

THE ORGANIC INDUSTRY AND ORGANIC FERTILIZERS

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Abstract

There are estimated to be between 1,700 and 2,000 organic producers within Australia. These numbers represent some 1-1.5 % of existing primary producers in Australia. Overall, production and ultimate consumption of organic products is estimated at less than 0.5% of current Australian domestic market.

Organic produce is certified by organizations that are accredited by the Australian Quarantine and Inspection Service (AQIS), through verification of ongoing compliance with the requirements of the National Standard for Organic and Biodynamic Produce (The National Standard).

Within the scope of the current National Standard guidelines there is a presumption of operator conformance with other health, agricultural and food regulatory requirements. However it is important to note that, both in Australia and internationally, the organic standards and end certified products are checked and verified for conformance with organic production criteria – not food safety criteria per se.

Allowed inputs into the system are generally prohibited if synthetically compounded – which is defined as a process which chemically changes a material extracted from naturally occurring plant, animal or mineral resources, excepting microbiological processes. Assessment of production processes and end products also takes into consideration consumer perception of such products, and may not be allowed where there is general perception of such products not conforming with the general opinion of what is natural or organic.

Developments in the organic production industry offer opportunities for fertilizer companies to tailor solutions to suit the specific needs of the organic sector.

The Organic Industry

The organic industry in Australia could be described as having moved past an infancy stage, however the level of maturation now seen in the EU and US economies is still somewhat off. There are estimated to be between 1,700 and 2,000 organic producers within Australia – most coming under the regulatory inspection system of one of currently seven accredited certifiers in the country. These numbers represent some 1-1.5 % of existing primary producers in Australia.¹

The numerical status of the industry however is still not reflective of its overall productive capacity. Overall, production and ultimate consumption of organic products is estimated at less than 0.5% of current Australian domestic market. Hot spot areas around the world for organic consumption are the US, EU and Japan, with the latter tipped to be the highest per capita consumer in the coming years.²

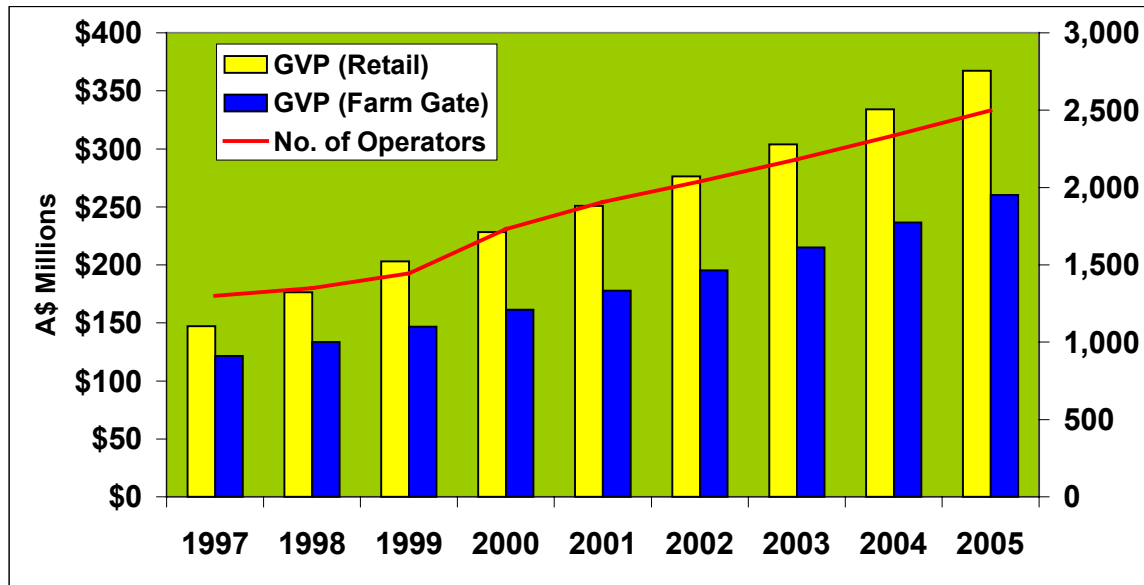
Organic products are now relatively international in their acceptance on the world trade scene – with the Codex Alimentarius listing specifications for organic production, and also in 1999 a draft for organic livestock production.³ Countries are choosing to adopt an approach that is seeing the principles laid out in ISO 65 being adopted as part of the criteria for certification organisations involved in organic certification (further reflecting the international and formalised nature of the industry).

¹ Hassall and Associates *ibid.*; Organic Federation of Australia, 1999 www.ofa.org.au.

² Lakin, Michelle and Shannon, Prue Export of Frozen Low-Chemical and Organic Vegetables to East Asia and the European Union Department of Primary Industries, Queensland 1999.

³ Codex 1999 see www.codex.

Figure 1: The Organic Industry - Value



Source: MacArthur Consulting (2000)

There is also a non-government organisation which carries out accreditation services – the International Federation of Organic Agriculture Movements (IFOAM) at the same time that government to government equivalence recognition systems are being forged. It is the latter instance that enables Australian certified organic produce to move freely into the EU and other markets of the world, based upon the Australian government backed regulatory system.⁴

Australian Organic Certifiers and Industry Regulation

Certification organisations – which operate via inspection or auditing systems, licensing arrangements and market regulation – maintain an industry regulated market for organic products. Certifiers are accredited by AQIS – the Australian Quarantine and Inspection Service – through verification of ongoing compliance with the requirements of the National Standard for Organic and Biodynamic Produce (The National Standard).

The accreditation system utilised within Australia is for export markets, however the regulatory system, operated through the Food Program section of AQIS is used as a default regulator domestically, with the major supermarkets as well as the traditional organic wholesalers of the industry actively demanding such status of all product traded. The involvement of AQIS deems the organic product leaving Australia a prescribed product, giving it a reasonably high status within the food regulation arena.

Operators are certified (by an accredited certifying organisation) based upon verified conformance to the National Standard, plus any extra requirements laid out by the certifier of choice. Minimum audits or inspections are carried out annually, with unannounced or random inspections and ongoing tissue testing of produce now mandatory. Licence agreements are signed, with annual declarations being made of production activity. Organic Management Plans are now more common parlance and further assist the industry in moving to a model of operator onus to ensure conformance with all requirements laid out in the National Standard via self imposed management plans.

⁴ Australia is one of few countries listed as having 3rd country import status for organic products into the EU – enabling free flow of trade through recognised regulatory equivalence.

The seven accredited certifiers of Australia are, in order of producer numbers certified under their inspection systems: Biological Farmers of Australia (BFA); Organic Herb Growers of Australia (OHGA); National Association for Sustainable Agriculture, Australia (NASAA); Biodynamic Research Institute (BDRI); Organic Food Chain (OFC); Tasmanian Organic-Dynamic Producers (TOP) and the Organic Vignerons Association of Australia (OVAA), with NASAA and the BFA certifying the bulk of traded organic produce on both the domestic and export markets.

The seven accredited certifiers in Australia pursue differing market strategies, providing varying services for the industry, from those servicing smaller operators in sector specific niches, through to full service across a range of sectors and sometimes audit modalities – grouped into one certification system. This may include HACCP⁵ food safety systems, or other quality oriented, HACCP based systems such as CattleCare, FlockCare and, possibly in the near future for some, FreshCare. Some operators also combine elements of ISO 9002 and similar quality management systems within their certification programs, whilst currently being assessed is the addition or combining of ISO 14001 (environmental management) criteria as part of organic certification.

HACCP and the Australian National Standard

Within the Australian National Standard there is allusion to HACCP "compatibility", however this is generic in that various hazards exist for organic production that may not necessarily be food safety concerns.⁶ The intention of the Standard is that these issues should be managed by operators via the principles implicit within HACCP.

Hence the organic industry has chosen to adopt the principle of HACCP in relation to regulation of organic production systems – including the use of any organic fertilizers or other inputs. Such Hazard Analysis may include water use on-farm, use of specific fertilizers, past farm use and potential for historic chemical residue build-up, or risk of over-spray of agrochemicals from neighbouring properties. However, this HACCP focus has not specifically led to certifiers licensing operators based upon mandatory food safety management requirements.

Within the scope of the current National Standard guidelines for certifiers⁷ there is a presumption of operator conformance with other health, agricultural and food regulatory requirements. As noted, some certifiers now offer more than just organic certification as part of this service, however it is important to note that at this point, both in Australia and internationally, that the organic standards and end certified products are checked and verified for conformance with organic production criteria – not food safety criteria per se. This is presumed as part of any producer requirements under either state regulation or industry codes of practice.

Organic Production Specifications and the Nature of Regulation

The nature of regulation within the organic industry is worth reflecting upon. It is important to note the nature of organic certification, which is aimed at both end product criteria but also production or process criteria – set nationally through the AQIS regulated guidelines.

The organic industry represents a case of being an early adopter of the principles of industry self regulation – audits/inspecting, recording requirements and legal licence agreements all being managed, paid for and instigated by the industry itself. Such developments were well underway in the 1980s in Australia, and led to the establishment of the AQIS system in the early 1990s. The nature of this system is still in place today, and relates back to a strong connection with consumer and producer input into industry regulatory guidelines.

⁵ HACCP – Hazard Analysis Critical Control Point – an assessment and management tool now used widely in the food industry to manage potential hazards to food safety. HACCP generically refers to analysis and management of hazards – which may include potential hazards to organic production – eg contamination, pollution, etc.

⁶ p15 Section 5 :OPAC – Organic Produce Advisory Committee National Standard for Organic and Biodynamic Produce – AQIS Canberra 1998.

⁷ OPAC *ibid.* Edition 2 – Point 1 under "Important Information": (1998)

Public submissions received from a recent US draft for the US National Standards is evidence of this aspect of consumer input. Over 250,000 submissions were forwarded to the United States Department of Agriculture (USDA) on the draft guidelines, with vocal positions being put in relation to such aspects as food irradiation, sewerage sludge use and Genetically Modified Organisms (GMOs) in organic foods. All were and still are prohibited for use in internationally recognised standards for organic production.

The former and latter prohibitions are worth briefly alluding to. With a divided scientific community in relation to ultimate health aspects of foods treated with or derived from such processes, the organic industry has chosen a technical position which reflects a nature of enrolling the "precautionary principle" in technical decision making, while deferring to a preferred model of endorsement for "traditional" and/or "natural" processes and/or products used within organic production systems.

Hence the prohibition on most synthetically derived fertilizers, pesticides and related inputs for organic production.

While there may be much to debate on both sides of the technical fence in regard to the safety merits of the above technologies or techniques, the issue here is that a position has been drawn, and this position is perceived by some consumers to be one which for them represents a definition of "food safety" in perhaps a more profound and/or more "ecological" way than has currently become the norm within food safety and regulation circles.

The same is true for chemical residue on produce – with an organic industry prohibition of most synthetically derived pesticides, fertilizers and veterinary chemicals within organic production systems. Some certifiers specify a maximum acceptable level of 10% of the conventional Australian and New Zealand Food Authority (ANZFA) allowance for Maximum Residue Limit (MRL) on produce for sale – denoting a recognition that ambient or historic contaminants are such as to prevent a full guarantee that any produce is completely clear of such historically residual agrochemicals as organochlorins, or heavy metals as cadmium.⁸ Use of synthetic pesticides during the production process however are expressly prohibited.

Thus "clean" in the organic instance is not necessarily one related to end product coming up negative from testing, but rather a production system which specifies or prohibits particular practices in order to achieve an end certified product. As noted, to this end, the certified organic product does not necessarily denote a food safety regulated or certified product, but presumes, based upon production practices and HACCP management of potential contamination risks, that end product comes well under the critical limits set by the conventional industry for such agents as chemical residues or heavy metals on fresh produce.

Thus the consumer is buying into a production practice, rather than specifically in this instance a "safer" or "cleaner" product – whatever the end product reality. Similarly, in this current period of non-GMO labelling possibilities, by default the organic certification mark has led to a specification of "non-GMO produced", which, it could be argued, currently is attracting a percentage of consumers who are concerned from a food safety point of view – again, whatever the end product reality.

Fertilizer specifications

The following outlines briefly the criteria which is used in assessing products for acceptability in organic production systems. The Biological Farmers of Australia maintains the organic industry's largest register of input products for use in or on organic production systems.

The BFA register of allowed and restricted inputs, aids and additives is managed to bring benefit to the organic and biologically oriented farmer and processor. Assessment of inputs which conform with the following criteria may be added for consideration to the BFA Allowed Input Register.

⁸ NASAA Standards for Organic Production Stirling 1997; BFA Standard for Organic and Bio-Dynamic Produce Toowoomba 2000.

Inputs are supplements to organic farming, and may assist in managing the conversion phase to fully biologically oriented, resilient and sustainable farming system.

Inputs which are assessed following application, and which are deemed to conform with the following criteria, may be licenced to bear an AI certification number which is borne of products along with the BFA Input Manufacturer logo.

Agricultural Inputs – Selection Criteria

- 1) Inputs shall be allowed generally where they are sourced from naturally occurring mined substances, or from organic materials from animal, vegetable or microbiological sources. Ingredients may be subjected to mechanical, physical, microbiological or enzymatic processes and restricted chemical processes only.
- 2) Allowed inputs into the system are generally prohibited if synthetically compounded – which is defined as a process which chemically changes a material extracted from naturally occurring plant, animal or mineral resources, excepting microbiological processes. Chemically created substances shall be restricted, shall be verified to be nature identical and not to be chronically toxic or to exhibit mutagenic or carcinogenic properties. Inputs shall be assessed upon the basis of necessity for organic production. The logic upon which such assessment will be based includes criteria such as yield, product quality, environmental safety, ecological protection, human and animal welfare.
- 3) Animal manure products shall be effectively composted, as per the basic production Standard.
- 4) End products for sale shall not contain levels of heavy metals or other contaminants which pose an ongoing environmental risk to the farming operation, and shall not add to the overall pesticide load in the soil. Levels are set out for individual heavy metals. Exceptions to this list may only be granted following submission and acceptance by the Certification Office (CO). Products shall be assessed in relation to standard rates and frequency of application.
- 5) Pesticide residues in manures and other ingredients shall be managed and eliminated from the production system so as not to pose on-farm contamination risk.
- 6) Where potential risk of contamination from ingredients or inputs is noted, random residue tests shall be carried out by the operator to verify that levels of pesticides and heavy metals, among other contaminants, are absent or below acceptable limits within the production system.
- 7) In cases where input ingredients for the end product are sourced from potentially contaminating areas or processes, a Quality Management system compatible with HACCP principles shall be documented, implemented and recorded by the input manufacturer to ensure the authenticity of manufactured end product.
- 8) No GE or GMOs shall be allowed in the production process.
- 9) No ionising radiation is allowed for use on the end product.
- 10) No human wastes such as urban or multi source water or sewerage shall be used within organic inputs.
- 11) Management and assessment of contamination shall take into consideration not only end testing of end product but also manage processes and input products to ensure that other potential contaminants or carcinogens, as well as potentially disruptive agents such as hormone mimics, are eliminated or removed from the production process.

- 12) Extraction processes, production and processing shall take place with consideration to sustainable management practices, protection of the environment, socio-economic aspects and work place health and safety conditions.
- 13) Inputs shall not be harmful to human health where utilised in the appropriate fashion.
- 14) Inputs shall not have a negative effect on the natural behaviour or physical functioning of animals kept on the organic farming operation.
- 15) Assessment of production processes and end products shall also take into consideration consumer perception of such products, and may not be allowed where there is general perception of such products not conforming with the general opinion of what is natural or organic.

Source: BFA Standard Version 4 (2001)

This last point highlights how the organic industry is driven both from a scientific base as well as a consumer driven base.

Also outlined by most certifiers is a guideline for heavy metal contamination levels. At all times zero contamination is aimed at, with an understanding that the environment carries with it inherent risks of contamination which cannot always be controlled.

Table 1: Guidelines for Maximum Levels of Heavy Metals

	In the Soil (PPM – mg/kg)	In manures & fertilizers (PPM – mg/kg)
Arsenic (As)	5	15
Cadmium (Cd)	5	20
Chromium (Cr)	150	1000
Copper (Cu)	50	400
Lead (Pb)	100	250
Mercury (Hg)	1	2
Nickel (Ni)	50	100
Zinc (Zn)	100	1000

Source: BFA Standard Version 4 2001.

Organic Challenges, Primary Challenges

There are challenges which the organic industry is more susceptible to and which are cause for occasional media hyperbolae.⁹ Manure use is the most regularly noted example. There is no need to highlight the concerns related to pathogenic organisms in such input products. Working within closed systems where feasible, and/or relying upon organic as opposed to inorganic input materials wherever feasible, some organic operators have traditionally utilised the natural waste of manures for fertilization. Australian certifiers, further advanced along the HACCP path, specify their own guidelines for composting and/or handling of manures, with some being more specific than others.¹⁰ It is outlined clearly in the National Standard that all manures being sourced shall be composted prior to

⁹ US ABC TV John Stossel "How good is organic food?" 4/2/2000

¹⁰ BFA (2000) *ibid.* Sections 4.3.1 – 4.3.7.

use, or where incorporated directly into the soil, shall see green manure crops (the incorporation into the soil of fresh crops) grown prior to food crops being produced.¹¹

Having noted this, there has also been a distinct technical change in many organic production units in recent years, with a flowering of new inputs which enable fertilization without the need for direct application of manures or manure based fertilizers. Indeed, it is in this area that potential exists for conventional fertilizer manufacturers to produce organic compliant products for this growing market. Nonetheless, the organic industry clearly does not prohibit the use of certain substances that are deemed to be potential food safety hazards – particularly from a microbiological perspective. This on-farm reality is not likely to change, but will be managed in increasingly more sophisticated ways through new developments of “clean” washes and sanitisers at the processing and packaging level, as well as ongoing HACCP based farm management and monitoring within the industry.

Production at the farm level is inherently “dirty” and mostly defies a true HACCP model. The real issue, from a HACCP point of view for most farm product, becomes one at harvest and then packaging or processing. Larger companies now moving into this sector represent an injection of a new culture and new technologies. This is leading to solutions to once difficult problems such as finding natural but still sanitarily effective and acceptable alternatives to ensuring safe food. In most sectors of the food industry, certified organic processing and handling operations are already certified under HACCP based food safety systems as a matter of course as part of their overall quality and safety management. Organic handling therefore is simply built into this existing quality and safety management system.

One main challenge, which perhaps is the challenge of the food industry generally across many sectors, is finding a balance between regulating the more traditional, and often commercially smaller, producers who may be less likely to adopt leading industry food safety guidelines, while also tending more and more to supply less mainstream, but nonetheless still large, alternative markets. The organic industry will remain with this dilemma at least as long as the conventional industry does.

Conclusion

The organic industry, being multi-sector based, and made up of a range of producer types, offers an equally diverse range of applications for those in the agribusiness inputs supply sector. Increasingly as the industry matures, it is collecting larger, more commercially oriented operators who in turn demand products and agricultural services to suit these new production systems.

These developments offer opportunities for fertilizer companies to tailor solutions to suit these specific needs of the organic sector. Most importantly, the increasing demand for “clean and green” food products will increasingly also drive the demand for “clean and green” agricultural inputs such as fertilizers.

Whilst organic production represents a small, albeit fast accelerating, sector of the agricultural and food industry, the important issue is to note the trend which it is leading. The organic industry and market is a tip of the iceberg of a trend towards cleaner and greener production which will impact upon all businesses which do not proactively ensure that they are meeting the challenges thrown up by such trends.

¹¹ OPAC *ibid* (1998) Section B 3.9

Reference points

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