SUPPLY CHAIN PERSPECTIVE

HORTICULTURE

QTLC

QUEENSLAND TRANSPORT
AND LOGISTICS COUNCIL

Overview

Horticulture is Queensland's second largest primary industry, worth more than $2.5m a year.

Queensland is Australia's leading state for fruit and vegetable production, growing one-third of the nation's produce. The 2,800 horticultural farms located in Queensland produce more than 120 types of fruit and vegetables, and are located from Stanthorpe in the south to the Atherton Tablelands and Lakeland Downs in the far north.

Many varieties of fruit and vegetables are produced in seasonal windows different to other Australian states and territories, enabling year-round availability.

Queensland produce ranges from stone fruits and apples to traditional and Asian vegetables, and macadamias, and is responsible for the majority of Australia's banana, pineapple, mango, mandarin, avocado, beetroot and fresh tomato production[1].

Dimensions

Queensland is the largest producer of vegetables in Australia and the second largest producer of fruit. In 2013/14, Queensland's total vegetable production was estimated to be worth $1.211b and its total fruit production $1.547b.

Queensland produces more than 90% of Australia's bananas, worth $570m for 2013/14. It is also the biggest producer of tropical fruits, including mangoes, pineapples, avocados, limes and lychees. It is the second largest producer of strawberries, producing around one third of Australia's total, worth an estimated $170m in 2013/14.

Queensland produces more than 50% of Australia's tomatoes ($291m a year), approximately 75% of Australia's capsicums ($155m a year) and 40% of Australia's sweet corn ($38m a year). Queensland is also a major producer of beans, lettuce, pumpkins, mushrooms and herbs[2].

➲ People working in horticulture

Queensland has more than 25,000 people employed in horticulture[1].

➲ Horticulture businesses

There are approximately 2,800 horticultural farms in Queensland[3], with the following business profile[4]:

- 2,240 businesses have 1-19 employees
- 654 have 20-199 employees
- 52 have 200 or more employees
- 338 businesses earn more than $2m a year.

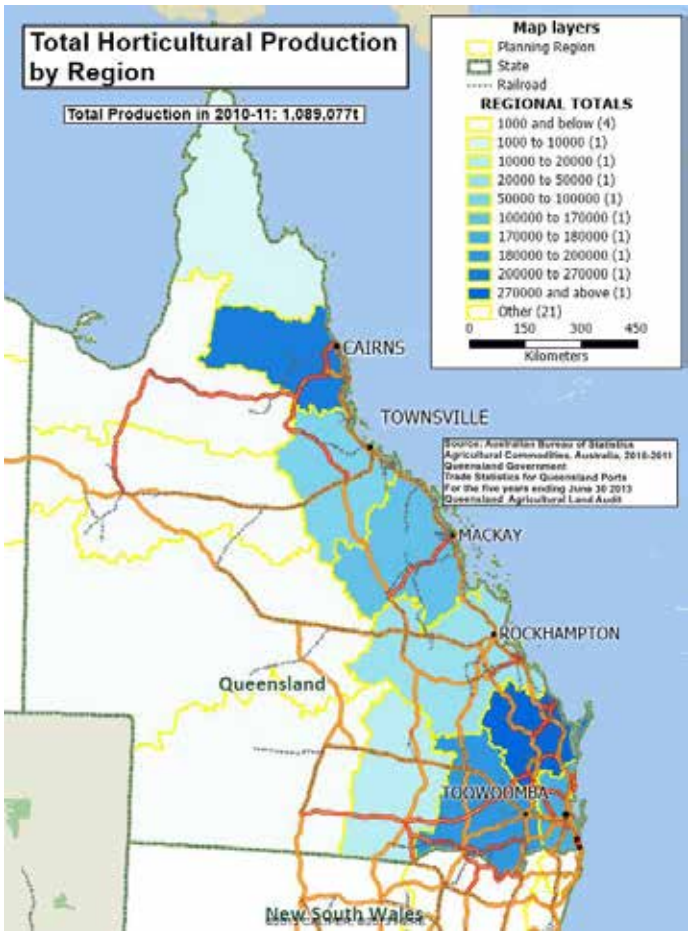
Areas of production

For annual horticulture (plants with a one-year life cycle), production currently occurs on 47,166 hecatre (0.03% of Queensland). The potential area for annual horticulture is much larger than the current area used, with 21.8 million hectares, or 12.7% of the state, suitable for horticultural development.

For perennial horticulture (plants that live for two or more years through multiple production cycles), production occurs on 87,829 hectares (0.05% of Queensland). The potential area for perennial horticulture is also much larger than the area currently used, with 12.8 million hectares, or 7.5% of the state, suitable for this purpose[5].

Figure 1 displays Queensland horticulture production by region.

Figure 1: Queensland horticulture - Tonnes of production by region



Source: Australian Bureau of Statistics

'71210DO007_201011 Agricultural Commodities, Australia, 2010-11', 2011

1 Queensland Agricultural Land Audit, Statewide Overview: Department of Agriculture, Fisheries and Forestry May 2013
2 State of Queensland Agriculture Report, June 2014: Department of Agriculture, Fisheries and Forestry
3 Queensland Agricultural Land Audit, Statewide Overview: Department of Agriculture, Fisheries and Forestry May 2013
4 ABS 816501 Number of Australian Businesses 30 June 2012
5 Queensland Agricultural Land Audit, Statewide Overview: Department of Agriculture, Fisheries and Forestry May 2013

Table 1 provides detail of horticultural production by produce category and tonnes by region.

Table 1: Fruit, vegetable and nut production by region

TONNES OF PRODUCTION	TOTAL VEGETABLES	Citrus fruit	Total stone fruit	Pome fruit	Nuts	Other orchard fruit	Berry fruit	Other fruit	Grapes	TOTAL FRUIT and NUTS	TOTAL VEG, FRUIT & NUTS
Wide Bay Burnett	**119,819**	101,241	503	0	10,174	10,387	612	26,993	626	**149,910**	**270,354**
Cairns	**45,079**	4,436	5	0	94	7,396	29	180,046	0	**192,007**	**237,086**
South East Queensland	**111,661**	3,381	594	0	2,849	2,875	9,854	39,861	9	**59,413**	**171,083**
Mackay, Isaac and Whitsunday	**103,181**	54	0	0	3	3,968	51	840	0	**4,916**	**108,097**
Darling Downs	**50,305**	14	5,591	36,552	26	1,348	703	54	1,279	**44,289**	**95,872**
Toowoomba	**84,259**	0	286	0	0	778	0	45	0	**1,109**	**85,368**
Townsville Region	**39,398**	475	0	0	0	7,067	0	4,944	114	**12,486**	**51,998**
Far North Queensland	**4,253**	6,002	0	0	0	7,197	0	10,829	42	**24,028**	**28,323**
Central Queensland	**6,510**	3,022	0	0	191	758	1	10,472	5,524	**14,444**	**26,477**
Maranoa Balonne	**7,198**	8	0	0	0	0	0	0	4,616	**8**	**11,822**
Cape York	**1,168**	38	0	0	160	15	0	121	0	**334**	**1,502**
South West Queensland	**0**	0	0	0	0	0	0	0	559	**0**	**559**
North West Queensland	**0**	0	368	0	0	0	0	0	0	**368**	**368**
Gulf Regional	**0**	0	0	0	0	167	0	0	0	**167**	**167**
Central West Queensland	**0**	0	0	0	0	0	0	0	0	**0**	**0**
TOTALS	**572,830**	118,671	7,348	36,552	13,497	41,954	11,251	274,205	12,769	**503,479**	**1,089,077**

Source: Australian Bureau of Statistics

'71210DO007_201011 Agricultural Commodities, Australia, 2010-11', 2011

Points of value add, transformation and consumption

Queensland's horticultural products are mainly sold on the domestic fresh markets, with only a lesser amount processed or value added [6]. Much of the value adding or transformation activity is in the form of packaged produce.

Australian export trade volumes for fruit and vegetables are low, equating to 7% of production. 77% of volume market share is attributable to the retail market channel [7]. Major retailers hold around 60% of the total market.

The areas of consumption, as well as the amount consumed in each area, are directly proportional to population. However, the broad variation between the produce types that comprise the horticulture sector creates a complex supply chain structure. Factors such as available production volumes, seasonality, perishability and the dominance of Queensland's production in some products, dictate this complexity.

In supply chain management terms, the horticulture sector has many discrete supply chains. To illustrate this point, the example of bananas will be used.

EXAMPLE: BANANAS

Far North Queensland produces more than 90% of Australia's bananas, worth $570m annually. These are generally packed on-farm and consolidated on the farm or locally. Transport to Brisbane and more distant markets is mainly done by full road vehicle loads with some rail used.

The choice of mode and movement configuration are determined by distance to market, customer's volume and timing requirements, and the availability of rail capacity.

Far North Queensland's banana production services all Australian markets and is supported by other state-based regional production. Customer types are dominated by grocery produce distribution centres and central markets, often via specialist market agents [8].

Bananas require a type of processing (ripening) before the point of consumption. This is now often conducted by the major chains for their own requirements or by the specialist market agents [9].

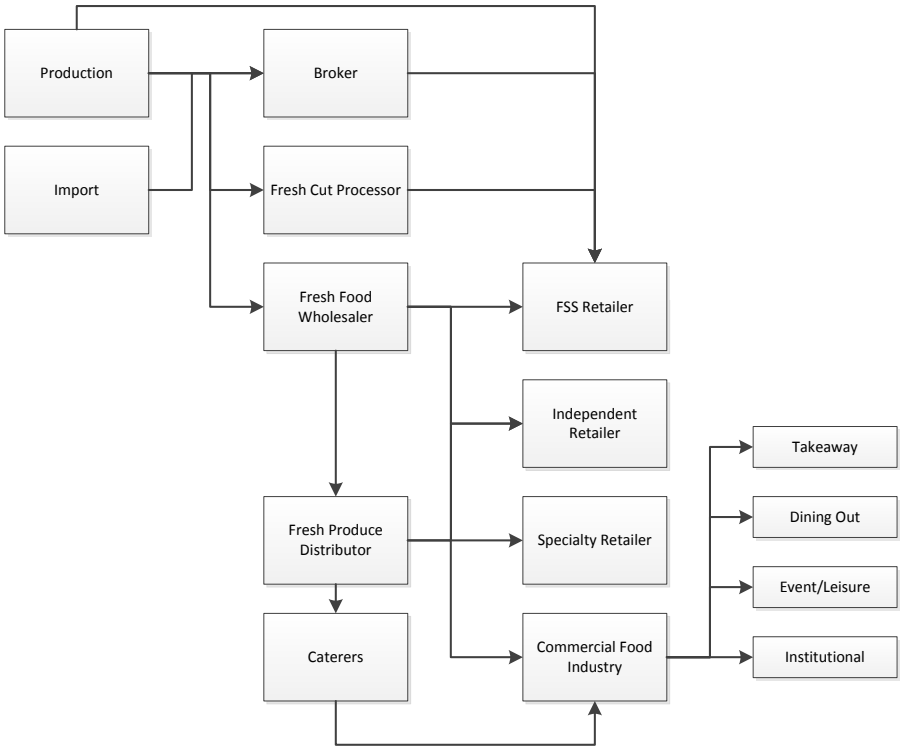
The banana supply chain is similar to produce such as orchard fruits, green vegetables, hard vegetables, melons and nuts, in that the goods enter the fast-moving consumer goods (FMCG) supply chains at the retailer distribution centres or via the central market systems.

While varying in structure based on the specific characteristics of the product type, the various horticulture supply chains involve a mixture of the following tasks:

- on-farm processing and packing
- local transport
- local (in area of production) packing and consolidation, including storage
- to-market transport
- marketing agents, including specialist processors/ packers
- retailer distribution centres and central markets.

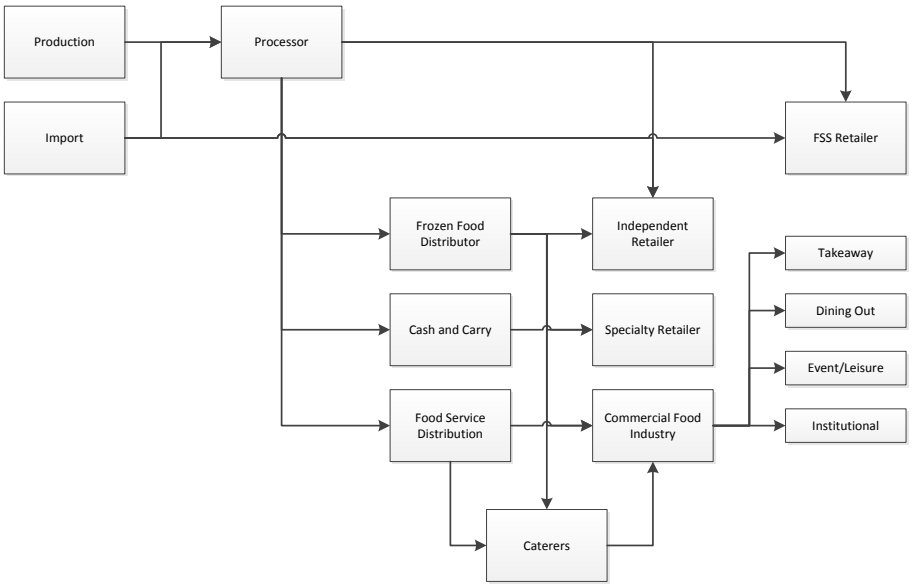
6 Queensland Agricultural Land Audit, Statewide Overview: Department of Agriculture, Fisheries and Forestry May 2013
7 State of Queensland Agriculture Report, June 2014: Department of Agriculture, Fisheries and Forestry
8 Banana Facts: www.australianbananas.com.au/banana-facts
9 Banana Facts: www.australianbananas.com.au/banana-facts

Figure 2: Fresh fruit and vegetable - Channels to consumer



Source: FOODmap, An analysis of the Australian food supply chains: Department of Agriculture, Fisheries and Forestry

Figure 3: Processed fruit and vegetable - Channels to consumer



Source: FOODmap, An analysis of the Australian food supply chain: Department of Agriculture, Fisheries and Forestry

Figures 2 and 3 display an overview of the supply chain structures for horticulture. Each individual horticultural commodity will fall into single or multiple channels, based on characteristics such as method of production and processing, volume of production and end use.

Freight movements

Horticulture generates the equivalent of approximately 47,350 single trip B-Double movements. This estimate is based on the total annual statewide tonnage (1,089,079 tonnes[10]) and using a 23-tonne average payload (provided by industry sources).

This reflects the profile of vehicle movements from the region of origin to the marketplace. However, a majority of the produce would move more than once, for example:

- from farm to regional hub or market
- from market to retailer.

The 34-pallet B-Double is recognised as an efficient option for horticulture movements, providing a time-to-market advantage. Industry sources advise that rail is used to transport bananas in 40 foot refrigerated containers from Innisfail, mainly to Brisbane and Melbourne markets. The volume moved by rail is variable, reaching more than 30 movements per week at seasonal peaks.

10 Australian Bureau of Statistics '71210DO007_201011 Agricultural Commodities, Australia, 2010-11', 2011

Transport mode

Conventional road transport equipment is widely used, with vehicles ranging from smaller rigid vehicles for at-farm and to-consolidation transport, through to high performance vehicle (HPV) combinations for transport to the more distant markets. The vehicle profile is also dependent on the commodity being transported, as individual produce types often have specific temperature and environment control requirements.

Main routes

Table 2 displays the point of origin and annual production for individual produce lines yielding more than 10,000 tonnes a year. This production volume represents a transport task equating to more than two standard articulated semi-trailers per day.

Figures4 and 5 show the origin of the major volume products relative to the freight network. The information is included to further demonstrate the diversity of production locations and product types, and therefore the complexity of the supply chain task in horticulture.

Table 2: Horticulture production - Ranked volumes by product by region

CATEGORY	REGION	TONNES	% of QLD	CATEGORY	REGION	TONNES	% of QLD
Bananas	Cairns	176,642	16.2%	Melons	Wide Bay Burnett	16,210	1.5%
Tomatoes	Wide Bay Burnett	69,363	6.4%	Melons	Townsville Region	13,442	1.2%
Mandarins	Wide Bay Burnett	66,914	6.1%	Melons	Darling Downs	13,396	1.2%
Tomatoes	Mackay, Isaac & Whitsunday	47,068	4.3%	Lettuce	Darling Downs	12,676	1.2%
Pineapples	South East Queensland	38,226	3.5%	Melons	Mackay, Isaac & Whitsunday	12,374	1.1%
Apples	Darling Downs	36,249	3.3%	Pumpkins	South East Queensland	11,643	1.1%
Potatoes	Cairns	29,853	2.7%	Lettuce	South East Queensland	11,370	1.0%
Lettuce	Toowoomba	29,520	2.7%	Capsicums	Wide Bay Burnett	10,866	1.0%
Pineapples	Wide Bay Burnett	25,353	2.3%	Lemons & limes	Wide Bay Burnett	10,543	1.0%
Capsicums	Mackay, Isaac & Whitsunday	23,186	2.1%	Potatoes	Toowoomba	10,518	1.0%
Carrots	South East Queensland	22,070	2.0%	Pineapples	Central Queensland	10,466	1.0%
Onions	South East Queensland	16,569	1.5%	Lemons	Wide Bay Burnett	10,053	0.9%
		581,012	53.3%			143,557	13.2%

Source: Australian Bureau of Statistics

'71210DO007_201011 Agricultural Commodities, Australia, 2010-11', 2011

Figure 4: Major horticulture production by type by area

Source: Australian Bureau of Statistics

'71210DO007_201011 Agricultural Commodities, Australia, 2010-11', 2011

Figure 5: Major horticulture production by type by area

Source: Australian Bureau of Statistics

'71210DO007_201011 Agricultural Commodities, Australia, 2010-11', 2011

Key nodal infrastructure

Key nodes of activity are:

- farms and areas of production
- rural consolidation hubs
- ripening and pre-packing facilities
- food processing facilities
- produce markets, usually being one main market in each state with some smaller regional markets
- FMCG distribution centres.

Change in the supply chain

In recent years, major grocery retailers have established direct commercial relationships with growers as opposed to receiving produce via central markets. This change to the supply chain has had little or no impact to the transport task as the retailer's distribution centres are also located within major population areas, limiting the potential for HPV.

The advances in freight vehicle technology have been concurrent with the direct sourcing strategy of the major retailers. Accordingly, the productivity advantages of B-Double configurations and higher capacity trailers have been implemented.

Given the location of marketplaces in major population centres, it is not expected that the recent and future advances in HPVs will have any significant impact on this supply chain. As B-Doubles are a major unit of movement, changes on the main B-Double routes in line with performance-based standards (PBS) increases will be beneficial.

For movements of large volumes from Far North Queensland to the Brisbane and Melbourne markets, notably bananas, rail may increase market share. This is likely to occur:

- in line with organic growth, and/or
- when road cost increases in operational inputs such as fuel are not be able to be offset against significant gains in vehicle productivity.

Horticulture movements by road from northern Queensland to southern markets will potentially access the inland freight route using HPV.