members of that community present at the workshop to demonstrate the linkages that exist at the local level. The date and locations of these workshops were as follows:

- Wanneroo – Department of Water Perth (WA), 16th October,
- Cowra – Lachlan Catchment Management Authority (NSW) 23rd October,

- Stanthorpe Qld Murray-Darling Basin Committee (Qld) 6th November,
- Ulverstone - North-West NRM (Tas) 27th November.

Two Healthy Soils workshops were held, with one in Bowen (Qld) on the 11th of November and the other in Cranbourne (Vic) on the 20th of November. Workshops reports are provided for each of these events in the following section. Overall however, it is worth noting that these workshops attracted a mix of vegetable growers, local agency personnel, NRM regional body staff, Landcare, Drum Muster and Farmers Federation representatives. These people appreciated the opportunity to interact directly with researchers, particularly when their levies have paid for the research being undertaken.

Awareness about the workshops was raised through two articles in the Vegetable Australia magazine, one in the September edition focusing on *Climate Change – Opportunities and Risks*:

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Climate change – What are the opportunities and risks for your business?

Concerned about the impact of climate change on your business? A new brochure produced by HAL should help clear the fog.

Australia's increasingly variable climate poses challenges for vegetable growers given the sector's dependency on natural resources, especially water for irrigation. This makes the sector inherently vulnerable to the impacts of both short-term climate variability and long-term climate change. The advent of these physical impacts affect products and businesses will be further straped by the:

- growing global demand for food
- impacts of climate change policy
- increasing demands for productivity growth
- increasing competition for natural resources
- requirements for ever more efficient and sustainable production practices.

Most of the anticipated climate change scenarios point towards the need for a very high standard of crop management. Growers will need to distinguish between 'old climate expectations' and 'new climate realities' in determining and implementing adaptation strategies or options.

It will be important for management strategies to be identified and implemented by growers to either offset negative impacts or take advantage of positive responses. It will also be necessary to develop capacity and knowledge so that growers can make effective business decisions, minimise risk, and manage their response to climate variability more effectively.



EnviroVeg

Brochure available
Horticulture Australia Limited (HAL) and the Climate Change Research Strategy for Primary Industries network have produced a new brochure so that growers have information about:

- predicted climate change impacts on horticulture
- research underway to assist growers in responding to climate change
- practical measures to mitigate and adapt to the challenges and opportunities presented by climate change
- a glossary of commonly used climate change terms.

The brochure clarifies what can be done now—through existing business operations and strategies—to help growers reduce greenhouse gas emissions (mitigation) and prepare for future climate conditions (adaptation).

Register for workshops
EnviroVeg will provide a series of four workshops in October and November to consider the impacts of climate change on the vegetable industry, and explain the latest research and practical tools for growers, including this Houston's Farm and Vegetable Carbon Footprinting Tool project (see panel).

The workshops will be held on:

- 16 October, Perth, WA
- 23 October, Geelong, NSW
- 6 November, Stanthorpe, Qld
- 27 November, Ulverstone, Tas.

If you are interested in attending a workshop, please contact the new EnviroVeg Consultant, Swan Lovett.

For more information about EnviroVeg, and the EnviroVeg Panel and workshops, contact:
Dr Swan Lovett, EnviroVeg Consultant
Phone: 08 9410 7980
Email: swan@enviroveg.com.au
For more information about climate change visit:
www.climate.gov.au
or www.ccsrpi.com.au

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Eco-jargon explained

Carbon footprint
Carbon footprints calculate the amount of carbon dioxide (CO₂) produced by an activity, a business or a country.

In its strictest sense, a carbon footprint accounts for both direct emissions (those that a business or activity is wholly responsible for, which means all on-farm activities that produce greenhouse gases) and indirect emissions (those related to activities such as transport of raw materials to a business, and transport of a product to the consumer).

Other greenhouse gases that contribute to global warming are often converted to 'carbon dioxide equivalents' (CO₂-e), which is the amount of carbon that would have a similar effect to the actual amount of the greenhouse gas released.

The carbon footprint combines the impact of all CO₂ and CO₂-e gases in terms of carbon. Growers will need to look at their exposure to all greenhouse gases for potential new product labeling and regulatory reporting under either the proposed Carbon Pollution Reduction Scheme (CPRS) or the National Greenhouse Energy Reporting Framework.

Life cycle assessment
A life cycle assessment is an assessment of the environmental, economic and social impacts of a production system or product. The life cycle commences from the raw materials stage through to processing, transport, use, reuse, recycling or disposal. Sometimes it is described as analysing a product's impact from the 'cradle to the grave'. A new fact sheet has been produced on life cycle assessment. If you would like a copy contact EnviroVeg Consultant, Swan Lovett, or visit www.enviroveg.com.au.

Food miles
Food miles are the distance food travels throughout the complete production process ending with the consumer. The concept allows for a simple comparison to be made among different foods in relation to energy use and greenhouse gas emissions.



Taking the first step

Houston's Farm is developing new tools for the industry to assess the impacts of climate change.

Houston's Farm is a fully integrated grower and processor of fresh-cut salads supplying more than 1,400 major retail outlets nationally.

In light of the retail focus in UK and US supermarkets on food miles, and the growing debate in Australia about greenhouse gas emissions, Houston's Farm developed a strategy to calculate its business carbon footprint using product life cycle assessment.

Using its fully integrated grower, processor and distribution model, Houston's Farm developed a calculation tool that has the ability to analyse the relative impact and merit of proposed changes to its production and distribution model.

In 2007, Houston's Farm was the inaugural winner of the Woolworths Fresh Food Grant in recognition of its strategy. It chose to leverage award funds by investing in a project through HAL to develop a project of wider significance.

The Houston's Farm project commenced in June 2008 and has three stages:

1. The development of the tool using Houston's Farm modeling
2. Development of a simple interface to enable adoption across industry
3. Dissemination to industry.

The first stage (June 2008 – June 2009) has been completed, and stages two and three (July 2009 – June 2011) are ready to commence. These involve the modification of the Houston's Farm tool into a more widely applicable Vegetable Carbon Footprinting Tool and will include dissemination to industry through an education process.

..and another in the November edition of with a feature on *Managing for Healthy Soils*.



Healthy soils for sustainable farms

Growers who want to maintain good soil-management practices have a number of tools available to them, writes EnviroVeg Consultant Dr Siwan Lovett.

Healthy soil is defined as soil that is productive and easy to manage under the intended land use. Healthy soils have chemical, biological and physical properties that promote the health of plants, animals and humans. They also support profitable farming systems and grow regional economies.

These were developed by bringing together the science of soil health with the experience of farmers. For vegetable growers, the *Healthy Soils for Sustainable Vegetable Farms Life Guide* and accompanying DVD were produced to communicate these messages in practical ways for on-farm use.

In some parts of Australia, good farming practices have resulted in degraded soils. Key degrading processes include erosion, structural decline, carbon depletion, nutrient loss, acidification and salinisation. These processes threaten the short- and long-term sustainability of productive agriculture.

To continue the work of the Healthy Soils for Sustainable Farms, the EnviroVeg Program is running two soil health workshops. The first of these was scheduled to be held in Bowen, Queensland, on 11 November, the second workshop will be in Cairns, Victoria, on 20 November.

Soil workshops
The Healthy Soils for Sustainable Farms Program (2005-2008) was established in response to these threats, it aimed to assist farmers to adopt good soil-management practices. Key messages to come out of the program were the six attributes of healthy soils, and the 10 habits of healthy soil farmers (see panel).

Vegetable growers in the Cranbourne region will be given the opportunity to talk to researchers and practitioners first hand about the latest developments in managing soil for optimal health and productivity. If you are interested in attending this workshop, please email admin@ausveg.com.au or call AUSVEG on 03 9544 8008. For growers unable to attend



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these workshops, a new Soil Health Knowledge Bank is available online at www.soilhealthknowledge.com.au. This website contains a range of free, locally-oriented soil health guides, case studies, soil assessment tools, and education and training materials. Links to the website can also be found on the new EnviroVeg soil health website, www.ausveg.com.au/healthysoils.cfm. **Climate Change seminars** In other EnviroVeg news, those of the four EnviroVeg Climate Change seminars have been



“There is much in agriculture we can’t control, however healthy soils and sustainable practices are our best opportunity to be successful. The decisions we make regarding sustainable practices and soil health now, will cement our place in profitable agriculture for generations to come.”

John and Kerry Steel, Farmers, Mid-Loddon sub-catchment, Victoria

successfully held in Western Australia, New South Wales and Queensland.

The first workshop, Understanding Climate Change Impacts in the Vegetable Industry: Opportunities and Risks, will be held in Lismore, Tasmania, on 27 November. Attending growers will learn about the impacts of climate change on the vegetable industry, and be given information about the latest research and practical tools.

from Elders. Further information can be obtained from the EnviroVeg website, via www.ausveg.com.au/healthysoils.cfm

The Healthy Soils for Sustainable Farms Program was managed by Land & Water Australia on behalf of the Department of Agriculture, Fisheries and Forestry, and in partnership with the Grants Research and Development Corporation.

Healthy soils:

- Maintain organic matter for robust soil structure and carbon storage
- Match nutrient supply and demand
- Optimise water entry, storage and supply
- Enhance soil biological function
- Optimise productivity
- Enhance environmental and community health and well-being.

The 10 habits of healthy soils farmers:

1. Maintain organic matter, ground cover and plant diversity
2. Balance (targeted) application of inputs to maintain soil fertility
3. Maintain healthy plant growth
4. Manage for soil structural stability
5. Monitor and evaluate soil condition
6. Understand soil limitations
7. Learn for continuous improvement
8. Value the balance between production, and ecological and environmental services
9. Invest in profitable strategies to enhance soil health
10. Manage for climatic variability.

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Home > Environment > About EnviroVeg

About EnviroVeg

“EnviroVeg is the vegetable industry’s own environmental program developed specifically for vegetable growers.”

About EnviroVeg
EnviroVeg provides growers with guidelines and information on how to manage their business in an environmentally responsible manner. It provides a visible way of demonstrating a responsible attitude towards the environment. It also assists growers by showing the community that they are responsible environmental managers. Growers achieving environmental certification may also benefit from a marketing edge. EnviroVeg is an industry owned and developed environmental program for vegetable growers. It is **FREE** to all levy paying vegetable growers.

Why should I join EnviroVeg?

- To have your environmental practices recognised and acknowledged
- To identify the farming practices that you already have in place which have a beneficial environmental impact
- To demonstrate to the community that you are actively engaged in environmentally responsible vegetable production
- To get information from the program’s website and newsletters on useful sites, courses and information
- To get information about any subsidies, grants or funding this is available to growers wishing to make environmental improvements on farm

[Click here to join EnviroVeg.](#)

EnviroVeg Contact
Dr Siwan Lovett
AUSVEG EnviroVeg Consultant
Ph: (02) 6247 7997
Email: siwan.lovett@ausveg.com.au

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

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<http://www.ausveg.com.au/enviroveg.cfm> [5/11/2009 12:58:23 PM]

The six workshops were also supported by on-line resources, with two new web pages available on the EnviroVeg website – one of these on Climate Change and the other on Healthy Soils. The latest brochures and web links were also provided, and once the workshops were completed the workbook notes were made available on-line.

HAL Enviroveg PROGRAM AUSVEG NSW Farmers ASSOCIATION

EnviroVeg invites you to attend an information session on:

Understanding Climate Change Impacts in the Vegetable Industry: Opportunities and Risks

Climate change is going to impact on vegetable growing in your local region, knowing what these predicted impacts are, and how best to prepare your farm to deal with them, is valuable information for your business enterprise. This information session will provide growers with access to the latest research, tools and materials being developed to manage potential opportunities and risks to the industry.

Speakers Include:

- Mr Jeff McSpedden** (Workshop Chair) – Chairman, Ausveg EnviroVeg Committee
- Peter Deuter** – Senior Principal Horticulturalist Qld DPIF, keynote speaker focusing on the latest climate change research and adaptive management practices. Peter will talk about his work on climate change 'tipping' points for different vegetables, as well as carbon footprinting work.
- Dr Siwan Lovett** – EnviroVeg – will discuss how EnviroVeg can help growers prepare for climate change and access resources
- Richard Mulcahy** – Chief Executive Officer, Ausveg
- Mr Ian Robertson** – Regional Sales Manager, Elders, will discuss Elders services and new products for the horticultural industry.
- Ms Lu Hogan** – Rural Directions

Representatives from relevant government agencies and authorities will also be present with further information about the work they are doing to assist vegetable growers.

Date: 23rd October 2009
Time: 2.30pm-6.00pm - afternoon tea and end of session refreshments will be provided
Location: Cowra Bowling Club, Brougham Street, Cowra

Please come along, we look forward to meeting you.
 To confirm your attendance by contacting AUSVEG on ph 03 9544 8098, fax 039558 6199 or email admin@ausveg.com.au no later than 16th October.

Industry communication is facilitated by HAL in partnership with AUSVEG and is funded by the National Vegetable and Potato Levies. The Australian Government provides matched funds for all HAL's R&D activities.

Workshop Flyer

HAL AUSVEG Enviroveg PROGRAM

Understanding Climate Change Impacts in the Vegetable Industry: Opportunities and Risks

INFORMATION SESSION NOTES

Industry communication is facilitated by HAL in partnership with AUSVEG and is funded by the National Vegetable and Potato Levies. The Australian Government provides matched funds for all HAL's R&D activities.

Workbook (see Appendix 1)

Some of the researchers – and practitioners featured in the workshops:



Peter Deuter (QDEEDI)

Chris Monsour (Peracto)

Ian Porter (DPI Vic)

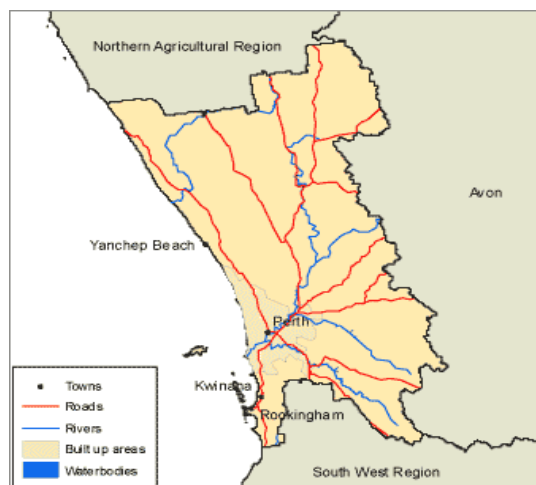
Individual workshop reports were compiled at the completion of each event so that a record of participants, issues raised and overall impressions could be gained. These reports now follow, interspersed with some photos from the events. In addition, a survey has been emailed out to all workshop attendees that seeks feedback on the benefits of attending and how the information can be applied on-farm (see Appendix 2). The survey also seeks input into what other topics growers would like to see covered.

EnviroVeg Workshops – Easy Index

| | |
|---|--|
| Western Australia Wanneroo - Climate Change pgs 75-76 | New South Wales Cowra - Climate Change pgs 77-78 |
| Queensland Stanthorpe - Climate Change pgs 91-81 | Queensland Bowen - Healthy Soils pgs 83 |
| Victoria Cranbourne - Healthy Soils pgs 84 | Tasmania Ulverstone - Climate Change pgs 85 |

**Wanneroo EnviroVeg Workshop Summary:
Understanding Climate Change Impacts in
the Vegetable Industry:
Opportunities and Risks**

Date: 16th October 2009
Venue: Wanneroo Tavern



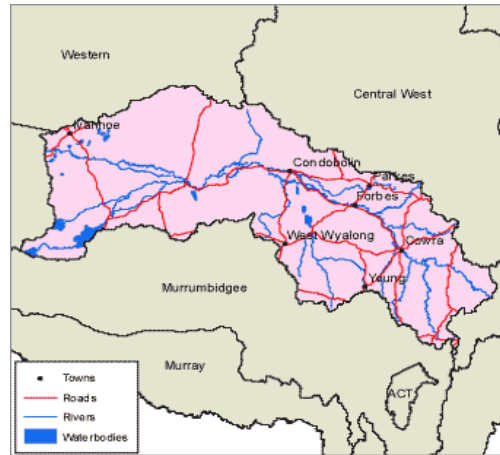
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| Number of attendees | 21 participants. |
| Issues Raised | <p>How have growers adapted to past climate change?</p> <ul style="list-style-type: none"> » Water issues dominated the first part of the discussion, as rainfall deficits were an important part of the changing climate at Wanneroo. Growers are reducing water use as well as reducing the potential for ground water contamination with nitrates, by using fertiliser and water scheduling services from contractors and Government. This provided opportunities to change irrigation methods, timing and amount to correspond with crop requirements, as measured by evapo-transpiration. Input costs were reduced as well. » Time of first planting has changed for several winter crops because of increased maximum temperatures in summer. Growers are delaying planting, as subsequent consecutive plantings all harvest at the same time, creating a marketing issue - <i>“this (traditional planting times) doesn’t work anymore, we need to do something different”</i> (grower from 10km south of Perth). » The season for leafy crops (lettuce in particular) is starting a month later, and varieties are different now as a consequence of higher temperatures and market requirements, especially in the most northern areas at Gingin. <i>“variety change is a simple change vs water and IPM”</i> » Western Flower Thrips is now being found in a few greenhouses because of the species being able to survive the warmer winters. A significant infestation occurred in 2002 (2002 was a very humid summer), and the pest has remained in the region. Field crop infestations have also occurred since 2002 in greenhouses and field |

| | |
|---------------------|---|
| | <p>grown tomatoes and capsicum. The question was asked – <i>“is this a result of climate shift”?</i></p> <ul style="list-style-type: none"> » One citrus grower who has his own weather station demonstrated that changes had occurred in recent years, and these had impacts in his orchard - Sun scald as a result of a few days of additional heat; this grower said – <i>“I can do something about water but not climate (temperature increases)”</i>. » Growers are confident that they can meet market specifications using current technologies. They often grow excess to market requirements to accommodate impacts which include adverse weather conditions. Over the last 20 years most growers have specialised in 2-3 crops, and grown many of these crops all year round to ensure market access and profitability. <p>How are growers going to adapt to these changes in the future?</p> <ul style="list-style-type: none"> » Sweet Corn growers have already expanded production into Broome for winter production and continuity of supply. » Continuity of supply is the main driver of change, and urbanisation will remain another driver of future change (production is being driven north as urbanisation also moves north of Perth, taking over the land which has been growing vegetables). As growers move north, they are moving into warmer regions which will get warmer in the future. » Climate change is considered in decision making by growers, as most have been aware of past changes, and future changes have been well publicised. |
| Supporting Products | <ul style="list-style-type: none"> » EnviroVeg Article in Vegetables Australia on Climate Change » EnviroVeg Flyer » Climate Change Research Strategy for Primary Industries Horticulture and Life Cycle Assessment Fact Sheets » EnviroVeg Climate Change Workbook |
| Overall impressions | <ul style="list-style-type: none"> » Past climate change has not been significant, and future climate change will be of the same magnitude. Water for irrigation is on the minds of most growers continuously. The general mood was of optimism about how they have managed in the past, and how they will manage into the future. These growers were the next most optimistic of all the grower groups I have engaged with over the past 2 years on this topic. |

Prepared by Peter Deuter

**Cowra EnviroVeg Workshop Summary:
Understanding Climate Change Impacts in
the Vegetable Industry:
Opportunities and Risks**

Date: 23rd October 2009
Venue: Cowra Bowling Club



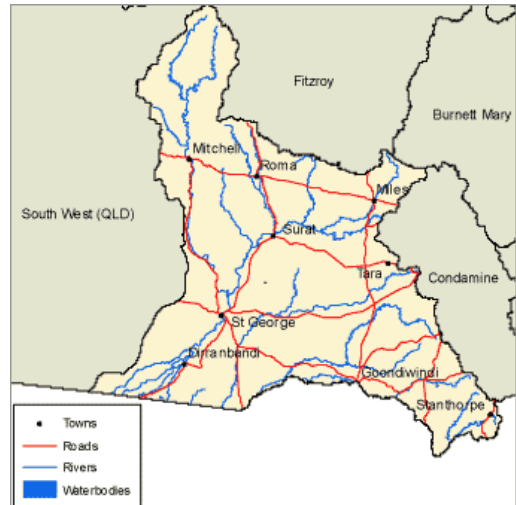
| | |
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| Number of attendees | » 18 participants. |
| Issues Raised | <p>» Water availability is the key determining factor for long-term viability of vegetable growing in this region. Predicted temperature increases (see workbook) can be managed by using water to irrigate and keep crops cool – in fact, if water is available the higher temperatures could promote more growth and increase vegetable production.</p> <p>» Currently, however, water allocations have been withdrawn as a result of severe drought, and the Lachlan River is under severe stress, being the worst affected catchment in New South Wales. The river south of Condoblin is to be ‘stopped’ at the end of November in an effort to provide drinking water for towns such as Cowra over the summer. This has major implications for the long term viability of agriculture in the region.</p> <p>» Of the growers present, half were retiring, or close to retiring in the new few years. Over the time many of them had been growing vegetables, the crops have changed, for example, asparagus used to be grown in the Lachlan and the region was the main supplier for Australia – due to water restrictions different crops are now being grown that require less water.</p> <p>» In terms of the social make-up of the industry, there are now culturally distinct groups farming in the region (for example, the Maltese growers) and don’t tend to mix with other farmers, preferring to keep to themselves. The CMA noted that this made communication difficult and time intensive to build trust with many different communities of ‘vegetable growers’, rather than a one size fits all approach.</p> |

| | |
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| | <ul style="list-style-type: none"> » Past work on environmental management plans through the EnviroVeg Program was reported by the CMA as being very successful, with around 15 farmers participating in a pilot scheme. It was noted by those involved that having resources (people, time and funding) to work one-on-one with growers in developing an environmental management plan was the best way to achieve on-farm change. » The climate change information session linked well with a recent Lachlan CMA publication that covered climate change impacts in the region – the messages in both publications (our workbook and the CMA brochure) were consistent. |
| Supporting Products | <ul style="list-style-type: none"> » EnviroVeg Article in Vegetables Australia on Climate Change » EnviroVeg Flyer » Climate Change Research Strategy for Primary Industries Horticulture and Life Cycle Assessment Fact Sheets » EnviroVeg Climate Change Workbook » Lachlan CMA Report on Climate Change Impacts |
| Overall impressions | <ul style="list-style-type: none"> » Growers in the Lachlan Region have adapted to climate variability and market changes throughout their farming careers. Climate change as a concept was recognised as being ‘real’, however, the feeling was that it is a continuation of the already variable climate they have been dealing with over many years. T » The key issue for the viability of vegetable growing in the region is water security – if water allocations are secure then vegetable growers felt they could adapt their operations to select crops that could withstand drier conditions and reorganise farming operations to ensure greater protection from heat stress (such as irrigating at night etc). » Although the demographic at the meeting was skewed towards growers that had been in the industry for some time, there are many growers in the region who are younger and keen to remain in the region if water security is provided. » The CMA in the region has had positive experiences with the EnviroVeg Program and are keen to undertake more collaborative projects should these opportunities arise. |

Prepared by Siwan Lovett

**Stanthorpe EnviroVeg Workshop Summary:
Understanding Climate Change Impacts in
the Vegetable Industry:
Opportunities and Risks**

Date: 6th November 2009
Venue: Queensland College of Wine Tourism



| | |
|---------------------|---|
| Number of attendees | » 15 participants. |
| Issues Raised | <p>How have growers adapted to past climate change?</p> <ul style="list-style-type: none"> » Although temperature and rainfall changes have occurred they have been relatively minor and for some growers have been advantageous to their business. » Rainfall has increased in the far eastern parts of the Granite Belt, ensuring that irrigation water has been plentiful for many years (this is in contrast to the western parts of the district which has seen reduced runoff over a number of summers in the past 10 years. Currently irrigation water availability is not an issue. » The number of frosts has reduced significantly and the length of the frost season has also reduced, allowing vegetable growers to extend their normal summer season further into the autumn, allowing for increased market access. » As this is a summer vegetable growing region, changes in maximum temperature will have impacts on the production system. Maximum temperatures have increased for all months except those in late spring and early summer, and late summer temperature increases have been small. The impacts have been minor, and growers have not identified any changes which they have made to their production system as a result of these changes. » Winter minimum temperatures have risen marginally, and coupled with less frosts have given advantages to extending the summer production season. “We can grow for longer over the summer, and capture more market share, as other regions reduce there |

| | |
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| | <p>early and late winter production”</p> <p>How are growers going to adapt to these changes in the future?</p> <ul style="list-style-type: none"> » With the expectation that the past changes will be repeated for the next 20 to 30 years for this region, and the impacts currently being very small, growers were very confident that they will manage any negative impacts quite well, and take advantage of the increase in the length of the summer season as a consequence of future warmer winters. » Rainfall changes are uncertain, but the best estimate for 2030 is for no change. Considering the variability which growers have managed quite well, there is confidence that they will continue to manage any impacts into the foreseeable future. » The general trend for more intensive rainfall in Eastern Australia is seen as an advantage to these growers who currently capture runoff in on-farm dams. A future adaptation strategy will be to improve this capture and storage to take advantage of increased runoff from less frequent but more intensive rainfall events. |
| Supporting Products | <ul style="list-style-type: none"> » EnviroVeg Article in Vegetables Australia on Climate Change » EnviroVeg Flyer » Climate Change Research Strategy for Primary Industries Horticulture and Life Cycle Assessment Fact Sheets » EnviroVeg Climate Change Workbook |
| Overall impressions | <ul style="list-style-type: none"> » Past climate change has not been significant, and future climate change will be of the same magnitude. The general mood was of optimism about how they have managed in the past, and how they will manage into the future. |

Prepared by Peter Deuter



Peter Deuter, Stanthorpe



Granite Belt gets seminar

PRODUCERS from the Granite Belt will have a chance to find out what the future holds when AusVeg presents an EnviroVeg Seminar in Stanthorpe on November 6.

The Stanthorpe seminar, the third in a series of four being held around Australia, will focus on climate change and the subsequent environmental impacts which will affect the way producers manage their properties.

Queensland Primary Industries senior principal horticulturalist and climate change specialist Peter Deuter will lead a panel of climate change experts in discussing how growers can deal with the potential problems associated with rising temperatures and decreasing rainfall as well as erratic weather patterns.

The discussions will include the presentation of temperature and rainfall data with predictions to 2030.

Data presented at the seminar will be collated into a booklet for participants to keep for future reference.

AusVeg chief executive officer Richard Mulcahy said the first two seminars in the series had been well-received and looks forward to a strong response from Granite Belt producers.

"This is an exciting opportunity for growers," Mr Mulcahy said.

The EnviroVeg seminar will be held at the Queensland College of Wine Tourism on November 6 from 2.30 to 6pm. Light refreshments will be provided.

For more information visit the AusVeg website at www.ausveg.com.au

- Deborah McNeill



 An event flyer for 'Manging for Healthy and Productive Soils'. At the top, it features logos for HAL, Enviroveg, AUSVEG, Elders, and BDGA. The text on the flyer includes:

- Enviroveg invites you to attend a free information session on:**
- Manging for Healthy and Productive Soils**
- A healthy soil is better as one that is productive and easy to manage under the stresses of drought, nearby zone, native coverages, biological and physical properties that promote the needs of plants, animals and humans, and support productive farming systems and growing economies. This workshop will provide vegetable growers with the latest information on creating and maintaining nearby productive zone.
- Speakers include:**
- Mr Carl Walker** - Carl Walker is the President of Bowen Growers' Association (BGA) and president of the Healthy and Productive Working Areas & Soil Institute.
- Mr Chris Morrison** - Chris is the owner and principal consultant of ProPlan Agriculture Pty Ltd, the soil health and water research and practice for healthy soils.
- Mr Stephen Zibeworth** - Stephen is a 2000 Ag-Entrepreneur with 15+ years of experience in the agribusiness sector.
- Mr Craig Palmer** - Craig is a regional sales manager for Boral, the Queensland and NT soil health and water research and practice for the region.
- Mr Richard Mulcahy** - CEO of the 1000+ acre Bowen Irrigation Community in QLD, Australia, including the Bowen Irrigation and Water Treatment Plant.

 At the bottom, it provides contact information for Enviroveg and mentions that the event is free and open to all.

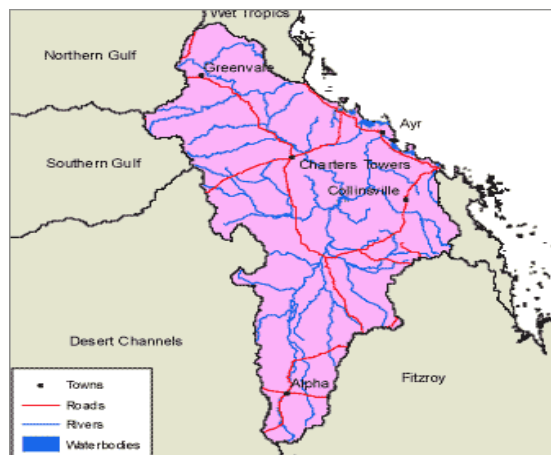
Richard Mulcahy & Carl Walker, president of the Bowen Growers' Association at Bowen Healthy Soils Workshops



Bowen EnviroVeg Workshop Summary: Managing for Healthy Soils

Date: 11th November 2009

Venue: Elders Office, Bowen



| | |
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| Number of attendees | » 31 |
| Issues Raised | <ul style="list-style-type: none"> » Comments from growers about their willingness to embrace practices which improve the environmental impact of their farm and also improve their farm's productivity. » Interest in recommended soil management practices presented and how these could be applied on-farm. |
| Supporting Products | <ul style="list-style-type: none"> » EnviroVeg Article in Vegetables Australia on Healthy Soils » EnviroVeg Healthy Soils Flyer » Healthy Soils Ute Guide and DVD » Workshop handouts |
| Overall impressions | <ul style="list-style-type: none"> » Growers were interested in research findings and how to apply them on-farm. » The workshop was well-attended, and presentations were informative – Richard's presentation on the new vision/direction for AUSVEG and the activities currently being undertaken (including the partnerships with Elders) was worthwhile hearing. » Resource material distributed was very useful » Good opportunity to meet Richard and network with local industry players. Growers and industry were encouraged by the new direction for AUSVEG » Great sharing of information and network building for the local industry |

Prepared by Chris Monsour

Cranbourne EnviroVeg Workshop Summary: Managing for Healthy Soils

Date: 20th November 2009
Venue: Turf Club, Cranbourne

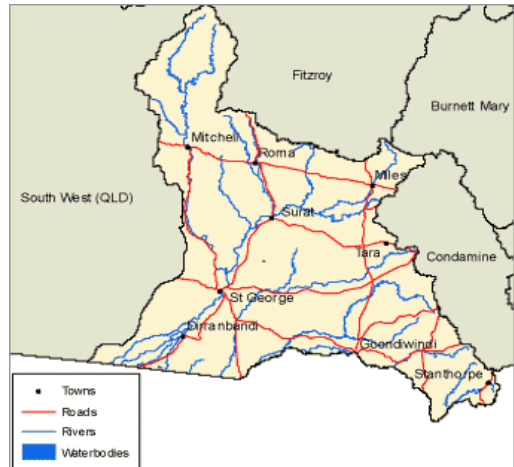


| | |
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| Number of attendees | <ul style="list-style-type: none"> » 22-25 people, plus several apologies at last minute from 4 growers who had to cancel their attendance due to a severe electrical storm at the time of the workshop. |
| Issues Raised | <ul style="list-style-type: none"> » Relevant Tests/Indicators of soil health » Benefits of a national soil health testing system » Potential profit gains on farm from good soil health management (>\$2000/ha) » Potential benefits of overseas programs (Cornell University) » Need for continuation of funding for national program (raised by Silvio Favero) |
| Supporting Products | <ul style="list-style-type: none"> » EnviroVeg Article in Vegetables Australia on Healthy Soils » EnviroVeg Healthy Soils Flyer » Healthy Soils Ute Guide and DVD » Workshop handouts |
| Overall impressions | <ul style="list-style-type: none"> » Excellent feedback from audience as evidenced by the many questions asked . » Attendee from IAC Beef and Dairy Industry commented openly to group at end of workshop how much she enjoyed the workshop and how the vegetable industry was much better coordinated and much further advanced than the beef and dairy industries. » Jo from the local CMI was very keen to link programs and discuss further with R and D program team » Richard Mulcahy was very supportive of the project work done by DPI and asked for a brief from Ian so he could convey further comments back to HAL. » A representative of Gazzola Farms declared that he had gained two ideas from Ian Porter’s presentation that would result in significant savings through reduced use of chemicals in their operations |

Prepared by Ian Porter

**Ulverstone EnviroVeg Workshop Summary:
Understanding Climate Change Impacts in
the Vegetable Industry:
Opportunities and Risks**

Date: 27th November 2009
Venue: Old Fire Station, Ulverstone



| | |
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| Number of attendees | » 20 attendees |
| Issues Raised | <ul style="list-style-type: none"> » Although temperature changes have occurred they have been relatively minor and for most growers have been advantageous to their business. » Rainfall has been more variable particularly in recent years. Traditionally, vegetable growers were able to grow without irrigation for much of the year. Irrigation has been an essential part of vegetable growing in northern Tasmania for many years now – demonstrating how the rainfall patterns have changed. » The number of frosts have reduced significantly, and the length of the frost season has been reduced, allowing vegetable growers to extend their normal summer season further into the autumn, allowing for increased market access. » As this is a summer vegetable growing region, changes in maximum temperature will have impacts on the production system. Maximum temperatures have increased for all months except those in late spring and early summer, and late summer temperature increases have been small. The impacts have been minor, and growers have not identified any changes which they have made to their production system as a result of these changes. » Winter minimum temperatures have risen, and coupled with less frosts have given advantages to extending the summer production season. “We can grow crops such as potatoes and brassicas all year round now in many locations”. <p>How are growers going to adapt to these changes in the future?</p> <ul style="list-style-type: none"> » With the expectation that the past changes will be repeated for the next 20 to 30 years for this region, and the impacts currently being |

| | |
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| | <p>very small, growers were very confident that they will manage any negative impacts quite well, and take advantage of the increase in the length of the summer season as a consequence of future warmer winters.</p> <ul style="list-style-type: none"> » Rainfall changes are uncertain, but the best estimate for 2030 is for no change. Considering the variability which growers have managed quite well, there is confidence that they will continue to manage any impacts into the foreseeable future. |
| Supporting Products | <ul style="list-style-type: none"> » EnviroVeg Article in Vegetables Australia on Climate Change » EnviroVeg Flyer » Climate Change Research Strategy for Primary Industries Horticulture and Life Cycle Assessment Fact Sheets » EnviroVeg Climate Change Workbook |
| Overall impressions | <ul style="list-style-type: none"> » Past climate change has not been significant, and future climate change is expected to be of the same magnitude. There is much optimism about how they have managed in the past, and how they will manage into the future. These growers were amongst the most optimistic of all the grower groups I have engaged with over the past 2 years on this topic. » The Ulverstone seminar was one of the most successful held. Positive grower involvement and support from the TFGA Vegetables Committee Chair, Keaton Miles, who chaired the worked assisted in the success of the event. |

Prepared by Peter Deuter and Richard Mulcahy



David Putland, Ulverstone



Peter Deuter, Ulverstone

Results:

The results section is organized against the four outcomes for this project.

1. The development of a matrix of NRM objectives and targets by region against current recommended industry environmental practice (EnviroVeg).

This output has been achieved with the development of a comprehensive NRM/EnviroVeg matrix for those States and Territory in which commercial vegetable growing occurs. In developing this tool, it has become apparent how well the EnviroVeg Manual links to overarching NRM Regional Body targets and objectives. This 'link' means the EnviroVeg Manual fits within broader State and Commonwealth priorities, placing those vegetable growers who use the manual in a strong position to access NRM funding initiatives like *Water for the Future*.

The EnviroVeg Manual and self-assessment checklist also provides growers with a strong basis upon which to engage with their local community on NRM issues. In many of the workshops, growers discussed the difficulties of communicating to others in their region how they have to balance caring about the environment with running a commercially successful enterprise. By referring to the EnviroVeg Manual, and having it endorsed by the local NRM regional body, Environment Protection Authority, local water authority and agricultural departments, vegetable growers can demonstrate how they are managing the resources on their farm responsibly, as well as complying with key legislative requirements.

2. The facilitation of partnerships between Industry, through AUSVEG, and regional NRM bodies leading to a better understanding and cooperation between the sectors.

Over the life of this project, twelve workshops and three soil-pit demonstration have been run in locations across Australia. These workshops have attracted 225 participants, with the majority of these being growers (70%) and those regional and national organizations (30%) that support them. Importantly, at each event representatives from the regional NRM Body were

present, and provided presentations on the work they were doing that is of relevance to vegetable growers. The workshops incorporated formal and informal sessions so that people could learn about new research and practice they can apply on-farm, as well as talk, mingle and get to know others in their region. 41 growers joined EnviroVeg as a result of attending one of these workshops, which is an excellent result for the program. In addition, tailored workbooks on climate change have been produced for four of the regions, and the local NRM body has received extra copies of these workbooks to distribute to others they felt would be interested.

Anecdotal feedback has been positive, and the workshop reports in the preceding section provide insights into each of the events. Generally speaking, people working in the NRM Regional bodies are time poor and often under-resourced to meet the needs of the many different stakeholders working in their catchment. In discussions with this group, the view was expressed that the EnviroVeg Manual provides them with a tool that speaks directly to vegetable growers. Following the workshops we had several of the NRM Bodies request copies of the EnviroVeg Manual for use in their region (Bowen, Cowra, Wanneroo and Stanthorpe). The self- assessment checklist was also viewed positively by this group, as the level of detail contained in each of the recommendations for on-farm management is more detailed and explicit to vegetable growers than any other document currently available.

Geoff Minchin, Lachlan Catchment Management Authority

I would say that the EnviroVeg resource aligns very well with the Lachlan Action Plan targets which fall under the themes of Land Management, Biodiversity and Native Vegetation, Water and Aquatic Ecosystems and People and Community. The resource is a great starting point for Regional NRM bodies to work with veggie growers and begin to address natural resource issues that may be present.



The following letter from Harley West, Landcare Coordinator, Granite Belt region, is representative of the sentiment expressed by a number of the people we involved from the NRM Regional Bodies, and supports Geoff's comments provided above.



Applethorpe Research Station
New England Highway
PO Box 501
Stanthorpe Qld 4380
Friday 20th November 2009

Dear Doctor Lovett

Thank you for the opportunity to address the growers meeting which was held recently in Stanthorpe. This meeting focused on the Challenges of Climate Change, the CPRS, and the Enviroveg Manual (2nd edition). It was a pleasure to be able to represent both Landcare and our Regional NRM body, Queensland Murray Darling Committee (QMDC).

Landcare, what it is and how it is implemented, is, as you know, as varied as the myriad of landscapes found across Australia and as diverse as the people who share the passion for "doing things better". While Landcare is able to plan and do at a local level, it is the Regional NRM bodies (such as QMDC) which are tasked to develop understandings of the broader catchment issues and to develop plans, strategies and actions to address these issues.

From the perspective of the NRM "industry" the EnviroVeg manual does a lot more than promote "smart" farming practices, it also introduces the essentials of sound NRM, e.g. the continuous improvement cycle, the whole of farm approach, the recognition of Biodiversity as an issue to be considered and more importantly, the benefits of working with neighbours to develop "group" (or sub catchment) plans.

In addition, there appears to be a strong alignment between the Resource Condition Targets and Management Action Targets, set by QMDC, and the direct outcomes of growers undertaking the actions recommended in the manual. In my own work, I can see strong opportunities for utilising the manual in the promotion of 'even' better practices and activities, particularly the Preparing an Action Plan hint sheets and the Self assessment tick sheets.

Landcare, the Regional NRM bodies and Industry organisations each have their own target audiences, areas of activity and influence. At the same opportunities to work together on outcomes which tick all the boxes are always sought after. I believe this manual is one such opportunity to meld the industry objectives with the Regional body targets and the Landcare ethic.

Yours sincerely

Harley West Landcare Coordinator Ph: 07 4681 6145 Mob: 0427 500 192
Email : stanthorpe.landcare@halenet.com.au

3. The demonstration of responsible environmental stewardship by vegetable growers to the community as well as to domestic and international markets.

Vegetable growers are under increasing pressure to demonstrate their environmental credentials, as consumers demand more information and assurance that the food they eat is produced responsibly. Through this project, the EnviroVeg Program has tried to support vegetable growers in responding to these demands and adapting their farming practices accordingly. Four of the EnviroVeg workshops focused on applying the EnviroVeg Manual on-farm, providing practical assistance, guidance and ongoing support. Another four took a broader view and considered climate change impacts on the sector. Australia's increasingly variable climate poses challenges for vegetable growers given the sector's dependency on natural resources, especially water for irrigation. The extent these physical impacts affect products and businesses will be further shaped by the:

- growing global demand for food,
- impacts of climate change policy,
- increasing demands for productivity growth,
- increasing competition for natural resources, and
- requirements for ever more efficient and sustainable production practices.

Most of the anticipated climate change scenarios point towards the need for a very high standard of crop management, and this was discussed in each of the workshops dealing with this topic. Presenters talked about the need for growers to distinguish between 'old climate expectations', and 'new climate realities', in determining and implementing adaptation strategies or options. Growers talked about the need for their management approaches to either offset negative impacts, or take advantage of positive responses. The climate change workshops also linked growers into broader initiatives being undertaken in Australia, for example, the *Climate Change Research Strategy for Primary Industries* initiative and the *Managing Climate Variability* program. Both these research and development programs have

HAL involvement, and it is important that vegetable growers are aware of key findings that are of relevance to them and the work they are doing in mitigating and adapting to climate change. Those growers and NRM bodies that have attended these workshops have tangible evidence of the sector’s desire to adopt responsible environmental stewardship on-farm. The EnviroVeg Manual and self-assessment checklist provides a document that clearly articulates how vegetable growers can achieve responsible environmental stewardship in their day-to-day management actions. The linking of the EnviroVeg Manual to NRM objectives and targets further strengthens the document’s relevance and use as a key underpinning approach for sustainable vegetable growing. More work can now be done to consolidate the use of the EnviroVeg Manual by vegetable growers, as well as to seek endorsement of the Manual by key regulatory and NRM institutions.

4. Increased grower understanding and skills for soil health testing and interpretation.

The Healthy Soils for Sustainable Farms Program was recognized as being very successful at engaging with growers across many different commodities (see Healthy Soils for Sustainable Farms Final Report on www.soilhealthknowledge.com.au). One of the most successful projects run through this program was the production of the Healthy Soils Ute Guide and DVD. These products have been taken up and used by growers across the vegetable sector, with only a few copies of the Ute Guide left. The four ‘Managing for Healthy Soils’ workshops and three soil-pit demonstrations run through this project, promoted the products from the Healthy Soils for Sustainable Farms Program, as well as providing growers with access to the latest information on soil testing, soil productivity and soil management practice. In addition to the workshops, materials from the AUSVEG work are now available on the www.soilhealthknowledge.com.au website, with powerpoint presentations that can be easily viewed on-line or downloaded, explaining how to test, analyse and manage your soil to optimize productivity and environmental outcomes.

<http://www.soilhealthknowledge.com.au/>

| | |
|---------------------|--|
| Guideline or manual | |
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| <ul style="list-style-type: none"> • AUSVEG Healthy Soils Ute Guide (Black and white version) • Order form for 'Healthy Soils Ute Guide' | PDF 1.8MB Order form |
| Workshop materials | |
| <ul style="list-style-type: none"> • AUSVEG Healthy Soils Soil Awareness Day powerpoint • AUSVEG Healthy Soils Soil Awareness Day powerpoint (translation to Vietnamese) • AUSVEG Healthy Soils Soil Awareness Day Notes for powerpoint (English) | PDF 0.2MB PDF 2.2MB PDF 0.1MB |

There is also a new soil health page on the EnviroVeg website that will keep growers up to date with the latest information on managing for healthy soils. The program has already been asked to run a further two workshops in Victoria on the basis of the success of the current workshop series.

Discussion:

This project has met each of the four outcomes it was created to achieve. In so doing, it has continued the work of the EnviroVeg Program previously started through the EMS Pathways and related projects. Vegetable growers across Australia have been provided with an opportunity to attend a workshop focusing on key issues relating to their business. Each of these workshops has been supported with a range of good quality materials available in hard copy and on-line.

The workshops have also provided vegetable growers with an opportunity to meet researchers undertaking projects that are funded through their levies, providing a tangible outcome of their investment. The focus on climate change has highlighted the need for further work to be undertaken in educating and developing vegetable grower's capability to mitigate and adapt to new climate realities. This topic will require further ongoing funding to develop the specific strategies vegetable growers will need to use on-farm to maintain productivity with less water, higher temperatures and an even more variable climate.

The interest in managing for healthy soils has also been met through this project, with further requests by growers for more of these seminars in other regions of Australia. Healthy soils are the key to ongoing productivity and sustainable farming, and it has been positive to see how well attended these workshops have been. Keeping growers up to date with the latest in soil health research and practice will be an ongoing commitment for the EnviroVeg Program.

The emphasis on improving connections between NRM Regional Bodies and vegetable growers has been rewarded, with the gap between these organizations lessening, particularly in those regions where the workshops were run. The benchmarking matrix has highlighted the complementary way in which the EnviroVeg Manual can be used by NRM Bodies to work with vegetable growers to achieve broader catchment management plan objectives and targets.

Circulating this information to the relevant NRM Regional Bodies and getting their feedback on how to tailor the EnviroVeg Manual for their region, would be a positive next step in this process. Providing vegetable growers with the opportunity to hear from NRM Regional Bodies in their area, and to learn about possible funding initiatives they may be eligible to apply for, has also been a useful way to demonstrate the positive way in which these groups could work together in the future.

Technology Transfer:

Several examples of the effort that has been made to effectively communicate the work of this project have already been provided in this report (see pages 71-73). Overall, the project has sought to raise awareness, provide information that is relevant and in a form that is meaningful for growers, and provide opportunities for researchers to interact with those who are paying for their work through their levies. These approaches have been supported by web-based information, local and national media. A few of the articles developed for the workshops are provided below:

STAR FM Dubbo (New South Wales)

08:30 News - 23/10/2009 - 08:32 AM

Robyn Herron Station Ph: 02 6881 8104

An **EnviroVeg** seminar in Cowra today will educate Central West **vegetable** farmers about climate change, and how they can better prepare their farms to tackle the problem. **AUSVEG** CEO **Richard Mulcahy** said the seminars will equip farmers with the research, tools, and materials they need to reduce risk to the industry and environment.

© Media Monitors 2009

Duration: 0:25

Summary ID: W00036598476

ABC Southern Queensland (Toowoomba)

Rural Report - 09/11/2009 - 06:16 AM

Arlie Douglas Station Ph: 07 4631 3811

Interview with **Richard Mulcahy**, CEO, **AUSVEG** about conducting workshops on climate change and the affect it has on **vegetable** industry, through their **EnviroVeg** program. Mulcahy lists the regions, where they have conducted the workshops. Mulcahy explains that they want to build awareness about climate change issues, which will impact on the **vegetable** industry. Mulcahy explains that Peter Deuter(*), Climate Expert, DIP, Qld and Growcom have contributed to the workshops. Mulcahy discusses the further implications of a carbon pollution reduction scheme on the **vegetable** industry. Mulcahy believes growers are anxious that their input costs could increase, without compensating credits, if a carbon pollution reduction scheme is introduced. Mulcahy believes growers are experiencing a tough season. Mulcahy announces that Malcolm Turnbull, Fed Opposition Leader, will join the board in two weeks.

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Interviewees: **Richard Mulcahy**, CEO, **AUSVEG**.

Duration: 5:00

Summary ID: W00036784012



Media Release

12 October 2009

For immediate release

Australia's vegetable farmers go to climate school

WA veggie farmers go back to school next week to learn about climate change from some of the best in the business in the first of a series of EnviroVeg seminars.

The first seminar, taking place in Wanneroo, Western Australia, coincides with Enviroweek, running from 11 to 17 October, 2009.

Enviroweek aims to raise awareness about everyone's responsibility to take care of our environment and live smarter.

"Australia's vegetable growers are already feeling the early effects of climate change and are incredibly enthusiastic about making positive changes in the way they run their businesses," said AUSVEG's CEO, Richard Mulcahy.

The EnviroVeg seminars will teach growers the ways in which climate change is impacting vegetable growing operations around Australia and how they can prepare their farms to deal with these impacts.

The seminars will provide growers with access to the latest research, tools and materials being developed to manage potential opportunities and risks to the industry and to the environment as a whole.

AUSVEG has a strong commitment to working for environmental sustainability within the horticulture industry and through the EnviroVeg program aims to provide Australian growers with guidelines and information on how to manage their business in an environmentally responsible manner.

Along with Wanneroo, three other EnviroVeg seminars are scheduled for 23 October at Cowra New South Wales, 6 November at Stanthorpe Queensland and 27 November in Ulverstone Tasmania. Further details about these seminars can be found on the EnviroVeg section of the AUSVEG website.

For more information, please contact AUSVEG Communications Coordinator, Peter Gregory

MEDIA CONTACT: Peter Gregory, AUSVEG, 03 9544 8098 or peter.gregory@ausveg.com.au

NB: A media release like the one above was issued for every workshop

A sustained communication effort was also undertaken so that every week over October through to November, vegetable growers learnt about the next seminar through the weekly AUSVEG Updates. The following media trail provides an idea of the amount of attention paid to ensuring that growers knew the seminars were on, and also heard about the results of running these events.

9 October 2009

EnviroVeg Climate Change seminars start next week in Perth

The first of four EnviroVeg Climate Change seminars starts next week at Wanneroo Tavern in Western Australia. The event, to be held on 16 October, will examine how climate change will impact on vegetable growing in the local region and how growers can prepare their farms. Speakers include: Jim Turley of Vegetables WA, Peter Deuter of QLD DPIF, Dr Siwan Lovett of the Enviroveg program, AUSVEG CEO Richard Mulcahy, Chris Puckridge from Elders, and Martin Kneebone of Freshlogic. Information regarding this seminar is available [here](#) and is also available in Vietnamese [here](#).

20 October 2009

EnviroVeg climate change seminars kick off in Perth

The first of the EnviroVeg Climate Change seminars kicked off in Perth on Friday 16 October with 25 attendees. The workshop, "Understanding Climate Change Impacts in the Vegetable Industry: Opportunities and Risks," included speakers; AUSVEG CEO, Richard Mulcahy; Vegetables WA Executive Director, Jim Turley; Qld DPIF Senior Principal Horticulturalist, Peter Deuter; Elders Regional Sales Manager, Chris Puckridge; and Martin Kneebone from Freshlogic. Workshops will also be held in Cowra, NSW, Stanthorpe Queensland, and Ulverstone, Tasmania over the next six weeks. Further information can be obtained on the [AUSVEG website](#).

27 October 2009

EnviroVeg Seminars continue

The second EnviroVeg Climate Change seminar was held in Cowra at the Cowra Bowling Club on Friday 23 October. The workshop followed on from a successful first seminar in Western Australia and included speakers: EnviroVeg Chair, Jeff McSpedden; AUSVEG CEO, Richard Mulcahy; EnviroVeg Consultant, Dr Siwan Lovett; and, Dr Leanne Webb from the CSIRO/University of Melbourne. The next workshop will be held in Stanthorpe, Queensland. Further information can be obtained on the AUSVEG website.

10 November 2009

EnviroVeg Seminar - Stanthorpe

The next in the current series of EnviroVeg Seminars took place on Friday 6 November in Stanthorpe, Queensland, at the Queensland College of Wine Tourism. Speakers at the Stanthorpe Seminar included: Senior Principal Horticulturalist at the Qld DPIF, Peter Deuter; AUSVEG CEO, Richard Mulcahy; and, Climate Change Project Officer, David Putland from Growcom. The next Seminar will be held on the 27th of November at the Old Fire Station, Ulverstone, Tasmania. In addition to the EnviroVeg Seminars, Soil Workshops will be held in Bowen on Wednesday 11 November at the Elders Office, and Cranbourne on 20 November at the Cranbourne Turf Club.

17 November 2009

EnviroVeg Committee meets in Launceston

The AUSVEG EnviroVeg Committee, under the leadership of NSW grower, Jeff McSpedden, met in Launceston last week to discuss success to date with the programme and to develop plans for the next stage of EnviroVeg. Also on hand were EnviroVeg consultant Dr Siwan Lovett, AUSVEG CEO Richard Mulcahy and Alison Turnbull from HAL. The meeting coincided with the Keep it Real Conference in Launceston where the EnviroVeg programme was on display to the 200 delegates attending the conference. Jeff Mc Spedden is looking to strengthen the EnviroVeg

Committee and to ensure active participation from all States. Special thanks go to Andrew Chien of AUSVEG for his work at the trade show.

24 November 2009

Soil Health Workshop in Cranbourne

An EnviroVeg Soil Health Workshop took place on Friday 20 November in Cranbourne, Victoria at the Cranbourne Turf Club. More than 20 growers attended to hear Dr Ian Porter, the Principal Research Scientist in Plant Pathology with DPI Victoria and AUSVEG CEO, Richard Mulcahy speak. Representatives from local natural resources management and Elders were also present for the workshop.

EnviroVeg Seminar in Ulverstone

EnviroVeg is holding a Climate Change Seminar at the Old Fire Station, Ulverstone, Tasmania, this week. The Seminar will be held on the 27th of November, with speakers including: Mr Peter Deuter of the QLD DPIF; Mr Andrew Meurant, Horticulture Segment Manager at Elders; Mr David Putland, Climate Change Project Officer for Growcom; and, AUSVEG CEO Richard Mulcahy. For further information and to register for the Seminar, please contact the AUSVEG office on 03 9544 8098, email admin@ausveg.com.au or see the [EnviroVeg section of the AUSVEG website](#).

As can be seen from the examples provided, local and national media were used to promote the workshops and the EnviroVeg Program. Importantly, efforts were made to talk about the content of the workshops within the broader context of running a successful vegetable growing business. This meant that looking after, and considering environmental factors on-farm, were not presented as a side issue, but rather, as an integrated part of farming operations.

A range of other speaking opportunities were also used by the EnviroVeg Consultant, Dr Siwan Lovett, and AUSVEG CEO Richard Mulcahy, to promote the project. For example, Siwan was the after dinner speaker at the Victorian Growers' Association Annual General Meeting, with her presentation covering the importance of communicating science effectively so that it is meaningful and relevant for vegetable growers in their day-to-day lives. Richard Mulcahy was also prominently featured in the media through the latter part of the project and took this opportunity to highlight vegetable growers as being proactive about environmental issues and keen to work with local NRM bodies to improve practices on-farm.

Recommendations:

1. To maximize the outcomes of this project it is recommended that further funding be provided to continue the work of the EnviroVeg Program. The EnviroVeg Program is known and trusted by the vegetable industry, and this provides HAL and other organizations wanting to work with growers like the NRM Regional Bodies, a mechanism to use. Of particular importance is the length of the time the EnviroVeg Program has been running (over+ ten years), as NRM in Australia is characterized by the constant churn of programs, people and projects. Vegetable growers now recognize the EnviroVeg brand and look to the program to provide them with the most up to date information on how to improve environmental management on-farm within the context of a commercial vegetable growing operation.
2. The EnviroVeg Program work with NRM Regional Bodies to tailor the EnviroVeg Manual so that it is specific to a particular region. For example, the Lachlan Catchment Management Authority could work with the EnviroVeg Program and local vegetable growing groups to develop an introductory section that relates specifically to local environmental issues and requirements in the Cowra, Bathurst and Young region. Ideally, this regional EnviroVeg Manual would be endorsed by all the relevant regulatory authorities in the area, so that vegetable growers are confident that by using the Manual they are meeting all on-farm legal requirements for land, water and biodiversity management.
3. Ongoing development of strategic public and private sector partnerships to further communication the EnviroVeg 'message' should occur. The establishment of a new strategic partner for AUSVEG, Elders, has proved

beneficial, especially in Bowen. In addition to being able to use their facilities and resources without charge to the programme, a second opportunity was provided to Richard Mulcahy to address 180 growers in the evening at a dinner funded by Elders wherein the primary purpose of his visit to Bowen –namely the conducting of the Enviroveg workshop –was shared with the growers. Prominent former Test Cricketer, Glenn McGrath, was also a speaker at the dinner that ensured a large turnout. Elders have advised AUSVEG that they believe that they can actively assist the Enviroveg programme by using their network and their strategic partnership with AUSVEG to promote the Enviroveg programme as ‘ambassadors’-. AUSVEG has also recently entered into strategic partnerships with other major suppliers to the industry and, as a result, there are now more new opportunities to use their networks and dealings with growers to promote key elements of Enviroveg.

4. There is a need to provide copies of the key products – EnviroVeg Manual and Ute Guide, in both hard copy and on-line. The opportunity clearly exists to reprint the Ute Guide and Enviroveg Manual in light of on-going interest in these publications and the continuation of seminars is important to maintain continuity in the programme. More lead time on the staging of these seminars and workshops will strengthen grower attendance and, again, Elders has offered to assist in the promotion of such events in the future.

Acknowledgements:

This project has involved many people, particular thanks goes to Dr Siwan Lovett, Mr Jeff McSpedden Chair of the AUSVEG Environment Committee and members of his committee, AUSVEG Directors, management and staff, Peter Deuter from QDEEDI, David Putland and Alex Livingstone from Growcom, Jason Cappello from NSWFA, Tony Imeson and Luis Gazzola from the VGA, Jim Turley, Vegetables WA, Nick Steele and Keaton Miles from the TFGA and Andrew Meurant and staff of Elders throughout Australia and representatives of the Vegetable Industry Development Programme.

Appendix 1: Copy of Workbook (provided as a separate pdf attachment)

Appendix 2: EnviroVeg Survey



2009 *EnviroVeg* Seminar Feedback Form

'Climate Change' (Wanneroo, Stanthorpe, Cowra and Ulverstone)

'Managing for Healthy Soils' (Bowen and Cranbourne)

Thank you for participating in the recent *EnviroVeg* seminar. We are pleased you were able to attend and we hope that you found what was presented beneficial to you and your business. In order for us to assess the effectiveness of the seminar, we would ask that you take a few minutes to fill out the following short survey and reply to our email with your answers and thoughts. **Replies should be sent to admin@ausveg.com.au.**

The questionnaire should take no longer than five minutes and we thank you for your answers.

1. Which seminar did you attend?
Climate Change or Managing for Healthy Soils (*delete one*)
2. Did you find the *EnviroVeg* seminar beneficial to your business? YES / NO
(*delete one*)
3. What specific advice or information did you find useful and how will you implement it on-farm?

4. After having attended the seminar would you now consider becoming a member of *EnviroVeg*? (A reminder that membership is free and your level of participation is at your discretion) YES / NO (*Delete one*)
5. Would you consider attending future seminars? YES / NO (*Delete one*)
6. What topics would you like to see covered in future seminars?

7. Do you have any other comments about the seminar or its content or the *EnviroVeg* programme?

Thank you for assisting us with this survey