



Organic Food in the North Coast Region of NSW

An Industry Snapshot

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Executive summary

Organic farming is a rapidly emerging type of agriculture that seeks to produce food and fibre that has not been subject to application of synthetic chemicals (e.g. synthetic herbicides, fertilisers, drenches), and aims to achieve an integrated production system where increased biodiversity and a functioning soil ecosystem promote plant and animal health. There is a growing perception that organic food is 'healthier' and 'better tasting' than conventional food, and with a robust certification system in place that assures consumers of organic integrity, demand for organic products is growing rapidly and new organic agri-businesses are emerging to meet that demand.

The total value of the certified organic industry in Australia is currently about \$1.7 billion (including production, processing, packaging, retail and wholesale), of which about 80% is domestic and 20% is export. The annual growth rate of organic agri-business in Australia is over 15%, more than 4 times that of conventional agriculture. Over 2,500 certified organic businesses now operate in Australia including 1,700 primary producers, 700 processors and 100 wholesalers.

In the North Coast region NSW, a diversity of organic businesses operate from Tweed Heads to Port Macquarie. The following key statistics are relevant for the region:

- About 270 certified organic businesses operate in the region which is roughly 35% of all certified businesses in NSW and 10% of all certified organic businesses in Australia
- Over 220 producers of certified organic food and fibre, mainly fruit and vegetables, with some livestock, and a few supplying leaves for the cosmetics industry
- Garlic, citrus, pumpkin, ginger, turmeric, avocados, macadamias, bananas, mangoes, melons, seasonal and green vegetables, seasonal fruit, herbs and spices, and beef cattle are the most popular organic foods, with each grown by at least 20 organic producers.
- Annual revenue from organic produce in the region is about \$24 million. Macadamias, garlic, beef and milk are each likely to gross more than \$1 million per annum.
- Total annual turnover of the organic industry is currently estimated at \$170 million, including revenue for processing, packaging, retailing, wholesaling and exporting, as well as production.
- A total of 75 organic businesses are processors of organic goods, including food packagers, cosmetic and essential oil processors, and abattoirs. A subset of 34 of these processors are also producers, so are able to value-add their farm-grown products.
- There are four (4) organic wholesalers in the North Coast region, all based in the Northern Rivers part of the region.
- A total of 13 businesses in the North Coast region are certified to export organic produce to overseas markets, with popular goods for overseas markets including essential oils and packaged foods (including tea and coffee).
- Total labour force associated with production of organic food and fibre in the North Coast region is about 160 FTE (indicative only).
- Total labour force associated with organic food and fibre production, processing, retail, wholesale and export in the North Coast region is about 640 FTE (indicative only).

The North Coast region possesses a diversity of agribusiness skills and extension services, and a diversity of good soils within a favourable climatic zone (high rainfall, moderate temperatures). Aligned with a good transport hub (road and rail), a strong export market, and access to key emerging overseas markets such as infant milk products, the prognosis for the organic sector on the North Coast is positive.

Support for the expanding organic sector is also important as industry practice aims for a more sustainable approach to land management, with organic production requiring use of natural mulching and fertilisers, and natural weed and pest control. Soil health and water quality are likely to be enhanced on organic farms.

This project makes three recommendations:

1. Community of Practice

It is recommended that NCLLS consider supporting the development of 'Community of Practice' for organic producers on the North Coast, which builds best practice in the sector through case studies, peer learning, and peak industry body support. This would help address the lack of institutional research/extension support for the sector.

2. Organic farm register

It is recommended that North Coast Local Land Service (NCLLS) develop a register of certified organic farms in the region, with the following minimum information:

- Area certified
- Organic products
- Environmental initiatives
- Annual turnover (mean)

The register could be developed through the distribution of a questionnaire followed up by direct liaison with producers.

3. Spatial database of organic farms

It is recommended that a spatial data layer be developed that shows the location of certified organic farms within the NCLLS region. A map layer of the spatial arrangement of organic farms may assist NCLLS in prioritising certain catchment actions, given the general observation that organic farms are likely to carry out their management more sustainably than conventional farms, particularly in regard to riverine water quality.

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Abbreviations

Abbreviation	Description
ABS	Australian Bureau of Statistics
ACO	Australian Certified Organic
AQIS	Australian Quarantine and Inspection Service
BDRI	Biodynamic Research Institute
DAFF	Department of Agriculture, Fisheries and Forestry (now DAWR)
DAWR	Department of Agriculture and Water Resources (formerly DAFF)
ELA	Eco Logical Australia
FTE	Full Time Equivalent
LLS	Local Land Services
NCLLS	North Coast Local Land Services
OGA	Organic Growers of Australia
SFQ	Safe Food Production Queensland
TOP	Tasmanian Organic Producers

1 Introduction

1.1 Overview

Interest in organically produced food is increasing in response to concerns about conventional agricultural practices, in particular food safety and human health concerns, animal welfare, and the environment (Chang and Zepeda 2005; Gregory 2000; Grunert and Juhl 1995; Harper and Makatouni 2002; Lea and Worsley 2005; Lockie *et al.* (2000); Yiridoe *et al.* 2005). An increasing demand for organic products in Australia and overseas has stimulated an industry that seeks to achieve a more sustainable footing than conventional agriculture, and provides a regulatory framework to secure the authenticity of organic produce, protecting both consumer and producer. As the Australian organic market is significantly outperforming the conventional market (Australian Organic 2013), an increasing number of produces are likely to transform to organic production, providing opportunities to improve the health of agricultural landscapes.

1.2 What is 'organic' produce

There is no standard definition of 'organic' in the context of food and other commodities, however there are several attributes against which organic and conventional products are routinely compared. These attributes guide the rules and principles that embody the organic certification framework. These attributes (from Caswell 2000) include:

- Food safety (e.g. pathogens, heavy metals, pesticide residues, food additives, veterinary residues)
- Nutrition (e.g. fat, calories, fibre, sodium, vitamins, minerals)
- Value (e.g. purity, compositional integrity, size, appearance, taste, convenience of preparation);
- Packaging (e.g. materials, labelling, information);
- Production process (e.g. animal welfare, genetic modification, environmental impact, pesticide use, worker safety).

Public concern for human health and safety, fuelled by an observed deterioration in health over time, motivates some consumers to buy organic food as insurance and/or an investment in health, and is a key driver in the consumer preference for organic food (e.g. Yiridoe *et al.* 2005). This is affirmed by Lockie *et al.* (2004), who found that Australian consumers of organic products were most concerned with the 'naturalness' of food and the sensory and emotional experience of eating food, as well as environmental concerns. It follows from the consumer perspective that organic food is guaranteed to have been produced, stored and processed without the addition of synthetically produced fertilisers and chemicals (Burch *et al.* 2001). Lockie *et al.* (2004) provides a more comprehensive definition that probably best defines the term 'organic' for the purpose of this report.

"Organic foods are foods that are guaranteed to have been produced and processed in a manner that avoids the use of synthetic fertilisers, pesticides, hormones, genetically modified organisms and irradiation, and which strives to enhance natural biological cycles and to meet minimum animal welfare standards" (Lockie *et al.* 2004).

The Australian Organic market report provides a similar definition:

“Certified organic [food] is cruelty free, pasture fed, socially responsible, free range, sustainably fished, biodiversity friendly, and grown and processed without synthetic pesticides and herbicides, genetic modification, antibiotics and artificial hormones”
(Australian Organic 2014).

It is important to clarify that many Australian farmers already adopt facets of organic management in their day to day operations irrespective of whether they intend to certify or not. However, only those farmers that are certified (or in-conversion) to deliver saleable organic goods to market are legally required to meet ALL management protocols stipulated in the Organic Standards (Australian Organic 2013). This generally requires a major shift in farm practice and a consequent need to re-educate the farmer. These can be impediments to more extensive enterprises (e.g. broad-acre cropping and livestock production) justifying the change, particularly where organic practices are also perceived to be too costly. In contrast, new or more intensive agricultural practices are often more amenable to organic conversion.

1.3 Project scope

Eco Logical Australia (ELA) was commissioned by the North Coast Local Land Services (NCLLS) to provide an overview of organic agriculture in the North Coast region of NSW. The project scope included the following broad objectives:

1. Outline of the organic sector in Australia
2. Outline of the organic sector in the NCLLS region
3. Summary broad socio-economic indicators associated the organic sector in the NCLLS region
4. Outline of three (3) prominent organic industries in the NCLLS region

1.4 Report structure

This report is divided into three (3) following chapters:

- Chapter 2 presents an overview of the Australian Organic industry, including broad national statistics as well as governance arrangements, standards and auditing.
- Chapter 3 provides information about organic production in the NCLLS region, summarised by producers, processors, wholesalers and exporters. Estimates of annual turnover and number of employees with the organic sector are provided for the NCLLS region.
- Chapter 4 presents a brief discussion that includes a section of organic farms and sustainability, as well as recommendations for future projects.

2 Australian Organic Industry

2.1 Overview

Australia is the leading country globally in term of the total area of land used for production of organic food, with 12 million hectares of land used in 2009, almost 3 times that of the next country (Argentina) and over 6 times that of the United States (Willer and Kilcher 2011). This expanded to 22.7 million hectares by 2014, although the vast majority of this land (about 97%) is extensive and relatively low-productivity grazing land used to produce organic beef, lambs and wool. As a result Australia's ranking compared with other countries is relatively low in terms of the total number of organic producers and the overall value of the industry (Willer and Kilcher 2011).

Organic lands within the non-pastoral region of Australia represent about 3% of the total organic land base but generate well over half of all revenues generated by the organic food sector (associated with horticulture and broadacre grain and feed production). Ironically, this land base is only 0.6% of the total non-pastoral land base in Australia (Willer and Kilcher 2011) so the opportunity for expansion would appear to be significant, given appropriate political, regulatory and socio-economic conditions.

A detailed synopsis of the Australian organic industry is presented in the *Australian Organic Market Report 2014* (Australia Organic 2014). The following key points are drawn from that report:

- Total value of certified organic industry ~ \$1.72 billion
- Total retail value of organic industry ~ \$1.38 billion
- Total value of organic exports ~ \$0.34 billion
- Total value of organic production ~ \$0.57 billion (including \$0.51 billion at 'farm gate')
- Total value of organic processing ~ \$1.19 billion
- Total value of organic imports ~ \$0.22 billion
- Annual growth rate of organic foods in Australia ~ 15.5% between 2009 and 2014 (compared to 3.4% for conventional foods, and 7.7% for organic foods worldwide)
- Australia represents 2.3% of the total global value of organic food
- Organic exports are increasing, particularly in North America and Europe
- Meat, processed foods, dairy, wine and beverages, and fruit and vegetables were the top 5 exported products in the organic sector in 2014
- Over 50% of certified organic primary producer operators are on small production farms supplying niche and local markets with higher value-add products
- Over 2,500 certified organic businesses operating in Australia (with NSW dominating), including over 1,700 primary producers, 700 processors and 100 wholesalers

The organic industry has been buoyant for over 20 years. Lockie et al. (2002) cite literature that found organic production to have doubled in Australia during the six years to 2000, with domestic value standing at \$A170 million (in addition to \$A80 million of exports) at the turn of the millennium. Domestic production had risen to about \$A950 million by 2009 and exports to \$220 million by 2007 (Willer and Kilcher 2011), representing an annual growth rate of about 21% in the domestic and 12% in the export markets, well above that of annual growth in the respective conventional food markets¹.

¹ The five year growth in total farm and fisheries food production increased from \$38.8 billion to \$42.8 billion between June 2008 and June 2013, an annual growth rate of about was 2% (Department of Agriculture 2014).

There are 2 major barriers to domestic consumption of organic products in Australia namely price premium/ perceived value of organic products, and low consumer confidence or cynicism in organic products/labelling (Willer and Kilcher 2011). These are slowly being addressed as major food retailers such as Coles and Woolworths expand their organic product range, and corporate activity in the organic sector escalates, including a number of capital raisings. According to the 2012 Australia Organic market report, more than 1 in 20 consumers are regular shoppers of organics, almost 2 in 3 have bought organic in the past year, and 3 in 4 organic products are bought at supermarkets, representing an ongoing market trend (cited at <http://austorganic.com/market-report/>).

Growth in the organic industry in Australia has also been strongly influenced by rapidly growing overseas demand. This influence may increase given the global demand for safe and healthy dairy products and fresh foods, particularly in China and India. Significant quantities of organic beef, lamb, wool, wine, honey and vegetables are currently exported. Bilateral and free trade agreements between Australia and other nations will support organic exports, for example the Korea-Australia and China-Australia Free Trade Agreements, and the Japan-Australia Economic Partnership Agreement.

2.2 Governance

2.2.1 Context

The organic industry is subject to robust system of certification and compliance that aims to protect consumers and producers of organic food from false claims and misleading labelling. Certification of any agri-business seeking organic status is undertaken by one of several certifying organisations against a minimum set of Standards that outline the rules under which organic enterprises must operate. Regular review of the Standards and routine auditing of both organic certifiers and organic companies provide a strong system of governance in Australia,

2.2.2 Certification

Certifying entities

Organic certification in Australia originated over 20 years ago when pioneers of the organic industry asked the Australian Quarantine and Inspection Service (AQIS) for assistance in developing a national standard for organic production. Certification now provides a system of traceability ensuring the integrity of organic produce from 'paddock to plate' (DII 2010).

Organic certification is currently performed by several organisations that are each accredited by the Department of Agriculture and Water Resources (DAWR) (formerly the Department of Agriculture, Fisheries and Forestry -DAFF) or other accreditation bodies, under the National Standard for Organic and Biodynamic Produce and the Australian Standard for Organic and Biodynamic Products – AS 6000-2009 (the Standards – section 2.2.3).

There are currently six (6) DAWR-accredited certifying bodies registered in Australia, and each must ensure that their members comply with the Standards. These bodies are:

- AUS-QUAL
- Australian Certified Organic (ACO)
- Biodynamic Research Institute (BDRI)
- NASAA Certified Organic
- Organic Food Chain
- Safe Food Production Queensland (SFQ)

There are two additional certification bodies in Australia that are accredited by a different organisation:

- Organic Growers of Australia (OGA) (accredited by the International Organic Accreditation Service)
- SAI Global (accredited by the Joint Accreditation System of Australia and New Zealand)

Each of the above certifiers possesses a distinctive 'logo' or badge that is affixed to an organic product (e.g. carton of milk) once the owner of that product has been certified. This guarantees to the consumer that the product has been certified according to the Standards, and is fit for consumption as an organic product.

Certification process

Any agri-business can become certified for the distribution and sale of organic products if it complies with the Standards and if due process is followed. This process broadly requires the following steps:

1. Development of an 'Organic Management Plan'
2. Initial soil testing and auditing
3. Qualification for 'Pre-certification' status
4. Qualification for 'In Conversion' status (following further audit)
5. Qualification for 'Certified Organic' status (following further audit)
6. Ongoing compliance with the Standards (ongoing annual auditing)

After lodgement and acceptance of the Organic Management Plan (subject to an initial audit – Section 2.2.4) the first year towards the granting of organic certification is the *pre-certification* stage in which products cannot bear reference to being certified organic. After a minimum 12 months of pre-certification, and subject to second audit, the *in-conversion* stage permits the business to sell produce with an 'in-conversion' organic logo, recognising that the business is conforming within the guidelines and procedures outlined in the Standard. After a minimum 36 months, and subject to a further audit, the *certified organic (A grade)* stage is achieved, permitting products to be traded on the organic market as certified organic (including a full certification logo). An example of in-conversion and certified organic badging is shown in Figure 1.



Figure 1. Example of 'in-conversion' and 'certified organic' logo (ACO logo)

The total time required to become organically certified is a minimum 3 years. The cost of organic certification varies from farm to farm depending on the certifying body, type of enterprise, the organic category (e.g. producer, processor, wholesale, retail), the size of the farm thus level of auditing, and other factors. The total cost of organic certification for a typical farm producing livestock and horticultural products in the North Coast region of NSW would be \$2,500 - \$4,000, plus an annual fee of about \$800-\$1,200 for ongoing inspections and maintenance of organic status.

2.2.3 The Standards

The *Australian Standard for Organic and Biodynamic Products – AS 6000-2009* is the domestic and import standard for organic produce in Australia. This Standard establishes an agreed set of procedures to be followed for the production, preparation, transportation, marketing and labelling of organic and biodynamic products including food and processed food within the Australian domestic market, and food imported into Australia (DII 2010). The role of the certifying organisations is to ensure that products marketed under their respective logos are produced according to this Standard, although some certifiers also have their own additional standards. Organic certification is ultimately established under the *Trade Practices Act 1974*, enforced by the Australian Competition and Consumer Commission (ACCC). Severe penalties can be imposed on organisations selling non-organic produce as organic.

The *National Standard for Organic and Biodynamic Produce* is administered by DAWR and is the national standard for organic exports, providing the minimum guidelines and rules under which organic exporters must operate in Australia. Organic exports are governed by Export Control Orders issued under the *Export Controls Act 1982* that give 'prescribed good' status to organic products. All products leaving Australia that are identified by the trade description 'organic' or 'biodynamic' (or word(s) of similar intent) must be accompanied by an Organic Produce Certificate. The Orders provide the necessary authority for AQIS to delegate the issue of certificates to accredited organisations. Certifiers listed in Section 2.2.2 are permitted to issue export certificates to exporters of organic produce (DII 2010).

The two Standards are summarised by Australian Organics (2013) in the document *Australian Certified Organic Standards 2013*. This document outlines the minimum requirements for certification of organic produce (raw and processed), including soil management, composting, water management environmental management, weed management, pest and disease management, and contamination response. It also provides sector-specific requirements for livestock production, poultry and eggs and dairy, provides rules and principles around processing, handling and marketing, and steps through the certification process. The document contains a list of permissible substances or processes within organic farming or in the processing of organic products. Expert panels regularly evaluate applications for the addition or removal of permitted substances to or from the Standards. The Standards themselves undergo periodic review to ensure they remain current and aligned with the requirements of State and Federal Governments and overseas countries (DII 2010).

2.2.4 Auditing

Governance of the organic industry includes regular auditing at both the certifier level and the supplier level. At the certifier level, each certifying organisation is audited to ensure that the organisation and its members meet the requirements of the Standards, and in addition AQIS accredits and conducts audits of certification organisations and their documented Export Control Orders and importing requirements (DII 2010).

At the supplier level, individual agri-businesses are audited annually to ensure ongoing compliance with the Standards.

3 NSW North Coast Organic Production

3.1 Overview

The following section provides a broad characterisation of the organic produce sector in the North Coast region of NSW. This region aligns with the North Coast Local Land Services (NCLLS) region, extending from the NSW-Queensland border to south of Port Macquarie, and encompassing 12 Local Councils with a collective area of 32,032 km². The NCLLS region is shown in Figure 2.

A number of metrics are reported in this report, including:

- Number of organic producers
- Number of organic processors
- Number of organic wholesalers
- Number of organic exporters
- Annual turnover (\$) of the organic sector
- Number of employees in the organic sector

3.2 Organic producers and suppliers in the North Coast region

3.2.1 Data acquisition

Information about organic businesses on the North Coast of NSW was sourced via the websites of the four prominent certifiers operating in the region, namely:

- AUS-QUAL (<http://www.ausqual.com.au/>)
- ACO (<http://aco.net.au/>)
- NASAA (<http://www.nasaa.com.au/>)
- OFC (<http://www.organicfoodchain.com.au/>)

Each of the above provides a search tool that enables a listing and download of organic businesses, their location (e.g. postcode), their status (e.g. producer, processor, exporter) and their product range (food and cosmetics). These data sets were sourced and merged into a single file for analysis and reporting. A total of 271 certified organic businesses were identified on the North Coast region of NSW, which is roughly 35% of all certified business operating in NSW, and about 10% of all certified organic businesses operating in Australia.

3.2.2 Organic producers

Of the 271 certified businesses operating in the NCLLS region, a total of 226 (83%) are producers of organic goods and services. A summary of the major product classes of organic producers are listed in Table 1. Horticulture and livestock are the major product classes.

Data from web searches were compiled and are summarised in Table 2 (food products) and Table 3 (non-food products). There is a considerable diversity in organic produce across the NCLLS region, with numerous businesses certified to produce food crops such as avocados, bananas, beef cattle, citrus fruits, garlic, ginger, herbs and spices, macadamias, mangoes, passionfruit, poultry and eggs, and seasonal and green vegetables including cucumbers, pumpkins and tomatoes. A number of businesses have also been established that provide a range of certified non-food products, with cattle feed, cut flowers, tea tree oil, mulch, and seeds and seedlings most common.

While Table 2 and Table 3 provide evidence of the number of businesses certified to produce a certain food and non-food product, they may not reflect the magnitude or significance of the industry. This is because certifiers may not grow or produce an organic commodity in any particular year (or ever) despite having the authority to do so, and if they do produce the commodity, it may be on a relatively small scale, for example to provide a very small market or even for self-sufficiency. Alternatively some organic growers may be producing an uncommon commodity on a relatively large commercial scale.

Table 1. Major product classes associated with organic producers in the NCLLS region

Product class	No. businesses	Notes
Horticulture	181	23 businesses value add by processing their products (including 3 that package food), while 8 also produce tea tree oil, 8 also produce mulch, 2 are exporters and 2 are involved in organic cosmetics.
Horticulture + Livestock	32	Livestock class includes production of animal products (e.g. meat, eggs) and/or livestock feed (e.g. lucerne hay). 2 businesses also involved in processing and/or packaging, 1 produces tea tree oil, and 1 produces cosmetics.
Livestock only	7	2 businesses also involved in processing, and 1 business is an exporter
Honey bees	1	Only 1 organic bee operator in the NCLLS region.
Essential oils and extracts	2	An addition 9 essential oil producers (tea tree oil) are involved in horticulture (above).
Cosmetics only	1	An addition 3 cosmetic producers also involved in horticulture (above).
Potting mix/compost	2	Only 2 organically certified producers of compost or potting mix in the NCLLS region, including Lismore City Council (in collaboration with Northern Rivers Waste). There are 8 producers of organic mulch (derived from pasture).
ALL	226	

Table 2: Organic food products certified for production in the NCLLS region

Produce	No farms certified	Notes
Garlic	78	Garlic is the most commonly produced organic food on the NSW North Coast in terms of the number of certified growers. There are a number of varieties, with Giant Australia Garlic (also called Russian or Elephant garlic) the most common.
Seasonal vegetables	70	Roughly a third of certified organic food producers on the NSW North Coast are certified to grow "seasonal vegetables" which include capsicum, horseradish, okra, parsnips, radish, rhubarb and swedes. A number of other vegetables in this table could be classed as "seasonal vegetables".
Citrus	69	Roughly a third of certified organic food producers on the NSW North Coast grow citrus trees that produce a range of fruits including cumquat, grapefruit, lemon, lime, mandarin, orange, pomello, satsuma, tangerine and tangelo.
Herbs and spices	55	A variety of organic herbs and spices are grown in the North Coast region, often in association with seasonal fruits and vegetables. Herbs and spices are sold directly, or used to make herbal teas and other products.
Pumpkins	41	Pumpkins are usually certified alongside a range of other seasonal fruits and vegetables.
Ginger	33	The most commonly certified root vegetable after garlic, this product is often grown with turmeric.
Green vegetables	31	Green vegetables include beans, bok choy, broccoli, brussel sprouts, cabbage, cauliflower, celery, chard, leek, lettuce, parsley, peas, shallots, silverbeet, snow peas, spinach, spring onion, squash, and zucchini. Many growers are also certified in herbs and seasonal fruits.
Tomatoes	28	Tomatoes are usually grown with a range of other certified herbs and vegetables.
Avocadoes	27	Only 2 businesses are certified in avocadoes alone, however several others are restricted to fewer than 6 certified foods including avocadoes. Bananas, citrus fruit and mangoes are commonly grown alongside avocadoes.
Macadamias	26	Organic macadamias are the most specialised organic food crop in the region, with almost 50% of growers certified to grow macadamias exclusively. Of those that grow other food crops, citrus is most common.
Bananas	25	Most banana growers are certified in a range of other crops, with avocadoes, citrus and mangoes most prevalent.
Mangoes	25	One business is certified to grow mangoes exclusively, while 7 other businesses are certified in 2-5 food crops, including mangoes. Avocadoes, bananas and citrus are commonly certified alongside mangoes.
Seasonal fruit	24	Seasonal fruit may include other individual fruits listed in this table (other than citrus). Many growers are also certified in herbs and seasonal vegetables.

Produce	No farms certified	Notes
Turmeric	22	Turmeric growers are often certified in other root vegetables, notably ginger
Beef Cattle	21	Unlike plant crops, many growers of beef do not diversify widely outside this product, with 3 producers certified only in beef, and 14 certified in fewer than 6 other foods.
Cucumbers	21	Certified cucumber growers are usually diversified across multiple food crops, with citrus, herbs, green vegetables, pumpkins and tomatoes most common.
Melons	21	Melons include rockmelon and watermelon, which are usually grown with a range of other food crops, particularly pumpkins.
Kale	19	This green vegetable is normally certified with a range of other vegetables and herbs.
Passionfruit	17	Passionfruit is normally certified with a range of other food crops, with bananas, citrus, green and seasonal vegetables, herbs and mangoes most prevalent.
Poultry	16	All but 1 poultry producer is certified to supply eggs. Poultry producers are commonly certified to produce citrus and seasonal vegetables.
Eggs	15	All egg producers are also certified to supply poultry. Eggs producers are also commonly certified to produce citrus and seasonal vegetables.
Custard Apples	14	Over half of all custard apple growers are certified to grow 5 or fewer additional food crops. Avocados, citrus and mangoes are commonly grown in association with custard apples.
Pecans	14	2 businesses grow pecans exclusively, while 3 other businesses grow pecans as one of 4 or fewer crops. Citrus, macadamias and mangoes are often certified alongside pecans.
Potatoes	14	Potatoes are commonly certified with a range of other food crops, with ginger, green vegetables, herbs and pumpkins being most prevalent.
Carrots	13	Cucumbers, green vegetables, herbs, kale, melons, pumpkins and tomatoes also commonly grown.
Beetroot	11	Carrots, melons and tomatoes also commonly grown.
Corn	11	Cucumbers, herbs, pumpkins and tomatoes also commonly grown.
Eggplant	11	Cucumbers, herbs, green vegetables, pumpkins and tomatoes also commonly grown.
Sweet potatoes	10	All sweet potato growers are also certified to produce pumpkins, while citrus and ginger are also commonly grown.
Chillies	9	Citrus, eggplant, ginger, herbs, melons, pumpkins and tomatoes also commonly grown.
Coffee	9	4 of the 9 certified businesses grow coffee exclusively. The others commonly grow citrus and herbs in addition to coffee.

Produce	No farms certified	Notes
Onions	8	Pumpkins and tomatoes also commonly grown.
Blueberries	7	Organic blueberry industry appears to be very small compared to the conventional blueberry industry, which is the largest horticultural enterprise in the NCLLS region, with turnover of about \$80M in 2012/2013 (ELA 2015). Blueberry producers are also commonly certified to produce garlic.
Grapes	7	No data are available on the number of growers of table grapes versus wine grapes. All grape growers are certified to produce a range of other food crops, with citrus, herbs, melons and pumpkins commonly grown.
Lychees	7	All lychee growers are certified to grow at least 10 other food crops. All lychee growers also certified to produce citrus, while herbs and mangoes are also commonly grown.
Raspberries	7	All raspberry growers are certified to produce other food crops, with citrus, cucumbers, herbs, pumpkins and tomatoes commonly grown.
Strawberries	7	All strawberry growers are certified to produce other food crops, with seasonal vegetables commonly grown.
Artichokes	6	Two growers produce artichokes as one of six or fewer crops, while the others have a diverse range of other crops, with pumpkins and tomatoes commonly grown.
Mulberries	6	One grower produces mulberries as one of three crops, while others have a diverse range of crops, All mulberry growers are also certified to produce mangoes, while citrus, herbs, kale and passionfruit are also commonly grown.
Paw Paws	6	Avocadoes, bananas, citrus and passionfruit also commonly grown.
Pineapples	6	Bananas, citrus and tomatoes also commonly grown.
Dragonfruits	5	Citrus and passionfruit also commonly grown.
Persimmons	5	Citrus and melons also commonly grown.
Plums	5	All plum growers also certified to produce citrus, while bananas and mangoes are also commonly grown.
Turnips	5	All turnip growers also certified to produce kale, while carrots, green vegetables, herbs, melons, potatoes, pumpkins and tomatoes are also commonly grown.
Other	< 5	There are numerous food crops certified by fewer than 5 organic business on the NSW North Coast. These are often grown as boutique products and include various food crops (e.g. almonds, apples, apricots, cherries, cranberries, elderberries, feijoas, figs, gooseberries, guava, honey, jaboticaba, jackfruit, kiwifruit, lablab, loganberries, longans, mung beans, mushrooms, nectarines, olives, papayas, peaches, peanuts, pears, pistachios, pomegranates, rice, sapote, starfruit and tea) and a number of animal products (e.g. geese, honey, lambs, pigs, sheep and turkeys).

Table 3: Organic non-food products grown in the NCLLS region

Produce	No farms certified	Notes
Cattle feed	15	Includes pasture grasses, hay and silage, as well as crops including barley, lucerne, maize, oats, soya beans and wheat. Often grown by producers that are also certified to produce organic beef cattle.
Flowers	14	Flowers grown to supply florists, and for cosmetics, extracts, medicinal products and food and drink products (e.g. cordial from elderflowers).
Tea tree oil	13	Most growers are also certified to sell tea tree mulch
Mulch	8	This is distinguished from cattle feed as it is not ideally suited to provide nutrition to livestock. For example, over mature <i>Setaria</i> grass is often cut to provide a mulch that can be applied to organic horticultural plots and to other gardens.
Seeds and seedlings	8	Commonly vegetable and fruit seedlings, but sometimes flowers and other stock.
Other	< 5	There are a number of non-food products certified by fewer than 5 organic businesses on the NSW North Coast. These include bee hives, bamboo, bees wax, compost, hemp, potting mix, sunflower and sugar cane.

3.2.3 Organic processors

Of the 271 certified businesses operating in the NCLLS region, a total of 75 (30%) are processors of organic goods and services. A subset of 34 of these processors are also producers, so are able to value-add to their products. A summary of the major product classes of organic processors are listed in Table 4. Packaged foods and cosmetics are the major product classes.

3.2.4 Organic wholesalers

Organic wholesalers purchase organic commodities from multiple businesses and distribute them to various suppliers. According to the web searches, there are four (4) certified organic wholesalers in operation in the NCLLS region (all located in the Far North Coast), namely:

- Bare Blends Pty Ltd (Byron Bay) – supplier of packaged food powders and flavours (<http://bareblends.com.au/>)
- Byron Bay Organics (Bangalow) – supplier of various packaged foods and snacks (<http://byronbayorganics.com.au/>)
- Santos Organics (Byron Bay) – supplier of a wide range of food and other organic produce, including beans and pulses, canned foods, cereals, chocolate and snacks, dried fruit, drinks and beverages, fermented foods, flour and baking powders, fresh fruit and vegetables, grains, herbs and spices, household products, nuts, oils, pasta, sauces, spreads, sweeteners and syrups. (<http://santosorganics.com.au/>)
- The Right Food Group (Murwillumbah) – a certified organic wholesaler and exporter of a variety of packaged food products including the 'Ozganics' range. (<http://www.rightfood.com.au/>)

Many organic producers supply to organic wholesalers located outside the NCLLS region, for example wholesalers in Brisbane or Sydney.

Table 4: Major product classes associated with organic processors in the NCLLS region

Product class	No. businesses	Notes
Packages foods	36	Includes 3 exporters and 2 wholesalers, 4 bottling operations, 11 producers of tea and coffee, 10 producers of snack foods, 9 producers of sauces or condiments, 7 producers of butters or pastes, 5 producers of cooking oils, as well as producers and/or distributors of bottled water, bread, breakfast cereals, butter, cheese, chocolate, coffee, food powders, formulated food, juices, milk and milk drinks, pasta, soft drinks, sugar, sweeteners and flavours, tea, vinegar, yoghurt, and other products. Organic food packaging companies include: <ul style="list-style-type: none"> - AVS Nutrition (Ballina) - Nambucca Macnuts (Macksville) - Organic Distributors (Byron Bay) - Quest Natural Spring Water (Murwillumbah) - Red Dragon Organics (Goonellabah) - The Koala Tea Company (South Lismore)
Cosmetics and essential oils	23	Includes 5 exporters and 1 importer. Products include essential oils (mainly tea tree), skincare, and hygiene products. Two cosmetic companies also process cooking oils and food powders, while 1 processes vinegar. Cosmetic companies include: <ul style="list-style-type: none"> - Australia Lemon Myrtle Products (Lismore) - Cawarra Cosmetics Pty Ltd (Billinudgel) - Collombatti Tea Tree (Collombatti) - Main camp Natural Extracts (Rappville) - Nature's Child (Byron Bay) - Southern Cross Botanicals (Lennox head) - The Australian Essential Oil Company (Coraki) - Vrindavan Natural Body Care (Murwillumbah)
Abattoirs	2	There are 2 certified abattoirs, both operating in Casino. These businesses are licenced to process cattle. They include: <ul style="list-style-type: none"> - Cassino RSM Processing - Northern Cooperative Meat Processing Co.
Other	14	There are a number of other organic processors operating in the NCLLS region. These include: <ul style="list-style-type: none"> - Macaz (Alstonville) – processor of macadamias - Grafton Rural Earthmoving (Grafton) – producer of organic bees wax - Norco Food (Raleigh) – producer of organic milks - Salt of the Earth (Tweed Head) – producer of organic salt

3.2.5 Organic exporters

A total of 13 businesses in the NCLLS region are certified to export organic produce to overseas markets. These are summarised in

Table 5. Organic exporters operating in the NCLLS region

Company	Produce
Alive Brands Pty Ltd	Listed on the ACO website as a processor and exporter operating in Ocean Shores NSW, with products including packaged and formulated food, sauces and condiments, and sweeteners and flavours. No website.
Australia Lemon Myrtle Products Pty Ltd	Listed on the AUS-QUAL website as a processor and exporter operating in Lismore NSW, this company produces a range of organic skincare and hygiene products as well as organic teas from the Australian tree Lemon Myrtle <i>Backhousia citriodora</i> . Website: http://www.lemonmyrtle.com.au/
Bun Coffee	Listed on the ACO website as a processor, exporter and importer of organic coffee, as well as milk drinks, sugar and tea, Bun Coffee is located in Byron Bay NSW. The company exports around the world to cafés and retailers, with its main market in Japan. Website: http://www.buncoffee.com.au/
Doubleduke Organic Farm	Based in Coraki NSW, Doubleduke Organic Farm is listed on the ACO website as a producer, processor and exporter of tea-tree oil, sourced from the native <i>Melaleuca alternifolia</i> . Most of the property from which tea tree foliage is harvested is covered by a Voluntary Conservation Agreement. Energy supplied to the house, shed and tea tree oil equipment is produced via solar panels. Website: http://www.doubledukeorganic.com.au/
Hemp Foods Australia	Listed on the ACO website as a processor and exporter operating in Bangalow NSW, Hemp Foods Australia is the largest hemp food business in the southern hemisphere, and markets a number of hemp products including seeds, protein, oil and soap. Website: http://www.hempfoods.com.au/
Jenbrook Pty Ltd	Jenbrook is based in Alstonville NSW and is listed on the ACO website as a producer, processor and exporter of organic tea tree products (derived from the native tree <i>Melaleuca alternifolia</i>). Their products include tea tree essential oils and hydrosols. Website: http://jenbrook.com.au/
Main Camp Natural Extracts Pty Ltd	Based in Rappville NSW, Main Camp is listed on the ACO website as a certified processor and exporter of essential oils. Main Camp is the world's largest commercial tea tree farming operation. It extracts its oils from a number of native plantation species. Website: http://mcnaturalextracts.com/
Mara Seeds Pty Ltd	Listed on the ACO website as a producer and exporter of livestock, Mara Seeds is based in Mallanganee NSW and produces organic round bales (from a variety of organic crops), as well as supplementary stock feed blocks, organic planting and pasture seeds and organic composts. Mara Seeds on-sells to a number of rural franchises including Norco and Landmark. Website: http://www.maraseeds.com.au/

Company	Produce
Southern Cross Botanicals Pty Ltd	Based in Lennox Head NSW, Southern Cross Botanicals is listed on the ACO website as a processor and exporter of organic cosmetics, essential oils and extracts. The company specialises in the development of ingredients exclusively derived from native Australian plants and has a strong focus on the sustainable use and preservation of natural resources. It is part of the LucasMeyer Group, a multi-national cosmetics company. Website: http://scbotanicals.com.au/
The Australian Essential Oil Company	Listed on the ACO website as a processor and exporter of cosmetics, the Australian Essential Oil Company is based in Coraki NSW. The company is a leader in the production and bulk-export of Australian essential oils, with 16 different oils exported to 15 countries worldwide. Website: http://www.australescence.com/
The Koala Tea Company	Listed on the ACO website as a processor and exporter of herbal teas and coffee, the Koala Tea Company is based in South Lismore NSW. The company buys in locally grown organic herbs from numerous growers, then value adds and sells organic teas and coffees within and outside Australia. Website: http://www.koalatea.com.au/ .
The Right Food Group	The Right Food Group was established in 1999 in Murwillumbah NSW, and is listed on the ACO website as a processor, packager, wholesaler and exporter of organic foods. It owns the popular 'Ozganics' label and exports to over 20 countries worldwide. Website: http://www.rightfood.com.au/#organic-food-manufacturing .
Wodonga Park Fruit and Nuts	This company is listed on the ACO website as a producer, processor, packager, wholesaler and exporter of organic foods, mainly macadamia products and avocado oil. The company is based in south-east Queensland with an office in Nimbin NSW. Website: http://www.wodonga-park.com.au/ .

3.2.6 Annual turnover

Overview

Regional economic data for the organic sector were not able to be obtained for this project, via either ABS or ACO. As an alternative, a proportional analysis was undertaken using relevant statistics and other data acquired for this project, to enable some indicative economic estimates for the main organic sectors. A key assumption in deriving these estimates is that the per farm turnover on the North Coast is consistent with per farm turnover elsewhere in Australia, other than for industries that chiefly operate in other parts of the nation (e.g. wine, beef, grains).

Production

Economic turnover associated with production of raw materials (food, fibre) in the organic sector is shown in Table 6. The national farm gate value of organics, not including nuts, is about \$420 million. Table 6 also provides a comparative estimate for farm gate sales of organic produce on the NSW North Coast. This estimate is \$24 million, representing about 2.5% of the \$770 million turnover for conventional agriculture (including forestry and fisheries) in the NSW North Coast (ELA 2015).

Table 6. National and North Coast organic production - \$million (2014)

Commodity	National	NSW North Coast
Fruit and vegetables	122.2	12
Wine and beverages	35.2	-
Meat	82.3	3
Dairy	113.5	2
Poultry meat and eggs	20.3	2
Nuts	Not available	4
Grains	39.9	-
Oil Crops	3.2	1
Wool, cotton and other textiles	0.9	-
Total	417.6	24

The value of organic versus conventional production on a per-business level is shown in Table 7. The total turnover per agribusiness is almost identical for conventional and organic, with each generating in excess of \$100,000 per year. This attests to the economic credentials of the organic industry, in which produce is likely to be harvested from a smaller area base than conventional farms.

Table 7. North Coast conventional vs organic production per agribusiness

Conventional			Organic		
Revenue (\$ million)	No. businesses	Revenue per business	Revenue (\$ million)	No. businesses	Revenue per business
771	7,377	\$105,000	\$24	226	\$106,000

Production and value adding

While no ABS data were available for the organic sector at the regional scale, other data suggest that annual turnover within the organic sector on the NSW North Coast is likely to be considerably greater than farm gate production alone. Given a total industry value of about \$1.7 billion nationally (Australian Organics 2015) and given that 10% of Australian organic industries are located in the North Coast region (Section 3.2.1), this infers a total turnover for the North Coast of about \$170 million, including revenue for processing, packaging, retailing, wholesaling and exporting, as well as production. As illustrated in Sections 3.2.3 to 3.2.5 above, there are 75 processors (including handlers and packagers), 13 exporters and 4 wholesalers of organic produce on the NSW North Coast. These businesses provide most of the revenue stream associated with the organic sector.

3.2.7 Labour force

Production

According to 2011 census data provided by the Australian Bureau of Statistics (ABS), the total number of people employed in the agriculture, forestry and fishing industries on the NSW North Coast was 7,146, just over 2% of all employees in the region (ELA 2015). In 2014, revenue from the organic produce industry as a proportion of revenue from the conventional produce industry was about 1.25% nationally (Australian Organic 2014).

To estimate the number of employees in the organic produce sector of the agriculture, forestry and fishing industries on the NSW North Coast, the following equation was used:

$$\begin{aligned} \text{No. employees in North Coast 2011 (organics)} \\ &= \text{No. employees in North Coast 2011 (conventional)} \times \% \text{ revenue in organics} \\ &= 7,146 \times 1.25\% = 89 \end{aligned}$$

Given a growth rate in organics over the past 4 years of about 15% per annum (Australian Organics 2014), the current estimate of employees involved in organic production on the NSW North Coast is thus about **160 employees** (full time equivalent - FTE).

Production and value-adding

The total level of North Coast employment associated with production, processing, wholesaling and exporting in the organic sector is likely to be significantly higher. Given a national turnover of \$240 billion in food production, processing, retailing and exports in 2012/2013, supporting a total of about 900,000 employees (Department of Agriculture 2014), and an estimated turnover of \$170 million within the NSW North Coast (Section 0), a proportional analysis can be undertaken as follows:

$$\begin{aligned} \text{No. employees (organics)} &= \text{No. employees (national)} \times \frac{\text{NC revenue (organics)}}{\text{Total revenue (national)}} \\ &= 900,000 \times \frac{\$170M}{\$240,000M} = 640 \end{aligned}$$

This infers a total staff base of about **640 employees** (FTE) in the organic sector on the NSW North Coast, across production, processing, packaging, retailing, wholesaling and exports, including food and non-food commodities, or just over 2 FTEs per organic business. This represents about 0.3% of the total working population of 202,000 on the North Coast (ELA 2015). It also represents about 7% of the total Australian workforce involved in the organic sector, which is currently estimated at just over 9,000 (cited at <http://www.ibisworld.com.au/industry/default.aspx?indid=1912>).

4 Discussion

4.1 Overview

The organic sector is fast expanding on the NSW North Coast, with 270 businesses currently in operation across production, processing, packaging, wholesaling and exporting. While farm gate sales generated about \$20 million in 2014, the overall industry generated an indicative \$170 million and employed 640 people along the NSW North Coast. Major food industries include citrus, garlic, macadamias, and seasonal fruit and vegetables, while cosmetics is also a significant industry. There is considerable potential to continue to expand and value add, with the coffee, tea, poultry (including eggs), and dairy industries perhaps favourably placed, while some traditional industries such as sugar may find it difficult to adapt from an agricultural production, infrastructure and processing viewpoint.

Industry expansion will be supported by an increasing recognition of the contribution of organic food in maintaining and improving the health of the population. Many school programs now include significant funding for school garden programs, and many education and health programs are being developed by the Commonwealth and State Governments. Ironically this recognition is not so apparent within the agricultural sector itself (e.g. Willer and Kilcher 2011), and there may be a level of inertia arising from lack of education and/or conservatism amongst North Coast farmers to move away from traditions that have been practiced routinely for generations. It is also likely that this inertia has been perpetuated by the fact that government and private extension and advisory services have focussed on traditional agricultural production systems. The lack of government research/extension to promote the growth of organic production systems is an ongoing impediment to stronger growth in the sector, and may limit the environmental and economic benefits that could be derived if more growers were supported with best available science and information.

It is thus more likely that ongoing expansion will be supported by new 'life-style' farmers (particularly women) taking up holdings and converting to organic. Women in agriculture are generally seen to be the key supporters and drivers of the organic industry in Australia (e.g. Lockie *et al.* 2004). Increasing consumers' awareness of organic farming and certification and the availability of organic foods may also increase organic suppliers, and may eventually be the most effective way of moving organic foods into mainstream (Chang and Zepeda 2005).

4.2 Organic food production and agricultural sustainability

Badgley *et al.* (2007) conducted a global analysis that found that organic farming methods could produce enough food on a global per capita basis to sustain the current human population, and potentially an even larger population, without increasing the agricultural land base or compromising the natural soil-nitrogen concentration in the absence of fertilisers. The authors therefore suggest that organic agriculture has the potential to contribute quite substantially to the global food supply while reducing the detrimental environmental impacts of conventional agriculture.

Organic farming is described by Wood *et al.* (2006) as a farming practice with a greater emphasis on long-term sustainability that may reduce the environmental impacts associated with provision of food more generally. Wood *et al.* (2006) found that while direct energy use and energy related emissions and greenhouse gas emissions are higher for organic farms than conventional farms, the indirect contributions are much higher for the conventional farms, leading to their total environmental impacts being substantially higher. The authors conclude that in addition to their local benefits, organic farming approaches can reduce the total water, energy and greenhouse gases involved in food production.

Conacher and Conacher (1998) reviewed the environmental effects of organic farming in Australia, and found beneficial environmental effects associated with positive changes to soil physical, biological and chemical properties, compared with conventional agriculture. Other benefits were found to be linked to organic waste recycling, reduced use of synthetic chemicals, improvements to plant and animal quality, reductions in erosion and runoff, and potential improvements to the serious problems of soil and water salinity and the loss and deterioration of ecosystems. Conacher and Conacher (1998) also observed adverse environmental effects associated with organic farming methods, including diminishing soil fertility and possible increases in soil acidity, and although the beneficial effects of organic farming were considered to outweigh the adverse, the authors identified a clear need for further scientific research into the complex relationships between organic farming and the environment in order to provide sound advice to agronomists and farmers.

4.3 Recommendations

1. Community of Practice

It is recommended that NCLLS consider supporting the development of 'Community of Practice' for organic producers on the North Coast, which builds best practice in the sector through case studies, peer learning, peak industry body support. This would help address the lack of institutional research/extension support for the sector.

2. Organic farm register

It is recommended that NCLLS build a register of certified organic farms in the region, with the following minimum information on each farm:

- Area certified
- Organic products
- Environmental initiatives
- Annual turnover (mean)

This could be completed via development of a questionnaire and direct liaison with producers (contact details already available via ACO website).

3. Spatial database of organic farms

It is recommended that a spatial data layer be developed, based on the NSW cadastre layer, that shows the location of certified organic farms within the NCLLS region. This layer would also contain relevant information established in Recommendation 1. A map layer of the spatial arrangement of organic farms may assist NCLLS in prioritising certain natural resource management actions, given the general observation that organic farms are likely to carry out their management more sustainably than conventional farms, particularly in regard to riverine water quality.

Profile - Organic Dairy Industry

Key facts

- Organic dairy products (foods and beverages) generated \$378 million in Australia in 2014, representing 22% of the national organic market
- A total of 30% of revenue was derived from milk production, while 70% was derived from dairy products (e.g. baby formula, butter, cheese, cream, flavoured drinks, ice-cream, yoghurt)
- About 14% of the total revenue from milk and dairy products was generated via the export market
- The organic dairy industry grew at 18% per annum from 2012 to 2014
- The organic dairy industry is currently worth about \$115 million
- The average retail price for a carton of milk is typically 2 to 3 times that of a carton of conventional milk
- Organic dairy farms are typically smaller than conventional dairy farms

North Coast profile

Most organic dairy products available on the North Coast of NSW are supplied from elsewhere in Australia, or are imported. The exception is Norco, a certified processor of organic milk (including non-homogenised, lite and full-cream), based in Raleigh NSW. Norco process and supply organic milk from its processing facility to a significant and growing number of businesses in Australia, and is currently expanding its milk supply in China.

The number of North Coast dairies that supply organic milk to Norco for processing appears to be low, perhaps a reflection of the perceived cost of transforming dairies from conventional to organic production.

Prospects

Global sales for organic products for babies and children are increasing, with food safety and chemical contamination a major concern for many overseas markets (Australian Organic 2014). China's recent change in population strategy from 1-child to 2-children per family, in conjunction with Australia's recent negotiation of a free trade agreement with China, offers great potential for the organic dairy industry.

Among the range of secondary dairy products, yoghurt is one of the fastest growing categories, and there is a high demand for organic milk to produce organic yoghurt. The demand for organic milk for producing other organic dairy products such as butter and cheese is also increasing. There may be an opportunity for a local company such as Norco to expand its organic product base from milk into secondary dairy products, including butter, cheese and yoghurt, for supply domestically and internationally.

Profile - Organic Macadamia Industry

Key facts

- The Macadamia tree (*Macadamia spp.*) is native to north east NSW and south east Queensland.
- The macadamia nut industry is based on cultivars of the two edible species - *Macadamia integrifolia* and *M. tetraphylla*. (other species are toxic to humans).
- Organic macadamia growers estimate their yield reduction to be 10–50% relative to expected yields from comparable conventional orchards, due to pest and/or disease damage. As a result, organic macadamia growers see the need to maintain a price premium of at least 20% as important to continued profitability, should pest or disease damage occur (DPI 2007)

North Coast profile

- North Coast is the only macadamia growing area in NSW.
- The North Coast macadamia industry is a significant driver of the rural economy.
- There are about 600 macadamia growers in the North Coast region, of which 31 (about 5%) are certified for organic production.
- The total area of all macadamia farms on the North Coast is 8,420 ha, with an annual turnover of about \$45 million (ELA 2015)
- According to ELA (2015), and based on 2011 ABS data, the NSW macadamia industry is declining moderately in terms of production and employment, but stable in terms of land base. More recent anecdotal evidence suggests that the NSW macadamia industry has recovered in the past 2-3 years, and along with the Queensland industry is now driving an expansion of the national macadamia industry.
- The 2014/2015 season is likely to be a record crop nationally, at about 47,000 tonnes in-shell (AMS 2015).
- The organic macadamia sector incorporates 31 producers in the NCLLS region (14% of all organic producers). Of these producers, a number are also processors and packagers (i.e. provide value added commodities including oils and snacks)
- Organic macadamias production is likely to generate the most revenue of any organic sector in the NCLLS region. While no definitive data are available, the indicative turnover is \$3 million to \$4 million, assuming organic growers have an equal representation of area as conventional growers, and obtain a price premium.

Prospects

The relatively high number of organic macadamia producers in the North Coast region suggests a level of success that may leverage other growers into the market. Organic processors are established to take and process raw organic macadamia kernels.

About 70% of all macadamia products grown in Australia are exported (to over 40 nations), thus there is considerable potential to increase the level of organic exports off what appears to be a currently low base.

Profile - Organic Garlic Industry

Key facts

- Garlic (*Allium sativum*; *A. ampeloprasum*) is a close relative of onions, leeks and chives.
- Garlic requires well drained soils and frequent watering
- Garlic is generally sown in April and harvested in November.
- Garlic is sold as bulbs or cloves
- ‘Scapes’ and flowers provide an additional but limited market
- Typically grown in small sub-hectare plots
- Typical yields for garlic is 6-8 tonnes/ha

North Coast profile

- The Australian Garlic Industry Association is based in Lawrence, NSW.
- Organic garlic is the most popular organic product in the North Coast region, with a total of 78 producers (35% of all organic producers).
- ‘Giant Australian’, ‘Russian’ or ‘Elephant’ garlic is the most popular.
- Although no data are available for the North Coast region, the annual output of organic garlic is likely to be 30-50 tonnes, assuming an average plot size of about 0.5 acres (0.1 ha) for each grower, and assuming not all certified growers produce a crop each year.
- Based on the above yield, it is estimated that organic garlic contributes about \$1 million per annum to the regional economy (about 8% of all return on fruit and vegetables)

Prospects

According to the NSW Department of Primary Industries (Hickey 2012), about 300 to 500 tonnes of garlic is produced in Australia each year, while consumption of fresh garlic is around 3,500 tonnes, imported mainly from China, Africa, Taiwan, New Zealand and the USA. Total market volume in 2014 was about 12,500 tonnes (AGIA 2015a), with most sourced from China.

The Australian garlic industry is limited due to a small grower base and pressure from China’s cheaper imports. However, China is increasingly known for using chemicals banned in Australia, thus its garlic tends to lack in flavour, and its spotlessly white colour is a result of bleaching as part of the import process (AGIA 2015a). Issues associated with quality of imported garlic are lifting the attractiveness of consuming home-grown garlic, and the Australian garlic industry is resurgent to consumer requests and becoming stronger as consumers return to the fresh, tasty, aromatic garlic grown throughout Australia (AGIA 2015a). The export potential of garlic also appears to be attractive given a global demand of about 25 million tonnes and a total global value of about \$15 billion (AGIA 2015a).

According to the AGIA Strategic Plan (AGIA 2015b), there are opportunities for improving efficiencies in the garlic market via mechanisation, and with various growing conditions and garlic varieties, there is potential to smooth out the production curve.

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