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COMPOST  
AUSTRALIA



A Division of the WASTE MANAGEMENT ASSOCIATION OF AUSTRALIA

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**RESEARCH &  
DEVELOPMENT  
ACTION PLAN**

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**2008 - 2011**

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Angus Campbell

Johannes Biala

Bob Paulin

Peter O'Malley

Jaya Nair

Katie Webster

Dr Richard Stewart

Ross Ballard

Steven Marshall

Angus Johnston

The Compost Australia Executive and Committee

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# 1 | INTRODUCTION

The Recycled Organics (RO) Industry seeks to build profitable businesses while actively contributing to society by reducing its impact on the environment. This is practical ecologically and economically sustainable development in action. Diverting organic materials from landfill, avoiding the use of mined topsoils, reducing the need for chemical fertilisers, storing carbon in soils, reducing the demand for irrigation water, increasing crop yield, building attractive urban landscapes – this Industry offers all of these benefits and more. It is in the interests of Australian society as a whole to grow the business and practice of organic recycling in Australia.

Compost Australia (CA), a non-profit, member-driven organisation, is the national body for the organics processing and recycling industry. Under its *Advancing the Recycled Organics Industry Proposal*, CA has called upon all stakeholders involved in organics recycling to join the association and make a financial and time commitment to the growth of the RO Industry. This document is one of a series of Action Plans designed to guide the development of the RO Industry over the three year period from July 2008 to June 2011.

## 1.1 Background

In 2003, the *Compost Industry Supply Chain Roadmap: Translating Recycled Organics into Differentiated Products* was developed with the involvement of a large number of stakeholders from the RO industry and the associated Supply Chain. The Roadmap reinforces the importance of communication within the industry and along the Supply Chain, and highlights the need for a more structured and managed approach to communication at all levels. The three core strategies that underpin the Roadmap are:

- Industry to influence
- Marketing
- Education and Research

While the Compost Supply Chain Roadmap identifies the central issues and provides a strategic framework for the industry, it does not provide the detailed actions, resources and timeframes that are essential to achieving the industry's identified vision. Four foundation Action Plans have been developed and documented to guide the implementation of the Roadmap and to support the case for allocation of resources to the organisation. They include a:

- Business Plan (for the Association)
- Communications Plan (including both internal and external stakeholders)
- Market Development Plan (joint market development activities) and
- Research and Development Plan (linked to market development initiatives)

## 1.2 Scope

This document is the Research and Development (R&D) Action Plan for CA and is therefore national in scope. It is designed to guide research and development activities undertaken throughout Australia towards a common outcome, using common strategies and measures of performance. The term R&D is used in a broad sense to include research into practice (elsewhere extension) and building industry capabilities (industry development).



The R&D proposed under this plan is focused on the manufacture and sale of RO products. This specifically includes the collection and treatment of organic wastes, which form the majority of input materials for the RO Industry. It also includes the soil science associated with the application and use of RO products.

R&D activities initiated and funded in whole or part by the RO Industry are guided directly by this plan. Government agencies and other organisations with an interest in expanding organic recycling are encouraged to reference this plan and its associated processes when developing and implementing their own R&D programs.

Compost New Zealand has shown interest in cooperating with CA to deliver a combined Australian and New Zealand R&D program. Consultation and information sharing with the New Zealand RO Industry indicate they have a similar goal, performance targets and target markets.

### **1.3 Consultation**

The RO Industry in cooperation with several state government environment agencies have organised and run a R&D Forum each year from 2005 to 2007. The Forums have involved dedicated researchers, project managers from state government departments and practitioners (from industry). They have worked together to define R&D priorities, share information about existing projects and outline priority R&D projects for future funding applications. This Action Plan draws from the outcome reports and presentations made during those events.

### **1.4 Term of the Plan**

The R&D Plan covers a three year period, however, it will require annual review and adjustment as R&D processes and procedures mature, and in response to changes in funding and resources allocation. State Groups and CA will nominate members to participate in a RO Technical Advisory Panel (see Strategy 3). The RO Technical Advisory Panel deals with R&D issues at a national level and coordinates an annual review of the Action Plan.



## 2 | DIRECTION

The R&D direction of CA and the state working groups is defined by the research outcome sought, selected performance indicators and the national strategies adopted to achieve the outcome.

### 2.1 Outcome

The outcome (or goal) of implementing the R&D Plan is to coordinate research and development activities nationally so that they lead to increased use of RO products at a profit.

### 2.2 Performance Indicators

CA will collect data for use in measuring and reporting the performance of the Action Plans. The key performance indicators as defined by measure and target are:

	MEASURE	TARGET
1	Approved expenditure on R&D projects delivering priority outcomes in priority markets (including expenditure by other organisations)	\$500,000 per year
2	Proportion of members satisfied or very satisfied with the performance of the technical advisory panel	>75%
3	Number of hits on any of the online information services	500 per year
4	Number of people satisfactorily completing an approved industry training course	50 per year
5	Number of personnel hours spent on extension activities nationally (and by state)	5000 hours

### 2.3 National Strategies

1. Focus R&D on priority markets and their identified needs.
2. Facilitate and/or fund R&D projects that:
  - a) Optimise and quantify the public environmental benefits (services) associated with use of specific RO product
  - b) Optimise and quantify the direct economic value (CBA) of using specific RO products
  - c) Develop transport and application techniques designed to meet identified end-user needs
  - d) Develop guidance for end-users (growers) on the integration of RO products into their (farm) management systems
  - e) Improve product standards and testing techniques
3. Set up and maintain a (paid) RO technical advisory panel to review and provide advice on: R&D proposals (methodology and relevance); Regulations and their enforcement; and Certified products and suitability for application.



4. Set up, maintain and promote online systems to catalogue and access publications and product/services information relevant to the RO Industry and its customers.
5. Access relevant international R&D programs and resources to deliver common outcomes.
6. Develop and deliver industry training resources and services in line with the Industry Competency Standard.
7. Collect the information necessary to monitor industry development against key performance indicators and support industry advocacy.



## 3 | CONTEXT

Historically R&D associated with the manufacture and sale of RO has been fragmented. State governments and state focused organisations have initiated and funded relevant R&D, often without a well defined pathway to commercialisation of research. Businesses in the RO industry are largely small-medium in size and cannot afford significant R&D Programs in their own right. These conditions have led to knowledge gaps and the inability to convert research outcomes into commercial products and services.

This section presents the context for R&D activities proposed in this Action Plan, including: a SWOT analysis; a summary of relevant research areas; profiles of R&D capacity in each state and NZ; and finally, a summary of the co-funding opportunities available to the industry.

### 3.1 SWOT Analysis

SWOT refers to strengths, weaknesses, opportunities and threats. Both strengths and weaknesses identify internal factors that the industry has relative control over. The opportunities and threats are those external factors that to a large degree are beyond the control of industry. This analysis provides a basis for the development of the R&D strategies.

#### 3.1.1 Strengths

- The technologies required for manufacturing RO products are not complicated and are widely available.
- Terminology has been standardised and is available online in the RO Dictionary and Thesaurus.
- Publications relating to R&D and marketing of RO are systematically collected and indexed by the RO Unit in the RO Library.
- There is sufficient expertise available (in Australia) in the area of RO processing.
- Research institutions such as the Recycled Organic Unit, the Centre for RO in Agriculture, SARDI and the Western Australian Department of Agriculture and Food already provide technical support to the RO Industry.
- The Industry has associations with all state departments of agriculture (or equivalent).
- Significant R&D has been, and is being, undertaken with the financial support of state governments (largely derived from waste levies).
- The RO Industry has endorsed standard field trial protocols for use in future R&D projects.
- The RO Industry has developed Industry Competency Standards which have been endorsed under the Rural Industries Training Package.

#### 3.1.2 Weaknesses

- There is a lack of technically experienced personnel with the processing, product development and marketing skills to manage the RO diverted from landfill.



- Technical R&D tends to be scientifically focused and lacks integration with marketing expertise and commercial priorities.
- R&D is not being effectively coordinated towards agreed outcomes resulting in duplication and inconsistent data sets that cannot effectively be compared or combined.
- Stakeholders within the industry lack awareness of key resources such as the RO Library and associated records of existing R&D and marketing material.

### 3.1.3 Opportunities

- Horticulture Australia Limited (HAL) may provide a source of matched funding from the Federal Government for RO R&D related to Horticulture (a key group of target markets).
- Due to the public benefits provided by the industry, from time-to-time government and private grants may become available that are suitable for projects aimed at developing the RO Industry.
- The rising cost of oil and the related increases in the cost of inorganic fertilisers will improve the economics of using compost.
- Compost NZ (members) have similar R&D needs and may contribute to a combined Australian/New Zealand R&D program.
- Promotion of the RO Library and Product Selector (maintained by the ROU) may reduce duplication in R&D and build markets for RO products.
- Compost manufacturers, regulators and other government agencies require technical advice on product development and certification, establishing and licensing facilities and dealing with environmental incidents.
- The RO Industry has shown strong interest in a process for reviewing, endorsing and recommending changes to R&D proposals prior to project funding/commencement.
- The appearance of 'Soil Health' as a topic of concern for farmers and an area of interest for government and researchers.

### 3.1.4 Threats

- Poor margins and regulatory uncertainty for compost manufacturers limits the commercial investment dollars available for research and development activities.
- Unclear and changing government policy priorities limits the commercial investment dollars available for research and development activities.
- State governments may reduce the level of investment dollars they have historically provided for R&D.
- Research institutions may devote their expertise and resources to developing competing organic amendments if attractive funding opportunities are available.

## 3.2 Areas of Research & Development

R&D can be divided into two broad categories:

1. Fundamental research (scientific trials/experiments/surveys etc) and
2. Science communication or 'research into practice' (rural extension/training/commercial product development etc).

Both categories of R&D are relevant to this plan. Historically the focus of organic recycling R&D has been on fundamental research. While this is natural given the relative youth of the industry and the associated lack of existing research, the need to meet the outcome of this



Action Plan will increase the emphasis on research into practice.

R&D associated with organic recycling can also be divided into the following areas:

R&D AREA	TARGETS	ACTIVITIES INCLUDE
<b>Understanding End-Users</b>	Understanding end-user needs and issues through market research	Surveys, interviews, field trials and demonstrations
<b>Developing Markets</b>	Addressing barriers to market development in priority market and incorporating RO use into grower/user practice	Integration with grower/user systems; understanding impacts on soil performance; trialing and demonstrating transport solutions, application rates and techniques; developing information resources; training
<b>Improved Standards</b>	Improved product standards, compost quality and regulations relating to land application	Experimenting with sampling and product testing techniques; establishing safe limits; risk assessment; understanding and measuring product properties
<b>New Applications</b>	Innovative new uses for (and types of) RO products	Developing new product specifications; addressing specific problems (e.g. disease); small scale experimentation; field trials
<b>RO Production Systems</b>	Improved collection and treatment of organic wastes leading to production of quality RO products	Developing and trialing new technologies and process improvements; improving source separation and lowering contamination

### 3.3 State profiles

R&D has historically been undertaken on a state-by-state basis, usually because funding is provided by state governments or is focused on a local commercial opportunity or research priority. This section briefly describes the institutions, resources and most significant R&D projects undertaken in each state. It also provides an estimate of the R&D dollars spent by public and private organisations over the last two years.



### 3.3.1 New South Wales

The organisations undertaking organic recycling R&D in NSW are:

NAME	CONTACT	SUMMARY
<b>Recycled Organics Unit (ROU), University of NSW (UNSW)</b>	Angus Campbell, Director	Formed by UNSW and NSW state government agencies in 1995, now self funding not-for-profit. Broad based R&D services but focuses on research into practice and provision of information services
<b>Centre for Recycled Organics in Agriculture (CROA), NSW Dept. of Primary Industries (DPI)</b>	Yin Chann, Principal Research Scientist	Research unit established in 2002 by state and federal government agencies, now self funding not-for-profit. Focus on application of recovered organic resources to land and associated benefits to Agriculture (developing markets)
<b>Centre for Organic Resource Enterprises (CORE)</b>	Chris Rochfort, Chief Executive	Private for-profit company providing primarily marketing services to members and commercial clients. Undertakes largely market research to identify and develop new markets (understanding end-users)
<b>Department of Environment and Climate Change, Sustainable Programs Division (DECC)</b>	Darren Bragg, Project Manager	Government agency that both funds and directly manages R&D projects in NSW. Out-sources the majority of R&D projects to other government agencies and private sector R&D organisations but manages some projects directly. Working in all areas of organic recycling R&D
<b>Wollongbar Agricultural Institute, NSW Department of Primary Industries</b>	Dr Lukas Van Zwieten	DPI Centre of Excellence for the Environment. Focused on a specific research project: The Benefits of Char for Crop Growth and Soil Health (new applications)

Significant R&D projects commenced or completed in NSW include:

- Life Cycle Inventory and Analysis for windrow composting (ROU, 2003)
- NSW Market Studies 2007, 2004, 2001, 1997 (Various consultancies commissioned by DECC)
- NSW regional RO audits/inventories (Various consultancies commissioned by DECC)
- Market research and trials using RO for stormwater filtration (CORE)
- Field trial of RO in vegetables (CROA/DECC)
- Field trial of RO in viticulture (CROA/DECC)
- Use of RO products in Council Parks and Gardens - CBA calculator
- Mine Site Rehabilitation study and CBA (NSW Forests/DECC)
- RO for roadside and erosion control (using express blowing) field and pot trials (DECC/RTA)
- Golf course field trials (x5) (DECC/NSW Golf Course Superintendents Association)
- Field trial of RO in turf grass growing (DECC)



- Land management to increase soil carbon sequestration in NSW (NSW DPI, Forest Resources Research – Dr Annette Cowie)

The key information resources available in NSW include:

- The RO Library – an on-line catalogue linked to a physical and digital library and housed at the ROU offices (part of the University of NSW)
- The Product Selector - an online searchable database of RO product types.
- Composted Mulch Nutrient Contribution Calculator for Vineyards and Orchards (Recycled Organics Unit)
- RO National E-news – a quarterly electronic newsletter summarising the latest R&D and resources from around Australia
- Recycled Organics Unit Website ([www.recycledorganics.com](http://www.recycledorganics.com))

Public spending (and private sector contributions) on organic recycling R&D projects in NSW was approximately \$500,000 in 2005/06 financial year and \$500,000 in the 2006/07 financial year. This excludes any R&D undertaken within private companies for the benefit of that company alone.

### 3.3.2 Victoria

The organisations undertaking organic recycling R&D in Victoria are:

NAME	CONTACT	SUMMARY
<b>Landscape Systems, Department of Primary Industries (Parkville, Victoria)</b>	Kevin Wilkinson, Statewide Leader, Ecosystems Analysis	Ecosystem Analysis is a 'sub-platform' (section) of the DPI. Focus on use of RO products in vegetable production. RO is part of a larger research program
<b>Sustainability Victoria</b>	Bill Grant, Project Manager	Government agency that funds research and development activities with specific market development outcomes, particularly demonstrations and trials

Significant R&D projects commenced or completed in Victoria include:

- On-farm participatory three year trials in vegetables plus demonstrations in viticulture and other horticulture, with some data capture (Victorian DPI)
- Weed and disease management processes (Victorian DPI)
- RO product standards and testing development (Victorian DPI)
- Best practice guides (Victorian DPI)
- Use of RO in roadside tree planting (Victorian DPI)
- Raised bed cropping in SW Victoria (Victorian DPI)
- Trials of RO in cut flower growing (ANL)
- Trials of ROs in viticulture & orchards (GreenPlanet)



### 3.3.3 South Australia

The organisations undertaking organic recycling R&D in South Australia are:

NAME	CONTACT	SUMMARY
<b>South Australian Research and Development Institute</b>	Rob Thomas, Chief Scientist Sustainable Systems	The Sustainable Systems division is working on application of compost for sustainable agricultural production. Currently implementing R&D under the SA Compost for Soils Program. But also has considerable past experience in organics related R&D
<b>Zero Waste SA</b>	Vaughan Levitzke, CEO	Statutory authority that both funds and directly manages R&D projects in SA. Out-sources the majority of R&D projects to public and private sector R&D organisations
<b>Flinders Bioremediation</b>	Prof. Andy Ball Technical Director	Private for-profit bio-technology development company providing consulting, contract research and bioremediation services. Strong links with Flinders University
<b>University of Adelaide</b>	Associate Professor Bo Jin, School of Earth and Environmental Sciences	The University of Adelaide is part of the leading Group of Eight Universities. Bo Jin's work centres around waste recycling and reprocessing including grape marc, compost, waste water and RO. Professor Mike McLaughlin, Jeff Baldock and David Chittleborough are also active in compost and soil related disciplines

Significant R&D projects commenced or completed in South Australia include:

- Organic amendments to control plant parasitic nematodes in citrus and vegetable crops (SARDI – Greg Walker)
- Long term broadacre trial comparing conventional and organic farming systems (University of Adelaide, Roseworthy – Chris Penfold)
- RO primarily targeting the viticulture industry – 10 Projects (CSIRO/ EcoResearch – John Buckerfield and Katie Webster)
- Assessment of biosolids in broadacre field sites (CSIRO Land and Water – Mike McLaughlin and Michael Warne)
- Anaerobic digestion of food wastes (Remediate Pty Ltd – Dr Ben Dearman)
- Bio-tech transformation of organic wastes into bio-materials and bio-energy – four projects (University of SA – Bo Jin)
- Integrated bio-systems to process livestock and food processing wastes (SARDI & University of Adelaide – Martin Kumar and Phil Glatz et al)
- Composts for disease suppression in greenhouse crops (SARDI – Matthew Ayres)
- Organic Amendments for the Control of Kelly's Citrus Thrip (SARDI & University of Adelaide – Greg Baker and Peter Crisp)
- Management of vineyard soils – impact of mulches and RO injection into sub-soils (SARDI & University of SA – Mike McCarthy)
- Management of Salinity in Hill's Vineyards (EcoResearch – Katie Webster)
- Composting and bio-remediation technologies – 12 projects (Flinders Bio-remediation – Dr Richard Stewart)



The key information resources available in South Australia include:

- Compost for Soils Website ([www.compostforsoils.com.au](http://www.compostforsoils.com.au))
- Compost for Soils information sheet series for vegetable growers and viticulturalists

### 3.3.4 Western Australia

The organisations undertaking organic recycling R&D in Western Australia are:

NAME	CONTACT	SUMMARY
<b>WA Department of Agriculture and Food (Perth)</b>	Bob Paulin, Snr Development Officer	Government agency that both funds and directly manages R&D projects in WA. Focus has been on RO in vegetable production but has wider experience in other agricultural applications
<b>Organic Farming Systems (OFS)</b>	Stephen David	Private for-profit consulting business that also does contract research in the area of sustainable agriculture and compost production and use
<b>Spartel</b>	Dr Harrie Hofstede, Director	Private for-profit environmental technology, engineering and consulting company that undertakes contract research with private and public sector. Greater emphasis on waste treatment and organic recycling processes
<b>Centre for Organic Waste Management Murdoch University</b>	Dr Ralf Cord-Ruwisch, Director	University research unit that provides R&D support to the waste management industry and government. Greater emphasis on waste treatment and organic recycling processes
<b>Soil Biology Research Group University of Western Australia</b>	Professor Lyn Abbott, Head of School	Part of the School of Earth and Geographical Sciences. Emphasis on understanding the activities of a wide range of soil organisms in the context of their contribution to important soil processes. Study soil organisms in natural ecosystems as well as in agriculture/horticulture and disturbed environments such as mine-sites
<b>Department of Environment and Conservation</b>	Jill Lethlean, Manager Strategic Policy	Government agency that both funds and directly manages R&D projects in WA. Out-sources the majority of R&D projects to other government agencies and private sector R&D organisations

Significant R&D projects commenced or completed in Western Australia include:

- Identifying the benefits of composted soil amendments to vegetable production (DAFWA – Bob Paulin)
- Field trials with RO in vegetables, wine grapes, apples – investigating use with irrigation and fertiliser practices (DAFWA – Bob Paulin)
- Demonstration of MSW compost use in agriculture/horticulture – 50 sites over two years (OFS/SMRC - Stephen David)
- COWM-DICOM process evaluation (Murdoch University - Dr Lee Walker)



The key information resources available in Western Australia include:

- CD of project – ‘Identifying the benefits of composted soil amendments to vegetable production’ – includes a number of other resources, posters, bulletin on compost (production for and use in horticulture), Issues paper on compost use in agriculture.
- Report on the MSW project. Available from the Southern Metropolitan Regional council
- Two reports on use of ‘Compost in horticultural’ to HAL and the WA Waste Management Board
- Lee Walker - Paper on the DICOM process and thesis. Contact Dr Ralf Cord-Ruwisch, Murdoch University
- Compost WA ‘Position statement on Recycled Organics’
- Reports on the ‘Spartel modular composting technology’ available from Dr Harrie Hofstede

Public spending (and private sector contributions) on organic recycling R&D projects in Western Australia was approximately \$300,000 in 2005/06 financial year and \$200,000 in the 2006/07 financial year. This excludes any R&D undertaken within private companies for the benefit of that company alone.



### 3.3.5 Other Australian R&D Capacity

The remaining states and territories do not have an extensive record of public or public-private co-investment in RO related R&D. Other organisations undertaking relevant R&D in Australia include:

NAME	CONTACT	SUMMARY
<b>CSIRO Land and Water, South Australia</b>	Jeff Baldock, Research Scientist, Prof Mike Mclaughlin	National R&D organisation. Key researchers based in Adelaide, SA. Expertise in the forms and fluxes of soil carbon and key soil nutrients. May assist in calculating soil carbon sequestration resulting from compost application.
<b>The Organic Force</b>	Johannes Biala	Independent researcher and consultant with an emphasis on research into practice (demonstration, training etc.). Based in SE Queensland.
<b>Remediate P/L</b>	Dr Richard Stewart and Dr Ben Dearman	Private for-profit company focussing on novel application for ROs in land remediation, waste treatment and mine site rehabilitation. Offices in Victoria and South Australia
<b>Chrysalis Landscape Consultants</b>	Pam Pittaway	Independent researcher and consultant with expertise in developing (and applying) RO products for intensive agriculture. Interests in production of quality composts and compost standards. Based in SE Queensland
<b>Biocontrol Australia</b>	Dean Metcalf, Plant Pathologist	Private for-profit company focusing on developing disease suppressive properties of compost and compost teas, particularly in vegetable crops. Based in Tasmania.
<b>Microbial Activity</b>	Alice Palmer & Tony Shearer	Private for-profit company focusing on developing disease suppressive properties of compost and compost teas, particularly viticulture. Based in Tasmania.
<b>Queensland Department of Primary Industries &amp; Fisheries</b>	Stephen Harper, Senior Research Scientist	Government agency that provides in-kind contributions and directly manages RO R&D projects in Queensland. Stephen's focus has been on RO in vegetable production and soil health in SE Queensland
	Tony Pattison, Senior Nematologist	Tony's focus has been on organic soil amendments in banana production and soil health in tropical N Queensland
<b>Queensland Department of Natural Resources</b>	Ram Dalal, Senior Principal Scientist	Government agency that provides in-kind contributions and directly manages RO and carbon/soil R&D projects in Queensland. Ram's focus has been on RO in broadacre agriculture and carbon/soil degradation



Significant R&D projects commenced or completed in the rest of Australia include:

- Assessment and development of the use of compost in intensive horticulture (DPI - Steve Harper & The Organic Force - Johannes Biala)
- Banana root and soil health project (DPI - Tony Pattison)
- Comparison of feedlot manure and 'green waste' compost in broadacre agriculture, plus many soil carbon projects (DNRW - Ram Dalal)
- Assessment of the beneficial effects of using recycled organic products in the viticulture industry in Queensland (part of national project) (The Organic Force - Johannes Biala)
- Modeling soil carbon dynamics (CSIRO/GRDC/AGO – Jeff Baldock)
- Disease suppressive composts for addressing crop disease – onion white rot (Bio-control Australia/DAFF/HAL – Dean Metcalf)
- Integrated management of grapevine disease with application of Aerated Compost Extract (UTAS/DPIWE/TIAR – Alice Palmer)

### 3.4 New Zealand

In NZ markets for bagged product are becoming saturated. There is a proliferation of cheap bagged products. There are still opportunities for sales in the bulk compost market – particularly at the high quality end of the market. For commercial operators, the target market is intensive horticulture and agricultural production. This is very similar to identified priority markets in Australia.

The 2006 New Zealand R&D Forum identified a number of areas where the Industry could increase the effectiveness of funded research.

Specific recommendations include:

- Bringing all research together under a Centre of Excellence
- Focusing on key researchable problems, and bringing to bear whatever combination of disciplines are needed to tackle them
- Giving more support for developing research capacity
- Putting more energy into getting research into use
- Positioning Compost NZ research in a broad international context rather than as a stand-alone programme
- Looking to international funding and
- Highlighting the role of private sector research and development and increasing the potential for collaboration

Key partners identified by Compost NZ are:

- Compost companies
- Local authorities
- Massey University
- University of Canterbury
- Zero Waste Academy
- Crown Research Institutes (ESR, Landcare Research)

Research needs to focus on two different areas. Firstly, evidence of the value of organic recycled product to end users. Secondly, on tools for processors to overcome capacity constraints. Priority research areas to meet these requirements are:

- Highlighting grower value
- Reducing processor capacity constraints



- Identifying and prioritising markets (high value markets)
- Undertaking detailed needs analysis: technical (agricultural) and market research
- Research to underpin the development and documentation of performance based product specifications and application guidelines
- Research to support development of industry capacity
- Development of pathways to market and marketing tools
- Evaluation and continuous improvement tools

### 3.5 Funding for Research and Development

As the commercial beneficiary of research and development activities the RO Industry is a key source of funding for relevant R&D. This Action Plan recognises the need for the RO Industry to make a contribution to R&D in Australia. Potential co-investors include:

CO-INVESTOR	RESEARCH AREA				
	UNDERSTANDING END-USERS	DEVELOPING MARKETS	DEVELOPING STANDARDS	NEW APPLICATIONS	PRODUCTION SYSTEMS
State government waste minimisation agencies					
State Departments of Primary Industries					
State Environmental Protection Agencies					
Cooperative Research Centres					
Horticulture Australia Limited					
Rural Industries Research and Development Corporations					
Universities and Australian Research Council					
Local Governments					
Foundations					
Water Industries					
Multi-nationals					
Large customers					
Organic farming organisations					
Mining Industries					
State transport departments					



## 4 | RESEARCH

Research priorities have been set and reviewed through the three consecutive R&D Forums. Research priorities are driven in part by the priority markets identified in the Market Development Plan. They are also guided by the RO Industry strength, weaknesses, opportunities and threats. Finally research priorities are influenced by the research capacity available in Australia and New Zealand.

### 4.1 R&D for Priority Markets

Priority or 'target' markets have been identified for each state in the CA Market Development Action Plan (2008-2011). R&D activities will focus on developing target markets and RO products designed for those markets.

While each state has its own target markets there is considerable overlap between the target markets in each state. A summary of the national target markets can be found in Appendix A.

### 4.2 Priority Research and Development Activities

Over several years, R&D Forums have identified the need to increase research into practice or 'extension' activities. It is generally understood that existing research is not always being effectively communicated to external stakeholders (who are defined in the CA Communications Action Plan). There is also general agreement on the solutions to this problem. They include:

1. Employment of Industry Development Officers (IDO) in each state to establish ongoing dialogue and information exchange with end-users
2. Development and delivery of a training modules for the industry, advisors to end-users and end-users themselves
3. Development and delivery of information services (digital and hard copy) to the industry; advisors to end-users and end-users themselves

A list of research priorities and topics for research can be found in Appendix B.

While research into practice activities must be established as a high priority there is also a need to continue fundamental research activities and more specifically, to plug gaps in existing knowledge.

Until high-value bulk markets are secured and ongoing product demand is established production system related R&D is a lower priority, at least in the short term (first three years). The exception is where production systems have an impact on product quality (e.g. physical contamination).

Australia has access to a wide range of organic treatment technologies, however in most cases the lowest cost/investment technology is used. In Australia this is aerobic open windrow composting for source separated organic materials. This is unlikely to change until prices for high quality RO products increase (due to increased demand).

Wherever practicable R&D activities should be designed to result in (or lead work towards) specification of application specific products that can then be independently certified and registered as application specific products under the industry owned Leaf Mark.



## 5 | ACTIONS

CA's R&D actions are designed to implement the selected strategies and achieve the overall communication outcome documented in Section 2. Even within the defined scope of this Action Plan there are more potential R&D projects than could be realistically funded by an industry of this size. The challenge is to prioritise those communications activities based on limited resources, identified strategies and the overall outcome or goal of this plan.

The resources required to implement the actions below are expressed in dollars to simplify presentation. The cost of each action includes both the time to implement the action (e.g. Industry Development Officer) and any additional external cost (e.g. website hosting). In most cases the actions would be implemented by an Industry Development Officer (state) or by the National Projects Manager.

### 1. Focus R&D on priority markets and their identified needs.

ACTION	YR 1	YR 2	YR 3
Undertake detailed primary research on the needs of the top five priority markets nationally (questionnaires and interviews)	\$80,000	\$60,000	\$60,000
Analyse data and develop detailed demand creation and market penetration strategies for each target market	\$20,000	\$20,000	\$10,000
Periodically review and update market needs (monitoring)		\$20,000	\$30,000
<b>TOTAL</b>	<b>\$100,000</b>	<b>\$100,000</b>	<b>\$100,000</b>

### 2. Facilitate and/or fund R&D projects.

ACTION	YR 1	YR 2	YR 3
Develop and adopt selection criteria for selection of R&D projects for funding/endorsement by the RO Industry	\$2,500		
Develop and adopt guidelines for R&D project methodology	\$2,500		
Publish and distribute selection criteria and guidelines to known researchers in the field	\$10,000		
As funding becomes available invite project proposals that meet the criteria and guidelines, then assess	\$5,000	\$5,000	\$5,000
Deliver and administer funding to selected R&D projects	\$130,000	\$170,000	\$170,000
<b>TOTAL</b>	<b>\$150,000</b>	<b>\$175,000</b>	<b>\$175,000</b>



3. Set up and maintain a (paid) RO technical advisory panel to review and provide advise on: R&D proposals (methodology and relevance); standards, regulations and their enforcement; and certified products and suitability for application.

ACTION	YR 1	YR 2	YR 3
Develop and adopt criteria for selection of technical advisory panel members in consultation with CA Committee and state environmental regulators	\$5,000		
Develop procedures for the composition and operation of the technical advisory panel	\$5,000		
Invite applications, evaluate applications and appoint staff to the technical advisory panel	\$10,000		
Administer the operation of the technical advisory panel including at least one annual face-to-face meeting	\$30,000	\$30,000	\$30,000
<b>TOTAL</b>	<b>\$50,000</b>	<b>\$30,000</b>	<b>\$30,000</b>

4. Set up, maintain and promote online systems to catalogue and access publications and product/services information relevant to the RO Industry and its customers.

ACTION	YR 1	YR 2	YR 3
Update RO Library (6 monthly review)	\$20,000	\$20,000	\$20,000
Design and implement an online product selector service	\$25,000	\$10,000	\$10,000
Design and implement an online directory of outlets and services (location/contact)	\$20,000	\$5,000	\$5,000
Promote information services to members	\$5,000	\$5,000	\$5,000
<b>TOTAL</b>	<b>\$70,000</b>	<b>\$40,000</b>	<b>\$40,000</b>

5. Access relevant international R&D programs and resources to deliver common outcomes.

ACTION	YR 1	YR 2	YR 3
Distribute Action Plans, project selection criteria and calls for project development to international RO Industry development organisations	\$3,000		
Arrange for reciprocal rights to relevant international research publications	\$2000		
Where appropriate contribute funding or in-kind to joint international R&D projects. (Goes through process developed under Strategy 2)	\$5,000	\$5,000	\$5,000
<b>TOTALS</b>	<b>\$10,000</b>	<b>\$5,000</b>	<b>\$5,000</b>



6. Develop and deliver industry training resources and services in line with the Industry Competency Standard.

<b>ACTION</b>	<b>YR 1</b>	<b>YR 2</b>	<b>YR 3</b>
Define training requirements and compile and review existing reference material	\$10,000		
Develop training modules	\$40,000		
Train the trainers to deliver training modules	\$15,000		
Pilot training services	\$15,000		
Evaluate and update modules and associated resources	\$5,000		
Implement training services for RO Industry		\$35,000	\$40,000
<b>TOTALS</b>	<b>\$85,000</b>	<b>\$35,000</b>	<b>\$40,000</b>

7. Collect the information necessary to monitor industry development against key performance indicators and support industry advocacy.

<b>ACTION</b>	<b>YR 1</b>	<b>YR 2</b>	<b>YR 3</b>
Undertake an annual survey of the Industry including (where possible) non-members	\$30,000	\$30,000	\$30,000
Analyse the data and present an annual update to stakeholders	\$10,000	\$10,000	\$10,000
Obtain economic information from a selection of members and establish good quality turnover data		\$20,000	
Gather and report membership and related operational data on a monthly basis	\$5,000	\$5,000	\$5,000
Compile and distribute a CA annual report for members including financials, performance indicators and achievements	\$5,000	\$5,000	\$5,000
<b>TOTAL</b>	<b>\$50,000</b>	<b>\$70,000</b>	<b>\$50,000</b>



## COMPOST AUSTRALIA

The national body for the organics processing and recycling industry

- Promoting the recovery of compostable organic material
- Developing markets for compost products
- Developing and promoting product standards and certification
- Providing a national information network for the organic industry
- Identifying and agreeing upon common organics industry priorities
- Informing and influencing key stakeholders and decision makers
- Coordinating research and development nationally