Australian Government

Department of Industry, Innovation
Science, Research and Tertiary Education

A footprint to Organic and Biodynamic production systems

DEVELOP AN ORGANIC MANAGEMENT PLAN – AHCORG501A

Workforce Innovations Program Project 275

RST

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Activity I Fact I Website

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Bridging the Gap between Chemical and Organic Food and Fibre Production.

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1 ABOUT YOURSELF

Please fill in your details below and save this PDF to your files.

Name	
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2 TROUBLE WITH WEBSITE LINKS

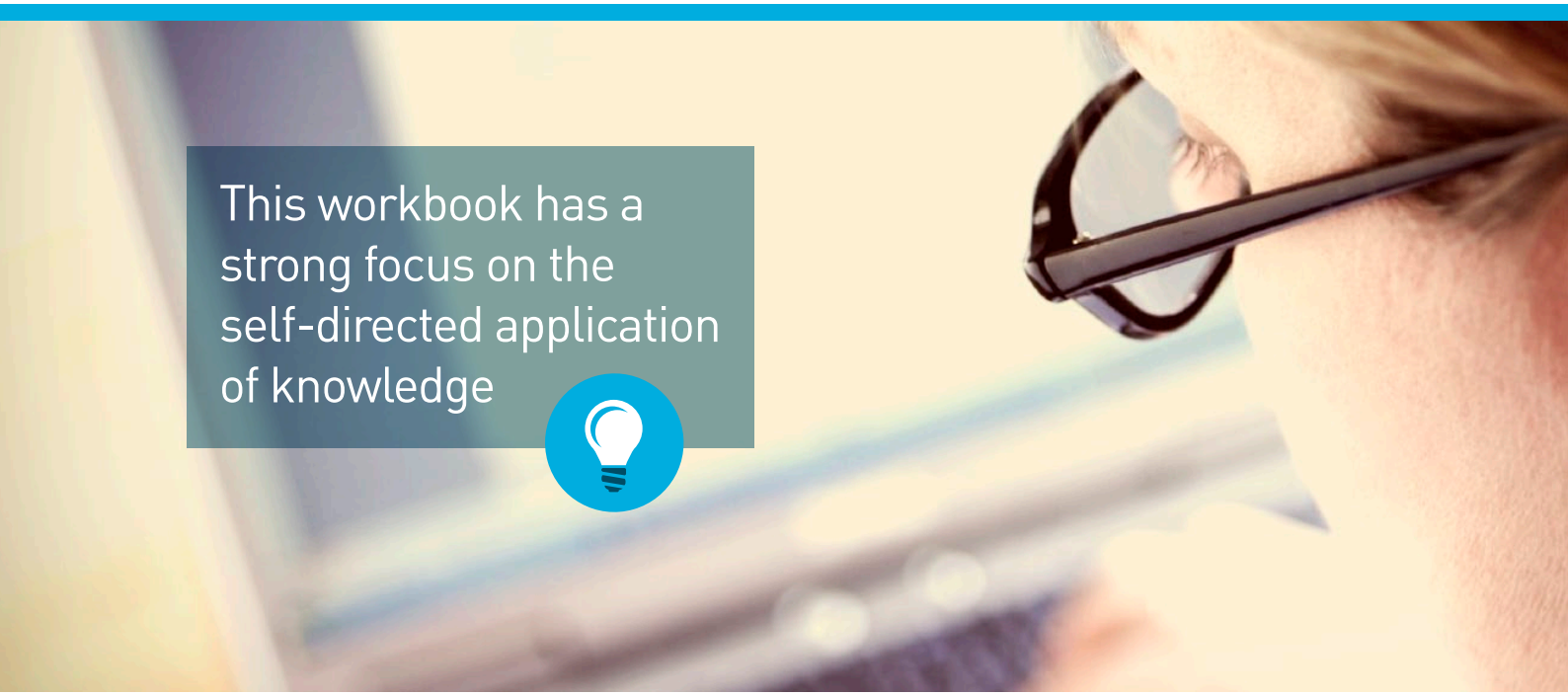
Sometimes you may click on a web link and the site will say it is not available. Please revisit the site when you are next working on your resource materials as web sites are sometimes “off line” for maintenance reasons.

If you are consistently unable to access a site you are free to answer any associated workbook activity or assessment question by searching for and finding an alternative site that you feel is applicable. PLEASE INCLUDE THE LINK IN YOUR ANSWERS so we know where to look to check your information.

3 HOW ARE THESE MATERIALS USED

This workbook has a strong focus on the self-directed application of knowledge. Completing this workbook and all formative assessments will thoroughly prepare you for your summative assessment. On successful completion of appropriate summative assessments provided by your Registered Training Organisation (RTO), you will achieve competency in this unit.

Please complete the feedback form at the back of the unit and advise us of any links that do not work



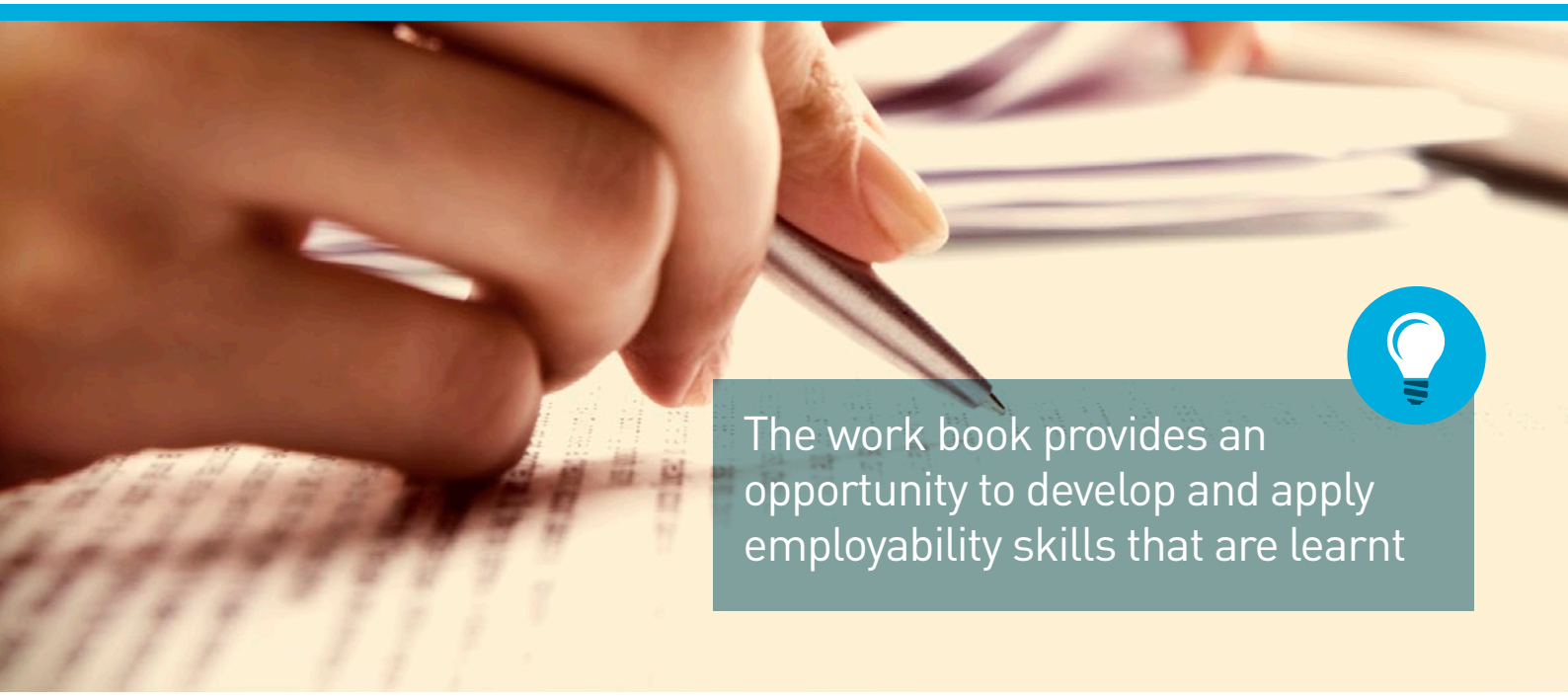
4 WHAT ARE THESE LEARNING MATERIALS ABOUT

This workbook applies to any producer involved in the conversion of an agricultural or horticultural farm to an organic, biological and ecological system. The scope of the workbook includes the following activities:

- Identify and develop required components of an Organic Management Plan for a property
- Understand and use interrelationships between soil, plant and animal health and the farming systems resilience when developing the plan
- Identify options for prevention and control of risks
- Apply appropriate regional catchment targets
- Document the plan in compliance with certification requirements.

This workbook has a strong focus on the self-directed application of knowledge with substantial depth in the areas of:

- Principles of organic agriculture, especially the fundamental role of soil health
- Principles of sustainable production
- Requirements and components of an Organic Management Plan
- Systems approach to agriculture and horticulture
- Organic and biodynamic certification requirements.



The work book provides an opportunity to develop and apply employability skills that are learnt

5 EMPLOYABILITY SKILLS

This workbook provides an opportunity to develop and apply employability skills that are learnt throughout work and life to your job.

The statements below list the typical employability skills that would be applied in a situation related to developing an Organic Management Plan for an agricultural or horticultural enterprise.

In completing your daily work tasks, and activities and summative assessments related to this unit of competence, you must be able to demonstrate that you are applying the "employability skills" listed below to this competency.

- Communication skills
- Identify and accurately report problems
- Organisational skills
- Teamwork skills
- Technological skills
- Use mathematical ideas and techniques.

6 UNIT DESCRIPTOR AND HOW THE UNIT APPLIES TO YOUR WORKPLACE

This unit of competency applies to those producers who develop an Organic Management Plan to convert an agricultural or horticultural farm to an organic, biological and ecological system. It requires the capability to set objectives to meet organic certification requirements of the National Standard for Organic and Biodynamic Produce.

This unit covers the following activities:

- Locate and access assistance in developing an Organic Management Plan
- Design the organic farming system to be described in the Organic Management Plan
- Develop sustainability and biodiversity sub-plan
- Develop soil management sub-plan
- Develop water management and ecology sub-plan
- Develop weed management sub-plan
- Develop and design an integrated pest and disease management sub-plan
- Develop an animal health sub-plan
- Develop a contamination risk management plan
- Integrate and finalise the organic management plan.

7 LOCATE AND ACCESS ASSISTANCE IN DEVELOPING THE ORGANIC MANAGEMENT PLAN

Organic farming is a growing industry in Australia and the global demand for 'clean, green' produce is rising. Market research suggests that organic industry revenue will reach $503.8m in 2012 which represents a growth of 9% from the previous year. Australia also has the largest area of organic farmland in the world at 12 million hectares (Source: IBISWorld; "Organic Farming in Australia: Market Research Report"; 2012). It is therefore no surprise that a growing number of producers are starting, or converting to, organic farming practices.

➤ Overlander TV; "Organic Farming Video, Australia, How to – Broadacre"; You Tube; Australia; 2009.

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www.youtube.com/watch?v=zbmF9mXqy7k&feature=results_main&playnext=1&list=PL574BBA9BBE956715

The conversion to organics requires a change of mindset and farming philosophy. There are also a number of barriers to entering the organic industry, mainly due to the lengthy certification process, conversion costs and the record keeping/auditing processes required to demonstrate compliance with organic standards. Full organic certification requires a farmer to produce organically, in accordance with all requirements of The National Standard for Organic and Bio-Dynamic Produce (National Standard), for at least 3 years. This period of conversion potentially incurs a drop in farm income. There is also the risk that your organic status may be affected by factors outside of your control (e.g. contamination from neighbouring properties).

The National Standard sets out the minimum requirements for the organic industry in Australia. This standard also provides assurance and access to the export and domestic markets for Australian organic produce. Organic certification ensures that what is purchased by consumers meets organic standards. The National Standard is administered by the Australian Quarantine Inspection Service (AQIS) and can be downloaded from the following website:

www.daff.gov.au/__data/assets/pdf_file/0018/126261/national-standard.pdf

WEB

At the time of writing, there are seven licensed Certification Organisations (COs) in Australia that are responsible for administering the National Standard. If you are to be certified 'organic' you must become a member of one of these organisations and comply with their standard. These incorporate all of the requirements of the National Standard and more.

For the purpose of this workbook, the Australian Certified Organic (ACO) Standard 2010 Version 1.0 (the Standard) will be used. Please note that this is not a recommendation of ACO over and above other COs.

Before deciding whether to go organic, you need to be fully informed of what is involved, the activities required to convert from conventional to organic practices, the risks and the potential costs/benefits. This process starts with the development of an Organic Management Plan (OMP) or Organic Farm Plan (OFP) for primary producers. These will be collectively referred to as OMPs for the purpose of this workbook and the focus will be on primary producers. An OMP consists of a thorough farm assessment to establish the current situation, followed by a step-by-step action plan that outlines what changes will be needed in order to comply with the Standard. It will require you to gather information on:

- Farm planning and design, including a farm map
- Soil and fertility management
- Pest, disease and weed management
- Water management and conservation
- Animal health management
- Sustainability and biodiversity aspects of the production system
- Contamination management.

Collating this information to produce an OMP, is a useful way to define the actual system you plan to implement and can highlight which aspects may require further consideration.

An OMP is a mandatory requirement for organic certification and is a living document. That is, it needs to be updated at least annually to maintain certification status.

In addition to an OMP, you must have:

- An Organic Livestock Plan to certify any livestock
- An Organic Handling Plan to certify the processing/handling portion of your operation. This outlines management control, audit trail recording systems and related management systems to be implemented or currently practiced to ensure maintenance of certified product authenticity and full conformance with this Standard.

Once an OMP is completed, you will be in a much better position to make an informed decision about whether organic farming is for you. The following factsheets provide a good introduction to the conversion process and the reasons for developing an OMP. Take some time to review these.

➤ Kondinin Group; "Going Organic: What You Need to Know"; Small Landholder Series NW 29; Australia; 2010.

WEB

www.agric.wa.gov.au/objtwr/imported_assets/content/fm/small/nw29_going%20organic_new_lr.pdf

➤ Australian Organic Producer; "Making the Most of Your Organic Management Plan"; Australia; Winter 2009; pp18-19.

WEB

www.bfa.com.au/Portals/0/BFAFiles/WIN09-OMP.pdf

Developing an OMP might feel like a daunting task at first. Keep in mind that it is a planning tool that will require you to conduct your own research, gather information, make decisions and then put it all together into one cohesive document. This workbook will take you through these steps, one at time, and ask you to complete a number of activities. In this way, you will gradually build your knowledge as you work through the activities and at the same time, develop your OMP. It is therefore important that you apply the activities to your enterprise so that the resulting OMP is relevant and meaningful to you.

7.1 OMP templates, planning documents and certifying organisations

Information on soil fertility and management, and weed, pest, disease and animal health status and their interrelationships is collected to serve as benchmarks for development of management options in plan.

Regional catchment targets for land, water and biodiversity are obtained and those applicable to property and sub-catchment are identified.

Components of OMP that need to be developed are identified.

Suitable format for planning documents is developed.

Before you get started, it is a good idea to understand what your final OMP might contain. This will help you focus your information gathering and planning activities.

How you structure your OMP is up to you. Some producers choose to prepare detailed plans (e.g. business plan, holistic farm plan, soil management plan, livestock management plan, environmental management plan) and then work with their CO to summarise relevant components into a preferred OMP template. Section 3.1.4.2 of the Standard defines what an OMP must contain at a minimum and states that:

"The requirement for and the extent and nature of this plan shall be determined by the CO depending on the complexity and nature of the operation. There are specific additional OMP requirements for such markets as the US."

Before determining the templates/planning documents you use, you need to determine if you want to be certified organic or not. If you want to be certified, then you will need to consider:

- The components of an OMP that you will need to complete for your enterprise, in accordance with the Standard and
- The requirements of your chosen CO.

So what is certification? The organic certification program was set up in the 1980s in Australia to ensure farmers, processors and others in the production chain are complying with the 'organic rules'. No one can simply claim their produce is certified organic if it's not. The term is defined by law and regulated by Australian Quarantine Inspection Service (AQIS) under the National Standard. The process of getting a farm certified organic takes at least three years. The first step in the certification process is to choose a CO, fill out an initial application and pay the necessary fees. Once approved, the CO will send you their forms, which will usually include a statutory declaration and their OMP template. See page 18 of the Standard for an overview of the certification process (www.bfa.com.au).

At the time of writing, there are seven licensed COs in Australia all of which have different application forms and templates, different services and fee structures. The following table identifies the current COs regulated by AQIS and provides links to the forms/templates section of their websites. Choosing a CO is a big decision as it is a long term relationship. See the following link for information that you should consider:

www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/introduction-to-organics/choosing-an-organic-certifier

Organisation	Description	Contact	Forms/Templates
Australian Certified Organic	Based in Brisbane, has two subsidiary certification streams of BFA – Australian Certified Organic and a smaller grower program called Organic Growers of Australia.	Phone (07) 3350 5716 www.aco.net.au/index.asp?Sec_ID=177 www.organicgrowers.org.au/contact.php	www.aco.net.au/index.asp?Sec_ID=12 www.organicgrowers.org.au/links.php
Organic Food Chain	Based near Toowoomba (Qld), offers certification and further assistance with marketing and supply management.	Phone (07) 4637 2600 www.organicfoodchain.com.au/contact_us.html	www.organicfoodchain.com.au/index.html
Tasmanian Organic-Dynamic Producers	Based at Campbell Town, this body deals with the Tasmanian industry only.	Phone (03) 6381 2004 www.tasorganicdynamic.com.au/	www.tasorganicdynamic.com.au/membershipform.pdf Note, templates not available to the public.
Aus-Qual	Based in Brisbane, is a wholly owned subsidiary of Aus-Meat Ltd, the Australian Meat Industry Standards watchdog. Also offers certification in agricultural, horticultural and secondary processing sectors.	Phone 1800 630 890 www.ausqual.com.au/about-us/contact-us.aspx	www.ausqual.com.au/public-documents/application-forms.aspx Note, templates not available to the public.
Safe Food Queensland	Based in Brisbane and deals with the Queensland industry only. Its core business is food safety and, although it is a licensed certifier, organics comes a distant second.	Phone 1800 300 815 www.safefood.qld.gov.au/index.php?option=com_content&view=article&id=54&Itemid=43	www.safefood.qld.gov.au/images/PDF/SFPQ025%20Accreditation%20Application%202012.pdf Note, templates not available to the public.
National Association for Sustainable Agriculture Australia	Based in the Adelaide Hills. NASAA Certified Organic covers seven million hectares and more than 900 licensed operators and offers a small grower program.	Phone (08) 8370 8455 www.nasaa.com.au/contact.html	www.nasaa.com.au/resource2.html#
Bio-Dynamic Research Institute	The BDRI, based at Powelltown, certifies for biodynamic and applies the Demeter Australia label.	Phone (03) 5966 7333 www.demeter.org.au/contactus.htm	www.demeter.org.au/index.htm

➤ Source: Colin Taylor; "Getting the Organic Tick"; Weeklytimesnow; Australia; August 10, 2011.

www.weeklytimesnow.com.au/article/2011/08/10/367205_print_friendly_article.html

It is assumed that you will be developing your own detailed plans and then summarising the detail in your Organic Farm Plan or Livestock Management Plan.

If you have chosen a CO it is suggested that you contact them and obtain a copy of their OMP template. You can then use their template for the related activities in this workbook. If you have not selected a CO, that's fine. For the purpose of this workbook, the Australian Certified Organic Template for Primary Producers will be used (**Organic Farm Plan**). If you are a livestock producer, then you will also need to complete the relevant OMPs for livestock **(Livestock Management Plan**). It is assumed that you will be developing your own detailed plans and then summarising the detail in your Organic Farm Plan or Livestock Management Plan.

Take some time to understand the OMP template and the data that you will be required to supply. Now consider what documents/data you already have that can assist you to complete the OMP e.g:

- Existing farm plans (business plan, farm plan, production plan, soil management plan, quality assurance plan, environmental management plan etc.).
- Farm history (what has the farm produced over the years and are there any risks of contamination from previous use, e.g. cattle dips).
- Paddock history (crops, yields, inputs, management practices).
- Chemical use records.
- Soil/water/plant tissue monitoring (test results, observations).
- Weed, pest and disease history (including incidence, inputs and management practices).
- Animal health and welfare status.
- Veterinary records.

Throughout this workbook you will be asked to complete a number of activities to demonstrate your understanding of the subjects being discussed. To get the most out of these activities, you need to make these applicable to your business. Use the extracts in this workbook (in this section and in the bibliography at the end of the workbook) and other sources to assist your research. Please include reference sources of information that you have used in your responses, so that we can check these sources as required.

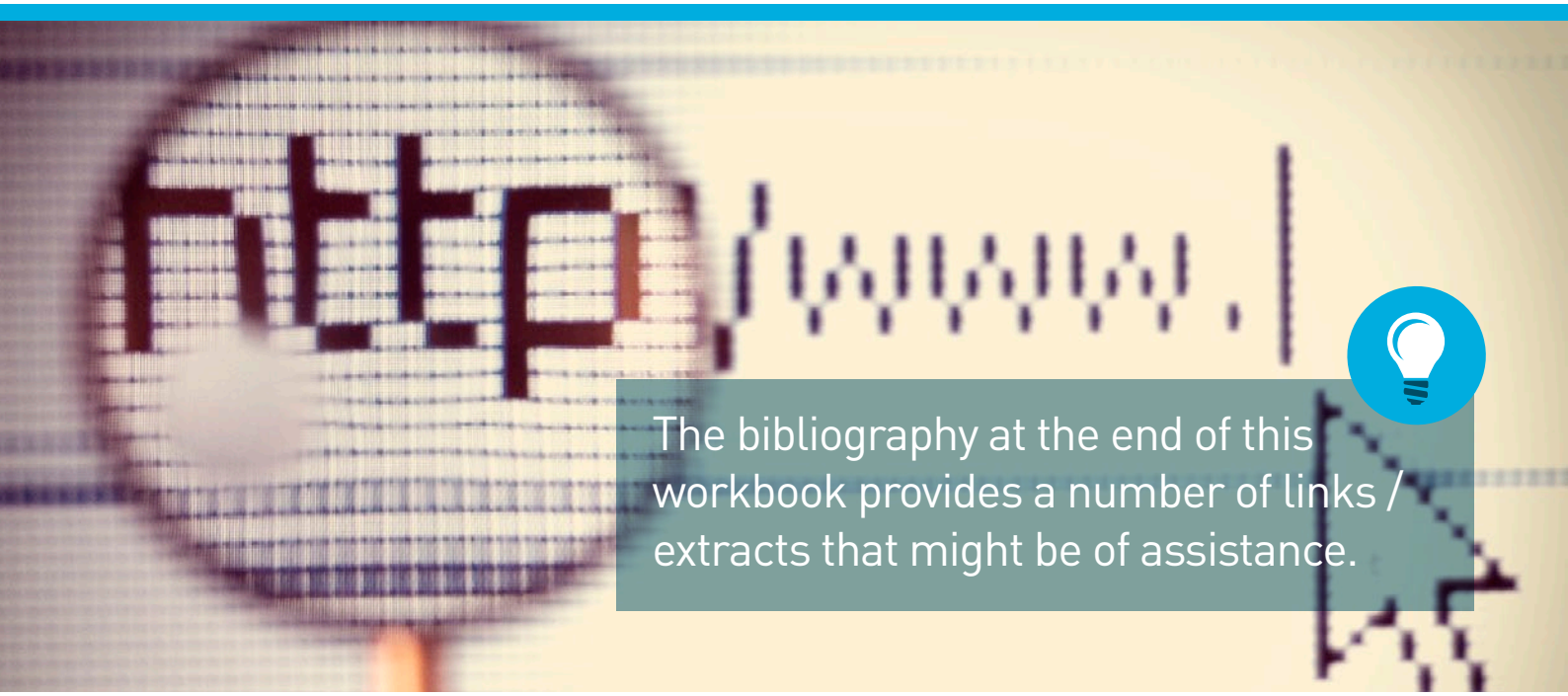
Activity 1

Briefly explain your current situation. Include a brief description of your enterprise, what you grow, the products you market and why you are considering conversion to organic production practices:

Question	Response
Have you decided if you want to be 'certified' organic?	
If so, have you selected a preferred CO?	
Which one?	

Take some time to review the OMP template (Organic Farm Plan, Livestock Management Plan or your own) and consider the data that you need to collect/supply. Identify whether this data is available and the source of the data. Please note, for other OMP templates, you may need to modify the activities (i.e. change OMP sections) to suit the format you are using.

OMP Section		Information Required	Existing Y/N	If existing, identify the source document
1	General			
2	Farm Plan Information			
3	Natural Resources			
4	Farm Systems			
5	Crop Management			
6	Organic Risk Management			
7	Record Keeping Systems			
8	Affirmation			



7.2 Sources of support and advice are located and accessed

Sources of support and advice including agricultural extension officers and training programs are located and accessed.

Industry publications and internet sources are assessed for their value in informing decision making.

Contributions of work colleagues and others are sought and considered during planning process.

Now that you have an idea of what is included in an OMP, you can identify information/knowledge gaps that need to be filled. This starts with reading, learning and talking to as many organic producers as you can.

You can achieve this by identifying relevant sources of information and then working out which ones (because there are hundreds!) are of real value to you.

The bibliography at the end of this workbook provides a number of links/extracts that might be of assistance to you when developing your OMP. It is suggested that:

- You initially become familiar with the Standard (or that of your chosen CO).

www.bfa.com.au

WEB

- Then review the various CO websites. Many of these include the contact details of producers, publications, templates, guides and training courses (see previous section for details).
- Talk to as many organic producers as you can. Ask them what they would change if they could do it all again, and what they did right. This will give you an opportunity to learn from their successes and mistakes.
- Identify the people who can help you with the conversion process (e.g. consultants, other producers willing to give you their time/ insights).
- Find a relevant organic production guide for your product/enterprise.

www.dpi.vic.gov.au/agriculture/farming-management/organic-farming

www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/introduction-to-organics/information-resources-for-organic-farming

https://rirdc.infoservices.com.au/collections/org

www.agric.wa.gov.au/PC_92627.html

WEB

Activity 2

Identify the people, publications, training and other sources of information that are available to assist you develop your OMP and convert to organic production. Update the following table with your results.

Note: Don't fall into the trap of listing every single resource that you find. Only include those that will be of real help/benefit to you.

Resource	How will this resource assist you?	Reference if applicable

Talk to as many organic producers as you can. As a result of your discussions, update the following table with answers to these questions:

What are the keys to successful organic conversion (i.e. critical success factors)?

What mistakes have others made that you can learn from (e.g. lessons learnt)?

8 DESIGN THE ORGANIC FARMING SYSTEM TO BE DESCRIBED IN THE OMP

Map of property to be covered by OMP is developed or obtained.
Soil types and topography are mapped on farm plan.

The scope of what you intend to produce organically, within the context of your property and the activities of neighboring properties, needs to be fully described in your OMP. To satisfy this requirement, you need to assemble current and historical data about your property, talk to your neighbors about your intention to go organic and the implications their activities may have for you. You also need to gather the following information:

- Property details
  - Location (address, Deposited Plan)
  - Ownership
  - Legal status
  - Total area of the farm and total area to be included in certification
  - Farm map and land apportionment (paddock names/numbers, hectares per paddock, crop/pasture)
  - Paddock history inputs/yields (for at least 3 years)
- Natural resources
  - Land class and topography
  - Soil types
  - Water
  - Vegetation
  - Seasonal and climatic conditions
  - Natural resource issues (erosion, contamination)
- Weeds, pests and diseases.
- Animal health issues.
- Cultural/management practices.
- Equipment and other infrastructure.
- Neighboring properties and associated activities. This is within the context of potential contamination from these properties and what buffer zones/actions are taken to prevent contamination.
- Membership to other programs (e.g. organic, quality assurance, environmental management).

If you have kept good records and know your neighbors well, this task will be relatively easy. For example, you need to have kept paddock history records or a paddock diary for at least 3 years. If you do not have these records, you may have a much bigger task ahead of you to gather the data from other sources and assemble it into something meaningful and fit for purpose. Consider the following information sources to start this process, other than those identified in activity 1:

- Photographs (on-ground, aerial).
- Interviews with key stakeholders (neighbors, previous owners/operators, staff, consultants, CMA/DPI/council staff).
- Regional catchment management authority (catchment targets). See www.malleecma.vic.gov.au/resources/corporate-documents/rsc_2003-08.pdf as an example.
- Self-assessment audits available from industry groups.
- Council (local planning documents, records, maps, DP lot history).
- Property walk to document status of natural assets, equipment and other infrastructure.

You will also need to supply a farm map with your OMP. When developing a farm map, ensure that all details are consistent with all other records (e.g. paddock names identified on your farm map must match the paddock names on your 'paddock history record' and the paddock names in your OMP). Your farm map might include:

- Obtaining an aerial photo of the property with scale, north and boundary lines.
- Infrastructure features such as roads, yards, internal fences.
- Water sources (bores, rivers, creeks, dams, springs, water holding devices).
- Vegetation (forests, protected vegetation and riparian areas, windbreaks, tree lines, wildlife plantings).
- Paddocks, including such details as:
  - Paddock names/numbers
  - Total hectares per paddock
- Land degradation features such as erosion sites, saline areas and boggy areas.
- Potential contamination areas (e.g. tips, dumps).
- Land classification features (note, this may be a separate map if required):
  - Soil types
  - Topography
  - Land capability
- Neighbouring properties:
  - Buffer zones and width
  - Type of buffer (e.g. crop land, treeline, wildlife planting, grass strip)
- Quarantine areas.

There are a number of tools that are available to land owners to assist in the development of farm maps, including on-line tools (see NSW SIX Spatial Information Exchange link below, Google Maps, Nearmap), computer based farm mapping programs and companies that provide land classification and mapping services. To view potential software mapping programs, Google 'farm mapping software programs'.

➤ NSW Government – Land and Property Information; "SIX Spatial Information Exchange"; NSW; 2012.

https://six.nsw.gov.au/wps/portal/!ut/p/b1/04_SjzQ0tTAzMDOwNDbXj9CPy kssy0xPLMnMz0vMAfGjzOKDnZxCTR0NzQwNzJ1dDDwNzfxMnEMNvfzNDPSDU_P0c6McFQGyE71G/

The following link provides an example of a farm map:

www.dpi.vic.gov.au/agriculture/farming-management/business-management/whole-farm-planning

It is time to gather this information and discuss your organic aspirations with your neighbors. Update:

- Sections 1: General Information
- Section 2: Farm Plan Information
- Organic Farm Plan and/or Livestock Management Plan with your results (or relevant sections of an alternative OMP)
- Attach the requested records (e.g. paddock history sheets)
- Attach your completed farm map (showing adjoining land use and paddock identification)

Make sure you read the relevant sections of the Standard before you complete these sections. Note: You will be refining/updating this template throughout the workbook. If you do not yet have all of the information to hand, you will have the opportunity to add details later.

8.1 What is your time scale

Time scale to be addressed in plan is determined

It is now time to consider the scale of the organic enterprise to be covered by the OMP and the timeframe required to complete the conversion. Consider whether you:

- Will convert the entire enterprise to organics or just a part of the enterprise?
- Don't over estimate your capability. Have you got the resources and experience available to convert the whole property at once?
- Should you trial organic techniques on a small area first before being applied on a larger scale? The advantage of this approach is that your investment is minimised up front and you can learn from your successes/mistakes before investing further. The disadvantage is that the organic area may have a high risk of contamination from adjacent areas. 'Parallel production' occurs when a grower produces a crop organically but is also producing the same type of crop using conventional methods. There are tight restrictions on 'parallel production' under organic standards. For example, check the COs requirements regarding dedicated machinery, especially spray equipment, for use on certified land.

When developing a conversion plan for the property, you need to document the phases that each area of the property will go through during conversion to organic management and the timescale to convert. After an application for organic certification is accepted it generally takes at least three years for a farm to attain 'organic' status. A longer conversion period may apply where difficulties delay the process. It may sometimes be possible to negotiate a shorter period depending on the farm's history, especially in relation to the use of prohibited inputs.

Years since last application of prohibited inputs, prior to applying for certification				Potential shortest timeframe for certification, starting from the date the application for certification is accepted (1)			
Scenario	2 or more	1	Recent	Year 1	Year 2	Year 3	Year 4
A	✓			Pre-cert.(2)	Organic		
B		✓		Pre-cert.	Conversion	Organic	
C			✓	Pre-cert.	Conversion	Conversion	Organic

11 – SCENARIOS A AND B ASSUME THAT COMPLIANCE WITH THE ORGANIC STANDARD HAS BEEN CLEARLY DOCUMENTED FOR THE TIME SINCE PROHIBITED INPUTS WERE LAST APPLIED.
2 – PRE-CERTIFICATION (A MANDATORY 12-MONTH PERIOD FOR ALL NEW CERTIFICATION APPLICANTS).

➤ Department of Primary Industries Victoria; "Conversion to Organic Farming"; Australia; 2012.

www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/introduction-to-organics/conversion-to-organic-farming

Activity 4

Will you convert your entire operation or just specific sections? Briefly explain why?

In the following table, identify the major activities involved in the organic conversion for your property and the anticipated timeframe involved. As you work through activities in this workbook it is likely you will make alterations to timeframes. As such you need to regularly "revisit" this activity to update it.

Major Activities	Duration	Start and End Date

Please update the following sections of **Organic Farm Plan** – Section 6: Organic Risk Management

- 6B Parallel Production.

9 DEVELOP SUSTAINABILITY AND BIODIVERSITY SUB-PLAN

Suitability of land for production is determined based on soil type, slope, aspect and previous use.

Organic management requires a commitment to sustainability, the protection and enhancement of biodiversity and appropriate management of environmental aspects of production. Management decisions must take into consideration any impacts on native vegetation and ecosystems. Practices such as shelter belts, corridors, wetlands and remnant vegetation protection are considered priority activities for biodiversity management.

The Standard requires all organic producers to regenerate lands and soils and implement best environmental practices for farming activities. Section 4.7 of the Standard addresses the requirements for Environmental Management and Social Policy. Take some time to review this section of the Standard before proceeding further.

When developing an OMP, it is vital to understand the strengths and weakness of the current environment and the condition of its natural assets. This starts with an in-depth understanding of your property:

- Soil types and topography
- Land capability classes
- Soil fertility
- Biodiversity (flora and fauna).

It is important to work with nature, rather than against it and this can be achieved through good management and matching the suitability of the land with production activities.

Soil Types and Topography

Soil types often change with topography, from rich fertile soils on flood plains to rocky infertile soils on steep slopes subject to wind/water erosion.

You can determine soil types by analyzing a number of soil attributes and understanding the soil types that are predominant in your region. The following resources will assist you to determine your soil types if you do not know them already:

➤ Australian Natural Resources Atlas; "Soils Overview"; Australia; 2009.

www.anra.gov.au/topics/soils/overview/index.html

WEB

➤ Soil Quality Pty Ltd; "Soil Quality Website"; Australia; 2012.

WEB

www.soilquality.org.au/

➤ Environment and Resource Management – Qld Government; "Understanding Soils"; Australia; 2012.

www.derm.qld.gov.au/science/slr/understanding_soils.html

WEB

➤ Department of Agriculture Fisheries and Forestry; "Soil Health Knowledge Bank"; Australia; 2012.

http://soilhealthknowledge.com.au/index.php?option=com_content&view=article&id=5&Itemid=44&limitstart=5

WEB

Land Capability Classes

Land capability refers to the ability of land to support a type of land use without causing damage. It considers both the specific requirements of the land use (e.g. rooting depth or soil water availability) and the risks of degradation associated with the land use (e.g. phosphorus export hazard or wind erosion). There are a number of methodologies used to describe land class. As an example, the following five land capability classes are used by the Western Australian Department of Agriculture and Food:

➤ Department of Agriculture and Food WA; "LAND EVALUATION STANDARDS FOR LAND RESOURCE MAPPING"; WA; 2005; p70.

www.agric.wa.gov.au/objtwr/imported_assets/content/lwe/rpm/landcap/tr298_part3.pdf

Capability class	General description
1 – Very high	Very few physical limitations present and easily overcome. Risk of land degradation is negligible.
2 – High	Minor physical limitations affecting either productive land use and/or risk of degradation. Limitations overcome by careful planning.
3 – Fair	Moderate physical limitations significantly affecting productive land use and/or risk of degradation. Careful planning and conservation measures required.
4 – Low	High degree of physical limitation not easily overcome by standard development techniques and/or resulting in high risk of degradation. Extensive conservation measures and careful ongoing management required.
5 – Very low	Severe limitations. Use is usually prohibitive in terms of development costs or the associated risk of degradation.

Further examples of how to class land and determine capability are available from the following links:

➤ NSW Agriculture; "Agricultural Land Classification – Agfact AC.25"; NSW, 2002.

www.dpi.nsw.gov.au/__data/assets/pdf_file/0004/189697/ag-land-classification.pdf

WEB

➤ Department of Primary Industries, Parks, Water and Environment – Tasmania; "Land Capability"; Tasmania; 2012.

www.dpipwe.tas.gov.au/inter.nsf/ThemeNodes/LBUN-6EX9PS?open

WEB

As a minimum, you should be able to classify land class as:

- Mountains
- Hills and ranges
- Coastal
- Floodplain
- Plains.

Consultants and expert farm planners are often engaged to develop farm capability assessments based on a range of interrelating factors, including but not limited to:

- Land class
- Natural resource condition
- Climatic conditions
- Soil tests
- Land degradation issues
- Previous vs intended use and
- The goals of the landowners.

Consider whether you need to contract this expertise. Once you have this information you can then determine if your intended production system is going to 'work with nature' rather than against it.

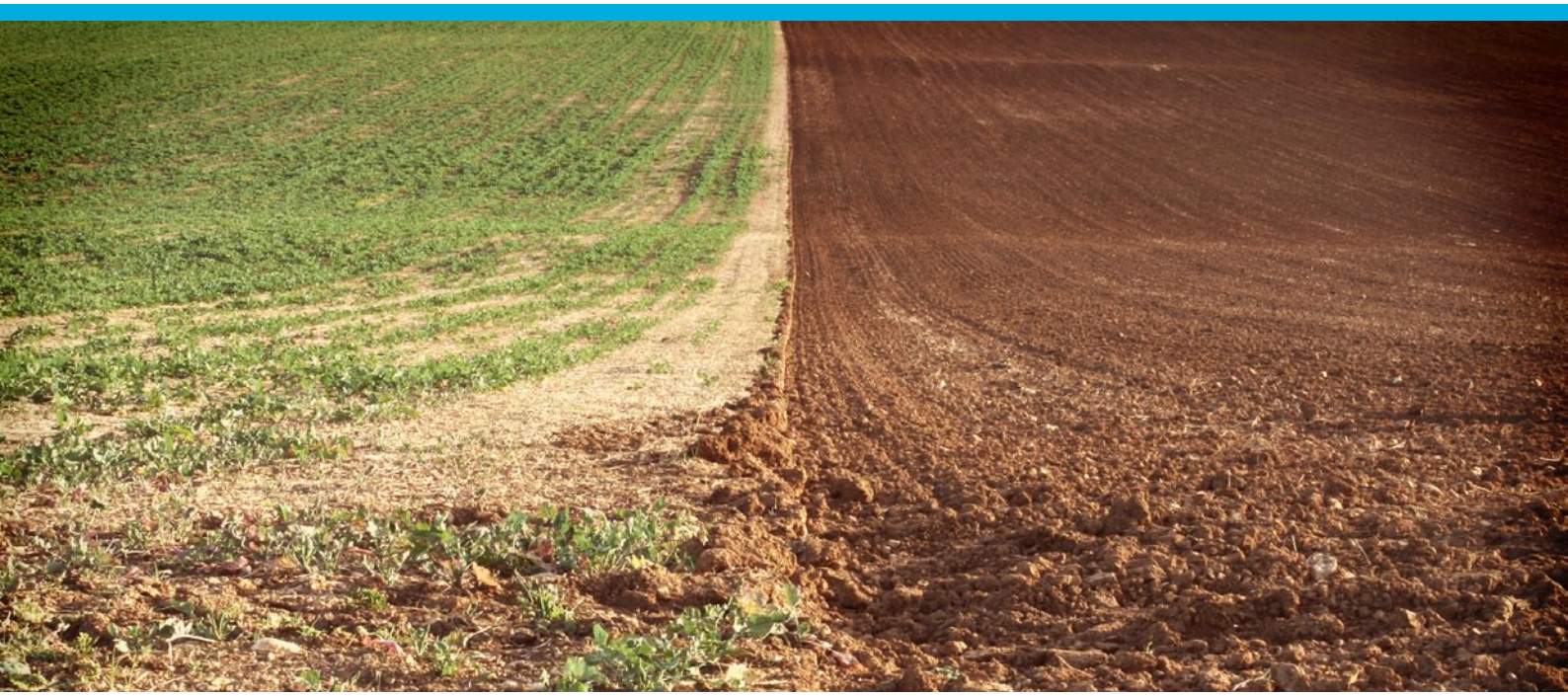
Identify the predominant climatic conditions that affect your production system/region. You can use the following map to identify climate:

www.bom.gov.au/climate/environ/other/kpn_group.shtml

Annual Rainfall		
Predominant Wind Direction	Summer:	
	Autumn:	
	Winter:	
	Spring:	
Climate		

Identify the different land classes/soil types that exist on your property, their intended use and whether the intended use is compatible with the land class.

Land Classification/ Soil Type	Intended Use	Is the Intended Use Compatible with the Land Class?	Source/Reference



9.1 Soil fertility assessment

A soil fertility assessment of farm production areas is undertaken or commissioned.

Now that you have identified the different soil types on your property, you need to assess the fertility of these soils. Soil fertility can be used to describe the availability of nutrients for plant uptake and in the broader context can be derived from soil type, soil organic matter status, soil properties including pH, as well as the concentration of available nutrients and should be reflective of land use.

The fertility of a soil reflects not only the turnover of organic and inorganic inputs, but also the management of soil. Organic management requires a soil fertility program that aims to improve soil fertility within the principles defined by the Standard. This process starts with an understanding of how fertile your soils are and whether there are any nutrient deficiencies that require correction.

Soil/nutrient deficiencies are identified via soil/plant tissue testing. This may be a combination of on-site observations (e.g. number of earthworms per shovel load of soil, leaf colour, root depth) and laboratory testing (soil, plant tissue, water).

As an organic producer, you must identify how you are going to monitor and measure soil fertility. There are a number of resources available online to assist you determine the most appropriate tests relative to enterprise requirements. Note: These links/extracts are provided as examples only and are not recommendations of a particular service provider:

Department of Agriculture Fisheries and Forestry; "Soil Health Knowledge Bank"; Australia; 2012.

WEB

http://soilhealthknowledge.com.au/index.php?option=com_content&view=article&id=52&Itemid=131

In an agricultural context, soil testing is commonly used:

- To help identify the main reasons for poor plant performance (diagnostic tests).
- To confirm nutrient status and warn of deficiencies.
- To predict likely response to fertiliser rate and type for individual situations.
- To monitor changes in soil health in response to changes in land use and management.

Activity 6

After considering the needs of your enterprise and the Standard, identify the soil monitoring activities that are relevant to your enterprise and update the following table with the required information. The areas that you monitor should be logical for your operation (e.g. soil type, land class, paddock, farm block, production type, area of risk).

Monitoring Activity	Area to be Monitored	Reason for Monitoring	Frequency of Monitoring
e.g. Soil Health Card	Paddock 1, 5, 10	Monitor soil conditions for emerging trends	Annual
e.g. Soil Test – Laboratory	Paddock 1, 5, 10	Monitor soil conditions for emerging trends	Annual

Once your soil monitoring program has been defined, you can then conduct the tests. The testing process consists of the following major activities:

- Preparation and planning.
- Site visit and collection of representative soil samples.
- On site or external (e.g. laboratory, consultant) analysis.
- Interpretation of the findings to identify issues that require resolution.
- Identify the most appropriate solution (e.g. soil re-mineralisation, soil ripping, fencing off water ways, prudent use of plant treatments to eradicate disease, compost and compost tea applications).
- Recording these steps for future reference and relating them to yield. Good records are an essential part of a soil fertility program.

Often, test results can be flawed if the sample sites have not been appropriately selected or the samples themselves have not been appropriately collected.

The following extracts and links identify how testing should be completed to get the best results from laboratory tests:

➤ Department of Agriculture Fisheries and Forestry; "Soil Health Knowledge Bank"; Australia; 2012.

http://soilhealthknowledge.com.au/index.php?option=com_content&view=article&id=58&Itemid=122

➤ Department of Primary Industries NSW – Soil Sampling and Submitting

www.dpi.nsw.gov.au/aboutus/services/das/soils#Preparing-and-submitting-samples

➤ Department of Primary Industries NSW – Water Sampling and Submitting

www.dpi.nsw.gov.au/aboutus/services/das/water#Preparing-and-submitting-samples

Once test results are available, they need to be interpreted. Laboratory test results can be complex to decipher and many labs may offer additional services whereby consultants/agronomists will provide an interpretive report.

If you are going to use expertise to analyze the results of soil tests and identify solutions to any identified issues, then it is important to find someone whose methods are aligned with the values of your enterprise.

The following links provide further information on soil test results and how to interpret them. You will need to conduct your own research to identify what is relevant to the needs of your enterprise.

www.dpi.nsw.gov.au/agriculture/resources/soils/testing/interpret

www.dpi.nsw.gov.au/agriculture/resources/soils/improvement/ca-mg

http://soilhealthknowledge.com.au/index.php?option=com_content&view=article&id=58&Itemid=122&limitstart=6

Activity 7

It is now assumed that you have conducted on-site observations and/or laboratory tests where indicated. Update the following table with any nutrient deficiencies that need to be addressed.

Location	Soil Type	Nutrient Deficiencies to be Addressed	Long Term Objectives to be Achieved

9.2 Land degradation, erosion and soil conservation practices

Soil conservation is a set of management strategies for prevention of soil erosion or soil becoming chemically altered by overuse, salinisation, acidification, or other contamination. The principal strategies are:

- Vegetative cover
- Erosion prevention
- Salinity management
- Acidity control
- Encouraging health of beneficial soil organisms
- Prevention and remediation of soil contamination
- Mineralisation
- No-till farming
- Contour plowing
- Wind rows
- Crop rotation
- The use of fertiliser
- Resting the land.

As healthy soil is the foundation of all organic production any potential loss of soil/fertility is considered a high risk that requires careful management.

The Soil Health Knowledge Bank developed by the Australian Government provides a useful resource for understanding the impacts of erosion and management practices that can be introduced to minimise the risk of erosion.

➤ Australian Government; "Soil Health Knowledge Bank: Australia; 2012.

WEB **http://soilhealthknowledge.com.au/index.php?view=article&catid=6%3Asection-grouping-1&id=10%3Asoil-erosion&tmpl=component&print=1&page=&option=com_content&Itemid=12**

Conduct an audit of your land and identify any areas that require soil conservation practices (e.g. erosion, water logging, compaction), their location, status and how you plan to arrest/reverse the problem.

Issue to be addressed	Status (minor, moderate, severe)	Location on farm	Conservation practices to arrest/reverse issue

9.3 Biodiversity

Biodiversity is defined as the natural diversity of all life: the sum of all our native species of flora and fauna, the genetic variation within them, their habitats, and the ecosystems of which they are an integral part. It encompasses a large range of living things and ecosystems, which are constantly evolving and adapting to environmental change.

Agricultural production has caused significant direct and indirect changes to the natural environment and the functioning of ecosystems.

A direct consequence of the clearance of native vegetation for agriculture has been the severe depletion of some native ecological communities and species.

While vegetation clearance is the major concern, a number of other land management issues affect biodiversity:

- Inappropriate stock grazing (e.g. continuous grazing and/or overstocking) can cause severe damage to fragile ecosystems around river banks and in remnant forests.
- The requisition of water for agriculture can reduced stream flows and affect threatened species.
- The use of synthetic fertilisers and poor management practices have caused significant changes in soil properties, water runoff and groundwater systems that have created further loss of natural vegetation, increased nutrient and salt loads in rivers and rising water tables which may cause salinity and nitrate pollution of groundwater.

Some biodiversity measures that producers can introduce to maintain and improve biodiversity might include:

- Protecting remnant vegetation through fencing off areas and connecting islands of remnant vegetation with neighbours and others (e.g. landcare groups).
- Establishing windbreaks, shelterbelts and wildlife corridors to increase farm productivity, beneficial insect and bird habitat and wildlife habitat.
- Re-vegetating cleared areas (particularly steep slopes, stream sides), saline recharge areas and wetlands.
- Using native pasture species that are more adapted to low-nutrient Australian soils.
- Minimising “fertiliser runoff” by increasing soil biological activity.

➤ Sarah Anderson, Kim Lowe, Kathy Preece, Alan Crouch; ”INCORPORATING BIODIVERSITY INTO ENVIRONMENTAL MANAGEMENT SYSTEMS FOR VICTORIAN AGRICULTURE- A Discussion Paper on Developing a Methodology for Linking Performance Standards and Management Systems”; Australia; 2012.

WEB

www.dpi.vic.gov.au/agriculture/farming-management/business-management/ems-in-victorian-agriculture/biodiversity/incorporating-biodiversity

Organic certification usually requires that more than 5% of your land is set aside for non-intensive production/biodiversity areas and that you have a plan to improve biodiversity on your property. To achieve this, you need to identify:

- Biodiversity assets on your property.
- Environmental legislation/regulations that are applicable to your catchment/property.
- Potential threats/risks to biodiversity.
- Actions to minimise these threats/risks.

Conduct an audit of your property and identify its biodiversity assets, potential threats/risks to these assets and the actions you will take to minimise these threats/risks:

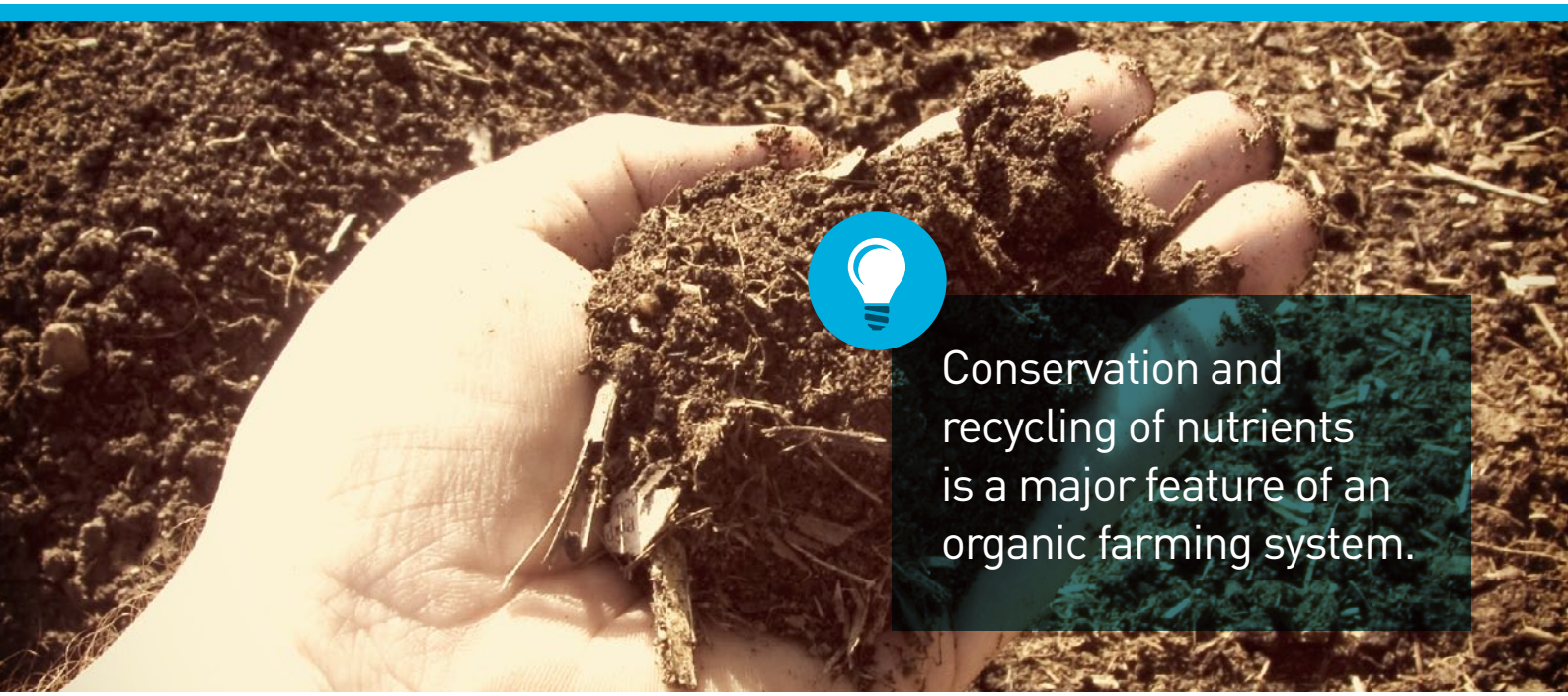
Biodiversity Assets	Area (Ha)	Potential Threats/Risks	Actions to Minimise Risks

Is the sum of all biodiversity assets > 5% of your total property?

Activity 10

It is now time to pull all of the information from this section together and update **Organic Farm Plan.**

WEB



10 DEVELOP SOIL MANAGEMENT SUB-PLAN

Soil fertility plan is developed and documented that amends soil chemistry, soil structure and soil biology, based on assessment results, overall budget and intended cropping regime.

Soil management plan to enhance soil structure and prevent compaction and water logging is developed.

Appropriate inputs are identified according to the National Standard for Organic and Biodynamic Produce.

Conservation and recycling of nutrients is a major feature of an organic farming system. The Standard requires producers to demonstrate that sufficient organic material is returned to the soil by the recycling, regeneration and addition of organic materials and nutrients to increase, or at least maintain, the humus content. The use of input materials are regarded as supplements to recycling and not as replacements in considering the long term fertility needs of the farming system.

Inputs are either allowable or restricted and these are defined in the relevant annexes of the Standard. As an organic producer, you need to become familiar with allowable/restricted inputs and implement a soil management plan that is aligned with these principles and section 4.1 – 4.3 of the Standard.

To comply with these organic principles, you need to develop (or have already developed) a soil management program that identifies the current condition of your soils, deficiencies to be addressed within the context of your production system and how to address these deficiencies. Amending soil chemistry, soil structure and soil biology must be accomplished via practices/inputs allowed by the Standard.

Activity 11

Take some time to read Section 4.1-4.3 of the Standard and relevant Annexes. Conduct an honest 'preliminary' appraisal of your existing farm practices and associated inputs and identify those practices that do not comply with the Standard in the following table.

Current Practices and Inputs That Do NOT Comply with the Standard	What Changes need to be made to Comply with the Standard

In the previous section you identified the current status of your soils and any deficiencies/issues.

The following links/extracts have been provided to help your research related to how to correct deficiencies and different management practices that may be appropriate.

➤ Northern Rivers Catchment Management Authority; "Publications"; Australia; 2012.

WEB

www.northern.cma.nsw.gov.au/publications

This webpage provides examples of soil best practice management guides that are region specific. See if your local CMA has similar publications that are specific to your local area.

➤ Soil Quality Pty Ltd; "Soil Quality Website"; Australia; 2012.

WEB

http://soilquality.org.au/

Using the tools provided on this website you can gain a greater understanding of the health of your soil, compare your data and examine soil relationships. A healthy soil has biological, chemical and physical properties that promote the health of plants, animals and humans while also maintaining environmental quality.

➤ Department of Primary Industries NSW; "Soil Acidity and Liming"; Agfact AC.19, 3rd Edition; Australia; 2005.

WEB

www.dpi.nsw.gov.au/__data/assets/pdf_file/0007/167209/soil-acidity-liming.pdf

This document provides a comprehensive overview of correcting soil acidity through liming.

➤ DAFF; "Soil Health Knowledge Bank"; Australia; 2012.

WEB

http://soilhealthknowledge.com.au/index.php?option=com_content&view=article&id=68&Itemid=134

In Activity 7 you identified the results of soil monitoring and issues to be corrected. Having conducted your own research of soil best practice management, it is now time to confirm how these issues will be addressed (e.g. through soil amendments, management practices, fertilisers). There is no 'silver bullet' solution and you will need to include a number of complementary strategies to resolve any deficiencies/issues.

An example has been provided as a guide to completing this table.

Soil Health Program – Strategies	Description of Activities to be Undertaken	When Will These Activities Occur	Application Rates (for Inputs)	How Were These Rates Determined?
Re-mineralisation	Apply lime, rock phosphate, hummates	Spring Year 1 Every 3 years thereafter, pending monitoring results	0.5 tonne fine Ag lime 0.25 tonne rock phosphate 0.25 tonne hummate	Organic consultant based on soil test results (field observations + lab results)

Activity 13

Any inputs that you decide to use must be allowable under the Standard. If you are using compost, all of the ingredients and the process of manufacture must be compliant with section 4.3 of the Standard. The Biological Farmers of Australia publishes the list of BFA registered allowed inputs as well as across industry allowed inputs for use in organic farming systems. The list of current products can be accessed from the following webpage:

WEB

www.bfa.com.au/PrimaryProducers/OrganicFarmingInputs.aspx

If you identified any inputs in the previous activity, you need to ascertain if they are; (A) Approved, (R) Restricted or (P) Prohibited, under the Standard. Update the following table with a list of all inputs (current and intended) and their status:

Product	Brand Name or Source	Status: Approved (A), Restricted (R), Prohibited (P)	Number of Applications Per Year	Reasons For Use

It is now time to consider the materials that will be required for the implementation of your nominated programs, calculate the quantities required and determine the cost of proceeding. Think about:

- How much land is affected
- What materials you will need
- Quantities of materials required
- Equipment required
- The people (e.g. staff, contractors and consultants) required to design, implement, manage, and maintain the program
- Any other necessary inputs.

The next step is to work out the cost of the fertiliser per hectare and the cost of individual nutrients per hectare, for various fertiliser products. The most accurate costing will include all costs and discounts.

When the 'as-spread' cost is considered, high-analysis fertilisers are often cheaper per hectare than are low-analysis fertilisers because of the smaller amount of fertiliser product to be spread to achieve the same nutrient application rate.

Once you have calculated quantities and costed these inputs, you should then ask yourself the question "should I do it?" What is the cost/benefit to you or your enterprise? This question should always be considered from the triple bottom line.

Activity 14

Time now to record the plant, materials, labor, equipment and other inputs required to implement your soil fertility program. Update the following table with your findings. When costing items, consider alternatives to outright purchasing. For example, you may choose to lease rather than buy outright, share equipment with other producers, hire on an 'as needs' basis. The choices that you make regarding resource use, acquisition and ownership can have a big impact on the overall profitability of your business.

Include a variance of + and – 20% to see the effect that price volatility may have on your budget.

Input Category (plant, equipment, materials, labour etc.)	Item	Quantity	Cost	Supplier	Availability
Total					
Variance +20%					
Variance -20%					

By now you have conducted a significant amount of research, identified options to improve soil health, and selected the most appropriate strategies based on your production requirements and cost/benefit analysis. It is now time to put all of this together into your OMP.

Activity 15

Using all of the information gathered and documented to date, you now need to update Sections 4A, 4B, and 4C of the **Organic Farm Plan**.

WEB

11 DEVELOP WATER MANAGEMENT AND ECOLOGY SUB-PLAN

Water contamination is a serious risk that needs to be monitored and managed within an organic enterprise. Contamination may occur as a result of:

- On-farm activities: e.g. historical use of the land such as cattle dips and rubbish dumps, irrigation system inputs, improper maintenance of water holding structures, allowing livestock access to waterways.
- Off-farm activities: e.g. spray drift, surface water flow or soil movement from neighboring properties during wind and water erosion.

The Standard requires organic producers to closely monitor water quality and water use efficiency. You must ensure that water on or leaving the production site, is not contaminated as a result of production activities. You also need to protect and enhance natural water features and manage/maintain water holding devices (e.g. dams and tanks).

Some practices to manage water include:

- Enhancement of water holding capacity of the soil via progressive humus build up.
- Permanent sod and mulching practices for the containment of moisture.
- Selection of appropriate irrigation equipment.
- Water catchment systems designed to. maximise on-farm water use efficiency.
- Monitoring using tensiometers, evaporation figures, etc.

Activity 16

Take some time to read Section 4.4 of the Standard. Conduct an honest 'preliminary' appraisal of your existing practices. Identify water management practices that do not comply with the Standard in the following table.

Current Practices That Do NOT Comply with the Standard	Changes Required to Comply with the Standard

Water testing will be required to assess and demonstrate water quality. The following link provides examples of water testing services:

➤ Southern Cross University – Environmental Analysis Laboratory.

WEB

www.scu.edu.au/eal/index.php/2/

Routine analysis is conducted on bore, dam, spring, creek and tank waters for physical, chemical and bacteriological parameters. Resulting data are used in a broad spectrum of suitability assessments.

These include drinking, domestic, recreational, agricultural and irrigation uses. EAL also routinely conducts environmental monitoring of waters for physiochemical parameters and metals, nutrients, salts, bacteria and algal biomass.

Activity 17

In the following table, identify all water sources (natural and man-made) that occur/are used within your production system. Identify how you monitor the quality of the water for each source and how you manage/ maintain the source to ensure water quality.

Water Source	Monitoring Activities and Frequency	Water Contamination Prevention/ Maintenance Activities	Water Contamination Control Activities	Identify any Inputs Used in Irrigation Systems	Are Inputs Allowable Under the Standard?

Using all of the information gathered and documented to date you now need to update Sections 4D of the **Organic Farm Plan.**

WEB

12 DEVELOP WEED MANAGEMENT SUB-PLAN

Problematic weed species are identified and weeds are observed as an indicator of soil health.

Life cycles of weeds species are identified to inform management options.

Appropriate inputs are identified according to the National Standard for Organic and Biodynamic Produce.

Options for managing weeds are developed and sub-plan is documented.

Weed management is one of the most challenging issues faced by organic producers. The Standard provides general principles for plant production and for plant protection. Knowledge of these principles is essential for successful management of weeds within organic mixed farming systems. Weed control must be achieved without using synthetic herbicides and ideally with minimal disruption to the soil. To meet this challenge you need to develop a weed management program that includes a number of complementary and acceptable strategies appropriate to your particular situation.

Before commencing a weed management program, consider the weeds that are prevalent in your enterprise and whether they are in fact 'undesirable'. A lot of time and money can be invested in programs that eliminate 'good' weeds. This is often one of the biggest mindset/ philosophical changes that organic producers need to make. Weeds can be good if they:

- Provide habitats for beneficial insects that reduce pest burden on desirable crops/pastures.
- Are indicators of soil deficiencies.
- Provide mulch and nutrients to desirable crops/ pastures when cut prior to seed heads forming.
- Provide fodder to livestock.
- Provide ground cover to bare soil, preventing erosion.
- Have deep roots which may absorb nutrients from lower in the soil profile and redistribute them when the plants decompose.

Peter Andrews also discusses the roles of weeds within the landscape. Whilst most farmers have been struggling to eradicate weeds with chemicals, he has a different take on the role that weeds play and what they indicate (Peter Andrews; "Beyond the Brink"; Australia; 2008; pp109,112):

"Few subjects seem to polarise Australian farmers as much as weeds. Most are convinced weeds are bad and have to be got rid of. A small but, I believe, growing minority are just as sure they are vital to the health of the landscape."

However, this is not always the case and there are weeds that need to be controlled. For example, weeds that:

- Cause death or injury to livestock.
- Cause injury to operators or damage to machinery (e.g. sharp thorns).
- Out compete desirable crops/pastures.
- Create soil conditions that inhibit the growth of desirable species via allelopathy. Allelopathy is a process by which one plant deters others from growing near it by releasing a chemical in the soil that inhibits the growth of the others.

Activity 18

In the following table, identify the weeds that are prevalent within your enterprise. Try and see both the good and bad aspects of these weeds. Identify the point at which you believe these weeds become a problem for your enterprise and need to be controlled. This is known as the 'acceptable threshold limit'.

The following sources may assist in the identification of weeds:

www.weeds.gov.au/weeds/lists/index.html

www.weeds.org.au/weedident.htm

WEB

- State Based Departments of Primary Industries, for example:

WEB

www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds

- Field days that focus on weed identification in your region.

Weed Species	Beneficial Aspects?	Potential Risks/Impacts?	Acceptable Threshold Limit

Once you have identified weeds that need to be controlled and at what threshold, you need to understand their characteristics. This will assist you identify different management options and when to implement them (e.g. when the weed is vulnerable). Consider the following characteristics and get to know your weeds:

- Preliminary classification of weeds includes whether they are annual, biennial or perennial, and how and when they reproduce:

  – Paterson's Curse (Echium plantagineum L.) is an annual weed, germinating and setting seed within one year.

  – Prickly Lettuce (Lactuca serriola L.) is an example of a biennial weed, germinating and establishing in the first year, and setting seed in the second year.

  – Sorrel is an example of a perennial weed that can reproduce by seed production but also by vegetative reproduction from shoots on lateral roots.

- How do weeds affect the enterprise? For example, Paterson's Curse can be a problem plant within a pasture system, competing effectively with other more productive species and can be toxic to livestock, but is generally not a problem weed in a cropping system because it can be managed through timely cultivation and appropriate agronomy. However, annual ryegrass is generally not considered a weed in a pasture but it competes vigorously with crop plants.

- How are weeds spread (e.g. via livestock grazing weeds when seeds have formed, wind, seed bed that lays dormant until soil becomes exposed)?

- What conditions do weeds thrive on (e.g. fireweed will take over a pasture that has been heavily overgrazed, exposed soil following cultivation, poor fertile soils)?

Activity 19

In activity 18, you identified the weed species on your property. From that list you are now required to select the undesirable species that require control. Conduct your own research and in the following table, identify the characteristics of each weed to enable the best control method to be determined. There are a number of on-line publications that you will be able to find to assist you with this exercise (e.g. www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/tropical-soda-apple). You can also talk to local weed control officers (e.g. council, catchment management, DPI, parks and wildlife, contractors), extension officers and land care groups.

Weed Species	Annual, Biennial or Perennial	How are Weeds Spread	Acceptable Conditions Weed Thrives On Threshold Limit

Once you have a good understanding of the weed's characteristics, you can consider the various management strategies that are allowable under the Standard. Set yourself realistic goals and focus on reducing weeds to acceptable levels rather than eradicating weeds. Often, more than one strategy is required on a continuous basis. It may take weeks, months or years to achieve your goal depending upon the extent of the weed problem and the weeds responsiveness to the control techniques you implement.

Some weed control practices/techniques to consider include:

- Grazing animals
- Slashing
- Manual removal
- Cultivation
- Crop rotation
- Increasing biodiversity
- Biological control agents
- Quarantine
- Hygiene
- Heat
- Mowing/mulching
- Organic herbicides.

The following links/publications provide further information on organic weed management techniques:

➤ Department of Primary Industries Victoria; "Organic Farming – Weed Management"; Australia; 2012.

www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/weed-management

WEB

➤ SARE; "Steel in the Field – A Farmer's Guide to Weed Management Tools"; USA; 2001.

www.sare.org/Learning-Center/Books/Steel-in-the-Field

WEB

www.sare.org/content/search?SubTreeArray=2%2C2003%2C4528&SearchText=organic+weed+management&x=31&y=8

➤ Department of Primary Industries NSW; "Organic Vegetable Production – Managing Weeds, Insect Pests and Diseases"; Australia; 2010.

www.dpi.nsw.gov.au/__data/assets/pdf_file/0008/353348/Organic-vegetable-production-managing-weeds-insect-pests-and-diseases.pdf

WEB

Activity 20

Conduct your own research and identify the weed control techniques (including any inputs) that are appropriate to your enterprise, when you will implement them, how you will monitor the effectiveness of the program and whether the techniques/inputs are allowable under the Standard.

Weed Species	Control Strategies (include Inputs)	When	Monitoring Program	Allowable Under the Standard?

The use of pesticides and other 'treat-the-symptoms' approaches are unsustainable and should be the last rather than the first line of defence

13 DEVELOP AND DESIGN AN INTEGRATED PEST AND DISEASE MANAGEMENT SUB-PLAN

- Pests and diseases and their life cycles are observed and monitored and evaluated as indicators of farming system health.
- Evidence of pest and disease burden in farming system is collected, documented and evaluated for management.
- Options for addressing pest and disease issues, including improving soil health, are identified.
- Appropriate inputs are identified according to the National Standard for Organic and Biodynamic Produce.

By developing robust farming systems based on healthy, living soils, organic farmers aim to optimise the resistance of crops and animals to pest and disease attack. Where a need can be demonstrated, organically approved pesticides and veterinary medicines may be used. For organic production, prevention is always better than the cure. The challenge for organic farmers is to reduce pest and disease problems by taking a holistic approach to designing better farming systems that rely more upon built-in regulation of disease and pest organisms.

"The use of pesticides and other 'treat-the-symptoms' approaches are unsustainable and should be the last rather than the first line of defence".

➤ Lewis WJ, et al. (1997) A Total System Approach to Sustainable Pest Management. Proceedings of the National Academy of Science. 94, p 12243–12248.

WEB **www.pnas.org/content/94/23/12243.full.pdf**

Collecting evidence of pest and disease burden in the farming system is the first step to identifying whether a problem exists or not. Not all pests and diseases require control. Many organisms are harmless, and some are beneficial. For example:

- Livestock can build immunity and resistance to some pests and diseases, decreasing reliance on expensive treatments.
- Livestock that do not respond well to exposure to pests and diseases can be culled from the herd. This approach will ultimately result in a genetically robust herd suited to local conditions.
- Beneficial insects can control populations of less desirable pests and diseases.

Monitoring and identifying pests and diseases accurately will enable you to make appropriate control decisions that can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that treatments will be used when they are not really needed or that the wrong kind of treatment will be used.

Before taking any pest and disease control action, set an action threshold, which is a point at which pest populations or environmental conditions indicate pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will become an economic or environmental threat is critical for guiding future pest control decisions.

"One objective of organic pest and disease management is to develop 'balanced' systems that do not require high levels of farmer intervention. Pests are often maintained in balance with their natural enemies – the farmer's objective is to have that balance in the farmer's favor. Maintaining a balance is a more rational approach than trying to eradicate all pests which is an impossible task. It is important to remember that because rational pest management usually involves a balance between pests and their natural enemies, pests will be present. You will need to learn to live with them"

Diseases differ from pests (in our perception at least), in that they are often more difficult to control once established, and under the right conditions have a high capacity to spread and cause damage. Disease management therefore usually aims for prevention or eradication rather than a 'balance', although in reality a balance is what is usually achieved.

➤ Department of Primary Industries Victoria; "Organic management of crop and livestock health"; Australia; 2012.

www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/introduction-to-organics/organic-management-of-crop-and-livestock

Activity 21

Within the context of your production system, identify the prevalent pests and diseases and update the following table.

Pest or Disease	Beneficial Aspects?	Potential Risks/Impacts?	What is Your Acceptable Pest/Disease Limit?

Knowing when an action threshold has been breached thus initiating the control action is just one of the decisions to be made when treating pests and diseases.

Applying the control at the right time ensures a more effective and efficient control. For instance, treating pests and diseases during the early stages of development is usually far more effective than treating at more mature stages, when significantly more damage has occurred and the pest or disease is potentially more aggressive.

This means that you must understand pest and disease lifecycles to be able to develop and implement an effective management program.

This is demonstrated in the following extract where a program was developed to control Western Flower Thrips at a hydroponic cucumber and tomato farm in South Australia. The program was based on understanding acceptable threshold limits and the lifecycle of the pest being managed.

➤ South Australian Research and Development Corporation; "Case 2; National IPM Newsletter Issue 01; P6.

WEB

www.sardi.sa.gov.au/__data/assets/pdf_file/0004/93631/IPM_Case_histories_-1.pdf

Regular monitoring enabled the manager and his staff to identify pest and disease problems earlier and with more confidence. They were then able to either treat or remove affected plants.

As a result of the monitored spray program:

- Thrips were easily kept at low levels. When numbers abruptly increased, a sample was sent to check for Western Flower Thrips (WFT) to see if spraying was required. Since there was only a very small number of WFT, spray applications were not increased and thrip numbers soon dropped again. The increase was mostly made up of plague thrips, probably flying in through the roof vents. They were easy to control without a heavy spray program.
- A whitefly explosion was stopped by a spray program that removed all stages of the lifecycle over a period of two weeks. Treatments were selected (Applaud and botanical oils) and application rates and volumes were discussed to get the best possible result. The undersides of plant leaves at various growth stages were checked with the help of a hand lens after each spray to assess what was happening to the numbers of adults, pupae and eggs. This resulted in three spray applications, the last being a botanical oil, and the clean up was very effective.

There are a number of environmental and cultural factors that predispose plants to attack by pests and diseases. Understanding these and how they apply to your enterprise is critical when commencing a pest and disease management program.

While you cannot change a pest's basic character, you can adjust management practices to decrease a crop's vulnerability. Understanding what makes a crop susceptible to pest attack is critical to devising management strategies that reduce crop losses, pesticide use and associated costs.

Monoculture plantings are more susceptible to pest pressure than mixed stands. Disease-causing organisms and plant-feeding insects are less likely to bother crops that grow amid other types of plants. Not only does a pest find it more difficult to locate its preferred host in a mixture, but the pest's natural enemies are often more abundant or effective.

Plants under stress from drought, a lack of nutrients, soil compaction, or other factors are more vulnerable to pests such as aphids. Practices that promote the growth of healthy plants – ones that are able to better compete with pests or protect against them – are key to minimising pest problems on the farm.

Once you have identified prevalent pests and diseases and understand their lifecycles and conditions where they thrive, you need to be able to monitor the extent of the burden so that you know when to act. The level of monitoring that you undertake will be dependent upon your particular set of circumstances, but may include:

- Regular observations by walking through crops/ moving livestock.
- Targeted monitoring using devices such as sticky traps for insects, plant tissue testing, worm testing livestock etc.

The following extracts provide some examples of how pest and disease burden can be monitored to inform producers as to when controls might be required:

➤ South Australian Research and Development Institute (SARDI); "Crop Monitoring Program"; South Australia.

WEB

www.sardi.sa.gov.au/pestsdiseases/horticulture/horticultural_pests/integrated_pest_management/resources/crop_monitoring_program

Effective pest management depends on identifying changes in pest (and beneficial) insect activity in and around the crop in time to keep damage levels low. Crop monitoring is the only way to gather information and determine the best response to changes in insect levels, including the option of NOT spraying. It is the backbone of reliable crop protection whether using chemical or non-chemical strategies. A good crop monitoring walk should identify:

- The presence or absence and levels of non-flying juvenile stages (eggs, larvae, pupae).
- The presence/absence and levels of non-flying adult insects (mites, snails etc.).
- The early stages and extent of pest/disease damage.

Activity 22

In activity 21, you identified prevalent Pests and Diseases (P&D) that affect your enterprise. For the pests and diseases you identified conduct your own research and provide the following information:

- What are the lifecycle stages for each pest and disease?
- What are the environmental and cultural factors that predispose plants/animals to attack?
- What is the most appropriate time to apply management controls?

Update the first 5 columns of the table in the activity 23 with your results.

So far you have gradually built your knowledge of pests and diseases that impact your enterprise. Now you need to determine what actions you need to apply.

Integrated pest and disease management (IPM) combines appropriate organically-acceptable techniques into strategies that protect plant and animal health cost-effectively with minimal negative impact.

Take some time to review the following resources/ links to get an overall understanding of IPM concepts and strategies:

➤ Altieri MA, Nicholls CI, Fritz MA (2005) Manage Insects on Your Farm – A Guide to Ecological Strategies. Handbook Series Book 7. Beltsville MD, USA: Sustainable Agric. Network.

www.sare.org/Learning-Center/Books/Manage-Insects-on-Your-Farm

WEB

➤ Sustainable Agriculture Network "A Whole Farm Approach to Managing Pests"; United States.

www.sare.org/Learning-Center/Bulletins

WEB

➤ Mike Raupp; The University of Maryland Extension; "Integrated Pest Management (IPM) Basics"; You Tube; USA; 2011.

www.youtube.com/watch?v=GqjJg6KGOe4

➤ Department of Primary Industries NSW; "Macadamia Culture in NSW – Primefact 5"; Australia, 2005; p6.

WEB

www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/75740/Macadamia-culture-in-NSW-Primefact-5---final.pdf

➤ Department of Primary Industries, Parks, Water and Environment – Tasmania; "Organic Management of Organic Apples – Integrated Pest Management Poster (IPM)"; Tasmania; 2012.

www.dpiw.tas.gov.au/inter.nsf/WebPages/CART-82L4FW?open

WEB

➤ Department of Primary Industries NSW; "Lettuce Integrated Pest Management"; , Yanco Agricultural Institute; INT11/52271; 2011.

www.dpi.nsw.gov.au/__data/assets/pdf_file/0011/57746/Lettuce-integrated-pest-management.pdf

Finding the right control methods within an organic enterprise requires careful consideration. The following list provides some examples of these. These have been summarised from the following publication. It is suggested that you go to this website and read the text in full:

➤ Department of Primary Industries Victoria; "Organic Management of Crop and Livestock Health"; Australia; 2012.

www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/introduction-to-organics/organic-management-of-crop-and-livestock

P&D Management Technique	Description
Quarantine and hygiene	Simple techniques like restricting vehicle access and plant, animal and soil movement onto farms; isolating new livestock for a period before mixing them with existing stock; destroying infected plant material and culling weak livestock where necessary; and equipment wash-down after off-farm use, can help avoid P&D introductions or limit their spread.
Stress management	Avoiding or minimising stress allows plants and animals to develop their full level of resistance and resilience naturally and lessens the need for farmer intervention against P&D.
Biological control	Examples of biological control include: reducing pasture levels of sheep internal parasites through dung beetle activity; suppressing citrus red scale with parasitic wasps; and controlling pest mites with predatory mites on greenhouse crops.

P&D management for plants	
Cultural control	Cultural control involves thoughtful design and management of a farm's physical and biological environment to make it less suitable for undesirable species while encouraging the diversity and population levels of beneficial species. Some common practices relevant to both crops and livestock are; soil improvement, resistant breeds and varieties, cultivation, crop rotation/ break crops.
Post-harvest control	For some fruit crops, post-harvest treatments such as washing and brushing can remove light to moderate infestations of pests.

Cultural control	Manual P&D removal: Some organic producers manually remove diseased plants and infestations of pests to reduce the P&D pressure on the crop. Bio fumigation: Some plants like mustards (Brassica) release compounds into the soil that suppress certain soil-borne diseases and pests. The compounds are released when the plants are turned in to decompose. These plants can be used as 'bio fumigant' crops to reduce P&D pressure in a field prior to growing a susceptible crop. Environment management: Wind reduction, dust minimisation, irrigation type, water management, nutrition, habitat management, larger predators. Mating disruption: The females of many insect pests release sex pheromones to attract males for mating. In 'mating disruption', comparatively huge amounts of pheromone are released to confuse the males and reduce their chance of meeting and mating with a female. Solarisation: Kills P&D organisms in the soil by trapping solar heat under a clear plastic sheet. It only works during hot weather, and takes several weeks to be effective. This technique is indiscriminate and will kill beneficial soil organisms as well as P&D organisms so should be used with caution.
Pesticides	A range of organically-acceptable pesticides and fungicides is available to assist organic farmers in pest management. Where possible, you should avoid spraying the whole crop at one time and spot-spray just the affected areas.

P&D management for animals	
Organic P&D management in livestock focuses on maintaining a high level of animal fitness and health through care with breed selection, diet, stocking rate, stress management and use of husbandry practices appropriate to the needs of each species. This will help to enhance the animals' natural immune system and resistance to P&D attack. Good observation and record keeping are also critical as they allow the organic farmer to detect, trace and address causes of animal health problems, including environmental issues, nutrition, bloodlines etc.	
Cultural control	Grazing rotation, resting pasture, mixed grazing, pasture composition, herbal pastures, stocking rates, strategic grazing, shelter.
Organic veterinary medicines	Australia's National Standard for Organic and Biodynamic Produce accepts a wide range of materials as organic treatments for animal P&D management. These include plant extracts, essential oils, various minerals, salts, seaweed extracts, vinegar, vitamins and trace elements. Vaccines are permitted on a very restricted basis. A real need has to be shown, such as presence of a disease with no other suitable treatment options, and the vaccines must not contain genetically modified organisms (GMO) or GMO by-products.
Conventional veterinary treatment	In the case of a serious health issue where no suitable organic treatments are available, conventional treatments must be used. An animal's welfare takes priority over its organic status. Animals treated with conventional medicines can never be sold as 'organic' or 'biodynamic'. They must be clearly identifiable from the remaining organic stock and be quarantined from that stock for three times the legal withholding period for the medicine. For this purpose, livestock farms require a quarantine paddock to isolate the treated stock. This area cannot be used for organic cropping until 12 months after the quarantine period ends.

Activity 23

Activity 22 required you to complete columns 1-5. It is now time to bring all of the pest and disease information together and identify the actions (preventative and control) that you will apply to manage pests and diseases within your enterprise. Please specify any inputs that you will use and whether these are allowable under the Standard. Complete the remaining columns of this table (6-8)

1. P&D Identification	2. Acceptable Threshold Limit	3. Lifecycle	4. Environmental and Cultural Factors that Predispose Plants/Animals to Attack	5. Optimum Time to Apply Controls	6. Preventative Measures (Include Inputs)	7. Control Measures (Include Inputs)	8. Allowable Under the Standard? Y/N

Activity 24

Please update Section 5A-5D of the **Organic Farm Plan**. Review the entire OMP and update any other sections that require pest and disease related information.

14 DEVELOP ANIMAL HEALTH SUB-PLAN

Regional and farm-based animal health issues are identified.

Options for preventative actions aimed at establishing and maintaining optimal animal health are identified.

Options for treating animal health issues are identified.

Sub-plan is documented according to established format.

In this section, you need to focus on specific health issues that may affect organically grown livestock. Organic management requires an in depth understanding these issues, the likelihood of their incidence and then how to prevent these from occurring. The underlying principle of organic animal production is that: 'healthy animals grow from healthy plants, and healthy plants grow from healthy soil'.

The Standard identifies the following principles of organic livestock production:

➤ BFA; "Australian Certified Organic Standard 2010 Version 1.0"; Australia; Section 5.

WEB

www.bfa.com.au

Livestock may contribute to the organic farming system in the following ways:

- Improving and maintaining the fertility of the soil
- Controlling weeds through well managed grazing.
- Diversifying the biology and interactions of the farm.

Organic production of livestock entails adherence to the following principles of livestock welfare:

- Livestock are able to perform all natural social and physical functions relevant to their species and breed.
- Livestock are afforded a quality of life and access to healthy diet and conditions so as to produce quality animal products.
- Livestock are grown or their by-products produced, in a way which conforms with natural processes of growth and development, rather than being force fed or growth induced by unnatural methods.
- Breed types are selected which are appropriate for the region and type of production system so as to achieve the principles listed above, including maintaining optimal environmental conditions with minimal impact.
- Breeding systems are based on breeds that can reproduce successfully under natural conditions without human involvement.

Animal welfare is of paramount importance in an organic livestock enterprise. Farming systems should meet the needs of the natural behaviors of animals and animal welfare codes of practice should be followed at all times.

Relevant codes of conduct are available from the DAFF website below:

WEB

www.daff.gov.au/animal-plant-health/welfare/model_code_of_practice_for_the_welfare_of_animals

It should be noted that Animal Health Australia has been commissioned by the Federal Government (DAFF) to review and standardise the various codes of practice that currently exist. The following webpage will inform you of progress relevant to your enterprise:

www.animalwelfarestandards.net.au/

WEB

The following extract has been compiled to demonstrate the requirements that would need to be considered when planning for an organic beef production system. You will need to conduct your own research to identify the requirements that apply to your livestock.

➤ Source: Department of Agriculture Western Australia; "Organic Beef, A Production Guide"; Australia; BULLETIN 4518 ISSN 1326-415X; January 2002; p7-9.

WEB **www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/introduction-to-organics/information-resources-for-organic-farming**

- Feeding should be suited to the animal's physiology. Ruminants require a high proportion of forage in their diet so their digestive systems can function naturally. The preferred method of nourishing organic livestock is by 'free choice' feeding, where animals are free to select from a wide variety of foods natural to their diet.
- Maintenance of livestock must be guided by an attitude of care, responsibility and respect. It is believed that the health and vitality of an animal largely depends on the way in which an animal is kept. Stress is seen as a contributing factor to development of disease, and distressed animals are reportedly less able to adjust to change.
- It is important to remember that cattle were originally woodland animals. Their natural habitat was woodland clearings and grassland at the edge of woodlands, so consideration must be given to their natural behavioral patterns. Living conditions should fulfill the natural needs of the animal for free movement, food, water, shelter and shade. Shelterbelts can be useful in providing protection from excessive sunlight, temperature, wind, rain and other climatic extremes.
- Mutilation such as castration and dehorning is only carried out where benefits outweigh the consequences of non-treatment, and there are no other acceptable options. Stress, injury and pain inflicted by these treatments must be kept to a minimum.
- Organic animal health aims to build immunity and develop resistance to disease, infection, parasitic attack and metabolic disorders through good management. This means practicing preventative healthcare, providing sound nutrition, and ensuring good breeding and selection.
- The cause of any disorder needs to be corrected, rather than simply treating the symptoms. Sound nutrition can be achieved through correct soil fertility and through diversity in the diet, which in turn provides balanced mineral and dietary input.
- Dietary intake should be based on balanced quality forage, and not reliance on supplements or concentrates. Feedlotting is generally considered unnatural – especially for ruminants. Some organic producers consider grain-fed organic beef to be contradictory to organic principles. Organic standards prohibit highly intensive feedlot production.
- Livestock should be bred using the natural method of sires. Artificial insemination is not recommended, although it may be permitted in some cases. Embryo transfer, genetic engineering and routine use of reproductive hormones or synchronising drugs are not permitted in organic farming.
- To give animals natural immunity against infection, calves should be reared by their mother. Suckling or bucket-rearing on organic whole milk for a minimum period after birth can be required in organic standards.

Activity 25

Conduct your own research and identify the natural behaviors of your livestock and the requirements of relevant animal welfare codes of practice that you will need to consider when planning your organic livestock production. Identify these in the following table and please remember to include reference sources. Complete an honest appraisal of whether you currently meet these requirements and briefly explain your response. For areas of non-compliance, identify how you will resolve the issue.

Requirement	Source	Do you currently meet this requirement (Y/N)? Briefly explain your response.	If you do not meet this requirement, what actions will you take to ensure compliance?

Managing organic livestock production requires an understanding of how to build livestock immunity and develop resistance to disease, infection, parasitic attack and metabolic disorders through good management. This means practicing:

- Preventative healthcare
- Providing sound nutrition and
- Ensuring good breeding and selection.

Preventative health programs require organic livestock producers to:

- Have a thorough understanding of the pests, diseases and other health issues that may affect your livestock/ region and their causes.
- How to prevent them from occurring, as allowed by the Standard.
- How to treat them if they do occur, as allowed by the Standard.

Understanding the regional and farm-based animal health issues that may affect your livestock is the first step in this process and it requires some dedicated research. Potential sources of information that may be of use include:

- Reviewing on-farm records that identify the incidence of pests, disease and other health issues.
- Sourcing publications that identify health issues specific to your region.
- Talking to local advisors including; vets, stock and station agents, Department of Primary Industry (DPI) and livestock associations (e.g. LHPA, MLA).
- Discussions with other producers in your area.

Some examples of these information sources are provided below to get you thinking about what might be available to you:

Regional newsletters reporting incidence of disease

www.lhpa.org.au/districts/northcoast

Beef Cattle Health publication

www.lhpa.org.au/__data/assets/pdf_file/0018/430515/NCLHPA-Beef-Cattle-Book.pdf

Australian Animal Welfare Standards and Guidelines

www.animalwelfarestandards.net.au/

Model codes of practice for animal welfare

www.publish.csiro.au/nid/22/sid/11.htm

Health management of poultry

www.poultryhub.org/health/health-management/

Links to resources for poultry management

www.agric.wa.gov.au/PC_91836.html

Activity 26

Conduct your own research and identify the health issues that are prevalent to your enterprise and then complete the following table.

- Identify if this health issue has been present on-farm historically, if it is a regional health issue of concern or both.
- Identify the impact that this health issue has/could have on your production system
- Based on the assessment of impact, what is your risk assessment of this health issue – extreme, high, medium, low.
- Source of information.

Health Issue	Historical (H) or of Regional Significance (R) or both (HR)	Describe the impact of this issue on your production system (actual or potential)	Risk Assessment (Extreme, High, Medium, Low)	Source of Information

Options for preventative actions aimed at establishing and maintaining optimal animal health are identified.

Once you have identified potential health issues, you can now work out a management plan that will work towards the prevention of these issues from occurring. Remember that your prevention program should be based on good management practices and comply with the Standard.

The following extracts provide some examples of preventative strategies:

Breed Selection and Culling Program

A rigorous and ongoing culling program for susceptible and weak animals is very important to improve genetic traits related to pest and disease resistance.

Selecting the right breed of livestock for your climate and your enterprise requirements is one of the most important decisions you will make. If you can select animals that tolerate your climate, will perform well on the feed you are able to provide and are resistant to parasites that are prevalent in your area, then you are already on your way to successful organic farming.

➤ North Coast LHPA; "Beef Cattle Health for the North and Mid Coast of NSW"; Version 4; Australia; 2012; p47.

www.lhpa.org.au/__data/assets/pdf_file/0018/430515/NCLHPA-Beef-Cattle-Book.pdf

Nutrition

Like humans, animals require food and water in sufficient quantity and quality. Nutritional needs of animals need to be matched to their growth stage (e.g. young, mature, pregnant, lactating), if they are to remain healthy and develop a good immune system to fight P&D's naturally. As an organic producer, you need to proactively match the nutritional requirements of the animal with available feed (quantity and quality) in order to maintain healthy, disease resistant livestock. You will need to conduct your own research to determine the nutritional requirements of your livestock.

➤ Department of Agriculture Western Australia; "Organic Beef, A Production Guide"; Australia; BULLETIN 4518 ISSN 1326-415X; January 2002; p14-21.

www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/introduction-to-organics/information-resources-for-organic-farming

Stress Free Environment

As with humans, animals can be susceptible to disease when stressed. Providing a stress free environment that provides for the natural behaviors of animals is another preventative health strategy that organic farmers use to reduce the incidence of disease.

Permitted Treatments

A range of treatments including herbs, vitamins and minerals, homoeopathy, acupuncture and dietary additives are used by organic producers. However, routine use of such treatments should not be used to mask poor preventative management.

Vaccines

Organic standards classify the use of vaccines as 'restricted'. This means that their routine use is discouraged and is only permitted when it can be demonstrated by the organic farmer that a specific disease is endemic in the region or on the organic farm, or where their use is required by law, or in proven cases, where such a disease cannot be effectively controlled by other management practices.

Organic certifiers require written verification from a veterinarian to confirm the presence or threat of disease infection prior to approving the application of the treatment. In addition, the vaccines must not contain genetically modified ingredients or by-products.

The use of vaccines under these circumstances will not prejudice certification and does not require quarantine procedures. Full records of all treatments must be kept.

➤ Department of Primary Industries NSW; "Use of vaccinations and other veterinary treatments in organic livestock farming"; Australia; 2008.

www.dpi.nsw.gov.au/__data/assets/pdf_file/0013/213601/Use-of-vaccinations-in-organic-farming.pdf

Activity 27

In the previous activities, you identified animal health and welfare requirements and potential pest and disease risks that require preventative actions. It is now time to identify what strategies (e.g. management practices) you will implement to promote animal health and welfare and prevent health issues from occurring. Please update the following table with these strategies.

Strategies	What will this strategy address?	Where using inputs, are such inputs allowed by the Standard?	How will these be communicated to others on the farm and implemented?	Reference

Animals given prohibited treatments must be identified and quarantined from organic land.

Options for treating animal health issues are identified.

If permissible treatment for an animal has failed, the animal must be treated by any appropriate means to ensure there is no unnecessary suffering for the animal.

These livestock will effectively become de-certified meaning that these livestock and their products cannot be marketed or sold as organic.

Animals given prohibited treatments must be identified and quarantined from organic land and animals for at least three times the withholding period of the treatment or 3 weeks, whichever is longer. Their offspring can be sold as organic, providing the non-permitted treatment was given prior to the last trimester of pregnancy.

Therefore, organic livestock producers should plan for the eventuality that a quarantine area will be required. This needs to be identified and marked on your farm map for certification purposes.

Take some time to read section 5.1.1 – 5.1.15 of the Standard to gain an understanding of stock treatment rules, prohibited/restricted substances and quarantine requirements, before completing the following activity.

The following factsheet from NSW DPI provides a good overview of the use of vaccinations and other veterinary treatments in organic livestock farming:

➤ Department of Primary Industries NSW; "Use of vaccinations and other veterinary treatments in organic livestock farming"; Australia; 2008.

www.dpi.nsw.gov.au/__data/assets/pdf_file/0013/213601/Use-of-vaccinations-in-organic-farming.pdf

WEB

Activity 28

Please outline how you will quarantine incoming livestock as well as any livestock required to be treated with prohibited inputs which removes them from the certification program?

Please review your farm map and ensure that it clearly identifies your quarantine area.

Activity 29

You are now required to document your animal health sub-plan. Use the template recommended by your CO or use **Livestock Management Plan** which is the ACO Livestock Management Plan template.

Please note, you do NOT need to complete any sections that are duplicated in the Organic Farm Plan.

15 DEVELOP A CONTAMINATION RISK MANAGEMENT SUB-PLAN

Sub-plan is documented according to established format.

Contamination of a certified organic property with inputs/materials that are not allowed under the Standard, can result in suspension of the certification and/or recall of affected produce from the marketplace.

This is a serious occurrence with significant negative implications (financial, reputation, viability of the business) for producers who have spent considerable time and money to achieve product price premiums for organically certified produce.

For this reason, contamination risks need to be analysed and a risk management plan developed to prevent and manage these risks.

Organic farming aims for a closed system where most inputs are produced on farm but this is not always possible or practical. Consider "typical" off-farm inputs that you receive onto your property and how you will manage potential contamination:

- Seedlings
- Soil mix/growth media
- Compost and manures
- Fertilisers, foliar sprays, water system additives, pest and disease inputs
- Livestock
- Livestock feed
- Machinery
- People (contractors, staff, visitors)
- Adjacent land use
- Genetically Modified Organisms (GMOs)

Activity 30

Take some time to read Section 4.8 of the Standard which identifies potential contamination risks that primary producers need to manage.

Conduct an honest 'preliminary' appraisal of your existing farm practices and inputs (on-farm and off-farm) and identify procedures/inputs that do not comply with the Standard in the following table.

Current practices and inputs that do NOT comply with the Standard	Changes required to comply with the Standard

The following extracts provide further insights into contamination risks and how to develop a risk management plan. It is suggested that you read the following extract in full:

➤ Department of Primary Industries Victoria; "Organic Farming: Risk Management Planning for Contamination Risks"; Note Number: AG1153; Australia; 2010.

WEB

www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/managing-contamination-on-organic-farms/risk-management-contamination-risks

Risk management planning can be applied to any type of risk and any type of enterprise. It involves a series of steps through which risks to the enterprise are identified, analysed and treated, then monitored to determine the effectiveness of the treatment. Developing a contamination risk management plan should not be difficult for most producers, and will provide some peace of mind that potential risks to the organic enterprise have been addressed appropriately.

The following extract provides an example of how buffer zones can be implemented to minimise the risk of contamination:

➤ Department of Primary Industries Victoria; "Organic Viticulture – Part 12 Contamination Risks"; Australia; 2012.

WEB

www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/organic-viticulture/organic-viticulture-manual/contamination-risks

Activity 31

In the following table identify:

- The contamination risks that need to be managed within your enterprise.
- Risk assessment (insignificant, minor, moderate, major, catastrophic).
- The actions you will implement to prevent the risk from being realised.
- The controls that you will implement if the risk does occur.

Tip: Use the table in the following webpage to work out the risk assessment rating:

www.dpi.vic.gov.au/agriculture/farming-management/organic-farming/managing-contamination-on-organic-farms/risk-management-contamination-risks

Contamination Risk	Risk Assessment	Preventative Actions	Control Actions

Please update Section 5E and 6A, 6C, D, E and F of the **Organic Farm Plan**. Review the entire OMP and update any other sections that require contamination related information.

WEB

16 INTEGRATE AND FINALISE THE ORGANIC MANAGEMENT PLAN

Record-keeping system is developed and implemented to track various components of OMP as they are put into practice and reviewed.

Sub-plans for soil fertility and management, and weed, pest, disease and animal health are integrated.

OMP is reviewed and updated annually.

As an organic producer, you must keep adequate records to demonstrate that your production system complies with the Standard. These records will be subject to formal audits by your CO. This means that you must have the necessary templates and processes in place to gather and record the required data. Paper work can be an onerous exercise if you fail to collect information at the right time (i.e. don't leave it until your audit!). Data collection is best conducted as the events occur (e.g. if applying treatments to paddocks, record the details on the approved template in the shed as you are preparing the treatments or after cleaning down the machinery).

The Standard requires the following to be recorded at a minimum:

- Production unit map/facilities layout.
- Organic management plan (and sub-plans).
- Production activity records that trace the arrival, storage, disposal of all products and any modifications made to products.
- Product traceability (throughout the supply chain) to ensure product recall can be effected if required. For example, NLIS tags for cattle.
- Transaction certificate.
- Corrective action records (CARs).

Your CO of choice will be able to provide a suite of templates to assist you conform to the requirements of the Standard. Listed below are a selection of some of the record sheets and templates from the Biological Farming Association website:

- Paddock Preparation
- Spray Diary
- Crop Monitoring
- Stock Treatments
- Livestock Purchase and sales
- Livestock Feed Records
- Livestock Inventory
- Inputs and Chemical Inventory
- Harvest Record
- Packing Record
- Transport Declaration
- Delivery Notification
- Contractor Declaration
- Neighbor Notification Letter

Activity 32

Read section 3.4 and 3.5 of the Standard and the requirements of your preferred CO (if applicable) and in the following table, identify the records that you must keep, the process to record data, how often data is updated, who is responsible, where records are kept (e.g. hard copy in folder or electronic copy file name) and how long records are kept. You should now update Section 7 of the Organic Farm Plan with this information.

Records / Documents Required	Process of Recording	Frequency of Recording/ Updating Records	Person Responsible	Where are Records Kept	How Long are Records Kept

16.1 Sub-plans are integrated and the OMP is reviewed and updated annually

In practice, organic management takes into consideration the whole farming system. You must be able to demonstrate and verify that a system is in place and operating in compliance with organic standards.

This typically includes crop rotation, strategies to maintain soil fertility, control weeds, pests and disease, as well as water management and buffer zones.

Throughout this workbook you have completed a number of activities and developed a number of plans to satisfy these requirements. These need to be integrated into a holistic organic management plan. It is up to you to decide how best to achieve this; using your own templates or those provided by your CO.

Once you have developed an OMP that meets your needs and the needs of your CO, it should become a living document that is updated at least annually. Maintain version control so that you can keep track of the status of your OMP (e.g. save your document with a new version number and date every time you update it) to assist you with this requirement.

Activity 33

This is the last activity for the unit and requires you to complete a final review and ensure all applicable sections of the **Organic Farm Plan** and the **Livestock Management Plan** are completed. Once you are happy with your work and believe that your Organic Management Plan is complete, you should submit it to your lecturer. If the plan has been thoroughly completed it should also be ready to submit to your Certifying Organisation. Good Luck with achieving your Organic Certification.

17 SUMMARY OF KEY INNOVATIONS/ OPPORTUNITIES IDENTIFIED AS A RESULT OF ADOPTING THESE SKILLS

The adoption of new opportunities and key innovations should always be considered from the perspective of the triple bottom line. However each producer will need to determine:

- What are the most important aspects of each opportunity and innovation?
- How can a new innovation or opportunity be sustainably applied to your business or production system?

The summary below is provided as a list of suggestions. It is by no means complete. It is also unrealistic to assume any single business can adopt every opportunity.

- Improve understanding of organic standards and how they apply to your production system.
- Improve understanding of the activities, risks, costs and benefits of converting to organic production.
- Develop good record keeping systems to monitor compliance with organic standards.
- Commence the process of preparing for organic certification.
- Develop a sound understanding of the current environment and how best to convert this environment to future, organic production practices.
- Determine whether organic production is viable for your set of circumstances.

18 BIBLIOGRAPHY AND SOURCE MATERIAL

Organisation	Standard Legislation	Contact Details	Web Site	Reason for Inclusion
Aus-Qual		Phone 1800 630 890 www.ausqual.com.au	www.ausqual.com.au	CO: Based in Brisbane, is a wholly owned subsidiary of Aus-Meat Ltd., the Australian meat industry standards watchdog. Also offers certification in agricultural, horticultural and secondary processing sectors.
Australian Certified Organic		Phone (07) 3350 5716 www.aco.net.au and www.oga.org.au	www.australianorganic.com.au	CO: Based in Brisbane, has two subsidiary certification streams of BFA – Australian Certified Organic and a smaller grower program called Organic Growers of Australia.
Biological Farmers of Australia (BFA	Organic Standard	www.bfa.com.au/ContactUs.aspx	www.bfa.com.au	Australian Certified Organic Standard 2010 – Version 1.0, fact sheets, farmers forums, publications, training courses, workshops and more.
Bio-Dynamic Research Institute		Phone (03) 5966 7333 www.demeter.org.au	www.demeter.org.au	CO: The BDRI, based at Powelltown, certifies for biodynamic and applies the Demeter Australia label.
Department of Agriculture Fisheries and Forestry (AQIS)		www.daff.gov.au/aqis/about/contact/aco	www.daff.gov.au/aqis/about/contact/aco	Regulator of the Standard and Cos.
Department of Agriculture and Food Western Australia		www.agric.wa.gov.au/CONTACT.html?s=2076014757	www.agric.wa.gov.au	Organic food and farming web page containing links to: organic management publications and production guides, agencies, organic industry organisations and more.
Department of Agriculture, Fisheries and Forestry – Australian Government		www.soilhealthknowledge.com.au/index.php?option=com_content&view=article&id=2&Itemid=4	www.soilhealthknowledge.com.au/	Soil Health Knowledge Bank – excellent resource for all things 'soil'.
Department of Primary Industries NSW		www.dpi.nsw.gov.au/aboutus/about/contact	www.dpi.nsw.gov.au	Land classification system.Sustainable agriculture in NSW.
Department of Primary Industries, Parks, Water and Environment Tasmania		www.dpipwe.tas.gov.au/inter.nsf/WebPages/MROD-4VMUA5?open#ContactingUs	www.dpipwe.tas.gov.au/inter.nsf/ThemeNodes/LBUN-6EX9PS?open www.dpiw.tas.gov.au/inter.nsf/WebPages/CART-82L4FW?open	Land capability matrix FarmPoint – Business planning tools, templates, methods, tutorials, links and other useful resources Organic management
Department of Primary Industries Victoria		www.dpi.vic.gov.au/about-us/contact-us	www.dpi.vic.gov.au/agriculture/farming-management/organic-farming	Introduction to Organics, The Certification Process, Managing Contamination on Organic Farms, Soil Management, Weed Management, Organic Viticulture, Organic Fruit and Vegetables, Organic Sheep and Lamb, Organic Crops and Pastures, Workshops for organic producers, Support for Organics Grant Program Guidelines, Organic Production Guides.

Organisation	Standard Legislation	Contact Details	Web Site	Reason for Inclusion
IBISWorld		www.ibisworld.com.au/about/contact.aspx	www.ibisworld.com.au/industry/default.aspx?indid=1912	Market research company.
Lewis WJ, et al			www.pnas.org/content/94/23/12243.full.pdf	A total system approach to sustainable pest management. Proceedings of the National Academy of Science.
Meat and Livestock Australian			www.mla.com.au	Fact sheets, industry best practice guidelines, EMS, NLIS, record keeping templates.
National Association for Sustainable Agriculture Australia		Phone (08) 8370 8455 www.nasaa.com.au	www.nasaa.com.au	CO: Based in the Adelaide Hills. NASAA Certified Organic covers seven million hectares and more than 900 licensed operators and offers a small grower program.
Organic Federation of Australia		www.ofa.org.au/pages/Contact-Us.html	www.ofa.org.au	The Organic Federation of Australia (OFA) was established in 1998 as the peak body for the organic industry in Australia.
Organic Food Chain		Phone (07) 4637 2600 www.organicfoodchain.com.au	www.organicfoodchain.com.au	CO: Based near Toowoomba (Qld), offers certification and further assistance with marketing and supply management.
Plant Health Australia		Tel: (02) 6215 7700 or APPD@phau.com.au	www.planthealthaustralia.com.au/go/phau/capacity-and-capability/information-support-systems/appd	The Australian Plant Pest Database (APPD) is a national, online database of pests and diseases of Australia's economically important plants.
RIRDC		www.rirdc.gov.au/publications/forms/contact-us	https://rirdc.infoservices.com.au/collections/org	Organic production manuals and publications.
Safe Food Queensland		Phone 1800 300 815 www.safefood.qld.gov.au	www.safefood.qld.gov.au	CO: Based in Brisbane and deals with the Queensland industry only. Its core business is food safety and, although it is a licensed certifier, organics comes a distant second.
SARE		www.sare.org/Contact-Us	www.sare.org/Learning-Center/SARE-Program-Materials/National-Program-Materials/What-is-Sustainable-Agriculture	Excellent resource site for sustainable agriculture texts, articles, research materials and on-line publications. USA based.
SoilQuality.org.au		http://soilquality.org.au/contact	http://soilquality.org.au/	Using the tools provided on this website you can gain a greater understanding of the health of your soil, compare your data and examine soil relationships.
Tasmanian Organic-Dynamic Producers		Phone (03) 6381 2004 www.tasorganicdynamic.com.au/	www.tasorganicdynamic.com.au	Based at Campbell Town, this body deals with the Tasmanian industry only.
Tuckombil Landcare Inc., NSW Agriculture, the Natural Heritage Trust			www.dpi.nsw.gov.au/__data/assets/pdf_file/0007/168703/northern-rivers-soil-health-card.pdf	Northern Rivers Soil Health Card – A soil management tool developed by farmers for farmers.
Weeds Australia		Telephone: (03) 6344 9657	www.weeds.org.au/	Weed identification site

19 BEING CONFIDENT ABOUT YOUR SKILL LEVELS

Before commencing on your summative assessment take a few minutes to review this workbook and ensure you feel that you are confident about your skill levels related to this topic.

Use the table below to help you check your skills. Before commencing your final assessments it is important to review any sections in which you feel unsure. Remember: it is always OK to ask your assessor/lecturer questions.

In the table below, read the list of skills and knowledge you should have after completing this workbook.

1. Put a tick in the column if you can do this now and a brief comment re why you believe you have this skill.
2. Put a tick in the next column if you feel you need more practice and must review the work before completing final assessments also a brief comment as to why.
3. If you require further training, complete the third column listing what training is needed. Show this list to your supervisor or assessor and ask for more time or training before completing the summative assessments.

Skills/knowledge you should have	Yes	Need Practice	Comment on why	What additional training do I need
Carry out property planning				
Undertake soil assessment				
Interpret the landscape				
Observe cycles, patterns, change and systems dynamics				
Use lateral thinking and a systems approach to develop solutions to problems				
Apply ecological principles to agricultural production				
Complete production planning				
Access industry information				
Monitor the farming system				
Keep records				

Skills/knowledge you should have	Yes	Need Practice	Comment on why	What additional training do I need
Principles of organic agriculture, especially fundamental role of soil health				
Principles of sustainable production				
Requirements and components of an OMP				
Systems approach to agriculture and horticulture				
Organic and biodynamic certification requirements				

20 ASSESSMENT

You have now reached the end of this workbook. All of the information and activities you have covered have developed your skills to competently develop an organic management plan in your workplace.

Your competency may be assessed through your successful completion of all formative activities throughout this workbook. Alternatively, your RTO may require completion of a final summative assessment. You will need to discuss this with your RTO.

FEEDBACK

This workbook has been developed to guide users to access current information related to gaining skills appropriate to their workplace. Please complete the following table notifying us of any errors or suggested improvements.

Subject Name	
Book Number	

Page	What is the error	Suggested improvement
10	You Tube video is not accurate	Better websites / You Tube example

Is there a link to your suggested improvement

Additional comments

Click here to email your feedback form to RST