



A Division of the WASTE MANAGEMENT ASSOCIATION OF AUSTRALIA

Application-Specific Product Development Process for Recycled Organic Products

Developed by Compost Australia for the
Australian Recycled Organics Industry

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CONTENTS

1	INTRODUCTION	1
1.1	BACKGROUND	1
1.2	PURPOSE.....	1
1.3	SCOPE.....	1
1.4	APPLICATION.....	1
1.5	ACKNOWLEDGEMENTS	2
1.6	DEFINITIONS	2
2	FRAMEWORK	3
3	PRODUCT DEVELOPMENT PROCESS	6
3.1	KNOW YOUR PRODUCT.....	6
3.2	IDENTIFY AND PRIORITISE TARGET MARKET	17
3.3	NEEDS ANALYSIS	18
3.4	GAP ANALYSIS	20
3.5	DEFINE PRODUCT CHARACTERISTICS (PRODUCT SPECIFICATION)	21
3.6	DEFINE PRODUCT APPLICATION GUIDELINES	23
3.7	PRODUCT VALIDATION	24
4	SELLING CERTIFIED PRODUCTS	25
APPENDIX 1	CUSTOMER NEEDS ANALYSIS	
APPENDIX 2	CRITERIA FOR THE SELECTION OF TECHNICAL ADVISORS	
APPENDIX 3	TYPICAL ORGANIC INGREDIENTS	
APPENDIX 4	PERFORMANCE SPECIFICATION WORKSHEET	
APPENDIX 5	PRODUCT SPECIFICATION WORKSHEET	
APPENDIX 6	APPLICATION GUIDELINES WORKSHEET	
APPENDIX 7	CUSTOMER REGISTER AND ACKNOWLEDGEMENT STATEMENT	
APPENDIX 8	AUDIT CHECKLIST	
APPENDIX 9	REFERENCES	

1 INTRODUCTION

1.1 Background

The Compost Supply Chain Roadmap, launched on 13 February 2006, identified the need to address end-users' needs and promote the idea of different quality products. It highlighted the necessity of redefining compost as a product designed with a specific purpose rather than a treated waste needing disposal. The existing certification scheme for Composts, Soil Conditioners and Mulches, known as Standards Mark, did not effectively link certified products with defined market requirements, nor did it allow individual market segments to identify a Recycled Organic product specifically designed to meet their needs.

In December 2007 Compost Australia, a division of the Waste Management Association of Australia, entered into a Joint Marking Agreement (JMA) with SAI Global in order to overcome the shortcomings of the Standards Mark certification. The resulting Certified Composts Program allows Compost Australia to undertake joint marketing activities on behalf of the industry using the Leaf Mark with the confidence that the products being promoted will be fit-for-purpose (application-specific) and independently certified.

1.2 Purpose

The purpose of this Application Specific Product Development Process (the Process) is to assist product manufacturers and their advisors to develop products that:

1. are designed for specific applications and/or contexts;
2. deliver specified performance outcomes when used as recommended;
3. require more rigorous specification and testing linked to guidelines for application and use in specific contexts.

The Process provides a mechanism for product manufacturers to certify recycled organic products that have been designed with a clear purpose (or application) and therefore have value as a product rather than a waste requiring disposal. This may include some products that fall outside the specifications provided in the Australian Standard for Composts, Soil Conditioners and Mulches (AS4454).

1.3 Scope

The Process and associated Product Information Template (the Template) cover recycled organic products that meet the specific physical, chemical and application requirements of end-users whilst also taking into account the environment where the product will be used. The Process is designed to be used in conjunction with the AS4454, the industry-accepted standard for Composts, Soil Conditioners and Mulches. The recycled organic product types intended to be developed and described using the Process and Template are specified in AS4454, Section 1.1.

1.4 Application

The Process and Template are intended for use by manufacturers and suppliers of recycled organic products. They are working product development documents designed to deliver consistent organic products that fit the particular application employed by the user. The resulting products can be audited and registered by SAI Global (a third-party certifier) under the Certified Compost scheme. Certified products may carry both the Standards Mark and Leaf Mark branding.

1.5 Acknowledgements

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Recycled Organics Unit (2002) *Guide to Selecting, Developing and Marketing Value-Added Recycled Organic Products*, Recycled Organics Unit, UNSW, Sydney.

Please refer to this freely available publication for further explanation and worked examples of the product development process.

1.6 Definitions

All general organics industry definitions are contained in the Recycled Organics Unit Dictionary & Thesaurus at:

<http://www.recycledorganics.com/dictionary/index.htm>

Market Category & Segments definitions are provided in the Compost Australia Market Development Action Plan 2008-2011 at:

<http://www.wmaa.asn.au/director/divisions/compost/Advancing.cfm>

2 FRAMEWORK

Recycled organics products can be considered to be 'technical products' as their development requires an understanding of the science and engineering underlying their performance. Product development needs to be combined with technical knowledge so that the specific technical performance requirements can be combined with the expressed needs and sensitivities of the market. This information must be documented, clearly understood, and translated into a format that can be used to inform the development of new and/or improved products.

To meet the needs of existing and new markets, product standards are required to ensure that the products can be used reliably, and produced to a consistent level of quality, in order to meet the performance and value expectations of the user. In other words, a standard is a published document, which sets out specifications and procedures designed to ensure that a material, product, method or service is fit for its purpose and consistently performs the way it was intended.

Quality standards define the characteristics of the product, including the physical, chemical and technological properties of materials or the processes used for manufacturing, treatment and handling of products. Principal benefits of quality standards include:

- improved information and confidence for manufactures and buyers;
- lower costs if production and sales are focused on a limited numbers of varieties allowing economies of scale;
- improved market acceptance and differentiation from low quality product.

Table1 summarises the recommended steps for recycled organics product development. This standardised Process allows product manufacturers to develop products designed for specific applications and register them with a third party certifier. The remainder of this document describes these steps in more detail and refers to useful supporting information developed to assist product design.

Table 1 – Application-Specific Product Development Process

Steps	Action
Know Your Product	<p>What are the biological, chemical and physical properties of your RO product?</p> <p><u>Refer Section 3.1</u></p>
Identify and Prioritise Target Market	<p>Is the target market being selected based on the existing process output or other factors?</p> <p>Is the target market a production or amenity-based market?</p> <p>Can sufficient market research be uncovered using secondary research techniques?</p> <p><u>Refer Section 3.2</u></p>
Needs Analysis	<p>What additional primary research is required?</p> <p>Distinguish between key limiting factors and soft personal preferences.</p> <p>Is external technical support required?</p> <p>Document the steps taken for future reference.</p> <p><u>Refer Section 3.3</u></p>
Gap Analysis	<p>Is there an existing general or application-specific product specification for the application?</p> <p>Is a new application specific product specification required?</p> <p>Document the performance specification.</p> <p><u>Refer Section 3.4 and Appendices 2 & 3.</u></p>
Define Product Characteristics (Product Specification)	<p>Draft a product specification and prepare a prototype product.</p> <p>What test methods are appropriate for the product?</p> <p>What are the risks relating to selected product characteristics?</p> <p>Consider variation of feedstock and blending with other materials.</p> <p>Document the guidelines for manufacturing to the product specification.</p> <p>Document the steps taken for future reference.</p> <p><u>Refer Section 3.5 and Appendices 4 & 5</u></p>
Define Product Application Guidelines	<p>How should the product be applied, at what rate, and when?</p> <p>In what context is the product suitable for application?</p> <p>Does the product require packaging?</p> <p>Document the steps taken for future reference.</p> <p><u>Refer Section 3.6</u></p>

Steps	Action
Product Validation	Batch manufacturing of product for testing and performance validation. Performance evaluation trials and gaining data for cost-benefit analysis. <u>Refer Section 3.7</u>
Submit Product for Auditing and Registration	Complete worksheets <u>Appendices 4,5 & 6</u> Complete Product Information Template Complete audit checklist for submission <u>Appendix 8</u>

3 PRODUCT DEVELOPMENT PROCESS

This section details the product development process outlined in Section 2. For each step there are web links to key reference documents that contain important background information, worked examples and useful tools for product development. Further reference information and worksheets are appended.

3.1 Know Your Product

Prior to designing a product it is important to understand what the existing feedstock and process currently produces (or is capable of producing). The biological, chemical and physical properties must be evaluated in order to effectively design an application-specific product and address risks to plant growth (if applicable), the environment and human health. Of these three properties it is the physical properties that are most easily controlled, post-processing, using size reduction or screening techniques. Chemical and biological properties must be varied by controlling feedstock or through process control.

Given that product design generally commences with an existing 'output material' (as opposed to a product), the first step is to understand the risks, value and potential of that output.

What are the Biological Properties of the Product?

The key biological property of a product is its level of 'biological' stability. Where a product has a low level of microbial activity under optimal conditions of temperature, moisture and passive aeration, it is said to have a high level of stability. A product becomes increasingly stable as it moves through the various phases of composting. Stability is difficult to determine using a single test method. Table 2 describes a stability and maturity index using the results of three test methods and with reference to the moisture content of the product.

A relatively stable product may still be toxic to plants. For this reason the term maturity is also used to describe the biological properties of a product. A mature product is both stable and non-toxic to plants. Product maturity is achieved by allowing the composting process to continue through a lower temperature maturation phase prior to testing and release. The duration of this maturation phase depends on the composting process being used and the level of control available to the operator of that process. A mature product meets the conditions of Phase 4 in Table 2.

Knowing the biological stability of a composted product is important for the following reasons:

1. Poorly composted products may contain plant chemicals that are toxic to seedlings and other plants;
2. Poorly composted products may contain animal and plant pathogens, and viable propagules of weedy plant species;
3. Poorly composted products may contain excessive levels of ammonium nitrogen that may be toxic to seedlings and other plants;
4. Poorly composted products may contain excessive amounts of plant waxes, rendering the product hydrophobic;
5. The microbial activity of composted products in the active phase may be sufficiently high to induce nutrient (nitrogen and phosphorus) draw down, adversely affecting plant growth;
6. The plant-available concentrations of the major nutrients nitrogen and phosphorus do not stabilise until the curing phase, when microbes have exhausted supplies of readily available organic carbon; and
7. The soil conditioning properties of nutrient (cation exchange capacity) and water holding capacity do not reach their optimum until the curing phase.

Table 2 defines four stability phases for use in product design in terms of an 'index' (phases 1 to 4). Only Stability Phase 4 represents mature product. **Tables 3 and 4** provide guidance on the suitability of products for specific markets and applications based on the Stability and Maturity Index. While the tables are a useful risk management tool they are not designed to be prescriptive. Application and post application management techniques may be used to manage risks associated with relatively unstable or immature products. Once stability/maturity risks have been identified the product manufacturer should document how those risks will be managed (see Section 3.6).

Table 2 – Stability and Maturity Index for Recycled Organic Products

INDICATOR	PHASE 1 Non-pasteurised (Raw) Product	PHASE 2 Pasteurised Product	PHASE 3 Composted Product	PHASE 4 Mature Product
Corresponding Composting Phase	Consolidation	Early active	Late active	Maturation
Compliance with AS4454, Section 2.3.1	Not compliant	Compliant	Compliant	Compliant
Nitrogen Draw-Down Index (NDI) (AS3743)	≤ 0.1	≤ 0.2	> 0.2	≥ 0.5
Ammonium N mg/kg (Solvita)	> 500 (1-3)	75 - 500 (4)	< 75 (5)	< 75 (5)
Wettability (AS3743)	> 5 minutes	≤ 5 minutes	≤ 2 minutes	< 2 minutes

Table 3 – Market Quality Matrix

Market Categories	Market Segments	Product Type	Application	Maturity Index	TEST PARAMETER AND METHODS				Usage Guide
					SIZE	NPK	E.C (ESP)	Chloride	
					Grading Guide	Content & Test	(dS/m)	(mg/Kg)	
Intensive Agriculture, Horticulture & Viticulture	Fruit & Orchard	Soil Conditioner	Top Soil	4	< 10mm	as per AS4419	< 1.2 AS4419	< 1000 R&H	Specific
	Fruit & Orchard	Fertiliser	Soil	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific
	Fruit & Orchard	Compost	Amendment	3	> 16mm	as per AS3743	< 2.2 AS4454	< 200 AS3743	Specific
	Market Gardening (vegetables)	Mulch	Surface Mulch	4	< 16mm	as per AS3743	< 2.2 AS3743	< 200 AS3743	Specific
	Market Gardening (vegetables)	Soil Conditioner	Soil Amendment	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific
	Cut Flower growing	Soil Conditioner	Soil Amendment	4	< 16mm	< 0.2% R&H	< 2.2 AS3743	< 200 AS3743	Specific
	Cut Flower growing	Fertiliser	Soil Additive	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific
	Mushroom growing	Compost	Soil Additive	4	< 16mm	< 0.2% AS4454	< 2.2 AS3743	< 200 AS3743	Specific
	Turf Grass growing	Soil Conditioner	Soil Amendment	4	< 5mm	< 0.2% AS4419	< 2.5 AS4419	< 1000 R&H	Specific
	Turf Grass growing	Fertiliser	Soil Additive	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific
	Viticulture	Compost	Soil Additive	4	< 10mm	< 0.2% AS4419	< 2.5 AS4419	< 1000 R&H	Specific
	Viticulture	Soil Conditioner	Soil Amendment	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific
	Viticulture	Fertiliser	Surface Mulch	3	> 16mm	as per AS3743	< 2.2 AS4454	< 200 AS3743	Specific
	Production Nurseries	Compost	Surface Mulch	3	> 16mm	as per AS3743	< 2.2 AS4454	< 200 AS3743	Specific
	Production Nurseries	Soil Conditioner	Tube Stocks	4	< 16mm	as per AS3743	< 2.2 AS3743	< 200 AS3743	Specific
Production Nurseries	Fertiliser	Soil Additive	3	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific	
Production Nurseries	Compost	Soil Additive	3	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific	

Table 3 – Market Quality Matrix

Market Categories	Market Segments	Product Type	Application	Maturity Index	TEST PARAMETER AND METHODS				Usage Guide
					SIZE	NPK	E.C (ESP)	Chloride	
					Grading Guide	Content & Test	(dS/m)	(mg/Kg)	
Extensive Agriculture	Pasture Farming (grazing)	Compost	Soil Additive	3	< 16mm	< 0.2% AS4419	< 2.2 AS4454	< 200 AS3743	Specific
	Pasture Farming (grazing)	Fertiliser Compost	Soil Additive	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific
	Cropping	Compost	Soil Additive	3	< 16mm	< 0.2% AS4419	< 2.2 AS4454	< 200 AS3743	Specific
	Cropping	Fertiliser Compost	Soil Additive	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific
	Forestry	Compost	Soil Additive	3	< 16mm	< 0.2% AS4419	< 2.2 AS4454	< 200 AS3743	Specific
	Forestry	Fertiliser Compost	Soil Additive	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific
	Forestry	Mulch	Surface Mulch	3	> 16mm	as per AS3743	< 2.2 AS4454	< 200 AS3743	Specific
	Compost Teas	Compost	Soil Additive	3	< 16mm	< 0.2% AS4419	< 2.2 AS4454	< 200 AS3743	Specific
Urban Amenity	Landscape Contractors	Compost	Soil Additive	3	< 16mm	as per AS3743	refer table 3.3 AS4454	N/A	Generic
	Landscape Contractors	Mulch	Surface Mulch	2	> 16mm	as per AS3743	refer table 3.3 AS4454	N/A	Generic
	Landscape Contractors	Soil Conditioner	Soil Additive	3	< 16mm	as per AS3743	refer table 3.3 AS4454	< 200 AS3743	Generic
	Landscape Contractors	Fertiliser Compost	Soil Additive	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific
	Sporting Grounds	Soil Conditioner	Top Dressing	4	< 5mm	as per AS4419	< 1.2 AS4419	< 200 AS3743	Generic
	Sporting Grounds	Fertiliser Compost	Soil Additive	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific
	Golf Courses	Soil Conditioner	Top Dressing	4	< 5mm	as per AS4419	< 1.2 AS4419	< 200 AS3743	Generic
	Golf Courses	Fertiliser Compost	Soil Additive	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific

Table 3 – Market Quality Matrix

Market Categories	Market Segments	Product Type	Application	Maturity Index	TEST PARAMETER AND METHODS				Usage Guide
					SIZE	NPK	E.C (ESP)	Chloride	
					Grading Guide	Content & Test	(dS/m)	(mg/Kg)	
Urban Amenity (Cont'd)	Retail Garden Centres	Compost	Garden Additive	3	< 16mm	as per AS3743	refer table 3.3 AS4454	N/A	Generic
	Retail Garden Centres	Fertiliser Compost	Soil Additive	4	< 10mm	> 0.2% R&H	ESP < 15%	< 1000 R&H	Specific
	Retail Garden Centres	Soil Conditioner	Soil Additive	3	< 16mm	as per AS3743	refer table 3.3 AS4454	N/A	Generic
	Retail Garden Centres	Mulch	Surface Mulch	2	> 16mm	as per AS3743	refer table 3.3 AS4454	N/A	Generic
	Council Parks & Gardens	Compost	Garden Additive	3	< 16mm	as per AS3743	refer table 3.3 AS4454	N/A	Generic
	Council Parks & Gardens	Mulch	Surface Mulch	2	> 16mm	as per AS3743	refer table 3.3 AS4454	N/A	Generic
	Domestic Gardens	Compost	Garden Additive	2	< 16mm	as per AS3743	refer table 3.3 AS4454	N/A	Generic
	Domestic Gardens	Mulch	Surface Mulch	2	> 16mm	as per AS3743	refer table 3.3 AS4454	N/A	Generic
	Domestic Gardens	Soil Conditioner	Soil Additive	3	< 16mm	as per AS3743	refer table 3.3 AS4454	N/A	Generic
Rehabilitation	General Landscaping	Mulch	Surface Mulch	2	Un-screened	as per AS4454	refer table 3.3 AS4454	N/A	Generic
	Landfill Rehabilitation	Mulch	Surface Mulch	2	> 16mm	as per AS4454	refer table 3.3 AS4454	N/A	Generic
	Mine Site Rehabilitation	Mulch	Surface Mulch	2	> 16mm	as per AS4454	refer table 3.3 AS4454	N/A	Generic
	Catchment Rehabilitation	Mulch	Surface Mulch	2	> 16mm	as per AS3743	refer table 3.3 AS4454	< 200 AS3743	Generic
	Erosion Control (blankets/berms)	Mulch	Erosion Control	2	> 16mm	as per AS3743	refer table 3.3 AS4454	< 200 AS3743	Generic
Bioremediation	Contaminated Sites	Compost	Bioremediation	2	< 16mm	N/A	N/A	< 1000 R&H	Specific
	Primary & Secondary Industry	Compost	Biofilter medium	2	< 16mm	as per AS3743	< 2.2 AS3743	< 200 AS3743	Generic

Table 3 Explanatory Notes

1. As methods used for a given test may differ between the Standards, the benchmark values provided are only valid for results obtained using the specified AS testing method.
2. All products listed shall otherwise comply with AS4454 for physical and chemical contaminants.
3. Information provided in the *NPK Content & Test* column indicates both the threshold concentration of Nitrogen, Phosphorus and Potassium and the recommended laboratory test method to determine the actual concentrations in the product.
4. *ESP* refers to the Exchangeable Sodium Percentage, the ratio of sodium ions to the total cation exchange capacity ie. the extent to which the adsorption complex of a soil is occupied by sodium. It is expressed as: $ESP = [\text{exchangeable sodium (meq/100g soil)} / \text{cation exchange capacity (meq/100g soil)}] \times 100$. Fertilising composts may have higher EC levels, provided the salt contribution to the EC is neither sodium nor chloride ions. The exchangeable sodium percentage indicates the relative contribution that Na makes to the EC.
5. *1R&H* refers to *The Australian Laboratory Handbook of Soil and Water Chemical Methods*, by Rayment & Higginson. Methods in this text can be used to interpret the fertiliser equivalence of composts used as fertilising composts and soil conditioners.
6. It is recommended that all fertilising composts should reach Stability Phase 4 (mature product) as the fertiliser value of unstabilised composts is subject to change in the short term.
7. **SPECIFIC** means that application guidelines need to be developed in consultation with expert advisors.
8. **GENERIC** means that there are application guidelines written prior to 2008 available for use.

What are the chemical properties of the product?

The chemical properties of a product fundamentally determine the range of applications that it may be suitable for and provides important information for determining the value of the product in a specific application. Initially, and then each time that the feedstock or process is varied, the full range of relevant chemical tests should be undertaken. The scope of ongoing testing can be limited subject to:

- identification of chemical properties that may present a risk (or value) through initial testing;
- definition of the product (for example a fertilising soil conditioner);
- definition of its application(s) (including context) and appropriate application technique.

Mulches require less chemical testing than soil conditioners or composts because their primary role is to act as a physical barrier rather than a chemically and biologically active soil additive or amendment.

Table 3 lists all chemical tests relevant to the design of application specific recycled organic products and provides guidance on the situations where each test is relevant. A limited number of tests are considered essential or normative (1). A slightly larger range of test (typical results) should be displayed on the standardised product information sheet (the Template) and are provided to the customer (2). The remaining tests may be required and/or displayed on the product information sheet depending on the product and its application (3 & 4).

Table 3 also recommends the test method that should be used by referring to methodologies described in several existing Australian Standards and *The Australian Laboratory Handbook of Soil and Water Chemical Methods* (Rayment & Higginson, 1992). As different test methods do not always provide comparable test results these methods should be used consistently.

Key for 'Maturity Index' column in Table 3

1	Normative for product release testing (includes requirements of 2 & 3)
2	Must be displayed on product specification supplied to customer (includes requirements of 3)
3	Must be included in initial testing for product design (know your product)
4	Optional informative test for product design

What are the physical properties of the product?

The key physical property of a product is its particle size grading. While the particle size grading does depend on the feedstock or process it can be adjusted post processing using shredding, screening and blending equipment. To simplify particle size grading measurement and specification the use of three standard sieve sizes (5, 10 & 20 millimetres) is recommended. Understanding the amount of product that passes through each sieve allows the product designer to specify how the product should be shredded, screened and/or blended post processing to deliver value in the intended application.

Product Classification based on Particle Size Grading:

Mulch	Equal to or more than 70% by mass retained on 20mm sieve
Fine Mulch	20% to 70% retained on 20mm sieve; > 50% retained on 10mm: < 25% retained on 5mm
Compost/Soil Conditioner	Not more than 20% to be retained by 20mm sieve
Unscreened	Not screened

Physical contamination is another physical property of a product that must be considered in product design. Acceptable levels of physical contamination are generally dictated by the aesthetic tastes of the customer. In some cases physical contamination can cause harm to human health or the environment, particularly as litter. The other significant risk is through cuts and abrasions caused by glass and other sharps contamination during or post application to land.

The levels of physical contamination that affect plant growth appear to exceed most aesthetic limits set by the customer. Compost Australia intends to publish 'Guidelines for Physical Contamination in Recycled Organic Products' during the 2008/2009 financial year.

Table 4 – Chemical and Physical Testing for Application Specific Products

No.	Tests	Method	Physical and Chemical Testing Requirements				Interpretive Information
			Mulch	Fine Mulch	Compost/SC	Unscreened	
1	pH	AS4454, AS4419 D5.2 (Compost/SC), Soil:water extractant ratios 1:5	1	1	1	1	Indicates whether compost is likely to damage plants. Can affect the availability of nutrients in mixes. This test used in conjunction with other tests to determine maximum application rate.
2	Electrical Conductivity	AS4454, AS4419 D5.2 (Compost/SC), Soil:water extractant ratios 1:5	1	1	1	1	Indicates both fertiliser value and/or high salt levels. If > 4 then further testing for nutrients/salts recommended. A soil:water extractant ratio of 1:5 ensures the nutrient value of the composts equates directly to their fertiliser/soil health value.
3	Phosphorus-Soluble	AS3373, AS4419 (Compost/SC), Soil:water extractant ratios 1:5		3	3	3	Mulches compliant with AS3743 criteria are suitable for high rate application.
4	Total P	AS3373, R&H 9A (Compost/SC)		2	2	2	Required for calculation of fertiliser equivalence.
5	Ammonia N	AS4454, AS4419 D5.2 (Compost/SC), Soil:water extractant ratios 1:5		1	1	1	A measure of product stability. Indicates levels of plant-available nitrogen.
6	Nitrate N	AS3373, R&H 7C1b (Compost/SC), Use 1:1.5 water soluble and calculate to mg/kg.		3	3	3	Indicates level of plant-available nitrogen.
7	Total N	AS3373, R&D 7A (Compost/SC)		2	2	2	Required for calculation of fertiliser equivalence.
8	Organic Carbon	AS4454, display organic carbon not estimate of organic matter		2	2	2	Informs application specific product development. Wet oxidation method more appropriate to understanding biologically-active organic carbon.
9	Boron	AS4454		3	3	3	Indicates whether compost is likely to damage plants. Can benefit plants in certain contexts.
10	Sodium	AS4454, AS4419 D5.2 (Compost/SC)		3	3	3	Indicates whether compost is likely to damage plants. Can benefit plants in certain contexts.

Table 4 – Chemical and Physical Testing for Application-Specific Products

No.	Tests	Method	Physical and Chemical Testing Requirements				Interpretive Information
			Mulch	Fine Mulch	Compost/SC	Unscreened	
11	Wettability	AS4454		1	1	1	A measure of product stability. Hydrophobic products are not suitable in many plant growth situations.
12	Toxicity (bioassay)	NA					Test as required in AS4454 replaced by stability/maturity index.
13	Particle Size Grading	NA	1	1	1		Screen dry material on 5, 10 and 20 mm sieve. Particle size criteria should conform to AS4419 for large particles and for topdressing: < 2% by wt retained on 20 mm, < 8% pass 20 mm but retained on 10 mm, and < 15% retained on 5mm.
14	Total CaCo ₃ Equivalent	AS4454			3	3	Liming equivalence important when used as a soil conditioner. Test not required when pH < 7.5.
15	Chemical Contamination (includes heavy metals, organic contaminants and pathogens)	AS4454	2	2	2	2	Tests for compliance with state and national guidelines or regulations.
16	Physical Contamination	AS4454	2	2	2	2	Informs product acceptance testing (marketing) and limits the use of some application techniques (e.g. use of compost blowing equipment)
17	Moisture Content	AS4454		1	1	1	Used to interpret the recommended tests for stability/maturity. Used to calculate nutrients value in field state (dry mass). Recommended < 40% for finished products.
18	Plant propagules	AS4454	2	2	2	2	Indicates if there are viable seeds present in the product. Where viable seeds exist there is a risk that weeds will germinate on application to land.
19	Nitrogen Drawdown Index (NDI)	AS3743, for mulches test < 10 mm fraction		1	1	1	Indicates whether product will draw nutrients out of the soil thus damaging or killing plants. Part of the stability/maturity index.
20	Soluble and Exchangeable Cations (CEC)	R&H 15A1			3		Indicates whether a product can improve the nutrient holding capacity of the soil or manage salinity (soil health benefits).
21	Chloride	AS3743, R&H 5A (Compost/SC)		3	3	3	Indicates whether moderate to high EC is related to presence of key nutrients or undesirable salt content. Not relevant when EC is low (< 4 ds/m). In certain applications/contexts high salt levels can cause damage to plants.

Table 4 – Chemical and Physical Testing for Application-Specific Products

No.	Tests	Method	Physical and Chemical Testing Requirements				Interpretive Information
			Mulch	Fine Mulch	Compost/SC	Unscreened	
22	Trace Element (Fe, Mn, Zn, Cu, B, Mg, Ca)	AS3743, R&H 12A (Compost/SC)		4	3	4	Depending on the application trace elements may benefit or damage plant growth.
23	Exchangeable Sodium Percentage (ESP)	R&H 15A1		4	3	4	Indicates whether the product may exacerbate sodic soils.
24	Colwell P	AS3743, AS4419 D5.2 (Composts/SC)		4	3	4	Informs calculation of fertiliser equivalence.
25	Sulphate/Sulphur	AS3743, R&H 10B		4	3	4	Indicates whether compost is likely to damage plants. Use 1:1.5 water soluble.
26	Bulk Density	AS4419		4	3	4	Required to calculate fertiliser equivalence and soil health benefits.
27	Stability/Maturity Index	Derived from tests 6, 12 and 20, with reference to test 18.	1	1	1 (Stability Phase \geq 3)	1	For mulch and fine mulch fines (< 10 mm) the Stability Phase should be \geq 2 to ensure mulch is not hydrophobic. For less mature/stabilised composts, the results of fertiliser equivalence testing is unreliable, and nutrient drawdown is likely to induce nutrient deficiency in seedlings and surface-feeding plants.

Table 4 Explanatory Notes

1. Tests to calculate the stability maturity index are 6, 12 and 20 with reference to test 18.
2. A moisture content of less than 40% is recommended in the final product. Results for test 5,7,9,21,23-25 done on products with greater than 40% moisture and a stability index of < 3 may change properties if stored for any length of time prior to application.
3. Mulches compliant with nutrient concentrations as given in AS3743 are suitable for high rates of application to the soil surface. Unscreened and fine mulch not compliant with AS3743 should be analysed as a compost/soil conditioner (excluding test 9).
4. A compost or soil conditioner may contribute to soil fertility. Testing should conform to the protocols used to assess soils and fertilisers for the concentration of plant available nutrients.

Guidance Documents

[Composting Science for Industry](http://www.recycledorganics.com/processing/composting/science/science.htm)

(<http://www.recycledorganics.com/processing/composting/science/science.htm>)

This package aids in understanding the fundamentals of composting and enables operators to manipulate the composting process to maximise the rate of decomposition of the organic material and meet other environmental or quality specifications.

[Information Sheet: Soil testing guidelines for intensive agriculture to guide recycled organics applications](http://www.recycledorganics.com/infosheets/IS_soil-testing.pdf)

(http://www.recycledorganics.com/infosheets/IS_soil-testing.pdf)

An agricultural soil-testing regime to inform soil and crop specific recycled organics product application.

[Know your Product Before Marketing Compost to Agriculture](http://www.wmaa.asn.au/uploads/documents/Knowyourproduct2004.pdf)

(<http://www.wmaa.asn.au/uploads/documents/Knowyourproduct2004.pdf>)

An explanation of why you need to 'know your product' before marketing to agriculture.

[The Need for Better Product Specifications in AS4454](http://www.wmaa.asn.au/uploads/documents/Needforbetterproduspec.pdf)

(<http://www.wmaa.asn.au/uploads/documents/Needforbetterproduspec.pdf>)

An explanation of the need for (and benefits of) additional testing and product specification beyond the current scope of AS4454-2003.

3.2 Identify and Prioritise Target Market

A 'target market' is a defined group of customers and the applications in which those customers may use recycled RO products. Over 30 separated markets have been identified for RO products, with multiple potential applications for RO products in each of those markets. With such a large number of potential markets and applications it is important to focus the product manufacturers' limited resources on priority markets.

Is the target market being selected based on the existing process output or other factors?

Target markets may be identified solely based on the knowledge that the output of an existing feedstock and process (the product) is suitable for a particular application. Alternatively a range of other factors, such as proximity to a particular market or access to market intelligence may influence the selection of a target market. In this situation an iterative product design process may be required where process or feedstock is varied to meet the needs of a particular market and application. Sections 3.1 to 3.5 of this document describe this iterative process.

Is the target market a production or amenity based market?

Market research reveals the needs and wants of potential product users. For example, amenity markets such as landscaping will be primarily interested in the look of the product. For markets focussed on production (rather than amenity), it is crucial to understand how a product may reduce production costs, lead to increased yield or otherwise increase profit for the customer. Recycled organic products also tend to have an environmental services value, such as reduced nutrification of waterways, which can improve the value proposition for the customer.

Can sufficient market research be uncovered using secondary research techniques?

A large quantity of market research information is publicly available online or through various government agencies and not-for-profit organisations. This information can be uncovered through secondary research such as internet and library searches, review of key references (reports & technical papers) and consultation with experts on particular markets. Primary market research, or collection of information directly from the customers, may be required to get complete understanding of target market requirements and to identify important local and regional differences (see Section 3.3 Needs Analysis).

Guidance Documents

[Recycled Organics Unit Product Use Publications](#)

(<http://www.recycledorganics.com/publications/index.htm#product>)

This web site provides a large number of reports arising from technical and market research in both urban and agricultural applications. It also provides generic fact sheets on the environmental benefits of using RO products.

[RO Library](#)

(<http://www.rolibrary.com/>)

The pre-eminent online desktop research tool for uncovering the latest publications and research in Australia relating to recycled organics. The RO Library is a searchable database that identifies relevant information and tells you where to get it. In many cases digital versions of the document can be easily accessed directly via links in the RO Library.

[Recycled Organics Clearinghouse](#)

(<http://www.recycledorganics.com/r&dclearinghouse/index.htm>)

The Clearinghouse aims to identify current programs and information resources available to the industry. The ROU maintains an on-line catalogue of information resources, and publishes a biannual [Recycled Organics National e-News](#) newsletter. Access the newsletter to uncover the latest research from around Australia.

3.3 Needs Analysis

It is critical that when developing existing products for new markets, or new products for existing or new markets, that the products developed can satisfy the needs of the customers. Product manufacturers therefore need to determine the specific needs of their target markets, and produce products that will meet those expressed needs. This will also enable a product manufacturer to develop a strategy to differentiate their products from competing products in the market place (e.g. chemical fertilisers, non-composted manures, or other generic recycled organics products).

What additional primary research is required?

Even if the results from secondary market research seem promising, primary market research is likely to be required. Primary market research is more expensive as it may involve field research, conducting face-to-face surveys, telephone surveys, setting up on-line market surveys, conducting focus groups, or in-depth interviews. Primary market research allows the marketer to determine / understand more clearly the needs and sensitivities of the market, and to better appreciate the performance requirements of the products which are required by that market segment. This can be achieved by evaluating needs at a customer level:

1. What are the functional requirements of the product?
2. What should be the balance between features and price?
3. How critical is it that the product reliably meets the performance requirements of the customer?
4. How critical is it that the product meets its specification or a separate standard?
5. How long will the product need to meet its performance requirements before it deteriorates?
6. How critical is it that the product be serviceable?
7. What are the aesthetic requirements of the product?
8. Is the customer sensitive to perceptions of market quality and value?

Distinguish between key limiting factors and soft personal preferences

When conducting such market research, it is important to focus on business challenges facing the user and/or market. Some of the responses to questions that are derived from these issues may be considered to be 'soft personal preference', and may not be critical in product choice. However, a range of issues including regulations (current and impending), economic factors, pressures and challenges facing a user and/or market all change the context of the market, and can be much more influential on bringing about change than soft personal preferences.

Refer to Appendix 1 for an example of the type of questions to ask the customer(s).

Is external technical support required?

Recycled organics products require an understanding of science and engineering underlying their performance. Market research needs to be combined with technical knowledge so the specific technical performance requirements can be combined with expressed needs and sensitivities of the market. Without a scientific understanding of the technical properties of recycled organics products, specific performance requirements associated with market opportunities that are identified through market research may not be achieved.

For example, within an intensive agricultural organics forum, an understanding of how composted soil conditions release nitrogen and phosphorus over time may be a significant advantage when discussing and identifying the nutrient and water requirements of a crop to maximise yields. Thus if technical expertise is coupled with sound market research, an organics processing enterprise can be confident of developing appropriate products with the required level of performance that will meet the expressed needs of their customers.

Depending on the product being developed, and the intended market application, technical support may be required and can be found in regional Department of Primary Industry departments, Agricultural Scientists and Horticulturalists, and from certified laboratories.

Under the Certified Composts Scheme product manufacturers must be able to demonstrate that they have followed the criteria for selecting the most appropriately qualified technical personnel for guidance in developing the product.

Refer to Appendix 2 'Criteria for Selection of Technical Advisors'.

Document the steps taken for future reference

Document the outcomes of research and development activities to inform the Gap Analysis and subsequent steps in the product development process.

Guidance Documents

[Guide to Researching Agricultural Markets for Recycled Organic Products](#)

(<http://www.recycledorganics.com/product/agriculture/roumktwkbook/rou-mkt-wkbook.htm>)

A step-by-step guide to the identification, evaluation and quantitative estimation of regional agricultural/horticultural markets for composts to enable prioritisation of viable market opportunities by recycled organics enterprises.

[Product Specifications and Application Guidelines for Compost Mulch for Orchard Production in NSW](#)

(<http://www.recycledorganics.com/product/agriculture/orchprodspecs/orchprodspecs.htm>)

A worked example of a product development process and the associated market research required. These product specifications are targeted at maximising agricultural performance from the application of composted mulches for orchard production in NSW.

[Australian Society of Soil Science Inc \(ASSSI\)](#)

(<http://www.asssi.asn.au/cpss/accredlist.php>)

Certified Professional Soil Scientists can be found by name or location using an online search service provided by the ASSSI. ASSI is Australia's national professional association for soil scientists.

[Commercial Laboratories](#)

(<http://www.recycledorganics.com/lab/commercial/commlabs.htm>)

An online listing of laboratories accredited by the National Association of Testing Authorities (NATA) and involved in testing of RO ingredients and products. These laboratories can often also provide advice on technical product design issues.

3.4 Gap Analysis

A gap analysis examines the difference between what the market requires and the product currently produced. If a 'gap' is identified then the feedstock, process and/or post processing activities may have to be varied to ensure that the product developed meets minimum human health and environmental protection requirements, and the identified customer and/or market place needs.

Is there an existing general or Application-Specific Product Specification for the application?

Existing product specifications may have already been developed for the target market and specific application (or similar application). These specifications may be publicly available or proprietary in nature. If available, existing product specifications can significantly shorten the product development process.

The Recycled Organics Unit, University of NSW, has developed an online tool for finding and selecting existing recycled organic products called the *Product Selector*. The *Product Selector* is designed to allow the selection of a recycled organic product that may suit the identified needs of a customer from a stock of publicly available specifications.

Is a new Application-Specific Product Specification required?

Compare the information collected in Section 3.1 with information collected in Section 3.3. Where existing product characteristics vary from target market needs, identify potential variations to feedstock, process and post processing activities to align performance with needs.

Where there is no 'gap' identified, or a relevant product specification is available, then further product design will not be required. Refer to Section 3.6 to develop application guidelines for the product.

Document the product performance specification.

A performance specification details how a product needs to perform in a certain application. In other words, it describes the necessary performance characteristics of the product in a given context. The required performance information for the product is obtained through a combination of market and technical research. Suitable expertise is required to define a performance specification, as it requires a consideration of material selection and blending to best meet the needs and performance expectations of the customer or market.

The performance specification produced describes the performance of an optimum product for the application. Achievement of the performance, however, is dependent on the amount of technical information available and the validation of the product following its trial production. Complete the performance specification worksheet in Appendix 4.

Guidance Documents

[Recycled Organics Product Selector](http://www.recycledorganics.com/product/selector/index.htm)

(<http://www.recycledorganics.com/product/selector/index.htm>)

The Product Selector is designed to help the user select a recycled organic product that suits their particular requirements. In its current form it provides information on general product types. It is intended that the Product Selector be expanded to provide publicly available (non-proprietary) detailed product specifications and application guidelines under each general product type.

[How to Use Recycled Organic Products](http://www.recycledorganics.com/product/howtouse/howtouse.htm)

(<http://www.recycledorganics.com/product/howtouse/howtouse.htm>)

A series of information sheets defining general product types and their use. Products covered include those in relevant Australian Standards such as compost, soil conditioners and mulches, soils for landscaping and garden use, and organic products used for playground resurfacing. The definition of these general product types provides the basis for developing products for more specific applications using the Process. This document also provides guidance on suitable product applications.

3.5 Define Product Characteristics (Product Specification)

Product characteristics, as defined in the Product Specification, that deliver the best value to the customer must be defined and documented based on the gap analysis. Conversion of the Performance Specification that has arisen out of market and technical research into a Product Specification is a critical step in the product development process. Technical knowledge of products, materials and market research information is required to convert performance specifications into a product specification. This information will have been collected through Sections 3.1 to 3.4 of the Process.

Draft a product specification and prepare a prototype product

Given the functional or performance objectives for a product, a draft product specification should be written so that a prototype product can be produced and tested against market-derived performance requirements. Consideration of a number of chemical, physical and biological properties is required in order to select materials to be incorporated into an application-specific product. This includes how the organic product is to be prepared, what level of decomposition and maturity is required, and whether any complementary products are required for a given application.

Unlike relatively inert materials chosen in the design and production of manufactured goods, organic materials used in recycled organics products tend to change with time as they are biologically active. Microorganisms present within the material can continuously decompose the organic fraction, leading to changes in performance characteristics. Potting mixes, for example, that contain partly matured compost as an organic amendment, can shrink in the pot over time. A fully cured composted amendment, which is not susceptible to significant decomposition and slumping over time, will minimise product variability over time.

What test methods are appropriate for the product?

A detailed chemical, physical and biological analysis is required at the product specification stage for all materials (both organic and inorganic) to be included in a product. Consideration of the properties of the materials will inform appropriate blending ratios and the likely properties of the product after formulation. The full range of properties that need to be considered during product design are described in Section 3.1.

The test methods recommended in Table 4 are drawn from a range of relevant Australian Standards and soil testing literature. In cases where the performance attributes cannot be validated by testing against a Standard, test methods should be developed in consultation with an external laboratory (if testing facilities and expertise do not exist within the organisation). The range of characteristics requiring ongoing testing may be reduced based on the intended product type, market and application.

Although product standards may not be available for products appropriate for emerging markets, manufacturers are encouraged to consider the basic quality requirements of the market by referring to related product standards in the product specification process. A number of characteristics for different recycled organics products are likely to be similar (e.g. physical contamination, weed and pathogen content), so reference back to a related minimum quality standard (e.g. AS4454 for Composts, Soil Conditioners and Mulches) is often appropriate.

Consider variation of feedstock and blending with additional materials

Choice of materials to be included in a recycled organics product should be made so that the combined attributes of the materials match performance requirements of the customer or market. Materials selection and decisions on blending ratios can be difficult in the product specification stage, particularly if the chemical, physical and biological properties of the organic material chosen are variable or are not available.

Depending on the application, engineering design is likely to reveal that some 90% or more of the component materials that can be included in the product formulation are known, based on their physical, chemical and biological properties. These materials may also be readily available, are reliable and are within reasonable price ranges.

Additional materials or components may need to be included into the product formulation to achieve the desired performance characteristics. Here is where creativity and specialised technical expertise may be necessary. This obstacle is overcome by developing or selecting a new material or component to be included in the design, or by eliminating the needs by changing the rest of the design. A variety of typical organic components may be incorporated into a purpose specific product, and some examples are given in Appendix 3.

What are the risks relating to the product and its application?

Low levels of product stability and maturity represent a significant risk in many markets and applications. To address this risk Section 3.1 provides an indication of product suitability for selected market categories based on the Stability and Maturity Index. Other risks relating to RO products should be identified and assessed using a risk management tool such as the Australian Standard for Risk Management (AS4360:2004).

Product related risks should be considered in the context of potential applications. Some risks only arise in particular contexts and many risks can be managed by varying application rate and technique. Examples of potential areas of risk in the context of product application include:

- Timing – what happens if it is used at wrong time of the year?
- Volume– what happens if too much mulch is used?
- Soil type – is the product appropriate for the particular soil type where it is being applied?
- Analysis – have I considered a soil analysis (where the product is being applied) when developing the product?
- Nutrient loading – is it too high or too low?
- Ph/E.C – what are the appropriate levels for application?

Document the guidelines for manufacturing to the Product Specification

The set of tools and information developed during the product development process can be used to develop procedures for materials selection and blending. Controlling the manufacturing process is critical to ensure the properties of the batch/prototype reflect the properties of the manufactured product. If this does not occur, the batch/prototype product may not accurately represent the performance of the product required by the customer and/or markets.

A key step in maintaining quality is to ensure that standard manufacturing procedures are in place. Draft procedures for manufacturing the prototype product allows easy integration into the manufacturing process after the product validation stage has been completed.

Guidance Documents

[Risk Management Tools for the Recycled Organics Industry](http://www.recycledorganics.com/publications/reports/riskmgttools/rmtools.htm)

(<http://www.recycledorganics.com/publications/reports/riskmgttools/rmtools.htm>)

This document is a risk management tool developed in response to international incidents, indicating the potential for herbicide contamination of recycled organics products. It is a precautionary step to inform the industry of the potential threat from two specific herbicides to various crops and applications and to assist producers of recycled organics products to avoid the problems that have occurred overseas. It provides an example of undertaking a risk assessment to inform product development.

[Risk Assessment of Garden Maintenance Chemicals in Recycled Organic Products](http://www.recycledorganics.com/publications/reports/riskassess/ra.htm)

(<http://www.recycledorganics.com/publications/reports/riskassess/ra.htm>)

Appendix 3 of this risk assessment summarises the risk management process fully described in AS4360:2004. See also Section 5 for an additional example of a qualitative risk assessment. The study was commissioned to evaluate the risk of domestically used garden maintenance chemicals on downstream recycling industries that use municipally collected garden organics as a feedstock material.

[Producing Quality Composts](http://www.recycledorganics.com/processing/composting/pqc/pqc.htm)

(<http://www.recycledorganics.com/processing/composting/pqc/pqc.htm>)

This package is a practical guide to assist compost manufacturers to produce quality composts and value-added products containing recycled organics. Includes advice on setting up a Quality Management System (QMS), testing, and a description of the relevant standards. This information will assist the manufacturer to gain control of their process so they can consistently meet a product specification.

3.6 Define Product Application Guidelines

Guidelines for use of the prototype batch of product must be developed at this stage to maximise the chance of success in the required application. Application or usage guidelines will vary depending on type of product and application; for recycled organics products, application guidelines usually refer the rate of use of the product, how is it applied (or installed), and how the condition of the product is to be maintained to ensure ongoing performance.

How should the product be applied, at what rate and when?

The method of product application will largely depend on the requirements of the market as revealed in the Needs Analysis (Section 3.3). The method for product application may also be dictated by the properties of the product. For example, products contaminated with light plastics may not be suitable for express blowing. The product application guidelines should indicate a preferred method of application and/or any restrictions on application technique.

Application rates and timing may need to be limited based on the properties of the product and/or the needs of the market and application. Examples: there is usually an optimum depth at which mulches are most effective in a particular application; a product with a lower stability index may need to be applied a specified period before planting to avoid negative impacts on germination.

Prescribing limits on application rate and frequency may also provide scope for a moderately contaminated product to be applied safely to land. The risk assessment undertaken as part of developing the product specifications (Section 3.5) should provide the basis for prescribing these limits. Where applicable the product application guidelines should indicate application rate and timing.

In what contexts is the product suitable for application?

The application context includes the:

- climatic conditions;
- soil type;
- crop type;
- growing system.

Many products will be suitable for application in a wide range of application contexts. However, some products may be designed to deal with specific application contexts, or may not be able to deliver to the performance specification unless they are applied in specific application contexts. For example, a product high in chloride is likely to be toxic to plants in saline soils and should therefore not be applied in that context. Where applicable the product application guidelines should indicate the preferred application context and/or any restrictions on the application context.

Does the product require packaging?

A commonly overlooked aspect of product development is how the product is to be packaged and delivered to the customer so as to minimise changes to the product. Presentation and aesthetics are particularly important in emerging markets when user acceptance and/or knowledge of the product are minimal. The aesthetic requirements of the marketplace may have been determined from the needs and sensitivities market research, and this design information needs to be considered in the product specification process.

The packaging (if necessary) will have to satisfy a number of requirements such as:

1. protection of the product against physical and chemical stress;
2. facilitation of transport, storage, display and handling;
3. information about name, content, characteristics and use, sales appeal and advertising.

Guidance Documents

[AS4454-2003](http://www.saiglobal.com/shop/Script/Details.asp?DocN=AS084665384392)

(<http://www.saiglobal.com/shop/Script/Details.asp?DocN=AS084665384392>)

Australian Standards documents must be purchased from SAI Global. See section 3 for detailed requirements relating to packaging, marking and documentation.

3.7 Product Validation

The Product Specification should be used to manufacture a batch of product so that it can be assessed against the performance specification documented in the Gap Analysis. The product validation process consists of two stages.

Batch manufacturing of product for testing and performance validation

The performance validation stage should be a two step process. The first is to assess the performance of the product through internal trials and, if successful, later confirmed by selected potential customers. The latter is referred to pre-test marketing, for which there are a number of different models available.

The amount of product required for internal performance trials depends on the range of outcomes required, and the required application. For example, the volume of a composted mulch product required for roadside erosion control applications is likely to be significantly greater than for an orchid growing mix for commercial nursery applications.

The criteria for the performance evaluation will be based on parameters defined in the product specification stage, as discussed in Section 6. The test criteria chosen must be able to measure the performance characteristics of the products.

Performance validation trials and gaining data for cost-benefit analysis.

The design of field trials to validate the performance of a prototype product is of paramount essential. Without such data, the performance of the product cannot be confirmed, making it difficult to place a value on the product and market it successfully into segments previously identified. Prior to the design of field trials to confirm the performance of the product, the objectives of the trial need to be determined, so the trial can be designed accordingly without wasting finite time and resources. Some objectives may be to:

- confirm that the performance is consistent with the expectations of the market;
- identify technical areas where the product can be improved;
- estimate the cost / benefits from using the product as an alternative to current practice;
- establish whether the product is a worthwhile project for continued investment;
- use the performance data for marketing and promotional purposes should the performance attributes be sufficient to meet market expectations.

Guidance Documents

[Guide to Selecting, Developing and Marketing Value-Added Recycled Organic Products](#)

(<http://www.recycledorganics.com/processing/composting/selecting/selecting.htm>)

See Section 7 for a complete description of the product validation process and an example of designing a performance validation trial.

4 SELLING CERTIFIED PRODUCTS

The outcome of the product development process should be a product designed to meet the performance specifications of a target market and application. To realise the full value of developing and certifying application specific products, it is important to provide clear and concise information to the (potential) customer. Clear product information adds value to your products and certification provides a clear point of differentiation from untreated organic wastes and low quality products.

Prepare and distribute a product information sheet

Products developed using the Process should only be sold with a product information sheet containing the information and using the layout described in the Template. Where a product has been designed for a particular application but is not used as recommended by the manufacturer, performance outcomes are unlikely to be achieved and identified risks may be realised. Selling products without appropriate product and application information may expose the manufacturer to legal liability.

Product information as defined in the Template should be supplied to the customer when quoting to supply the product and with the invoice. Product specifications and application guidelines are also useful at the point of the product application. To this end the product information should also be available when the product is delivered to the customer.

Prepare sales and marketing materials

Independent certification under the Certified Compost Program entitles the product manufacturer to display the Standards Mark and Leaf Mark on their sales and marketing materials, including signage. To preserve the integrity of the scheme branding must be always be used in accordance with the Branding Guidelines, which are available from the certifier. When in doubt submit designs for sales and marketing literature to the product certifier for review.

Educate the market

As discussed in Section 2, recycled organic products are technical products requiring expertise in both their production and use. Sales of recycled organic products are often hindered by a lack of customer knowledge and expertise regarding their benefits and use. Uninformed customers tend to purchase products based almost entirely on the initial purchase price rather than product quality or performance over time, often because they do not understand why one product may perform better than another. Market education provides an objective basis for customers to select products based on product performance, not just price.

Market education is difficult for any single product manufacturer to achieve due the up front investment required. Once a market is educated there is often little stopping competitors entering the market with similar products at significantly lower cost. The Certified Compost Program and Leaf Mark offer manufacturers a mechanism to work together to educate markets whilst differentiating themselves from competitors who do not produce quality, application-specific recycled organic products. The Template means that the customer can also compare the product specification and product benefits of various certified products.

Guidance Documents

[Template for Recycled Organic Product Information Sheet](http://www.wmaa.asn.au/uploads/documents/CertifiedCompost.dot)

(<http://www.wmaa.asn.au/uploads/documents/CertifiedCompost.dot>)

A standard format for presenting product specifications and application guidelines to customers. Ensures that customers obtain the information they need to select and use recycled organic products and allows them to directly compare products.

[Certified Compost Program](http://www.wmaa.com.au/certified/compost.html)

(<http://www.wmaa.com.au/certified/compost.html>)

A website providing up to date information on the Certified Compost Program. The Certified Compost Branding Guidelines can also be downloaded from this site.

[SAI Global Product Certification](http://www.saiglobal.com/assurance/ProductCertification/CertifiedCompost/default.htm)

(<http://www.saiglobal.com/assurance/ProductCertification/CertifiedCompost/default.htm>)

A website providing further information on certification for recycled organic products and details on how to apply for certification.